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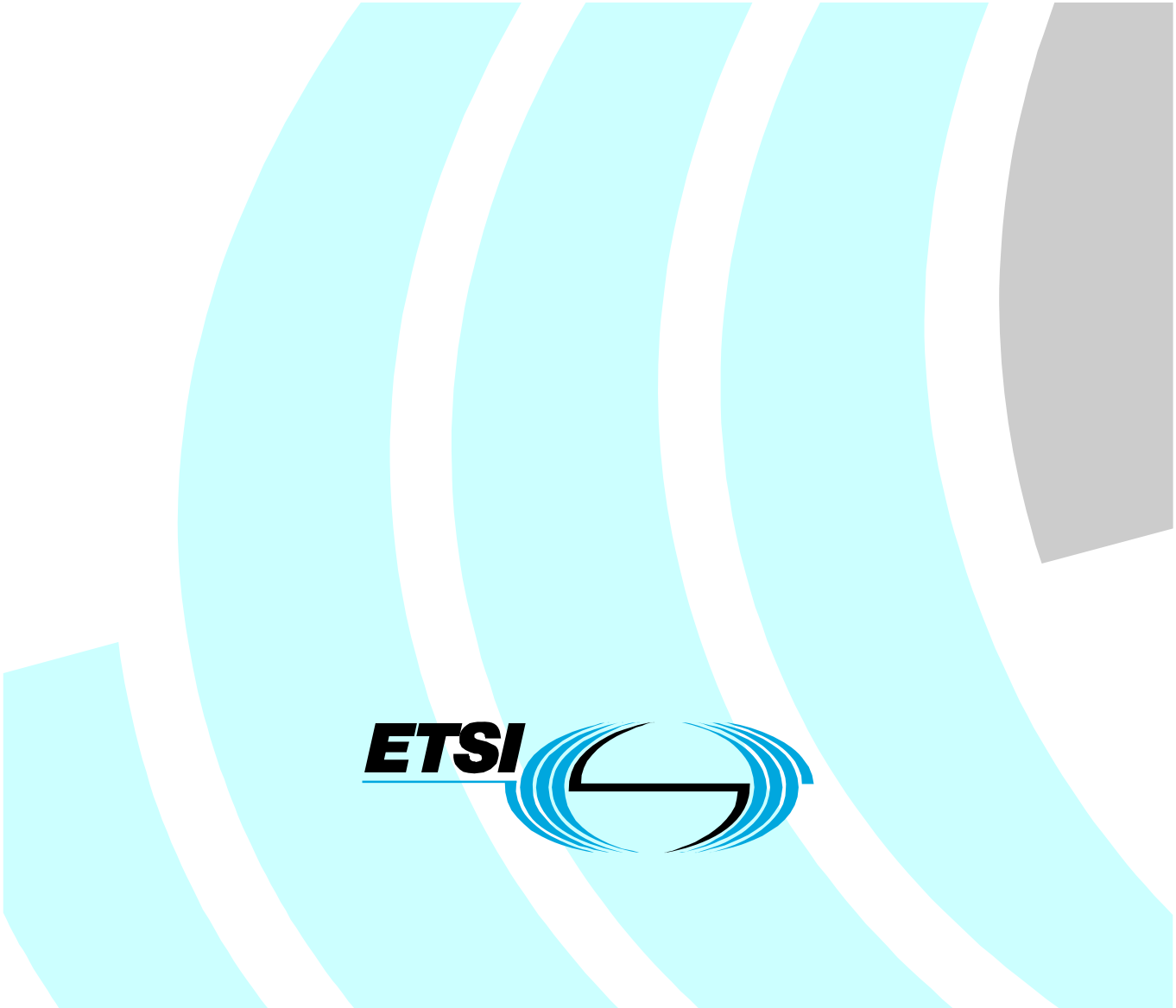
Technical Specification

eCall Network Access Device (NAD) conformance specification; Part 1: Protocol test specification



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Foreword

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

The present document is part 1 of a multi-part deliverable covering eCall Network Access Device (NAD) conformance specification as identified below:

Part 1: "Protocol test specification";

Part 2: "Test suites".

The present document may refer to technical specifications or reports using their 3GPP identities, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under http://webapp.etsi.org/key/queryform.asp.

Introduction

Following a decision of the European Parliament, and a request by the European Commission to ETSI, ETSI TC MSG was tasked with managing the technical specification and creation of open standards for the Pan-European eCall emergency service.

