



**Intelligent Transport Systems (ITS);
Communications Access for Land Mobiles (CALM);
Test specifications for non-IP networking (ISO 29281);
Part 1: Protocol Implementation Conformance
Statement (PICS) proforma**

Reference

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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 Communications Access for Land Mobiles (CALM); Test specifications for non-IP networking (ISO 29281), as identified below:

Part 1: "Protocol Implementation Conformance Statement (PICS) proforma";

Part 2: "Test Suite Structure and Test Purposes (TSS & TP)";

Part 3: "Abstract Test Suite (ATS) and partial PIXIT proforma".

1 Scope

The present document provides the "Protocol Implementation Conformance Statement" (PICS) proforma for the ISO protocols specified in ISO 29281-1 [1] in compliance with the relevant requirements, and in accordance with the relevant guidance given in ISO/IEC 9646-7 [3], ETS 300 406 [2] and EG 202 798 [i.3].

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 reference 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] ISO 29281-1:2013: "Intelligent transport systems -- Communication access for land mobiles (CALM) -- Non-IP networking -- Part 1: Fast networking & transport layer protocol (FNTP)".
- [2] ETSI ETS 300 406 (1995): "Methods for testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".
- [3] ISO/IEC 9646-7: "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 7: Implementation Conformance Statements".

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] ARIB STD-T88:2004: "DSRC application sub-layer".
- [i.2] ISO 29281-2:2013: "Intelligent transport systems -- Communication access for land mobiles (CALM) -- Non-IP networking -- Part 2: Legacy system support".
- [i.3] ETSI EG 202 798: "Intelligent Transport Systems (ITS); Testing; Framework for conformance and interoperability testing".
- [i.4] ISO 15628: "Road transport and traffic telematics -- Dedicated short range communication (DSRC) -- DSRC application layer".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ISO 29281-1 [1], ETS 300 406 [2], ISO/IEC 9646-7 [3], EG 202 798 [i.3] and the following apply:

PICS proforma: document, in the form of a questionnaire, which when completed for a protocol implementation or system becomes a PICS

Protocol Implementation Conformance Statement (PICS): statement made by the supplier of a protocol implementation or system claimed to conform to a given specification, stating which capabilities have been implemented

NOTE: The PICS can take several forms: protocol PICS, profile PICS, profile specific PICS, information object PICS, etc.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in ISO 29281-1 [1], ETS 300 406 [2], ISO/IEC 9646-7 [3], EG 202 798 [i.3] and the following apply:

FNTP	Fast Networking & Transport Protocol
IUT	Implementation Under Test
PICS	Protocol Implementation Conformance Statement
SCS	System Conformance Statement
SUT	System Under Test

4 Conformance to this PICS proforma specification

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

A PICS which conforms to the "Fast Networking & Transport Protocol (FNTP)" specified in ISO 29281-1 [1] shall be a conforming PICS proforma completed in accordance with the guidance for completion given in clause A.1.

Annex A (normative): PICS proforma for "Fast Networking & Transport Protocol"

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 PICS proforma in this annex so that it can be used for its intended purposes and may further publish the completed PICS.

A.1 Guidance for completing the PICS proforma

A.1.1 Purposes and structure

The purpose of this PICS proforma is to provide a mechanism whereby a supplier of an implementation of the requirements defined in ISO 29281-1 [1] may provide information about the implementation in a standardized manner.

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

- guidance for completing the PICS proforma;
- identification of the implementation;
- identification of the protocol;
- global statement of conformance;
- PICS proforma tables.

A.1.2 Abbreviations and conventions

The PICS proforma contained in this annex is comprised of information in tabular form in accordance with the guidelines presented in ISO/IEC 9646-7 [3].

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 [3], 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.

ci 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.

Reference column

The reference column makes reference to ISO 29281-1 [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 [3], 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: As stated in ISO/IEC 9646-7 [3], 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: <min value> .. <max value>
example: 5 .. 20
- list of values: <value1>, <value2>, ..., <valueN>
example: 2 ,4 ,6, 8, 9
example: '1101'B, '1011'B, '1111'B
example: '0A'H, '34'H, '2F'H
- list of named values: <name1>(<val1>), <name2>(<val2>), ..., <nameN>(<valN>)
example: reject(1), accept(2)
- length: size (<min size> .. <max size>)
example: 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 PICS proforma 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: B.5/4 is the reference to the answer of item 4 in table 5 of annex B.

