



**EMTEL;**  
**Testing - Conformance test specifications for core elements  
for network independent access to emergency services  
(NG112);**  
**Part 2: Abstract Test Suite (ATS) and  
Protocol Implementation eXtra Information for Testing (PIXIT)**

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## Foreword

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

The present document is part 2 of a multi-part deliverable covering Conformance test specifications for Geonetworking ITS-G5, as identified below:

Part 1: "Protocol Implementation Conformance Statement (PICS), Test Suite Structure and Test Purposes (TSS & TP)";

Part 2: "**Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT)**".

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## 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 contains the Abstract Test Suite (ATS) for core elements for network independent access to emergency services (NG112) as defined in standards listed in clause 2.1 of the present document.

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## 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 103 650-1 (V1.1.1): "EMTEL; Testing - Conformance test specifications for core elements for network independent access to emergency services (NG112); Part 1: Protocol Implementation Conformance Statement (PICS), Test Suite Structure and Test Purposes (TSS & TP)".

### 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 9646-2 (1994): "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 2: Abstract Test Suite specification".
- [i.3] ETSI ETS 300 406 (1995): "Methods for testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".
- [i.4] ETSI ES 201 873-1 (V4.5.1): "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 1: TTCN-3 Core Language".
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## 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], ISO/IEC 9646-2 [i.2] and ETSI ETS 300 406 [i.3] apply.

## 3.2 Symbols

Void.

## 3.3 Abbreviations

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

ATM	Abstract Test Method
ATS	Abstract Test Suite
IUT	Implementation Under Test
MTC	Main Test Component
PICS	Protocol Implementation Conformance Statement
PIXIT	Partial Protocol Implementation Extra Information for Testing
PTC	Parallel Test Component
SUT	System Under Test
TC	Test Case
TP	Test Purposes
TTCN	Testing and Test Control Notation

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## 4 Abstract Test Method (ATM)

### 4.1 Test Configuration

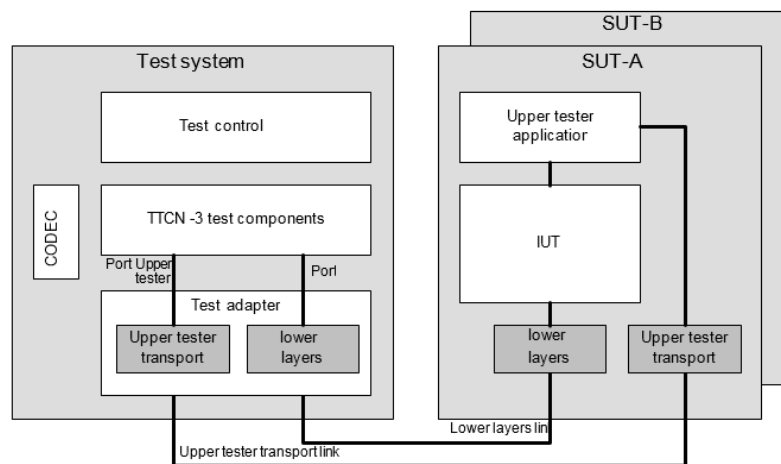
The test configurations as defined in ETSI TS 103 650-1 [1], clause 5 shall apply.

### 4.2 Test architecture

The present document implements the general TTCN-3 test architecture as shown in figure 1.

In single-component testcases, the MTC communicates with SUT over a port. In multi-component testcases, the MTC is used to synchronize the different PTCs. The PTCs communicate with the SUT over ports.

The Upper tester entity in the SUT enables triggering functionalities by simulating primitives from application.



**Figure 1: Test system architecture**

## 4.3 Ports and ASPs (Abstract Services Primitives)

### 4.3.1 Introduction

Two ports are used by the NG112 test suite:

- The httpPort, of type HttpPort
- The SIPP port of type SipPort

### 4.3.2 Primitives on httpPort

One type of primitives is used in the httpPort:

- HttpMessage type which can be either a Request message or a Response message

### 4.3.3 Primitives on SIPP

Several types of primitives are used in the SIPP:

- Request type, which is a generic SIP request message type
- REGISTER\_Request type, which is a REGISTER SIP request message type
- INVITE\_Request type, which is an INVITE SIP request message type
- OPTIONS\_Request type, which is an OPTION SIP request message type
- BYE\_Request type, which is a BYE SIP request message type
- CANCEL\_Request type, which is a CANCEL SIP request message type
- NOTIFY\_Request type, which is a NOTIFY SIP request message type
- SUBSCRIBE\_Request type, which is a SUBSCRIBE SIP request message type
- Response type, which is a generic SIP response message type

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## 5 Untestable Test Purposes

Not applicable.

