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**Mobile Standards Group (MSG);
Pan-European eCall end to end and in-band modem
conformance testing;
Prose test specification**

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Contents

Intellectual Property Rights	9
Foreword.....	9
Modal verbs terminology.....	9
1 Scope	10
2 References	10
2.1 Normative references	10
2.2 Informative references.....	11
3 Abbreviations	12
4 Glossary.....	13
4.1 Intention of the glossary	13
4.2 General	13
4.3 States	13
4.4 Decisions	14
4.5 Procedures	14
4.6 Tester input / output, internal tester actions / trigger.....	15
5 Overview	16
5.1 Test definition methodology.....	16
5.1.1 Derivation of Test Case Descriptions from CEN EN 16454	16
5.1.2 Structure of Test Case Descriptions.....	16
5.1.3 Test Purposes	17
5.1.4 Pre-Test Conditions	17
5.1.5 Test Sequence	17
5.1.6 Final conditions	17
5.2 Abstract Test Architecture.....	17
5.2.0 Preface	17
5.2.1 Overview	17
5.2.1.1 IVS Testing	17
5.2.1.1.1 Test Model IVS	17
5.2.1.1.2 Interface descriptions.....	18
5.2.1.2 PSAP Testing	18
5.2.2 Interface Specifications.....	18
5.2.2.1 IVS Testing	18
5.2.2.1.0 Preface	18
5.2.2.1.1 IVS and Upper Tester.....	19
5.2.2.1.2 IVS and MNO	19
5.2.2.1.3 IVS and GNSS Simulator	20
5.2.2.2 MNO Testing	20
5.2.2.3 PSAP Testing	20
5.2.2.4 TPS-eCall Testing	20
5.2.3 State diagram	20
5.3 Specification in TTCN	23
5.4 Capabilities.....	23
5.5 Test Case Selection	24
5.6 Test Configuration Parameters	24
5.6.1 eCall Type Suffix.....	24
5.7 TTCN Implementation	24
5.8 Execution Guidelines	24
6 Generic Procedures.....	24
6.0 Preface.....	24
6.1 General	25
6.1.1 General assumptions	25
6.1.2 Generic procedures	25
6.1.2.0 Preface.....	25
6.1.2.1 Procedure for network registration.....	26