An eCall is an emergency voice call, initiated manually or automatically from a vehicle to a Public Safety Answering Point (PSAP), supplemented by up to 140 bytes of incident related data. The Minimum Set of Data (MSD) has been defined by CEN Technical Committee 278 and includes the GNSS derived location and direction of travel of the vehicle, the Vehicle Identification Number (VIN) and other information to enable the emergency response teams to quickly locate and provide medical and other life saving assistance to the accident victims.

eCall has been designed to operate over any PLMN that supports emergency voice calls, specifically TeleService 12. Should the MSD not be transmitted or received for any reason, or if the PSAP is not equipped with the necessary eCall equipment (eCall modem / server), the accident victims and PSAP operator may still converse using the In-Vehicle System (IVS) audio equipment.

The 3rd Generation Partnership Project (3GPP) has specified the eCall service requirements, data transmission protocols and network signaling aspects for Release 8. The in-band modem used to transfer the MSD from the vehicle to the PSAP, following the establishment of a TS12 emergency voice call, has been specified by 3GPP TSG SA WG 4.

Once an eCall is invoked, initiated manually by the vehicle occupants or automatically as the result of an accident, the eCall call set-up and clear-down procedures (RR, CC, and MM) are automatically controlled by the eCall in-vehicle system (IVS) and its associated network access device (NAD). Once initiated the system requires no MMI intervention and does not permit the user to intervene at any stage during call management. It is important, therefore, that the eCall system works autonomously and reliably when faced with a wide range of probable network access events.

The present document specifies the eCall applicable tests required to ensure eCall NAD conformance when accessing Digital cellular telecommunications system (Phase 2+) and Universal Mobile Telecommunications System (UMTS) mobile networks. The present document includes references to existing ETSI technical specifications including TS 151 010-1 [6] and TS 134 123-1 [3] that contain the necessary detailed eCall and generic UE conformance tests.

The eCall in-band modem conformance test protocols are as specified in TS 126 269 [2].

A guide to the applicability of ETSI GSM and UMTS mobile station harmonised standards EN 301 908 parts 1 [8] and 2 [9] and EN 301 511 [10] to the ETSI specified eCall NAD, for the purpose of demonstrating compliance with R&TTE Directive 1999/5/EC [i.2] article 3.2, can be found in TR 102 937 [i.1].

1 Scope

The present document specifies the eCall applicable tests required to ensure eCall NAD conformance when accessing Digital cellular telecommunications system (Phase 2+) and Universal Telecommunication System (UMTS) mobile networks. The present document includes references to existing ETSI technical specifications including TS 151 010-1 [6] and TS 134 123-1 [3] that contain the necessary detailed eCall and generic UE conformance tests.

2 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.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

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

2.1 Normative references

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

[1] ETSI TS 122 101: "Universal Mobile Telecommunications System (UMTS); LTE; Service aspects; Service principles (3GPP TS 22.101)".

[2] ETSI TS 126 269: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); eCall data transfer; In-band modem solution; Conformance testing (3GPP TS 26.269)".

[3] 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)".

[4] ETSI TS 134 123-2: "Universal Mobile Telecommunications System (UMTS); User Equipment (UE) conformance specification; Part 2: Implementation conformance statement (ICS) proforma specification (3GPP TS 34.123-2)".

[5] ETSI TS 134 123-3: "Universal Mobile Telecommunications System (UMTS); User Equipment (UE) conformance specification; Part 3: Abstract Test Suites (ATSs) (3GPP TS 34.123-3)".

[6] 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)".

[7] ETSI TS 151 010-2: "Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) conformance specification; Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification (3GPP TS 51.010-2)".

[8] ETSI EN 301 908-1: "IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 1: Introduction and common requirements".

[9] ETSI EN 301 908-2: "IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive; Part 2: CDMA Direct Spread (UTRA FDD) User Equipment (UE)".

[10] ETSI EN 301 511: "Global System for Mobile communications (GSM); Harmonized EN for mobile stations in the GSM 900 and GSM 1800 bands covering essential requirements under article 3.2 of the R&TTE directive (1999/5/EC)".

2.2 Informative references

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 TR 102 937: "Mobile systems; Guidelines on applicability of GSM and UMTS mobile station harmonized standards to eCall Network Access Device (NAD)".

[i.2] Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE Directive).

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

eCall: manually or automatically initiated emergency call, (TS12) from a vehicle, supplemented with a minimum set of emergency related data (MSD), as defined under the EU Commission's eSafety initiative

Minimum Set of Data (MSD): data component of an eCall sent from a vehicle to a Public Safety Answering Point or other designated emergency call centre

NOTE: The MSD has a maximum size of 140 bytes and includes, for example, vehicle identity, location information and time-stamp.

