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**Emergency Communications (EMTEL);
Testing - Conformance test specifications for Advanced Mobile
Location; Test Purposes (TP) for the handsets**

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Contents

Intellectual Property Rights	4
Foreword.....	4
Modal verbs terminology.....	4
1 Scope	5
2 References	5
2.1 Normative references	5
2.2 Informative references.....	5
3 Definition of terms, symbols and abbreviations.....	5
3.1 Terms.....	5
3.2 Symbols.....	5
3.3 Abbreviations	6
4 Prerequisites and Test Configurations.....	6
4.1 Test Configurations	6
4.2 Protocol Implementation Conformance Statement (PICS).....	7
4.3 Protocol Implementation eXtra Information for Testing (PIXIT)	7
5 Test Suite Structure (TSS).....	7
5.1 Overview	7
5.2 Test groups specifications	8
5.3 Conventions.....	8
6 AML Test Purposes.....	8
6.1 SMS Transmission	8
6.2 HTTPS Transmission	11
Annex A (informative): Information on the tools to generate the present document	14
History	15

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Foreword

This Technical Specification (TS) has been produced by ETSI Special Committee Emergency Communications (EMTEL).

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 provides the Test Purposes (TP) for Development of AML Test Descriptions for handsets as defined in the ETSI AML specification ETSI TS 103 625 [1] listed in clause 2.1 of the present document.

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] ETSI TS 103 625 (V1.2.1): "Emergency Communications (EMTEL); Transporting Handset Location to PSAPs for Emergency Communications - Advanced Mobile Location".
- [2] ETSI ES 203 119-4 (V1.4.1): "Methods for Testing and Specification (MTS); The Test Description Language (TDL); Part 4: Structured Test Objective Specification (Extension)".

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] ISO/IEC 9646-1 (1994): "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 1: General concepts".
- [i.2] ISO/IEC 9646-7 (1995): "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 7: Implementation Conformance Statements".

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in ISO/IEC 9646-1 [i.1] and ISO/IEC 9646-7 [i.2] apply.

3.2 Symbols

Void.

3.3 Abbreviations

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

AML	Advanced Mobile Location
ATS	Abstract Test Suite
BV	Valid Behaviour
HTTP	HyperText Transfer Protocol
HTTPS	HTTP Secure
ID	Identity
IDE	Integrated Development Environment
IFS	Interoperable Functions Statement
IMEI	International Mobile Equipment Identity
IUT	Implementation Under Test
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
SIM	Subscriber Identity Module
SMS	Short Message Service
TDL	Test Description Language
TDL-TO	TDL-Test Objective
TOP	TDL Open Source Project
TP	Test Purposes
TS	Test Suite
TSS	Test Suite Structure

4 Prerequisites and Test Configurations

4.1 Test Configurations

Test configurations capture and describe the components identified in the tests and the connections between them. For the present test suite, two (2) configurations are identified and listed in the present clause. For each test configuration two (2) main components are identified: the IUT implementing the AML specification and the Tester implementing the AML endpoint.

Figure 4.1-1 includes a Handset as the IUT and a SMS Endpoint as the Tester. This configuration is applicable for all test purposes in SMS Group.

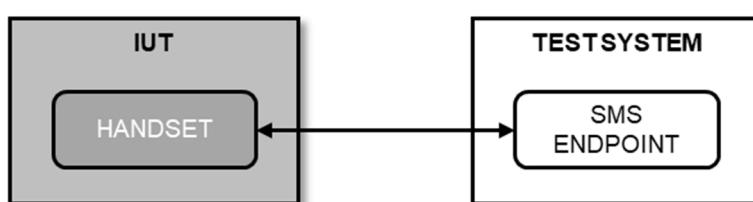


Figure 4.1-1: Config_SMS

Figure 4.1-2 includes a Handset as the IUT and a HTTPS Endpoint as the Tester. This configuration is applicable for all test purposes in HTTP Group.

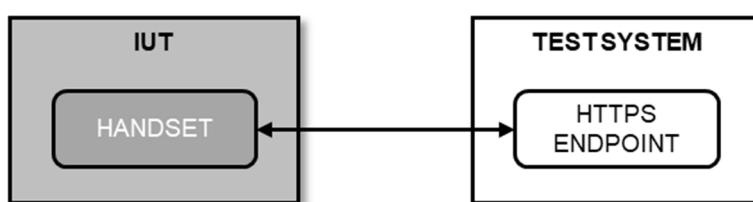


Figure 4.1-2: Config_HTTPS

NOTE: The AML HTTPS endpoint is configurable and differs from country to country where AML is used. The IUT should be able to verify the server certificate to test over HTTPS. There are the following options for this: use a server certificate signed by a trusted root certificate or use a self-signed certificate and import this certificate into the IUT.

