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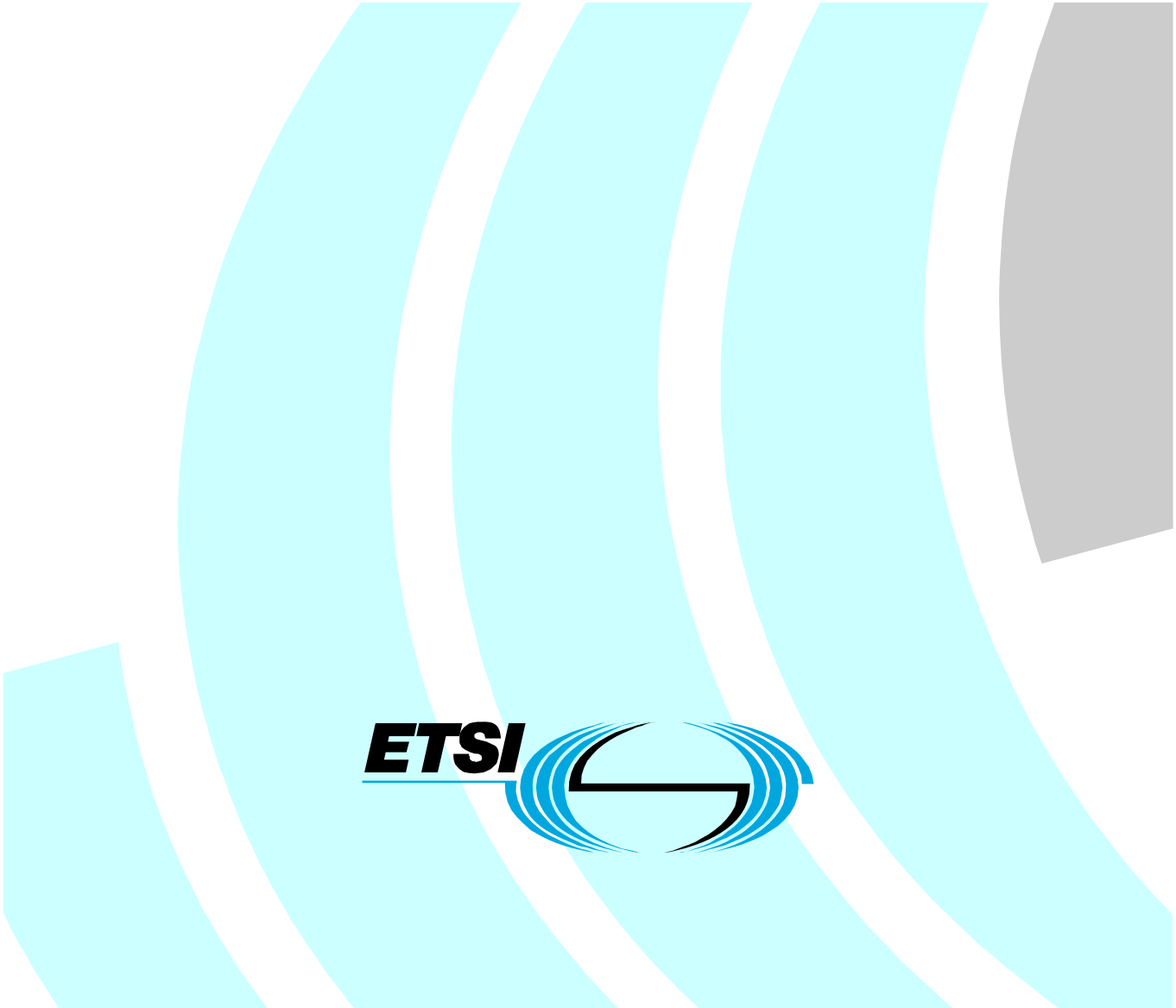
Technical Specification

Intelligent Transport Systems (ITS); Testing; Conformance test specification for Decentralized Environmental Notification Messages (DENM); Part 1: Test requirements and Protocol Implementation Conformance Statement (PICS) proforma



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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 of a multi-part deliverable covering Conformance test specification for Decentralized Environmental Notification Messages (DENM) as identified below:

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

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

Part 3: "Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT)".