3.2 Abbreviations

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

AIeC	Automatically Initiated eCall
CC	Call Control
CEN	Commission Européen de Normalisation
EF_{FDN}	Elementary File Fixed Dialling Numbers
EF_{SDN}	Elementary File Service Dialling Numbers
GNSS	Global Navigation Satellite System
ICS	Implementation Conformance Statement
IVS	In Vehicle System (eCall terminal and associated sub-systems in vehicle)
MIeC	Manually Initiated eCall
MM	Mobility Management
MSD	Minimum Set of Data
NAD	Network Access Device
PLMN	Public Land Mobile Network
PSAP	Public Safety Answering Point
RR	Radio Resource
UMTS	Universal Mobile Telecommunications System
USIM	UMTS Subscriber Identification Module
VIN	Vehicle Identification Number

4 General aspects of eCall conformance testing

The eCall service is based on the pan-European harmonised 112 emergency service supplemented by accident related data. An eCall is initiated automatically when a collision of sufficient severity occurs, or manually by the vehicle occupants. Once initiated the eCall proceeds automatically without the need for any user intervention. As a life saving emergency service the correct operation and reliability of the autonomous eCall system needs to be ensured through conformance testing.

4.1 Types of eCall capable UE - Unrestricted and Restricted

In order to avoid the generation of large volumes of unnecessary mobility management (MM) signaling, when not engaged in an eCall, test or reconfiguration call, additional network access restrictions apply to certain 'eCall only' devices in accordance with TS 122 101 [1].

eCall capable UEs are divided into two types, unrestricted and restricted. Unrestricted eCall UEs are those that have the capability and are configured to also access other non-emergency subscription services. Restricted eCall UEs are those that either do not support the capability to access other non-emergency services, or are normally unrestricted eCall UEs that have been configured to make only eCalls. In the latter case the restricted eCall capable UE is referred to as an 'eCall only' UE.

All eCall capable UEs may make calls to a network operator designated non-emergency numbers for the purpose of making test eCalls, and to request reconfiguration of the UE allowing access to commercial services.

4.2 Establishment of eCalls by the UE under test

A Manually Initiated eCall (MIeC) or an Automatically Initiated eCall (AIeC) shall be initiated in accordance with the information provided by the manufacturer in the Implementation Conformance Statement (ICS) proforma [4].

The eCall capable UE is expected to provide a call set-up MMI that enables the user to manually establish an eCall e.g. an SOS button. Additionally, an eCall capable UE is expected to support an interface that allows an associated eCall in-vehicle system (IVS) to automatically initiate an eCall. The emergency call set-up message sent to the network includes, in the Service Category information element, an indication that the present call is either a Manually Initiated eCall (MIeC) or an Automatically Initiated eCall (AIeC).

4.3 Establishment of eCall test and reconfiguration calls

An eCall test or reconfiguration call shall be initiated in accordance with the information provided by the manufacturer in the Implementation Conformance Statement (ICS) proforma [4].

The purpose of the eCall test and reconfiguration calls is to ensure that the UE under test, when configured for 'eCall only', is capable of establishing a call to each of the non-emergency fixed dialling numbers stored on the USIM in EF_{FDN}. It is also verified that, following call clear-down, an 'eCall only' UE deregisters from the network and returns to the MM IDLE eCall INACTIVE state when timer T3242 or T3243 expires.

The eCall capable UE provides a call set-up MMI that enables test and reconfiguration calls to be established using the dialled numbers stored on the USIM in EF_{FDN} or, in the case of an unrestricted eCall capable UE, in EF_{SDN}

5 UMTS network access eCall NAD conformance tests

The terminal type and eCall applicable tests required to ensure eCall NAD conformance when accessing a Universal Telecommunication System (UMTS) mobile network are specified, by reference, in the following clauses. eCall NAD conformance testing shall be carried out in accordance with the tests and test procedures specified in TS 134 123 Part 1 [3], Part 2 [4] and Part 3 [5].

5.1 eCall Emergency Call Procedures

Reference TS 134 123-1 [3], clause 13.3.

5.1.1 eCall with USIM

Reference TS 134 123-1 [3], clause 13.3.1.

5.1.1.1 Void

5.1.1.2 Test call using eCall capable UE with 'eCall only' subscription on USIM

Reference TS 134 123-1 [3], clause 13.3.1.2.

5.1.1.3 Manually initiated eCall using eCall capable UE with 'eCall only' subscription on USIM

Reference TS 134 123-1 [3], clause 13.3.1.3.

5.1.1.4 Reconfiguration call using eCall capable UE with 'eCall only' subscription

Reference TS 134 123-1 [3], clause 13.3.1.4.

5.1.1.5 Manually initiated eCall using eCall capable UE with eCall and non eCall subscription on USIM

Reference TS 134 123-1 [3], clause 13.3.1.5.

5.1.1.6 eCall Inactivity State after T3242 expires

Reference TS 134 123-1 [3], clause 13.3.1.6.

5.1.1.7 Automatically initiated eCall

Reference TS 134 123-1 [3], clause 13.3.1.7.

