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Intelligent Transport Systems (ITS);
Testing;
Conformance test specifications for
Co-operative Awareness Messages (CAM);
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 Systems (ITS).

The present document is part 1 of a multi-part deliverable covering Conformance test specification for Co-operative Awareness Messages (CAM) 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 Co-operative Awareness Messages (CAM) as defined in EN 302 637-2 [1] in compliance with the relevant requirements and in accordance with the relevant guidance given in ISO/IEC 9646-7 [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] ETSI EN 302 637-2 (V1.3.0): "Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 2: Specification of Cooperative Awareness Basic Service".

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

[3] ISO/IEC 9646-7 (1995): "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 7: Implementation Conformance Statements".

[4] ETSI TS 102 894-2 (V1.1.1): "Intelligent Transport Systems (ITS); Users and applications requirements; Part 2: Applications and facilities layer common data dictionary".

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 terms and definitions given in EN 302 637-2 [1], ISO/IEC 9646-1 [2] and in ISO/IEC 9646-7 [3] apply.

3.2 Abbreviations

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

BTP	Basic Transport Protocol
CAM	Co-operative Awareness Messages
CAN	Controller Area Network
DCC	Decentralized Congestion Control
ICS	Implementation Conformance Statement
ITS	Intelligent Transport Systems
IUT	Implementation Under Test
LSB	Least Significant Bit
PDU	Protocol Data Unit
PICS	Protocol Implementation Conformance Statement
SUT	System Under Test

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): CAM 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 EN 302 637-2 (V1.3.0) [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 ICS proforma;
- identification of the implementation;
- identification of the EN 302 637-2 (V1.3.0) [1];
- 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 [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.
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 EN 302 637-2 (V1.3.0) [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 2: 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 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: EN 302 637-2 (V1.3.0) [1]: "Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 2: Specification of Cooperative Awareness 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 CAM 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

Table A.1: ITS Station type

Item	Type	Reference	Status	Support
1	Personal ITS-S	[1] 6.1.2	n/a	
2	Road side ITS-S	[1] 6.1.2	o	
3	Vehicle ITS-S	[1] 6.1.2	m	
4	Other	[1] 6.1.2	n/a	

A.5.2 CAM vehicle profiles

Table A.2: CAM vehicle profiles supported

Prerequisite: A.1/3				
Item	**CAM vehicle profile**	**Reference**	**Status**	**Support**
1	PublicTransport	[1] 7.1.2	o.201	
2	SpecialTransport	[1] 7.1.2	o.201	
3	DangerousGoods	[1] 7.1.2	o.201	
4	RoadWork	[1] 7.1.2	o.201	
5	Rescue	[1] 7.1.2	o.201	
6	Emergency	[1] 7.1.2	o.201	
7	SafetyCar	[1] 7.1.2	o.201	
8	BasicVehicle	[1] 7.1.2	o.201	
o.201: It is mandatory to support only one of these type.				

A.5.3 CAM Basic Functionality

Table A.3: CAM Basic Functionality supported

Item	Vehicle Type	Reference	Status	Support
1	Dissemination of CAM Messages	[1] 6.2	m	
2	Transmission of CAM Messages	[1] 4.2.1	m	
3	Reception of CAM Messages	[1] 4.2.2	m	

A.5.4 CAM Interfaces to data provisioning services

Table A.4: CAM Interfaces supported

Item	Vehicle Type	Reference	Status	Support
1	Interface to ITS applications	[1] 5.3.1	m	
2	Interface to data provisioning facilities	[1] 5.3.2	m	
3	Interface to the Networking & Transport Layer	[1] 5.3.3	m	
4	Interface to the Management entity	[1] 5.3.4	m	
5	Interface to the Security entity	[1] 5.3.5	m	

Table A.5: CAM Interfaces to Networking & Transport Layer

Prerequisite: A.4/3				
Item	**Vehicle Type**	**Reference**	**Status**	**Support**
1	Interface to the GeoNetworking/BTP stack	[1] 5.3.3.1	m	
2	Interface to the IPv6 stack and the combined IPv6/GeoNetworking stack	[1] 5.3.3.2	m	

A.5.5 CAM Message

Table A.6: CAM message

Item	Name of field	Ref.	Type	Status	Support
1	header	[1] B.1	ItsPduHeader (Table B.1)	m	
2	cam	[1] B.2, [1] Annex A	CoopAwareness (Table A.7)	m	

