



SLOVENSKI STANDARD

oSIST prEN 17240:2023

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Inteligentni transportni sistemi - e-Varnost - Preskušanje skladnosti e-klica v zvezi pošiljatelj-prejemnik za paketno preklapne 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

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

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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

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.

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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.

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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.....	7
Introduction	8
1 Scope	9
2 Normative references	9
3 Terms and definitions	10
4 Symbols and abbreviations	15
5 Conformance	16
5.1 General	16
5.2 General conditions	16
6 General overview of the eCall transaction for pan-European eCall	17
7 How to use this Standard	21
7.1 Layout and procedures	21
7.2 System under test	22
7.3 Accelerated test procedures	22
7.4 Accelerated test procedures for IVS	23
7.4.1 Accelerated test procedures for all types of IVS	23
7.4.2 Additional accelerated test procedures for eCall-only IVS	25
7.5 Accelerated test procedures for MNOs	25
7.6 Accelerated test procedures for PSAPs	26
8 Requirements	28
8.1 Requirements — General objectives	28
8.1.1 State transitions	28
8.1.2 Classification of testing	34
8.1.3 CTP naming conventions	36
8.1.4 CTP <stage> naming convention for IVS conformance tests	37
8.2 CTP structure	37
8.3 IMS-eCall timers	39
9 Conformance test requirements for in-vehicle user equipment and systems (IVS)	39
9.1 Conformance test requirements for in-vehicle user equipment and systems for IMS-eCall	39
9.2 Test objectives and purposes	39
9.3 Classification of testing and referenced tests for in-vehicle user equipment for IMS-eCall	39
9.3.1 Taxonomy of testing	39
9.3.2 Referenced tests	40
9.4 State transition conformance tests for in-vehicle equipment and system to comply to Standards for IMS-eCall	40
9.4.1 Use case test objectives by stage	40
9.4.2 CTP 1.1.0.1 — Conformance to ETSI TS 136 523, ETSI TS 138 523 and ETSI TS 134 229 — IVS	43
9.4.3 CTP 1.1.0.2 — Test for conformance to valid SIM/USIM — IVS	44
9.4.4 CTP 1.1.0.3 — Automatic eCall triggering does not occur when engine control OFF — IVS	45