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## 6 ATS conventions

### 6.1 Introduction

The ATS conventions are intended to give a better understanding of the ATS but they also describe the conventions made for the development of the ATS. These conventions shall be considered during any later maintenance or further development of the ATS.

The ATS conventions contain two clauses, the testing conventions and the naming conventions. The testing conventions describe the functional structure of the ATS. The naming conventions describe the structure of the naming of all ATS elements.

To define the ATS, the guidelines of the document ETSI ETS 300 406 [i.3] were considered.

## 6.2 Testing conventions

### 6.2.1 Testing states

#### 6.2.1.1 Initial state

All test cases start with the function `f_prInitialState`. This function brings the IUT in an "initialized" state by invoking the upper tester primitive `UtInitialize`.

#### 6.2.1.2 Final state

All test cases end with the function `f_poDefault`. This function brings the IUT back in an "idle" state. As no specific actions are required for the idle state in the base standard, the function `f_poDefault` does not invoke any action.

As necessary, further actions may be included in the `f_poDefault` function.

## 6.3 Naming conventions

### 6.3.1 General guidelines

The naming convention is based on the following underlying principles:

- in most cases, identifiers should be prefixed with a short alphabetic string (specified in table 1) indicating the type of TTCN-3 element it represents;
- suffixes should not be used except in those specific cases identified in table 2;
- prefixes and suffixes should be separated from the body of the identifier with an underscore ("\_");

EXAMPLE 1: `c_sixteen`, `t_wait`.

- only module names, data type names and module parameters should begin with an upper-case letter. All other names (i.e. the part of the identifier following the prefix) should begin with a lower-case letter;
- the start of second and subsequent words in an identifier should be indicated by capitalizing the first character. Underscores should not be used for this purpose.

EXAMPLE 2: `f_initialState`.

Table 1 specifies the naming guidelines for each element of the TTCN-3 language indicating the recommended prefix, suffixes (if any) and capitalization.



**Table 1: ETSI TTCN-3 generic naming conventions**

Language element	Naming convention	Prefix	Example identifier
Module	Use upper-case initial letter	none	NG112Templates
Group within a module	Use lower-case initial letter	none	messageGroup
Data type	Use upper-case initial letter	none	SetupContents
Message template	Use lower-case initial letter	m_	m_setupInit
Message template with wildcard or matching expression	Use lower-case initial letters	mw_	mw_anyUserReply
Signature template	Use lower-case initial letter	s_	s_callSignature
Port instance	Use lower-case initial letter	none	signallingPort
Test component instance	Use lower-case initial letter	none	userTerminal
Constant	Use lower-case initial letter	c_	c_maxRetransmission
Constant (defined within component type)	Use lower-case initial letter	cc_	cc_minDuration
External constant	Use lower-case initial letter	cx_	cx_macId
Function	Use lower-case initial letter	f_	f_authentication()
External function	Use lower-case initial letter	fx_	fx_calculateLength()
Altstep (incl. Default)	Use lower-case initial letter	a_	a_receiveSetup()
Test case	Use ETSI numbering	TC_	TC_COR_0009_47_ND
Variable (local)	Use lower-case initial letter	v_	v_macId
Variable (defined within a component type)	Use lower-case initial letters	vc_	vc_systemName
Timer (local)	Use lower-case initial letter	t_	t_wait
Timer (defined within a component)	Use lower-case initial letters	tc_	tc_authMin
Module parameters for PICS	Use all upper case letters	PICS_	PICS_DOOROPEN
Module parameters for other parameters	Use all upper case letters	PX_	PX_TESTER_STATION_ID
Formal Parameters	Use lower-case initial letter	p_	p_macId
Enumerated Values	Use lower-case initial letter	e_	e_syncOk

### 6.3.2 ITS specific TTCN-3 naming conventions

Next to such general naming conventions, table 2 shows specific naming conventions that apply to the ITS TTCN-3 test suite.

**Table 2: ITS specific TTCN-3 naming conventions**

Language element	Naming convention	Identifier
Module containing the control part	Use upper-case initial letter	AtsNg112_TestControl
Module containing test cases	Use upper-case initial letter	AtsNg112_TestCases
Module containing types and values	Use upper-case initial letter	LibNg112_TypesAndValues
Module containing Templates	Use upper-case initial letter	LibNg112_Templates
Module containing functions	Use upper-case initial letter	LibNg112_Functions
Module containing external functions	Use upper-case initial letter	LibNg112_ExternalFunctions
Module containing components, ports and message definitions	Use upper-case initial letter	LibNg112_Interface
Module containing main component definitions	Use upper-case initial letter	LibNg112_TestSystem

### 6.3.3 Usage of Log statements

All TTCN-3 log statements use the following format using the same order:

- Three asterisks.
- The TTCN-3 test case or function identifier in which the log statement is defined.
- One of the categories of log: INFO, WARNING, ERROR, PASS, FAIL, INCONC, TIMEOUT.
- Free text.
- Three asterisks.