6.1.2.2	Procedure for eCall establishment.....	26
6.1.2.3	Procedure for eCall in progress.....	29
6.1.2.4	Procedure for eCall release (PSAP initiated).....	29
6.1.2.5	Procedure for eCall release (IVS initiated, preceding AL-ACK call clear down).....	29
6.1.2.6	Procedure for PSAP callback.....	29
6.2	Preambles.....	30
6.3	Postambles.....	33
6.3.0	Preface.....	33
6.3.1	Postambles for eCall capable devices.....	34
6.3.2	Postambles for eCall only devices.....	34
6.3.3	Special case: Limited Service Condition.....	34
7	Test Cases.....	34
7.1	In-vehicle equipment and system (IVS).....	34
7.1.1	Conformance tests for in-vehicle user equipment for Pan European eCall.....	34
7.1.1.1	CTP 1.1.0.1 Conformance to ETSI TS 102 936-1 and ETSI TS 102 936-2 - PE eCall IVS.....	34
7.1.1.2a	CTP 1.1.0.2 Test for conformance to valid SIM/USIM - PE eCall capable IVS.....	35
7.1.1.2a.1	Test Purpose (TP).....	35
7.1.1.2a.2	Test applicability.....	35
7.1.1.2a.3	Conformance requirements.....	35
7.1.1.2a.4	Test description.....	35
7.1.1.2b	CTP 1.1.0.2 Test for conformance to valid SIM/USIM - PE eCall only IVS.....	35
7.1.1.2b.1	Test Purpose (TP).....	35
7.1.1.2b.2	Test applicability.....	35
7.1.1.2b.3	Conformance requirements.....	35
7.1.1.2b.4	Test description.....	36
7.1.1.3	CTP 1.1.0.3 Automatic eCall triggering does not occur when ignition OFF - PE eCall IVS.....	36
7.1.1.3.1	Test Purpose (TP).....	36
7.1.1.3.2	Test applicability.....	36
7.1.1.3.3	Conformance requirements.....	36
7.1.1.3.4	Test description.....	36
7.1.1.4	CTP 1.1.1.1 Power on and self test - PE eCall IVS.....	37
7.1.1.4.1	Test Purpose (TP).....	37
7.1.1.4.2	Test applicability.....	37
7.1.1.4.3	Conformance requirements.....	37
7.1.1.4.4	Test description.....	37
7.1.1.5	CTP 1.1.2.1 eCall automatically activated - PE eCall IVS.....	37
7.1.1.5.1	Test Purpose (TP).....	37
7.1.1.5.2	Test applicability.....	38
7.1.1.5.3	Conformance requirements.....	38
7.1.1.5.4	Test description.....	38
7.1.1.6	CTP 1.1.2.2 Automatically triggered eCall in progress was not disconnected upon a new eCall trigger - PE eCall IVS.....	38
7.1.1.6.1	Test Purpose (TP).....	38
7.1.1.6.2	Test applicability.....	38
7.1.1.6.3	Conformance requirements.....	38
7.1.1.6.4	Test description.....	39
7.1.1.7	CTP 1.1.2.3 Post-side-crash performance of automatic trigger - IVS.....	39
7.1.1.7.1	Test Purpose (TP).....	39
7.1.1.7.2	Test applicability.....	39
7.1.1.7.3	Conformance requirements.....	39
7.1.1.7.4	Test description.....	39
7.1.1.8	CTP 1.1.2.4 Post-frontal-crash performance of automatic trigger - IVS.....	40
7.1.1.9	CTP 1.1.2.5 Performance of automatic trigger - different crash types - IVS.....	40
7.1.1.9.1	Test Purpose (TP).....	40
7.1.1.9.2	Test applicability.....	40
7.1.1.9.3	Conformance requirements.....	40
7.1.1.9.4	Test description.....	40
7.1.1.10	CTP 1.1.3.1 eCall manually activated - PE eCall IVS.....	41
7.1.1.10.1	Test Purpose (TP).....	41
7.1.1.10.2	Test applicability.....	41
7.1.1.10.3	Conformance requirements.....	41

7.1.1.10.4	Test description	41
7.1.1.11	CTP 1.1.3.2 Manually triggered eCall in progress was not disconnected upon a new eCall trigger - PE eCall IVS	42
7.1.1.11.1	Test Purpose (TP)	42
7.1.1.11.2	Test applicability	42
7.1.1.11.3	Conformance requirements	42
7.1.1.11.4	Test description	42
7.1.1.12	CTP 1.1.4.1 Test eCall activated - PE eCall IVS	43
7.1.1.12.1	Test Purpose (TP)	43
7.1.1.12.2	Test applicability	43
7.1.1.12.3	Conformance requirements	43
7.1.1.12.4	Test description	43
7.1.1.13	CTP 1.1.5.1 Network registration - PE eCall IVS	43
7.1.1.13.1	Test Purpose (TP)	43
7.1.1.13.2	Test applicability	44
7.1.1.13.3	Conformance requirements	44
7.1.1.13.4	Test description	44
7.1.1.14	CTP 1.1.5.2 Manual termination of eCall by vehicle occupants not allowed (automatically triggered eCall) - PE eCall IVS	44
7.1.1.14.1	Test Purpose (TP)	44
7.1.1.14.2	Test applicability	44
7.1.1.14.3	Conformance requirements	44
7.1.1.14.4	Test description	45
7.1.1.15	CTP 1.1.5.3 Manual termination of eCall by vehicle occupants not allowed (manually triggered eCall) - PE eCall IVS	45
7.1.1.15.1	Test Purpose (TP)	45
7.1.1.15.2	Test applicability	45
7.1.1.15.3	Conformance requirements	45
7.1.1.15.4	Test description	45
7.1.1.16	CTP 1.1.5.4 Automatically triggered eCall in progress was not disconnected when ignition is switched to OFF - PE eCall IVS	46
7.1.1.16.1	Test Purpose (TP)	46
7.1.1.16.2	Test applicability	46
7.1.1.16.3	Conformance requirements	46
7.1.1.16.4	Test description	46
7.1.1.17	CTP 1.1.5.5 Manually triggered eCall in progress was not disconnected when ignition is switched to OFF - PE eCall IVS	46
7.1.1.17.1	Test Purpose (TP)	46
7.1.1.17.2	Test applicability	46
7.1.1.17.3	Conformance requirements	47
7.1.1.17.4	Test description	47
7.1.1.18	CTP 1.1.5.6 Priority over conflicting communication - PE eCall IVS	47
7.1.1.18.1	Test Purpose (TP)	47
7.1.1.18.2	Test applicability	48
7.1.1.18.3	Conformance requirements	48
7.1.1.18.4	Test description	48
7.1.1.19	CTP 1.1.5.7 Network registration is re-tried when network registration attempt was not successful - PE eCall IVS	48
7.1.1.20a	CTP 1.1.6.1 Mute IVS and vehicle audio - PE eCall capable IVS	49
7.1.1.20a.1	Test Purpose (TP)	49
7.1.1.20a.2	Test applicability	49
7.1.1.20a.3	Conformance requirements	49
7.1.1.20a.4	Test description	49
7.1.1.20b	CTP 1.1.6.1 Mute IVS and vehicle audio - PE eCall only IVS	50
7.1.1.20b.1	Test Purpose (TP)	50
7.1.1.20b.2	Test applicability	51
7.1.1.20b.3	Conformance requirements	51
7.1.1.20b.4	Test description	51
7.1.1.21	CTP 1.1.7.1 Set-up TS12 call with eCall identifier (flag) set to "automatic" - PE eCall IVS	52
7.1.1.21.1	Test Purpose (TP)	52
7.1.1.21.2	Test applicability	52
7.1.1.21.3	Conformance requirements	52