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

Prerequisite line

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

A prerequisite line indicates that the whole table is not required to be completed if the predicate is FALSE.

A.1.3 Instructions for completing the PICS proforma

The supplier of the implementation shall complete the PICS proforma in each of the spaces provided. In particular, an explicit answer shall be entered, in each of the support or supported column boxes provided, using the notation described in clause A.1.2.

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

More detailed instructions may be given at the beginning of the different clauses of the PICS proforma.

A.2 Identification of the implementation

A.2.1 Date of the statement

.....
.....

A.2.2 Implementation Under Test (IUT) identification

IUT name:

.....
.....

IUT version:

.....

A.2.3 System Under Test (SUT) identification

SUT name:

.....
.....

Hardware configuration:

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

Operating system:

.....

A.2.4 Product supplier

Name:

.....

Address:

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

Telephone number:

.....

Facsimile number:

.....

E-mail address:

.....

Additional information:

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

A.2.5 Client (if different from product supplier)

Name:

.....

Address:

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

Telephone number:

.....

Facsimile number:

.....

E-mail address:

.....

Additional information:

.....
.....

A.2.6 PICS contact person

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

Name:

Telephone number:

Facsimile number:

E-mail address:

Additional information:

A.3 Identification of the protocol

This PICS proforma applies to the following protocol specified in ISO 29281-1: "Intelligent transport systems -- Communication access for land mobiles (CALM) -- Non-IP networking -- Part 1: Fast networking & transport layer protocol (FNTP)" [1].

A.4 Global statement of conformance

Are all mandatory capabilities implemented? (Yes/No)

NOTE: Answering "No" to this question indicates non-conformance to the ISO 29281-1 - FNTP specification [1]. Non-supported mandatory capabilities are to be identified in the PICS, with an explanation of why the implementation is non-conforming, on pages attached to the PICS proforma.

A.5 Basic functionality

Table A.1: Implementation architectures

Item	Supported architecture	Reference	Status	Support
1	Support of ITS station-internal network	5.4	c101	
c101:	IF (A.2/1 OR A.2/2) THEN m ELSE o -- ITS-S host and ITS-S router in separate ITS-SCUs.			

Table A.2: ITS-SCU roles

Item	ITS-SCU role	Reference	Status	Support
1	Stand-alone ITS-S host	5.1, 5.4	o.201	
2	Stand-alone ITS-S router	5.1, 5.4	o.201	
3	Combined ITS-S host/router	5.1, 5.4	o.201	
o.201: It is mandatory to support at least one of these items.				

Table A.3: Communication protocol functionality

Item	Supported architecture	Reference	Status	Support
1	Basic functionality, i.e. single-hop communications	5.1	m	
2	Extended functionality	5.1	o	

Table A.4: Extended communication protocol functionality

Prerequisite: A.3/2 -- Support of FNTP extended functionality				
Item	Additional protocol functionality	Reference	Status	Support
1	ITS station-internal forwarding	5.1.3	c401	
2	Secure communications	5.1.3	o	
3	N-hop broadcast	5.1.3	o	
4	Local port protocol; ARIB STD_T88 [i.2]	5.1.3	o	
5	CIP management	5.1.3, 7.9	o	
c401: IF A.1/1 THEN m ELSE o -- Support of ITS station-internal forwarding.				

Table A.5: Support of other protocols

Item	Support of other protocols	Reference	Status	Support
1	ISO 15628 [i.4] support	5.1, 6.2.2.2	o	

A.6 Protocol elements

A.6.1 Service access points

Table A.6: Service access points

Item	Supported SAP functionality	Reference	Status	Support
1	IN-SAP	6.1.1, 7.1.2	m	
2	NF-SAP	6.1.2, 7.1.3, 8	m	
3	MN-SAP	6.1.3, 7.1.4	m	
4	SN-SAP	6.1.4, 7.1.5	o	

A.6.2 FNTP PDU

Table A.7: FNTP NPDUs

Item	PDU for	Sending			Receiving		
		Reference	Status	Support	Reference	Status	Support
1	FNTP PDU	6.2	m		6.2	m	