4.2 Protocol Implementation Conformance Statement (PICS)

The "Protocol Implementation Conformance Statement" (PICS) identifies the standardized functions of an IUT. These functions can be mandatory, optional or conditional (depending on other functions), and depend on the role played by the IUT. The PICS can also be used as a proforma by a vendor to identify the functions that its IUT will support when interoperating with corresponding functions from other vendors.

Table 4.2-1: PICS

Item	IFS ID	Description	Status
1	PICS_SMS_SUPPORT	IUT supports AML via SMS	Optional. See note.
2	PICS_HTTPS_SUPPORT	IUT supports AML via HTTPS	Optional. See note.

NOTE: At least one of the options shall be selected.

4.3 Protocol Implementation eXtra Information for Testing (PIXIT)

The "Protocol Implementation eXtra Information for Testing" (PIXIT) defines the actual value and format of optional information elements according to the specifications implemented in the IUT.

Table 4.3-1: PIXIT

Item	PIXIT ID	Description
1	PX_LATITUDE	The WGS84 latitude of the centre of the location area given in decimal degrees using 5 decimal places giving resolution to 1,1 meters
2	PX_LONGITUDE	The WGS84 longitude of the centre of the location area given in decimal degrees using 5 decimal places giving resolution to 1,1 meters
3	PX_IMSI	The SIM card identifier of the IUT
4	PX_IMEI	The identifier of the IUT
5	PX_MCC	Mobile Country Code of the IUT
6	PX_MNC	Mobile Network Code of the IUT

5 Test Suite Structure (TSS)

5.1 Overview

The test suite structure identifies grouping of test purposes and serves a base for grouping of Test Case in the ATS (Abstract Test Suite).

The Test Suite structure is used for the creation of identifiers of Test Purposes.

Table 5.1-1 identifies the Test Suite Structure for the AML Conformance test suites. Documentation on the groups is provided in clause 5.2.

Table 5.1-1: Test Suite Structure for AML Conformance

TP_<root>_<gr>_<xx>_<n>		
<root> = root	AML	AML
<gr> = group	SMS	AML via SMS
	HTTPS	AML via HTTPS
<xx> = type of testing	BV	Valid/Successful behaviour
<n> = sequential number		01 to 99

5.2 Test groups specifications

The groups identify the different transport mechanisms of the AML data. Moreover, test purposes are identified and categorized by a sequential two-digits number (uniquely assigned upon definition of each test purpose) and by the type of test performed. The type of test helps quickly identify the type of behaviour that is expected by the IUT in the test purpose.

5.3 Conventions

The test purposes are primarily developed in textual syntax of TDL-T0, where the Initial Conditions and Expected Behaviour of each Test Purpose is written and shall be interpreted using the TDL-T0 notation as defined in ETSI ES 203 119-4 (V1.4.1) [2]. The sources for the Test Purposes are available in https://forge.etsi.org/rep/emtel/NG112-/tree/ttf_t009/test_purposes/aml.

The definitions of PICS, Entities and Events are available in Domain section in the aml-common.tplan2 file. The definitions of PIXITS and data types are available in Data section in the aml-common.tplan2 file.

6 AML Test Purposes

6.1 SMS Transmission

TP Id	TP_AML_SMS_BV_01
Test Objective	Verify that the IUT automatically sends AML via SMS when an emergency call is initiated
Reference	ETSI TS 103 625 (V1.2.1) [1], clause 5.2, paragraph 2
PICS Selection	PICS_SMS_SUPPORT
Initial Conditions	
with { } the IUT is configured to the SMS_ENDPOINT entity }	
Expected Behaviour	
ensure that { when { the IUT initiates an emergency call } then { the IUT sends an AML_SMS_MESSAGE to the SMS_ENDPOINT entity } }	

TP Id	TP_AML_SMS_BV_02
Test Objective	Verify that the IUT automatically sends AML via SMS when an emergency SMS is sent
Reference	ETSI TS 103 625 (V1.2.1) [1], clause 5.2, paragraph 3
PICS Selection	PICS_SMS_SUPPORT
Initial Conditions	
with { } the IUT is configured to the SMS_ENDPOINT entity }	
Expected Behaviour	
ensure that { when { the IUT initiates an emergency sms } then { the IUT sends an AML_SMS_MESSAGE to the SMS_ENDPOINT entity } }	