5.2 Applicability of eCall NAD tests for UMTS network access

Table 5.1: Applicability of tests (TS 134 123-2 [4])

Clause	Title	Release	Comments
13.3	**eCall Emergency Call Procedures**		
13.3.1	**eCall with USIM**		
13.3.1.2	Test call using eCall capable UE with 'eCall only' subscription on USIM	Rel-8	UEs supporting 'eCall only' subscription and capable of triggering a test eCall
13.3.1.3	Manually initiated eCall using eCall capable UE with 'eCall only' subscription on USIM	Rel-8	UEs supporting 'eCall only' subscription and capable of initiating manual eCall
13.3.1.4	Reconfiguration call using eCall capable UE with 'eCall only' subscription on USIM	Rel-8	UEs supporting 'eCall only' subscription and capable of triggering a reconfiguration call
13.3.1.5	Manually initiated eCall using eCall capable UE with eCall and non eCall subscriptions on USIM	Rel-8	UEs supporting emergency speech call and eCall subscription and capable of initiating manual eCall
13.3.1.6	eCall Inactivity State after T3242 expires	Rel-8	UEs supporting eCall only subscription and capable of initiating manual eCall
13.3.1.7	Automatically initiated eCall	Rel-8	UEs supporting emergency speech and 'eCall only' subscription and capable of initiating automatic eCall

6 GSM network access eCall NAD conformance tests

The terminal type and eCall applicable tests required to ensure eCall NAD conformance when accessing a Digital cellular telecommunications system (Phase 2+) mobile network are specified, by reference, in the following clauses. eCall NAD conformance testing shall be carried out in accordance with the tests and test procedures specified in TS 151 010 Parts 1 [6] and 2 [7].

6.1 eCall Emergency Call Procedures

Reference TS 151 010-1 [6], clause 26.9.6a.

6.1.1 eCall with USIM

Reference TS 151 010-1 [6], clause 26.9.6a.1.

6.1.1.1 Void

6.1.1.2 Test call using eCall capable MS with 'eCall only' subscription on USIM

Reference TS 151 010-1 [6], clause 26.9.6a.1.2.

6.1.1.3 Manually initiated eCall using eCall capable MS with 'eCall only' subscription on USIM

Reference TS 151 010-1 [6], clause 26.9.6a.1.3.

6.1.1.4 Manually initiated eCall using eCall capable MS with eCall capable USIM

Reference TS 151 010-1 [6], clause 26.9.6a.1.4.

6.1.1.5 eCall Inactivity State after T3242 expires

Reference TS 151 010-1 [6], clause 26.9.6a.1.5.

6.1.1.6 Automatically initiated eCall

Reference TS 151 010-1 [6], clause 26.9.6a.1.6.

6.1.1.7 Reconfiguration call using eCall capable MS with 'eCall only' subscription

Reference TS 151 010-1 [6], clause 26.9.6a.1.7.

6.2 Applicability of eCall NAD tests for GSM network access

Table 6.1: Applicability of tests (TS 151 010-2 [7])

Clause	Title	Release	Comments
26.9.6a	**Structured Calls / eCall**		
26.9.6a.1	**eCall with USIM**		
26.9.6a.1.2	Test call using eCall capable MS with 'eCall only' subscription on USIM	Rel-8	MS supporting 'eCall only' subscription and capable of triggering a test eCall
26.9.6a.1.3	Manually initiated eCall using eCall capable MS with 'eCall only' subscription on USIM	Rel-8	MS supporting 'eCall only' subscription and capable of initiating manual eCall
26.9.6a.1.4	Manually initiated eCall using eCall capable MS with eCall capable USIM	Rel-8	MS supporting emergency speech call and eCall subscription and capable of initiating manual eCall
26.9.6a.1.5	eCall Inactivity State after T3242 expires	Rel-8	MS supporting 'eCall only' subscription and capable of initiating manual eCall
26.9.6a.1.6	Automatically initiated eCall	Rel-8	MS supporting emergency speech and 'eCall only' subscription and capable of initiating automatic eCall
26.9.6a.1.7	Reconfiguration call using eCall capable MS with 'eCall only' subscription on USIM	Rel-8	MS supporting 'eCall only' subscription and capable of triggering a reconfiguration call

Annex A (informative): Bibliography

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)".

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)".

ETSI TS 131 102: "Universal Mobile Telecommunications System (UMTS); LTE; Characteristics of the Universal Subscriber Identity Module (USIM) application (3GPP TS 31.102)".

ETSI TS 134 108: "Universal Mobile Telecommunications System (UMTS); LTE; Common test environments for User Equipment (UE); Conformance testing (3GPP TS 34.108)".

ETSI TS 134 109: "Universal Mobile Telecommunications System (UMTS); LTE; Terminal logical test interface; Special conformance testing functions (3GPP TS 34.109)".

ETSI TS 102 936-2: "Mobile systems; eCall Network Access Device (NAD) conformance specification Part 2: Test suites".

History

Document history		
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