



EyeQ SPI API Inter-Processor Communication

PDD-022_ADAS_ECU_SPI_EyeQ4

	Mobileye SW Release	Major API	Minor API	Date
1	SW 2.2	2	2	11 Sept. 2018
2	SW 3.0	3	0	17 Nov. 2018
3	SW 4.0	4	1	12 Dec. 2018
4	SW5.0	5	0	28 Jan. 2019
5	SW6.0	6	0	26 Mar. 2019
6	SW7.0	7	0	15 May 2019
7	SW8.0	8	0	22 July 2019
8	SW8.1	8	1	16 Oct. 2019
9	SW8.3	8	3	30 Oct. 2019
10	SW9.0	9	0	9 Dec. 2019

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1 Definitions

1.1 Glossary

CS	Coordinate System
DASP	Defined Aptiv Serial Protocol
IPB	Image Processing Bundle . It contains FCW/AEB parameters for VEH targets (cars, trucks, motorcycles)
MESP	Mobileye Serial Protocol
MISO	master In, slave out line of a SPI bus
MOSI	master out, slave In line of a SPI bus
PCW	Pedestrian Collision Warning. Contains FCW/AEB parameters for VRU targets (pedestrians and cyclists)
SCLK	serial clock line of a SPI bus
SPI	Serial Peripheral Interface, a serial communications bus
SPC	Service Point Calibration
TAC	Target Auto-Calibration

1.2 Global Data Types

1.2.1 ISO 9899 Data Types

The following ISO 9899 data types, referred to as C99 types, are used as basic fixed width types:

1. int8_t
2. int16_t
3. int32_t
4. int64_t
5. uint8_t
6. uint16_t
7. uint32_t
8. uint64_t

The ISO 9899 'bool' data type is used to define variables that can accept a 'true' or 'false' value.

A bitfield is used to pack Boolean types.

1.2.2 General Floating Point Types

When the desired precision is known, the types `real32_T` or `real64_T` can be used to fix the precision and data width.

1.2.2.1 `real32_T`

Name	<code>real32_T</code>
Type	float
Range	n/a
Units	n/a
Description	Type to represent 32 bit real numbers


1.2.2.2 `real64_T`

Name	<code>real64_T</code>
Type	Double
Range	n/a
Units	n/a
Description	Type to represent 64 bit real numbers

1.2.3 General Enumeration Types

✓ **Approved, MAPC-67283 - General Enumeration Types**

Enums shall be defined as types of ISO 9899 Data Types when defining signals. If the enumeration is not defined it is treated as a `uint8_t`

[ Should Have]

2 Revision History

Rev	Date	Author	Change Description
1.0	06 June 2018	All Function Owners + Johnson	Initial Release for DAT2.0 Stage C.
1.1	27 July 2018	Johnson	Updated for Stage D Release on A2.5 HW. Edited to show all messages from EyeQ are periodic at 18Hz. Added 2 byte API version and 2 byte SW version to <code>EYEQ_BASE_DIAG_STATUS_MSG</code> (0xA0) and Increased API version to 2 bytes in <code>host_vehicle_state_t</code> . Section 9.1 bools changed to a bitfield. Inter-Frame Delay (frameFlowControl) set for 200usec.
2.0	19Aug 2018	Johnson	Updated for Stage D Release on A4 HW. Added Calibration, Initialization and Failsafes. Moved API Version Major and Minor to the top of <code>host_init_t</code> and <code>host_vehicle_state_t</code> . Failsafes removed from message 0xA1 and moved to DASP message ID 0xE5. Updated with input from Mobileye in DPHME-341
2.1	28Aug 2018	Johnson	Updated for SW2.1 Release. Added Message 0xE6 and SRP info. Added <code>eyeq_road_hpp_fusion_info_t</code> to <code>eyeq_road_info_t</code> . Several <code>LaneMarkerTypes</code> deleted, updated <code>LaneMarkerType</code> enumerations to 0-6. <code>SignType</code> now points to external Excel document. Deleted <code>signValue</code> and <code>signIsElectronic</code> from <code>eyeq_traffic_sign_t</code> . Updated age and class for <code>eyeq_vision_object_t</code> . 26 Aug: Added <code>enum 0 = none</code> to <code>outOfCalibTSR</code> , incremented the other enums and increased the range to 255. Changed type of <code>hwExitLeft</code> , <code>hwExitRight</code> , <code>hwEntryLeft</code> and <code>hwEntryRight</code> to bool. Added range info to <code>transitionLongPosition</code> and <code>transitionLatPosition</code> . Added <code>numOfActiveLightSpots</code> and <code>numOfReflectiveSigns</code> to <code>eyeq_active_light_sensor_info_t</code> . Changed <code>signSupplementalType1</code> and <code>Type2</code> to <code>uint8_t</code> . Deleted <code>enum 9, 10</code> and <code>11</code> (MOVE TO RIGHT LANE ARROW, MOVE TO LEFT LANE ARROW and UNKNOWN ARROW from <code>arrowType</code> . Changed <code>laneAssignment</code> type to <code>int8_t</code> with UNKNOWN = 3. Changed <code>xCoord</code> , <code>yTopCoord</code> and <code>yBottomCoord</code> to <code>int16_t</code> type relative to the image center, range = +/- half image pixels. Changed type of <code>xLeftCoord</code> , <code>xRightCoord</code> , <code>yTopCoord</code> and <code>yBottomCoord</code> to <code>int8_t</code> , reported in 1/4 resolution with full image range. 28 Aug: Deleted <code>enum 0</code> in <code>outOfCalibTSR</code> , decremented the other enums. In <code>eyeq_vision_object_t</code> "class" changed to "classification" due to compiler keyword. Rearranged <code>eyeq_traffic_sign_t</code> for efficiency.
2.2	18Sep 2018	Johnson	Updated Pending States and <code>ct_stages</code> to match email and BPP document: 0x92 = Pending Vision, 0x80 = Pending TAC, 0x82 = Pending SPC. Added Appendix A to show new traffic sign types. Need Updated <code>Aptiv_DAT2_Init.dbc</code> file from Mobileye.
3.0	16Oct 2018	Johnson	Init messages for Vision, SPC and Intrinsic Cals. Mobileye support for AR0220 and AR0138 imagers. EDR Supported and Appendix B added to show EDR settings to be used with <code>SendParamsToCalibrationTool</code> MESP Service. Support for Light Cone. Three new sections are added for Stage E, separate from Stage D+ to avoid confusion about Stage E requirements: 1. <code>eyeq_active_light_sensor_info_t</code> -- Stage E (added lightCone) 2. <code>eyeq_active_light_spot_t</code> -- Stage E (added <code>vdID</code> and <code>isTruck</code>) 3. <code>eyeq_traffic_sign_t</code> -- Stage E (added <code>signSuppConfidence1</code> and <code>signSuppConfidence2</code>)
3.0	25Oct. 2018	Johnson	Edited requirements (98982, 98985 and 99039) to match DAT2.0 BPP Document from Mobileye to show that DV mode == 0x5, Running TAC == 0xAC and Pending DV == N/A. Added 3 Dec 2018 for clarification: <code>ctrTestPatternFailure</code> is NOT functional.
4.0	17 Nov 2018	Johnson	Changed title of document on page 1 to delete "DAT2.0" and add "EyeQ4". For Stage D+: Deleted Boot Status Message 0x99 not supported by Mobileye. Added Boot Status Message 0x10. Fixed typographical errors and unclear descriptions. Deleted the "Other AR0220" column from the EDR table in Appendix B. For Stage E (SW4.0): Added <code>cameraHeight</code> and <code>cameraHeightValid</code> to <code>host_vehicle_state_t</code> . Added <code>beamRequest</code> and <code>eventsDetected</code> to <code>eyeq_active_light_sensor_info_t</code>
4.1	12 Dec 2018	Johnson	For Stage E (SW4.0): Added <code>Sidelong Light</code> (classification = 8) in <code>eyeq_active_light_spot_t</code> header but not yet implemented in SW4.0 Increased pixel range to 1824 x 944 in <code>eyeq_active_light_spot_t</code> for 100 deg cameras. Increased pixel range to 1824 x 944 in <code>eyeq_traffic_sign_t</code> for 100 deg cameras. <code>ImagerType</code> (register 0x3000) added to <code>eyeq_vision_application_init_info_t</code> . <code>HOST_VEH_STATE_MSG</code> ID changed to 0x20 (was previously 0x10) to prevent confusion with EyeQ message 0x10. DBC file edited for <code>Init_Params_Vision</code> message 0x92 to include <code>HILLMode</code> (Boolean added for SW4.0 but not yet implemented). <code>ctrTestPatternFailure</code> IS functional. Boot Status GPIO's not yet supported. Changed TAC Init message number and pending TAC mode number to 0x85 (from 0x80) as requested by Mobileye. . Fixed minor typos and added NVM storage info (description only) for various signals. Changed range of <code>eyeq_vision_object_t</code> id to 1- <code>EYEQ_MAX_VISION_OBJECTS</code> (was previously 0-65535) to match the implementation. Changed the range of <code>camHeight</code> to 0.5 to 3.5 to match DBC file <code>cameraHeight</code> . 12 December 2018: Changed the range of <code>distYaw</code> and <code>distPitch</code> in <code>eyeq_vision_calibration_static_t</code> and <code>eyeq_vision_calibration_dynamic_t</code> to +/-500 pixels to match the original document. Changed the description of yaw, pitch and roll alignment results stored in NVM in <code>eyeq_vision_calibration_static_t</code> and <code>eyeq_vision_calibration_dynamic_t</code> as directed by Mobileye. Moved <code>cameraHeight</code> and <code>cameraHeightValid</code> to the bottom of <code>host_vehicle_state_t</code> as directed by Mobileye for backward compatibility reasons. Corrected the range of <code>gridFrequency</code> in <code>eyeq_active_light_sensor_info_t</code> to 0-2 (Unknown, 50 and 60). Only 50Hz or 60Hz will be stored in NVM. Range of <code>gridFrequency</code> in DBC will be only 1-2 because unknown <code>gridFrequency</code> will not be saved in NVM. Size of <code>imagerFuseld</code> array increased to 8 from 4. (Now 0-0xFFFFFFFF range)
5.0	8 Jan. 2019	Johnson	Stage F (SW5.0). • Functional Safety 1. For New message added for Functional Safety: <code>EYEQ_SAFETY_MSG</code> (0xE7). 2. CRC-16' s and Rolling Frame Counters added to: 3. <code>eyeq_vision_AEB_info_t</code> 4. <code>eyeq_vision_safety_diagnostic_info_t</code> 5. <code>eyeq_road_info_t</code>

			<p>6. eyeq_vision_obstacles_info_t 7. host_vehicle_state_t 8. eyeq_vision_calibration_dynamic_t 9. eyeq_vision_calibration_static_t</p> <ul style="list-style-type: none"> Road <p>1. Added 'transitionProbability' signal (type real32_t; range: [0,1]) to eyeq_transition_point_t after 'transitionLatPosition'</p> <p>2. Removed isValid from eyeq_transition_point_t 3. roadPredictionLeft bit 0 = RESERVED (undefined) 4. roadPredictionRight bit 0 = RESERVED (undefined)</p> <ul style="list-style-type: none"> Added ttc_const_vel to eyeq_vision_object_t · eyeq_video_diagnostics.t : ctrTestPatternFailure is not supported and is removed grabAcquireFailure is not supported and is changed to RESERVED grabReleaseFailure is not supported and is changed to RESERVED · eyeq_base_diag_status_msg_s.eyeqSPIMsg10RxCtr name changed to eyeqSPIMsg20RxCtr eyeq_base_diag_status_msg_s.eyeqSPIMsg12RxCtr deleted Traffic Signs <p>1. RoadMarking – 2. Updated description for roadMarkings in eyeq_traffic_sign_info_t 3. Added structures to eyeq_road_marking_info_t: roadMarkingSpeedLimits and roadMarkingCrossing. 4. Added signals to eyeq_road_marking_info_t: numberOfSpeedLimitMarkings and numberOfCrossingMarkings to 5. Added #define: E_EYEQ_MAX_ROAD_MARKING_SPEED_LIMIT 10 and E_EYEQ_MAX_ROAD_MARKING_CROSSING 10 6. Updated #define: E_EYEQ_MAX_ROAD_MARKING_STOP_LINES 10 and E_EYEQ_MAX_ROAD_MARKING_ARROWS 10 7. arrowType updated in eyeq_road_marking_arrow_t 8. stopLineType updated in eyeq_road_marking_stipline_t 9. Added eyeq_road_marking_speedlimit_t structure 10. Added eyeq_road_marking_crossing_t structure 11. Change signPositionBottom and signPositionTop max range to 960 (For 52deg max values) 12. APPENDIX A: Updated Traffic Sign enums to match the TSR Enums 4.15.1 External.xlsx file provided with the release. 13. APPENDIX A: Updated Traffic Sign enums to match the RoadMarking_Enums-v4.15.1.xlsx file provided with the release.</p> <ul style="list-style-type: none"> Updated Aptiv hyperlinks in References section. Data type of xLeftCoord and xRightCoord changed to int16_t in eyeq_rect_t. Swapped 0/1 definition of drivingSide Right/Left to match DBC init file. parametersInvalid deleted from eyeq_vision_application_init_info_t, not applicable to this implementation. <ul style="list-style-type: none"> Added fcwWarningSensitivityLevel to host_vehicle_state_t.
5.0	28 Jan 2019	Johnson	<p>GPIO definitions added in Appendix D. Added specific details of CRC calculation for the Safety Message. In host_vehicle_state_t, included entire signal validity bitfield in CRC. In eyeq_vision_safety_diagnostic_info_t, changed safety_Diagnostic_Manager bits as an array. Changed challenge_Response to an array of 4. Added E_EYEQ_MAX_SAFETY_DIAGNOSTIC_MSG = 64.</p>
6.0	26 Mar 2019	Johnson	<p>Intrinsic Calibrations: 1. Added one Intrinsic Cal CRC Failure bit in Message 0x41. 2. Added one Intrinsic Cal CRC Comparison In Progress bit in Message 0x41. 3. Added data format and flowchart diagrams in Appendix E and Appendix F.</p> <p>TimeSync: 1. In message 0x20, "host_sync_timestamp_ms" name changed to RESERVED. 2. host_sync_timestamp_us and host_sync_timestamp_us_valid added to host_vehicle_state_t 3. Added eyeq_timesync_info_t in new message EYEQ_TIMESYNC_MSG (0x08). 4. Corrected descriptions of all "timestamp_us" signals to "The timestamp represents the effective time of these measurements in the Host time frame" .</p> <p>Other: a. Init_Params_TAC2: The params descriptions for the middle target and right target were wrong and are corrected in the DBC file definition. b. Coding: Add ct_type = 4 for coding IPB/PCW. c. freeSight added to eyeq_vision_failsafes_t d. visOnlyVRUBrake is changed from a uint32 change to uint8 e. Frame flow control note updated: any value >= 200 usec is OK. f. Added text: All Structs shall be collected in mudp format. g. Added text: DASP Message Protocol is 0x65 h. Added inTunnel to eyeq_active_light_sensor_info_t i. Added relevancyConfidence in eyeq_traffic_sign_t j. Added AHBC Init message from Host to EyeQ4, defined in DBC file. Coding is recommended. k. Changed description of reverseGear "True when vehicle is moving backward. Mobileye uses this to disable AEB." l. Changed description of initial CRC-16 value to 0xFFFF m. CRC and Rolling Frame Counter added to eyeq_vision_failsafes_t n. Added EDR logic, March 26 o. Added Intrinsic Calibration logic, including the MESP command Get Camera Info to read from camera EEPROM , March 26</p>
7.0	15May2019	Johnson	<p>1. Updated roadBorderType in eyeq_road_border_t to 0=Undecided, 1=Invalid, 2=Flat, 3=Curb,4=Barrier, 5=Cones, 6=ParkedCars, 7=Reserved.</p>

			<ol style="list-style-type: none"> 2. Add <code>hppCenterWeight</code> to <code>eyeq_road_hpp_fusion_info_t</code>. 3. All CRC descriptions updated to show the ORDER in which the elements are calculated. 4. CameraSelect GPIO implemented on AURIX_EYEQ_STARTUP ball. 0 = Narrow FOV, 1=Wide FOV. (not shown in this document) 5. PROPOSED new content in Mobileye SW (not shown in this document) <ol style="list-style-type: none"> A. Send AEB Cals CRC every power cycle B. Send Mfg Checksum after coding 6. DBC File Changes (not shown in this document) <ol style="list-style-type: none"> A. REM Messages added. B. For Functional Safety, CRC' s added for ASIL signals in Init msg's. C. Init and Coding messages defined in DBC file shall contain version information to be checked by the EyeQ4. D. Change in the scaling of <code>horizonFull</code> & <code>yawFull</code>. Previously were factor = 4 (1/4 resolution = Level 0). For SW7 and later, they will be taken as factor 1 (full resolution = Level -2). E. Add <code>DarkSceneOncomingSensitivity</code> and <code>DarkSceneTaillightSensitivity</code> to <code>Init_Params_Vision</code> (0x92).
8.0	22 July 2019	Johnson	<ol style="list-style-type: none"> 1. <code>eyeq_road_marker_t</code>: Add <code>measuredViewRange</code> 2. <code>host_vehicle_state_t</code>: Move <code>vehicleVelocityValidity</code> and <code>vehicleYawRateValidity</code> to bottom of structure and include them explicitly in the CRC. Removed bitfield from the CRC. Changed name of previous <code>vehicleVelocityValidity</code> and <code>vehicleYawRateValidity</code> signals to "OBS" (obsolete). They may not be deleted due to backward compatibility. 3. Added <code>E_EYEQ_TSR_e_std_invalid</code> = 255,
8.1	16 Oct. 2019	Johnson	<ol style="list-style-type: none"> 1. 4 new TSR ENUMS added: <ul style="list-style-type: none"> • <code>e_sharp_deviation_left</code> = 392, • <code>e_sharp_deviation_right</code> = 393, • <code>e_exit_chinese</code> = 394, • <code>e_level_crossing</code> = 395 2. <code>host_wheel_speed_t</code> added to the <code>HOST_VEH_STATE_MSG</code>(0x20) for REM purposes. 3. The range of the following signals increased (from [0,1] to [0,2]) in <code>eyeq_road_hpp_fusion_info_t</code>: <ul style="list-style-type: none"> • <code>hppLeftWeight</code> • <code>hppCenterWeight</code> • <code>hppRightWeight</code> • <code>roadLeftWeight</code> • <code>roadRightWeight</code> 4. CRC and RFC added to <code>road_info_t</code> for the following signals: <ul style="list-style-type: none"> • <code>rollingFrameCounter</code> (uint8) • <code>roadHppFusionInfo.JaneCenter.a0</code> • <code>roadHppFusionInfo.JaneCenter.a1</code> • <code>roadHppFusionInfo.JaneCenter.a2</code> • <code>roadHppFusionInfo.JaneCenter.a3</code> • <code>roadHppFusionInfo.roadFusionConf</code> • <code>roadMarkerInfo.hostLeftMarker.laneMarker.a0</code> • <code>roadMarkerInfo.hostRightMarker.laneMarker.a0</code> • <code>roadMarkerInfo.hostLeftMarker.laneMarker.JaneMarkerConf.sfConf</code> • <code>roadMarkerInfo.hostRightMarker.laneMarker.JaneMarkerConf.sfConf</code> 5. Added <code>VehicleCfg.SteeringRatio</code> to the Init Params Vision DBC file for SRP. 6. Speed Factor Init range/resolution corrected in DBC for REM 7. Increase size of <code>age</code> in <code>eyeq_vision_object_t</code> to uint32_t 8. Increase size of <code>autofixHorizon</code> and <code>autofixYaw</code> to int16 in <code>Init_Params_Vision</code> and <code>Init_Params_SPC</code> in the DBC file. Comments updated in DBC file to indicate these values must be EVEN. 9. Init Message ASIL-B content explicitly defined.
8.3	30 Oct. 2019	Johnson	<p>Documentation Updates for SW8.3 and Later Releases:</p> <ol style="list-style-type: none"> 1. Updated <code>APPLICATION_DIAGNOSTIC</code> - part 2 in message 0x41 to show detailed bit definitions. 2. Updated <code>EYEQ_BOOT_STATUS_MSG</code> to add 31 bytes for <code>Failure_info[0]</code> and <code>Failure_info[1]</code> (all zero's at this time).
9.0	9 Dec. 2019	Johnson	<ol style="list-style-type: none"> 1. Changed CRC calculation to protect only the ASIL-rated signals in <code>eyeq_vision_object_t</code>.

3 References

- REF[1] Mobileye Serial Protocol Specification [MESP.doc](#) ,Version 6.39
- REF[2] Mobileye Interprocessor Communication Over SPI Specification,[ME-STP_Spec_v1.12.pdf](#)
- REF[3] Aptiv PDD' s for Functions maintained in Polarion
- REF[4] Mobileye EDR Specification , version 1.5 [ME-EDR.doc](#)
- REF[5] [BPP-base-communication-protocol.docx](#) , version 1.2
- REF[6] [Aptiv_DAT2_Init_Dec5_2018.dbc](#)
- REF[7] For more Mobileye documents: [Mobileye Documents, Archive](#)
- REF[8] [VisionInitParams_Dictionary.xlsx](#)
- REF[9] JIRA Tickets
SW4.0 JIRA <https://delphiactivesafety.atlassian.net/browse/DPHME-343> ,
SW5.0 JIRA <https://delphiactivesafety.atlassian.net/browse/DPHME-344>

Ref[10] [Init Messages from Host to EyeQ](#)

Ref[11] [IPB and PCW Parameter Mapping](#)

4 Scope

This document specifies the requirements for the inter-processor serial communications interface between the Mobileye EyeQ4® device and Aptiv Host processor. The following communication layers are defined: Physical Layer, Data Link Layer, Transport Layer, and Application Layer. The Application layer defines usage of two separate protocols: Mobileye Serial Protocol (0x5E) and Defined Aptiv Serial Protocol (0x65). All required messages for both protocols and their respective contents are defined.

5 Physical Layer

✓ Approved, MAPC-67288 - Physical Layer

All inter-processor communications with the EyeQ4 shall occur via Serial Peripheral Interface (SPI) bus. There shall be two independent SPI channels: one shall operate with the EyeQ4 as the master and the connected device as the slave and the other shall operate with the connected device as the master and the EyeQ4 as the slave. This is illustrated in the figure below.



[Should Have]

6 Data Link and Transport Layer

Approved, MAPC-67290 - Data Link and Transport Layer

The data link layer of the SPI inter-processor communications shall conform to the specification in REF[1] and therefore this section is for Aptiv information only.

The data link implementation shall be the same as REF [1] except that the implementation shall meet additional requirements specified by the SPI data link requirements in this section.

The data link layer shall support reception and transmission of data, acknowledgement, and negative acknowledgement frames.

The data link layer shall transmit and receive the Least Significant bit first for each 32 bit data element sent.

The data link layer shall delay a minimum time between transmissions of frames; the delay time shall be configurable when the SPI driver is initialized. The delay allows the Host MCU time to initialize between frames.

The table below defines the default SPI Driver settings that shall be used. It shall be possible to set the following SPI driver settings in the software parameter file (SWP3).

Parameter Name	Default Value
masterSettings.baudRate	10000000 Hz
masterSettings.frameFormat	E_CADS4_SPI_POLARITY_0_PHASE_1
slaveSettings.baudRate	10000000 Hz
slaveSettings.frameFormat	E_CADS4_SPI_POLARITY_0_PHASE_1
ackTimeout	10000 us
transmitTimeout	25 ms
frameFlowControl (Inter-frame delay) FROM the Host.	500 us (any value >= 200 usec is OK)
frameFlowControl frameFlowControl (Inter-frame delay) FROM the EyeQ	200 us (any value >= 200 usec is OK)

The data link layer shall not resend unacknowledged data frames unless required for the Mobileye REM feature.

A data link frame ends at the rising edge of Chip Select or after 128 bytes have been transmitted, whichever comes first.

All frames transmitted by the data link layer shall always be exactly 128 bytes; therefore, a data link frame that is less than or greater than 128 bytes is an invalid frame.

For Data, ACK, and NAK data link frames, the data link layer shall compute a 16 bit CRC. The 16 bit CRC shall be placed in bytes 4 and 5 of the message frame in little endian format.

The DATA field within data frames shall be padded with bytes set to 0 at the end of the field to force the frame to be exactly 128 bytes.

The CRC shall also include the pad bytes.

Acknowledgement and negative acknowledgement frames shall have 122 pad bytes set to 0 appended after the CRC field to force the frame to be exactly 128 bytes in length.

A CRC is not required for the pad bytes.

The SPI transport layer shall support transmission of multi-frame SPI messages up to 8 kilobytes in size. The SPI transport layer shall support reception of multi-frame SPI messages up to 512 bytes in size.

The format of Data Frames sent on the SPI data link shall be according to the format tables listed in the following sub-sections.

The data fields in the format tables are specified in the order they appear on the data link where the leftmost field is transmitted first.

[Should Have]

6.1 Single Frame Message Format

Approved, MAPC-67292 - Single Frame Message Format

The single frame message format shall be used when the application sends a SPI message that fits within one Data Link Frame. The single frame format shall be per REF[2] Section 5.1.1.

Data Link Info				Transport Info			Message Data	PAD
D (4 bits)	R (4 bits)	RSP (12 bits)	NUM (12 bits)	Checksum (16 bits)	Single (8 bits)	Size (8 bits)		
0x8	0x0	0.4095	0.4095	0.65535	0x00	1..120	1 to 120 bytes	0 to 119 bytes

[Should Have]

6.2 Multi-Frame Message Format

Approved, MAPC-67294 - Multi-Frame Message Format

The Multi frame message format shall be used when the application sends a SPI message that cannot fit within one Data Link Frame. The multi frame format shall be per REF[2] Section 5.1.2.

[Should Have]

6.2.1 First Frame Format

Approved, MAPC-67296 - First Frame Format

The SPI driver transport layer shall send the first 116 data bytes of the message according to the First Frame format and the remaining data bytes in a Multi-Frame Consecutive Frame.

Data Link Info					Transport Info			Message
D (4 bits)	R (4 bits)	RSP (12 bits)	NUM (12 bits)	Checksum (16 bits)	First (8 bits)	ID (8 bits)	Total (32 bits)	Data
0x8	0x0	0.4095	0.4095	0.65535	0x01	0.255	117..8191	116 bytes

The ID shall be a number assigned by the SPI Driver Transport Layer.

[Should Have]

6.2.2 Consecutive Frame(s) Format

Approved, MAPC-67298 - Consecutive Frame(s) Format

Data Link Info					Transport Info		Message Data	PAD
D (4 bits)	R (4 bits)	RSP (12 bits)	NUM (12 bits)	Checksum (16 bits)	Multi (8 bits)	ID (8 bits)		
0x8	0x0	0.4095	0.4095	0.65535	0x2	0.255	0 to 120 bytes	0 to 119 bytes

The ID value in all Consecutive Frames shall be the same ID assigned in the First Frame of the transport layer message.

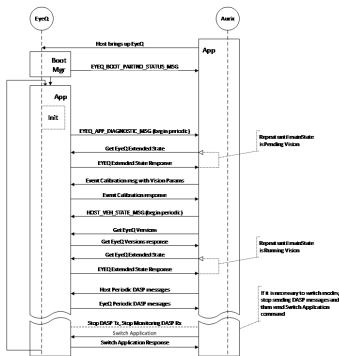
[Should Have]

Approved, MAPC-67299 -

Message Flow

Upon power on, the EyeQ will assume it is transitioning to Vision mode unless a switch application message is sent to transition it to a different mode. If going into Vision mode from power on it is not necessary to send the Switch App Vision mode command.

- Host (Aurix) brings up EyeQ.
- EyeQ boot manager diagnostics are executed
- EyeQ Sends out EYEQ_BOOT_STATUS_MSG SPI message
- EyeQ Application is initialized
- EyeQ starts sending EYEQ_APP_DIAGNOSTIC_MSG periodic SPI message
- Host sends Get EyeQ Extended State
- EyeQ responds with state
- Repeat steps 6/7 until EyeQ is in Pending Vision Mode "from power on init is should be in pending vision mode by default. If transitioning to vision mode from another mode will need to transition to Pending Vision
- Host sends Event Calibration Tool SPI message with the Vision Sensor Application Mode parameters
- EyeQ sends response to Event Calibration Tool message
- Host starts sending DASP messages (EyeQ to receive HOST_VEH_STATE_MSG before transitioning from 'pending vision' to 'running vision' mode).
- During Power on init sequence send MESP request to Get EyeQ Versions. It is only necessary to do this once per ignition cycle (after positive response from eyeq)
- Host sends Get EyeQ Extended State
- EyeQ responds with state
- Repeat steps 12/13 until EyeQ is in Running Vision Mode
- After transition to Running Vision mode, EyeQ to start sending DASP messages
- If transitioning to another mode from Vision, stop transmitting DASP messages and monitoring for DASP receive messages and Send Switch Application MESP message to start transition to new mode



[Should Have]

7 Application Layer

7.1 Application Message Format

7.1.1 Mobileye Serial Protocol (MESP)

Approved, MAPC-67303 -

The Mobileye Serial Protocol (MESP) specified in REF[1] and REF[5] shall be used to send service requests to the EyeQ4 with additional customization for Aptiv applications as specified in these requirements. Below specifications come from REF[1] and are restated below for clarity of this document and are for Aptiv information only.

The Mobileye Serial Protocol uses a client-server architecture where a client (Host) sends a request with parameters to a server (EyeQ4). The server sends a reply to the client with response parameters.

A reply message from the EyeQ4 server is sent to the Host client within 500 milliseconds after receiving a client request message.

All MESP messages comply with the following format:

Message Data				
Protocol Header				MESP Data
Byte 0	Byte 1	Byte 2	Byte 3	Byte 4
Service	Protocol	Service	Function	Msg-tag
				Signal[0] ... Signal[N]

A detailed description of the individual bytes is given in the following comments.

Protocol:

This value describes the application protocol used to produce this message. The protocol value for all MESP messages shall be 0x5E.

Service:

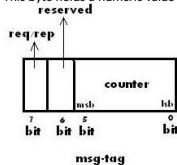
This byte holds a numeric value (unsigned char, between: 0x00-0xFF) which represents a specific service. A service is a set of functions. The service values are defined below in section 6.1.1.1. Note: This information is transferred twice within the Protocol Header (in Byte 0 and Byte 2).

Function:

This byte holds a numeric value (unsigned char, between: 0x00-0xFF) which represents a specific function that belongs to the service specified in the previous byte. The function values are defined below in section 6.1.1.1. Note: Each service holds/implements 256 functions at most.

Msg-tag:

This byte holds a numeric value (unsigned char, between: 0x00-0xFF) which represents a tag number of the specific message which was sent. The Host will send a different msg-tag for each service request:



Bit 0 (LSB) – Bit 5 (MSB) – Wrap-around counter which increments by one for every request sent by Host (from 0-63). The purpose of the 'counter' field is to validate (at the MESP application layer) that the exact relevant reply message is received for an exact request message.

req/rep:

Bit 7 – If the message is a request this bit is 0, if the message is a reply this bit is 1.

Parameter Data:

All parameters are serialized to the message buffer using little endian byte order. Types used for parameters shall be ISO 9899 data types, custom types specified in REF [1], or custom types specified in this specification.

There is no requirement to pack MESP parameters.

[Should Have]

7.1.1.1 MESP Services

Approved, MAPC-67305 - MESP Services

The MESP Services shall be implemented as defined in Ref [1] Sections 3.6 and 3.7. The table below summarizes all Mobileye Serial Protocol (MESP) service functions that shall be supported in this application:

Service Type	Service Number	Function Number	Service Function Name
Basic	0x05	0x03	Get EyeQ Extended State

The SendParamsToCalibrationTool message shall be used only to send data for the EDR.

The Event Calibration message shall be used to send Vision, TAC, and SPC Mode parameters

Application specific details of these services are defined in the following subsections.

[Should Have]

Approved, MAPC-67306 - MESP Services

The MESP Services shall be implemented as defined in Ref [1] Sections 3.6 and 3.7. The table below summarizes all Mobileye Serial Protocol (MESP) service functions that shall be supported in this application:

Service Type	Service Number	Function Number	Service Function Name
Basic	0x05	0x05	Switch EyeQ Application

The SendParamsToCalibrationTool message shall be used only to send data for the EDR.