9.4.5	CTP 1.1.1.1 — Power on and self-test — IVS.....	46
9.4.6	CTP 1.1.2.1 — Test for automatic activation of eCall — IVS.....	47
9.4.7	CTP 1.1.2.2 — Automatically triggered eCall in progress was not disconnected upon a new eCall trigger — IVS.....	48
9.4.8	CTP 1.1.2.3 — Post-Lateral-crash performance of automatic trigger — IVS.....	49
9.4.9	CTP 1.1.2.4 — Post-frontal-crash performance of automatic trigger — IVS.....	50
9.4.10	CTP 1.1.2.5 — Performance of automatic trigger - Different crash types — IVS.....	51
9.4.11	CTP 1.1.3.1 — eCall manually activated — IVS.....	52
9.4.12	CTP 1.1.3.2 — Manually triggered eCall in progress was not disconnected upon a new eCall trigger — IVS.....	53
9.4.13	CTP 1.1.4.1 — Test eCall activated — IVS.....	54
9.4.14	CTP 1.1.5.1 — Network registration — IVS.....	55
9.4.15	CTP 1.1.5.2 — Manual termination of eCall by vehicle occupants not allowed (automatically triggered eCall) — IVS.....	56
9.4.16	CTP 1.1.5.3.1 — Manual termination of eCall by vehicle occupants not allowed (manually triggered eCall) — IVS.....	57
9.4.17	CTP 1.1.5.3.2 — Manual termination of eCall by vehicle occupants allowed (manually triggered eCall) — IVS.....	58
9.4.18	CTP 1.1.5.4 — Automatically triggered eCall in progress was not disconnected when engine control is switched to OFF — IVS.....	59
9.4.19	CTP 1.1.5.5 — Manually triggered eCall in progress was not disconnected when engine control is switched to OFF — IVS.....	60
9.4.20	CTP 1.1.5.6 — Priority over conflicting communication — IVS.....	61
9.4.21	CTP 1.1.6.2 — SIP Invite sent — IVS.....	62
9.4.22	CTP 1.1.7.1 — Establish session with urn:service:sos.ecall.automatic — IVS.....	63
9.4.23	CTP 1.1.8.1 — Establish session with urn:service:sos.ecall.manual — IVS.....	64
9.4.24	CTP 1.1.9.1 — Establish session with urn:service:test.sos.ecall — IVS.....	65
9.4.25	CTP 1.1.10.1 — eCall is attempted when no networks are available (limited service condition) — IVS.....	66
9.4.26	CTP 1.1.10.2 — Redial attempt completed within 2 min after eCall is dropped — IVS.....	67
9.4.27	CTP 1.1.10.5 — Test eCall is not attempted in limited service condition — IVS.....	68
9.4.28	CTP 1.1.10.6 — Remain registered after eCall is rejected and MSD acknowledged — IVS.....	69
9.4.29	CTP 1.1.10.7 — Redial after eCall is rejected and negative AL-ACK — IVS.....	71
9.4.30	CTP 1.1.10.8 — Redial after eCall is rejected and missing AL-ACK — IVS.....	72
9.4.31	CTP 1.1.10.9 — Redial after eCall is not answered — IVS.....	73
9.4.32	CTP 1.1.10.10 — Negative AL-ACK for initial MSD — IVS.....	74
9.4.33	CTP 1.1.10.11 — Missing AL-ACK for initial MSD — IVS.....	75
9.4.34	CTP 1.1.10.12 — IMS emergency call is attempted when no networks with set IMS eCall support indicator are available — IVS.....	76
9.4.35	CTP 1.1.10.13 — eCall is attempted when no networks with set IMS eCall support indicator are available — IVS.....	77
9.4.36	CTP 1.1.10.14 — IVS logs if initial MSD is not acknowledged — IVS.....	79
9.4.37	CTP 1.1.11.1 — Send MSD with indicator set to 'Automatically Initiated eCall' (AleC) — IVS.....	80
9.4.38	CTP 1.1.12.1 — Send MSD with indicator set to 'Manually Initiated eCall' (MleC) — IVS.....	81
9.4.39	CTP 1.1.13.1 — Send MSD with indicator set to 'Test Call' — IVS.....	82
9.4.40	CTP 1.1.15.1 — Voice link established — IVS.....	83
9.4.41	CTP 1.1.15.2 — Verify new/updated MSD received while eCall conversation in progress — IVS.....	84
9.4.42	CTP 1.1.16.2 — IVS clears down the eCall upon timer T2 expiry — IVS.....	85
9.4.43	CTP 1.1.16.3 — IVS registers recent eCalls — IVS.....	86
9.4.44	CTP 1.1.17.1 — Call-back allowed and able to be answered by IVS — IVS.....	87

prEN 17240:2023 (E)