7.1.1.21.4	Test description	52
7.1.1.22	CTP 1.1.8.1 Set-up TS12 call with eCall identifier (flag) set to "manual" - PE eCall IVS.....	52
7.1.1.22.1	Test Purpose (TP)	52
7.1.1.22.2	Test applicability	52
7.1.1.22.3	Conformance requirements.....	53
7.1.1.22.4	Test description	53
7.1.1.23	CTP 1.1.9.1 Set-up TS11 call to test number - PE eCall IVS	53
7.1.1.23.1	Test Purpose (TP)	53
7.1.1.23.2	Test applicability	53
7.1.1.23.3	Conformance requirements.....	53
7.1.1.23.4	Test description	53
7.1.1.24a	CTP 1.1.10.1 eCall is attempted when no networks are available (limited service condition with forbidden PLMN on SIM/USIM) - PE eCall IVS	54
7.1.1.24a.1	Test Purpose (TP)	54
7.1.1.24a.2	Test applicability	54
7.1.1.24a.3	Conformance requirements.....	54
7.1.1.24a.4	Test description	54
7.1.1.24b	CTP 1.1.10.1 eCall is attempted when no networks are available (limited service condition, location update rejected by network) - PE eCall IVS.....	55
7.1.1.24b.1	Test Purpose (TP)	55
7.1.1.24b.2	Test applicability	55
7.1.1.24b.3	Conformance requirements.....	55
7.1.1.24b.4	Test description	55
7.1.1.25	CTP 1.1.10.2 Re-dial attempt completed within 2 minutes after eCall is dropped - PE eCall IVS.....	56
7.1.1.25.1	Test Purpose (TP)	56
7.1.1.25.2	Test applicability	56
7.1.1.25.3	Conformance requirements.....	56
7.1.1.25.4	Test description	57
7.1.1.26	CTP 1.1.10.3 Duration of eCall Initiation signal - PE eCall IVS	57
7.1.1.26.1	Test Purpose (TP)	57
7.1.1.26.2	Test applicability	57
7.1.1.26.3	Conformance requirements.....	57
7.1.1.26.4	Test description	57
7.1.1.27	CTP 1.1.11.1 Send MSD with indicator set to "Automatically Initiated eCall" (AleC) - PE eCall IVS	58
7.1.1.27.1	Test Purpose (TP)	58
7.1.1.27.2	Test applicability	58
7.1.1.27.3	Conformance requirements.....	58
7.1.1.27.4	Test description	58
7.1.1.28	CTP 1.1.12.1 Send MSD with indicator set to "Manually Initiated eCall" (MleC) - PE eCall IVS.....	59
7.1.1.28.1	Test Purpose (TP)	59
7.1.1.28.2	Test applicability	59
7.1.1.28.3	Conformance requirements.....	59
7.1.1.28.4	Test description	59
7.1.1.29	CTP 1.1.13.1 Send MSD with indicator set to "Test eCall" - PE eCall IVS	59
7.1.1.29.1	Test Purpose (TP)	59
7.1.1.29.2	Test applicability	59
7.1.1.29.3	Conformance requirements.....	60
7.1.1.29.4	Test description	60
7.1.1.30	CTP 1.1.14.1 Verify MSD transfer - PE eCall IVS.....	60
7.1.1.30.1	Test Purpose (TP)	60
7.1.1.30.2	Test applicability	61
7.1.1.30.3	Conformance requirements.....	61
7.1.1.30.4	Test description	61
7.1.1.31	CTP 1.1.14.2 Un-mute IVS audio when AL-ACK received - PE eCall IVS	62
7.1.1.31.1	Test Purpose (TP)	62
7.1.1.31.2	Test applicability	62
7.1.1.31.3	Conformance requirements.....	62
7.1.1.31.4	Test description	62
7.1.1.32	CTP 1.1.15.1 Establish voice link to PSAP - PE eCall IVS.....	62
7.1.1.32.1	Test Purpose (TP)	62
7.1.1.32.2	Test applicability	63