The Event Calibration message shall be used to send Vision, TAC, and SPC Mode parameters

Application specific details of these services are defined in the following subsections.

[Should Have]

In Review, MAPC-67307 - MESP Services

The MESP Services shall be implemented as defined in Ref [1] Sections 3.6 and 3.7. The table below summarizes all Mobileye Serial Protocol (MESP) service functions that shall be supported in this application:

Service Type	Service	Function	Service Function Name
--------------	---------	----------	-----------------------

	Number	Number	
Basic	0x05	0x04	Get EyeQ Versions

The SendParamsToCalibrationTool message shall be used only to send data for the EDR.
The Event Calibration message shall be used to send Vision, TAC, and SPC Mode parameters
Application specific details of these services are defined in the following subsections.

[] Will not Have]

✓ Approved, MAPC-67308 - MESP Services

The MESP Services shall be implemented as defined in **Ref [1]** Sections 3.6 and 3.7. The table below summarizes all Mobileye Serial Protocol (MESP) service functions that shall be supported in this application:

Service Type	Service Number	Function Number	Service Function Name
Calibration Tool	0x06	0x03	EventCalibrationTool

The SendParamsToCalibrationTool message shall be used only to send data for the EDR.
The Event Calibration message shall be used to send Vision, TAC, and SPC Mode parameters
Application specific details of these services are defined in the following subsections.

[] Should Have]

✓ Approved, MAPC-67309 - MESP Services

The MESP Services shall be implemented as defined in **Ref [1]** Sections 3.6 and 3.7. The table below summarizes all Mobileye Serial Protocol (MESP) service functions that shall be supported in this application:

Service Type	Service Number	Function Number	Service Function Name
Calibration Tool	0x06	0x01	SendParamsToCalibrationTool

The SendParamsToCalibrationTool message shall be used only to send data for the EDR.
The Event Calibration message shall be used to send Vision, TAC, and SPC Mode parameters
Application specific details of these services are defined in the following subsections.

[] Should Have]

7.1.1.1.1 Get EyeQ Extended State Service

This function is used to get the EyeQ4 processing mode, also known as the EyeQ Main State as well as the additional state details.

7.1.1.1.1.1 Request Message

✓ Approved, MAPC-67312 - Request Message

The Get EyeQ Extended State request message shall be as follows:

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	...	Byte 5+N
Service	Protocol	Service	Function	Msg-tag	Signal[0]	...	Signal[N]
0x05	0x5E	0x05	0x03	0x00...0x3F			N/A

There are no request signals for this service function.

[] Should Have]

7.1.1.1.2 Response Message

✓ Approved, MAPC-67314 - Response Message

The Get EyeQ Extended State response message shall be as follows:

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	...	Byte 5+N
Service	Protocol	Service	Function	Msg-tag	Signal[0]	...	Signal[N]
0x05	0x5E	0x05	0x03	0x80...0xBF			See Below

The response signals shall be per Ref [1] section 3.6.4 where mainState and Substate can have the following values:

mainState	Description	subState Values/Descriptions
0x00	Unknown	
0x01	Pending	0x92 -- Pending Vision 0x85 -- Pending TAC 0x82 -- Pending SPC
0x02	Running Vision	
0xAC	Running TAC	
0x22	Running SPC	
N/A	Pending Init DV	
0xAA	Running Diagnostics (DV Mode)	

[] Should Have]

7.1.1.2 FFS - Read File

✓ Approved, MAPC-67316 - This MESP function shall be used to read the block of Intrinsic Calibration data from the EEPROM on the camera.

The MESP Services shall be implemented as defined in **Ref [1]** Sections 3.6 and 3.7. The table below summarizes all Mobileye Serial Protocol (MESP) service functions that shall be supported in this application:
This function allows reading a file from EyeQ file system.

Service Type	Service Number	Function Number	Service Function Name
Flash Management Service	0x03	0x02	FFS read file

[] Should Have]

7.1.1.2.1 Request Message

✓ Approved, MAPC-67318 - The FFS - Read File request message shall be as follows:

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	...	Byte 5+N
Service	Protocol	Service	Function	Msg-tag	Signal[0]	...	Signal[N]
0x03	0x5E	0x03	0x02	0x00...0x3F			See below
Request Parameters Descriptions							
Name	Type	Description			Value		
filename	string	/mesp/eprom.data1					

[] Should Have]

7.1.1.2.2 Response Message

✓ Approved, MAPC-67320 - The FFS - Read File response message shall be as follows:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	...	Byte 6+N
Service	Protocol	Service	Function	Msg-tag	Signal[0]	...	Signal[N]
0x03	0x5E	0x03	0x02	0x80...0xBF			See Below

The FFS - Read File response message shall be as follows:

Reply Parameters Descriptions			
Name	Type	Description	Value
ret	uint32	Operation return value	(see section 3.4.1 of the MESP document)

lastModified	uint32	Time of last modified.	
flags	uint32	Flags.	
desc	string	description	
data	byte[] (Note: the first 4 bytes are the array size)	File data.(Intrinsic Calibration "EEPROM DATA")	

[Should Have]

7.1.1.1.3 Compute Hash

✓ **Approved, MAPC-67322** - This MESP function shall be used to command the EyeQ4 to calculate a CRC32 of a region of serial flash.

The MESP Services shall be implemented as defined in **Ref [1]** Section 3.4. The table below summarizes all Mobileye Serial Protocol (MESP) service functions that shall be supported in this application: This function allows calculating a CRC32 from EyeQ file system.

Service Type	Service Number	Function Number	Service Function Name
Flash Management Service	0x03	0x11	Compute Hash

[Should Have]

7.1.1.1.3.1 Request Message

✓ **Approved, MAPC-67324** - The Compute Hash request message shall be as follows:

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	...	Byte 5+N
Service	Protocol	Service	Function	Msg-tag	Signal[0]	...	Signal[N]
0x03	0x5E	0x03	0x11	0x00_0x3F	See below		

Request Parameters Descriptions			
Name	Type	Description	Value
Hash type	uint8	Hash type enum	SHA-256 = 0 CRC32 = 1
Data set type	uint8	Enumeration of data set on which the hash is computed EXPLICIT_DATASET: address and size provided in function USER_DATASET: predefined set FFS_DATASET: flash file system block	EXPLICIT_DATASET = 0 USER_DATASET = 1 FFS_DATASET = 2
Explicit Data block Start Address	uint32, hexadecimal representation	Block start address to compute NOTE: Relevant only for "EXPLICIT_DATASET" 0	Any valid address 0x0 - for unsupported dataset types
Explicit data block size	uint32	Block size (in bytes) to compute (from start address) NOTE: Relevant only for "EXPLICIT_DATASET" 0	The size to compute 0 - for unsupported dataset types

[Should Have]

Example A. for Low Range of Flash (XCP User Cmd)

Hash type = 1 (CRC32)

Data set type = 0 (EXPLICIT)

For 64MB Flash OR For 128MB Low Range:

Explicit Data block Start Address = 0

Explicit Data block size = 0x3DFFFF

Example B. for High Range of Flash (XCP User Cmd)

Hash type = 1 (CRC32)

Data set type = 0 (EXPLICIT)

For 128MB Flash High Range:

Explicit Data block Start Address = 0x4000000

Explicit Data block size = 0x7FFFFFFF

7.1.1.1.3.2 Response Message

✓ **Approved, MAPC-67326** - The Compute Hash response message shall be as follows:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	...	Byte 6+N
Service	Protocol	Service	Function	Msg-tag	Signal[0]	...	Signal[N]
0x03	0x5E	0x03	0x11	0x80_0xBF	See Below		

Reply Parameters Descriptions			
Name	Type	Description	Value
ret	uint32	Operation return value	(see section 3.4.1)
Hash type	uint8	The hash type that was used	
Dataset type	uint8	The dataset type that was used	
Hash Results	byte[] (Note: include 4 first bytes of size)	Computed hash results.	(for SHA-256 the result is 32 bytes + 4 byte size, total=36 bytes)

The Return values will be as follows (otherwise command failed): [Should Have]

ret == 0 (32 bits)

Hash type == 1 (8 bits)

Data set type == 0 (8 bits)

Hash Results = 8 bytes (first 4 bytes indicate size = 4, last 4 bytes are the CRC32)

7.1.1.1.4 Switch EyeQ Application Service

This service function allows the Host to command the Vision Processing Subsystem Application Modes. This service is also used to perform a "soft reset" of the EyeQ4 without removing power to the EyeQ.

7.1.1.1.4.1 Request Message

✓ **Approved, MAPC-67329 - Request Message**

The Switch EyeQ Application request message shall be as follows:

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	...	Byte 5+N
Service	Protocol	Service	Function	Msg-tag	Signal[0]	...	Signal[N]
0x05	0x5E	0x05	0x05	0x00_0x3F	See Below		

The request signals shall be per Ref[1] Section 3.6.6.

Application modes supported by this service shall be as follows:

ApplicationID	Description
0x01	Vision Sensor Application Processing Mode
0x03	Target Auto-Calibration Processing Mode
0x04	Service Point Application Processing Mode
0x05	Diagnostic Processing Mode (DV mode)

[Should Have]

7.1.1.1.4.2 Response Message

✓ Approved, MAPC-67331 - Response Message

The Switch EyeQ Application response message shall be as follows:

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	...	Byte 6+N
Service	Protocol	Service	Function	Msg-tag	Signal[0]	...	Signal[N]
0x05	0x5E	0x05	0x05	0x80_0x8F	See Below		

The response signals shall be per Ref[1] Section 3.6.6.

[] Should Have]

7.1.1.1.5 Get EyeQ Versions

7.1.1.1.5.1 Request Message

⚠ In Review, MAPC-67334 - Request Message

The Get EyeQ Versions request message shall be as follows:

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	...	Byte 5+N
Service	Protocol	Service	Function	Msg-tag	Signal[0]	...	Signal[N]
0x05	0x5E	0x05	0x04	0x00_0x3F	N/A		

There are no request signals for this service function.

[] Will not Have]

7.1.1.1.5.2 Response Message

✓ Approved, MAPC-67336 - Response Message

The Get EyeQ Versions response message shall be as follows:

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	...	Byte 5+N
Service	Protocol	Service	Function	Msg-tag	Signal[0]	...	Signal[N]
0x05	0x5E	0x05	0x04	0x80_0x8F	See Below		

The signal data shall be populated as shown below:

Signal Name	Type	Description
ret	uint32_t	Return value of the MESP request. See Ref[1] section 3.6.1
apiVersionMajor	uint8_t	n/a
apiVersionMinor	uint8_t	n/a
eyeqSwVersionMajor	uint8_t	n/a
eyeqSwVersionMinor	uint8_t	n/a

[] Should Have]

7.1.1.1.6 Send Params To Calibration Tool (EDR trigger)

This service is used to send the EDR trigger and other necessary event data to the EyeQ.

Refer to Appendix B for EDR Settings to be used for this project.

7.1.1.1.6.1 Request Message

⚠ In Review, MAPC-67339 - Request Message

The Send Params to Calibration Tool for EDR shall be as follows:

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	...	Byte 5+N
Service	Protocol	Service	Function	Msg-tag	Signals[0]	...	Signals[N]
0x06	0x5E	0x06	0x01	0x00_0x3F	See below		

The signal data shall be populated as shown in the table below from Mobileye EDR doc section 4.4:

Signals in Byte 5 to Byte 5+N			
Name	Type	Description	Value
edr_type	uint8	EDR type is 0x6 (constant value, always).	Value = 6 (CONSTANT!)
edr_policy	uint8	EDR policy number. Note: Indexing of policies begins with 1. The only the EDR policy implemented (in 2017) is the Simple Policy, so 1 is the only policy recognized.	0 = no policy type (i.e. this message is intended for EDR manager). 1 = simple policy (the only policy implemented at this time).
edr_function	uint8	edr_function id to perform.*	See table in Ref[4] section 4.5
edr_params_num	uint8	The total number of parameters (not always the same as the number of bytes) in the following 'params' field.	
params	byte[]	The description of this field is according to the specific EDR policy process. See Ref[4]. The first four bytes indicate the dynamic array size in bytes.	

*An EDR trigger is commanded with edr_LB_triggerEventTo (0x4)

- Only the the EDR Logger Buffer (LB) Trigger command shall be implemented for SW6.
- The MESP msg-tag shall be incremented to 0x3F and then roll over to 0x00 to count the messages sent.
- After triggering an LB, the LB_tag (Logger Buffer tag) shall be incremented by Aptiv SW from 1 to 4 and then roll over to LB1 after LB4 has been triggered.
- The EDR trigger command is received from the CMBB SWC.

EXAMPLE: These are the sequence of commands to trigger LB1 and trigger LB2:

1. Trigger LB1(Logger Buffer 1)

COMMAND: 0x06, 0x5E, 0x06, 0x01, 0x02, 0x06, 0x01, 0x04, 0x01, 0x01, 0x00, 0x00, 0x00, 0x01

MESP HEADER

0x06 = MESP Service from MESP document for Calibration Tools Service

0x5E = MESP Protocol from MESP document for all MESP Services

0x06 = MESP Service (Repeat of first byte).

0x01 = MESP EDR Function ID from EDR document, EDR Simple Policy

0x02 = MESP msg-tag from MESP document, this is a counter. A leading 1 indicates a reply.

MESP PARAMS

0x06 = edr_type

0x01 = edr_policy, from EDR document, EDR Simple Policy

0x04 = edr_LB_triggerEventTo, from EDR document,

0x01 = edr_params_num, from EDR document (indicates 1 parameter to follow)

0x01, 0x00, 0x00, 0x00 = 4 bytes indicating size of parameter to follow is 1 byte.

0x01 = LB_tag, Logger Buffer tag, from EDR document.

2. Trigger LB2:

MESP HEADER

0x06 = MESP Service from MESP document for Calibration Tools Service

0x5E = MESP Protocol from MESP document for all MESP Services
0x06 = MESP Service (Repeat of first byte).
0x01 = MESP EDR Function ID from EDR document, EDR Simple Policy
0x03 = MESP msg-tag from MESP document, this is a counter. A leading 1 indicates a reply.
MESP PARAMS
0x06 = edr_type
0x01 = edr_policy, from EDR document, EDR Simple Policy
0x04 = edr_LB_triggerEventTo, from EDR document,
0x01 = edr_params_num, from EDR document (indicates 1 parameter to follow)
0x01, 0x00, 0x00, 0x00 = 4 bytes indicating size of parameter to follow is 1 byte.
0x02 = LB_tag, Logger Buffer tag, from EDR document.

[] Will not Have]

7.1.1.6.2 Response Message

In Review, MAPC-67341 - Response Message

The Send Params to Calibration Tool response message shall be as follows:

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	...	Byte 5+N
Service	Protocol	Service	Function	Msg-tag	Signals[0]	...	Signals[N]
0x06	0x5E	0x06	0x01	0x00_0x3F	See below or n/a?		

The response signals shall be per Ref[4] Section 4.4, where the EDR_type, EDR_policy and EDR_function have the same value as described in the request message.

[] Will not Have]

7.1.1.7 Event Calibration Tool

This service is used to send mode specific calibration data to/from the EyeQ. The data transferred to the EyeQ is temporary (stored in RAM).

7.1.1.7.1 Request Message

Approved, MAPC-67344 - Request Message

The Event Calibration Tool request message shall follow a Switch EyeQ Application command and be formatted as follows:

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	...	Byte 5+N
Service	Protocol	Service	Function	Msg-tag	Signal[0]	...	Signal[N]
0x06	0x5E	0x06	0x03	0x00_0x3F	See below		

The request signals shall be per Ref[1] Section 3.7.4 where:

- The ct_type parameter shall be set to 3 to indicate an initialization message is being sent.
- The ct_type parameter shall be set to 4 to indicate coding of the IPB and PCW messages.
- The ct_version parameter shall always be set to 1
- A ct_stage value of 0x85 shall indicate the Host is sending parameters for TAC mode
- A ct_stage value of 0x82 shall indicate the Host is sending parameters for SPC mode
- A ct_stage value of 0x78 shall indicate the Host is sending IPB parameters for Vision mode
- A ct_stage value of 0x79 shall indicate the Host is sending PCW parameters for Vision mode
- A ct_stage value of 0x92 shall indicate the Host is sending parameters for Vision mode

Note that the IPB and PCW messages (0x78 and 0x79) are only sent when transitioning to vision mode and must be sent before Vision mode parameters (0x92).

[] Should Have]

7.1.1.7.2 Response Message

Approved, MAPC-67346 - Response Message

The Event Calibration Tool response message shall be as follows:

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	...	Byte 5+N
Service	Protocol	Service	Function	Msg-tag	Signal[0]	...	Signal[N]
0x06	0x5E	0x06	0x03	0x80_0xBF	See Below		

The response signals shall be per Ref[1] Section 3.7.4 where ct_type, ct_stage, and ct_version values are the same as defined in the request messages.

Init_Params_Vision (0x92) message sent when ct_stage equals 'Main State Pending Vision' . REF[8]

Uncontrolled copy from Aptiv_DAT2_Init.dbc shown below for reference only. REF[9]

Name	Star.	Len.	Value Type	Init.	Facts.	Offs.	Min.	Max.	Unit	Comment	GenSig/Val
0xInitConfCollision	8	8	Unsigned	1	1	0	1	1	counter	S01: key=Init_Vision_Protocol_Version sec=2MSG file=init_msg.ttp sep=+ ty=...	1
0xInitConfFull	8	16	Signed	0	4	0	-180	180	pixels	S01: key=bottomFull sec=2main file=initCamera.conf sep=+ type=init	0
0xInitConfYaw	24	16	Signed	0	4	0	-180	180	pixels	S01: key=yawFull sec=2main file=initCamera.conf sep=+ type=init	0
0xInitConfSteer	40	8	Signed	0	1	0	-40	40	pixels	S01: key=autoSteer sec=2main file=initCamera.conf sep=+ type=init	0
0xInitConfYaw	48	8	Signed	0	1	0	-40	40	pixels	S01: key=autoSteer sec=2main file=initCamera.conf sep=+ type=init	0
0xInitAngle	56	8	Signed	0	0.005	0	-0.5	0.055	radians	S01: key=rollAngle sec=2main file=initCamera.conf sep=+ type=float	0
0xInitAngle	64	8	Unsigned	0	1	0	0	2	enum	S01: key=rollAngle sec=2main file=initCamera.conf sep=+ type=init	0
0xInitCode	72	8	Unsigned	1	1	0	1	10	ENUM	S01: key=rollCode sec=2main file=initCamera.conf sep=+ type=init	0
0xInitAngle	80	16	Signed	0.5	0.001	0	0.5	3.5	[m]	S01: key=rollAngle sec=2main file=initCamera.conf sep=+ type=float	100
0xInitAngle	96	16	Unsigned	0	0.01	0	0	255	m	S01: key=rollAngle sec=2main file=initCamera.conf sep=+ type=float	100
0xInitYawRate	112	16	Signed	2	0.01	0	-2	2	m	S01: key=rollAngle sec=2main file=initCamera.conf sep=+ type=float	200
0xInitYawRate	128	1	Unsigned	0	1	0	0	1	bool	S01: key=rollAngle sec=2main file=initCamera.conf sep=+ type=float	0
0xInitFrequency	129	2	Unsigned	0	1	0	0	2	NA	TRD	0
0xInitRoll	131	8	Unsigned	0	1	0	0	4	NA	TRD	0
0xInitRoll	136	8	Unsigned	1	0.01	0	0.2	255	m	S01: key=rollAngle sec=2main file=initCamera.conf sep=+ type=float	100
0xInitRoll	144	8	Unsigned	1	0.01	0	0.2	255	m	S01: key=rollAngle sec=2main file=initCamera.conf sep=+ type=float	100
0xInitRollRate	152	8	Unsigned	0	0.001	0	0	5	m	S01: key=rollAngle sec=2main file=initCamera.conf sep=+ type=float	0
0xInitRollRate	161	7	Unsigned	0	1	0	0	0	NA	TRD	0
0xInitRoll	168	8	Signed	-40	1	0	-120	120	pixels	S01: key=bottom sec=2main file=initCamera.conf sep=+ type=init	80
0xInitRoll	176	8	Signed	80	1	0	-120	120	pixels	S01: key=top sec=2main file=initCamera.conf sep=+ type=init	80
0xInitRollRateThreshold	184	8	Unsigned	0.3	0.1	0	0	20	NA	S01: key=BS_ENTER_THRESHOLD sec=2main file=initCamera.conf sep=+ type=float	3
0xInitRollRateThreshold	192	8	Unsigned	0.2	0.1	0	0	20	NA	S01: key=BS_EXIT_THRESHOLD sec=2main file=initCamera.conf sep=+ type=float	2
0xInitRollRateThreshold	200	8	Unsigned	0.1	0	0	0	20	NA	S01: key=BS_EXIT_THRESHOLD sec=2main file=initCamera.conf sep=+ type=float	80
0xInitRollRateThreshold	208	8	Unsigned	0.1	0	0	0	20	NA	S01: key=BS_EXIT_THRESHOLD sec=2main file=initCamera.conf sep=+ type=float	80
0xInitRollRateThreshold	216	8	Signed	-0.2	0.1	0	-5	0	NA	S01: key=HS_ENTER_THRESHOLD sec=2main file=initCamera.conf sep=+ type=float	2
0xInitRollRateThreshold	224	8	Signed	-0.2	0.1	0	-5	0	NA	S01: key=HS_EXIT_THRESHOLD sec=2main file=initCamera.conf sep=+ type=float	2
0xInitRollRateThreshold	232	8	Unsigned	0.1	0	0	255	kph	S01: key=HS_ENTER_THRESHOLD sec=2main file=initCamera.conf sep=+ type=float	80	
0xInitRollRateThreshold	240	8	Unsigned	0.1	0	0	255	kph	S01: key=HS_EXIT_THRESHOLD sec=2main file=initCamera.conf sep=+ type=float	80	
0xInitRollRateThreshold	248	20	Unsigned	0	1	0	0	605	NA	S01: key=HS_EXIT_THRESHOLD sec=2main file=initCamera.conf sep=+ type=float	0
0xInitRollRateThreshold	256	4	Unsigned	0	1	0	0	0	NA	S01: key=HS_EXIT_THRESHOLD sec=2main file=initCamera.conf sep=+ type=float	0
0xInitRollRateThreshold	272	2	Unsigned	0	1	0	0	2	ENUM	S01: key=HS_EXIT_THRESHOLD sec=2main file=initCamera.conf sep=+ type=float	0
0xInitRollRateThreshold	274	6	Unsigned	0	1	0	0	0	NA	S01: key=HS_EXIT_THRESHOLD sec=2main file=initCamera.conf sep=+ type=float	0

[] Should Have]

Approved, MAPC-67347 - Message 0x92 for SW7.0 and Later Releases:

Name	Star.	Len.	Value Type	Init	Facts	Offs	Min	Max	Unit	Comment	Gen.
0xInitType	8	8	Unsigned	0	1	0	0	255	NA		1
0xInitParams_Vision_Protocol_Version	8	8	Unsigned	1	1	0	1	1	NA		1
0xInitConfFull	16	16	Signed	0	1	0	-180	180	Level -2 Pts.	S01: key=yawFull, ty=...	0
0xInitConfFull	32	16	Signed	0	1	0	-180	180	Level -2 Pts.	S01: key=yawFull, ty=...	0
0xInitConfSteer	48	8	Signed	0	1	0	-180	180	Level -2 Pts.	S01: key=rollFull, ty=...	0
0xInitConfSteer	56	8	Signed	0	1	0	-180	180	Level -2 Pts.	S01: key=rollFull, ty=...	0
0xInitAngle	64	8	Signed	0	0.005	0	-0.5	0.055	radians	S01: key=rollAngle, ty=...	0
0xInitCode	72	8	Unsigned	0	1	0	0	2	enum	S01: key=rollCode, ty=...	0
0xInitAngle	80	8	Unsigned	1	1	0	0	10	ENUM	S01: key=rollCode, ty=...	1
0xInitRoll	88	8	Unsigned	0	1	0	0	0	NA	S01: key=rollCode, ty=...	0
0xInitRollRate	96	16	Unsigned	0.5	0.001	0	0.5	3.5	[m]	S01: key=rollRate, ty=...	100
0xInitRollRate	112	16	Unsigned	0	0.01	0	0	255	m	S01: key=rollRate, ty=...	0
0xInitRollRate	128	16	Signed	2	0.01	0	-2	2	m	S01: key=rollRate, ty=...	200
0xInitFrequency	129	2	Unsigned	0	1	0	0	2	NA	TRD	0
0xInitRoll	144	2	Unsigned	0	1	0	0	1	NA	S01: key=rollRate, ty=...	0
0xInitRoll	145	2	Unsigned	0	1	0	0	1	NA	S01: key=rollRate, ty=...	0
0xInitRoll	147	1	Unsigned	1	0.01	0	0.2	255	m	S01: key=rollRate, ty=...	100
0xInitRoll	156	4	Unsigned	0	1	0	0	0	NA	S01: key=rollRate, ty=...	0
0xInitRollRate	160	8	Unsigned	1	0.01	0	0.2	255	m	S01: key=rollRate, ty=...	100
0xInitRollRate	168	8	Unsigned	0	0.01	0	0	5	m	S01: key=rollRate, ty=...	0
0xInitRollRate	177	8	Signed	-120	1	0	-120	-20	Level 0 Pts.	S01: key=bottom, ty=...	-120
0xInitRollRate	185	7	Unsigned	0	1	0	0	0	NA	S01: key=bottom, ty=...	0
0xInitRollRate	192	8	Signed	120	1	0	20	120	Level 0 Pts.	S01: key=top, ty=...	120
0xInitRollRateThreshold	200	8	Unsigned	0.3	0.1	0	0	20	NA	S01: key=BS_ENTER, ty=...	3
0xInitRollRateThreshold	208	8	Unsigned	0.2	0.1	0	0	20	NA	S01: key=BS_EXIT, ty=...	2
0xInitRollRateThreshold	216	8	Unsigned	0	0.1	0	0	20	NA	S01: key=BS_EXIT, ty=...	80
0xInitRollRateThreshold	224	8	Unsigned	0	0.1	0	0	20	NA	S01: key=BS_EXIT, ty=...	80
0xInitRollRateThreshold	232	8	Signed	-0.2	0.1	0	-5	0	NA	S01: key=HS_ENTER, ty=...	2
0xInitRollRateThreshold	240	8	Signed	-0.2	0.1	0	-5	0	NA	S01: key=HS_EXIT, ty=...	2
0xInitRollRateThreshold	248	8	Unsigned	0	1	0	0	255	kph	S01: key=HS_ENTER, ty=...	80
0xInitRollRateThreshold	256	8	Unsigned	0	1	0	0	255	kph	S01: key=HS_EXIT, ty=...	80
0xInitRollRateThreshold	264	20	Unsigned	0	1	0	0	605	NA	S01: key=HS_EXIT, ty=...	0
0xInitRollRateThreshold	272	2	Unsigned	0	1	0	0	2	ENUM	S01: key=HS_EXIT, ty=...	0
0xInitRollRateThreshold	274	6	Unsigned	0	1	0	0	0	NA	S01: key=HS_EXIT, ty=...	0
0xInitRollRateThreshold	288	8	Unsigned	-40	1	0	-40	-40	pixels - Level	S01: key=rollRate, ty=...	-20
0xInitRollRateThreshold	297	8	Unsigned	110	1	0	0	62	pixels - Level	S01: key=rollRate, ty=...	110
0xInitRollRateThreshold	305	8	Signed	-125	1	0	-47	-47	pixels - Level	S01: key=rollRate, ty=...	-125
0xInitRollRateThreshold	313	8	Unsigned	-125	1	0	-47	-47	pixels - Level	S01: key=rollRate, ty=...	-78
0xInitRollRateThreshold	321	8	Signed	0	0.001	0	0	0.055	radians	S01: key=rollRate, ty=...	0
0xInitRollRateThreshold	328	2	Unsigned	0	1	0	0	3	ENUM	S01: key=rollRate, ty=...	0
0xInitRollRateThreshold	331	5	Unsigned	0	1	0	0	0	NA	S01: key=rollRate, ty=...	0

[] Should Have]

Approved, MAPC-67348 - Init_Params_Vision Message (0x92) Format for SW8.1 and Later Releases

Name	Len	Typ	Resolut	Offset	Range From	Range To	Unit
Zero_byte	8	uint	1	0	0	255	NA
init_params_vision_protocol_version	8	uint	1	0	3	3	NA
horizonFull	16	sint	1	0	-160	160	Level -2 Pixels
yawFull	16	sint	1	0	-160	160	Level -2 Pixels
autofxHorizon	16	sint	1	0	-160	160	Level -2 Pixels
autofxYaw	16	sint	1	0	-160	160	Level -2 Pixels
rollAngle	8	sint	0.005	0	-0.055	0.055	radians
drivingSide	8	uint	1	0	0	2	enum
regionCode	8	uint	1	0	0	10	ENUM
cameraHeight	16	uint	0.001	0	0.5	3.5	Im
Reserved_1	8	uint	1	0	0	0	NA
cameraToFrontBumper	16	uint	0.01	0	0	2.55	m
camToFrontAxle	16	sint	0.01	0	-2	2	m
cameraAlignmentValid	1	uint	1	0	0	1	bool
gridFrequency	2	uint	1	0	0	2	NA
HilMode	1	uint	1	0	0	1	NA
leftWheel	8	uint	0.01	0	0.2	2.55	m
rightWheel	8	uint	0.01	0	0.2	2.55	m
camToRearAxle	9	uint	0.01	0	0	5	m
Reserved_2	3	uint	1	0	0	0	NA
bottom	8	sint	1	0	-120	120	Level 0 Pixels
top	8	sint	1	0	20	120	Level 0 Pixels
brightSceneEnterThreshold	8	uint	0.1	0	0	20	NA
brightSceneExitThreshold	8	uint	0.1	0	0	20	NA
brightSceneObviouslyBrightEnterThreshold	8	uint	0.1	0	0	20	NA
brightSceneObviouslyBrightExitThreshold	8	uint	0.1	0	0	20	NA
highwayOncomingSensitivity	8	sint	0.1	0	-5	0	NA
highwayPositionLightSensitivity	8	sint	0.1	0	-5	0	NA
liteNightOnlySLSpeedEnter_kph	8	uint	1	0	0	255	kmh
liteNightOnlySLSpeedExit_kph	8	uint	1	0	0	255	kmh
Reserved_3	16	uint	1	0	0	0	NA
brightSceneDuskDelay	20	uint	1	0	0	600000	NA
litNightBehaviour	2	uint	1	0	0	2	ENUM
ProjectConfiguration	3	uint	1	0	1	4	ENUM
Reserved_4	7	uint	1	0	0	0	NA
minHorizon	8	uint	1	-40	-40	0	pixel - Level 0
maxHorizon	8	uint	1	0	0	62	pixel - Level 0
minYaw	8	uint	1	-47	-47	0	pixel - Level 0
maxYaw	8	sint	1	0	0	47	pixel - Level 0
maxRollAngle	8	sint	0.001	0	0	0.055	radians
adaptorOperations	2	uint	1	0	0	3	ENUM
DarkSceneOncomingSensitivity	8	uint	0.01	-1	-1	1	Normalized
DarkSceneTailightSensitivity	8	uint	0.01	-1	-1	1	Normalized
SideLampDetectionEnabled	1	uint	1	0	0	1	NA

Note: autofxHorizon and autofxYaw shall be sent as EVEN values. [Should Have]

7.1.2 Defined Atpv Serial Protocol (DASP)

Approved, MAPC-67350 -

Defined Atpv Serial Protocol (DASP) messages shall use the following frame format:

Message Data					
Frame Header			DASP Data		
Byte 0	Byte 1	Byte 3	Byte 3	Byte 4	Byte 4+N
0x65	Data ID	Counter	RESERVED	Data[0]	Data[N]

Detailed descriptions of the individual bytes are given in the remainder of this subsection.

Protocol:

This value describes the Defined Atpv Serial Protocol used to produce this message. The protocol value for all DASP messages shall be 0x65.

Data ID:

An 8-bit Data ID shall be used. See table below for IDs assigned to individual messages. To prevent conflict with MESP commands, there shall not be a DASP message with Data ID 0x5E.