9.4.45	CTP 1.1.17.2 — Call-back answered by IVS in the event of abnormal termination — IVS	88
9.4.46	CTP 1.1.17.3 — MSD transfer occurs upon PSAP request during call-back — IVS	89
9.4.47	CTP 1.1.17.4 – Remain registered for ≥ 1 hr — IVS	90
9.4.48	CTP 1.1.17.6 — No redial attempt in the event of abnormal termination after MSD ACK — IVS	91
9.4.49	CTP 1.1.18.1 — Compliance with MSD version 3 — IVS	93
9.4.50	CTP 1.1.18.2 — MSD transfer using in-band modem after negative AL-ACK — IVS	94
9.4.51	CTP 1.1.18.3 — MSD transfer using in-band modem after missing AL-ACK — IVS	96
9.4.52	CTP 1.1.18.4 — Conformance to ETSI TS 126 269 — IVS	98
9.4.53	CTP 1.1.18.5 — MSD transfer using IPv4 — IVS	99
9.4.54	CTP 1.1.18.6 — MSD transfer using IPv6 — IVS	100
9.5	State transition test descriptions for in-vehicle equipment and system to comply to Standards for IMS-eCall - additional tests for eCall-only systems	100
9.5.1	General	100
9.5.2	CTP 1.1.1.2 — IVS does not perform registration after power-up — eCall-only IVS	102
9.5.3	CTP 1.1.10.4 — Verify that PLMN registration procedure is executed upon initiating an eCall — eCall-only IVS	103
9.5.4	CTP 1.1.17.5 – Remain registered for ≥ 1 hr ≤ 12 hr — eCall-only IVS	104
10	Conformance tests for mobile network operators	105
10.1	Test objectives and purposes	105
10.1.1	General	105
10.1.2	Default assumptions	105
10.2	Taxonomy of testing and referenced tests	105
10.3	Use case conformance tests for mobile network operator systems to comply to Standards for IMS-eCall	105
10.3.1	Conformance requirement	105
10.3.2	Use case test objectives by stage	105
10.4	State transition test descriptions for mobile network operators to demonstrate compliance with IMS-eCall standards	106
10.4.1	General	106
10.4.2	CTP 2.0.1 — Keep SIMs/USIMs alive even though not in regular operation — MNO	108
10.4.3	CTP 2.0.2 — MNO supports general eCall relevant requirements — MNO	109
10.4.4	CTP 2.0.4 — Support IMS-eCall routing — MNO	111
10.4.5	CTP 2.1.2 — Accept registration - Roaming — MNO	112
10.4.6	CTP 2.2.1.1 — Establish automatically initiated eCall — MNO	113
10.4.7	CTP 2.2.1.2 — Route call to 'most appropriate' PSAP — MNO	114
10.4.8	CTP 2.2.1.3 — Provide IMS emergency data/caller ID — MNO	115
10.4.9	CTP 2.2.1.4 — Initial MSD transfer in an automatically initiated eCall — MNO	116
10.4.10	CTP 2.2.2.1 — Establish manually initiated eCall — MNO	117
10.4.11	CTP 2.2.2.4 — Initial MSD transfer in a manually initiated eCall — MNO	118
10.4.12	CTP 2.2.3.1 — Establish test eCall — MNO	119
10.4.13	CTP 2.2.3.3 — Provide test eCall data — MNO	120
10.4.14	CTP 2.2.3.4 — Initial MSD transfer in a test eCall — MNO	121
10.4.15	CTP 2.3.1.1 — MSD transfer using IPv4 — MNO	122
10.4.16	CTP 2.3.1.2 — MSD transfer using IPv6 — MNO	123
10.4.17	CTP 2.3.1.3 — New MSD transfer before call clear-down — MNO	124
10.4.18	CTP 2.3.1.4 — New MSD transfer using in-band modem before call clear-down — MNO	125
10.4.19	CTP 2.5.1 — Support call-back — MNO	126
10.4.20	CTP 2.5.2 — New MSD transfer during call-back — MNO	127
10.4.21	CTP 2.5.3 — Support call-back - Roaming — MNO	128
11	Conformance tests for PSAP systems	129