7.1.1.32.3	Conformance requirements.....	63
7.1.1.32.4	Test description	63
7.1.1.33	CTP 1.1.15.2 MSD transfer request while eCall conversation in progress - PE eCall IVS	63
7.1.1.33.1	Test Purpose (TP)	63
7.1.1.33.2	Test applicability	64
7.1.1.33.3	Conformance requirements.....	64
7.1.1.33.4	Test description	64
7.1.1.34	CTP 1.1.15.3 eCall continuation when SEND MSD request not received (T5 expired) - PE eCall IVS	65
7.1.1.34.1	Test Purpose (TP)	65
7.1.1.34.2	Test applicability	65
7.1.1.34.3	Conformance requirements.....	65
7.1.1.34.4	Test description	65
7.1.1.35	CTP 1.1.15.4 Call continuation when AL-ACK not received (T6 expired) - PE eCall IVS	66
7.1.1.35.1	Test Purpose (TP)	66
7.1.1.35.2	Test applicability	66
7.1.1.35.3	Conformance requirements.....	66
7.1.1.35.4	Test description	66
7.1.1.36	CTP 1.1.15.5 MSD is transferred continuously until T7 expires and IVS reconnects loudspeaker and microphone on its expiry - PE eCall IVS	67
7.1.1.36.1	Test Purpose (TP)	67
7.1.1.36.2	Test applicability	67
7.1.1.36.3	Conformance requirements.....	67
7.1.1.36.4	Test description	67
7.1.1.37	CTP 1.1.16.1 Clear down call automatically - PE eCall IVS	68
7.1.1.37.1	Test Purpose (TP)	68
7.1.1.37.2	Test applicability	68
7.1.1.37.3	Conformance requirements.....	68
7.1.1.37.4	Test description	68
7.1.1.38	CTP 1.1.16.2 IVS clears down the eCall upon T2 expiry - PE eCall IVS	69
7.1.1.38.1	Test Purpose (TP)	69
7.1.1.38.2	Test applicability	69
7.1.1.38.3	Conformance requirements.....	69
7.1.1.38.4	Test description	70
7.1.1.39	CTP 1.1.16.3 IVS registers recent eCalls - PE eCall IVS	70
7.1.1.39.1	Test Purpose (TP)	70
7.1.1.39.2	Test applicability	70
7.1.1.39.3	Conformance requirements.....	71
7.1.1.39.4	Test description	71
7.1.1.40	CTP 1.1.17.1 Call-back allowed and able to be answered by IVS - PE eCall IVS	71
7.1.1.41	CTP 1.1.17.2 Call-back answered by IVS in the event of abnormal termination - PE eCall IVS	71
7.1.1.41.1	Test Purpose (TP)	71
7.1.1.41.2	Test applicability	72
7.1.1.41.3	Conformance requirements.....	72
7.1.1.41.4	Test description	72
7.1.1.42	CTP 1.1.17.3 MSD transfer occurs upon PSAP request during call-back - PE eCall IVS	73
7.1.1.42.1	Test Purpose (TP)	73
7.1.1.42.2	Test applicability	73
7.1.1.42.3	Conformance requirements.....	73
7.1.1.42.4	Test description	73
7.1.1.43	CTP 1.1.17.4 Remain registered for ≥ 1 hr - PE eCall IVS.....	74
7.1.1.43.1	Test Purpose (TP)	74
7.1.1.43.2	Test applicability	74
7.1.1.43.3	Conformance requirements.....	74
7.1.1.43.4	Test description	74
7.1.2	Conformance tests for in-vehicle user equipment for Pan European eCall - additional tests for eCall only systems.....	75
7.1.2.1	CTP 1.1.1.2 IVS does not perform registration after power-up - PE eCall only IVS.....	75
7.1.2.1.1	Test Purpose (TP)	75
7.1.2.1.2	Test applicability	75
7.1.2.1.3	Conformance requirements.....	75
7.1.2.1.4	Test description	75