1 Scope

The present document provides the Protocol Implementation Conformance Statement (PICS) proforma for Conformance test specification for Decentralized Environmental Notification Messages (DENM) as defined in TS 102 637-3 [2] in compliance with the relevant requirements and in accordance with the relevant guidance given in ISO/IEC 9646-7 [4].

The supplier of an implementation which is claimed to conform to TS 102 637-3 [2] is required to complete a copy of the PICS proforma provided in the annex A of the present document.

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] ETSI TS 102 637-1: "Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 1: Functional Requirements".

[2] ETSI TS 102 637-3 (V1.1.1): "Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 3: Specifications of Decentralized Environmental Notification Basic Service".

[3] ISO/IEC 9646-1 (1994): "Information technology -- Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts".

[4] ISO/IEC 9646-7 (1995): "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.

Not applicable.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

- terms given in TS 102 637-3 [2];
- terms given in ISO/IEC 9646-1 [3] and in ISO/IEC 9646-7 [4].

In particular, the following terms given in ISO/IEC 9646-1 [3] 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. The ICS can take several forms: protocol ICS, profile ICS, profile specific ICS, information object ICS, etc.

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

Protocol ICS (PICS): PICS for an implementation or system claimed to conform to a given protocol specification

3.2 Abbreviations

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

CAN	Controller Area Network
DE	Data Element
DEN	Decentralized Environmental Notification
DENM	DEN Message
ICS	Implementation Conformance Statement
ITS	Intelligent Transportation Systems
IUT	Implementation Under Test
PICS	Protocol Implementation Conformance Statement
SUT	System Under Test
V2I	Vehicle-to-Infrastructure
V2V	Vehicle-to-Vehicle

4 Conformance requirement concerning PICS

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.

An ICS which conforms to the present document shall be a conforming PICS proforma completed in accordance with the instructions for completion given in clause A.1.

Annex A (normative): DENM PICS Proforma

A.1 Guidance for completing the ICS 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 TS 102 637-3 [2] 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 ICS proforma;
- identification of the implementation;
- identification of the TS 102 637-3 [2];
- global statement of conformance;
- PICS proforma tables.

A.1.2 Abbreviations and conventions

The ICS proforma contained in this annex is comprised of information in tabular form in accordance with the guidelines presented in ISO/IEC 9646-7 [4].

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 [4], 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.
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 TS 102 637-3 [2], 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 [4], 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 [4], 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 ICS 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 ICS proforma

The supplier of the implementation shall complete the ICS 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 are given at the beginning of the different clauses of the ICS proforma.

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 ICS 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 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.3 Identification of the protocol

This ICS proforma applies to the following standard:

ETSI TS 102 637-3 [2]:"Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 3: Specifications of Decentralized Environmental Notification Basic Service".

A.4 Global statement of conformance

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

NOTE: Answering "No" to this question indicates non-conformance to the DENM 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 proforma.

A.5 Tables

A.5.1 ITS Station type

The supplier of the implementation shall state the support of type of the implementation according to the following station type, in table A.1.

Table A.1: Station type

Item	Type	Reference	Status	Support
1	central ITS station	6.1 [1]	n/a	
2	road side ITS station	6.1 [1]	o.101	
3	Vehicle ITS station	6.1 [1]	o.101	
o.101:	It is mandatory to support one of these type.			

A.5.2 DEN Causes

The supplier of the implementation shall state the support of the implementation for each of the following direct causes, in the table below.