A.6.3 PDU elements

A.6.3.1 Elements of Fntp NPDU

Table A.8: Elements of Fntp NPDU

Item	Elements of FBTP NPDU	Reference	Status	Support
1	Fntp header	6.2.2	m	
2	Fntp body	6.2.3	m	

Table A.9: Elements of Fntp NPDU header

Item	Element of Fntp NPDU header	Reference	Status	Support
1	sourcePort	6.2.2	m	
2	destinationPort	6.2.2	m	
3	Fntp Control	6.2.2	m	

Table A.10: Elements of Fntp NPDU header Options for station-internal forwarding mode of operation

Prerequisite: A.4/1 -- Support of ITS station-internal forwarding				
Item	Element of forwarding NPDU	Reference	Status	Support
1	ITS-SCU-ID ITS-S host	6.2.2.3.2	m	
2	Link-ID VCI in ITS-S router	6.2.2.3.2	m	
3	Counter	6.2.2.3.2	m	
4	sourcePort	6.2.2.3.2	m	
5	destinationPort	6.2.2.3.2	m	

Table A.11: Elements of Fntp NPDU header Options for secure communications

Prerequisite: A.4/2 -- Support of secure communications				
Item	Element of forwarding NPDU	Reference	Status	Support
1	Length	6.2.2.3.3	m	
2	Security elements	6.2.2.3.3	m	

Table A.12: Elements of Fntp NPDU header Options for N-hop broadcast

Prerequisite: A.4/3 -- Support of N-hop broadcast				
Item	Element of forwarding NPDU	Reference	Status	Support
1	Fntp hop count	6.2.2.3.4	m	
2	Security elements	6.2.2.3.4	m	

Table A.13: Elements of Fntp NPDU header Options for CIP management

Prerequisite: A.4/5 -- Support of CIP management				
Item	Element of forwarding NPDU	Reference	Status	Support
1	RX Length	6.2.2.3.6	m	
2	RX CIPs	6.2.2.3.6	m	
3	TX Length	6.2.2.3.6	m	
4	TX CIPs	6.2.2.3.6	m	

A.6.3.2 Parameters of FNTP NPDUs

Table A.14: Special port numbers

Item	Special port	Reference	Status	Support	Values	
					Allowed	Supported
1	Station-internal forwarding: Identification of ITS-S router	6.2.2.2	c1401		PORT_RTR	
2	Station-internal forwarding: Identification of ITS-S host	6.2.2.2	c1401		PORT_HST	
3	Indication of unknown port / do not care value in tables	6.2.2.2	m		PORT_UNK	
4	Reserved for special purposes	6.2.2.2	x		PORT_RES	

c1401: IF A.4/1 THEN m ELSE n/a -- Support of ITS station-internal forwarding.

Table A.15: Other port numbers

Item	Port number	Reference	Status	Support
1	PORT_DYN	6.2.2.2	m	
2	PORT_REG	6.2.2.2	o	

A.6.4 Protocol management elements

Table A.16: Protocol management elements

Item	Support of functionality of	Reference	Status	Support
1	Service look-up table	6.3.1	m	
2	Forwarding table	6.3.2	m	

A.7 Protocol procedures

Table A.17: General protocol procedures

Item	General protocol procedure	Reference	Status	Support
1	Port manager	7.2	m	
2	Maintenance of entries in forwarding tables	7.3	m	
3	ITS-S host: Allocation and deletion of a port	7.4.1	c1702	
4	ITS-S host: Assignment of communication interfaces	7.4.2	c1701	
5	ITS-S router: Assignment of communication interfaces	7.5.1	c1703	
6	Setting of forwarding tables by ITS-S management	7.8.1	m	
7	Notification of changes in forwarding table to the ITS-S management	7.8.2	m	

c1701: IF (A.2/1 AND A.1/1) OR A.2/3 THEN m ELSE n/a -- ITS-S host role and support of ITS station-internal network, or ITS-S host/router role.

c1702: IF A.2/1 OR A.2/3 THEN m ELSE n/a -- ITS-S host role.

c1703: IF (A.2/2 AND A.1.1) OR A.2/3 THEN m ELSE n/a -- ITS-S router role and support of ITS station-internal network, or ITS-S host/router role.