Table A.7: CoopAwareness

Prerequisite: A.6/2					
Item	**Name of field**	**Ref.**	**Type**	**Status**	**Support**
1	generationDeltaTime	[1] B.3, [1] Annex A	Integer { oneMilliSec(1) } (0..65535)	m	
2	camParameters	[1] B.4, [1] Annex A	CamParameters (Table A.8)	m	

Table A.8: CamParameters

Prerequisite: A.7/2					
Item	**Name of field**	**Ref.**	**Type**	**Status**	**Support**
1	basicContainer	[1] B.5, [1] Annex A	BasicContainer (Table A.9)	m	
2	highFrequencyContainer	[1] B.6, [1] Annex A	HighFrequencyContainer (Table A.10)	m	
3	lowFrequencyContainer	[1] B.7, [1] Annex A	LowFrequencyContainer (Table A.11)	o	
4	specialVehicleContainer	[1] B.8, [1] Annex A	SpecialVehicleContainer (Table A.12)	o	

Table A.9: BasicContainer

Prerequisite: A.8/1					
Item	**Name of field**	**Ref.**	**Type**	**Status**	**Support**
1	stationType	[1] B.18	StationType (Table B.3)	m	
2	referencePosition	[1] B.19	ReferencePosition (Table B.2))	m	

Table A.10: HighFrequencyContainer

Prerequisite: A.8/2					
Item	**Name of field**	**Ref.**	**Type**	**Status**	**Support**
1	basicVehicleHF	[1] B.9, [1] Annex A	BasicVehicleContainerHighFrequency (Table A.13)	c.1001	
2	emptyRSUHF	[1] Annex A	NULL	c.1002	
c.1001: IF vehicle THEN m ELSE x. c.1002: IF road side unit THEN m ELSE x.					

Table A.11: LowFrequencyContainer

Prerequisite: A.8/3					
Item	**Name of field**	**Ref.**	**Type**	**Status**	**Support**
1	basicVehicleLF	[1] B.10, [1] Annex A	BasicVehicleContainerLowFrequency (Table A.14)	m	

Table A.12: SpecialVehicleContainer

Prerequisite: A.8/4					
Item	**Name of field**	**Ref.**	**Type**	**Status**	**Support**
1	publicTransport	[1] B.11, [1] Annex A	PublicTransportContainer (Table A.15)	m	
2	specialTransport	[1] B.12, [1] Annex A	SpecialTransportContainer (Table A.16)	m	
3	dangerousGoods	[1] B.13, [1] Annex A	DangerousGoodsContainer (Table A.17)	m	
4	roadWorksBasic	[1] B.14, [1] Annex A	RoadWorksContainerBasic (Table A.18)	m	
5	rescue	[1] B.15, [1] Annex A	RescueContainer (Table A.19)	m	
6	emergency	[1] B.16, [1] Annex A	EmergencyContainer (Table A.20)	m	
7	safetyCar	[1] B.17, [1] Annex A	SafetyCarContainer (Table A.21)	m	

Table A.13: BasicVehicleContainerHighFrequency

Prerequisite: A.10/1					
Item	**Name of field**	**Ref.**	**Type**	**Status**	**Support**
1	heading	[1] B.21	Heading (Table B.4)	m	
2	speed	[1] B.22	Speed (Table B.5)	m	
3	driveDirection	[1] B.25	DriveDirection (Table B.6)	m	
4	vehicleLength	[1] B.35	VehicleLength (Table B.19)	m	
5	vehicleWidth	[1] B.36	VehicleWidth (Table B.20)	m	
6	longitudinalAcceleration	[1] B.26	LongitudinalAcceleration (Table B.10)	m	
7	curvature	[1] B.31	Curvature (Table B.15)	m	
8	curvatureCalculationMode	[1] B.32	CurvatureCalculationMode (Table B.16)	m	
9	yawRate	[1] B.33	YawRate (Table B.17)	m	
10	accelerationControl	[1] B.27	AccelerationControl (Table B.11)	o	
11	laneNumber	[1] B.24	LaneNumber (Table B.9)	o	
12	steeringWheelAngle	[1] B.34	SteeringWheelAngle (Table B.18)	o	
13	lateralAcceleration	[1] B.28	LateralAcceleration (Table B.12)	o	
14	verticalAcceleration	[1] B.29	VerticalAcceleration (Table B.13)	o	
15	performanceClass	[1] B.20	PerformanceClass (Table B.7)	o	