Counter:

An 8-bit number, representing numbers from 0 to 255 that is incremented on every send request. There shall be a separate counter for each Data ID. The counter is used to detect repetition, deletion, insertion, or incorrect sequence of data transfer. Messages received with an unexpected counter shall still be processed, but the eyeqSPIMsgRxBadSeqCtr counter shall be incremented (refer to EyeQ4_BASE_DIAG_STATUS_MSG). The expected counter for each Data ID shall be relearned every time that Data ID is received.

Data:

The application message data. Little endian notation is used for frame header and message data. All unused bits in Application Message data shall be set to 1. If the EyeQ4 receives a DASP message with an unexpected length, it shall not process that message but increment the eyeqSPIMsgRxBadHdRctr counter (refer to EYEQ4_BASE_DIAG_STATUS_MSG).

All DASP messages and data structures shall be collected in mudp format for display by DV tool.

MsgVersion:

The version of the message format for each DASP Message (by Data ID). This will be incremented each a message when the format of the message changes.

[Should Have]

7.1.2.1 #Defines

Approved, MAPC-67352 - #Defines

All measurements are corrected and reported according to the current estimated camera alignment parameters.

#define E_EYEQ_MAX_REFLECTIVE_SIGNS 12

#define E_EYEQ_MAX_ACTIVE_LIGHT_SPOTS 15

#define E_EYEQ_MAX_VISION_OBJECTS 15

#define E_EYEQ_MAX_TRANSITION_POINTS 12

#define E_EYEQ_MAX_TRAFFIC_SIGNS 20

#define E_EYEQ_MAX_ROAD_MARKINGS_ARROWS 5

#define E_EYEQ_MAX_ROAD_MARKINGS_STOP_LINES 4

#define E_EYEQ_MAX_SRP_DATA_POINTS 10 [Should Have]

Approved, MAPC-67353 - #Defines for [FOR SW5.0 and LATER RELEASES]

All measurements are corrected and reported according to the current estimated camera alignment parameters.

#define E_EYEQ_MAX_REFLECTIVE_SIGNS 12

#define E_EYEQ_MAX_ACTIVE_LIGHT_SPOTS 15

#define E_EYEQ_MAX_VISION_OBJECTS 15

#define E_EYEQ_MAX_TRANSITION_POINTS 12

#define E_EYEQ_MAX_TRAFFIC_SIGNS 20

#define E_EYEQ_MAX_ROAD_MARKING_ARROWS 10

#define E_EYEQ_MAX_ROAD_MARKING_STOP_LINES 10

#define E_EYEQ_MAX_ROAD_MARKING_SPEED_LIMIT 10

#define E_EYEQ_MAX_ROAD_MARKING_CROSSING 10

#define E_EYEQ_MAX_SRP_DATA_POINTS 10

#define E_EYEQ_MAX_SAFETY_DIAGNOSTIC_MSG 64

[Should Have]

7.1.2.2 Host DASP Messages For SW3.0 and earlier releases (changed from 0x10 to 0x20 for SW4.0 and later releases)

All Host DASP messages and all of the structures within those messages shall be included in a UDP output stream.

Approved, MAPC-67355 - Host DASP Messages

The following table lists all Defined Atpv Serial Protocol Messages that shall be transmitted from the Host and received by the EyeQ during Running Vision mode. Implementation shall be according to the specifications given in the following subsections:

Data ID	Message Name	Modes	Periodic Rate (Hz)	Rate Tolerance (ms)	Description
0x20	HOST_VEH_STATE_MSG	APP	66.67	+/- 5	Host vehicle state message. Message Number changed from 0x10 to 0x20 in SW4.0 and later releases to prevent confusion with EyeQ Message 0x10.

Note: Do not assign a Data ID to 0x5E

All messages shall be transmitted periodically at the rate specified in attribute "Periodic Rate" with a tolerance as specified in "Rate Tolerance".

[Should Have]

7.1.2.2.1 HOST_VEH_STATE_MSG (0x20) [changed to 0x20 for SW4.0 and SW5.0 (was previously 0x10)]

In Review, MAPC-67357 - The DASP Data in the Host Vehicle State Message shall be as shown below.

Member Name	Type	Array Size	Description	Range	Units
vehStateInfo	host_vehicle_state_t	n/a	This contains information about the Ego vehicle state with 64 bit timestamp.	n/a	n/a
host_sync_timestamp_ms	uint32_t	n/a	The time when the Host received the latest EyeQ4 Clock Sync pulse.	0 to 2 ³² -1	ms
global_real_time	uint32_t	n/a	Global real time from the vehicle bus data to be populated and sent every SPI Transmission. This will be used in the EDR in the EyeQ. (This is not for synchronizing the ECU clocks. This is the date/time data received from the vehicle bus. Date/time data is stored with the EDR.)	0 to 2 ³² -1	s
SPI_Rolling_Count	uint16_t	n/a	Rolling counter to be incremented by one on every message transmission	0 to 2 ¹⁶ -1	n/a
WheelSlipEvent	uint8_t	n/a	a Current wheel slip event: 0 = No Slip 1 = Brake Slip Control Active 2 = Traction Slip Control Active	0 to 2	n/a

Will not Have]

7.1.2.2.2 HOST_VEH_STATE_MSG (0x20) [FOR SW5.0]

In Review, MAPC-67359 - The DASP Data in the Host Vehicle State Message shall be as shown below.

Member Name	Type	Array Size	Description	Range	Units
vehStateInfo	host_vehicle_state_t	n/a	This contains information about the Ego vehicle state with 64 bit timestamp.	n/a	n/a
host_sync_timestamp_ms	uint32_t	n/a	The time when the Host received the latest EyeQ4 Clock Sync pulse.	0 to 2 ³² -1	ms
global_real_time	uint32_t	n/a	Global real time from the vehicle bus data to be populated and sent every SPI Transmission. This will be used in the EDR in the EyeQ. (This is not for synchronizing the ECU clocks. This is the date/time data received from the vehicle bus. Date/time data is stored with the EDR.)	0 to 2 ³² -1	s
SPI_Rolling_Count	uint16_t	n/a	Rolling counter to be incremented by one on every message transmission	0 to 2 ¹⁶ -1	n/a
WheelSlipEvent	uint8_t	n/a	a Current wheel slip event: 0 = No Slip 1 = Brake Slip Control Active 2 = Traction Slip Control Active	0 to 2	n/a
host_sync_timestamp_ms_valid	uint8_t	n/a	0x69 = VALID, ELSE NOT VALID	0 to 0xFF	n/a

Will not Have]

HOST_VEH_STATE_MSG (0x20) [For SW6.0 and Later Releases]

Approved, MAPC-67360 - The DASP Data in the Host Vehicle State Message shall be as shown below.

Member Name	Type	Array Size	Description	Range	Units
vehStateInfo	host_vehicle_state_t	n/a	This contains information about the Ego vehicle state with 64 bit timestamp.	n/a	n/a
RESERVED	uint32_t	n/a	RESERVED. Previously used for host_sync_timestamp_ms	n/a	n/a
global_real_time	uint32_t	n/a	Global real time from the vehicle bus data to be populated and sent every SPI Transmission. This will be used in the EDR in the EyeQ. (This is not for synchronizing the ECU clocks. This is the date/time data received from the vehicle bus. Date/time data is stored with the EDR.)	0 to 2 ³² -1	s
SPI_Rolling_Count	uint16_t	n/a	Rolling counter to be incremented by one on every message transmission	0 to 2 ¹⁶ -1	n/a
WheelSlipEvent	uint8_t	n/a	a Current wheel slip event: 0 = No Slip 1 = Brake Slip Control Active 2 = Traction Slip Control Active	0 to 2	n/a
host_sync_timestamp_us_valid	uint8_t	n/a	0x69 = VALID, ELSE NOT	0 to	n/a

host_sync_timestamp_us	uint64_t	n/a	VALID The time when the Host received the latest EyeQ4 Clock Sync pulse.	0xFF 0 to 2 ⁶⁴ -1	n/a
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[Should Have]

HOST_VEH_STATE_MSG (0x20) [For SW8.1 and Later Releases]

✓ **Approved, MAPC-67361** - The DASP Data in the Host Vehicle State Message shall be as shown below.

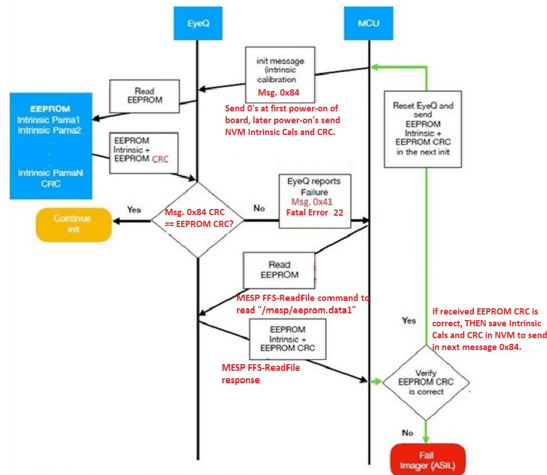
Member Name	Type	Array Size	Description	Range	Units
vehStateInfo	host_vehicle_state_t	n/a	The Host vehicle state with 64 bit timestamp.	n/a	n/a
RESERVED	uint32_t	n/a	RESERVED. Previously used for host_sync_timestamp_ms	n/a	n/a
global_real_time	uint32_t	n/a	Global real time from the vehicle bus data to be populated and sent every SPI Transmission. Not for synchronizing the ECU clocks. This is the date/time data received from the vehicle bus to be stored with the EDR.	0 to 2 ³² -1	s
SPI_Rolling_Count	uint16_t	n/a	Rolling counter to be incremented on every message transmission	0 to 2 ¹⁶ -1	n/a
WheelSlipEvent	uint8_t	n/a	a Current wheel slip event: 0 = No Slip 1 = Brake Slip Control Active 2 = Traction Slip Control Active	0 to 2	n/a
host_sync_timestamp_us_valid	uint8_t	n/a	0x69 = VALID, ELSE NOT VALID	0 to 0xFF	n/a
host_sync_timestamp_us	uint64_t	n/a	The time when the Host received the latest EyeQ4 Clock Sync pulse.	0 to 2 ⁶⁴ -1	n/a
wheelSpeedInfo	host_wheel_speed_t	n/a	Wheel speed structure for REM	n/a	n/a

[Should Have]

7.1.3 Intrinsic Calibration Logic and Flowchart

✓ **Approved, MAPC-67363** - The Host shall follow the following steps to check the Intrinsic Calibration and update it if required:

- At power-on the Aurix shall send the Intrinsic Calibration (0x84) message to the EyeQ4, based on the contents of NVM. For the first power-cycle of the ADAS-ECU the NVM is empty and the parameters will be zero's.
- When an ACK is received, the Aurix shall send the Init Params Vision (0x92) message and begin to monitor message 0x41 from the EyeQ4.
- If Vision mode is entered, then the EEPROM data matches the previous EEPROM data and there is no need to perform steps 4-7 below to read new Intrinsic Calibrations.
- Before Vision mode is entered, If the Aurix receives a message 0x41 with a Fatal Error 22, then the Aurix shall send a Read EEPROM command to the EyeQ4. The Read EEPROM command is a MESP 'FFS - Read File' command with the following filename: "/mesp/eprom.data1".
- When the Aurix receives the 'FFS - Read File' Response it shall calculate the CRC-16 of the received parameters and compare it to the CRC-16 included in the EEPROM data.
- If the CRC's do not match then the unit is failed and must be repaired or replaced.
- If the CRC's do match, then the Intrinsic Calibrations shall be written to NVM and the Aurix shall reset the EyeQ4 and return to Step 1.



[Should Have]

✓ **Approved, MAPC-67364** - The Host shall store Intrinsic Calibration "EEPROM DATA" in NVM and send to EyeQ4 in message 0x84 at next reset:

Intrinsic Cal Block From EEPROM to the EyeQ4			
NAME	STARTBIT	LENGTH	TYPE
CCAM_Num_Of_distorParams_m	0	4	UINT
Reserved_1	4	4	UINT
CCAM_camK1_FocalLengthX_m	8	16	UINT
CCAM_K2_FocalLengthY_m	24	16	UINT
CCAM_K3_Skew_m	40	16	UINT
CCAM_K4_PrincipalPointX_m	56	16	UINT
CCAM_K5_PrincipalPointY_m	72	16	UINT

CCAM_distortionModelType_m	88	8	UINT
CCAM_CODX_m	96	16	UINT
CCAM_CODY_m	112	16	UINT
CCAM_distorParams_m_0	128	32	IEEE Float
CCAM_distorParams_m_1	160	32	IEEE Float
CCAM_distorParams_m_2	192	32	IEEE Float
CCAM_distorParams_m_3	224	32	IEEE Float
CCAM_distorParams_m_4	256	32	IEEE Float
CCAM_distorParams_m_5	288	32	IEEE Float
CCAM_distorParams_m_6	320	32	IEEE Float
CCAM_distorParams_m_7	352	32	IEEE Float
CCAM_distorParams_m_8	384	32	IEEE Float
CCAM_distorParams_m_9	416	32	IEEE Float
CCAM_distorParams_m_10	448	32	IEEE Float
CCAM_distorParams_m_11	480	32	IEEE Float
CCAM_distorParams_m_12	512	32	IEEE Float
CCAM_distorParams_m_13	544	32	IEEE Float
CCAM_distorParams_m_14	576	32	IEEE Float
CALCULATED CRC-16	608	16	UINT

CORRELATION BETWEEN PARAMETERS IN MESSAGE 0x84 and in EEPROM:

Parameter#	IN MESSAGE 0x84			IN EEPROM		
	Name	Startbit	Length	NAME	STARTBIT	LENGTH TYPE
0	apiVersionMajor	0	8	NONE		
1	apiVersionMinor	8	8	NONE		
2	CCAM_Num_Of_distorParams_m	16	4	CCAM_Num_Of_distorParams_m	0	4 UINT
3	Reserved_1	20	12	Reserved_1	4	4 UINT
4	CCAM_camK1_FocalLengthX_m	32	16	CCAM_camK1_FocalLengthX_m	8	16 UINT
5	CCAM_K2_FocalLengthY_m	48	16	CCAM_K2_FocalLengthY_m	24	16 UINT
6	CCAM_K3_Skew_m	64	16	CCAM_K3_Skew_m	40	16 UINT
7	CCAM_K4_PrincipalPointX_m	80	16	CCAM_K4_PrincipalPointX_m	56	16 UINT
8	CCAM_K5_PrincipalPointY_m	96	16	CCAM_K5_PrincipalPointY_m	72	16 UINT
9	CCAM_distortionModelType_m	112	8	CCAM_distortionModelType_m	88	8 UINT
10	Reserved_2	120	8	NONE		
11	CCAM_CODX_m	128	16	CCAM_CODX_m	96	16 UINT
12	CCAM_CODY_m	144	16	CCAM_CODY_m	112	16 UINT
13	CCAM_distorParams_m_0	160	32	CCAM_distorParams_m_0	128	32 IEEE Float
14	CCAM_distorParams_m_1	192	32	CCAM_distorParams_m_1	160	32 IEEE Float
15	CCAM_distorParams_m_2	224	32	CCAM_distorParams_m_2	192	32 IEEE Float
16	CCAM_distorParams_m_3	256	32	CCAM_distorParams_m_3	224	32 IEEE Float
17	CCAM_distorParams_m_4	288	32	CCAM_distorParams_m_4	256	32 IEEE Float
18	CCAM_distorParams_m_5	320	32	CCAM_distorParams_m_5	288	32 IEEE Float
19	CCAM_distorParams_m_6	352	32	CCAM_distorParams_m_6	320	32 IEEE Float
20	CCAM_distorParams_m_7	384	32	CCAM_distorParams_m_7	352	32 IEEE Float
21	CCAM_distorParams_m_8	416	32	CCAM_distorParams_m_8	384	32 IEEE Float
22	CCAM_distorParams_m_9	448	32	CCAM_distorParams_m_9	416	32 IEEE Float
23	CCAM_distorParams_m_10	480	32	CCAM_distorParams_m_10	448	32 IEEE Float
24	CCAM_distorParams_m_11	512	32	CCAM_distorParams_m_11	480	32 IEEE Float
25	CCAM_distorParams_m_12	544	32	CCAM_distorParams_m_12	512	32 IEEE Float
26	CCAM_distorParams_m_13	576	32	CCAM_distorParams_m_13	544	32 IEEE Float
27	CCAM_distorParams_m_14	608	32	CCAM_distorParams_m_14	576	32 IEEE Float
28	NONE			CALCULATED CRC-16	608	16 UINT

[] Should Have)


✓ Approved, MAPC-67365 - Full Contents of EEPROM to Read with MESP FFS-ReadFile Command

NAME	Description	Address (Hex)	# of Bytes
CCAM_Num_Of_distorParams_m	Number of Distortion Parameters used	00	1
CCAM_K1_FocalLengthX_m	Focal length - float in pixels	01	2
CCAM_K2_FocalLengthY_m	Focal length - float in pixels	03	2
CCAM_K3_Skew_m	Skew - float in pixels	05	2
CCAM_K4_PrincipalPointX_m	PP - float in pixels	07	2
CCAM_K5_PrincipalPointY_m	PP - float in pixels	09	2
CCAM_distortionModelType_m	Model used - int16	0B	1
CCAM_CODX_m	COD - float in pixels	0C	2
CCAM_CODY_m	COD - float in pixels	0E	2
CCAM_distorParams_m_0	IEEE754 single precision float, little endian	10	4
CCAM_distorParams_m_1	IEEE754 single precision float, little endian	14	4
CCAM_distorParams_m_2	IEEE754 single precision float, little endian	18	4
CCAM_distorParams_m_3	IEEE754 single precision float, little endian	1C	4
CCAM_distorParams_m_4	IEEE754 single precision float, little endian	20	4
CCAM_distorParams_m_5	IEEE754 single precision float, little endian	24	4
CCAM_distorParams_m_6	IEEE754 single precision float, little endian	28	4
CCAM_distorParams_m_7	IEEE754 single precision float, little endian	2C	4
CCAM_distorParams_m_8	IEEE754 single precision float, little endian	30	4
CCAM_distorParams_m_9	IEEE754 single precision float, little endian	34	4
CCAM_distorParams_m_10	IEEE754 single precision float, little endian	38	4
CCAM_distorParams_m_11	IEEE754 single precision float, little endian	3C	4
CCAM_distorParams_m_12	IEEE754 single precision float, little endian	40	4
CCAM_distorParams_m_13	IEEE754 single precision float, little endian	44	4
CCAM_distorParams_m_14	IEEE754 single precision float, little endian	48	4
Camera Calibration CRC	CRC16	4C	2
Default_Calibration_Used		4E	1
UNUSED		4F	1
k_ECU_Core_Assembly_PN_WERS[0]	OEM Assembly Number	80	1
k_ECU_Core_Assembly_PN_WERS[1]		81	1
k_ECU_Core_Assembly_PN_WERS[2]		82	1
k_ECU_Core_Assembly_PN_WERS[3]		83	1
k_ECU_Core_Assembly_PN_WERS[4]		84	1
k_ECU_Core_Assembly_PN_WERS[5]		85	1

k_ECU_Core_Assembly_PN_WERS[6]		86	1
k_ECU_Core_Assembly_PN_WERS[7]		87	1
k_ECU_Core_Assembly_PN_WERS[8]		88	1
k_ECU_Core_Assembly_PN_WERS[9]		89	1
k_ECU_Core_Assembly_PN_WERS[10]		8A	1
k_ECU_Core_Assembly_PN_WERS[11]		8B	1
Delphi_End_Model_PN[0]	Aptiv End Model Number	8C	1
Delphi_End_Model_PN[1]		8D	1
Delphi_End_Model_PN[2]		8E	1
Delphi_End_Model_PN[3]		8F	1
Delphi_End_Model_PN[4]		90	1
Delphi_End_Model_PN[5]		91	1
Delphi_End_Model_PN[6]		92	1
Delphi_End_Model_PN[7]		93	1
k_JFV_Mfg_Site	Manufacturing Site	94	1
k_JFV_Julian_Production_Year	Last Digit of Year of Manufacture	95	1
k_JFV_Julian_Production_Date_0	Julian Date of Manufacture (MSB)	96	1
k_JFV_Julian_Production_Date_1	Julian Date of Manufacture	97	1
k_JFV_Julian_Production_Date_2	Julian Date of Manufacture (LSB)	98	1
ECU_Serial_Number[1]	Manufacturing serial number (MSB)	99	1
ECU_Serial_Number[2]	Manufacturing serial number	9A	1
ECU_Serial_Number[3]	Manufacturing serial number	9B	1
ECU_Serial_Number[4]	Manufacturing serial number (LSB)	9C	1
UNUSED		9D	1
Imager_Fuse_ID	OnSemi Imager Fuse ID 1	B0	2
Imager_Fuse_ID	OnSemi Imager Fuse ID 2	B2	2
Imager_Fuse_ID	OnSemi Imager Fuse ID 3	B4	2
Imager_Fuse_ID	OnSemi Imager Fuse ID 4	B6	2
Imager_Fuse_ID	OnSemi Imager Fuse ID 5	B8	2
Imager_Fuse_ID	OnSemi Imager Fuse ID 6	BA	2
Imager_Fuse_ID	OnSemi Imager Fuse ID 7	BC	2
Imager_Fuse_ID	OnSemi Imager Fuse ID 8	BE	2
UNUSED		C0	1
k_Yaw	Yaw (positive shift is clockwise spin of camera)	D0	2
k_Pitch	Pitch (positive shift is upward shift of camera)	D2	2
k_Roll	Roll (positive shift is clockwise tilt of camera)	D4	2
k_MTFCenter	MTF for Center Target	D6	2
k_MTFLeft	MTF for Left of Center Target	D8	2
k_MTFRight	MTF for Right of Center Target	DA	2
k_MTFTop	MTF for Top Center Target	DC	2
k_MTFBottom	MTF for Bottom Center Target	DE	2
k_MTFMidLeft	MTF for Mid Left Target	E0	2
k_MTFMidRight	MTF for Mid Right Target	E2	2
	NotProgrammed	E4	1

The following MTF parameters from EEPROM shall be written to NVM:

K_MTFCenter
K_MTFLeftK_MTFLeft
K_MTFRightK_MTFRight
K_MTFTopK_MTFTop
K_MTFBottomK_MTFBottom
k_MTFMidLeft
k_MTFMidRight


[ Should Have]

✔ **Approved, MAPC-67366** - Intrinsic Cal Number of Parameters Calculation

For backward compatibility with camera MPI files produced by Aptiv before Sept.2019, the CCAM_Num_Of_distorParams_m shall be calculated as follows:

IF (CCAM_Num_Of_distorParams_m == 3 **OR** CCAM_Num_Of_distorParams_m == 7) read from EEPROM,
THEN CCAM_Num_Of_distorParams_m = 7 shall be stored in NVM and sent in message 0x84.

IF (CCAM_Num_Of_distorParams_m == 11 **OR** CCAM_Num_Of_distorParams_m == 15) read from EEPROM,
THEN CCAM_Num_Of_distorParams_m = 15 shall be stored in NVM and sent in message 0x84.

[ Should Have]

✔ **Approved, MAPC-67367** - Intrinsic Cal Init Message Format

Name	Start...	Len...	Value Type	Initial Value	Fact...	Offs...	Mini...	Max...	Unit	Comment	Gen...
EyeQ_byte	0	8	Unsigned	0	1	0	0	255	NA		0P
EyeQ_VERSION_calib_protocol_version	8	8	Unsigned	1	1	0	1	1	NA	Version of the calib...	0P
CCAM_Nam_04_dlistofParams_m	16	4	Unsigned	0	1	0	0	15	counter	S20: key=CCAM_N...	0P
Reserved_1	20	12	Unsigned	0	1	0	0	0	NA		0P
CCAM_xam0_FocalLength_m	32	16	Unsigned	0	0.06L	0	0	4000	pixels	S20: key=cam0_sec...	0P
CCAM_x2_FocalLength_m	48	16	Unsigned	0	0.06L	0	0	4000	pixels	S20: key=cam2_sec...	0P
CCAM_x3_Same_m	64	16	Unsigned	0	0.06L	0	0	2000	pixels	S20: key=cam3_sec...	0P
CCAM_x4_PrincipalPoint_m	80	16	Unsigned	0	0.06L	0	0	2000	pixels	S20: key=cam4_sec...	0P
CCAM_x5_PrincipalPoint_m	96	16	Unsigned	0	0.06L	0	0	2000	pixels	S20: key=cam5_sec...	0P
CCAM_dlistofParamType_m	112	8	Unsigned	0	1	0	0	3	n/a	S20: key=dlistofP...	0P
Reserved_2	120	8	Unsigned	0	1	0	0	0	NA		0P
CCAM_CDD_m	128	16	Unsigned	0	0.06L	0	0	2000	pixels	S20: key=dlistofP...	0P
CCAM_CDD_m	144	16	Unsigned	0	0.06L	0	0	2000	pixels	S20: key=dlistofP...	0P
CCAM_dlistofParams_m0	160	32	IEEE Float	0	1	0	-0.8	1	n/a	S20: key=dlistofP...	0P
CCAM_dlistofParams_m1	192	32	IEEE Float	0	1	0	-0.8	1	n/a	S20: key=dlistofP...	0P
CCAM_dlistofParams_m2	224	32	IEEE Float	0	1	0	-0.8	1	n/a	S20: key=dlistofP...	0P
CCAM_dlistofParams_m3	256	32	IEEE Float	0	1	0	-0.8	1	n/a	S20: key=dlistofP...	0P
CCAM_dlistofParams_m4	288	32	IEEE Float	0	1	0	-0.8	1	n/a	S20: key=dlistofP...	0P
CCAM_dlistofParams_m5	320	32	IEEE Float	0	1	0	-0.8	1	n/a	S20: key=dlistofP...	0P
CCAM_dlistofParams_m6	352	32	IEEE Float	0	1	0	-0.8	1	n/a	S20: key=dlistofP...	0P
CCAM_dlistofParams_m7	384	32	IEEE Float	0	1	0	-0.8	1	n/a	S20: key=dlistofP...	0P
CCAM_dlistofParams_m8	416	32	IEEE Float	0	1	0	-0.8	1	n/a	S20: key=dlistofP...	0P
CCAM_dlistofParams_m9	448	32	IEEE Float	0	1	0	-0.8	1	n/a	S20: key=dlistofP...	0P
CCAM_dlistofParams_m10	480	32	IEEE Float	0	1	0	-0.8	1	n/a	S20: key=dlistofP...	0P
CCAM_dlistofParams_m11	512	32	IEEE Float	0	1	0	-0.8	1	n/a	S20: key=dlistofP...	0P
CCAM_dlistofParams_m12	544	32	IEEE Float	0	1	0	-0.8	1	n/a	S20: key=dlistofP...	0P
CCAM_dlistofParams_m13	576	32	IEEE Float	0	1	0	-0.8	1	n/a	S20: key=dlistofP...	0P
CCAM_dlistofParams_m14	608	32	IEEE Float	0	1	0	-0.8	1	n/a	S20: key=dlistofP...	0P
ESC_from_ESPCAM	640	16	Unsigned	65535	1	0	0	255	n/a	S20: key=esc_sec=...	655...

[Should Have]

7.1.4 EyeQ DASP Messages

EyeQ DASP Messages [For SW4.0 and Earlier Releases]

The following table lists all Defined Aptiv Serial Protocol Messages that shall be transmitted from the EyeQ and received by the Host. Implementation shall be according to the specifications given in the following subsections.

All EyeQ DASP messages and all of the structures within those messages shall be included in a UDP output stream.

Data ID	Message Name	Modes	Periodic Rate (Hz)	Rate Tolerance (ms)	Description
0xA0	EYEQ_BASE_DIAG_STATUS_MSG	APP / SPC / TAC	18	+/- 10	EyeQ4 base diagnostic status message.
0xA1	EYEQ_APP_DIAG_STATUS_MSG	APP/ SPC	18	+/- 10	EyeQ4 application diagnostic status message.
0xA2	EYEQ_DYNAMIC_CAL_MSG	APP/ SPC	18	+/- 10	EyeQ4 Service Point Calibration (SPC) and AutoFix output.
0xA3	EYEQ_TAC_CAL_MSG	TAC	18	+/- 10	EyeQ4 Target Auto-Calibration (TAC) output.
0xE0	EYEQ_VIS_ROAD_DATA_MSG	APP	18	+/- 10	EyeQ4 road detection data message.
0xE1	EYEQ_VIS_LIGHT_SENSOR_DATA_MSG	APP	18	+/- 10	EyeQ4 AHBC function data message.
0xE2	EYEQ_VIS_TRAFFIC_SIGNS_MSG	APP	18	+/- 10	Traffic signs as detected by vision subsystem.
0xE3	EYEQ_VIS_AEB_INFO_MSG	APP	18	+/- 10	AEB decisions (for braking or warning) based on vision.
0xE4	EYEQ_VIS_OBSTACLES_MSG	APP	18	+/- 10	Vision objects as detected by vision subsystem.
0xE5	EYEQ_VIS_FAILSAFE_MSG	APP	18	+/- 10	Vision failsafes
0xE6	EYEQ_VIS_SRP_MSG	APP	18	+/- 10	Suspension Road Preview

Note: Do not assign a Data ID to 0x5E.

All messages shall be transmitted periodically at the rate specified in attribute "Periodic Rate" with a tolerance as specified in "Rate Tolerance".

In Review, MAPC-67369 - EyeQ DASP Messages [FOR SW5.0 AND LATER RELEASES]

The following table lists all Defined Aptiv Serial Protocol Messages that shall be transmitted from the EyeQ and received by the Host. Implementation shall be according to the specifications given in the following subsections:

Data ID	Message Name	Modes	Periodic Rate (Hz)	Rate Tolerance (ms)	Description
0xA0	EYEQ_BASE_DIAG_STATUS_MSG	APP / SPC / TAC	18	+/- 10	EyeQ4 base diagnostic status message.
0xA1	EYEQ_APP_DIAG_STATUS_MSG	APP/ SPC	18	+/- 10	EyeQ4 application diagnostic status message.
0xA2	EYEQ_DYNAMIC_CAL_MSG	APP/ SPC	18	+/- 10	EyeQ4 Service Point Calibration (SPC) and AutoFix output.
0xA3	EYEQ_TAC_CAL_MSG	TAC	18	+/- 10	EyeQ4 Target Auto-Calibration (TAC) output.
0xE0	EYEQ_VIS_ROAD_DATA_MSG	APP	18	+/- 10	EyeQ4 road detection data message.
0xE1	EYEQ_VIS_LIGHT_SENSOR_DATA_MSG	APP	18	+/- 10	EyeQ4 AHBC function data message.
0xE2	EYEQ_VIS_TRAFFIC_SIGNS_MSG	APP	18	+/- 10	Traffic signs as detected by vision subsystem.
0xE3	EYEQ_VIS_AEB_INFO_MSG	APP	18	+/- 10	AEB decisions (for braking or warning) based on vision.
0xE4	EYEQ_VIS_OBSTACLES_MSG	APP	18	+/- 10	Vision objects as detected by vision subsystem.
0xE5	EYEQ_VIS_FAILSAFE_MSG	APP	18	+/- 10	Vision failsafes
0xE6	EYEQ_VIS_SRP_MSG	APP	18	+/- 10	Suspension Road Preview
0xE7	EYEQ_VIS_SAFETY_MSG	APP	18	+/- 10	SCFM and Challenge and Response

Note: Do not assign a Data ID to 0x5E.

All messages shall be transmitted periodically at the rate specified in attribute "Periodic Rate" with a tolerance as specified in "Rate Tolerance". [Will not Have]

Approved, MAPC-67370 - EyeQ DASP Messages [FOR SW6.0 AND LATER RELEASES]

EyeQ DASP Messages [FOR SW6.0 AND LATER RELEASES]

The following table lists all Defined Aptiv Serial Protocol Messages that shall be transmitted from the EyeQ and received by the Host. Implementation shall be according to the specifications given in the following subsections:

Data ID	Message Name	Modes	Periodic Rate (Hz)	Rate Tolerance (ms)	Description
0xA0	EYEQ_BASE_DIAG_STATUS_MSG	APP / SPC / TAC	18	+/- 10	EyeQ4 base diagnostic status message.
0xA1	EYEQ_APP_DIAG_STATUS_MSG	APP/ SPC	18	+/- 10	EyeQ4 application diagnostic status message.