7.1.2.2	CTP 1.1.1.3 IVS periodically scans and maintains a list of available PLMNs - PE eCall only IVS.....	76
7.1.2.3	CTP 1.1.10.4 Verify that PLMN registration procedure is executed upon initiating an eCall - PE eCall only IVS.....	76
7.1.2.3.1	Test Purpose (TP).....	76
7.1.2.3.2	Test applicability.....	76
7.1.2.3.3	Conformance requirements.....	76
7.1.2.3.4	Test description.....	76
7.1.2.4	CTP 1.1.17.5 Remain registered for ≥ 1 hr ≤ 12 hr - PE eCall only IVS.....	77
7.1.2.4.1	Test Purpose (TP).....	77
7.1.2.4.2	Test applicability.....	77
7.1.2.4.3	Conformance requirements.....	77
7.1.2.4.4	Test description.....	77
7.1.3	Conformance tests for in-vehicle user equipment for Pan European eCall via a third party service provider.....	78
7.1.4	Minimum Performance requirements for in-vehicle user equipment for Pan-European eCall.....	78
7.1.4.1	MSD transmission time for different channel conditions.....	78
7.1.4.1.1	Definition.....	78
7.1.4.1.2	Conformance requirements.....	78
7.1.4.1.3	Test purpose.....	78
7.1.4.1.4	Method of test.....	78
7.1.4.1.5	Test requirements.....	80
7.1.4.2	MSD transmission time in noisy conditions.....	80
7.1.4.3	MSD transmission time with scaling of PCM signals.....	80
7.2	Mobile Network Operators.....	80
7.3	PSAP Systems.....	80
7.4	TPS-eCall.....	80
Annex A (informative):	Recommended test case applicability.....	81
History.....		84

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Mobile Standards Group (MSG).

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

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1 Scope

The present document specifies the Pan-European eCall end to end and in-band modem conformance testing.

This is a complete test specification. The following information can be found in the present document:

- the overall test structure;
- the test configurations;
- the conformance requirement and reference to the core specifications;
- the test purposes; and
- a brief description of the test procedure, the specific test requirements and <eventually> short message exchange table;
- the default setting of the test parameters;
- the applicability of each test case.

The present document is valid for a Pan-European (PE) eCall IVS.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents are necessary for the application of the present document.

