



**Intelligent Transport Systems (ITS);  
Testing;  
Conformance test specifications for GeoNetworking;  
Part 1: Test requirements and Protocol Implementation  
Conformance Statement (PICS) pro forma**

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**Reference**

RTS/ITS-00369

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# Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Intelligent Transport Systems (ITS).

The present document is part 1 of a multi-part deliverable covering Conformance test specifications for ITS GeoNetworking as identified below:

- Part 1:** "Test requirements and Protocol Implementation Conformance Statement (PICS) pro forma";
- Part 2: "Test Suite Structure and Test Purposes (TSS & TP)";
- Part 3: "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 provides the Protocol Implementation Conformance Statement (PICS) pro forma for Conformance test specifications for ITS GeoNetworking as defined in ETSI EN 302 636-4-1 [1] in compliance with the relevant requirements and in accordance with the relevant guidance given in ISO/IEC 9646-7 [i.2].

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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 EN 302 636-4-1 (V1.4.1): "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 4: Geographical addressing and forwarding for point-to-point and point-to-multipoint communications; Sub-part 1: Media-Independent Functionality".
- [2] ETSI TS 102 636-4-2 (V1.4.1): "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 4: Geographical addressing and forwarding for point-to-point and point-to-multipoint communications; Sub-part 2: Media-dependent functionalities for ITS-G5".
- [3] ETSI TS 102 636-4-3 (V1.1.1): "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 4: Geographical addressing and forwarding for point-to-point and point-to-multipoint communications; Sub-part 3: Media-dependent functionalities for LTE-V2X".

### 2.2 Informative references

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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".

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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 ETSI EN 302 636-4-1 [1], 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:

CBF	Contention-Based Forwarding
GAC	Geographically-Scoped Anycast
GBC	Geographically-Scoped Broadcast
GEONET	GeoNetworking
GUC	Geo Unicast
ICS	Implementation Conformance Statement
ITS	Intelligent Transportation Systems
ITS-G5	5 GHz wireless communication
IUT	Implementation Under Test
LS	Location Service
LTE	Long Term Evolution
PDU	Protocol Data Unit
PICS	Protocol Implementation Conformance Statement
SHB	Single Hop Broadcast
SUT	System Under Test
TSB	Topology Scoped Broadcast
V2X	Vehicle to any

---

## 4 Conformance requirement concerning PICS

If it claims to conform to the present document, the actual PICS pro forma to be filled in by a supplier shall be technically equivalent to the text of the PICS pro forma given in annex A, and shall preserve the numbering, naming and ordering of the pro forma items.

An ICS which conforms to the present document shall be a conforming PICS pro forma completed in accordance with the instructions for completion given in clause A.2.

---

## 5 Mnemonics for PICS reference

To avoid an update of all related documents when the PICS document is changed, table 1 introduces mnemonic names and the correspondence with the PICS item number.