0xA2	EYEQ_DYNAMIC_CAL_MSG	APP/SPC	18	+/- 10	EyeQ4 Service Point Calibration (SPC) and AutoFix output.
0xA3	EYEQ_TAC_CAL_MSG	TAC	18	+/- 10	EyeQ4 Target Auto-Calibration (TAC) output.
0xE0	EYEQ_VIS_ROAD_DATA_MSG	APP	18	+/- 10	EyeQ4 road detection data message.
0xE1	EYEQ_VIS_LIGHT_SENSOR_DATA_MSG	APP	18	+/- 10	EyeQ4 AHBC function data message.
0xE2	EYEQ_VIS_TRAFFIC_SIGNS_MSG	APP	18	+/- 10	Traffic signs as detected by vision subsystem.
0xE3	EYEQ_VIS_AEB_INFO_MSG	APP	18	+/- 10	AEB decisions (for braking or warning) based on vision.
0xE4	EYEQ_VIS_OBSTACLES_MSG	APP	18	+/- 10	Vision objects as detected by vision subsystem.
0xE5	EYEQ_VIS_FAILSAFE_MSG	APP	18	+/- 10	Vision failsafes
0xE6	EYEQ_VIS_SRP_MSG	APP	18	+/- 10	Suspension Road Preview
0xE7	EYEQ_VIS_SAFETY_MSG	APP	18	+/- 10	SCFM and Challenge and Response
0xE8	EYEQ_TIMESYNC_MSG	APP	18	+/- 10	Timestamp synchronization data

Note: Do not assign a Data ID to 0x5E.

All messages shall be transmitted periodically at the rate specified in attribute "Periodic Rate" with a tolerance as specified in "Rate Tolerance". [] Should Have]

✓ **Approved, MAPC-67371 -**

Data type definitions conflict resolution

In case data type definitions related to EyeQ DASP messages differ between this document and header files, header files shall be treated as correct.

[] Should Have]

7.1.4.1 EYEQ_BASE_DIAG_STATUS_MSG (0xA0)

✓ **Approved, MAPC-67373 -**

The DASP Data in the EyeQ Base Diag Status Message shall be as shown below.

Member Name	Type	Array/Description Size	Range	Units
timestamp_ms	uint32_t	n/a	Timestamp to determine if message has been updated. 0 to 2 ³² -1	ms
apiVersionMajor	uint8_t	n/a	The Major API version	0 to 255 n/a
apiVersionMinor	uint8_t	n/a	The Minor API version	0 to 255 n/a
eyeqSwVersionMajor	uint8_t	n/a	The Major EyeQ SW version	0 to 255 n/a
eyeqSwVersionMinor	uint8_t	n/a	The Minor EyeQ SW version	0 to 255 n/a
applInitInfo	eyeq_vision_application_init_info_t	n/a	Diagnostic information from when the application was initialized.	n/a n/a
videoDiagnosticInfo	eyeq_video_diagnostics_t	n/a	The camera video driver diagnostic fault information.	n/a n/a
spiDiagnosticInfo	eyeq_spi_diagnostic_info_t	n/a	The SPI driver diagnostic fault information.	n/a n/a
temperatureInfo	eyeq_temperature_info_t	n/a	Temperature information.	n/a n/a
SPI_Rolling_Count_Echo	uint16_t	n/a	Rolling counter echo, to be populated with the value of SPI_Rolling_Count from the last HOST_VEH_STATE_MSG received.	0 to 65535 n/a
eyeqSPIMsg10RxCtr	uint16_t	n/a	Counter of HOST_VEH_STATE_MSG (ID 0x10) messages received by the EyeQ4 which were correctly formatted, had the expected length and were processed on the EyeQ4.	0 to 65535 n/a
eyeqSPIMsg12RxCtr	uint16_t	n/a	Counter of ID 0x12 messages (for tracklets if needed in DAT2.0) received by the EyeQ4 which were correctly formatted, had the expected length and were processed on the EyeQ4.	0 to 65535 n/a
eyeqSPIMsgTxCtr	uint16_t	n/a	Counter of EyeQ4 SPI messages (messages, not frames) that were put into the transmit queue. This includes both MESP reply messages and DASP broadcast messages.	0 to 65535 n/a
eyeqSPIMsgRxBadHdrCtr	uint8_t	n/a	Counter of SPI messages received by the EyeQ4 with an unexpected DASP Data ID or unexpected DASP message length.	0 to 255 n/a
eyeqSPIMsgRxBadSeqCtr	uint8_t	n/a	Counter of DASP messages received by EyeQ4 with an unexpected "Counter" value in the frame header.	0 to 255 n/a

Note , The above data types are defined in the EyeQ Diagnostic Output Types section of this document.

[Should Have]

Approved, MAPC-67374 - EYE_Q_BASE_DIAG_STATUS_MSG (0xA0) [FOR SW5.0 and LATER RELEASES]

The DASP Data in the EyeQ Base Diag Status Message shall be as shown below.

Member Name	Type	Array Size	Description	Range	Units
timestamp_ms	uint32_t	n/a	Timestamp to determine if message has been updated.	0 to 2 ³² -1	ms
apiVersionMajor	uint8_t	n/a	The Major API version	0 to 255	n/a
apiVersionMinor	uint8_t	n/a	The Minor API version	0 to 255	n/a
eyeqSwVersionMajor	uint8_t	n/a	The Major EyeQ SW version	0 to 255	n/a
eyeqSwVersionMinor	uint8_t	n/a	The Minor EyeQ SW version	0 to 255	n/a
appInitInfo	eyeq_vision_application_init_info_t	n/a	Diagnostic information from when the application was initialized.	n/a	n/a
videoDiagnosticInfo	eyeq_video_diagnostics_t	n/a	The camera video driver diagnostic fault information.	n/a	n/a
spiDiagnosticInfo	eyeq_spi_diagnostic_info_t	n/a	The SPI driver diagnostic fault information.	n/a	n/a
temperatureInfo	eyeq_temperature_info_t	n/a	Temperature information.	n/a	n/a
SPI_Rolling_Count_Echo	uint16_t	n/a	Rolling counter echo, to be populated with the value of SPI_Rolling_Count from the last HOST_VEH_STATE_MSG received.	0 to 65535	n/a
eyeqSPIMsgRxRxCtr	uint16_t	n/a	Counter of HOST_VEH_STATE_MSG (ID 0x20) messages received by the EyeQ4 which were correctly formatted, had the expected length and were processed on the EyeQ4.	0 to 65535	n/a
eyeqSPIMsgTxRxCtr	uint16_t	n/a	Counter of EyeQ4 SPI messages (messages, not frames) that were put into the transmit queue. This includes both MESP reply messages and DASP broadcast messages.	0 to 65535	n/a
eyeqSPIMsgRxBadHdrCtr	uint8_t	n/a	Counter of SPI messages received by the EyeQ4 with an unexpected DASP Data ID or unexpected DASP message length.	0 to 255	n/a
eyeqSPIMsgRxBadSeqCtr	uint8_t	n/a	Counter of DASP messages received by EyeQ4 with an unexpected "Counter" value in the frame header.	0 to 255	n/a

Note, The above data types are defined in the EyeQ Diagnostic Output Types section of this document.

[Should Have]

7.1.4.2 EYE_Q_APP_DIAG_STATUS_MSG (0xA1)[FOR SW6.0 and EARLIER RELEASES]

Approved, MAPC-67376 -

The DASP Data in the EyeQ App Diag Status Message shall be as shown below.

Member Name	Type	Array Size	Description	Range	Units
timestamp_ms	uint32_t	n/a	Timestamp to determine if message has been updated.	0 to 2 ³² -1	ms
visionDiagnosticInfo	eyeq_vision_diagnostic_info_t	n/a	This contains information about vision AGC control settings for day/night detection.	n/a	n/a

Note, The eyeq_vision_diagnostic_info_t data type is defined in the EyeQ Diagnostic Output Types section of this document.

[Should Have]

7.1.4.3 EYE_Q_DYNAMIC_CAL_MSG (0xA2)

Approved, MAPC-67378 - The EyeQ SPC and AutoFix Outputs Message shall be as shown below.

Member Name	Type	Array Size	Description	Range	Units
timestamp_ms	uint32_t	n/a	Timestamp to determine if message has been updated.	0 to 2 ³² -1	ms
dynamicCalParams	eyeq_vision_calibration_dynamic_t	n/a	The SPC and AutoFix results with a 64 bit timestamp.	n/a	n/a

[Should Have]

7.1.4.4 EYE_Q_TAC_CAL_MSG (0xA3)

Approved, MAPC-67380 - The EyeQ TAC Outputs Message shall be as shown below.

Member Name	Type	Array Size	Description	Range	Units
timestamp_ms	uint32_t	n/a	Timestamp to determine if message has been updated.	0 to 2 ³² -1	ms
tacCalParams	eyeq_vision_calibration_static_t	n/a	The TAC output results with a 64 bit timestamp.	n/a	n/a

[Should Have]

7.1.4.5 EYE_Q_VIS_ROAD_DATA_MSG (0xE0)

Approved, MAPC-67382 - The DASP Data in the EyeQ Road Data Message shall be as shown below.

Member Name	Type	Array Size	Description	Range	Units
timestamp_ms	uint32_t	n/a	Timestamp to determine if message has been updated.	0 to 2 ³² -1	ms
roadInfo	eyeq_road_info_t	n/a	Information about the road including lane markers and road	n/a	n/a

		center with a 64 bit timestamp.		
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Note: eyeq_road_info_t is defined in the Lane Keeping System section of this document.

[] Should Have]

✓ Approved, MAPC-67383 - EYE_Q_VIS_LIGHT_SENSOR_DATA_MSG (0xE1)

The DASP Data in the EyeQ Light Sensor Data Message shall be as shown below.

Member Name	Type	Array Size	Description	Range	Units
timestamp_ms	uint32_t	n/a	Timestamp to determine if message has been updated.	0 to 2 ³² -1	ms
activeLightSensorInfo	eyeq_active_light_sensor_info_t	n/a	The active light sensor information with a 64 bit timestamp.	n/a	n/a

Note: eyeq_active_light_sensor_info_t is defined in the Light Objects section of this document.

[] Should Have]

7.1.4.6 EYE_Q_VIS_TRAFFIC_SIGNS_MSG (0xE2)

✓ Approved, MAPC-67385 - The DASP Data in the EyeQ Traffic Signs Message shall be as shown below.

Member Name	Type	Array Size	Description	Range	Units
timestamp_ms	uint32_t	n/a	Timestamp to determine if message has been updated.	0 to 2 ³² -1	ms
tsrInfo	eyeq_traffic_sign_info_t	n/a	Current traffic sign detections as received from vision subsystem with a 64 bit timestamp.	n/a	n/a

Note: eyeq_traffic_sign_info_t is defined in the Traffic Sign Recognition section of this document.

[] Should Have]

7.1.4.7 EYE_Q_VIS_AEB_INFO_MSG (0xE3)

✓ Approved, MAPC-67387 - The DASP Data in the EyeQ Vision AEB Message shall be as shown below.

Member Name	Type	Array Size	Description	Range	Units
timestamp_ms	uint32_t	n/a	Timestamp to determine if message has been updated.	0 to 2 ³² -1	ms
visAEB	eyeq_vision_aeb_info_t	n/a	Vision only AEB decisions (for warning or braking) with a 64 bit timestamp.	n/a	n/a

Note: eyeq_vision_aeb_info_t is defined in the Vision Objects section of this document.

[] Should Have]

7.1.4.8 EYE_Q_VIS_OBSTACLES_MSG (0xE4)

✓ Approved, MAPC-67389 - The DASP Data in the EyeQ Vision Obstacles Message shall be as shown below.

Member Name	Type	Array Size	Description	Range	Units
timestamp_ms	uint32_t	n/a	Timestamp to determine if message has been updated.	0 to 2 ³² -1	ms
visObjects	eyeq_vision_obstacles_info_t	1	Vision only obstacles as received from Vision Processing subsystem with a 64 bit timestamp.	n/a	n/a

Note: eyeq_vision_obstacles_info_t is defined in the Vision Objects section of this document.

[] Should Have]

7.1.4.9 EYE_Q_VIS_FAILSAFE_MSG (0xE5)

✓ Approved, MAPC-67391 - The DASP Data in the EyeQ Vision Failsafe Message shall be as shown below.

Member Name	Type	Array Size	Description	Range	Units
timestamp_ms	uint32_t	n/a	Timestamp to determine if message has been updated.	0 to 2 ³² -1	ms
visFailsafes	eyeq_vision_failsafes_t	1	Vision Failsafes as defined in eyeq_vision_failsafes_t	n/a	n/a

[] Should Have]

7.1.4.10 EYE_Q_VIS_SRP_MSG (0xE6)

ⓘ In Review, MAPC-67393 - The DASP Data in the EyeQ Vision SRP Message shall be as shown below.

Member Name	Type	Array Size	Description	Range	Units
timestamp_ms	uint32_t	n/a	Timestamp to determine if message has been updated.	0 to 2 ³² -1	ms
visSRP	eyeq_vision_srp_info_t	1	Vision Suspension Road Preview info as defined in eyeq_vision_srp_info_t	n/a	n/a

[] Will not Have]

7.1.4.11 EYE_Q_SAFETY_MSG (0xE7) [NEW FOR SW5.0 and LATER RELEASES]

✓ Approved, MAPC-67395 - The DASP Data in the EyeQ Safety Message shall be as shown below.

Member Name	Type	Array Size	Description	Range	Units
timestamp_ms	uint32_t	n/a	Timestamp to determine if message has been updated.	0 to 2 ³² -1	ms
visSafety	eyeq_vision_safety_diagnostic_info_t	1	Vision SCFM and Challenge and Response info as defined in eyeq_vision_safety_diagnostic_info_t	n/a	n/a

[] Should Have]

7.1.4.12 EYEQ_TIMESYNC_MSG (0xE8) [NEW FOR SW6.0 and LATER RELEASES]

ⓘ **In Review, MAPC-67397 - EYEQ_TIMESYNC_MSG (0xE8)** - The DASP Data in the EyeQ TimeSync Message shall be as shown below:

Member Name	Type	Array Size	Description	Range	Units
timestamp_ms	uint32_t	n/a	Timestamp to determine if message has been updated.	0 to 2 ³² -1	ms
timeSyncData	eyeq_vision_timesync_info_t	1	Vision Time Synchronization data	n/a	n/a

ⓘ Will not Have]

7.1.5 Other EyeQ Messages

The following EyeQ messages and all of the structures within those messages shall be included in a UDP output stream.

✔ **Approved, MAPC-67399 - Other EyeQ Messages**

The following are messages sent from the EyeQ to the Host that do not fall under the MESP or DASP classification.

Data ID	Message Name	Modes	Periodic Rate (Hz)	Rate Tolerance (ms)	Description
0x41	EYEQ_DIAGNOSTIC_MSG	APP/ SPC/ TAC/DIAG	37	- 25 ms / +50 ms	The application diagnostics protocol is a message that contains information about the current status of the application (internal states, diagnostics, errors, etc.). The message is being sent from EyeQ at the end of every image processing loop. Detailed documentation of the message is below.
0x10	EYEQ_BOOT_STATUS_MSG	Pending			Boot status message

All Periodic messages shall be transmitted at the rate specified in attribute "Periodic Rate" with a tolerance as specified in "Rate Tolerance".

ⓘ Should Have]

7.1.5.1 EYEQ_DIAGNOSTIC_MSG (0x41) For SW5 and PREVIOUS RELEASES

ⓘ **In Review, MAPC-67401 - Message 0x41 Fault Information from Mobileye** "Application Diagnostics Message.xlsx" document (previously named "BPP diagnostic protocol").

Name	Bit Offset	Byte Offset	Length	Type	Value	Resolution	Offset	Range From	Range To	Unit	Description	
Reserved_1	0	0	8	uint		1	0	0	0	NA		
Application_Message_Version	8	1	8	uint		1	0	1	1	NA		
Main_State	16	2	8	uint	0x0 = UNKNOWN 0x1 = PENDING 0x2 = RUNNING_VISION 0x3 = BOOT 0x22 = RUNNING_SPC 0x85 = PENDING_TAC 0x82 = PENDING_SPC 0x92 = PENDING_VISION 0xAC = RUNNING_TAC N/A = PENDING_INIT_DV 0xAA = RUNNING_DV	1	0	0	255	Enum	Application main state.	
Sub_State	24	3	8	uint		1	0	0	255	NA	Application sub-state.	
EyeQ_Process_Index	32	4	32	uint		1	0	0	4.29E+09	NA	Frame number	
EyeQ_Timestamp	64	8	32	uint		1	0	0	4.29E+09	millisecond	The time when the image was grabbed. Used for synchronization with algorithmic output.	
EyeQ_Current_Timestamp	96	12	32	uint		1	0	0	4.29E+09	millisecond	The actual time read from the EyeQ. Used for synchronization with algorithmic output.	
Application_Diagnostics_part_1	128	16	16	uint	See description below.	1	0	0	65535	bitwise	Application Diagnostics (first short)	
Application_Diagnostics_part_2	144	18	16	uint	See description below.	1	0	0	65535	bitwise	Application Diagnostics (second short)	
Fatal_Error	160	20	8	uint	0=APP_OK 1=APP_ERROR 10=APP_FS_ERROR 11=APP_CALIBRATION_ERROR 20=APP_INIT_FAILED 21=APP_INIT_CAMERA_INIT 50=APP_IDC_VIDEO_GRAB_FAILED 51=APP_IDC_CAMERA_SELF_RESET 52=APP_IDC_TIMEOUT_ERROR 70=APP_PATTERN_TEST 80=APP_CAM_PARAMS_CCFT_CRC_FAILED 81=PLL_COMPARISON_ERROR 82=APP_CPS_STL_FAILED 90=PV_GENERAL_ERROR 91=PV_VERIFICATION_ERROR	1	0	0	91	Enum	Error that requires SW reset. EyeQ cannot continue to function. If happens continuously, needs to go to Service Point. Note - as long as this Enum is 0, there is no fatal error. In the event of any fatal errors, only message 0x41 will continue to be sent and no DASP messages will be sent.	
Reserved_2	168	21	8	uint		1	0	0	0	NA		
Minor_Error	176	22	16	uint	0=BM_OK 1=BM_ERROR 5001=BM_EM_ERROR 5002=BM_EM_ERR_FAILED_LOAD_SETTING 5003=BM_EM_ERR_FAILED_LOAD_REGISTRY 5004=BM_EM_ERR_FAILED_INIT_REGISTRY 5005=BM_EM_ERR_FAILED_INIT 5006=BM_EM_ERR_FAILED_INIT_BB 5007=BM_EM_ERR_FAILED_INIT_BB_REG 5008=BM_EM_ERR_FAILED_OPEN_BLACKBOX 5009=BM_EM_ERR_FAILED_INIT_EP 5010=BM_EM_ERR_FAILED_POST_INIT_EP 5011=BM_EM_ERR_FAILED_INIT_CREATE_LOGGER 5012=BM_EM_ERR_FAILED_INIT_IL 5013=BM_EM_ERR_FAILED_CHECK_REG_VERSIONS	1	0	0	5013	Enum	BPP Minor error. problem exists in one of the elements (e.g - EDR problem). In this case, EyeQ main processing loop continue running as usual. NOTE: For now only mapped to EDR errors.	
Temperature_MIPS	192	24	16	uint		1	0	0	40	125	deg	MIPS temperature
Temperature_VMP	208	26	16	uint		1	0	0	40	125	deg	VMP temperature
Temperature_DDR	224	28	8	uint	0 - temperature is 85°C; default refresh. 1 - SDRAM low temperature operating limit exceeded. 2 - SDRAM high temperature operating limit exceeded. 3 - temperature is much greater than 85°C; 0.25x refresh, with derating. 4 - temperature is much less than 85°C; default refresh. 5 - temperature is less than 85°C; default refresh. 6 - temperature is greater than 85°C; 0.5x refresh. 7 - temperature is greater than 85°C; 0.25x refresh, no derating	1	0	0	3	Enum	DDR Temperature	
Reserved_3	232	29	8	uint		1	0	0	0	NA		
CFG_status	240	30	16	uint		1	0	0	65535	bitwise	TBD	
SPI_status	256	32	16	uint		1	0	0	65535	bitwise	bit 0 - CRC SPI error bit 1 - CRC SPI continuous error (more than 3 times in a row) bit 2 - sequence SPI error bit 3 - sequence SPI continuous error (more than 3 times in a row)	

 Will not Have

✓ **Approved, MAPC-67403** - Message 0x41 Fault Information from Mobileye "Application Diagnostics Message.xlsx" document (previously named "BPP diagnostic protocol").

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					81=PLL_COMPARISON_ERROR 82=APP_CPS_STL_FAILED 84 = APP_INVALID_INTRINSIC_CALIB 90=PV_GENERAL_ERROR 91=PV_VERIFICATION_ERROR						
Reserved_2	168	21	8	uint		1	0	0	0	NA	
Minor_Error	176	22	16	uint	0=BM_OK 1=BM_ERROR 5001=BM_EM_ERROR 5002=BM_EM_ERR_FAILED_LOAD_SETTING 5003=BM_EM_ERR_FAILED_LOAD_REGISTRY 5004=BM_EM_ERR_FAILED_INIT_REGISTRY 5005=BM_EM_ERR_FAILED_INIT 5006=BM_EM_ERR_FAILED_INIT_BB 5007=BM_EM_ERR_FAILED_INIT_BB_REG 5008=BM_EM_ERR_FAILED_OPEN_BLACKBOX 5009=BM_EM_ERR_FAILED_INIT_EP 5010=BM_EM_ERR_FAILED_POST_INIT_EP 5011=BM_EM_ERR_FAILED_INIT_CREATE_LOGGER 5012=BM_EM_ERR_FAILED_INIT_IL 5013=BM_EM_ERR_FAILED_CHECK_REG_VERSIONS	1	0	0	5013	Enum	BPP Minor error. problem exists in one of the elements (e.g - EDR problem). In this case, EyeQ main processing loop continue running as usual. NOTE: For now only mapped to EDR errors.
Temperature_MIPS	192	24	16	sint		1	0	-40	125	deg	MIPS temperature
Temperature_VMP	208	26	16	sint		1	0	-40	125	deg	VMP temperature
Temperature_DDR	224	28	8	uint	0 - temperature is 85°C; default refresh. 1 - SDRAM low temperature operating limit exceeded. 2 - SDRAM high temperature operating limit exceeded. 3 - temperature is much greater than 85°C; 0.25x refresh, with derating. 4 - temperature is much less than 85°C; default refresh. 5 - temperature is less than 85°C; default refresh. 6 - temperature is greater than 85°C; 0.5x refresh. 7 - temperature is greater than 85°C; 0.25x refresh, no derating	1	0	0	3	Enum	DDR Temperature
Reserved_3	232	29	8	uint		1	0	0	0	NA	
CFG_status	240	30	16	uint		1	0	0	65535	bitwise	TBD
SPI_status	256	32	16	uint		1	0	0	65535	bitwise	bit 0 - CRC SPI error bit 1 - CRC SPI continuous error (more than 3 times in a row) bit 2 - sequence SPI error bit 3 - sequence SPI continuous error (more than 3 times in a row) bits 4,5 - reserved bits 6-13 - SPI health, not functional yet
Reserved_4	272	34	8	uint		1	0	0	0	NA	
CameraInformation	280	35	8	uint	bit 0 - camera1 information valid bit 1 - camera2 information valid bit 2 - camera3 information valid bit 3 - camera4 information valid bit 4 - camera5 information valid bit 5 - camera6 information valid bit 6 - camera7 information valid bit 7 - camera8 information valid	1	0	0	7	bitwise	For systems with multiple Mobileye cameras, the bits indicate which cameras are valid.
Camera1_temperature	288	36	8	sint		1	0	-40	125	deg	Camera1 temperature
Camera2_temperature	296	37	8	sint		1	0	-40	125	deg	Camera2 temperature
Camera3_temperature	304	38	8	sint		1	0	-40	125	deg	Camera3 temperature
Camera4_temperature	312	39	8	sint		1	0	-40	125	deg	Camera4 temperature
Camera5_temperature	320	40	8	sint		1	0	-40	125	deg	Camera5 temperature
Camera6_temperature	328	41	8	sint		1	0	-40	125	deg	Camera6 temperature
Camera7_temperature	336	42	8	sint		1	0	-40	125	deg	Camera7 temperature
Camera8_temperature	344	43	8	sint		1	0	-40	125	deg	Camera8 temperature
Camera1_VideoErrorRange	352	44	8	uint		1	0	0	255	bitwise	VideoErrorRange - This is not Implemented yet! 4 MSB bits are how many video errors were in this frame. 4 LSB bits are when was the first error, it will be the last 4 bits of the frame index and not all the number.
Camera2_VideoErrorRange	360	45	8	uint		1	0	0	255	bitwise	Not functional yet
Camera3_VideoErrorRange	368	46	8	uint		1	0	0	255	bitwise	Not functional yet
Camera4_VideoErrorRange	376	47	8	uint		1	0	0	255	bitwise	Not functional yet
Camera5_VideoErrorRange	384	48	8	uint		1	0	0	255	bitwise	Not functional yet
Camera6_VideoErrorRange	392	49	8	uint		1	0	0	255	bitwise	Not functional yet
Camera7_VideoErrorRange	400	50	8	uint		1	0	0	255	bitwise	Not functional yet
Camera8_VideoErrorRange	408	51	8	uint		1	0	0	255	bitwise	Not functional yet
Camera1_VideoErrorFlags	416	52	64	uint		1	0	0	1.84E+19	bitwise	NO_VIDEO_ERROR = 0x0, VDI_VIDEO_ERROR = 0x1, I2C_NOT_ON_TIME_VIDEO_ERROR = 0x2, LOGICAL_VIDEO_ERROR = 0x4, INCONSISTENT_FRAMES_VIDEO_ERROR = 0x8, VERIFICATION_FAILURE_VIDEO_ERROR = 0x10, INVALID_VIDEO_HEADER = 0x20, ERROR_REG_FLAG = 0x40, REG_WRITE_HIL_FAILURE_ERROR = 0x80, ZERO_HISTOGRAM_ERROR = 0x100, SUM_NOT_MATCH_HISTOGRAM_ERROR = 0x200, VDI_INTERNAL_ERROR = 0x400, VDI_ERR_NO_BUFFERS = 0x800, VDI_ERR_BUFFER_INVALID_FORMAT = 0x1000, VDI_ERR_TIMEOUT = 0x2000, VDI_ERR_FIFO_OVERFLOW = 0x4000, VDI_ERR_FIFO_UNDERFLOW = 0x8000, VDI_ERR_PARITY_FIFO = 0x10000, VDI_ERR_PARITY_WEIGHTS = 0x20000, VDI_ERR_PARITY_GAMMA = 0x40000, VDI_ERR_PARITY_HIST = 0x80000, VDI_ERR_START_AFTER_START = 0x100000, VDI_ERR_CORE_ID = 0x200000, FRAME_COUNT_READ_FAIL = 0x400000, HISTOGRAMS_MISMATCH = 0x800000, CCFT_DECISIONS_MISMATCH = 0x1000000, HEADER_VERIFICATION_ERROR = 0x2000000, VDI_ERR_SHUTDOWN = 0x4000000, SHOT_OUT_OF_SYNC = 0x8000000
Camera2_VideoErrorFlags	480	60	64	uint		1	0	0	1.84E+19	bitwise	TBD. Error Flags 2-8 are for systems with multiple Mobileye cameras.

Camera3_VideoErrorFlags	544	68	64	uint		1	0	0	1.84E+19	bitwise	TBD
Camera4_VideoErrorFlags	608	76	64	uint		1	0	0	1.84E+19	bitwise	TBD
Camera5_VideoErrorFlags	672	84	64	uint		1	0	0	1.84E+19	bitwise	TBD
Camera6_VideoErrorFlags	736	92	64	uint		1	0	0	1.84E+19	bitwise	TBD
Camera7_VideoErrorFlags	800	100	64	uint		1	0	0	1.84E+19	bitwise	TBD
Camera8_VideoErrorFlags	864	108	64	uint		1	0	0	1.84E+19	bitwise	TBD
Total	928	116									

[Should Have]

Approved, MAPC-67404 - APPLICATION_DIAGNOSTIC - part 1 (first short)

Table 1 APPLICATION_DIAGNOSTIC - part 1 (first short)

Name	bit No.	Description	Comments	MCU Error Handling
Reserved.	0			
Video Error – DMA problem.	1	One of the following problems has occurred: 1. EyeQ overuses the DMA. Usually causes sporadic video errors. In extreme cases can cause frequent video errors. 2. Camera problem, either with the line or with the camera itself. Usually causes frequent video errors.		Reset. If problem reoccurs 3 times in a bounce, report. Might indicate a board issue
Missing Input Signals Error	2	EyeQ has not received an Input Signals message for this frame. The last valid SPI message will be used. System continues to run as usual. This is a single frame indication. It is turned ON only in problematic frames.		Reset. If problem reoccurs 3 times in a bounce, report.
Input Signal Out-of-Range	3	One of the input signals is invalid or out of range. The problematic signal will not be updated. The last valid value will be used. System continues to run as usual. This is a single frame indication. It is turned on only in problematic frames.	Not activated - moved to vision protocol	
Consecutive Input Signals Error	4	3 consecutive frames or 5 of the last 10 frames had an Input Signal Error on one of the critical input signals, or 3 consecutive frames had Missing Input Signal Error. [A critical input signal is ANY signal except: Wiper info and Temperature] System should be reset. The system continues to run, but is actually in shutdown. 1. LDA Availability is turned OFF. 2. HBA High Beam decision is turned OFF. 3. FCW will issue no warning. 4. SLI will detect no signs. After this signal is turned ON, it stays ON until reset, as the performance in this case is unexpected.		Reset. If problem reoccurs 3 times in a bounce, report.
I2C Write None Blocking NACK Error	5	not getting ACK on I2C operation		Reset. If problem reoccurs 3 times in a bounce, report. Might indicate a board issue
I2C Write None Blocking Bus Error	6	Bus is not ready to start another transaction or there is a BERR Error		Reset. If problem reoccurs 3 times in a bounce, report. Might indicate a board issue
I2C Write None Blocking Arbitration Error	7	I2C arbitration loss		Reset. If problem reoccurs 3 times in a bounce, report. Might indicate a board issue
I2C Write None Blocking TO	8	I2C write request time out		Reset. If problem reoccurs 3 times in a bounce, report. Might indicate a board issue
I2C Read None Blocking NACK Error	9	not getting ACK on I2C operation		Reset. If problem reoccurs 3 times in a bounce, report. Might indicate a board issue
I2C Read None Blocking Bus Error	10	Bus is not ready to start another transaction		Reset. If problem reoccurs 3 times in a bounce, report. Might indicate a board issue
I2C Read None blocking Arbitration	11	I2C arbitration loss		Reset. If problem reoccurs 3 times in a bounce, report. Might indicate a board issue
I2C Read NB TO	12	I2C read request time out		Reset. If problem reoccurs 3 times in a bounce, report. Might indicate a board issue
Reserved	13			
Reserved	14			
Reserved	15			

[Should Have]

In Review, MAPC-67405 -

APPLICATION_DIAGNOSTIC - part 2 (second short)

Name	Bit No.	Description	Comments
Reserved	0		
Reserved	1		
Reserved	2	ddr refresh state mode	E_DDR_MODE_NORMAL = 0 E_DDR_MODE_HIGH_REFRESH_RATE = 1
Reserved	3		
Reserved	4		

Reserved	5		
Reserved	6		
Reserved	7		
Reserved	8		
Reserved	9		
Reserved	10		
Reserved	11		
Reserved	12		
Reserved	13		
Reserved	14		
Reserved	15		

Signals from cameras 2-8 in the tables above may be ignored for the DAT2.0 application.

Will not Have]

Draft, MAPC-67406 -

APPLICATION_DIAGNOSTIC - part 2 (second short) [FOR SW8.3 and LATER RELEASES]

Name	Bit No.	Description	Comments
Reserved	0		
DDR Refresh Rate	1-2	0 = E_DDR_MODE_NORMAL 1 = E_DDR_MODE_HIGH_REFRESH_RATE 2 = DDR_MODE_HIGH_DERAT_REFRESH_RATE	
DDR Clock Drift Warnings	3 - 5	0 = NO DRIFT WARNING 1 = DRIFT_TOO_FAST 2 = DRIFT_TOO_LATE 3 = DRIFT_TIMEOUT_WR 4 = DRIFT_PASSED 5 = DRIFT_TIMEOUT_DONE 6 = DRIFT_NOT_DONE_LAST_SECOND	
Internal Init	6	1 = Internal Init	
Brain Drop	7	Brain Drop (EyeQ Algorithm Failure) occurred in the current image frame.	
Reserved	8		
Reserved	9		
Reserved	10		
Reserved	11		
Reserved	12		
Reserved	13		
Reserved	14		
Reserved	15		

Signals from cameras 2-8 in the tables above may be ignored for single Mobileye camera applications.