Table A.14: BasicVehicleContainerLowFrequency

Prerequisite: A.11/1					
Item	**Name of field**	**Ref.**	**Type**	**Status**	**Support**
1	vehicleRole	[1] B.23	VehicleRole (Table B.8)	m	
2	exteriorLights	[1] B.37	ExteriorLights (Table B.21)	m	
3	pathHistory	[1] B.38	PathHistory (Table B.22)	m	

Table A.15: PublicTransportContainer

Prerequisite: A.12/1					
Item	**Name of field**	**Ref.**	**Type**	**Status**	**Support**
1	embarkationStatus	[1] B.30	EmbarkationStatus (Table B.14)	m	
2	ptActivation	[1] B.39	PtActivation (Table B.23)	o	

Table A.16: SpecialTransportContainer

Prerequisite: A.12/2					
Item	**Name of field**	**Ref.**	**Type**	**Status**	**Support**
1	specialTransportType	[1] B.40	SpecialTransportType (Table B.25)	m	
2	lightBarSirenInUse	[1] B.46	LightBarSirenInUse (Table B.24)	o	

Table A.17: DangerousGoodsContainer

Prerequisite: A.12/3					
Item	**Name of field**	**Ref.**	**Type**	**Status**	**Support**
1	dangerousGoodsBasic	[1] B.41	DangerousGoodsBasic (Table B.26)	m	

Table A.18: RoadWorksContainerBasic

Prerequisite: A.12/4					
Item	**Name of field**	**Ref.**	**Type**	**Status**	**Support**
1	roadworksSubCauseCode	[1] B.42	RoadworksSubCauseCode (Table B.27)	o	
2	lightBarSirenInUse	[1] B.46	LightBarSirenInUse (Table B.24)	m	
3	closedLanes	[1] B.43	ClosedLanes (Table B.28)	o	

Table A.19: RescueContainer

Prerequisite: A.12/5					
Item	**Name of field**	**Ref.**	**Type**	**Status**	**Support**
1	lightBarSirenInUse	[1] B.46	LightBarSirenInUse (Table B.24)	m	
9	emergencyPriority	[1] B.48	EmergencyPriority (Table B.29)	o	

Table A.20: EmergencyContainer

Prerequisite: A.12/6					
Item	**Name of field**	**Ref.**	**Type**	**Status**	**Support**
1	lightBarSirenInUse	[1] B.46	LightBarSirenInUse (Table B.24)	m	
2	incidentIndication	[1] B.47	CauseCode (Table B.30)	o	
3	emergencyPriority	[1] B.48	EmergencyPriority (Table B.29)	o	

Table A.21: SafetyCarContainer

Prerequisite: A.12/7					
Item	**Name of field**	**Ref.**	**Type**	**Status**	**Support**
1	lightBarSirenInUse	[1] B.46	LightBarSirenInUse (Table B.24)	m	
2	incidentIndication	[1] B.47	CauseCode (Table B.30)	o	
3	trafficRule	[1] B.44	TrafficRule (Table B.31)	o	
3	speedLimit	[1] B.45	SpeedLimit (Table B.32)	o	

A.5.6 Protocol parameters

A.5.6.1 Timing requirements

Table A.22: Timing requirements

Item	Name of field	Reference	Default value	Status	Support
1	Maximum CAM generation frequency (T_GenCamMax)	[1] 6.1.3	1 000 ms	m	
2	Minimum CAM generation frequency (T_GenCamMin)	[1] 6.1.3	100 ms	m	
3	T_CheckCamGen	[1] 6.1.3	≤ T_GenCamMin	m	
4	T_ GenCam_Dcc	[1] 6.1.3	T_GenCamMin ≤ T_GenCam_DCC ≤ T_GenCamMax.	m	
5	T_GenCam	[1] 6.1.3	T_GenCamMax	m	
6	N_GenCam	[1] 6.1.3	maximum value 3	m	
7	Maximum time without including low frequency container	[1] 6.1.3	500 ms	m	
8	Maximum time without including special vehicle container	[1] 6.1.3	500 ms	m	
9	CAM generation time	[1] 6.1.4.2	< 50 ms	m	
10	Difference between CAM generation time and time stamp	[1] 6.1.4.2	< 32 767 ms	m	

Annex B (normative): Common Data Dictionary

This annex provides tables of the TS 102 894-2 [4] and which are used for the CAM PICS Proforma (annex A).