Table 1: Mnemonics for PICS reference

Mnemonic	PICS item
PICS_GN_LOCAL_GN_ADDR	A.15/1
PICS_GN_LOCAL_ADDR_CONF_METHOD	A.15/2
PICS_GN_IS_MOBILE	A.15/4
PICS_GN_IF_TYPE	A.15/5
PICS_GN_MINIMUM_UPDATE_FREQUENCY_LPV	A.15/6
PICS_GN_MAX_SDU_SIZE	A.15/8
PICS_GN_MAX_GN_HEADER_SIZE	A.15/9
PICS_GN_LIFETIME_LOC_TE	A.15/10
PICS_GN_SECURITY	A.15/11
PICS_GN_LOCATION_SERVICE_MAX_RETRANS	A.15/13
PICS_GN_LOCATION_SERVICE_RETRANSMIT_TIMER	A.15/14
PICS_GN_LOCATION_SERVICE_PACKET_BUFFER_SIZE	A.15/15
PICS_GN_BEACON_SERVICE_RETRANSMIT_TIMER	A.15/16
PICS_GN_BEACON_SERVICE_MAX_JITTER	A.15/17
PICS_GN_DEFAULT_HOP_LIMIT	A.15/18
PICS_GN_MAX_PACKET_LIFETIME	A.15/20
PICS_GN_MAX_GEO_AREA_SIZE	A.15/24
PICS_GN_MIN_PACKET_REPETITION_INTERVAL	A.15/25
PICS_GN_NON_AREA_FORWARDING_ALGORITHM	A.15/26
PICS_GN_AREA_FORWARDING_ALGORITHM	A.15/27
PICS_GN_CBF_MIN_TIME	A.15/28
PICS_GN_CBF_MAX_TIME	A.15/29
PICS_GN_DEFAULT_MAX_COMMUNICATION_RANGE	A.15/30
PICS_GN_UC_FORWARDING_PACKET_BUFFER_SIZE	A.15/32
PICS_GN_BC_FORWARDING_PACKET_BUFFER_SIZE	A.15/33
PICS_GN_BEACON_SRC	A.7/1
PICS_GN_BEACON_DST	A.7/2
PICS_GUC	A.6/7
PICS_GN_GUC_SRC	A.10/1
PICS_GN_GUC_DST	A.10/3
PICS_GN_GUC_FWD	A.10/2
PICS_GBC	A.6/10
PICS_GN_GBC_SRC	A.13/1
PICS_GN_GBC_DST	A.13/2
PICS_GN_GBC_FWD	A.13/2
PICS_GAC	A.6/11
PICS_GN_GAC_SRC	A.14/1
PICS_GN_GAC_DST	A.14/2
PICS_GN_GAC_FWD	A.14/2
PICS_SHB	A.6/9
PICS_GN_SHB_SRC	A.12/1
PICS_GN_SHB_DST	A.12/2
PICS_TSB	A.6/8
PICS_GN_TSB_SRC	A.11/1
PICS_GN_TSB_DST	A.11/2
PICS_GN_TSB_FWD	A.11/2
PICS_GN_LS_REQ_SRC	A.9/1
PICS_GN_LS_REQ_RETRANSMISSION	A.9/2
PICS_GN_LS_REQ_DST	A.8/3
PICS_GN_LS_REP_DST	A.9/3
PICS_GN_LS_FWD	A.8/2
PICS_GN_ADDR_AUTO	A.3/1
PICS_GN_ADDR_MANAGED	A.3/2
PICS_GN_ADDR_ANONYMOUS	A.3/3
PICS_GN_DAD	A.3/4
PICS_GN_LTE_TIME_SYNC	A.17/1

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## Annex A (normative): GEONETW PICS pro forma (Media independent)

### A.1 The right to copy

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the GEONETW PICS pro forma in this annex so that it can be used for its intended purposes and may further publish the completed GEONETW PICS.

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### A.2 Guidance for completing the ICS pro forma

#### A.2.1 Purposes and structure

The purpose of this PICS pro forma is to provide a mechanism whereby a supplier of an implementation of the requirements defined in ETSI EN 302 636-4-1 may provide information about the implementation in a standardized manner.

The PICS pro forma is subdivided into clauses for the following categories of information:

- guidance for completing the ICS pro forma;
- identification of the implementation;
- identification of the ETSI EN 302 636-4-1;
- global statement of conformance;
- PICS pro forma tables.

#### A.2.2 Abbreviations and conventions

The ICS pro forma contained in this annex is comprised of information in tabular form in accordance with the guidelines presented in ISO/IEC 9646-7.

##### Item column

The item column contains a number which identifies the item in the table.

##### Item description column

The item description column describes in free text each respective item (e.g. parameters, timers, etc.). It implicitly means "is <item description> supported by the implementation?".



## Status column

The following notations, defined in ISO/IEC 9646-7, are used for the status column:

m	mandatory - the capability is required to be supported.
o	optional - the capability may be supported or not.
n/a	not applicable - in the given context, it is impossible to use the capability.
x	prohibited (excluded) - there is a requirement not to use this capability in the given context.
o.i	qualified optional - for mutually exclusive or selectable options from a set. "i" is an integer which identifies an unique group of related optional items and the logic of their selection which is defined immediately following the table.
c.i	conditional - the requirement on the capability ("m", "o", "x" or "n/a") depends on the support of other optional or conditional items. "i" is an integer identifying an unique conditional status expression which is defined immediately following the table.
i	irrelevant (out-of-scope) - capability outside the scope of the reference specification. No answer is requested from the supplier.

NOTE 1: This use of "i" status is not to be confused with the suffix "i" to the "o" and "c" statuses above.