- [1] CEN EN 16454:2015: "Intelligent transport systems - ESafety - ECall end to end conformance testing".
- [2] ETSI TS 134 123-1: "Universal Mobile Telecommunications System (UMTS); User Equipment (UE) conformance specification; Part 1: Protocol conformance specification (3GPP TS 34.123-1)".
- [3] ETSI TS 102 936-1 (V1.1.1) (2011-04): "eCall Network Access Device (NAD) conformance specification; Part 1: Protocol test specification".
- [4] ETSI TS 102 936-2 (V1.1.1) (2011-04): "eCall Network Access Device (NAD) conformance specification; Part 2: Test suites".
- [5] ETSI TS 126 269 (V13.0.0) (2015-09): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); eCall data transfer; In-band modem solution; Conformance testing (3GPP TS 26.269 version 13.0.0 Release 13)".
- [6] CEN EN 16062:2015: "Intelligent transport systems - ESafety - eCall high level application requirements (HLAP) using GSM/UMTS circuit switched networks".
- [7] ETSI TS 127 007: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; AT command set for User Equipment (UE) (3GPP TS 27.007)".

- [8] CEN EN 16072:2015: "Intelligent transport systems - ESafety - Pan-European eCall operating requirements".
- [9] ETSI TS 151 010-1: "Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) conformance specification; Part 1: Conformance specification (3GPP TS 51.010-1)".
- [10] ETSI TS 136 508: "LTE; Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); Common test environments for User Equipment (UE) conformance testing (3GPP TS 36.508)".
- [11] ETSI TS 124 008: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Mobile radio interface Layer 3 specification; Core network protocols; Stage 3 (3GPP TS 24.008)".
- [12] CEN EN 15722:2015: "Intelligent transport systems - ESafety - ECall minimum set of data".
- [13] ETSI TR 126 969: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); eCall data transfer; In-band modem solution; Characterization report (3GPP TR 26.969)".
- [14] Directive 96/27/EC of the European Parliament and of the Council of 20 May 1996 on the protection of occupants of motor vehicles in the event of a side impact and amending Directive 70/156/EEC or equivalent Regulation No 95 of the Economic Commission for Europe of the United Nations (UN/ECE) Uniform provisions concerning the approval of vehicles with regard to the protection of the occupants in the event of a lateral collision. Addendum 94: Regulation No 95.
- NOTE: Available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:313:0001:0057:EN:PDF>.
- [15] ETSI TS 100 910: "Digital cellular telecommunications system (Phase 2+); Radio Transmission and Reception (3GPP TS 05.05)".

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] ETSI TS 103 321: "Mobile Standards Group (MSG); eCall HLAP Conformance Testing; Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT)".
- [i.2] ETSI MSG(14)042005r1: "STF483(eCallHLAPTesting)-Feedback-CEN16454".
- [i.3] 3GPP RAN5 PRD 13: "3rd Generation Partnership Project; Technical Specification Group RAN WG5; Permanent Reference Document (PRD); EPS (E-UTRAN & EPC) TC prose specification requirements".
- [i.4] ISO 15031-3:2004: "Road vehicles -- Communication between vehicle and external equipment for emissions-related diagnostics -- Part 3: Diagnostic connector and related electrical circuits, specification and use".
- [i.5] ETSI TS 134 108: "Universal Mobile Telecommunications System (UMTS); LTE; Common test environments for User Equipment (UE); Conformance testing (3GPP TS 34.108)".
- [i.6] ETSI TS 122 011: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Service accessibility (3GPP TS 22.011)".

- [i.7] ETSI TS 123 122: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Non-Access-Stratum (NAS) functions related to Mobile Station (MS) in idle mode (3GPP TS 23.122)".