Table B.1: ITS PDU header [1]

Item	Type	Reference	Value
1	protocolVersion	[1] 7.1.1, B.1	currentVersion(1)
2	messageID	[1] 7.1.1, B.1	cam(2) [1]
3	stationID	[1] 7.1.1, B.1	Integer (0..4 294 967 295)

Table B.2: ReferencePosition

Item	Type	Reference	Value	
1	latitude	[1] B.19	Integer { oneMicrodegreeNorth (10), oneMicrodegreeSouth (-10), unavailable(900 000 001) } (-900 000 000..900 000 001) -- multiples of 0,1 microdegree	
2	longitude	[1] B.19	Integer { oneMicrodegreeEast (10), oneMicrodegreeWest (-10), unavailable(1 800 000 001) } (-1 799 999 999..1 800 000 001) -- multiples of 0,1 microdegree	
3	positionConfidenceEllipse	[1] B.19	semiMajorConfidence	Integer { oneCentimeter(1), outOfRange(4 094), unavailable(4 095) } (0..4 095)
			semiMinorConfidence	Integer { oneCentimeter(1), outOfRange(4 094), unavailable(4 095) } (0..4 095)
			semiMajorOrientation	Heading
4	altitude	[1] B.19	altitudeValue	Integer { seaLevel(0), oneCentimeter(1), unavailable(800 001) } (-100 000..800 001)
			altitudeConfidence	Enum { alt-000-01 (0), alt-000-02 (1), alt-000-05 (2), alt-000-10 (3), alt-000-20 (4), alt-000-50 (5), alt-001-00 (6), alt-002-00 (7), alt-005-00 (8), alt-010-00 (9), alt-020-00 (10), alt-050-00 (11), alt-100-00 (12), alt-200-00 (13), outOfRange (14), unavailable (15)} (1..127)

Table B.3: StationType

Item	Type	Reference	Value
1	stationType	[1] B.18	Integer { unknown(0), pedestrian(1), cyclist(2), moped(3), motorcycle(4), passengerCar(5), bus(6), lightTruck(7), heavyTruck(8), trailer(9), specialVehicles(10), tram(11), roadSideUnit(15) } (0..255)

Table B.4: Heading

Item	Type	Reference	Value
1	headingValue	[1] B.21	Integer { wgs84North(0), wgs84East(900), wgs84South(1 800), wgs84West(2 700), unavailable(3 600) } (0..3 600)
2	headingConfidence	[1] B.21	Integer { withinZeroPointOneDegree(1), withinOneDegree(10), outOfRange(126), unavailable(127) } (1..127)

Table B.5: Speed

Item	Type	Reference	Value
1	speedValue	[1] B.22	Integer { standstill(0), oneCentimeterPerSec(1), unavailable(16 383) } (0..16 383)
2	SpeedConfidence	[1] B.22	Integer { withinOneCentimeterPerSec(1), withinOneMeterPerSec(100), outOfRange(126), unavailable(127) } (1..127)

Table B.6: DriveDirection

Item	Type	Reference	Value
1	driveDirection	[1] B.25	Enum { forward (0), backward (1), unavailable (2) }

Table B.7: PerformanceClass

Item	Type	Reference	Value
1	performanceClass	[1] B.20	Integer { unavailable(0), performanceClassA(1), performanceClassB(2) } (0..7)

Table B.8: VehicleRole

Item	Type	Reference	Value
1	vehicleRole	[1] B.23	Enum { default(0), publicTransport(1), specialTransport(2), dangerousGoods(3), roadWork(4), rescue(5), emergency(6), safetyCar(7) }

Table B.9: LaneNumber

Item	Type	Reference	Value
1	laneNumber	[1] B.24	Integer { offTheRoad(-1), hardShoulder(0), outermostDrivingLane(1), secondLaneFromOutside(2) } (-1..14)

Table B.10: LongitudinalAcceleration

Item	Type	Reference	Value
1	longitudinalAccelerationValue	[1] B.26	Integer { pointOneMeterPerSecSquaredForward(1), pointOneMeterPerSecSquaredBackward(-1), unavailable(161)} (-160 .. 161)
2	longitudinalAccelerationConfidence	[1] B.26	Integer{ pointOneMeterPerSecSquared(1), outOfRange(101), unavailable(102)} (0 .. 102)