TP Id	TP_AML_SMS_BV_03
Test Objective	Verify the SMS format and values of the AML SMS message
Reference	ETSI TS 103 625 (V1.2.1) [1], Annex A, table A.1
PICS Selection	PICS_SMS_SUPPORT
Initial Conditions	
with { the IUT is configured to the SMS_ENDPOINT entity and the IUT determines a Location containing latitude indicating value close_to PX_LATITUDE, longitude indicating value close_to PX_LONGITUDE }	
Expected Behaviour	
ensure that { when { the IUT initiates an emergency call } then { the IUT sends an AML_SMS_MESSAGE containing User_Data containing "A\"ML" indicating value AML_VERSION, "lt" indicating value close_to PX_LATITUDE, "lg" indicating value close_to PX_LONGITUDE, "rd" containing Number indicating value "the radius of the location area in meters", "top" containing UTCString indicating value "when the location was determined", "lc" containing Number indicating value "the level of confidence", "pm" indicating value "'G' 'W' 'C'", "si" containing PartialImsi derived from PX_IMSI;, "ei" containing PartialImei derived from PX_IMEI;, "mcc" corresponding to PX_MCC, "mnc" corresponding to PX_MNC, "ml" derived from the value of AML_SMS_MESSAGE to the SMS_ENDPOINT entity } }	
NOTE 1: For privacy reasons, a partial IMEI may be provided, specifically when only SMS transport is used. A completed IMEI is provided if multiple transport methods are used.	
NOTE 2: The notation A\"ML is used above instead of A"ML (as defined in ETSI TS 103 625 [1]) due to character escape requirements in TDL-T0.	

TP Id	TP_AML_SMS_BV_04
Test Objective	Verify that the IUT sends AML via SMS within the timeout T1
Reference	ETSI TS 103 625 (V1.2.1) [1], clause 5.1, paragraph 1-2
PICS Selection	PICS_SMS_SUPPORT
Initial Conditions	
with { } the IUT is configured to the SMS_ENDPOINT entity and the IUT is configured the timeout T1 }	
Expected Behaviour	
ensure that { when { the IUT initiates an emergency call } then { the IUT sends an AML_SMS_MESSAGE "within" timeout T1 to the SMS_ENDPOINT entity } }	

TP Id	TP_AML_SMS_BV_05
Test Objective	Verify the SMS format and values of the AML message when no location can be determined
Reference	ETSI TS 103 625 (V1.2.1) [1], Annex A, table A.1
PICS Selection	PICS_SMS_SUPPORT
Initial Conditions	
with { } the IUT is configured to the SMS_ENDPOINT entity and the IUT not determines a Location }	
Expected Behaviour	
ensure that { when { the IUT initiates an emergency call } then { the IUT sends an AML_SMS_MESSAGE containing User_Data containing "A\"ML" indicating value AML_VERSION, "lt" set to '+00.00000', "lg" set to '+000.00000', "rd" set to 'N', "top" containing UTCString indicating value "when location process was deemed to have failed", "lc" set to 0, "pm" set to 'N', "si" containing PartialImsi derived from PX_IMSI;, "ei" containing PartialImei derived from PX_IMEI;, "mcc" set to PX_MCC, "mnc" set to PX_MNC, "ml" derived from the value of AML_SMS_MESSAGE to the SMS_ENDPOINT entity } }	
NOTE 1: For privacy reasons, a partial IMEI may be provided, specifically when only SMS transport is used.	
NOTE 2: The notation A\"ML is used above instead of A"ML (as defined in ETSI TS 103 625 [1]) due to character escape requirements in TDL-T0.	

TP Id	TP_AML_SMS_BV_06
Test Objective	Verify that no record of the AML message is available to the user
Reference	ETSI TS 103 625 (V1.2.1) [1], clause 5.2, paragraph 2
PICS Selection	PICS_SMS_SUPPORT
Expected Behaviour	
<pre>ensure that { when { the IUT initiates an emergency call } then { the IUT sends an AML_SMS_MESSAGE to the SMS_ENDPOINT entity and the USER has_no_record_of the AML_SMS_MESSAGE } }</pre>	

6.2 HTTPS Transmission

TP Id	TP_AML_HTTPS_BV_01
Test Objective	Verify that the IUT automatically sends AML via HTTPS when an emergency call is initiated
Reference	ETSI TS 103 625 (V1.2.1) [1], clause 5.2, paragraph 2
PICS Selection	PICS_HTTPS_SUPPORT
Initial Conditions	
<pre>with { the IUT is configured to the HTTPS_ENDPOINT entity }</pre>	
Expected Behaviour	
<pre>ensure that { when { the IUT initiates an emergency call } then { the IUT sends an HTTP_MESSAGE containing Method set to 'POST', ContentType set to 'application/x-www-form-urlencoded', Body corresponding to any AML_BODY to the HTTPS_ENDPOINT entity } }</pre>	