Will not Have]

7.1.5.3 EYEQ_BOOT_STATUS_MSG (0x10)

The example below is for information only. Mobileye maintains the specification in a separate document: [EyeQ4 Boot Diagnostics_v2 .pdf](#)

Approved, MAPC-67408 - EYEQ_BOOT_STATUS_MSG (0x10)

Message Field	Byte	Start bit	Array Size(Bytes)	Description
Zero byte	0	0	1	Constant zero value
Protocol Version	1	0	1	The version of the message structure and data fields. Current protocol version is 2.
Reserved0	2	0	2	Reserved fields value is 0
Test results	4	0	2	It is a bit map where each bit represents single test result: 0 – OK, 1 – Failure. The bit values are as follows- Bit 0 = EyeQ Over Temperature Bit 1 = BIST Bit 2 = PLL init finished Bit 3 = Parity Check Bit 4 = Flash CRC of Boot Bit 5 = DDR init finished Bit 6 = DDR Temperature Bit 7 = DDR Test Bit 8 = Flash CRC of Application Bit 9 = Flash CRC of FFS Bit 10 = Unsupported EyeQ version Bit 11 = Authentication failure of the secure SW signature. Bit 12-15 = Reserved
Board project code (Mobileye's internal code)	6	0	1	Internal Mobileye' s code.
Board revision (based on GPIO)	7	0	1	Based on GPIO.
Boot version	8	0	4	4-bytes field: byte 0 (MSB) – first number of version; byte 1 – second number of version; byte 2 – third number of version; byte 3 – reserved;
Application version	12	0	4	Example: Boot version 7.1.23 will be represented as the following byte sequence: byte#8 = 0x07, byte#9 = 0x01, byte#10 = 0x17, byte#11 = 0x00
EyeQ Type	16	0	4	-Not Implemented
EyeQ ID	20	0	4	-Serial number of the specific EyeQ4 chip.
DDR manufacturer code	24	0	1	LPDDR4 Manufacturer ID according to JEDEC standard No. 209. For example: 0x08 – Winbond; 0xFF – Micron.
DDR size in MB	25	0	3	-
Flash manufacturer code	28	0	1	Each flash memory device has a manufacturer ID (which is assigned by JEDEC). For example: 0x01 – Spansion; 0x20 – Micron; Numonyx – 0x89.
Flash size in MB	29	0	3	-
EyeQ Temperature Sensor 1	32	0	1	The temperature measurement provided by two EyeQ4 internal sensors in degree Celsius.
EyeQ Temperature Sensor 2	33	0	1	
LPDDR4 Temperature and Refresh Status	34	0	1	LPDDR4 Temperature and Refresh Status 0 – temperature is 85°C; default refresh. 1 – SDRAM low temperature operating limit exceeded. 2 – SDRAM high temperature operating limit exceeded. 3 – temperature is much greater than 85°C; 0.25x refresh, with derating. 4 – temperature is much less than 85°C; default refresh.

				5 – temperature is less than 85°C; default refresh. 6 – temperature is greater than 85°C; 0.5x refresh. 7 – temperature is greater than 85°C; 0.25x refresh, no derating
Reserved1	35	0	1	-
Flash 2 manufacturer code	36	0	1	-
Flash 2 size in MB	37	0	3	-
Boot stage completed	40	0	1	Sequential Stage 0 – reserved (illegal value). 1 – BIST results. 2 – Boot authentication result. 3 – DRAM initialization & training result. 4 – DRAM test result. 5 – Application authentication and loading result.
Failure information	41	0	1	Reports only 0' s until TBD' s are defined. The failure information format is dependent on the boot stage and the failure type. 1. BIST result. Reports failures of the following types: - temperature issue; - VDI memory parity error; - BIST fault; Format: TBD 2. Boot authentication result. pass / fail 3. DRAM initialization & training result. - Memory controller initialization issue; - Memory PHY initialization issue; - DRAM training failure; Format: TBD 4. DRAM test result. - temperature issue; - DRAM test failure; Format: TBD 5. Application authentication and loading result. - authentication pass / fail; - loading failure; Format: TBD
Padding (0x00)	42	0	79	Padding by zeroes up to 128 bytes

[Should Have]

✓ Approved, MAPC-67409 - EYE_Q_BOOT_STATUS_MSG (0x10) [FOR SW8.3 and LATER RELEASES]

Message Field	Byte	Start bit	Array Size(Bytes)	Description
Zero byte	0	0	1	Constant zero value
Protocol Version	1	0	1	The version of the message structure and data fields. Current protocol version is 2.
Reserved0	2	0	2	Reserved fields value is 0
Test results	4	0	2	Each bit represents single test fault: All 0's indicates all tests passed OK. The bit values are as follows- Bit 0 = EyeQ Over Temperature Bit 1 = BIST Bit 2 = PLL init finished Bit 3 = Parity Check Bit 4 = Flash CRC of Boot Bit 5 = DDR init finished Bit 6 = DDR Temperature Bit 7 = DDR Test Bit 8 = Flash CRC of Application Bit 9 = Flash CRC of FFS Bit 10 = Unsupported EyeQ version Bit 11 = Authentication failure of the secure SW signature. Bit 12-15 = Reserved
Board project code (Mobileye's internal code)	6	0	1	Internal Mobileye' s code.
Board revision (based on GPIO)	7	0	1	Based on GPIO.
Boot version	8	0	4	4-bytes field: byte 0 (MSB) – first number of version; byte 1 – second number of version; byte 2 – third number of version; byte 3 – reserved; Example: Boot version 7.1.23 will be represented as the following byte sequence: byte#8 = 0x07, byte#9 = 0x01, byte#10 = 0x17, byte#11 = 0x00
Application version	12	0	4	
EyeQ Type	16	0	4	-Not Implemented
EyeQ ID	20	0	4	-Serial number of the specific EyeQ4 chip.
DDR manufacturer code	24	0	1	LPDDR4 Manufacturer ID according to JEDEC standard No. 209. For example: 0x08 – Winbond; 0xFF – Micron.
DDR size in MB	25	0	3	-
Flash manufacturer code	28	0	1	Each flash memory device has a manufacturer ID (which is assigned by JEDEC). For example: 0x01 – Spansion; 0x20 – Micron; Numonyx – 0x89.
Flash size in MB	29	0	3	-
EyeQ Temperature Sensor 1	32	0	1	The temperature measurement provided by two EyeQ4 internal sensors in degree Celsius.
EyeQ Temperature Sensor 2	33	0	1	
				LPDDR4 Temperature and Refresh Status 0 – temperature is 85°C; default refresh.

LPDDR4 Temperature and Refresh Status	34	0	1	1 – SDRAM low temperature operating limit exceeded. 2 – SDRAM high temperature operating limit exceeded. 3 – temperature is much greater than 85°C, 0.25x refresh, with derating. 4 – temperature is much less than 85°C, default refresh. 5 – temperature is less than 85°C, default refresh. 6 – temperature is greater than 85°C, 0.5x refresh. 7 – temperature is greater than 85°C, 0.25x refresh, no derating
Reserved1	35	0	1	-
Flash 2 manufacturer code	36	0	1	-
Flash 2 size in MB	37	0	3	-
Boot stage completed	40	0	1	Sequential Stage 0 – reserved (illegal value). 1 – BIST results. 2 – Boot authentication result. 3 – DRAM initialization & training result. 4 – DRAM test result. 5 – Application authentication and loading result.
Failure_info[0]	41	0	Array of 3 uint8_t	Reports only 0' s.
Failure_info[1]	44	0	Array of 7 uint32_t	Reports only 0' s.

❗ Should Have]

8 Host Output Types

🔗 In Review, MAPC-67411 - Host Output stream shall use the latest Updated version of the Data Types Defined per EyeQ SW version [❗ Will not Have]


8.1 host_vehicle_state_t [FOR SW3.0 AND EARLER RELEASES]

✅ Approved, MAPC-67413 -

Name	host_vehicle_state_t	Contents: Vehicle status input to MobilEye sent in HOST_VEH_STATE_MSG (0x10)			
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The time-stamp of the vehicle state data based on the sync pulse received from the EyeQ.	0 to $2^{64} - 1$	us
apiVersionMajor	uint8_t	n/a	The Major API version	0 to 255	n/a
apiVersionMinor	uint8_t	n/a	The Minor API version	0 to 255	n/a
countryIdentification	uint16_t	n/a	Signal to indicate the numeric country code as defined in ISO 3166-1. A value of 0 indicates the country is unknown.	0 to 1023	n/a
vehIndex	uint32_t	n/a	The index of the vehicle state data.	0 to $2^{32} - 1$	n/a
vehicleLatAccel	real32_T	n/a	Ego vehicle lateral acceleration. (+): Acceleration to the right (-): Acceleration to the left	-16 to 16	m/s ²
vehicleLongAccel	real32_T	n/a	Ego vehicle longitudinal acceleration. (+): Accelerating (-): Decelerating	-16 to 16	m/s ²
vehicleRollRate	real32_T	n/a	Vehicle roll rate from the Host. (+): Roll to the right (-): Roll to the left	-6 to 6	rad/s
vehicleVelocity	real32_T	n/a	Ego vehicle velocity. This does not take into account the speed compensation factor calculated by the radar unless agreed by ME/Aptiv for a specific application.	-20 to 100	m/s
vehicleVerticalAccel	real32_T	n/a	Ego vehicle vertical acceleration. (+): Up (-): Down	-16 to 16	m/s ²
vehicleYawRate	real32_T	n/a	Vehicle yaw rate from the Host. This is compensated (takes into account the yaw rate bias) (+): Yaw to the right (-): Yaw to the left	-2.8798 to 2.8798	rad/s
steeringWheelAngle	real32_T	n/a	positive when steering to the right	-32 to +32	radians
accelPedPosPct	real32_T	n/a	Accelerator Pedal Position Accelerator Pedal Position defined in %. 100% means fully-pressed. (default is 0%)	0 to 100.0	%
turnIndicator	uint8_t		Turn signal status 0 = None 1 = Left 2 = Right 3 = Left and Right Both On	0 to 3	3
wiperSpeedInfo	uint8_t		Indicates the speed of the front windscreen wiper. 0 = Wipers off (default case, also used for error conditions) 1 = Wipers intermittent 2 = Wipers continuous slow 3 = Wipers continuous fast	0 to 3	3
accBrakingStatus	uint8_t	n/a	Reports the Adaptive Cruise Control Braking function status. 0 = ACC Braking Unknown (default) 1 = ACC Braking Inactive 2 = ACC Braking Active	0 to 2	n/a
aebActive	uint8_t	n/a	Signal that indicates that aeb is active. 0 = AEB status unknown 1 = AEB is not active 2 = AEB is active	0 to 2	n/a
vehicleLatAccelValidity	bitfield bit 0	n/a	Validity of the vehicleLatAccel signal. 0 = Not valid 1 = Valid	0 to 3	n/a
vehicleLongAccelValidity	bitfield bit 1	n/a	Validity of the vehicleLongAccel signal. 0 = Not valid 1 = Valid	0 to 3	n/a


vehicleRollRateValidity	bitfield bit 2	n/a	Validity of the vehicleRollRate signal. 0 = Not valid 1 = Valid	0 to 3	n/a
vehicleVelocityValidity	bitfield bit 3	n/a	Validity of the signal vehicleVelocity. 0 = Not valid 1 = Valid	0 to 3	n/a
vehicleVerticalAccelValidity	bitfield bit 4	n/a	Validity of the vehicleVerticalAccel signal. 0 = Not valid 1 = Valid	0 to 3	n/a
vehicleYawRateValidity	bitfield bit 5	n/a	Validity of the vehicleYawRate signal. 0 = Not valid 1 = Valid	0 to 3	n/a
steeringWheelAngleValidity	bitfield bit 6	n/a	Validity of the steeringWheelAngle 0 = Not valid 1 = Valid	0 to 3	n/a
accelPedPosPctValidity	bitfield bit 7	n/a	Validity of the accelPedPosPctQF signal. 0 = Not valid 1 = Valid	0 to 3	n/a
mainBeamIndication	bitfield bit 0	n/a	Indicates the high beam is activated. 0 = Off 1 = On Note: Used for AHBC	0 to 1	n/a
wiperFrontCmd	bitfield bit 1	n/a	Indicates the mode control of the front windscreen wiper. 0 = Wiper Off 1 = Wiper On	0 to 1	n/a
reverseGear	bitfield bit 2	n/a	True when vehicle is in reverse gear. Otherwise, vehicle is in neutral, park or forward gear.	0 to 1	n/a
brakePedalPressed	bitfield bit 3	n/a	Signal that indicates that the Brake Pedal has been pressed . 0 = Not Pressed 1 = Pressed	0 to 1	n/a

Will not Have]

 In Review, MAPC-67414 -
for SW4.0 and later releases

Name	host_vehicle_state_t	Contents: Vehicle status input to MobilEye sent in HOST_VEH_STATE_MSG (0x20 for SW4.0 and later, previously was message 0x10)			
(fMember Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The time-stamp of the vehicle state data based on the sync pulse received from the EyeQ.	0 to 2 ⁶⁴ - 1	us
apiVersionMajor	uint8_t	n/a	The Major API version	0 to 255	n/a
apiVersionMinor	uint8_t	n/a	The Minor API version	0 to 255	n/a
countryIdentification	uint16_t	n/a	Signal to indicate the numeric country code as defined in ISO 3166-1. A value of 0 indicates the country is unknown. Vehicles with GPS may use this to override the currentMarket.	0 to 1023	n/a
vehIndex	uint32_t	n/a	The index of the vehicle state data.	0 to 2 ³² -1	n/a
vehicleLatAccel	real32_T	n/a	Ego vehicle lateral acceleration. (+): Acceleration to the right (-): Acceleration to the left	-16 to 16	m/s ²
vehicleLongAccel	real32_T	n/a	Ego vehicle longitudinal acceleration. (+): Accelerating (-): Decelerating	-16 to 16	m/s ²
vehicleRollRate	real32_T	n/a	Vehicle roll rate from the Host. (+): Roll to the right (-): Roll to the left	-6 to 6	rad/s
vehicleVelocity	real32_T	n/a	Ego vehicle velocity. This does not take into account the speed compensation factor calculated by the radar unless agreed by ME/Aptiv for a specific application.	-20 to 100	m/s
vehicleVerticalAccel	real32_T	n/a	Ego vehicle vertical acceleration. (+): Up (-): Down	-16 to 16	m/s ²
vehicleYawRate	real32_T	n/a	Vehicle yaw rate from the Host. This is compensated (takes into account the yaw rate bias) (+): Yaw to the right (-): Yaw to the left	-2.8798 to 2.8798	rad/s
steeringWheelAngle	real32_T	n/a	positive when steering to the right	-32 to +32	radians
accelPedPosPct	real32_T	n/a	Accelerator Pedal Position Accelerator Pedal Position defined in %. 100% means fully-pressed. (default is 0%)	0 to 100.0	%
turnIndicator	uint8_t		Turn signal status 0 = None 1 = Left 2 = Right 3 = Left and Right Both On	0 to 3	3

wiperSpeedInfo	uint8_t		Indicates the speed of the front windscreen wiper. 0 = Wipers off (default case, also used for error conditions) 1 = Wipers intermittent 2 = Wipers continuous slow 3 = Wipers continuous fast	0 to 3	3
accBrakingStatus	uint8_t	n/a	Reports the Adaptive Cruise Control Braking function status. 0 = ACC Braking Unknown (default) 1 = ACC Braking Inactive 2 = ACC Braking Active	0 to 2	n/a
aebActive	uint8_t	n/a	Signal that indicates that aeb is active. 0 = AEB status unknown 1 = AEB is not active 2 = AEB is active	0 to 2	n/a
vehicleLatAccelValidity	bitfield bit 0	n/a	Validity of the vehicleLatAccel signal. 0 = Not valid 1 = Valid	0 to 3	n/a
vehicleLongAccelValidity	bitfield bit 1	n/a	Validity of the vehicleLongAccel signal. 0 = Not valid 1 = Valid	0 to 3	n/a
vehicleRollRateValidity	bitfield bit 2	n/a	Validity of the vehicleRollRate signal. 0 = Not valid 1 = Valid	0 to 3	n/a
vehicleVelocityValidity	bitfield bit 3	n/a	Validity of the signal vehicleVelocity. 0 = Not valid 1 = Valid	0 to 3	n/a
vehicleVerticalAccelValidity	bitfield bit 4	n/a	Validity of the vehicleVerticalAccel signal. 0 = Not valid 1 = Valid	0 to 3	n/a
vehicleYawRateValidity	bitfield bit 5	n/a	Validity of the vehicleYawRate signal. 0 = Not valid 1 = Valid	0 to 3	n/a
steeringWheelAngleValidity	bitfield bit 6	n/a	Validity of the steeringWheelAngle 0 = Not valid 1 = Valid	0 to 3	n/a
accelPedPosPctValidity	bitfield bit 7	n/a	Validity of the accelPedPosPctQF signal. 0 = Not valid 1 = Valid	0 to 3	n/a
mainBeamIndication	bitfield bit 0	n/a	Indicates the high beam is activated. 0 = Off 1 = On Note: Used for AHBC	0 to 1	n/a
wiperFrontCmd	bitfield bit 1	n/a	Indicates the mode control of the front windscreen wiper. 0 = Wiper Off 1 = Wiper On	0 to 1	n/a
reverseGear	bitfield bit 2	n/a	True when vehicle is in reverse gear. Otherwise, vehicle is in neutral, park or forward gear.	0 to 1	n/a
brakePedalPressed	bitfield bit 3	n/a	Signal that indicates that the Brake Pedal has been pressed . 0 = Not Pressed 1 = Pressed	0 to 1	n/a
cameraHeight	uint16_t	n/a	The distance from the ground to the center of the camera lens.	500 to 2550mm	n/a
cameraHeightValid	bool	n/a	TRUE if cameraHeight is valid	0 to 1	n/a

 Will not Have]

✔ **Approved, MAPC-67415** - host_vehicle_state_t [FOR SW5.0 and LATER RELEASES]

Name	host_vehicle_state_t	Contents: Vehicle status input to MobileEye sent in HOST_VEH_STATE_MSG (0x20)			
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The time-stamp of the vehicle state data based on the sync pulse received from the EyeQ.	0 to 264 - 1	us
apiVersionMajor	uint8_t	n/a	The Major API version	0 to 255	n/a
apiVersionMinor	uint8_t	n/a	The Minor API version	0 to 255	n/a
countryIdentification	uint16_t	n/a	Signal to indicate the numeric country code as defined in ISO 3166-1. A value of 0 indicates the country is unknown. Vehicles with GPS may use this to override the currentMarket.	0 to 1023	n/a
vehIndex	uint32_t	n/a	The index of the vehicle state data.	0 to 232-1	n/a
vehicleLatAccel	real32_T	n/a	Ego vehicle lateral acceleration.	-16 to 16	m/s2

			(+): Acceleration to the right (-): Acceleration to the left		
vehicleLongAccel	real32_T	n/a	Ego vehicle longitudinal acceleration. (+): Accelerating (-): Decelerating	-16 to 16	m/s2
vehicleRollRate	real32_T	n/a	Vehicle roll rate from the Host. (+): Roll to the right (-): Roll to the left	-6 to 6	rad/s
vehicleVelocity	real32_T	n/a	Ego vehicle velocity. This does not take into account the speed compensation factor calculated by the radar unless agreed by ME/Aptiv for a specific application. ASIL-B signal.	-20 to 100	m/s
vehicleVerticalAccel	real32_T	n/a	Ego vehicle vertical acceleration. (+): Up (-): Down	-16 to 16	m/s2
vehicleYawRate	real32_T	n/a	Vehicle yaw rate from the Host. This is compensated (takes into account the yaw rate bias) (+): Yaw to the right (-): Yaw to the left ASIL-B signal.	-2.8798 to 2.8798	rad/s
steeringWheelAngle	real32_T	n/a	positive when steering to the right	-32 to +32	radians
accelPedPosPct	real32_T	n/a	Accelerator Pedal Position Accelerator Pedal Position defined in % . 100% means fully-pressed. (default is 0%)	0 to 100.0	%
turnIndicator	uint8_t		Turn signal status 0 = None 1 = Left 2 = Right 3 = Left and Right Both On	0 to 3	3
wiperSpeedInfo	uint8_t		Indicates the speed of the front windscreen wiper. 0 = Wipers off (default case, also used for error conditions) 1 = Wipers intermittent 2 = Wipers continuous slow 3 = Wipers continuous fast	0 to 3	3
accBrakingStatus	uint8_t	n/a	Reports the Adaptive Cruise Control Braking function status. 0 = ACC Braking Unknown (default) 1 = ACC Braking Inactive 2 = ACC Braking Active	0 to 2	n/a
aebActive	uint8_t	n/a	Signal that indicates that aeb is active. 0 = AEB status unknown 1 = AEB is not active 2 = AEB is active	0 to 2	n/a
vehicleLatAccelValidity	Signal validity bitfield bit 0	n/a	Validity of the vehicleLatAccel signal. 0 = Not valid 1 = Valid	0 to 3	n/a
vehicleLongAccelValidity	Signal validity bitfield bit 1	n/a	Validity of the vehicleLongAccel signal. 0 = Not valid 1 = Valid	0 to 3	n/a
vehicleRollRateValidity	Signal validity bitfield bit 2	n/a	Validity of the vehicleRollRate signal. 0 = Not valid 1 = Valid	0 to 3	n/a
vehicleVelocityValidity	Signal validity bitfield bit 3	n/a	Validity of the signal vehicleVelocity. 0 = Not valid 1 = Valid	0 to 3	n/a
vehicleVerticalAccelValidity	Signal validity bitfield bit 4	n/a	Validity of the vehicleVerticalAccel signal. 0 = Not valid 1 = Valid	0 to 3	n/a
vehicleYawRateValidity	Signal validity bitfield bit 5	n/a	Validity of the vehicleYawRate signal. 0 = Not valid 1 = Valid	0 to 3	n/a
steeringWheelAngleValidity	Signal validity bitfield bit 6	n/a	Validity of the steeringWheelAngle 0 = Not valid 1 = Valid	0 to 3	n/a
accelPedPosPctValidity	Signal validity bitfield bit 7	n/a	Validity of the accelPedPosPctQF signal. 0 = Not valid 1 = Valid	0 to 3	n/a
mainBeamIndication	bitfield bit 0	n/a	Indicates the high beam is activated. 0 = Off 1 = On Note: Used for AHBC	0 to 1	n/a

wiperFrontCmd	bitfield bit 1	n/a	Indicates the mode control of the front windscreen wiper. 0 = Wiper Off 1 = Wiper On	0 to 1	n/a
reverseGear	bitfield bit 2	n/a	True when vehicle is in reverse gear. Otherwise, vehicle is in neutral, park or forward gear.	0 to 1	n/a
brakePedalPressed	bitfield bit 3	n/a	Signal that indicates that the Brake Pedal has been pressed . 0 = Not Pressed 1 = Pressed	0 to 1	n/a
cameraHeight	uint16_t	n/a	The distance from the ground to the center of the camera lens.	500 to 2550mm	n/a
cameraHeightValid	bool	n/a	TRUE if cameraHeight is valid	0 to 1	n/a
crc_16	uint16_t	n/a	*Used to validate that no bits were corrupted in this safety critical message. Using CRC16 based on CRC-16 Ethernet protocol $X16 \oplus X12 \oplus X5 \oplus 1$ init value = 0xFFFFFFFF. The CRC shall be calculated on the following signals: 1. rollingFrameCount 2. vehicleVelocity 3. vehicleYawRate 4. Signal validity bitfield	Crc_16	uint16_t
rollingFrameCount	uint8_t	n/a	Counter for ASIL – B signals.	0 to 255	n/a
fcwWarningSensitivityLevel	uint8_t	n/a	Sets the sensitivity level for Forward Collision Warnings. Higher levels cause the vision subsystem to be more aggressive at reporting collision warnings: 0 = FCW Off 1 = FCW Near 2 = FCW Mid 3 = FCW Far	0 to 3	n/a


Will not Have]

host_vehicle_state_t [FOR SW6.0 and 7.0]

In Review, MAPC-67416 - host_vehicle_state_t

Name	host_vehicle_state_t	Contents: Vehicle status input to MobilEye sent in HOST_VEH_STATE_MSG (0x20)			
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The timestamp represents the effective time of the measurements in the Host time frame.	0 to $2^{64} - 1$	us
apiVersionMajor	uint8_t	n/a	The Major API version	0 to 255	n/a
apiVersionMinor	uint8_t	n/a	The Minor API version	0 to 255	n/a
countryIdentification	uint16_t	n/a	Signal to indicate the numeric country code as defined in ISO 3166-1. A value of 0 indicates the country is unknown. Vehicles with GPS may use this to override the currentMarket.	0 to 1023	n/a
vehIndex	uint32_t	n/a	The index of the vehicle state data.	0 to $2^{32} - 1$	n/a
vehicleLatAccel	real32_T	n/a	Ego vehicle lateral acceleration. (+): Acceleration to the right (-): Acceleration to the left	-16 to 16	m/s ²
vehicleLongAccel	real32_T	n/a	Ego vehicle longitudinal acceleration. (+): Accelerating (-): Decelerating	-16 to 16	m/s ²
vehicleRollRate	real32_T	n/a	Vehicle roll rate from the Host. (+): Roll to the right (-): Roll to the left	-6 to 6	rad/s
vehicleVelocity	real32_T	n/a	Ego vehicle velocity. This does not take into account the speed compensation factor calculated by the radar unless agreed by ME/Aptiv for a specific application. ASIL-B signal.	-20 to 100	m/s
vehicleVerticalAccel	real32_T	n/a	Ego vehicle vertical acceleration. (+): Up (-): Down	-16 to 16	m/s ²
vehicleYawRate	real32_T	n/a	Vehicle yaw rate from the Host. This is compensated (takes into account the yaw rate bias) (+): Yaw to the right (-): Yaw to the left ASIL-B signal.	-2.8798 to 2.8798	rad/s
steeringWheelAngle	real32_T	n/a	positive when steering to the right	-32 to +32	radians
accelPedPosPct	real32_T	n/a	Accelerator Pedal Position Accelerator Pedal Position defined in %. 100% means fully-pressed. (default is 0%)	0 to 100.0	%
turnIndicator	uint8_t		Turn signal status 0 = None 1 = Left	0 to 3	3

			2 = Right 3 = Left and Right Both On		
wiperSpeedInfo	uint8_t		Indicates the speed of the front windscreen wiper. 0 = Wipers off (default case, also used for error conditions) 1 = Wipers intermittent 2 = Wipers continuous slow 3 = Wipers continuous fast	0 to 3	3
accBrakingStatus	uint8_t	n/a	Reports the Adaptive Cruise Control Braking function status. 0 = ACC Braking Unknown (default) 1 = ACC Braking Inactive 2 = ACC Braking Active	0 to 2	n/a
aebActive	uint8_t	n/a	Signal that indicates that aeb is active. 0 = AEB status unknown 1 = AEB is not active 2 = AEB is active	0 to 2	n/a
vehicleLatAccelValidity	Signal validity bitfield bit 0	n/a	Validity of the vehicleLatAccel signal. 0 = Not valid 1 = Valid	0 to 3	n/a
vehicleLongAccelValidity	Signal validity bitfield bit 1	n/a	Validity of the vehicleLongAccel signal. 0 = Not valid 1 = Valid	0 to 3	n/a
vehicleRollRateValidity	Signal validity bitfield bit 2	n/a	Validity of the vehicleRollRate signal. 0 = Not valid 1 = Valid	0 to 3	n/a
vehicleVelocityValidity	Signal validity bitfield bit 3	n/a	Validity of the signal vehicleVelocity. 0 = Not valid 1 = Valid	0 to 3	n/a
vehicleVerticalAccelValidity	Signal validity bitfield bit 4	n/a	Validity of the vehicleVerticalAccel signal. 0 = Not valid 1 = Valid	0 to 3	n/a
vehicleYawRateValidity	Signal validity bitfield bit 5	n/a	Validity of the vehicleYawRate signal. 0 = Not valid 1 = Valid	0 to 3	n/a
steeringWheelAngleValidity	Signal validity bitfield bit 6	n/a	Validity of the steeringWheelAngle 0 = Not valid 1 = Valid	0 to 3	n/a
accelPedPosPctValidity	Signal validity bitfield bit 7	n/a	Validity of the accelPedPosPctQF signal. 0 = Not valid 1 = Valid	0 to 3	n/a
mainBeamIndication	bitfield bit 0	n/a	Indicates the high beam is activated. 0 = Off 1 = On Note: Used for AHBC	0 to 1	n/a
wiperFrontCmd	bitfield bit 1	n/a	Indicates the mode control of the front windscreen wiper. 0 = Wiper Off 1 = Wiper On	0 to 1	n/a
reverseGear	bitfield bit 2	n/a	True when vehicle moving backward. Mobileye uses this to disable AEB.	0 to 1	n/a
brakePedalPressed	bitfield bit 3	n/a	Signal that indicates that the Brake Pedal has been pressed . 0 = Not Pressed 1 = Pressed	0 to 1	n/a
cameraHeight	uint16_t	n/a	The distance from the ground to the center of the camera lens.	500 to 2550mm	n/a
cameraHeightValid	bool	n/a	TRUE if cameraHeight is valid	0 to 1	n/a
rollingFrameCount	uint8_t	n/a	Counter for ASIL – B signals.	0 to 255	n/a
crc_16	uint16_t	n/a	'Used to validate that no bits were corrupted in this safety critical message. Using CRC16 based on CRC-16 Ethernet protocol X16+X12+X5+1 init value = 0xFFFF. The CRC shall be calculated on the following signals: 1. rollingFrameCount 2. vehicleVelocity 3. vehicleYawRate 4. Signal validity bitfield	Crc_16	uint16_t
fcwWarningSensitivityLevel	uint8_t	n/a	Sets the sensitivity level for Forward Collision Warnings. Higher levels cause the vision subsystem to be more aggressive at reporting collision warnings: 0 = FCW Off 1 = FCW Near 2 = FCW Mid 3 = FCW Far	0 to 3	n/a

 Will not Have]

✔ Approved, MAPC-67417 - host_vehicle_state_t For SW8.0 and Later Releases

Name	host_vehicle_state_t	Contents: Vehicle status input to MobilEye sent in HOST_VEH_STATE_MSG (0x20)			
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The timestamp represents the effective time of the measurements in the Host time frame.	0 to $2^{64} - 1$	us
apiVersionMajor	uint8_t	n/a	The Major API version	0 to 255	n/a
apiVersionMinor	uint8_t	n/a	The Minor API version	0 to 255	n/a
countryIdentification	uint16_t	n/a	Signal to indicate the numeric country code as defined in ISO 3166-1. A value of 0 indicates the country is unknown. Vehicles with GPS may use this to override the currentMarket.	0 to 1023	n/a
vehIndex	uint32_t	n/a	The index of the vehicle state data.	0 to $2^{32}-1$	n/a
vehicleLatAccel	real32_T	n/a	Ego vehicle lateral acceleration. (+): Acceleration to the right (-): Acceleration to the left	-16 to 16	m/s ²
vehicleLongAccel	real32_T	n/a	Ego vehicle longitudinal acceleration. (+): Accelerating (-): Decelerating	-16 to 16	m/s ²
vehicleRollRate	real32_T	n/a	Vehicle roll rate from the Host. (+): Roll to the right (-): Roll to the left	-6 to 6	rad/s
vehicleVelocity	real32_T	n/a	Ego vehicle velocity. This does not take into account the speed compensation factor calculated by the radar unless agreed by ME/Aptiv for a specific application. ASIL-B signal.	-20 to 100	m/s
vehicleVerticalAccel	real32_T	n/a	Ego vehicle vertical acceleration. (+): Up (-): Down	-16 to 16	m/s ²
vehicleYawRate	real32_T	n/a	Vehicle yaw rate from the Host. This is compensated (takes into account the yaw rate bias) (+): Yaw to the right (-): Yaw to the left ASIL-B signal.	-2.8798 to 2.8798	rad/s
steeringWheelAngle	real32_T	n/a	positive when steering to the right	-32 to +32	radians
accelPedPosPct	real32_T	n/a	Accelerator Pedal Position Accelerator Pedal Position defined in %. 100% means fully-pressed. (default is 0%)	0 to 100.0	%
turnIndicator	uint8_t		Turn signal status 0 = None 1 = Left 2 = Right 3 = Left and Right Both On	0 to 3	3
wiperSpeedInfo	uint8_t		Indicates the speed of the front windscreen wiper. 0 = Wipers off (default case, also used for error conditions) 1 = Wipers intermittent 2 = Wipers continuous slow 3 = Wipers continuous fast	0 to 3	3
accBrakingStatus	uint8_t	n/a	Reports the Adaptive Cruise Control Braking function status. 0 = ACC Braking Unknown (default) 1 = ACC Braking Inactive 2 = ACC Braking Active	0 to 2	n/a
aebActive	uint8_t	n/a	Signal that indicates that aeb is active. 0 = AEB status unknown 1 = AEB is not active 2 = AEB is active	0 to 2	n/a
vehicleLatAccelValidity	Signal validity bitfield bit 0	n/a	Validity of the vehicleLatAccel signal. 0 = Not valid 1 = Valid	0 to 3	n/a
vehicleLongAccelValidity	Signal validity bitfield bit 1	n/a	Validity of the vehicleLongAccel signal. 0 = Not valid 1 = Valid	0 to 3	n/a
vehicleRollRateValidity	Signal validity bitfield bit 2	n/a	Validity of the vehicleRollRate signal. 0 = Not valid 1 = Valid	0 to 3	n/a
OBS_vehicleVelocityValidity	Signal validity bitfield bit 3	n/a	Signal not used, SW8 and Later Releases.	0 to 3	n/a
vehicleVerticalAccelValidity	Signal validity bitfield bit 4	n/a	Validity of the vehicleVerticalAccel signal. 0 = Not valid 1 = Valid	0 to 3	n/a

OBS_vehicleYawRateValidity	Signal validity bitfield bit 5	n/a	Signal not used, SW8 and Later Releases.	0 to 3	n/a
steeringWheelAngleValidity	Signal validity bitfield bit 6	n/a	Validity of the steeringWheelAngle 0 = Not valid 1 = Valid	0 to 3	n/a
accelPedPosPctValidity	Signal validity bitfield bit 7	n/a	Validity of the accelPedPosPctQF signal. 0 = Not valid 1 = Valid	0 to 3	n/a
mainBeamIndication	bitfield bit 0	n/a	Indicates the high beam is activated. 0 = Off 1 = On Note: Used for AHBC	0 to 1	n/a
wiperFrontCmd	bitfield bit 1	n/a	Indicates the mode control of the front windscreen wiper. 0 = Wiper Off 1 = Wiper On	0 to 1	n/a
reverseGear	bitfield bit 2	n/a	True when vehicle moving backward. Mobileye uses this to disable AEB.	0 to 1	n/a
brakePedalPressed	bitfield bit 3	n/a	Signal that indicates that the Brake Pedal has been pressed. 0 = Not Pressed 1 = Pressed	0 to 1	n/a
cameraHeight	uint16_t	n/a	The distance from the ground to the center of the camera lens.	500 to 2550mm	n/a
cameraHeightValid	bool	n/a	TRUE if cameraHeight is valid	0 to 1	n/a
rollingFrameCount	uint8_t	n/a	Counter for ASIL – B signals.	0 to 255	n/a
crc_16	uint16_t	n/a	“Used to validate that no bits were corrupted in this safety critical message. Using CRC16 based on CRC-16 Ethernet protocol X16+X12+ X5+1 init value = 0xFFFF. The CRC shall be calculated on the following signals: 1. rollingFrameCount 2. vehicleVelocity 3. vehicleYawRate 4. vehicleVelocityValidity 5.vehicleYawRateValidity	Crc_16	uint16_t
fcwWarningSensitivityLevel	uint8_t	n/a	Sets the sensitivity level for Forward Collision Warnings. Higher levels cause the vision subsystem to be more aggressive at reporting collision warnings: 0 = FCW Off 1= FCW Near 2 = FCW Mid 3 = FCW Far	0 to 3	n/a
vehicleVelocityValidity	uint8_t	n/a	Validity of the vehicleVelocity. 0 = Not valid 1 = Valid	0 to 3	n/a
vehicleYawRateValidity	uint8_t	n/a	Validity of the vehicleYawRate. 0 = Not valid 1 = Valid	0 to 3	n/a

[] Should Have]

Note: Negative vehicleVelocity indicates vehicle reverse driving.

