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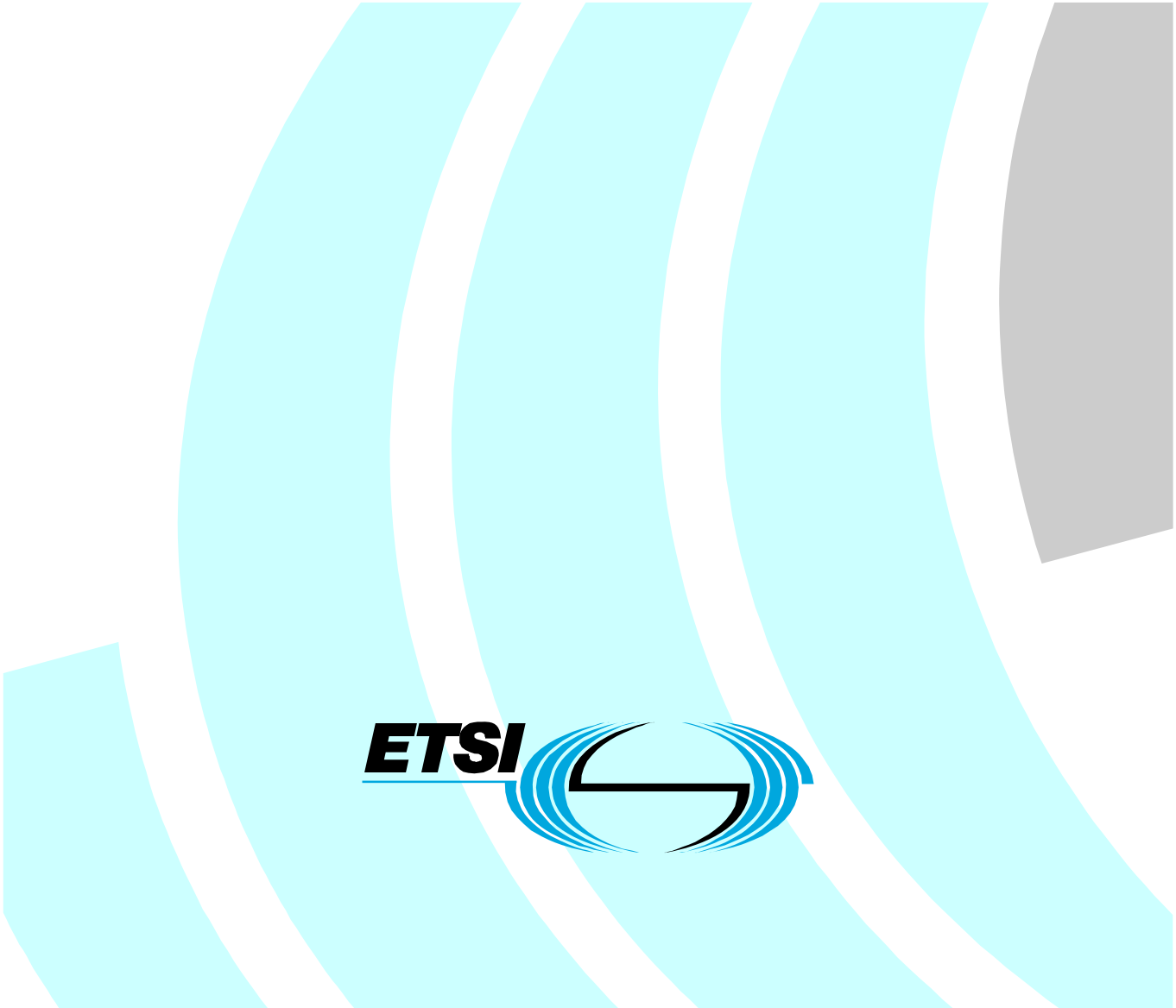
Technical Specification

Intelligent Transport Systems (ITS);
RTTT;
Test specifications for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz ISM band;
Part 1: Data Link Layer;
Sub-Part 1: Protocol Implementation Conformance Statement (PICS) proforma specification



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Contents

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Foreword

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

The present document is part 1, sub-part 1 of a multi-part deliverable covering the test specifications for High Data Rate (HDR) Dedicated Short Range Communication (DSRC), as identified below:

Part 1: "Data Link Layer";

Sub-part 1: "Protocol Implementation Conformance Statement (PICS) proforma specification";

Sub-part 2: "Test Suite Structure and Test Purposes (TSS&TP)";

Sub-part 3: "Abstract Test Suite (ATS) and partial PIXIT proforma";

Part 2: "Application Layer Common Application Service Elements".

1 Scope

The present document specifies Protocol Implementation Conformance Statement (PICS) proformas for the OSI data link layer of HDR DSRC as defined in ES 200 467-1 [1], in compliance with the relevant requirements, and in accordance with the relevant guidance given in ISO/IEC 9646-7 [3] and in ETS 300 406 [4].