11.1	Test objectives and purposes.....	129
11.2	Taxonomy of testing.....	129
11.3	Use case conformance tests for PSAP systems to comply to Standards for IMS-eCall	129
11.3.1	Use case test objectives by stage.....	129
11.4	State transition conformance tests for PSAPs - IMS-eCall.....	130
11.4.1	General.....	130
11.4.2	CTP 3.1.0.1 — Provide MNOs with appropriate routing data — Member State/ PSAP ...	132
11.4.3	CTP 3.1.0.2 — Maintain map geo-information — PSAP.....	133
11.4.4	CTP 3.1.1.1 — Receive automatically initiated eCall — PSAP.....	134
11.4.5	CTP 3.1.1.2 — Receive manually initiated eCall — PSAP.....	135
11.4.6	CTP 3.1.1.3 — Receive test eCall — PSAP.....	136
11.4.7	CTP 3.1.2 — Interpret IMS emergency data - Caller ID and location — PSAP.....	137
11.4.8	CTP 3.1.7.1 — Receive MSD — PSAP.....	138
11.4.9	CTP 3.1.7.5 — Verify PSAP behaviour when MSD format check fails — PSAP.....	139
11.4.10	CTP 3.1.7.6 — Verify PSAP behaviour when MSD contains unknown optional additional data set — PSAP.....	140
11.4.11	CTP 3.1.7.7 — Verify PSAP behaviour when MSD contains ASN.1 extended data-elements — PSAP.....	141
11.4.12	CTP 3.1.7.8 — Verify PSAP behaviour when MSD contains ASN.1 extended data-values — PSAP.....	142
11.4.13	CTP 3.1.7.9 — Compliance with MSD version 2 — PSAP.....	143
11.4.14	CTP 3.1.7.10 — Compliance with MSD version 3 — PSAP.....	145
11.4.15	CTP 3.1.7.11 — Request MSD using in-band modem — PSAP.....	147
11.4.16	CTP 3.1.7.12 — Receive MSD using in-band modem — PSAP.....	149
11.4.17	CTP 3.1.7.13 — Receive MSD using IPv4 — PSAP.....	151
11.4.18	CTP 3.1.7.14 — Receive MSD using IPv6 — PSAP.....	152
11.4.19	CTP 3.1.7.15 — eCall is rejected and MSD acknowledged — PSAP.....	153
11.4.20	CTP 3.1.7.16 — MSD corrupted — PSAP.....	154
11.4.21	CTP 3.1.9 — Route voice and MSD to operator — PSAP.....	156
11.4.22	CTP 3.1.10 — Display IMS-eCall data and MSD to operator — PSAP.....	157
11.4.23	CTP 3.1.11 — Decode VIN — PSAP.....	158
11.4.24	CTP 3.1.12 — Talk to vehicle occupants — PSAP.....	159
11.4.25	CTP 3.1.13 — Request new MSD before call clear-down — PSAP.....	160
11.4.26	CTP 3.1.14.1 — Call clear-down — PSAP.....	161
11.4.27	CTP 3.1.15 — Call-back to vehicle — PSAP.....	162
11.4.28	CTP 3.1.16 — Request new/updated MSD after call clear-down — PSAP.....	163
11.4.29	CTP 3.1.17 — Record of not handled eCall — PSAP.....	164
12	Marking, labelling and packaging.....	165
13	Declaration of patents and intellectual property.....	165
	Annex A Void.....	166
	Annex B Void.....	167
	Annex C Void.....	168
	Annex D (informative) MSD examples for special PSAP tests.....	169
D.1	General.....	169
D.2	Example: standard MSD (version 3).....	170
D.3	Example: standard MSD (version 3) with 'unknown' OAD.....	173
D.4	Example: extended MSD (version 3).....	176
	added elements to MSDStructure and vehiclePropulsionStorageType.....	176
D.5	Example: standard MSD (version 3), extended valuelist.....	182

prEN 17240:2023 (E)

added element to VehicleType	182
Annex E (informative) Relation to EN 16454	187
E.1 Introduction	187
E.2 Relation of IVS tests.....	187
E.3 Relation of MNO tests.....	188
E.4 Relation of PSAP tests.....	189
Bibliography.....	190

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Document Preview

[oSIST prEN 17240:2023](https://standards.iteh.ai/catalog/standards/sist/b0d93d45-11db-44d5-abfa-e5e08d064afd/osist-pren-17240-2023)

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European foreword

This document (prEN 17240:2023) 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 17240:2018.

Part of this revision of the document has been aimed at making the document pure packet switched and removing references to eCall over circuit switched networks, this in order to make the document future proof.