Table A.2: Cause and sub cause codes supported

Item	Direct cause	Cause code	Sub code	Sub cause	Ref.	Status	Support
1	101	Dangerous Driving	1	Hard brake vehicle	6.1.2	m	
2	35	Wrong way driving	0		6.1.2	m	
3	102	Intersection violation	1	Stop sign violation	6.1.2	m	
4			2	Traffic light violation	6.1.2	m	
5			3	Turning regulation violation	6.1.2	m	
6	2	Accident	0		6.1.2	m	
7	103	Vehicle problems	1	Break down vehicle	6.1.2	m	
8			2	Vehicle speed reduced with safety lights on.	6.1.2	m	
9	62	Slow vehicle	0		6.1.2	m	
10	1	Traffic jam	0		6.1.2	m	
11	3	Road work	0		6.1.2	m	
12	104	Intersection collision	1	Left turn collision risk	6.1.2	m	
13			2	Right turn collision risk	6.1.2	m	
14			3	Crossing collision risk	6.1.2	m	
15			4	Merging collision risk	6.1.2	m	
16	105	Hazardous location	1	Dangerous curve	6.1.2	m	
17			2	Obstacle on the road	6.1.2	m	
18	45	Precipitation	1	Heavy rain	6.1.2	m	
19			2	Heavy snow	6.1.2	m	
20	42	Extreme weather condition	0		6.1.2	m	
21	11	Slippery Road	9	Low road adhesion	6.1.2	m	
22			6	Black ice	6.1.2	m	
23	43	Visibility reduced	1	Bad visibility due to fog	6.1.2	m	
24			4	Bad visibility due to heavy rain	6.1.2	m	
25	36	Rescue on the way	1	Emergency vehicle	6.1.2	m	

A.5.3 DENM Message

Table A.3: Fields of DENM message supported

It.	Name of field	Ref.	Status	Sp.	Value allowed	Value sp.
1	ITS Pdu Header	6.2.3	m		ItsPduHeader	
2	denm	6.2.4	m		DecentralizedEnvironmentalNotificationMessage	

A.5.3.1 ItsPduHeader element

Table A.4: Fields of ItsPduHeader element supported

Prerequisite: A.3/1						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	protocolVersion	6.2.4	m		0..255	
2	messageID	6.2.4	m		0..255	
3	generationtime	6.2.4	m		TimeStamp	

A.5.3.2 DecentralizedEnvironmentalNotificationMessage element

Table A.5: Fields of DecentralizedEnvironmentalNotificationMessage supported

Prerequisite: A.3/2						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	management	6.2.3	m		DecentralizedSituationManagement	
2	situation	6.2.3	m		DecentralizedSituation	
3	location	6.2.3	m		DecentralizedSituationLocation	

A.5.3.2.1 DecentralizedSituationManagement element

Table A.6: Fields of DecentralizedSituationManagement element supported

Prerequisite: A.5/1						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	actionID	6.2.4	m		ActionID	
2	dataVersion	6.2.4	m		DataVersion	
3	expiryTime	6.2.4	o		TimeStamp	
4	frequency	6.2.4	o		0..255	
5	reliability	6.2.4	m		0..100	
6	isNegation	6.2.4	m		Boolean	

A.5.3.2.1.1 DecentralizedSituationManagement sub-elements

Table A.7: ActionID

Prerequisite: A.6/1						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	stationID	6.2.4	m		0..4294967295	
2	sequenceNo	6.2.4	m		0..65 535	

Table A.8: DataVersion

Prerequisite: A.6/2						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	DataVersion	6.2.4	m		0..255 firstVersion(0), secondVersion(1), cancellation(255)	

A.5.3.2.2 DecentralizedSituation element

Table A.9: Fields of DecentralizedSituation element supported

Prerequisite: A.5/2						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	trafficFlowEffect	6.2.4	o		TrafficFlowEffect	
2	situation	6.2.4	m		Situation	
3	linkedCause	6.2.4	o		Situation	
4	severity	6.2.4	m		Severity	
5	eventCharact	6.2.4	o		EventCharact	
6	vehicleCommonParameters	6.2.4	o		VehicleCommonParameters	
7	profile	6.2.4	o		ProfileParameters	

A.5.3.2.2.1 DecentralizedSituation sub-elements

Table A.10: TrafficFlowEffect

Prerequisite: A.9/1						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	trafficFlowEffect	6.2.4	m		0..7	