✓ Approved, MAPC-67418 - host_wheel_speed_t For SW8.1 and Later Releases

Name	host_wheel_speed_t	Contents: Vehicle Wheel Speed for REM sent in HOST_VEH_STATE_MSG (0x20)			
Member Name	Type	Array	Description	Range	Units
timestamp_us	uint64_t	n/a	The timestamp represents the effective time of the measurements in the Host time frame.	0 to 2 ⁶⁴ – 1	us
apiVersionMajor	uint8_t	n/a	The Major API version	0 to 255	n/a
apiVersionMinor	uint8_t	n/a	The Minor API version	0 to 255	n/a
FLwheelSpeed	int16	n/a	FL Wheel speed 0xFFFF=INIT, 0xFFFE=UNDER_VOLTAGE, 0xFFFF=ERROR	0 to 0xFFFF (0x0 = -327.7 rad/sec 0x7FFE = 0 rad/sec 0xFFFC = +327.7 rad/sec)	0.01 rad/sec
FRwheelSpeed	int16	n/a	FR Wheel speed 0xFFFF=INIT, 0xFFFE=UNDER_VOLTAGE, 0xFFFF=ERROR	0 to 0xFFFF (0x0 = -327.7 rad/sec 0x7FFE = 0 rad/sec 0xFFFC = +327.7 rad/sec)	0.01 rad/sec
RLwheelSpeed	int16	n/a	RL Wheel speed 0xFFFF=INIT, 0xFFFE=UNDER_VOLTAGE, 0xFFFF=ERROR	0 to 0xFFFF (0x0 = -327.7 rad/sec 0x7FFE = 0 rad/sec 0xFFFC = +327.7 rad/sec)	0.01 rad/sec
RRwheelSpeed	int16	n/a	RR Wheel speed 0xFFFF=INIT, 0xFFFE=UNDER_VOLTAGE, 0xFFFF=ERROR	0 to 0xFFFF (0x0 = -327.7 rad/sec 0x7FFE = 0 rad/sec 0xFFFC = +327.7 rad/sec)	0.01 rad/sec
FLwheelSpeedValidity	Signal validity bitfield bit 0	n/a	FL Wheel Speed Validity 0 = INVALID 1 = VALID	0 to 1	n/a
FRwheelSpeedValidity	Signal validity bitfield bit 1	n/a	FR Wheel Speed Validity 0 = INVALID 1 = VALID	0 to 1	n/a
RLwheelSpeedValidity	Signal validity bitfield bit 2	n/a	RL Wheel Speed Validity 0 = INVALID 1 = VALID	0 to 1	n/a
RRwheelSpeedValidity	Signal validity bitfield	n/a	RR Wheel Speed Validity	0 to 1	n/a

	bit 3		0 = INVALID 1 = VALID		
FLwheelDirValidity	Signal validity bitfield bit 4	n/a	FL Wheel Direction Validity 0 = INVALID 1 = VALID	0 to 1	n/a
FRwheelDirValidity	Signal validity bitfield bit 5	n/a	FR Wheel Direction Validity 0 = INVALID 1 = VALID	0 to 1	n/a
RLwheelDirValidity	Signal validity bitfield bit 6	n/a	RL Wheel Direction Validity 0 = INVALID 1 = VALID	0 to 1	n/a
RRwheelDirValidity	Signal validity bitfield bit 7	n/a	RR Wheel Direction Validity 0 = INVALID 1 = VALID	0 to 1	n/a
FLwheel_Direction	BYTE_ENUM	n/a	FL Wheel Direction 0 = FORWARD 1 = REVERSE 2 = INIT 3 = INVALID	0 to 3	n/a
FRwheel_Direction	BYTE_ENUM	n/a	FR Wheel Direction 0 = FORWARD 1 = REVERSE 2 = INIT 3 = INVALID	0 to 3	n/a
RLwheel_Direction	BYTE_ENUM	n/a	RL Wheel Direction 0 = FORWARD 1 = REVERSE 2 = INIT 3 = INVALID	0 to 3	n/a
RRwheel_Direction	BYTE_ENUM	n/a	RR Wheel Direction 0 = FORWARD 1 = REVERSE 2 = INIT 3 = INVALID	0 to 3	n/a
FLwheelTickValidity	Signal validity bitfield bit 0	n/a	FL Wheel Tick Validity 0 = INVALID 1 = VALID	0 to 1	n/a
FRwheelTickValidity	Signal validity bitfield bit 1	n/a	FR Wheel Tick Validity 0 = INVALID 1 = VALID	0 to 1	n/a
RLwheelTickValidity	Signal validity bitfield bit 2	n/a	RL Wheel Tick Validity 0 = INVALID 1 = VALID	0 to 1	n/a
RRwheelTickValidity	Signal validity bitfield bit 3	n/a	RR Wheel Tick Validity 0 = INVALID 1 = VALID	0 to 1	n/a
FLwheelTicks	uint8_t	n/a	FL Wheel Ticks 0 = INVALID 1 = VALID	0 to 0xFE 0xFF = INVALID	counts
FRwheelTicks	uint8_t	n/a	FR Wheel Ticks 0 = INVALID 1 = VALID	0 to 0xFE 0xFF = INVALID	counts
RLwheelTicks	uint8_t	n/a	RL Wheel Ticks 0 = INVALID 1 = VALID	0 to 0xFE 0xFF = INVALID	counts
RRwheelTicks	uint8_t	n/a	RR Wheel Ticks 0 = INVALID 1 = VALID	0 to 0xFE 0xFF = INVALID	counts

⚠ Should Have]

8.2 Init Messages from Host to EyeQ

✓ Approved, MAPC-67420 - Init_Params_Vision (0x92)

Signals defined in VisionInitParams_Dictionary REF[10]

⚠ Should Have]

✓ Approved, MAPC-67421 - Init_Params_TAC2 (0x85)

Default values are in Init_Params_TAC2.xlsx Ref[10]

⚠ Should Have]

✓ Approved, MAPC-67422 - TAC Message Format

Name	Star...	Len.	Value Type	Initial Value	Fact...	Offs.	Mini...	Max.	Unit	Comment	Gen.
⚡ tac2_type	0	8	Unsigned	0	1	0	0	255	N/A		DP
⚡ tac2_params_TAC2_protocol_version	8	8	Unsigned	1	1	0	1	1	N/A		1
⚡ tac2_mode	16	8	Unsigned	0	1	0	0	5	ENUM	SD1-key-tac2_m...	DP
⚡ tac2_num_filters	24	2	Unsigned	0	1	0	0	3	counter	SD1-key-tac2_num...	DP
⚡ filtervec_1	26	6	Unsigned	0	1	0	0	0	N/A		DP
⚡ tac2_squareSideSize	32	9	Unsigned	0	0.001	0	0	0.5	m	SD1-key-tac2_sq...	DP
⚡ tac2_flow_squareSideSize	41	9	Unsigned	0	0.001	0	0	0.5	m	SD1-key-tac2_sq...	DP
⚡ tac2_num_squares_row	50	3	Unsigned	2	1	0	2	5	counter	SD1-key-tac2_num...	2
⚡ filtervec_2	53	3	Unsigned	2	1	0	2	5	counter	SD1-key-tac2_num...	2
⚡ filtervec_3	56	6	Unsigned	0	1	0	0	0	N/A		DP
⚡ targetInfo_tac2_height_0	64	9	Unsigned	0	0.01	0	0	5	m	SD1-key-targetInf...	DP
⚡ targetInfo_tac2_height_1	73	9	Unsigned	0	0.01	0	0	5	m	SD1-key-targetInf...	DP
⚡ targetInfo_tac2_height_2	82	9	Unsigned	0	0.01	0	0	5	m	SD1-key-targetInf...	DP
⚡ targetInfo_tac2_height_3	91	1	Unsigned	0	1	0	0	1	ENUM	SD1-key-targetInf...	DP
⚡ targetInfo_tac2_height_4	92	1	Unsigned	0	1	0	0	1	ENUM	SD1-key-targetInf...	DP
⚡ targetInfo_tac2_height_5	93	1	Unsigned	0	1	0	0	1	ENUM	SD1-key-targetInf...	DP
⚡ filtervec_4	94	2	Unsigned	0	1	0	0	0	N/A		DP
⚡ cameraInfo_tac2_1	96	16	Unsigned	0	0.001	0	0	20	m	SD1-key-cameraIn...	DP
⚡ cameraInfo_tac2_posse_2	112	16	Unsigned	0	0.001	0	0	20	m	SD1-key-cameraIn...	DP
⚡ cameraInfo_tac2_height	128	16	Unsigned	0.5	0.001	0	0.5	5	m	SD1-key-cameraIn...	SD0
⚡ tac2_left_wheel	144	16	Unsigned	0.2	0.01	0	0.2	5	m	SD1-key-wheelInw...	SD
⚡ tac2_right_wheel	160	16	Unsigned	0.2	0.01	0	0.2	5	m	SD1-key-wheelInw...	SD
⚡ tac2_max_resolution	176	8	Signed	0	1	0	0	40	pixels	SD1-key-tac2_max...	DP
⚡ tac2_min_resolution	184	8	Signed	0	1	0	40	0	pixels	SD1-key-tac2_min...	DP
⚡ tac2_max_yaw	192	8	Unsigned	0	1	0	0	40	pixels	SD1-key-tac2_max...	DP
⚡ tac2_min_yaw	200	8	Signed	0	1	0	40	0	pixels	SD1-key-tac2_min...	DP
⚡ tac2_flow_resolution_row	208	16	Unsigned	0	0.001	0	0	0.1	m	SD1-key-tac2_flow...	DP
⚡ targetInfo_tac2_yaw_offset_0	224	16	Unsigned	-5	0.01	-5	-5	5	m	SD1-key-targetInf...	DP
⚡ targetInfo_tac2_yaw_offset_1	240	16	Unsigned	-5	0.01	-5	-5	5	m	SD1-key-targetInf...	DP
⚡ targetInfo_tac2_yaw_offset_2	256	16	Unsigned	-5	0.01	-5	-5	5	m	SD1-key-targetInf...	DP
⚡ filtervec_5	272	16	Unsigned	0	1	0	0	0	N/A		DP

⚠ Should Have]

✓ Approved, MAPC-67423 - Init_Params_SPC (0x82)

Default values are in Init_Params_SPC.xlsx Ref[10]

⚠ Should Have]

✓ Approved, MAPC-67424 - SPC Message Format

Name	Star.	Len.	Value Type	Initial Value	Fact.	Offs.	Mini.	Max.	Unit	Comment	Gen.
Zero_byte	0	8	Unsigned	1	0	0	0	255	NA		0*
Init_params_protocol_version	8	8	Unsigned	1	1	0	1	1	NA		1
horizonFull	16	16	Signed	0	1	0	-160	160	Level -2 Pix...	SD1 key=horizonFull...	0*
yawFull	32	16	Signed	0	1	0	-160	160	Level -2 Pix...	SD1 key=yawFull...	0*
autoRollHorizon	48	8	Signed	0	1	0	-160	160	Level -2 Pix...	SD1 key=autoRoll...	0*
autoRollYaw	56	8	Signed	0	1	0	-160	160	Level -2 Pix...	SD1 key=autoRoll...	0*
rollAngle	64	8	Signed	0	0.005	0	-0.55	0.55	radians	SD1 key=rollAngle...	0*
drivingSide	72	8	Unsigned	1	1	0	2	enum	SD1 key=drivingSide...	0*	
regionCode	80	8	Unsigned	1	1	0	0	10	ENUM	SD1 key=regionCode...	1
Reserved_1	88	8	Unsigned	0	1	0	0	0	NA		0*
cameraHeight	96	16	Unsigned	0.5	0.001	0	0.5	3.5	m	SD1 key=cameraH...	100
cameraToFrontBumper	112	16	Unsigned	0	0.01	0	0	2.55	m	SD1 key=camer...	0*
camToFrontAxle	128	16	Signed	2	0.01	0	-2	2	m	SD1 key=camer...	200
cameraAlignmentValid	144	1	Unsigned	0	1	0	0	1	bool	SD1 key=...	0*
gridFrequency	145	2	Unsigned	0	1	0	0	2	NA	SD1 key=gridFreq...	0*
HilMode	147	1	Unsigned	0	1	0	0	1	NA	SD1 key=HilMode...	0*
leftWheel	148	8	Unsigned	1	0.01	0	0.2	2.55	m	SD1 key=leftWheel...	100
Reserved_2	156	4	Unsigned	0	1	0	0	0	NA		0*
rightWheel	160	8	Unsigned	1	0.01	0	0.2	2.55	m	SD1 key=rightWheel...	100
camToRearAxle	168	9	Unsigned	0	0.01	0	0	5	m	SD1 key=camToRear...	0*
bottom	177	8	Signed	-120	1	0	-120	-20	Level 0 Pixels	SD1 key=bottom...	-120
Reserved_3	185	7	Unsigned	0	1	0	0	0	NA		0*
top	192	8	Signed	120	1	0	20	120	Level 0 Pixels	SD1 key=top...	120
brightSceneEnterThreshold	200	8	Unsigned	0.3	0.1	0	0	20	NA	SD1 key=BS_ENTL...	1
brightSceneExitThreshold	208	8	Unsigned	0.2	0.1	0	0	20	NA	SD1 key=BS_EXIT...	1
brightScoreObviouslyBrightEnterThreshold	216	8	Unsigned	0	0.1	0	0	20	NA	SD1 key=BS_OB...	80
brightScoreObviouslyBrightExitThreshold	224	8	Unsigned	0	0.1	0	0	20	NA	SD1 key=BS_OB...	80
highwayOncomingLightSensitivity	232	8	Signed	-0.2	0.1	0	-5	0	NA	SD1 key=HGWL...	-2
highwayPositionLightSensitivity	240	8	Signed	-0.2	0.1	0	-5	0	NA	SD1 key=HGWL...	-2
liteNightOnlySpeedEnter_kph	248	8	Unsigned	90	1	0	0	255	kmh	SD1 key=NL_O...	90
liteNightOnlySpeedExit_kph	256	8	Unsigned	90	1	0	0	255	kmh	SD1 key=NL_O...	90
brightSceneDuskDelay	264	20	Unsigned	0	1	0	0	60000	NA	SD1 key=BS_D...	0*
litNightBehaviour	284	2	Unsigned	0	1	0	0	2	ENUM	SD1 key=NL_B...	0*
ProjectConfiguration	286	3	Unsigned	0	1	0	1	4	ENUM	SD1 key=Project...	0*
minHorizon	289	8	Unsigned	-40	1	-40	-40	0	pixel - Level...	SD1 key=minHoriz...	-20
maxHorizon	297	8	Unsigned	180	1	0	0	62	pixel - Level...	SD1 key=maxHoriz...	180
minYaw	305	8	Signed	125	1	0	0	47	pixel - Level...	SD1 key=minYaw...	125
maxYaw	305	8	Unsigned	-125	1	-47	-47	0	pixel - Level...	SD1 key=maxYaw...	-125
maxRollAngle	317	8	Signed	0	0.001	0	0	0.055	radians	SD1 key=maxRoll...	0*
adaptOpsOperations	329	2	Unsigned	0	1	0	0	3	ENUM	SD1 key=adaptOps...	0*
Reserved_4	331	5	Unsigned	0	1	0	0	0	NA		0*

[Should Have]

Approved, MAPC-67425 - Init_Params_SPC (0x82) Message Format for SW8.1 and Later Releases

Name	Len	Typ	Resoluti	Offset	Range From	Range To	Unit
Zero_byte	8	uint	1	0	0	255	NA
Init_params_spc_protocol_version	8	uint	1	0	3	3	NA
horizonFull	16	stnt	1	0	-160	160	Level -2 Pixels
yawFull	16	stnt	1	0	-160	160	Level -2 Pixels
autoRollHorizon	16	stnt	1	0	-160	160	Level -2 Pixels
autoRollYaw	16	stnt	1	0	-160	160	Level -2 Pixels
rollAngle	8	stnt	0.005	0	-0.55	0.55	radians
drivingSide	8	uint	1	0	0	2	enum
regionCode	8	uint	1	0	0	10	ENUM
cameraHeight	16	uint	0.001	0	0.5	3.5	m
Reserved_1	8	uint	1	0	0	0	NA
cameraToFrontBumper	16	uint	0.01	0	0	2.55	m
camToFrontAxle	16	stnt	0.01	0	-2	2	m
cameraAlignmentValid	1	uint	1	0	0	1	bool
gridFrequency	2	uint	1	0	0	2	NA
HilMode	1	uint	1	0	0	1	NA
leftWheel	8	uint	0.01	0	0.2	2.55	m
rightWheel	8	uint	0.01	0	0.2	2.55	m
camToRearAxle	9	uint	0.01	0	0	5	m
Reserved_2	3	uint	1	0	0	0	NA
bottom	8	stnt	1	0	-120	-20	Level 0 Pixels
top	8	stnt	1	0	20	120	Level 0 Pixels
brightSceneEnterThreshold	8	uint	0.1	0	0	20	NA
brightSceneExitThreshold	8	uint	0.1	0	0	20	NA
brightScoreObviouslyBrightEnterThreshold	8	uint	0.1	0	0	20	NA
brightScoreObviouslyBrightExitThreshold	8	uint	0.1	0	0	20	NA
highwayOncomingLightSensitivity	8	stnt	0.1	0	-5	0	NA
highwayPositionLightSensitivity	8	stnt	0.1	0	-5	0	NA
liteNightOnlySpeedEnter_kph	8	uint	1	0	0	255	kmh
liteNightOnlySpeedExit_kph	8	uint	1	0	0	255	kmh
Reserved_3	16	uint	1	0	0	0	NA
brightSceneDuskDelay	20	uint	1	0	0	600000	NA
litNightBehaviour	2	uint	1	0	0	2	ENUM
ProjectConfiguration	3	uint	1	0	1	4	ENUM
Reserved_4	7	uint	1	0	0	0	NA
minHorizon	8	uint	1	-40	-40	0	pixel - Level 0
maxHorizon	8	uint	1	0	0	62	pixel - Level 0
minYaw	8	uint	1	-47	-47	0	pixel - Level 0
maxYaw	8	stnt	1	0	0	47	pixel - Level 0
maxRollAngle	8	stnt	0.001	0	0	0.55	radians
adaptOpsOperations	2	uint	1	0	0	3	ENUM
Reserved_5	22	uint	1	0	0	0	NA

Note: autoRollHorizon and autoRollYaw shall be sent as EVEN values. [Should Have]

Approved, MAPC-67426 - DV Mode Init Message Format [Should Have]

Name	Star.	Len.	Value Type	Initial Value	Fact.	Offs.	Mini.	Max.	Unit	Comment	Gen.
Init_DV_Zero_byte	0	8	Unsigned	0	1	0	0	0	NA		0*

Approved, MAPC-67427 - Messages Init_IPB (0x78) and Init_PCW (0x79) while Camera Only AEB Mode

Ford uses a DID to configure the calibration parameter (VehicleCfg_PCAType) to switch between Camera Only AEB Mode and Fusion AEB mode.

The switch will occur at the next power-on-cycle.

The Host shall send Messages Init_IPB (0x78) and Init_PCW (0x79) before Init_Parms_Vision (0x92) only when (VehicleCfg_PCAType=0x2) Camera Only AEB Mode, If (VehicleCfg_PCAType=0x2) Fusion AEB The host shall NOT send Messages Init_IPB (0x78) and Init_PCW (0x79).

In Fusion AEB, Mobileye will have the default constants in their flash, it comes from their FFS file in EyeQ Flash.

The default Values for 0x78 and 0x79 shall be stored in SWP4. [Should Have]

Approved, MAPC-67428 - Init_IPB (0x78)

In Camera Only AEB, HOST shall send message Init_IPB (0x78)

Default values are intab 'AEBbC_Vehicle(IPB)' in AEB_Calibration_Parameters_3_19_s414_20180910.xism Ref[10]

Parameter mapping is available in Ref[11]. [Should Have]

Approved, MAPC-67429 - IPB Init Message Format

Name	Star.	Len.	Value Type	Initial Value	Fact.	Offs.	Mini.	Max.	Unit	Comment	Gen.
Zero_byte	0	8	Unsigned	0	1	0	0	255	NA		0*
Init_IPB_protocol_version	8	8	Unsigned	1	1	0	1	1	NA		1
AEB_decoration_0_yarb	16	10	Unsigned	-25	0.01	-10	-10	0	my*2	SD1 key=AEB_deco...	750
Reserved_1	26	6	Unsigned	0	1	0	0	0	NA		0*
AEB_decoration_1_yarb	32	10	Unsigned	-1	0.01	-10	-10	0	my*2	SD1 key=AEB_deco...	900
AEB_decoration_2_yarb	42	10	Unsigned	-10	0.01	-10	-10	0	my*2	SD1 key=AEB_deco...	0*
AEB_decoration_3_yarb	52	10	Unsigned	-25	0.01	-10	-10	0	my*2	SD1 key=AEB_deco...	750
Reserved_2	62	2	Unsigned	0	1	0	0	0	NA		0*
AEB_decoration_1_yarb	64	10	Unsigned	-1	0.01	-10	-10	0	my*2	SD1 key=AEB_deco...	900
AEB_decoration_2_yarb	74	10	Unsigned	-10	0.01	-10	-10	0	my*2	SD1 key=AEB_deco...	0*
AEB_decoration_3_yarb	84	10	Unsigned	-25	0.01	-10	-10	0	my*2	SD1 key=AEB_deco...	750
Reserved_3	94	2	Unsigned	0	1	0	0	0	NA		0*
AEB_decoration_1_yarb	96	10	Unsigned	-1	0.01	-10	-10	0	my*2	SD1 key=AEB_deco...	900
AEB_decoration_2_yarb	106	10	Unsigned	-10	0.01	-10	-10	0	my*2	SD1 key=AEB_deco...	0*
AEB_decoration_3_yarb	116	10	Unsigned	-25	0.01	-10	-10	0	my*2	SD1 key=AEB_deco...	750
Reserved_4	126	2	Unsigned	0	1	0	0	0	NA		0*
AEB_decoration_1_yarb	128	10	Unsigned	-1	0.01	-10	-10	0	my*2	SD1 key=AEB_deco...	900
AEB_decoration_2_yarb	138	10	Unsigned	-10	0.01	-10	-10	0	my*2	SD1 key=AEB_deco...	0*
AEB_decoration_3_yarb	148	10	Unsigned	-25	0.01	-10	-10	0	my*2	SD1 key=AEB_deco...	750
Reserved_5	158	2	Unsigned	0	1	0	0	0	NA		0*
AEB_decoration_1_yarb	160	10	Unsigned	-1	0.01	-10	-10	0	my*2	SD1 key=AEB_deco...	900
AEB_decoration_2_yarb	170	10	Unsigned	-10	0.01	-10	-10	0	my*2	SD1 key=AEB_deco...	0*
AEB_decoration_3_yarb	180	10	Unsigned	-25	0.01	-10	-10	0	my*2	SD1 key=AEB_deco...	750
Reserved_6	190	2	Unsigned	0	1	0	0	0	NA		0*
AEB_decoration_1_yarb	192	10	Unsigned	-1	0.01	-10	-10	0	my*2	SD1 key=AEB_deco...	900
AEB_decoration_2_yarb	202	10	Unsigned	-10	0.01	-10	-10	0	my*2	SD1 key=AEB_deco...	0*
AEB_decoration_reduction_0_yarb	212	8	Unsigned	1.2	0.01	0	2	seconds	SD1 key=AEB_deco...	120	
Reserved_7	220	4	Unsigned	0	1	0	0	0	NA		0*
AEB_decoration_reduction_1_yarb	224	8	Unsigned	0.8	0.01	0	2	seconds	SD1 key=AEB_deco...	60	
AEB_decoration_reduction_2_yarb	232	8	Unsigned	0.2	0.01	0	2	seconds	SD1 key=AEB_deco...	120	
AEB_decoration_reduction_3_yarb	240	8	Unsigned	1.2	0.01	0	2	seconds	SD1 key=AEB_deco...	120	
AEB_decoration_reduction_4_yarb	248	8	Unsigned	0.8	0.01	0	2	seconds	SD1 key=AEB_deco...	60	
AEB_decoration_reduction_5_yarb	256	8	Unsigned	0.2	0.01	0	2	seconds	SD1 key=AEB_deco...	120	
AEB_decoration_reduction_6_yarb	264	8	Unsigned	1.2	0.01	0	2	seconds	SD1 key=AEB_deco...	120	
AEB_decoration_reduction_7_yarb	272	8	Unsigned	0.8	0.01	0	2	seconds	SD1 key=AEB_deco...	60	
AEB_decoration_reduction_8_yarb	280	8	Unsigned	0.2	0.01	0	2	seconds	SD1 key=AEB_deco...	120	
AEB_decoration_reduction_9_yarb	288	8	Unsigned	1.2	0.01	0	2	seconds	SD1 key=AEB_deco...	120	
AEB_decoration_reduction_10_yarb	296	8	Unsigned	0.8	0.01	0	2	seconds	SD1 key=AEB_deco...	60	
AEB_decoration_reduction_11_yarb	304	8	Unsigned	0.2	0.01	0	2	seconds	SD1 key=AEB_deco...	120	
AEB_decoration_reduction_12_yarb	312	8	Unsigned	1.2	0.01	0	2	seconds	SD1 key=AEB_deco...	120	
AEB_decoration_reduction_13_yarb	320	8	Unsigned	0.8	0.01	0	2	seconds	SD1 key=AEB_deco...	60	
AEB_decoration_reduction_14_yarb	328	8	Unsigned	0.2	0.01	0	2	seconds	SD1 key=AEB_deco...	120	
AEB_decoration_reduction_15_yarb	336	8	Unsigned	1.2	0.01	0	2	seconds	SD1 key=AEB_deco...	120	
AEB_decoration_reduction_16_yarb	344	8	Unsigned	0.8	0.01	0	2	seconds	SD1 key=AEB_deco...	60	
AEB_decoration_reduction_17_yarb	352	8	Unsigned	0.2	0.01	0	2	seconds	SD1 key=AEB_deco...	120	
AEB_maxPacketSize	360	14	Unsigned	22.02	0.01	0	0	100	ms	SD1 key=AEB_maxP...	2202
Reserved_8	374	10	Unsigned	0	1	0	0	0	NA		0*
AEB_maxRate	384	14	Unsigned	22.22	0.01	0	0	100	ms	SD1 key=AEB_maxR...	2222

[Should Have]

Approved, MAPC-67430 - Init_PCW (0x79)

Default values are in tab 'AEBbC_Pedestrian(PCW)' in AEB_Calibration_Parameters_3_19_s414_20180910.xlsm Ref[10]

Parameter mapping is available in Ref[11].