Table B.11: AccelerationControl

Item	Type	Reference	Value
1	accelerationControl	[1] B.27	Bitstring { brakePedalActive (0), gasPedalActive (1), emergencyBrakeActive (2), collisionWarningActive (3), accActive (4), cruiseControl (5), speedLimiterActive (6)} (SIZE(7))

Table B.12: LateralAcceleration

Item	Type	Reference	Value
1	lateralAccelerationValue	[1] B.28	Integer { pointOneMeterPerSecSquaredToRight(-1), pointOneMeterPerSecSquaredToLeft(1), unavailable(161) } (-160 .. 161)
2	lateralAccelerationConfidence	[1] B.28	Integer { pointOneMeterPerSecSquared(1), outOfRange(101), unavailable(102)} (0 .. 102)

Table B.13: VerticalAcceleration

Item	Type	Reference	Value
1	verticalAccelerationValue	[1] B.29	Integer { pointOneMeterPerSecSquaredUp(1), pointOneMeterPerSecSquaredDown(-1), unavailable(161) } (-160 .. 161)
2	verticalAccelerationConfidence	[1] B.29	Integer { pointOneMeterPerSecSquared(1), outOfRange(101), unavailable(102)} (0 .. 102)

Table B.14: EmbarkationStatus

Item	Type	Reference	Value
1	embarkationStatus	[1] B.30	Boolean

Table B.15: Curvature

Item	Type	Reference	Value
1	curvatureValue	[1] B.31	Integer { straight(0), reciprocalOf1MeterRadiusToRight(-30 000), reciprocalOf1MeterRadiusToLeft(30 000), unavailable(30001) } (-30 000..30 001) }
2	curvatureConfidence	[1] B.31	Enum { onePerMeter-0-00002 (0), -- within 0,00002 m^-1 onePerMeter-0-0001 (1), -- within 0,0001 m^-1 onePerMeter-0-0005 (2), -- within 0,0005 m^-1 onePerMeter-0-002 (3), -- within 0,002 m^-1 onePerMeter-0-01 (4), -- within 0,01 m^-1 onePerMeter-0-1 (5), -- within 0,1 m^-1 outOfRange (6), unavailable (7) }

Table B.16: CurvatureCalculationMode

Item	Type	Reference	Value
1	curvatureCalculationMode	[1] B.32	Enum { yawRateUsed(0), yawRateNotUsed(1), transitionMode(2), ... }

Table B.17: YawRate

Item	Type	Reference	Value
1	yawRateValue	[1] B.33	Integer { straight(0), degSec-000-01ToRight(-1), degSec-000-01ToLeft(1), unavailable(32 767) } (-32 767..32 767) LSB units of 0,01 degrees per second
2	yawRateConfidence	[1] B.33	Enum { degSec-000-01 (0), degSec-000-05 (1), degSec-000-10 (2), degSec-001-00 (3), degSec-005-00 (4), degSec-010-00 (5), degSec-100-00 (6), outOfRange (7), unavailable (8) }

Table B.18: SteeringWheelAngle

Item	Type	Reference	Value
1	steeringWheelAngleValue	[1] B.34	Integer { straight(0), onePointFiveDegreesToRight(-1), onePointFiveDegreesToLeft(1), unavailable(511) } (-511..511)
2	steeringWheelConfidence	[1] B.34	Integer { withinOnePointFiveDegrees(1), outOfRange(126), unavailable(127) } (1..127)

Table B.19: VehicleLength

Item	Type	Reference	Value
1	vehicleLengthValue	[1] B.35	Integer { tenCentimeters(1), outOfRange(1 022), unavailable(1 023) } (1..1 023)
2	vehicleLengthConfidenceIndication	[1] B.35	Enum { noTrailerPresent(0), trailerPresentWithKnownLength(1), trailerPresentWithUnknownLength(2), trailerPresenceIsUnknown(3) }

Table B.20: VehicleWidth

Item	Type	Reference	Value
1	vehicleWidth	[1] B.36	Integer { tenCentimeters(1), outOfRange(61), unavailable(62) } (1..62)