Table A.11: Situation

Prerequisite: A.9/2 or A.9/3						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	cause	6.2.4	m		CauseCode	
2	subCause	6.2.4	m		SubCauseCode	

Table A.12: Severity

Prerequisite: A.9/4						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	severity	6.2.4	m		Informative (1), danger level 1: obstacles (2), danger level 2: danger (3), danger level 3: highest danger (4)	

Table A.13: EventCharact

Prerequisite: A.9/5						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	eventmobility	6.2.4	m		Boolean	
2	causeType	6.2.4	m		itsStation, geographicalRegion	
3	relevant	6.2.4	m		physicallyRelevant, difficultDrivingConditions	
4	timeCriticality	6.2.4	m		Boolean	

Table A.14: CauseCode

Prerequisite: A.11/1						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	causeCode	6.2.4	m		Reserved (0), …., Dangerous driving (101), Intersection violation (102), Vehicle problem (103), Intersection collision (104), Hazardous location (105), …., 0..255	

Table A.15: SubCauseCode

Prerequisite: A.11/2						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	subCauseCode	6.2.4	m		Unknown (0), …., 0..255	

Table A.16: VehicleCommonParameters

Prerequisite: A.9/6						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	vehicleType	6.2.4	m		VehicleType	
2	stationLength	6.2.4	m		StationLength	
3	stationLengthConfidence	6.2.4	o		StationLengthConfidence	
4	stationWidth	6.2.4	m		StationWidth	
5	stationWidthConfidence	6.2.4	o		StationWidthConfidence	
6	vehicleSpeed	6.2.4	m		VehicleSpeed	
7	vehicleSpeedConfidence	6.2.4	m		VehicleSpeedConfidence	
8	longAcceleration	6.2.4	m		LongAcceleration	
9	longAccelerationConfidence	6.2.4	m		LongAccelerationConfidence	
10	accelerationControl	6.2.4	m		AccelerationControl	
11	yawRate	6.2.4	m		YawRate	
12	yawRateConfidence	6.2.4	m		YawRateConfidence	
13	exteriorLights	6.2.4	m		ExteriorLights	
14	turnAdvice	6.2.4	o		TurnAdvice	
15	distanceToStopLine	6.2.4	o		DistanceToStopLine	
16	occupancy	6.2.4	o		Occupancy	
17	doorOpen	6.2.4	o		DoorOpen	
18	posConfidenceEllipse	6.2.4	m		PosConfidenceEllipse	
19	curvature	6.2.4	m		Curvature	
20	curvatureChange	6.2.4	o		CurvatureChange	
21	curvatureConfidence	6.2.4	m		CurvatureConfidence	
22	crashStatus	6.2.4	o		CrashStatus	
23	headingConfidence	6.2.4	m		HeadingConfidence	
24	dangerousGoods	6.2.4	o		DangerousGoods	

A.5.3.2.2.2 VehicleCommonParameters sub-elements

Table A.17: VehicleType

Prerequisite: A.16/1						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	VehicleType	6.2.4	m		0..255	

Table A.18: StationLength

Prerequisite: A.16/2						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	StationLength	6.2.4	m		Dimension	

Table A.19: StationLengthConfidence

Prerequisite: A.16/3						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	StationLengthConfidence	6.2.4	m		Confidence	

Table A.20: StationWidth

Prerequisite: A.16/4						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	StationWidth	6.2.4	m		Dimension	

Table A.21: StationWidthConfidence

Prerequisite: A.16/5						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	StationWidthConfidence	6.2.4	m		Confidence	

Table A.22: VehicleSpeed

Prerequisite: A.16/6						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	VehicleSpeed	6.2.4	m		Speed	

Table A.23: VehicleSpeedConfidence

Prerequisite: A.16/7						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	VehicleSpeedConfidence	6.2.4	m		Confidence	

Table A.24: LongAcceleration

Prerequisite: A.16/8						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	LongAcceleration	6.2.4	m		-2000..2000	