This proforma is intended for use by suppliers of equipment which is claimed to conform to the HDR DSRC data link layer, as specified in ES 200 674-1 [1].

To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented for a telecommunication specification. Such a statement is called an Implementation Conformance Statement (ICS). The present document provides proforma ICS templates, to be filled in by equipment suppliers.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.
- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:
  - if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;
  - for informative references.

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 indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

[1] ETSI ES 200 674-1: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Road Transport and Traffic Telematics (RTTT); Part 1: Technical characteristics and test methods for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz Industrial, Scientific and Medical (ISM) band".

[2] ISO/IEC 9646-1: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concept".

[3] ISO/IEC 9646-7: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".

[4] ETSI ETS 300 406: "Methods for testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".

2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Not applicable.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ES 200 674-1 [1], ISO/IEC 9646-1 [2], ISO/IEC 9646-7 [3] and the following apply:

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

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

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in ES 200 674-1 [1], ISO/IEC 9646-1 [2], ISO/IEC 9646-7 [3] and the following apply:

DSRC	Dedicated Short Range Communication
FCS	Frame Check Sequence
ICS	Implementation Conformance Statement
IUT	Implementation Under Test
LLC	Logical Link Control
MAC	Medium Access Control
OBU	On Board Unit, an alternative descriptor to Mobile Equipment
PICS	Protocol Implementation Conformance Statement
RSU	Road Side Unit, an alternative descriptor to Fixed Equipment
RTTT	Road Transport and Traffic Telematics
SUT	System Under Test

4 Overview of the templates

The present document contains common PICS templates for On Board Unit (OBU) and Road Side Unit (RSU), for the OSI data link layer of HDR DSRC.

5 Conformance requirement concerning PICS

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.

An ICS which conforms to the present document shall be a conforming PICS proforma completed in accordance with the instructions for completion given at the start of each annex.

Annex A (normative): PICS proforma for HDR DSRC data link layer

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 ES 200 674-1 [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 ES 200 674-1 [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: 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.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.

A.2 Identification of the implementation

Identification of the Implementation Under Test (IUT) and the system in which it resides (the System Under Test (SUT)) should 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 should both be filled in if they are different.

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

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 standard:

ES 200 674-1 [1]: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Road Transport and Traffic Telematics (RTTT); Part 1: Technical characteristics and test methods for High Data Rate (HDR) data transmission equipment operating in the 5,8 GHz Industrial, Scientific and Medical (ISM) band".

A.4 Global statement of conformance

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

NOTE: Answering "No" to this question indicates non-conformance to the protocol specification. 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 General requirements

Table A.1: Device type

Item	Service implemented	Reference	Status	Support
1	OBU	10.1	o.1	
2	RSU	10.1	o.1	

o.1 Exactly one device type has to be implemented.

A.6 LLC Data Service

A.6.1 LLC Frame format

Table A.2: LLC Frame format

Item	Capability	Reference	Status	Support
1	Frame format	10.2	m	
2	Flags	10.3	m	
3	LPDU	10.4	m	
4	16 bit FCS	10.5	m	
5	Bit order	10.2.2.2	m	

A.6.2 LLC Address and Information Fields

Table A.3: LLC Control and Status fields

Item	Format of field implemented	Reference	Status	Support
1	LLC Address field	10.4	m	
2	LLC Information field	10.4	m	

A.6.3 Protocol procedures

Table A.4: LLC protocol procedures

Item	Procedure	Reference	Status	Support
1	Frame reception – Validity of frame	10.2.2.1	m	
2	RSU Link ID	10.8.1	c1	
3	OBU Link ID	10.9.1	c2	
4	Frame transmission	10.6	m	
5	RSU transmission	10.8.2	c1	
6	OBU transmission	10.9.2	c2	
7	Frame reception	10.7	m	
8	RSU reception	10.8.3	c1	
9	OBU reception	10.9.3	c2	
10	Transparency	10.2.2.3	m	

c1 IF Table A.1/2 THEN m else n/a.

c2 IF Table A.1/1 THEN m else n/a.

A.6.4 LLC frame size and timing

Table A.5: LLC Timers and Counters

Item	Timer or Counter implemented	Value	Reference	Status	Support
1	Maximum value of T1 (polling interval time)	10 ms	10.8.2	c1	
2	T_{dmax}: Maximum downlink communication time	590 µs	10.8.2	m	
3	T_{umax}: Maximum uplink communication time	3 800 µs	10.9.2	m	
4	N2: maximum number of octets in frame in downlink window	64	10.2.2.4	m	
5	N3: maximum number of octets in frame in private uplink window	64	10.2.2.4	m	

History

Document history		
V1.1.1	March 2010	Publication