Table A.18: Transmit protocol procedures

Item	Transmit protocol procedure	Reference	Status	Support
1	Transmitting packets - NF-SAP transmission request	7.6.1	m	
2	Transmitting packets - Basic procedure	7.6.1, 7.6.2	m	
3	Transmitting packets - Extended procedure	7.6.1, 7.6.3	c1801	
4	Transmitting packets - Forwarding host to router procedure	7.6.1, 7.6.4	c1802	
c1801: IF A.3/2 THEN m ELSE n/a -- Support of FNTCP extended functionality.				
c1802: IF (A.2/1 OR A.2/3) AND A.4/1 THEN m ELSE n/a -- ITS-S host role and support of ITS station-internal forwarding.				

Table A.19: Receive protocol procedures

Item	Receive protocol procedure	Reference	Status	Support
1	Receiving packets - Checking of FNTCP header	7.7.1	m	
2	Receiving packets - ITS-SPcheck and forwarding table update	7.7.2	m	
3	Receiving packets - Basic delivery procedure	7.7.3	m	
4	Receiving packets - Extended delivery procedure	7.7.4	c1903	
5	Receiving packets - N-hop broadcast procedure	7.7.5	c1901	
6	Receiving packets - Forwarded delivery procedure	7.7.6	c1902	
7	Receiving packets - Send procedure	7.7.7	c1904	
8	Receiving packets - Forwarding router to host procedure	7.7.8	c1904	
c1901: IF (A.2/2 OR A.2/3) AND A.4/3 THEN m ELSE n/a -- ITS-S router role and N-hop broadcast.				
c1902: IF A.2/1 OR A.2/3 THEN m ELSE n/a -- ITS-S host role.				
c1903: If A.3/2 THEN m ELSE n/a -- Support of FNTCP extended functionality.				
c1904: IF (A.2/2 OR A.2/3) THEN m ELSE n/a -- ITS-S router role.				

A.8 Procedures related to CIP management

Table A.20: Procedures related to CIP management

Prerequisite: A.4/5 -- CIP management supported				
Item	Procedure related to CIP management	Reference	Status	Support
1	CIP management	7.9.1	m	
2	Forwarding of CIPs from ITS-S host to ITS-S router	7.9.2	c2001	
3	Forwarding of CIPs from ITS-S router to ITS-S host	7.9.3	c2001	
c2001: IF A.4/1 THEN m ELSE n/a -- Support of ITS station-internal forwarding.				

A.9 NF-SAP service primitives

Table A.21: NF-SAP service primitives

Prerequisite: A.2/1 OR A.2/3 -- ITS-S host role supported				
Item	Support of NF-SAP service primitive functionality	Reference	Status	Support
1	NF-FNTP-PORT.request	8.2.1	m	
2	NF-FNTP-PORT.confirm	8.2.2	m	
3	NF-FNTP-COMM.request	8.3.1	m	
4	NF-FNTP-COMM.confirm	8.3.2	m	
5	NF-FNTP-COMM.indication	8.3.3	m	

A.10 MN-SAP service primitives

Table A.22: MN-SAP service primitives

Item	Support of MN-SAP service primitive functionality	Reference	Status	Support
1	MN-COMMAND.request	7.1.4, 7.8.1	m	
2	MN-COMMAND.confirm	7.1.4, 7.8.1	m	
3	MN-REQUEST.request	7.1.4, 7.8.2	m	
4	MN-REQUEST.confirm	7.1.4, 7.8.2	m	

Table A.23: MN-Commands supported

Item	MN-Command functionality	Reference	Status	Support
1	FWTset	7.8.1	m	
2	FWTupdate	7.8.1	m	
3	FWTdelete	7.8.1	m	

Table A.24: MN-Requests supported

Item	MN-Request functionality	Reference	Status	Support
1	FWTsetNot	7.8.2	m	
2	FWTupdateNot	7.8.2	m	
3	FWTdeleteNot	7.8.2	m	

A.11 IN-SAP service primitives

Table A.25: IN-SAP service primitives supported

Item	IN-SAP service primitive functionality	Reference	Status	Support
1	IN-UNITDATA.request	7.1.2	m	
2	IN-UNITDATA.indication	7.1.2	m	
3	IN-UNITDATA-STATUS.indication	7.1.2	o	

History

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