Table A.25: LongAccelerationConfidence

Prerequisite: A.16/9						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	LongAccelerationConfidence	6.2.4	m		Confidence	

Table A.26: AccelerationControl

Prerequisite: A.16/10						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	brakePedal	6.2.4	m		Boolean	
2	throttlePedal	6.2.4	m		Boolean	
3	cruiseControl	6.2.4	m		Boolean	
4	acc	6.2.4	m		Boolean	
5	limiter	6.2.4	m		Boolean	
6	brakeAssist	6.2.4	m		Boolean	

Table A.27: YawRate

Prerequisite: A.16/11						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	yawDirection	6.2.4	m		left (0), right (1)	
2	yawRateValue	6.2.4	m		0..32765	

A Table A.28: YawRateConfidence

Prerequisite: A.16/12						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	YawRateConfidence	6.2.4	m		Confidence	

Table A.29: ExteriorLights

Prerequisite: A.16/13						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	lowBeamHeadlightsOn	6.2.4	m		Boolean	
2	highBeamHeadlightsOn	6.2.4	m		Boolean	
3	leftTurnSignalOn	6.2.4	m		Boolean	
4	rightTurnSignalOn	6.2.4	m		Boolean	
5	automaticLightControlOn	6.2.4	m		Boolean	
6	daytimeRunningLightsOn	6.2.4	m		Boolean	
7	fogLightOn	6.2.4	m		Boolean	
8	parkingLightsOn	6.2.4	m		Boolean	

Table A.30: TurnAdvice

Prerequisite: A.16/14						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	direction	6.2.4	m		TurnDirection	
2	distance	6.2.4	m		Distance	

Table A.31: DistanceToStopLine

Prerequisite: A.16/15						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	DistanceToStopLine	6.2.4	m		Distance	

Table A.32: Occupancy

Prerequisite: A.16/16						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	Occupancy	6.2.4	m		0..255	

Table A.33: DoorOpen

Prerequisite: A.16/17						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	driver	6.2.4	m		Boolean	
2	passenger	6.2.4	m		Boolean	
3	maintenance	6.2.4	m		Boolean	
4	luggage	6.2.4	m		Boolean	

Table A.34: PosConfidenceEllipse

Prerequisite: A.16/18						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	semiMajorConfidence	6.2.4	m		Confidence	
2	semiMinorConfidence	6.2.4	m		Confidence	
3	semiMajorOrientation	6.2.4	m		Direction	

Table A.35: Curvature

Prerequisite: A.16/19						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	Curvature	6.2.4	m		-32765..32765	

Table A.36: CurvatureChange

Prerequisite: A.16/20						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	CurvatureChange	6.2.4	m		-1023..1023	

Table A.37: CurvatureConfidence

Prerequisite: A.16/21						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	CurvatureConfidence	6.2.4	m		Confidence	

Table A.38: CrashStatus

Prerequisite: A.16/22						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	CrashStatus	6.2.4	m		Boolean	

Table A.39: HeadingConfidence

Prerequisite: A.16/23						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	HeadingConfidence	6.2.4	m		Confidence	

Table A.40: DangerousGoods

Prerequisite: A.16/24						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	DangerousGoods	6.2.4	m		0..8191	

Table A.41: ProfileParameters

Prerequisite: A.9/7						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	basicVehicle	6.2.4	m		BasicVehicle	
2	emergencyVehicle	6.2.4	m		EmergencyVehicle	
3	publicTransportVehicle	6.2.4	m		PublicTransportVehicle	

A.5.3.2.2.3 ProfileParameters sub-elements

Table A.42: EmergencyVehicle

Prerequisite: A.3/7						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	lightBarInUse	6.2.4	o		LightBarInUse	
2	sireneInUse	6.2.4	o		SireneInUse	
3	emergencyResponseType	6.2.4	m		EmergencyResponseType	