3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ACK	ACKnowledgement
AL	Application Layer
AL-ACK	Application Layer ACKnowledgement
AT	ATtention
CAN	Controller Area Network
CEN	European Committee for Standardization
CM	Communication Management
CTP	Conformance Test Point
DFT	De-registration Fallback Timer
ECE	(United Nations) Economic Commission for Europe
EN	European Norm
FDN	Service n°2 Service Dialling Numbers
GERAN	GSM/EDGE Radio Access Network
GNSS	Global Navigation Satellite System
GSM	Global System for Mobile Communications
HLAP	Higher Layer Application Protocol
HMI	Human Machine Interface
ICS	Implementation Conformance Statement
IE	Information Element
IGN_ON	IGNition ON
IMSI	International Mobile Subscriber Identity
ISO	International Standardization Organization
IVS	In-Vehicle System
LL	Link Layer
LL-ACK	Link Layer ACKnowledgement
MM	Mobility Management
MMI	Man Machine Interface
MNO	Mobile Network Operator
MS	Mobile Station
MSD	Minimum Set of Data
MSG	Mobile Standards Group
NACK	Negative ACKnowledge
NAD	Network Access Device
PE	Pan-European
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation Extra Information for Testing
PLMN	Public Land Mobile Network
PRD	Permanent Reference Document
PSAP	Public Safety Answering Point
RACH	Random Access CHannel
RAN	Radio Access Network
RRC	Radio Resource Control
SDN	Service n°4 Service Dialling Numbers
SIM	Subscriber Identity Module
SS	System Simulator
STF	Special Task Force
TC	Test Case
TMSI	Temporary Mobile Subscriber Identity
TP	Test Purpose
TTCN	Testing and Test Control Notation
UE	User Equipment
UMTS	Universal Mobile Telecommunications System
USIM	Universal Subscriber Identification/Identity Module

4 Glossary

4.1 Intention of the glossary

For eCall there exist several specifications that use different wording. The main intention of the glossary is to provide background information on the formulations used in the present document, especially in figures 5.2.3-1 to 5.2.3-3, and to prevent ambiguities. The expressions are used throughout the whole document e.g. in the test case section as well. Please note that other documents may contain the same formulation with a different meaning.

The state diagram introduces several categories (see legend in Figure 5.2.3-1) according to which the glossary is sorted:

- States are the mirrored states of the IVS as perceived monitored at the tester. A mirror state will remain until there is any tester input / output, internal tester actions / trigger.
- Decisions are alternatives in the process. The tester makes the decision.
- Procedures describe multiple step message exchange between the IVS and the MNO/PSAP / tester. The messages may vary for different Radio Access Technologies used.
- Tester input / output, internal tester actions / trigger are events that enable a state transition. The tester input and tester output are visible on the interfaces between the IVS, the tester and the user interface. The internal tester actions / trigger are not visible on any interface but necessary within the tester to emulate the timers running in the IVS and the PSAP and enable the tester to check for correct behaviour e.g. in case of expiry of a timer. A detailed description of the timers is available in CEN EN 16062 [6], annex A.

4.2 General

PE eCall capable IVS	PE eCall capable IVS are devices that comprise commercial UE functionality as well as eCall service.
PE eCall only IVS	PE eCall only IVS support only eCall service.
PE eCall IVS	The expression PE eCall IVS comprises both kind of devices: PE eCall capable IVS and PE eCall only IVS.

4.3 States

IGNITION OFF	The vehicle ignition is switched off, i.e. the vehicle battery does not supply the IVS module with power. The IVS module is unpowered.
Self-test	The self-test is ongoing within the IVS.
IGNITION ON eCall INACTIVE / IDLE, registered	This is the normal state of the IVS during vehicle operation when no eCall has been triggered. Depending on the device capability the device is either registered to the network (IDLE, registered) for a PE eCall capable IVS or not registered to the network (eCall INACTIVE) for a PE eCall only IVS.
False triggering "eCall activation"	In case the vehicle occupants trigger a manual eCall by mistake they can cancel / abort the call during the time period T1.
Waiting for HMI alert	This state follows T1 expiry and ends with the IVS sending an HMI alert to the vehicle occupants.
In-band modem connected	In this state the mobile network connection is completed and the in-band modem message exchange can start.
Wait for end of initiation signal	Initiation signal transmission is ongoing.
Modems in sync	IVS and PSAP modems are synchronized.
MSD tx done / check whether successful	The MSD transmission is finalized.
E112 - voice call	Successful completion of the procedure "Connect voice" leads to the state "E112 - voice call". The in-band modem connection has switched from data transmission mode to a voice connection.
Call cleared callback possible IDLE registered	In this state the PE eCall IVS stays registered to support callback functionality from the PSAP after an eCall is cleared down.