Table B.21: ExteriorLights

Item	Type	Reference	Value
1	exteriorLights	[1] B.37	Bitstring { lowBeamHeadlightsOn (0), highBeamHeadlightsOn (1), leftTurnSignalOn (2), rightTurnSignalOn (3), daytimeRunningLightsOn (4), reverseLightOn (5), fogLightOn (6), parkingLightsOn (7) } (SIZE(8))

Table B.22: PathHistory

Item	Type	Reference	Value
1	pathHistory	[1] B.38	Sequence (SIZE(0..23)) OF PathPoint

Table B.23: PtActivation

Item	Type	Reference	Value
1	ptActivationType	[1] B.39	Integer { undefinedCodingType(0), r09-16CodingType(1), vdv-50149CodingType(2) } (0..255)
2	ptActivationData	[1] B.39	OctetString (SIZE(1..20))

Table B.24: LightBarSirenInUse

Item	Type	Reference	Value
1	lightBarSirenInUse	[1] B.46	Bitstring { lightBarActivated (0), sirenActivated (1)} (SIZE(2))

Table B.25: SpecialTransportType

Item	Type	Reference	Value
1	specialTransportType	[1] B.40	Bitstring { heavyLoad(0), excessWidth(1), excessLength(2), excessHeight(3) } (SIZE(4))

Table B.26: DangerousGoodsBasic

Item	Type	Reference	Value
1	dangerousGoodsBasic	[1] B.41	Bitstring { explosives1(0), explosives2(1), explosives3(2), explosives4(3), explosives5(4), explosives6(5), flammableGases(6), nonFlammableGases(7), toxicGases(8), flammableLiquids(9), flammableSolids(10), substancesLiableToSpontaneousCombustion(11), substancesEmittingFlammableGasesUponContactWithWater(12), oxidizingSubstances(13), organicPeroxides(14), toxicSubstances(15), infectiousSubstances(16), radioactiveMaterial(17), corrosiveSubstances(18), miscellaneousDangerousSubstances(19)}

Table B.27: RoadworksSubCauseCode

Item	Type	Reference	Value
1	roadworksSubCauseCode	[1] B.42	Integer {unavailable(0), majorRoadworks(1), roadMarkingWork(2), slowMovingRoadMaintenance(3), winterService(4), streetCleaning(5) } (0..255)

Table B.28: ClosedLanes

Item	Type	Reference	Value
1	hardShoulderStatus	[1] B.43	Enum { availableForStopping(0), closed(1), availableForDriving(2) } OPTIONAL
2	drivingLaneStatus	[1] B.43	Bitstring { outermostLaneClosed(1), secondLaneFromOutsideClosed(2) } (SIZE (1..14))

Table B.29: EmergencyPriority

Item	Type	Reference	Value
1	emergencyPriority	[1] B.48	BitString { requestForRightOfWay(0), requestForFreeCrossingAtATrafficLight(1) } (SIZE (2))

Table B.30: CauseCode

Item	Type	Reference	Value
1	causeCode	[1] B.47	Integer { reserved (0), trafficCondition (1), accident (2), roadworks (3), adverseWeatherCondition-Adhesion (6),hazardousLocation-SurfaceCondition (9), hazardousLocation-ObstacleOnTheRoad (10), hazardousLocation-AnimalOnTheRoad (11), humanPresenceOnTheRoad (12), wrongWayDriving (14), rescueAndRecoveryWorkInProgress (15), adverseWeatherCondition-ExtremeWeatherCondition (17), adverseWeatherCondition-Visibility (18), adverseWeatherCondition-Precipitation (19), slowVehicle (26), dangerousEndOfQueue (27), vehicleBreakdown (91), postCrash (92), humanProblem (93), stationaryVehicle (94), emergencyVehicleApproaching (95), hazardousLocation-DangerousCurve (96), collisionRisk (97), signalViolation (98), dangerousSituation (99) } (0..255)
2	subCauseCode	[1] B.47	Integer (0..255)

Table B.31: TrafficRule

Item	Type	Reference	Value
1	trafficRule	[1] B.44	Enum { noPassing(0), noPassingForTrucks(1), ...

Table B.32: SpeedLimit

Item	Type	Reference	Value
1	speedLimit	[1] B.45	Integer { oneKmPerHour(1) } (0..255)

Annex C (informative): Bibliography

- 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".
- ETSI TS 102 637-4: "Intelligent Transport Systems (ITS); Vehicular Communications; Basic set of applications; Part 4: Operational Requirements".
- ETSI ETS 300 406 (1995): "Methods for testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".

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