Table A.43: PublicTransportVehicle

Prerequisite: A.3/7						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	publicVehicleType	6.2.4	m		PublicVehicleType	
2	pTLineDescription	6.2.4	o		PTLineDescription	
3	scheduleDeviation	6.2.4	o		ScheduleDeviation	
4	trafficLightPriority	6.2.4	o		TrafficLightPriority	

A.5.3.2.2.4 EmergencyVehicle sub-elements

Table A.44: LightBarInUse

Prerequisite: A.42/1						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	LightBarInUse	6.2.4	m		SimpleSystemState	

Table A.45: SireneInUse

Prerequisite: A.42/2						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	SireneInUse	6.2.4	m		SimpleSystemState	

Table A.46: EmergencyResponseType

Prerequisite: A.42/3						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	EmergencyResponseType	6.2.4	m		None(0) staticSafeguard (1) movingSafeguard (2) rightOfWay (3)	

A.5.3.2.2.5 PublicTransportVehicle sub-elements

Table A.47: PublicVehicleType

Prerequisite: A.43/1						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	PublicVehicleType	6.2.4	m		0..255	

Table A.48: PTLineDescription

Prerequisite: A.43/2						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	courseOfJourney	6.2.4	m		CourseOfJourney	
2	lineRef	6.2.4	m		LineRef	
3	routeRef	6.2.4	m		RouteRef	

Table A.49: ScheduleDeviation

Prerequisite: A.43/3						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	ScheduleDeviation	6.2.4	m		-900..3600	

Table A.50: TrafficLightPriority

Prerequisite: A.43/4						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	TrafficLightPriority	6.2.4	m		Priority	

A.5.3.2.2.6 PTLineDescription sub-elements

Table A.51: CourseOfJourney

Prerequisite: A.48/1						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	CourseOfJourney	6.2.4	m		32 characters max	

Table A.52: LineRef

Prerequisite: A.48/2						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	LineRef	6.2.4	m		32 characters max	

Table A.53: RouteRef

Prerequisite: A.48/3						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	RouteRef	6.2.4	m		32 characters max	

A.5.3.2.3 DecentralizedSituationLocation element

Table A.54: Fields of DecentralizedSituationLocation element supported

Prerequisite: A.5/3						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	eventPosition	6.2.4	m		EventPosition	
2	locationRef	6.2.4	m		LocationRef	

A.5.3.2.3.1 DecentralizedSituationLocation sub-elements

Table A.55: EventPosition

Prerequisite: A.54/1						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	refPosition	6.2.4	m		ReferencePosition	
2	eventSpeed	6.2.4	o		Speed	

Table A.56: LocationRef

Prerequisite: A.54/2						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	locationRef	6.2.4	m		TraceLocData, ...	

Table A.57: ReferencePosition

Prerequisite: A.55/1						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	longitude	6.2.4	m		Longitude	
2	latitude	6.2.4	m		Latitude	
3	elevation	6.2.4	m		Elevation	
4	heading	6.2.4	o		Heading	
5	streetName	6.2.4	o		StreetName	
6	positionConfidence	6.2.4	o		Confidence	
6	elevationConfidence	6.2.4	o		Confidence	
6	roadSegmentID	6.2.4	o		RoadSegmentID	

Table A.58: TraceLocData

Prerequisite: A.54/1						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	traceID	6.2.4	m		0..7	
2	waypoints	6.2.4	m		Waypoint Size (0..31)	

Table A.59: Waypoint

Prerequisite: A.58/1						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	PtLat	6.2.4	m		Latitude	
2	PtLong	6.2.4	m		Longitude	
3	PtAlt	6.2.4	m		Elevation	

A.5.3.2.3.1.1 ReferencePosition sub-elements

Table A.60: Heading

Prerequisite: A.57/4						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	Heading	6.2.4	m		Direction	

Table A.61: StreetName

Prerequisite: A.57/5						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	StreetName	6.2.4	m		32 characters max 1 character min	

Table A.62: PositionConfidence

Prerequisite: A.57/7						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	elevationConfidence	6.2.4	m		Confidence	