## Reference column

The reference column makes reference to ETSI EN 302 636-4-1, except where explicitly stated otherwise.

## Support column

The support column shall be filled in by the supplier of the implementation. The following common notations, defined in ISO/IEC 9646-7, are used for the support column:

Y or y	supported by the implementation.
N or n	not supported by the implementation.
N/A, n/a or -	no answer required (allowed only if the status is n/a, directly or after evaluation of a conditional status).

NOTE 2: As stated in ISO/IEC 9646-7, support for a received PDU requires the ability to parse all valid parameters of that PDU. Supporting a PDU while having no ability to parse a valid parameter is non-conformant. Support for a parameter on a PDU means that the semantics of that parameter are supported.

## Values allowed column

The values allowed column contains the type, the list, the range, or the length of values allowed. The following notations are used:

- range of values: example:	<min value> .. <max value> 5 .. 20
- list of values: example: example: example:	<value1>, <value2>, ..., <valueN> 2, 4, 6, 8, 9 '1101'B, '1011'B, '1111'B '0A'H, '34'H, '2F'H
- list of named values: example:	<name1>(<val1>), <name2>(<val2>), ..., <nameN>(<valN>) reject(1), accept(2)
- length: example:	size (<min size> .. <max size>) size (1 .. 8)

### Values supported column

The values supported column shall be filled in by the supplier of the implementation. In this column, the values or the ranges of values supported by the implementation shall be indicated.

### References to items

For each possible item answer (answer in the support column) within the ICS pro forma a unique reference exists, used, for example, in the conditional expressions. It is defined as the table identifier, followed by a solidus character "/", followed by the item number in the table. If there is more than one support column in a table, the columns are discriminated by letters (a, b, etc.), respectively.

EXAMPLE 1: A.5/4 is the reference to the answer of item 4 in table 5 of annex A.

EXAMPLE 2: A.6/3b is the reference to the second answer (i.e. in the second support column) of item 3 in table 6 of annex A.

### Prerequisite line

A prerequisite line takes the form: Prerequisite: <predicate>.

A prerequisite line after a clause or table title indicates that the whole clause or the whole table is not required to be completed if the predicate is FALSE.

## A.2.3 Instructions for completing the ICS pro forma

The supplier of the implementation shall complete the ICS pro forma in each of the spaces provided. In particular, an explicit answer shall be entered, in each of the support or supported column boxes provided.

If necessary, the supplier may provide additional comments in space at the bottom of the tables or separately.

More detailed instructions are given at the beginning of the different clauses of the ICS pro forma.

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## A.3 Identification of the implementation

### A.3.1 Introduction

Identification of the Implementation Under Test (IUT) and the system in which it resides (the System Under Test (SUT)) shall be filled in so as to provide as much detail as possible regarding version numbers and configuration options.

The product supplier information and client information shall both be filled in if they are different.

A person who can answer queries regarding information supplied in the ICS shall be named as the contact person.

### A.3.2 Date of the statement

.....

### A.3.3 Implementation Under Test (IUT) identification

IUT name:

.....

.....

IUT version:

.....

### A.3.4 System Under Test (SUT) identification

SUT name:

.....  
.....

Hardware configuration:

.....  
.....  
.....

Operating system:

.....

### A.3.5 Product supplier

Name:

.....

Address:

.....  
.....  
.....

Telephone number:

.....

Facsimile number:

.....

E-mail address:

.....

Additional information:

.....  
.....  
.....

### A.3.6 Client (if different from product supplier)

Name:

.....

Address:

.....

.....

.....

Telephone number:

.....

Facsimile number:

.....

E-mail address:

.....

Additional information:

.....

.....

### A.3.7 ICS contact person

(A person to contact if there are any queries concerning the content of the ICS)

Name:

.....

Telephone number:

.....

Facsimile number:

.....

E-mail address:

.....

Additional information:

.....

.....

.....

## A.4 Identification of the protocol

This ICS pro forma applies to the following standard:

ETSI EN 302 636-4-1: "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 4: Geographical addressing and forwarding for point-to-point and point-to-multipoint communications; Sub-part 1: Media independent functionalities".

## A.5 Global statement of conformance

Are all mandatory capabilities implemented? (Yes/No) .....