[Should Have]

Approved, MAPC-67431 - PCW Init Message Format

Name	Star...	Len.	Value Type	Initial Value	Fact...	Offs...	Mini...	Max...	Unit	Comment	Gen...
Zero_byte	0	8	Unsigned	0	1	0	0	255	NA		0*
Init_PCW_protocol_version	8	8	Unsigned	1	1	0	1	1	NA		1
PCW_L1_TTC_awarePoints_warm_0	16	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L1...	0*
Reserved_1	25	7	Unsigned	0	1	0	0	0	NA		0*
PCW_L1_TTC_awarePoints_warm_1	32	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L1...	0*
PCW_L1_TTC_awarePoints_warm_2	41	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L1...	0*
PCW_L1_TTC_awarePoints_warm_3	50	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L1...	0*
Reserved_2	59	5	Unsigned	0	1	0	0	0	NA		0*
PCW_L2_TTC_awarePoints_warm_0	64	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L2...	0*
PCW_L2_TTC_awarePoints_warm_1	73	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L2...	0*
PCW_L2_TTC_awarePoints_warm_2	82	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L2...	0*
Reserved_3	91	5	Unsigned	0	1	0	0	0	NA		0*
PCW_L2_TTC_awarePoints_warm_3	96	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L2...	0*
PCW_L3_TTC_awarePoints_warm_0	105	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L3...	0*
PCW_L3_TTC_awarePoints_warm_1	114	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L3...	0*
Reserved_4	123	5	Unsigned	0	1	0	0	0	NA		0*
PCW_L3_TTC_awarePoints_warm_2	128	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L3...	0*
PCW_L3_TTC_awarePoints_warm_3	137	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L3...	0*
Reserved_5	146	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L4...	0*
Reserved_5	155	5	Unsigned	0	1	0	0	0	NA		0*
PCW_L4_TTC_awarePoints_warm_1	160	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L4...	0*
PCW_L4_TTC_awarePoints_warm_2	169	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L4...	0*
PCW_L4_TTC_awarePoints_warm_3	178	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L4...	0*
Reserved_6	187	5	Unsigned	0	1	0	0	0	NA		0*
PCW_L1_TTC_awarePoints_right_0	192	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L1...	0*
PCW_L1_TTC_awarePoints_right_1	201	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L1...	0*
PCW_L1_TTC_awarePoints_right_2	210	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L1...	0*
Reserved_7	219	5	Unsigned	0	1	0	0	0	NA		0*
PCW_L1_TTC_awarePoints_right_3	224	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L1...	0*
PCW_L2_TTC_awarePoints_right_0	233	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L2...	0*
PCW_L2_TTC_awarePoints_right_1	242	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L2...	0*
Reserved_8	251	5	Unsigned	0	1	0	0	0	NA		0*
PCW_L2_TTC_awarePoints_right_2	256	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L2...	0*
PCW_L2_TTC_awarePoints_right_3	265	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L2...	0*
PCW_L3_TTC_awarePoints_right_0	274	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L3...	0*
Reserved_9	283	5	Unsigned	0	1	0	0	0	NA		0*
PCW_L3_TTC_awarePoints_right_1	288	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L3...	0*
PCW_L3_TTC_awarePoints_right_2	297	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L3...	0*
PCW_L3_TTC_awarePoints_right_3	306	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L3...	0*
Reserved_10	315	5	Unsigned	0	1	0	0	0	NA		0*
PCW_L4_TTC_awarePoints_right_0	320	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L4...	0*
PCW_L4_TTC_awarePoints_right_1	329	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L4...	0*
PCW_L4_TTC_awarePoints_right_2	338	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L4...	0*
Reserved_11	347	5	Unsigned	0	1	0	0	0	NA		0*
PCW_L4_TTC_awarePoints_right_3	352	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L4...	0*
PCW_L1_TTC_awarePoints_bicycle_0	361	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L1...	0*
PCW_L1_TTC_awarePoints_bicycle_1	370	9	Unsigned	0	0.01	0	0	5	sec	SD1-key-PCW_L1...	0*
Reserved_12	379	5	Unsigned	0	1	0	0	0	NA		0*

[Should Have]

9 EyeQ Output Types

In Review, MAPC-67433 - EyeQ Output stream shall use the latest Updated version of the Data Types Defined per EyeQ SW version [Will not Have]

9.1 eyeq_vision_application_init_info_t

Approved, MAPC-67435 -

Type	structure	Contents: HW ID's and calibrations for the imager sent in EYEQ_BASE_DIAG_STATUS_MSG (0xA0)			
Member Name	Type	Array Size	Description	Range	Units
rcclCalibration	uint32_t	8	The imager RCCC calibration values stored for Functional Safety checks. The values are stored as follows: RCCC Calibration [0] = multiGainClearR RCCC Calibration [1] = multiGainClearG1 RCCC Calibration [2] = multiGainClearG2 RCCC Calibration [3] = multiGainClearB RCCC Calibration [4] = multiGainRedR RCCC Calibration [5] = multiGainRedG1 RCCC Calibration [6] = multiGainRedG2 RCCC Calibration [7] = multiGainRedB	0 to 0xFFFFFFFF	n/a
imagerFuseID	uint16_t	4 for SW3.0 8 for SW4.0	The imager fuse ID. The fuse ID is unique for each imager. The ID is stored as follows: imagerFuseID[0] = fuse_id1 imagerFuseID[7] = fuse_id8 SIZE OF ARRAY INCREASED FROM 4 TO 8 FOR SW4.0 AND LATER RELEASES.	0 to 0xFFFF for SW3.0 0 to 0xFFFFFFFF for SW4.0 and later.	n/a
imagerChipVersion	uint16_t	n/a	The version of the imager chip. This chip version is read from an imager register.	0x0 to 0xFFFF	n/a
imagerType	uint16_t	n/a	The imager type read from address 0x3000. ADDED FOR SW4.0 AND LATER RELEASES.	0x0 to 0xFFFF	n/a
hardwareRevision	uint8_t	n/a	The revision of the hardware as determined by GPIO pins.	0 to 15	n/a
imagerInitialized	uint8_t bitfield, bit 0	n/a	True if the imager has been successfully initialized.	0 to 1	n/a
imagerPatternFault	uint8_t bitfield, bit 1	n/a	Fault set when imager test pattern test fails.	0 to 1	n/a
parametersInvalid	uint8_t bitfield, bit 2	n/a	Set to true when the Vision Processing Subsystem detects that a software parameter sent by the Fusion Subsystem has an invalid value.	0 to 1	n/a

[Should Have]

Approved, MAPC-67436 - eyeq_vision_application_init_info_t [FOR SW5.0 AND LATER RELEASES]

Type	structure	Contents: HW ID's and calibrations for the imager sent in EYEQ_BASE_DIAG_STATUS_MSG (0xA0)			
Member Name	Type	Array Size	Description	Range	Units
rcclCalibration	uint32_t	8	The imager RCCC calibration values stored for Functional Safety checks. The values are stored as follows: RCCC Calibration [0] = multiGainClearR RCCC Calibration [1] = multiGainClearG1 RCCC Calibration [2] = multiGainClearG2 RCCC Calibration [3] = multiGainClearB RCCC Calibration [4] = multiGainRedR RCCC Calibration [5] = multiGainRedG1 RCCC Calibration [6] = multiGainRedG2 RCCC Calibration [7] = multiGainRedB	0 to 0xFFFFFFFF	n/a

			RCCCalibration [6] = multiGainRedG2 RCCCalibration [7] = multiGainRedB		
imagerFuseID	uint16_t	4 for SW3.0 8 for SW4.0	The imager fuse ID. The fuse ID is unique for each imager. The ID is stored as follows: imagerFuseID[0] = fuse_id1 imagerFuseID[7] = fuse_id8 SIZE OF ARRAY INCREASED FROM 4 TO 8 FOR SW4.0 AND LATER RELEASES.	0 to 0xFFFF for SW3.0 0 to 0xFFFFFFFF for SW4.0 and later.	n/a
imagerChipVersion	uint16_t	n/a	The version of the imager chip. This chip version is read from an imager register.	0x0 to 0xFFFF	n/a
imagerType	uint16_t	n/a	The imager type read from address 0x3000. ADDED FOR SW4.0 AND LATER RELEASES.	0x0 to 0xFFFF	n/a
hardwareRevision	uint8_t	n/a	The revision of the hardware as determined by GPIO pins.	0 to 15	n/a
imagerInitialized	uint8_t bitfield, bit 0	n/a	True if the imager has been successfully initialized.	0 to 1	n/a
imagerPatternFault	uint8_t bitfield, bit 1	n/a	Fault set when imager test pattern test fails.	0 to 1	n/a

❌ Should Have]

9.2 eyeq_spi_diagnostic_info_t

✅ Approved, MAPC-67438 -

Type	Structure	The SPI driver diagnostic fault information sent in EYEQ_BASE_DIAG_STATUS_MSG (0xA0)			
Member Name	Type	Array Size	Description	Range	Units
sequenceErrorCounter	uint32_t	n/a	The number of SPI frames that have been received with a NUM field outside the current receive window and is a synchronization error. This error is associated with NACK reason 0x01.	0x0 .. 0xFFFFFFFF	n/a
dataCRCErrorCounter	uint32_t	n/a	The number of SPI frames that have been received where the Check Value in the frame header does not match the computed Check value. This error is associated with NACK reason 0x02.	0x0 .. 0xFFFFFFFF	n/a
formatErrorCounter	uint32_t	n/a	The number of SPI frames that have been received that have an invalid value in one or more of the header fields. This error is associated with NACK reason 0x11.	0x0 .. 0xFFFFFFFF	n/a
sendFailedErrorCounter	uint32_t	n/a	Updated if the SPI driver failed to send an application message.	0x0 .. 0xFFFFFFFF	n/a
fifoNonEmptyCounter	uint32_t	n/a	Updated if next datalink frame should be sent but previous is still being sent.	0x0 .. 0xFFFFFFFF	n/a
busyFrames	uint32_t	n/a	Number of frames currently in transit.	0x0 .. 0xFFFFFFFF	n/a
rcvOverflowErrors	uint32_t	n/a	Counter of total receive overflow errors.	0x0 .. 0xFFFFFFFF	n/a

❌ Should Have]

9.3 eyeq_video_diagnostics_t

✓ Approved, MAPC-67440 -

Type	structure		Contents: video system errors sent in EYEQ_BASE_DIAG_STATUS_MSG (0xA0)		
Member Name	Type	Array Size	Description	Range	Units
ctrVdiVideoError	uint32_t	n/a	Counter that is incremented when there is an overflow or under-run in the video interface.	0 – 0xFFFFFFFF	n/a
ctrI2CvideoError	uint32_t	n/a	Counter that is incremented when the I2C configuration of current images was not completed.	0 – 0xFFFFFFFF	n/a
ctrLogicalVideoError	uint32_t	n/a	Counter that is incremented when there is an incorrect sequence of images.	0 – 0xFFFFFFFF	n/a
ctrInconsistentVideoError	uint32_t	n/a	Counter that is incremented when there is a mismatch between vdi counter and camera counter detected.	0 – 0xFFFFFFFF	n/a
ctrVerificationVideoError	uint32_t	n/a	Counter that is incremented when physical registers of the camera do not match the mirror image of the registers.	0 – 0xFFFFFFFF	n/a
ctrDropError	uint32_t	n/a	Counter that is incremented when the grab loop was too slow to collect an image.	0 – 0xFFFFFFFF	n/a
ctrTestPatternFailure	uint32_t	n/a	Counter that is incremented when running in diagnostic mode with camera test pattern mode on, and frame fails the check.	0 – 0xFFFFFFFF	n/a
initGeneralFailure	bitfield bit 0	n/a	Fatal error that can happen because of an invalid configuration or memory allocation problems.	0 to 1	n/a
initVdiFailure	bitfield bit 1	n/a	Fatal error that can theoretically happen if driver was not able to read or write to interface registers.	0 to 1	n/a
initI2Cfailure	bitfield bit 2	n/a	Fatal error that indicates error of accessing camera (not video interface) registers.	0 to 1	n/a
grabNoFreeHeaderFailure	bitfield bit 3	n/a	Fatal error that indicates the header was not released on time.	0 to 1	n/a
grabIssueFailure	bitfield bit 4	n/a	Fatal error that indicates a driver queue overflow.	0 to 1	n/a
grabAcquireFailure	bitfield bit 5	n/a	Fatal error that can happen because of invalid pointer passed to function.	0 to 1	n/a
grabReleaseFailure	bitfield bit 6	n/a	Fatal error that can happen because of invalid pointer passed to function.	0 to 1	n/a
grabVideoTimeout	bitfield bit 7	n/a	Fatal error caused by grabVID timeout in application. Once set - no more video is processed	0 to 1	n/a

[] Should Have]

✓ Approved, MAPC-67441 - Eyeq_video_diagnostics_t (For SW 5 and later releases)

Type	structure		Contents: video system errors sent in EYEQ_BASE_DIAG_STATUS_MSG (0xA0)		
Member Name	Type	Array Size	Description	Range	Units
ctrVdiVideoError	uint32_t	n/a	Counter that is incremented when there is an overflow or under-run in the video interface.	0 – 0xFFFFFFFF	n/a
ctrI2CvideoError	uint32_t	n/a	Counter that is incremented when the I2C configuration of current images was not completed.	0 – 0xFFFFFFFF	n/a
ctrLogicalVideoError	uint32_t	n/a	Counter that is incremented when there is an incorrect sequence of images.	0 – 0xFFFFFFFF	n/a
ctrInconsistentVideoError	uint32_t	n/a	Counter that is incremented when there is a mismatch between vdi counter and camera counter detected.	0 – 0xFFFFFFFF	n/a
ctrVerificationVideoError	uint32_t	n/a	Counter that is incremented when physical registers of the camera do not match the mirror image of the registers.	0 – 0xFFFFFFFF	n/a
ctrDropError	uint32_t	n/a	Counter that is incremented when the grab loop was too slow to collect an image.	0 – 0xFFFFFFFF	n/a
initGeneralFailure	bitfield bit 0	n/a	Fatal error that can happen because of an invalid configuration or memory allocation problems.	0 to 1	n/a
initVdiFailure	bitfield bit 1	n/a	Fatal error that can theoretically happen if driver was not able to read or write to interface registers.	0 to 1	n/a
initI2Cfailure	bitfield bit 2	n/a	Fatal error that indicates error of accessing camera (not video interface) registers.	0 to 1	n/a
grabNoFreeHeaderFailure	bitfield bit 3	n/a	Fatal error that indicates the header was not released on time.	0 to 1	n/a
grabIssueFailure	bitfield bit 4	n/a	Fatal error that indicates a driver queue overflow.	0 to 1	n/a
RESERVED		n/a	RESERVED	0 to 1	n/a

	bitfield bit 5				
RESERVED	bitfield bit 6	n/a	RESERVED	0 to 1	n/a
grabVideoTimeout	bitfield bit 7	n/a	Fatal error caused by grabVID timeout in application. Once set - no more video is processed	0 to 1	n/a

[Should Have]

9.4 eyeq_vision_diagnostic_info_t

Approved, MAPC-67443 -

Type	structure	Camera Automatic Gain Control (AGC) Information sent in EYEQ_APP_DIAG_STATUS_MSG (0xA1)			
Member Name	Type	Array Size	Description	Range	Units
agcSettingVehicles	Enum(uint8_t)	n/a	Enumeration selected for FWC control settings based on illumination of scene for vehicles. 0 = None 1 = Day 2 = Dusk 3 = Night	0 to 3	n/a
agcSettingPedestrians	Enum(uint8_t)	n/a	Enumeration selected for FWC control settings based on illumination of scene for pedestrians. 0 = None 1 = Day 2 = Night	0 to 2	n/a

[Should Have]

9.5 eyeq_vision_timesync_info_t

Approved, MAPC-67445 -

Type	structure	Clock Time Synchronization Information sent in EYEQ_TIMESYNC_MSG (0xE8)			
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	For the vision signals provided, the timestamp represents the effective time for all information in this structure.	0 to $2^{64} - 1$	us
frameIndex	uint32_t	n/a	The index of the last vision frame used for the function decisions.	0 to 4294967295	n/a
vehIndexUsed	uint32_t	n/a	The index of the last vehicle state data used when making a vision only decision.	0 to 4294967295	n/a
imageIndex	uint16_t	n/a	The index of the camera image used to update vision function information.	0 to 65535	n/a
Frame_MCU_TS_Start	UInt64_t	n/a	timestamp of exposure start expressed in MCU time system. Not required for the TimeSync mechanism	0 to 18446744073709551615	microsecond
Last_MCU_Sync_TS	UInt64_t	n/a	Feedback of the last clock sync timestamp that was sent to the EyeQ from the MCU	0 to 18446744073709551615	microsecond
Last_Clock_Sync_Skew	Int32_t	n/a	Skew between the actual clock sync time that was sent to the EyeQ and what the EyeQ was expecting. If the internal skew exceeds the signal limits, the signal is clamped to its maximum.	-2047000 to 2047000	microsecond

[Should Have]

9.6 eyeq_vision_failsafes_t[For SW 5 and earlier releases]

Approved, MAPC-67447 - For all Failsafes where range is 0 to 5 the values are: 0 = NOT_READY, 1 = NONE, 2 = 25, 3 = 50, 4 = 75, 5 = 99

Name	eyeq_vision_failsafes_t				
Type	structure	Contents: Vision Failsafes to be sent in EYEQ_VIS_FAILSAFE_MSG (0xE5)			
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The time-stamp of the vehicle state data based on the sync pulse received from the EyeQ.	0 to $2^{64} - 1$	us
frameIndex	uint32_t	n/a	The index of the latest vision frame used to detect Failsafe information.	0 to 4294967295	n/a
vehIndexUsed	uint32_t	n/a	The index of the vehicle state data used when calculating Failsafe information.	0 to 4294967295	n/a
imageIndex	uint16_t	n/a	The index of the camera image used to update Failsafe information.	0 to 65535	n/a
rainSeverityLevel	uint8_t	n/a	Detection of rain or similar precipitation	0 to 5	n/a
fullBlockageSeverityLevel	uint8_t	n/a	Reports when the camera sensor is fully blocked. This signal is available in day and night.	0 to 5	n/a
blurredImageSeverityLevel	uint8_t	n/a	Reports when the camera images are blurry because of weather conditions such as rain or fog. The failsafe computes edge 'scores' for a fixed grid over the center of the image. Available during day and night	0 to 5	n/a
splashesSeverityLevel	uint8_t	n/a	Reports when vision detects heavy rain or splashes. When the road is wet, splashes by vehicles make the bottom blurry. The failsafe compares the intensity of the bottom of the clique to the intensity of its top and of the surrounding road	0 to 5	n/a

			for vehicle candidates. Available during day.		
lowSunSeverityLevel	uint8_t	n/a	Reports when glare from the sun disrupts camera images. The failsafe localizes the sun in the image and evaluates the contrast of the sky and darkness of the road. Available during the day.	0 to 5	n/a
sunRaySeverityLevel	uint8_t	n/a	Reports when sun rays form on an image caused by scratches on the windshield that diffract sunlight. The failsafe detects correlation between local maxima of intensity by line and loops on overlapping vertical rectangles. Available during day, dusk, and night.	0 to 5	n/a
outOfFocusSeverityLevel	uint8_t	n/a	Reports when the camera is out-of-focus. Available during day.	0 to 5	n/a
outOfCalibrationSeverityLevel	uint8_t	n/a	The vision detects that the calibration is wrong (Auto Fix)	0 to 5	n/a
partialBlockageSeverityLevel	uint8_t	n/a	Reports when the camera sensor is partially blocked. This signal is available in day and night.	0 to 5	n/a
frozenWindshieldSeverityLevel	uint8_t	n/a	Reports when vision detects a frozen windshield.	0 to 5	n/a
fogSeverityLevel	uint8_t	n/a	Detection of fog	0 to 5	n/a
outOfCalibTSR	bitfield bit0-bit5	n/a	Out Of Calibration Signal based on TSR bit 0 = TSROutOfCalib bit 1 = TSROutOfCalib_AEB bit 2 = TSROutOfCalib_yaw bit 3 = TSROutOfCalib_horizon	0 to 255	bitwise

[Should Have]

9.7 eyeq_vision_failsafes_t [For SW6 and later releases]

✓ Approved, MAPC-67449 - For all Failsafes where range is 0 to 5 the values are: 0 = NOT_READY, 1 = NONE, 2 = 25, 3 = 50, 4 = 75, 5 = 99

Name: eyeq_vision_failsafes_t					
Type		structure			
		Contents: Vision Failsafes to be sent in EYEQ_VIS_FAILSAFE_MSG (0xE5)			
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The timestamp represents the effective time of these measurements in the Host time frame.	0 to 2 ⁶⁴ - 1	us
frameIndex	uint32_t	n/a	The index of the latest vision frame used to detect Failsafe information.	0 to 4294967295	n/a
vehIndexUsed	uint32_t	n/a	The index of the vehicle state data used when calculating Failsafe information.	0 to 4294967295	n/a
imageIndex	uint16_t	n/a	The index of the camera image used to update Failsafe information.	0 to 65535	n/a
crc_16	uint16_t	n/a	Used to validate that no bits were corrupted in this safety critical message. Using CRC16 based on CRC-16 Ethernet protocol X16+X12+ X5+1 init value = 0xFFFF. The CRC shall be calculated on the following signals: 1. rollingFrameCount 2. rainSeverityLevel 3. fullBlockageSeverityLevel 4. blurredImageSeverityLevel 5. splashesSeverityLevel 6. lowSunSeverityLevel 7. sunRaySeverityLevel 8. outOfFocusSeverityLevel 9. outOfCalibrationSeverityLevel 10. partialBlockageSeverityLevel 11. frozenWindshieldSeverityLevel 12. fogSeverityLevel 13. outOfCalibTSR	crc_16	uint16_t
rainSeverityLevel	uint8_t	n/a	Detection of rain or similar precipitation	0 to 5	n/a
fullBlockageSeverityLevel	uint8_t	n/a	Reports when the camera sensor is fully blocked. This signal is available in day and night.	0 to 5	n/a
blurredImageSeverityLevel	uint8_t	n/a	Reports when the camera images are blurry because of weather conditions such as rain or fog. The failsafe computes edge 'scores' for a fixed grid over the center of the image. Available during day and night	0 to 5	n/a
splashesSeverityLevel	uint8_t	n/a	Reports when vision detects heavy rain or splashes. When the road is wet, splashes by vehicles make the bottom blurry. The failsafe compares the intensity of the bottom of the clique to the intensity of its top and of the surrounding road for vehicle candidates. Available during day.	0 to 5	n/a
lowSunSeverityLevel	uint8_t	n/a	Reports when glare from the sun disrupts camera images. The failsafe localizes the sun in the image and evaluates the contrast of the sky and darkness of the road. Available during the day.	0 to 5	n/a
sunRaySeverityLevel	uint8_t	n/a	Reports when sun rays form on an image caused by scratches on the windshield that diffract sunlight. The failsafe detects correlation between local maxima of intensity by line and loops on overlapping vertical rectangles. Available during day, dusk, and night.	0 to 5	n/a
outOfFocusSeverityLevel	uint8_t	n/a	Reports when the camera is out-of-focus. Available during day.	0 to 5	n/a
outOfCalibrationSeverityLevel	uint8_t	n/a	The vision detects that the calibration is wrong (Auto Fix)	0 to 5	n/a
partialBlockageSeverityLevel	uint8_t	n/a	Reports when the camera sensor is partially blocked. This signal is available in day and night.	0 to 5	n/a
frozenWindshieldSeverityLevel	uint8_t	n/a	Reports when vision detects a frozen windshield.	0 to 5	n/a
fogSeverityLevel	uint8_t	n/a	Detection of fog	0 to 5	n/a

freeSight	uint8_t	n/a	False until free sight is approved. Technologies are operational: 0=FALSE 1=TRUE	0 to 1	n/a
outOfCalibTSR	bitfield bit0- bit5	n/a	Out Of Calibration Signal based on TSR bit 0 = TSROutOfCalib bit 1 = TSROutOfCalib_AEB bit 2 = TSROutOfCalib_yaw bit 3 = TSROutOfCalib_horizon	0 to 255	bitwise
rollingFrameCount	uint8_t	n/a	Counter for ASIL – B signals.	0 to 255	n/a

[Should Have]

9.8 eyeq_temperature_info_t

✓ Approved, MAPC-67451 -

Type	structure		Contents: structure of various temperature measurements used in EYEQ_BASE_DIAG_STATUS_MSG (0xA0)		
Member Name	Type	Array Size	Description	Range	Units
imagerTemperature	int8_t	n/a	The temperature of the imager or -128 (0x80) if the read failed.	-128 to 127	deg. C
mipsTemperature	int8_t	n/a	The temperature of the MIPS processors or -128 (0x80) if the read failed..	-128 to 127	deg. C
vmpTemperature	int8_t	n/a	The temperature of the VMP processors or -128 (0x80) if the read failed..	-128 to 127	deg. C
ddrTemperature	Enum (uint8_t)	n/a	Enumeration for temperature of the DDR memory. 0 = Range OK 1 = Below Spec 2 = Above Spec 3 = Above 85C 255 = Error (if the read failed.)	0-255	n/a

[Should Have]

9.9 eyeq_vision_calibration_dynamic_t

✓ Approved, MAPC-67453 -

Name eyeq_vision_calibration_dynamic_t					
Type	SPC or Auto Fix results sent in EYEQ_DYNAMIC_CAL_MSG (0xA2)				
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The time-stamp of the vehicle state data based on the sync pulse received from the EyeQ.	0 to $2^{64} - 1$	us
frameIndex	uint32_t	n/a	The index of the latest vision frame used to detect dynamic calibration information.	0 to 4294967295	n/a
vehIndexUsed	uint32_t	n/a	The index of the vehicle state data used when calculating dynamic calibration information.	0 to 4294967295	n/a
phYaw	real32_t	n/a	Pinhole yaw deviation from the chassis coord. sys. For reference only, NOT to be stored in NVM.	-180 to 180	degrees
phPitch	real32_t	n/a	Pinhole pitch deviation from the chassis coord. sys. For reference only, NOT to be stored in NVM.	-180 to 180	degrees
roll	real32_t	n/a	Roll deviation from the chassis coord. sys. STORED in NVM. Roll from TAC or SPC is summed with roll from Autofix by the Host and sent in Init message as rollAngle.	-180 to 180	degrees
camHeight	real32_t	n/a	Height above road surface. STORED in NVM and sent in Init message as cameraHeight.	0.5 to 3.5	meters
distYaw	int16_t	n/a	Distorted image yaw deviation from the chassis coord. sys. STORED in NVM and sent to EyeQ in Init message as yawFull IF measured by SPC mode OR sent to EyeQ in Init message as autofixYaw IF measured by Autofix in Vision mode. yawFull and autofixYaw are summed by the EyeQ to obtain total Yaw.	-500 to 500	pixel
distPitch	int16_t	n/a	Distorted image pitch deviation from the chassis coord. sys. STORED in NVM and sent to EyeQ in Init message as horizonFull IF measured by SPC mode OR sent to EyeQ in Init message as autofixHorizon IF measured by Autofix in Vision mode. horizonFull and autofixHorizon are summed by the EyeQ to obtain total Pitch.	-500 to 500	pixel
imageIndex	uint16_t	n/a	The index of the camera image used to update dynamic calibration information.	0 to 65535	n/a
runMode	Enum (uint8_t)	n/a	Calibration run mode: 0=NONE 4=AUTOFIX 5=SPC	0 to 5	n/a
status	Enum (uint8_t)	n/a	SPC/AutoFix status: 0=INIT 1=SUCCESS 2=ERROR	0 to 2	n/a
error	Enum (uint8_t)	n/a	SPC/AutoFix error cause: 0=GENERAL 1=TIMEOUT 2=OOR 3=OK	0 to 3	n/a
overallProgress	uint8_t	n/a	Overall progress of AutoFix process	0 to 100	percent

[] Should Have]

✓ Approved, MAPC-67454 - Eyeq_vision_calibration_dynamic_t (For SW 5 and later releases)

Name eyeq_vision_calibration_dynamic_t					
Type	SPC or Auto Fix results sent in EYEQ_DYNAMIC_CAL_MSG (0xA2)				
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The time-stamp of the vehicle state data based on the sync pulse received from the EyeQ.	0 to $2^{64} - 1$	us
frameIndex	uint32_t	n/a	The index of the latest vision frame used to detect dynamic calibration information.	0 to 4294967295	n/a
vehIndexUsed	uint32_t	n/a	The index of the vehicle state data used when calculating dynamic calibration information.	0 to 4294967295	n/a
phYaw	real32_t	n/a	Pinhole yaw deviation from the chassis coord. sys. For reference only, NOT to be stored in NVM.	-180 to 180	degrees
phPitch	real32_t	n/a	Pinhole pitch deviation from the chassis coord. sys. For reference only, NOT to be stored in NVM.	-180 to 180	degrees
roll	real32_t	n/a	Roll deviation from the chassis coord. sys. Roll from SPC is stored as 0 in NVM. Roll from Autofix is NOT stored in NVM. See Alignment NVM Table in Appendix.	-180 to 180	degrees
camHeight	real32_t	n/a	Height above road surface. STORED in NVM and sent in Init message as cameraHeight.	0.5 to 3.5	meters
distYaw	int16_t	n/a	Distorted image yaw deviation from the chassis coord. sys. STORED in NVM and sent to EyeQ in Init message as yawFull IF measured by SPC mode OR sent to EyeQ in Init message as autofixYaw IF measured by Autofix in Vision mode. yawFull and autofixYaw are summed by the EyeQ to obtain total Yaw.	-500 to 500	pixel
distPitch	int16_t	n/a	Distorted image pitch deviation from the chassis coord. sys. STORED in NVM and sent to EyeQ in Init message as horizonFull IF measured by SPC mode OR sent to EyeQ in Init message as autofixHorizon IF measured by Autofix in Vision mode. horizonFull and autofixHorizon are summed by the EyeQ to obtain total Pitch.	-500 to 500	pixel
imageIndex	uint16_t	n/a	The index of the camera image used to update dynamic calibration information.	0 to 65535	n/a
crc_16	uint16_t	n/a	*Used to validate that no bits were corrupted in this safety critical message. Using CRC16 based on CRC-16 Ethernet protocol X16+X12+X5+1 init value = 0xFFFFFFFF. The CRC shall be calculated on the following signals:	crc_16	uint16_t

			1. rollingFrameCount 2. camHeight 3. distPitch 4. distYaw 5. roll		
runMode	Enum (uint8_t)	n/a	Calibration run mode: 0=NONE 4=AUTOFIX 5=SPC	0 to 5	n/a
status	Enum (uint8_t)	n/a	SPC/AutoFix status: 0=INIT 1=SUCCESS 2=ERROR	0 to 2	n/a
error	Enum (uint8_t)	n/a	SPC/AutoFix error cause: 0=GENERAL 1=TIMEOUT 2=OOR 3=OK	0 to 3	n/a
overallProgress	uint8_t	n/a	Overall progress of AutoFix process	0 to 100	percent
rollingFrameCount	uint8_t	n/a	Counter for ASIL – B signals.	0-255	n/a

[] Should Have]

✓ Approved, MAPC-67455 - Eyeq_vision_calibration_dynamic_t (For SW 9 and later releases)

Name eyeq_vision_calibration_dynamic_t					
Type	WMBC (SPC or Auto Fix) results sent in EYEQ_DYNAMIC_CAL_MSG (0xA2)				
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The time-stamp of the vehicle state data based on the sync pulse received from the EyeQ.	0 to 2 ⁶⁴ – 1	us
frameIndex	uint32_t	n/a	The index of the latest vision frame used to detect dynamic calibration information.	0 to 4294967295	n/a
vehIndexUsed	uint32_t	n/a	The index of the vehicle state data used when calculating dynamic calibration information.	0 to 4294967295	n/a
phYaw	real32_t	n/a	Pinhole yaw deviation from the chassis coord. sys. For reference only, NOT to be stored in NVM.	-180 to 180	degrees
phPitch	real32_t	n/a	Pinhole pitch deviation from the chassis coord. sys. For reference only, NOT to be stored in NVM.	-180 to 180	degrees
roll	real32_t	n/a	Roll deviation from the chassis coord. sys. Roll from SPC is stored in NVM. Roll from Autofix is NOT stored in NVM. See Alignment NVM Table in Appendix.	-180 to 180	degrees
reserved	real32_t	n/a	Reserved. Previously was camHeight. NOT stored in NVM and NOT sent in Init message.	0.5 to 3.5	meters
distYaw	int16_t	n/a	Distorted image yaw deviation from the chassis coord. sys. STORED in NVM and sent to EyeQ in Init message as yawFull IF measured by SPC mode OR sent to EyeQ in Init message as autofixYaw IF measured by Autofix in Vision mode. yawFull and autofixYaw are summed by the EyeQ to obtain total Yaw.	-500 to 500	pixel
distPitch	int16_t	n/a	Distorted image pitch deviation from the chassis coord. sys. STORED in NVM and sent to EyeQ in Init message as horizonFull IF measured by SPC mode OR sent to EyeQ in Init message as autofixHorizon IF measured by Autofix in Vision mode. horizonFull and autofixHorizon are summed by the EyeQ to obtain total Pitch.	-500 to 500	pixel
imageIndex	uint16_t	n/a	The index of the camera image used to update dynamic calibration information.	0 to 65535	n/a
crc_16	uint16_t	n/a	<p>*Used to validate that no bits were corrupted in this safety critical message. Using CRC16 based on CRC-16 Ethernet protocol X16+X12+ X5+1 init value = 0xFFFFFFFF.</p> <p>The CRC shall be calculated on the following signals:</p> <p>1. rollingFrameCount 2. reserved 3. distPitch 4. distYaw 5. roll</p>	crc_16	uint16_t
runMode	Enum (uint8_t)	n/a	Calibration run mode: 0=NONE 4=AUTOFIX 5=SPC	0 to 5	n/a
status	Enum (uint8_t)	n/a	SPC/AutoFix status: 0=INIT 1=SUCCESS 2=ERROR	0 to 2	n/a
error	Enum (uint8_t)	n/a	SPC/AutoFix error cause: 0=GENERAL 1=TIMEOUT 2=OOR 3=OK	0 to 3	n/a
overallProgress	uint8_t	n/a	Overall progress of AutoFix process	0 to 100	percent
rollingFrameCount	uint8_t	n/a	Counter for ASIL – B signals.	0-255	n/a