The following changes have been introduced in this revision:

- Tests added to check for compliance with MSD version 3
- Tests added to check for support of IPv4 and IPv6
- Tests added to check for MSD transfer using in-band modem
- IVS tests added to check for special cases of eCall attempts
- PSAP test added to check for compliance with MSD version 2
- PSAP tests added to check for ASN.1 compliance
- Corrections in multiple tests, figures and tables
- Voided Annex A, B and C
- Added Annex D and E

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prEN 17240:2023 (E)

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 Point* (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*.

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 over packet switched networks.

European Regulations require support of *eCall* by *vehicle manufacturers*, 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* 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.

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. <https://standards.iteh.ai>
Document Preview

NOTE 3 The term PSAP (Public Safety Answering 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* 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* and cellular mobile networks.

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

1 Scope

This document specifies the key actors in the eCall chain of service provision using IMS over packet switched networks (such as LTE, 5G and their successors) as:

- 1) *In-Vehicle System (IVS)/vehicle,*
- 2) *Mobile Network Operator (MNO),*
- 3) *Public Safety Answering Point (PSAP),*

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

NOTE 1 Conformance tests are not appropriate nor required for *vehicle occupants*, 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* standard (EN 16102) does not specify the communications link between the vehicle and the *TPS service provider*.

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 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.

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.

The scope covers conformance testing 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 15722:2020, *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 16072:2022, *Intelligent transport systems — ESafety — Pan—European eCall operating requirements*

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

CEN/TS 17184:2022, *Intelligent transport systems — eSafety — eCall High level application Protocols (HLAP) using IMS packet switched networks*

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

prEN 17240:2023 (E)

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 123 401 (2022-09), *LTE; General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access (3GPP TS 23.401 version 16.13.0 Release 16)*

ETSI TS 123 501 (2023-01), *5G; System architecture for the 5G System (5GS) (3GPP TS 23.501 version 16.15.0 Release 16)*

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)*

ETSI TS 134 229-1 V16.2.0 (2022-08) or later, *Universal Mobile Telecommunications System (UMTS); LTE; Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); User Equipment (UE) conformance specification; Part 1: Protocol conformance specification (3GPP TS 34.229-1 version 16.2.0)*

ETSI TS 134 229-5 V16.3.0 (2022-08) or later, *5G; Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); User Equipment (UE) conformance specification; Part 5: Protocol conformance specification using 5G System (5GS) (3GPP TS 34.229-5 version 16.3.0)*

ETSI TS 136 523-1 V16.11.0 (2022-03) or later, *LTE; Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); User Equipment (UE) conformance specification; Part 1: Protocol conformance specification (3GPP TS 36.523-1 version 16.11.0)*

ETSI TS 138 523-1 V16.11.2 (2022-06) or later, *5G; LTE; 5GS; User Equipment (UE) conformance specification; Part 1: Protocol (3GPP TS 38.523-1 version 16.11.2)*

ETSI TS 126 269 V17.0.0 (2022-05) or later, *Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); eCall data transfer; In-band modem solution; Conformance testing (3GPP TS 26.269 version 17.0.0 Release 17)*

<https://standards.iteh.ai/catalog/standards/sist/b0d93d45-11db-44d5-abfa-e5e08d064afd/osist-pren-17240-2023>
ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

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)

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

concept 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

3.8

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*, 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* (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-capable

provision of *eCall service* with availability of wireless communication network to undertake other application services

prEN 17240:2023 (E)

3.11

eCall-only

provision of *eCall service* without availability of wireless communication network to undertake other application services

3.12

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

3.13

eCall generator

occupant of a vehicle or equipment within a vehicle that has caused to trigger an *eCall transaction* by automatic or manual means

3.14

eCall service

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

3.15

eCall transaction

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

3.16

emergency call response centre

term used in ITS Implementation Directive to mean *Public safety answering point* (PSAP)

3.17

established

created or set up

3.18

identifier

label, symbol or token that names or identifies an entity or a collection of *data* or the means of designating or referring to a specific instance of a *data concept*

3.19

IMS-eCall

an eCall making use of packet switched mobile network

3.20

in progress

taking place

3.21

in-vehicle equipment

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