NOTE: Answering "No" to this question indicates non-conformance to the GEONET standard specification. Non-supported mandatory capabilities are to be identified in the ICS, with an explanation of why the implementation is non-conforming, on pages attached to the ICS pro forma.

## A.6 Tables

### A.6.1 Introduction

Unless stated otherwise, the column references of all tables below indicates the clause numbers of ETSI EN 302 636-4-1.

### A.6.2 Media independent

#### A.6.2.1 Introduction

This clause of the ICS pro forma applies to the following standard: ETSI EN 302 636-4-1.

#### A.6.2.2 Protocol operation

**Table A.1: Protocol operation**

Item	Name of field	Reference	Status	Support
1	Network management	10.2	m	
2	Packet handling	10.3	m	

**Table A.2: Network management**

Prerequisite: A.1/1				
Item	Name of field	Reference	Status	Support
1	Address configuration	10.2.1	m	
2	Ego position vector and time update	10.2.2	m	
3	Beaconing	10.2.3	m	
4	Location service	10.2.4	m	

**Table A.3: Address configuration**

Prerequisite: A.21				
Item	Name of field	Reference	Status	Support
1	Auto-address configuration	10.2.1.2	m	
2	Managed address configuration	10.2.1.3	m	
3	Anonymous address configuration	10.2.1.4	m	
4	Duplicate address detection	10.2.1.5	m	

**Table A.4: Managed address configuration**

Prerequisite: A.3/2				
Item	Name of field	Reference	Status	Support
1	Initial address configuration	10.2.1.3.1	m	
2	Address update	10.2.1.3.2	m	

**Table A.5: Local position and time update**

Prerequisite: A.2/2				
Item	Name of field	Reference	Status	Support
1	Ego position vector update	10.2.2.2	m	
2	Time update	10.2.2.3	m	

**Table A.6: Packet handling**

Prerequisite: A.1/2				
Item	Name of field	Reference	Status	Support
1	Basic Header field settings	10.3.2	m	
2	Basic Header processing	10.3.3	m	
3	Common Header field settings	10.3.4	m	
4	Common Header processing	10.3.5	m	
5	Beacon packet handling	10.3.6	m	
6	Location service packet handling	10.3.7	m	
7	GUC packet handling	10.3.8	m	
8	TSB packet handling	10.3.9	m	
9	SHB packet handling	10.3.10	m	
10	GBC packet handling	10.3.11	m	
11	GAC packet handling	10.3.12	m	

**Table A.7: Beacon packet handling**

Prerequisite: A.6/5				
Item	Name of field	Reference	Status	Support
1	Source operations	10.3.6.2	m	
2	Receiver operations	10.3.6.3	m	

**Table A.8: Location service packet handling**

Prerequisite: A.6/6				
Item	Name of field	Reference	Status	Support
1	Source operations	10.3.7.1	m	
2	Forwarder operations	10.3.7.2	m	
3	Destination operations	10.3.7.3	m	

**Table A.9: Source operations for Location service**

Prerequisite: A.8/1				
Item	Name of field	Reference	Status	Support
1	Source operation for initial LS Request	10.3.7.1.2	m	
2	Source operation for LS Request re-transmission	10.3.7.1.3	m	
3	Source operation for LS Reply	10.3.7.1.4	m	

**Table A.10: GUC Packet handling**

Prerequisite: A.6/7				
Item	Name of field	Reference	Status	Support
1	Source operations	10.3.8.2	m	
2	Forwarder operations	10.3.8.3	m	
3	Destination operations	10.3.8.4	m	

**Table A.11: TSB Packet handling**

Prerequisite: A.6/8				
Item	Name of field	Reference	Status	Support
1	Source operations	10.3.9.2	m	
2	Forwarder and receiver operations	10.3.9.3	m	

**Table A.12: SHB Packet handling**

Prerequisite: A.6/9				
Item	Name of field	Reference	Status	Support
1	Source operations	10.3.10.2	m	
2	Receiver operations	10.3.10.3	m	

**Table A.13: GBC Packet handling**

Prerequisite: A.6/10				
Item	Name of field	Reference	Status	Support
1	Source operations	10.3.11.2	m	
2	Forwarder and receiver operations	10.3.11.3	m	

**Table A.14: GAC Packet handling**

Prerequisite: A.6/11				
Item	Name of field	Reference	Status	Support
1	Source operations	10.3.12.2	m	
2	Forwarder and receiver operations	10.3.12.3	m	

