GCDC16 Local Message Set

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Contents

Version:	0.1	First draft
	0.2	Revised CAM and added DENM
	0.3	Added iCLCM
	0.4	Rewrote introduction
	0.5	Revised CAM
	0.6	Added stationID to all messages

1 Introduction

This document presents the local message set (LMS) to be used for GCDC16. The LMS is used for sending and receiving CAM/DENM/iCLCM from/to the vehicle control system implemented in Simulink.

The communication stack includes a vehicle adapter that will receive these messages and use them to create proper CAM/DENM/iCLCM that will be forwarded to other vehicles and vice versa. The LMS follows the ETSI specification as closely as possible, but makes some changes to make is possible to create the messages in Simulink.

Every message type has a corresponding local message that is used for creating that specific message.

All local messages are of identical length, and bit masks are used to handle messages with optional containers. The bit mask is set to indicate which of the optional fields are present. If the bit mask indicates that the field is not present, its value is undefined.

All data is in network byte order, which is identical to big endian.

2 CAM

CAM messages are created by the vehicle adapter using the data fields present in a local CAM message as detailed below. CAM messages have both mandatory and optional data fields, where the optional data fields are contained in the low frequency container. The container mask is a bit mask that indicates whether this container is present. Note that the optional fields in the local CAM message always are present. However their values are undefined if they are not indicated as present.

Message part:	Bytes:	Data:	Notes:
Header	1	Message ID	= 2 for CAM
	4	Station ID	Unique station ID
	4	GenerationDeltaTime	See D3.2
Container Mask	1	ContainerMask	See D3.2
Basic Container	4	StationType	See D3.2
	4	Latitude	See D3.2
	4	Longitude	See D3.2
	4	SemiMajorConfidence	See D3.2
	4	SemiMinorConfidence	See D3.2
	4	SemiMajorOrientation	See D3.2
	4	Altitude	= 800001
High Frequency Container	4	Heading	See D3.2
	4	HeadingConfidence	See D3.2
	4	Speed	See D3.2
	4	SpeedConfidence	See D3.2
	4	VehicleLength	See D3.2
	4	VehicleWidth	See D3.2
	4	LongAcceleration	See D3.2
	4	LongAccelerationConfidence	See D3.2
	4	YawRate	See D3.2
	4	YawRateConfidence	See D3.2
(opt) Low Frequency Container	4	VehicleRole	See D3.2

3 DENM

The first part of the message, after the header, is a bit mask that indicates which of the optional containers that are present. The containers also start with a bit mask to indicate which of the optional data fields inside that container are used. Data fields marked as unused by the bit mask can have arbitrary values as they are ignored by the communication stack. This also means that every local DENM message has the same size, making it easier to use in Simulink.

The fields marked as not implemented should be ignored.

Message part:	Bytes:	Data:	Notes:
Header	1	MessageID	= 1 for DENM
	4	StationID	Unique station ID
Container Mask	1	ContainerMask	
Management Container	1	ManagementMask	
	8	DetectionTime	
	8	ReferenceTime	
	4	(opt) Termination	
	4	Latitude	See D3.2
	4	Longitude	See D3.2
	4	SemiMajorConfidence	See D3.2
	4	SemiMinorConfidence	See D3.2
	4	SemiMajorOrientation	See D3.2
	4	Altitude	Not in D3.2?
	4	(opt) RelevanceDistance	
	4	(opt) RelevanceTrafficDirection	
	4	(opt) ValidityDuration	
	4	(opt) TransmissionIntervall	
	4	StationType	
(opt)Situation Container	1	SituationMask	
	4	InformationQuality	
	4	CauseCode	
	4	SubCauseCode	
	4	(opt) LinkedCauseCode	
	4	(opt) LinkedSubCauseCode	
	0	(opt) EventHistory	Not implemented
(opt) Location Container	0	LocationMask	Not implemented
	0	(opt) EventSpeed	Not implemented
	0	(opt) EventPositionheading	Not implemented
	0	Traces	Not implemented
	0	(opt) RoadType	Not implemented
(opt) Alacarte Container	1	AlacarteMask	
	4	(opt) LanePosition	See D3.2
	0	(opt) ImpactReducationContainer	Not implemented
	4	(opt) ExternalTemperature	
	0	(opt) RoadWorksContainerExtended	Not implemented
	4	(opt) PositioningSolution	
	0	(opt) StationaryVehicleContainer	Not implemented

4 iCLCM

The iGAME Cooperative Lane Changing Message (iCLCM) is structured very similarly to CAM. It consists of a base message with additional containers added for various events or scenarios. As with the other message types, iCLCM are created by sending a corresponding local message to the vehicle adapter.

Please note that the iCLCM set is still under proposal and may change.

Message part:	Bytes:	Data:	Notes:
Header	1	MessageID	= 10 for iCLCM
	4	StationID	Unique station ID
Container Mask	1	Container mask	
High frequency container	4	Rear axle location	See D3.2
	4	Controller type	See D3.2
	4	Response time constant	See D3.2
	4	Response time delay	See D3.2
	4	Target longitudinal acceleration	See D3.2
	4	Time headway	See D3.2
	4	Cruise speed	See D3.2
(opt) Low frequency container	1	Low frequency mask	See D3.2
	4	(opt) Participants ready	See D3.2
	4	(opt) Start platoon	See D3.2
	4	(opt) End-of-scenario	See D3.2
MIO	4	Mio ID	See D3.2
	4	Mio Range	See D3.2
	4	Mio Bearing	See D3.2
	4	Mio Range rate	See D3.2
Lane	4	Lane	See D3.2
Pair ID	4	Forward ID	See D3.2
	4	Backward ID	See D3.2
	4	Acknowledgement flag	See D3.2
Merge	4	Merge request	See D3.2
	4	Safe-to-merge	See D3.2
	4	Flag	See D3.2
	4	Flag tail	See D3.2
	4	Flag head	See D3.2
Intersection	4	Platoon ID	See D3.2
	4	Distance travelled in CZ	See D3.2
	4	Intention	See D3.2
	4	Counter	See D3.2