Table A.63: ElevationConfidence

Prerequisite: A.57/7						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	elevationConfidence	6.2.4	m		Confidence	

Table A.64: RoadSegmentID

Prerequisite: A.57/8						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	RoadSegmentID	6.2.4	m		0..99999999	

A.5.3.3 Common sub-elements

Table A.65: Longitude

Prerequisite: A.57/2 or A.59/2						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	hemisphere	6.2.4	m		east (0), west (1)	
2	degree	6.4.2	m		0..1800000000	

Table A.66: Latitude

Prerequisite: A.57/1 or A.59/1						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	hemisphere	6.2.4	m		north (0), south (1)	
2	degree	6.2.4	m		0..900000000	

Table A.67: Elevation

Prerequisite: A.57/3 or A.59/3						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	elevation	6.2.4	m		-10000..16767215	

Table A.68: TimeStamp

Prerequisite: A.4/3 or A.6/3						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	longTimeStamp	6.2.4	m		0.. 281 474 976 710 655	

Table A.69: Speed

Prerequisite: A.22/1 or A.55/2						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	Speed	6.2.4	m		-32765..32765	

Table A.70: Direction

Prerequisite: A.60/1 or A.34/1						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	Direction	6.2.4	m		0..28799 north (0) east(7200) south(14400) west(21600)	

Table A.71: Distance

Prerequisite: A.31/1 or A.30/2						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	Distance	6.2.4	m		0..65535	

Table A.72: Confidence

Prerequisite: A.63/1 or A.37/1 or A.39/1 or A.25/1 or A.19/1 or A.21/1 or A.23/1 or A.28/1						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	Confidence	6.2.4	m		0..15	

Table A.73: Dimension

Prerequisite: A.18/1 or A.20/1						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	Dimension	6.2.4	m		0..16383	

Table A.74: Priority

Prerequisite: A.50/1						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	Priority	6.2.4	m		0..7	

Table A.75: SimpleSystemState

Prerequisite: A.44/1 or A.45/1						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	SimpleSystemState	6.2.4	m		unavailable (0) disabled (1) enabled (2) engaged (3)	

Table A.76: Temperature

Prerequisite: A.78/1						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	Temperature	6.2.4	m		-40..215	

Table A.77: TurnDirection

Prerequisite: A.30/1						
It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	TurnDirection	6.2.4	m		uTurn (0) sharpRight (1) right (2) slightRight (3) straight (4) slightLeft (5) left (6) sharpLeft (7)	

Table A.78: AmbientAirTemperature

It.	**Name of field**	**Ref.**	**Status**	**Sp.**	**Value allowed**	**Value sp.**
1	AmbientAirTemperature	6.2.4	m		Temperature	

Table A.79: DataReference

It.	Name of field	Ref.	Status	Sp.	Value allowed	Value sp.
1	DataReference	6.2.4	m		128 characters max 1 character min	

Table A.80: WiperSystemFront

It.	Name of field	Ref.	Status	Sp.	Value allowed	Value sp.
1	WiperSystemFront	6.2.4	m		Idle (0) interval (1) normal (2) fast (3) washerActive (4)	

A.5.4 Protocol parameters

A.5.4.1 Timing requirements

The supplier of the implementation shall provide information about the timing requirements.

Table A.81: Timing requirements

Item	Name	Ref.	Status	Sp.
1	default expiry time of DENM generations	B.6 notes	m	

Annex B (informative): Bibliography

- ETSI TS 102 637-2 (V1.2.1): "Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 2: Specification of Cooperative Awareness Basic Service".
- ETSI TS 102 637-4: "Intelligent Transport Systems (ITS); Vehicular Communications; Basic set of applications; Part 4: Operational Requirements".
- ETSI TS 102 868-1: "Intelligent Transport Systems (ITS); Testing; Conformance test specification for Co-operative Awareness Messages (CAM); Part 1: Test requirements and Protocol Implementation Conformance Statement (PICS) proforma".
- ETSI ETS 300 406 (1995): "Methods for testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".

History

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