### A.6.2.3 Protocol constants

**Table A.15: Protocol constants**

Item	Constant	Ref.	Status	Value allowed	Value
1	itsGnLocalGnAddr	Annex H	m	0 .. 2 <sup>48</sup> -1	
2	itsGnLocalAddrConfMethod	Annex H	m	Auto (0) Managed (1) Anonymous (2)	
3	itsGnProtocolVersion	Annex H	m	1	
4	itsGnIsMobile	Annex H	m	Stationary (0) Mobile (1)	

Item	Constant	Ref.	Status	Value allowed	Value
5	itsGnIfType	Annex H	m	Unspecified (0) ITS-G5 (1) LTE-V2X (2)	
6	itsGnMinimumUpdateFrequencyLPV	Annex H	m	0 .. 65 635	
7	itsGnPaiInterval	Annex H	m	0 .. 100	
8	itsGnMaxSduSize	Annex H	m	0 .. 65 635	
9	itsGnMaxGeoNetworkingHeaderSize	Annex H	m	0 .. 65 635	
10	itsGnLifetimeLocTE	Annex H	m	0 .. 65 635	
11	itsGnSecurity	Annex H	m	DISABLED (0) ENABLED (1)	
12	itsGnSnDecapResultHandling	Annex H	m	STRICT (0) NON-STRICT (1)	
13	itsGnLocationServiceMaxRetrans	Annex H	m	0 .. 255	
14	itsGnLocationServiceRetransmitTimer	Annex H	m	0 .. 65 635	
15	itsGnLocationServicePacketBufferSize	Annex H	m	0 .. 65 635	
16	itsGnBeaconServiceRetransmitTimer	Annex H	m	0 .. 65 635	
17	itsGnBeaconServiceMaxJitter	Annex H	m	itsGnMaxPacketLifetime / 4	
18	itsGnDefaultHopLimit	Annex H	m	0 .. 255	
19	itsGnDPLLength	Annex H	m	0 .. 255	
20	itsGnMaxPacketLifetime	Annex H	m	0 .. 6 300	
21	itsGnDefaultPacketLifetime	Annex H	m	0 .. 6 300	
22	itsGnMaxPacketDataRate	Annex H	m	0 .. 65 635	
23	itsGnMaxPacketDataRateEmaBeta	Annex H	m	0 .. 65 635	
24	itsGnMaxGeoAreaSize	Annex H	m	0 .. 65 635	
25	itsGnMinPacketRepetitionInterval	Annex H	m	0 .. 1 000	
26	itsGnNonAreaForwardingAlgorithm	Annex H	m	UNSPECIFIED (0) GREEDY (1) CBF (2)	
27	itsGnAreaForwardingAlgorithm	Annex H	m	UNSPECIFIED (0) SIMPLE (1) CBF(2) ADVANCED (3)	
28	itsGnCbfMinTime	Annex H	m	0 .. 65 635	
29	itsGnCbfMaxTime	Annex H	m	0 .. 65 635	
30	itsGnDefaultMaxCommunicationRange	Annex H	m	0 .. 65 635	
31	itsGnBroadcastCBFDefSectorAngle	Annex H	m	0 .. 360	
32	itsGnUcForwardingPacketBufferSize	Annex H	m	0 .. 255	
33	itsGnBcForwardingPacketBufferSize	Annex H	m	0 .. 65 635	
34	itsGnCbfPacketBufferSize	Annex H	m	0 .. 65 635	
35	itsGnDefaultTrafficClass	Annex H	m	0 .. 255	

## A.6.3 Media dependent

### A.6.3.1 ITS-G5 media dependent functionality

Table A.16: ITS-G5 media dependent functionality

Prerequisite: A.15/5 = 1 (ITS-G5)				
Item	Name of field	Reference	Status	Support
1	DCC_NET support	ETSI TS 102 636-4-2, clause 5	m	



## A.6.3.2 LTE C-V2X media dependent functionality

Table A.17: TSB Packet handling

Prerequisite: A.15/5 = 2 (LTE C-V2X)				
Item	Name of field	Reference	Status	Support
1	Time synchronization	ETSI TS 102 636-4-3, clause 5.3.4	m	

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## History

<b>Document history</b>		
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