EXAMPLE 1:

```
log("*** TC_XX: INFO: Preamble: Received and answered Location Service  
Request ***");
```

Furthermore, the following rules are applied:

- Log statements are used in the body of the functions, so that invocation of functions are visible in the test logs.
- All TTCN-3 setverdict statement are combined (as defined in TTCN-3 as defined in ETSI ES 201 873-1 [i.4]) with a log statement following the same above rules (see example 2).

EXAMPLE 2:

```
setverdict(pass, "*** TC_XX: PASS: Header correctly formatted ***");
```

### 6.3.4 Test Case (TC) identifier

The test case naming convention shall follow the same naming convention as defined in ETSI TS 103 650-1 [1], clause 7.1.2.

EXAMPLE:      TP identifier: TP\_ESRP\_SIP\_INVITE\_BV\_01  
                  TC identifier: TC\_ESRP\_SIP\_INVITE\_BV\_01

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## Annex A (normative): TTCN-3 modules

### A.1 Online TTCN-3 modules

This test suite has been produced using the Testing and Test Control Notation (TTCN) according to ETSI ES 201 873-1 [i.4].

The TTCN-3 library modules, which form parts of the present document, are contained in the following repository:  
<https://forge.etsi.org/rep/emergency-communications/NG112/tree/V1.1.1>.

## Annex B (normative): Parameters for Test Suite Configuration

### B.1 IUT parameters

Table B.1: IUT parameters

Identifier	Description	
PX_DEVICE_URI_SIP	Comment	Devie SIP URI
	Type	Charstring
	Def. value	""
PX_DEVICE_NUMBER	Comment	Device <tel> number
	Type	DeviceURIs
	Def. value	{}
PX_DEVICE_NUMBER_POINT	Comment	Device <tel> number, Point configuration
	Type	Integer
	Def. value	0
PX_DEVICE_NUMBER_CIRCLE	Comment	Device <tel> number, Circle configuration
	Type	Integer
	Def. value	1
PX_DEVICE_NUMBER_CIVIC	Comment	Device <tel> number, Circle configuration
	Type	Integer
	Def. value	2
PX_UNKNOWN_DEVICE_NUMBER	Comment	Unknown device <tel> number
	Type	Integer
	Def. value	3
PX_UNKNOWN_DEVICE_URI	Comment	Unknown device URI
	Type	Charstring
	Def. value	""
PX_DEVICE_NUMBER_POINT_POS	Comment	Device <tel> number, Circle configuration
	Type	XSD.DoubleList
	Def. value	{ 43.616891, 7.053179 }
PX_CIRCLE_POS	Comment	Circle position
	Type	XSD.DoubleList
	Def. value	{ 43.617174, 7.052750 }
PX_CIRCLE_UOM	Comment	Circle UOM
	Type	XSD.AnyURI
	Def. value	"urn:ogc:def:uom:EPSG::9001"
PX_CIRCLE_RADIUS	Comment	Circle radius
	Type	XSD.double
	Def. value	15.00
PX_SRS_NAME	Comment	Circle SRS
	Type	XSD.AnyURI
	Def. value	"urn:ogc:def:crs:EPSG::4326"
PX_POINT_IN_E_POLICE_SERVICE_BOUNDARY	Comment	Point in Police service boundary
	Type	XSD.DoubleList
	Def. value	{ 43.62023, 7.071032 }
PX_CIRCLE_IN_V_POLICE_SERVICE_BOUNDARY_POS	Comment	Point in Police service boundary
	Type	XSD.DoubleList
	Def. value	{ 43.617174, 7.052750 }
PX_CIRCLE_IN_V_POLICE_SERVICE_BOUNDARY_RADIUS	Comment	Radius in Police service boundary
	Type	XSD.Double
	Def. value	2.00
PX_LOST_EXPIRES	Comment	Expiry time
	Type	XSD.DateTime
	Def. value	"2019-08-30T08:48:17+00:00"

<b>Identifier</b>	<b>Description</b>	
PX_LOST_LAST_UPDATED	<b>Comment</b>	Last update time
	<b>Type</b>	XSD.DateTime
	<b>Def. value</b>	"2018-08-30T08:48:17+00:00"
PX_E_UNKNOWN_SERVICE_URN	<b>Comment</b>	Unknown URN
	<b>Type</b>	XSD.AnyURI
	<b>Def. value</b>	"urn:service:sos.unknown"

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## History

<b>Document history</b>		
V1.1.1	January 2020	Publication