TP Id	TP_AML_HTTPS_BV_02
Test Objective	Verify that the IUT automatically sends AML via HTTPS when an emergency SMS is sent
Reference	ETSI TS 103 625 (V1.2.1) [1], clause 5.2, paragraph 3
PICS Selection	PICS_HTTPS_SUPPORT
Initial Conditions	
<pre>with { the IUT is configured to the HTTPS_ENDPOINT entity }</pre>	
Expected Behaviour	
<pre>ensure that { when { the IUT initiates an emergency sms } then { the IUT sends an HTTP_MESSAGE containing Method set to 'POST', ContentType set to 'application/x-www-form-urlencoded', Body corresponding to any AML_BODY to the HTTPS_ENDPOINT entity } }</pre>	

TP Id	TP_AML_HTTPS_BV_03
Test Objective	Verify the HTTP Format of the AML message
Reference	ETSI TS 103 625 (V1.2.1) [1], Annex A, table A.1
PICS Selection	PICS_HTTPS_SUPPORT
Initial Conditions	
with {	<p>the IUT is configured to the HTTPS_ENDPOINT entity and the IUT determines a Location containing latitude indicating value close_to PX_LATITUDE, longitude indicating value close_to PX_LONGITUDE</p> }
Expected Behaviour	
ensure that {	<p>when { the IUT is_triggered_to_perform an emergency call } then { the IUT sends an HTTP_MESSAGE containing Method set to 'POST', ContentType set to 'application/x-www-form-urlencoded', Body containing "v" indicating value AML_VERSION, "location_latitude" indicating value close_to PX_LATITUDE, "location_longitude" indicating value close_to PX_LONGITUDE, "location_time" containing Number indicating value "when the location was determined", "location_accuracy" containing Number indicating value "the radius of the location area in meters", "location_source" indicating value "'gps' 'Wi-Fi' 'cell'", "location_confidence" containing Number indicating value "the level of confidence", "device_imsi" corresponding to PX_IMSI, "device_imei" corresponding to PX_IMEI, "cell_network_mcc" corresponding to PX_MCC, "cell_network_mnc" corresponding to PX_MNC to the HTTPS_ENDPOINT entity }</p> }

TP Id	TP_AML_HTTPS_BV_04
Test Objective	Verify that the IUT sends AML via HTTPS within the timeout T1
Reference	ETSI TS 103 625 (V1.2.1) [1], clause 5.1, paragraph 1-2
PICS Selection	PICS_HTTPS_SUPPORT
Initial Conditions	
with {	<p>the IUT is configured to the HTTPS_ENDPOINT entity and the IUT is configured the timeout T1</p> }
Expected Behaviour	
ensure that {	<p>when { the IUT initiates an emergency call } then { the IUT sends an HTTP_MESSAGE "within" timeout T1 containing Method set to 'POST', ContentType set to 'application/x-www-form-urlencoded', Body corresponding to any AML_BODY to the HTTPS_ENDPOINT entity }</p> }

TP Id	TP_AML_HTTPS_BV_05
Test Objective	Verify the HTTP format and values of the AML message when no location can be determined
Reference	ETSI TS 103 625 (V1.2.1) [1], clause 6.3.6.2, paragraph 3, Annex A, table B.1
PICS Selection	PICS_HTTPS_SUPPORT
Initial Conditions	
with { the IUT is configured to the HTTPS_ENDPOINT entity and the IUT not determines a Location }	
Expected Behaviour	
ensure that { when { the IUT is_triggered_to_perform an emergency call } then { the IUT sends an HTTP_MESSAGE containing Method set to 'POST', ContentType set to 'application/x-www-form-urlencoded', Body containing "v" indicating value AML_VERSION, "location_latitude" set to '+00.00000', "location_longitude" set to '+000.00000', "location_time" containing Number indicating value "when location process was deemed to have failed", "location_source" set to 'unknown', "location_accuracy" set to 0, "location_confidence" set to 0, "device_imsi" corresponding to PX_IMSI, "device_imei" corresponding to PX_IMEI, "cell_network_mcc" corresponding to PX_MCC, "cell_network_mnc" corresponding to PX_MNC to the HTTPS_ENDPOINT entity } }	

Annex A (informative): Information on the tools to generate the present document

The Test Purposes have been first developed in textual syntax of TDL-TO. The sources are available at <https://forge.etsi.org/rep/emtel/ng112> via web access or using the Git versioning system.

The reader may make use of the IDE available as part of the TDL Open Source project (TOP), freely available at <https://top.etsi.org>.

History

Document history		
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