[] Should Have]

9.10 eyeq_vision_calibration_static_t

9.11 eyeq_vision_calibration_static_t

✓ Approved, MAPC-67458 -

Name eyeq_vision_calibration_static_t					
Type	TAC results sent in EYEQ_TAC_CAL_MSG (0xA3)				
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The time-stamp of the vehicle state data based on the sync pulse received from the EyeQ.	0 to 2 ⁶⁴ – 1	us
frameIndex	uint32_t	n/a	The index of the latest vision frame used to detect static calibration information.	0 to 4294967295	n/a
vehIndexUsed	uint32_t	n/a	The index of the vehicle state data used	0 to	n/a


			when calculating static calibration information.	4294967295	
phYaw	real32_t	n/a	Pinhole yaw deviation from the chassis coord sys. For reference only, NOT to be stored in NVM.	-180 to 180	degrees
phPitch	real32_t	n/a	Pinhole pitch deviation from the chassis coord sys. For reference only, NOT to be stored in NVM.	-180 to 180	degrees
roll	real32_t	n/a	Roll deviation from the chassis coord sys. STORED in NVM and sent in Init message as rollAngle.	-180 to 180	degrees
camHeight	real32_t	n/a	Camera height above the road surface. STORED in NVM and sent in Init message as cameraHeight for TWIN TAC ONLY. NOT for standard TAC.	0.5 to 3.5	meters
distYaw	int16_t	n/a	Distorted image yaw deviation from the chassis coord sys, Range depends on the camera resolution (used for visualization). STORED in NVM and sent in Init message as yawFull.	-500 to 500	pixel
distPitch	int16_t	n/a	Distorted image pitch deviation from the chassis coord sys, Range depends on the camera resolution (used for visualization). STORED in NVM and sent in Init message as horizonFull.	-500 to 500	pixel
imageIndex	uint16_t	n/a	The index of the camera image used to update static calibration information.	0 to 65535	n/a
runMode	Enum (uint8_t)	n/a	Calibration run mode: 0=NONE 1=TAC	0 to 3	n/a
progress	Enum (uint8_t)	n/a	Static Calibration status: 0=NONE 1=INIT 2=CLOSE_TARGET_COMPLETE (not in use for TAC) 3=FAR_TARGET_COMPLETE (not in use for TAC) 4=RESULTS_READY	0 to 4	n/a
error	Enum (uint8_t)	n/a	TAC error values: 0=UNDEFINED 1=NO_ERROR 2=TARGET_NOT_FOUND: either the targets are not detected or the detected targets could not be matched 3=Roll_ANGLE_TOO_LARGE: tac2 roll value is out of defined range 4=FOE_OUT_OF_TOLERANCE: tac2 completed successfully but yaw and/or pitch values are out of the defined range 5=PARAMS_LOAD_FAILED: TAC2.conf sanity failed 6=BAD_PARAMS_DISTANCE: the distance between the detected targets is not consistent with the defined distance. 7=BAD_PARAMS_SQUARE_SIDE_SIZE: image square size derived from the supplied input parameters (square size, distance etc.) is smaller than minimum requirements 8=BAD_PARAMS_TARGET_Yaw: the target horizontal position in the image derived from the supplied input parameters is out of bounds 9=BAD_PARAMS_TARGET_HORIZON: the target vertical position in the image derived from the supplied input parameters is out of bounds	0 to 9	n/a

[] Should Have]

✓ Approved, MAPC-67459 - eyeq_vision_calibration_static.t (For SW 5 and later releases)

Name: eyeq_vision_calibration_static.t					
Type: TAC results sent in EYEQ_TAC_CAL_MSG (0xA3)					
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The time-stamp of the vehicle state data based on the sync pulse received from the EyeQ.	0 to 264 - 1	us
frameIndex	uint32_t	n/a	The index of the latest vision frame used to detect static calibration information.	0 to 4294967295	n/a
vehIndexUsed	uint32_t	n/a	The index of the vehicle state data used when calculating static calibration information.	0 to 4294967295	n/a
phYaw	real32_t	n/a	Pinhole yaw deviation from the chassis coord sys. For reference only, NOT to be stored in NVM.	-180 to 180	degrees
phPitch	real32_t	n/a	Pinhole pitch deviation from the chassis coord sys. For reference only, NOT to be stored in NVM.	-180 to 180	degrees
roll	real32_t	n/a	Roll deviation from the chassis coord sys. STORED in NVM and sent in Init message as rollAngle.	-180 to 180	degrees
camHeight	real32_t	n/a	Camera height above the road surface. STORED in NVM and sent in Init message as cameraHeight for TWIN TAC ONLY. NOT for standard TAC.	0.5 to 3.5	meters
distYaw	int16_t	n/a	Distorted image yaw deviation from the chassis coord sys, Range depends on the camera resolution (used for visualization). STORED in NVM and sent in Init message as yawFull.	-500 to 500	pixel
distPitch	int16_t	n/a	Distorted image pitch deviation from the chassis coord sys, Range depends on the camera resolution (used for visualization). STORED in NVM and sent in Init message as horizonFull.	-500 to 500	pixel
imageIndex	uint16_t	n/a	The index of the camera image used to update static calibration information.	0 to 65535	n/a
crc_16	uint16_t		Used to validate that no bits were corrupted in this safety critical message. Using CRC16 based on CRC-16 Ethernet protocol X16+X12+ X5+1 init value = 0xFFFFFFFF. The CRC shall be calculated on the following signals: 1. rollingFrameCount 2. camHeight	crc_16	uint16_t

			3. distPitch 4. distYaw 5. roll		
runMode	Enum (uint8_t)	n/a	Calibration run mode: 0=NONE 1=TAC	0 to 3	n/a
progress	Enum (uint8_t)	n/a	Static Calibration status: 0=NONE 1=INIT 2=CLOSE_TARGET_COMPLETE (not in use for TAC) 3=FAR_TARGET_COMPLETE (not in use for TAC) 4=RESULTS_READY	0 to 4	n/a
error	Enum (uint8_t)	n/a	TAC error values: 0=UNDEFINED 1=NO_ERROR 2=TARGET_NOT_FOUND: either the targets are not detected or the detected targets could not be matched 3=Roll_ANGLE_TOO_LARGE: tac2 roll value is out of defined range 4=FOE_OUT_OF_TOLERANCE: tac2 completed successfully but yaw and/or pitch values are out of the defined range 5=PARAMS_LOAD_FAILED: TAC2.conf sanity failed 6=BAD_PARAMS_DISTANCE: the distance between the detected targets is not consistent with the defined distance. 7=BAD_PARAMS_SQUARE_SIDE_SIZE: image square size derived from the supplied input parameters (square size, distance etc.) is smaller than minimum requirements 8=BAD_PARAMS_TARGET_Yaw: the target horizontal position in the image derived from the supplied input parameters is out of bounds 9=BAD_PARAMS_TARGET_HORIZON: the target vertical position in the image derived from the supplied input parameters is out of bounds	0 to 9	n/a
rollingFrameCount	uint8_t	n/a	Counter for ASIL – B signals.	0-255	n/a

[ Should Have]

10 Lane Keeping System

All measurements are corrected and reported according to the current estimated camera alignment parameters.

10.1 eyeq_road_info_t [FOR SW4.1 and Previous Releases]

✓ Approved, MAPC-67462 -

Name: eyeq_road_info_t						
Type		Structure				
		Contents: Highest level road info from vision used in EYEQ_VIS_ROAD_DATA_MSG (0xE0)				
Member Name	Type	Array Size	Description	Range	Units	
timestamp_us	uint64_t	n/a	The time-stamp of the vehicle state data based on the sync pulse received from the EyeQ.	0 to 2 ⁶⁴ – 1	us	
roadMarkerInfo	eyeq_road_marker_info_t	n/a	Road marker measurements and information.	n/a	n/a	
roadBorderInfo	eyeq_road_border_info_t	n/a	Road borders measurements and information.	n/a	n/a	
roadHppFusionInfo	eyeq_road_hpp_fusion_info_t	n/a	Result of HPP and Lanes technologies fusion.	n/a	n/a	
roadTransitionPoints	eyeq_transition_point_t	E_EYEQ_MAX_TRANSITION_POINTS	Array of transition points (split, merge, etc.)	n/a	n/a	
frameIndex	uint32_t	n/a	The index of the latest vision frame used to detect road information.	0 to 4294967295	n/a	
vehIndexUsed	uint32_t	n/a	The index of the vehicle state data used when calculating road information.	0 to 4294967295	n/a	
imageIndex	uint16_t	n/a	The index of the camera image used to update road information.	0 to 65535	n/a	
drivingSide	uint8_t	n/a	Indicates what side of the road the host vehicle is driving on. 0 = Right Side 1 = Left Side STORED in NVM and sent in Init message as drivingSide (a value of 2 = Unknown in the init	0 to 1	n/a	

laneChange	uint8_t	n/a	message).	0 to 2	n/a
			Indicates when the vision system detects a lane change. The member value is set to >0 for exactly one cycle when the lane change occurs. Otherwise it is set to 0. 0 = No lane change 1 = Lane change to the left 2 = Lane change to the right		
hwExitLeft	bool	n/a	Highway exit on the left was found	0 to 1	n/a
hwExitRight	bool	n/a	Highway exit on the right was found	0 to 1	n/a
hwEntryLeft	bool	n/a	Highway merging from the left was found	0 to 1	n/a
hwEntryRight	bool	n/a	Highway merging from the right was found	0 to 1	n/a

[] Will not Have]

✓ Approved, MAPC-67463 - eyeq_road_info_t [FOR SW5.0 and LATER RELEASES]

Name	eyeq_road_info_t				
Type	Structure		Contents: Highest level road info from vision used in EYEQ_VIS_ROAD_DATA_MSG (0xE0)		
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The time-stamp of the vehicle state data based on the sync pulse received from the EyeQ.	0 to 264 - 1	us
roadMarkerInfo	eyeq_road_marker_info_t	n/a	Road marker measurements and information.	n/a	n/a
roadBorderInfo	eyeq_road_border_info_t	n/a	Road borders measurements and information.	n/a	n/a
roadHppFusionInfo	eyeq_road_hpp_fusion_info_t	n/a	Result of HPP and Lanes technologies fusion.	n/a	n/a
roadTransitionPoints	eyeq_transition_point_t	E_EYEQ_MAX_TRANSITION_POINTS	Array of transition points (split, merge, etc.)	n/a	n/a
frameIndex	uint32_t	n/a	The index of the latest vision frame used to detect road information.	0 to 4294967295	n/a
vehIndexUsed	uint32_t	n/a	The index of the vehicle state data used when calculating road information.	0 to 4294967295	n/a
crc_16	uint16_t	n/a	*Used to validate that no bits were corrupted in this safety critical message. Using CRC16 based on CRC-16 Ethernet protocol X16+X12+X5+1. init value = 0xFFFFFFFF. The CRC shall be calculated on the following: 1. rollingFrameCount 2. roadHppFusionInfo 3. roadMarkerInfo 4. roadBorderInfo	Crc_16	uint16_t
imageIndex	uint16_t	n/a	The index of the camera image used to update road information.	0 to 65535	n/a
rollingFrameCount	uint8_t	n/a	Counter for ASIL - B signals.	0 to 255	n/a
drivingSide	uint8_t	n/a	Indicates what side of the road the host vehicle is driving on. 0 = Right Side 1 = Left Side STORED in NVM and sent in Init message as drivingSide (a value of 2 == Unknown in the init	0 to 1	n/a

			message).		
laneChange	uint8_t	n/a	Indicates when the vision system detects a lane change. The member value is set to >0 for exactly one cycle when the lane change occurs. Otherwise it is set to 0. 0 = No lane change 1 = Lane change to the left 2 = Lane change to the right	0 to 2	n/a
hwExitLeft	bool	n/a	Highway exit on the left was found	0 to 1	n/a
hwExitRight	bool	n/a	Highway exit on the right was found	0 to 1	n/a
hwEntryLeft	bool	n/a	Highway merging from the left was found	0 to 1	n/a
hwEntryRight	bool	n/a	Highway merging from the right was found	0 to 1	n/a

[Should Have]

✓ Approved, MAPC-67464 - eyeq_road_info_t [FOR SW8.1 and LATER RELEASES]

Name	eyeq_road_info_t				
Type	Structure		Contents: Highest level road info from vision used in EYEQ_VIS_ROAD_DATA_MSG (0xE0)		
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The time-stamp of the vehicle state data based on the sync pulse received from the EyeQ.	0 to 264 – 1	us
roadMarkerInfo	eyeq_road_marker_info_t	n/a	Road marker measurements and information.	n/a	n/a
roadBorderInfo	eyeq_road_border_info_t	n/a	Road borders measurements and information.	n/a	n/a
roadHppFusionInfo	eyeq_road_hpp_fusion_info_t	n/a	Result of HPP and Lanes technologies fusion.	n/a	n/a
roadTransitionPoints	eyeq_transition_point_t	E_EYEQ_MAX_TRANSITION_POINTS	Array of transition points (split, merge, etc.)	n/a	n/a
frameIndex	uint32_t	n/a	The index of the latest vision frame used to detect road information.	0 to 4294967295	n/a
vehIndexUsed	uint32_t	n/a	The index of the vehicle state data used when calculating road information.	0 to 4294967295	n/a
crc_16	uint16_t	n/a	*Used to validate that no bits were corrupted in this safety critical message. Using CRC16 based on CRC-16 Ethernet protocol X16+X12+ X5+1. init value = 0xFFFF. The CRC shall be calculated on the following: 1. rollingFrameCount 2. roadHppFusionInfo 3. roadMarkerInfo 4. roadBorderInfo	crc_16	uint16_t
imageIndex	uint16_t	n/a	The index of the camera image used to update road information.	0 to 65535	n/a
road_info_crc_16	uint16_t	n/a	Used to validate that no bits were corrupted in this safety critical message. Using CRC16 based on CRC-16 Ethernet protocol X16+X12+ X5+1. init value = 0xFFFF. The CRC shall be calculated on the following in the following order: - rollingFrameCounter (uint8) - eyeq_road_info_t.roadHppFusionInfo.laneCenter.a0 (single) - eyeq_road_info_t.roadHppFusionInfo.laneCenter.a1 (single) - eyeq_road_info_t.roadHppFusionInfo.laneCenter.a2 (single) - eyeq_road_info_t.roadHppFusionInfo.laneCenter.a3 (single) - eyeq_road_info_t.roadHppFusionInfo.roadFusionConf (single) - eyeq_road_marker_info_t.hostLeftMarker.laneMarker.a0 (single) - eyeq_road_marker_info_t.hostRightMarker.laneMarker.a0 (single) - eyeq_road_marker_info_t.hostLeftMarker.laneMarkerConf.sfConf (single) - eyeq_road_marker_info_t.hostRightMarker.laneMarkerConf.sfConf (single)	crc_16	uint16_t
road_info_rfc_16	uint8_t	n/a	Counter for road_info_crc above	0 to 255	n/a
rollingFrameCount	uint8_t	n/a	Counter for roadHppFusion, roadMarker, roadBoarder crc above.	0 to 255	n/a
drivingSide	uint8_t	n/a	Indicates what side of the road the host vehicle is driving on. 0 = Right Side 1 = Left Side STORED in NVM and sent in Init message as drivingSide (a value of 2 == Unknown in the init message).	0 to 1	n/a
laneChange	uint8_t	n/a	Indicates when the vision system detects a lane change. The member value is set to >0 for exactly one cycle when the lane change occurs. Otherwise it is set to 0. 0 = No lane change 1 = Lane change to the left 2 = Lane change to the right	0 to 2	n/a
hwExitLeft	bool	n/a	Highway exit on the left was found	0 to 1	n/a
hwExitRight	bool	n/a	Highway exit on the right was found	0 to 1	n/a

hwEntryLeft	bool	n/a	Highway merging from the left was found	0 to 1	n/a
hwEntryRight	bool	n/a	Highway merging from the right was found	0 to 1	n/a

[] Should Have]

10.2 eyeq_road_border_info_t

✓ Approved, MAPC-67466 -

Name	eyeq_road_border_info_t				
Type	structure	Contents: Road border structure from vision system used in eyeq_road_info_t. Contains left and right road_edge structures.			
Member Name	Type	Array Size	Description	Range	Units
leftRoadBorder	eyeq_road_border_t	n/a	Estimates for the left road border.	n/a	n/a
rightRoadBorder	eyeq_road_border_t	n/a	Estimates for the right road border.	n/a	n/a

[] Should Have]

10.3 eyeq_road_border_t

✓ Approved, MAPC-67468 -

Name	eyeq_road_border_t				
Type	structure	Contents: Low level road border polynomial and confidence info used in road_border_info_t			
Member Name	Type	Array Size	Description	Range	Units
roadBorder	eyeq_polynomial_model_t	n/a	Road border polynomial model. Used to compute the lateral offset given a longitudinal position.	n/a	n/a
roadBorderConf	eyeq_road_confidence_t	n/a	The confidence measures for the road border measurement.	n/a	n/a
roadBorderHeight	real32_T	n/a	The height of the road border (-99 if n/a)	0 to 2	meters
roadBorderType	Enum (uint8_t)	n/a	The type of the border: 0 = Road edge 1 = Curb 2 = Barrier 3 = ConesPoles 4 = ParkedCars	0 to 4	n/a

[] Should Have]

✓ Approved, MAPC-67469 - eyeq_road_border_t (FOR SW7.0 and LATER RELEASES)

Name	eyeq_road_border_t				
Type	structure	Contents: Low level road border polynomial and confidence info used in road_border_info_t			
Member Name	Type	Array Size	Description	Range	Units
roadBorder	eyeq_polynomial_model_t	n/a	Road border polynomial model. Used to compute the lateral offset given a longitudinal position.	n/a	n/a
roadBorderConf	eyeq_road_confidence_t	n/a	The confidence measures for the road border measurement.	n/a	n/a
roadBorderHeight	real32_T	n/a	The height of the road border (-99 if n/a)	0 to 2	meters
roadBorderType	Enum (uint8_t)	n/a	The type of the border: 0 = Undecided 1 = Invalid 2 = FlatRoad edge 3 = Curb 4 = Barrier 5 = Traffic Cones 6 = ParkedCars 7=Reserved.	0 to 7	n/a

[] Should Have]

10.4 eyeq_road_hpp_fusion_info_t

✓ Approved, MAPC-67471 -

Name	eyeq_road_hpp_fusion_info_t				
Type	structure	Results of HPP/Lanes technologies fusion.			
Member Name	Type	Array Size	Description	Range	Units
laneCenter	eyeq_polynomial_model_t	n/a	Lane center polynomial model. Used to compute the lateral offset from the vehicle center line to the ego-lane for a given longitudinal position.	n/a	n/a
roadFusionConf	real32_T	n/a	The confidence measures for the lane center measurement.	0 to 1.0	n/a
halfWidth	real32_T	n/a	width from center line to lane border (of the pathPredictionmodel)	0 to 2	n/a
hppLeftWeight	real32_T	n/a	The weight of the HPP left model from fusion. This signal is not maintained or approved for production.	0 to 1.0	n/a
hppRightWeight	real32_T	n/a	The weight of the HPP right model from fusion. This signal is not maintained or approved for production.	0 to 1.0	n/a
roadLeftWeight	real32_T	n/a	The weight of the left Road model from fusion. This signal is not maintained or approved for production.	0 to 1.0	n/a
roadRightWeight	real32_T	n/a	The weight of the right Road model from fusion. This signal is not maintained or approved for production.	0 to 1.0	n/a

[] Should Have]

⚠ In Review, MAPC-67472 - (FOR SW7.0 and LATER RELEASES)

Name	eyeq_road_hpp_fusion_info_t				

Type	structure		Results of HPP/Lanes technologies fusion.		
Member Name	Type	Array Size	Description	Range	Units
laneCenter	eyeq_polynomial_model_t	n/a	Lane center polynomial model. Used to compute the lateral offset from the vehicle center line to the ego-lane for a given longitudinal position.	n/a	n/a
roadFusionConf	real32_T	n/a	The confidence measures for the lane center measurement.	0 to 1.0	n/a
halfWidth	real32_T	n/a	width from center line to lane border (of the pathPredictionmodel)	0 to 2	n/a
hppLeftWeight	real32_T	n/a	The weight of the HPP left model from fusion. This signal is not maintained or approved for production.	0 to 1.0	n/a
hppCenterWeight	real32_T	n/a	The weight of the HPP center model from fusion. This signal is not maintained or approved for production.	0 to 1.0	n/a
hppRightWeight	real32_T	n/a	The weight of the HPP right model from fusion. This signal is not maintained or approved for production.	0 to 1.0	n/a
roadLeftWeight	real32_T	n/a	The weight of the left Road model from fusion. This signal is not maintained or approved for production.	0 to 1.0	n/a
roadRightWeight	real32_T	n/a	The weight of the right Road model from fusion. This signal is not maintained or approved for production.	0 to 1.0	n/a

Will not Have]

✓ Approved, MAPC-67473 - FOR SW8.1 and LATER RELEASES]

Name	eyeq_road_hpp_fusion_info_t				
Type	structure		Results of HPP/Lanes technologies fusion.		
Member Name	Type	Array Size	Description	Range	Units
laneCenter	eyeq_polynomial_model_t	n/a	Lane center polynomial model. Used to compute the lateral offset from the vehicle center line to the ego-lane for a given longitudinal position.	n/a	n/a
roadFusionConf	real32_T	n/a	The confidence measures for the lane center measurement.	0 to 1.0	n/a
halfWidth	real32_T	n/a	width from center line to lane border (of the pathPredictionmodel)	0 to 2	n/a
hppLeftWeight	real32_T	n/a	The weight of the HPP left model from fusion. This signal is not maintained or approved for production.	0 to 2.0	n/a
hppCenterWeight	real32_T	n/a	The weight of the HPP center model from fusion. This signal is not maintained or approved for production.	0 to 2.0	n/a
hppRightWeight	real32_T	n/a	The weight of the HPP right model from fusion. This signal is not maintained or approved for production.	0 to 2.0	n/a
roadLeftWeight	real32_T	n/a	The weight of the left Road model from fusion. This signal is not maintained or approved for production.	0 to 2.0	n/a
roadRightWeight	real32_T	n/a	The weight of the right Road model from fusion. This signal is not maintained or approved for production.	0 to 2.0	n/a

Should Have]

10.5 eyeq_road_marker_info_t

In Review, MAPC-67475 -

Name	eyeq_road_marker_info_t				
Type	structure		Contents: High level road marker info used in eyeq_road_info_t		
Member Name	Type	Array Size	Description	Range	Units
hostLeftMarker	eyeq_road_marker_t	n/a	Information about the lane marker nearest the ego vehicle on the left	n/a	n/a

			side. All polynomial coefficients between left and right may be different.		
hostRightMarker	eyeq_road_marker_t	n/a	Information about the lane marker nearest the ego vehicle on the right side. All polynomial coefficients between left and right may be different.	n/a	n/a
nextLeftLeftMarker	eyeq_road_marker_t	n/a	Information about the left lane marker of the lane on the left side of the ego vehicle.	n/a	n/a
nextLeftRightMarker	eyeq_road_marker_t	n/a	Information about the right lane marker of the lane on the left side of the ego vehicle. This signal is only available when there is a wide separation between the host and the left lane. *** Under development ***	n/a	n/a
nextRightRightMarker	eyeq_road_marker_t	n/a	Information about the right lane marker of the lane on the right side of the ego vehicle.	n/a	n/a
nextRightLeftMarker	eyeq_road_marker_t	n/a	Information about the left lane marker of the lane on the right side of the ego vehicle. This signal is only available when there is a wide separation between the host and the right lane. *** Under development ***	n/a	n/a
ambiguousLinePatternLeft	bitfield bit0	n/a	When true, indicates the line pattern on the left of the ego vehicle is ambiguous; otherwise, it is set to false.	0 to 1	n/a
ambiguousLinePatternRight	bitfield bit1	n/a	When true, indicates the line pattern on the right of the ego vehicle is ambiguous; otherwise, it is set to false.	0 to 1	n/a
constructionArea	bitfield bit2	n/a	When true, indicates that construction / road-work area is detected; otherwise, it is set to false.	0 to 1	n/a
roadPredictionLeft	bitfield bit0-bit5	n/a	Prediction information describing which prediction is applied on the left of the ego vehicle. bit 0 = None bit 1 = Occluded bit 2 = Other_Side bit 3 = Override bit 4 = Dist_Based_Extrapolation bit 5 = Headway_Oriented	n/a	n/a
roadPredictionRight	bitfield bit0-bit5	n/a	Prediction information describing which prediction is applied on the right of the ego vehicle. bit 0 = None bit 1 = Occluded bit 2 = Other_Side bit 3 = Override bit 4 = Dist_Based_Extrapolation bit 5 = Headway_Oriented	n/a	n/a

[] Will not Have]

✓ Approved, MAPC-67476 - eyeq_road_marker_info_t (For SW 5 and Later Releases)

Name eyeq_road_marker_info_t					
Type	structure		Contents: High level road marker info used in eyeq_road_info_t		
Member Name	Type	Array Size	Description	Range	Units
hostLeftMarker	eyeq_road_marker_t	n/a	Information about the lane marker nearest the ego vehicle on the left side. All polynomial coefficients between left and right may be different. ASIL-B signal	n/a	n/a
hostRightMarker	eyeq_road_marker_t	n/a	Information about the lane marker nearest the ego vehicle on the right side. All polynomial coefficients between left and right may be different. ASIL-B signal	n/a	n/a
nextLeftLeftMarker	eyeq_road_marker_t	n/a	Information about the left lane marker of the lane on the left side of the ego vehicle.	n/a	n/a
nextLeftRightMarker	eyeq_road_marker_t	n/a	Information about the right lane marker of the lane on the left side of the ego vehicle. This signal is only available when there is a wide separation between the host and the left lane. *** Under development ***	n/a	n/a
nextRightRightMarker	eyeq_road_marker_t	n/a	Information about the right lane marker of the lane on the right side of the ego vehicle.	n/a	n/a
nextRightLeftMarker	eyeq_road_marker_t	n/a	Information about the left lane marker of the lane on the right side of the ego vehicle. This signal is only available when there is a wide separation between the host and the right lane. *** Under development ***	n/a	n/a
ambiguousLinePatternLeft	bitfield bit0	n/a	When true, indicates the line pattern on the left of the ego vehicle is ambiguous; otherwise, it is set to false.	0 to 1	n/a
ambiguousLinePatternRight	bitfield bit1	n/a	When true, indicates the line pattern on the right of the ego vehicle is ambiguous; otherwise, it is set to false.	0 to 1	n/a
constructionArea	bitfield bit2	n/a	When true, indicates that construction / road-work area is	0 to 1	n/a

			detected; otherwise, it is set to false.		
roadPredictionLeft	bitfield bit0-bit5	n/a	Prediction information describing which prediction is applied on the left of the ego vehicle. bit 0 = RESERVED (undefined) bit 1 = Occluded bit 2 = Other_Side bit 3 = Override bit 4 = Dist_Based_Extrapolation bit 5 = Headway_Oriented	n/a	n/a
roadPredictionRight	bitfield bit0-bit5	n/a	Prediction information describing which prediction is applied on the right of the ego vehicle. bit 0 = RESERVED (undefined) bit 1 = Occluded bit 2 = Other_Side bit 3 = Override bit 4 = Dist_Based_Extrapolation bit 5 = Headway_Oriented	n/a	n/a

[] Should Have]

10.6 eyeq_road_marker_t

✓ Approved, MAPC-67478 -

Name eyeq_road_marker_t					
Type	structure	Contents: Mid level road marker info used in road marker info t			
Member Name	Type	Array Size	Description	Range	Units
laneMarker	eyeq_polynomial_model_t	n/a	Lane marker polynomial model. Used to compute the lateral offset given a longitudinal position.	n/a	n/a
laneMarkerConf	eyeq_road_confidence_t	n/a	The confidence measures for the lane marker measurement.	n/a	n/a
laneMarkerWidth	real32_T	n/a	The width of the detected lane marker	0 to 0.7	meters
laneMarkerType	Enum (uint8_t)	n/a	Lane marker type 0=DASHED 1=SOLID 2=UNDECIDED 3=DLM 4=BOTTS 5=DECEL 6=INVALID	0 to 6	n/a
dLmType	Enum (uint8_t)	n/a	In case of double lane mark, what is the type of the DLM: 0=NOTDLM 1=SOLIDDASHED 2=DASHEDSOLID 3=SOLIDSOLID 4=DASHEDDASHED 5=UNDECIDED	0 to 5	n/a
decelType	Enum (uint8_t)	n/a	In case of deceleration what is the inner line type: 0=NOTDECEL 1=SOLID 2=DASHED 3=UNDECIDED 4=INVALID	0 to 4	n/a
laneMarkerColor	Enum (uint8_t)	n/a	The color of the detected lane marker. 0 = Unknown 1 = White 2 = Yellow 3 = Blue	0 to 3	n/a

[] Will not Have]

For SW7 and Earlier Releases:

⚠ In Review, MAPC-67479 - eyeq_road_marker_t

Name eyeq_road_marker_t					
Type	structure	Contents: Mid level road marker info used in road marker info t			
Member Name	Type	Array Size	Description	Range	Units
laneMarker	eyeq_polynomial_model_t	n/a	Lane marker polynomial model. Used to compute the lateral offset given a longitudinal position. ASIL-B signal.	n/a	n/a
laneMarkerConf	eyeq_road_confidence_t	n/a	The confidence measures for the lane marker measurement. ASIL-B signal.	n/a	n/a
laneMarkerWidth	real32_T	n/a	The width of the detected lane marker	0 to 0.7	meters
laneMarkerType	Enum (uint8_t)	n/a	Lane marker type 0=DASHED 1=SOLID 2=UNDECIDED 3=DLM 4=BOTTS 5=DECEL 6=INVALID ASIL-B signal.	0 to 6	n/a
dLmType	Enum (uint8_t)	n/a	In case of double lane mark, what is the type of the DLM: 0=NOTDLM 1=SOLIDDASHED 2=DASHEDSOLID 3=SOLIDSOLID 4=DASHEDDASHED 5=UNDECIDED	0 to 5	n/a
decelType	Enum (uint8_t)	n/a	In case of deceleration what is the inner line type: 0=NOTDECEL 1=SOLID 2=DASHED 3=UNDECIDED 4=INVALID	0 to 4	n/a
laneMarkerColor	Enum	n/a	The color of the detected	0 to 3	n/a

	(uint8_t)	lane marker. 0 = Unknown 1 = White 2 = Yellow 3 = Blue		
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[] Will not Have]

✓ Approved, MAPC-67480 - eyeq_road_marker_t for SW8.0 and Later Releases

Name	eyeq_road_marker_t				
Type	structure	Contents: Mid level road marker info used in road_marker_info_t			
Member Name	Type	Array Size	Description	Range	Units
laneMarker	eyeq_polynomial_model_t	n/a	Lane marker polynomial model. Used to compute the lateral offset given a longitudinal position. ASIL-B signal.	n/a	n/a
laneMarkerConf	eyeq_road_confidence_t	n/a	The confidence measures for the lane marker measurement. ASIL-B signal.	n/a	n/a
measuredViewRange	real32_t	n/a	actual detected range for the polynomial lane marker model	0 to 128	m
laneMarkerWidth	real32_T	n/a	The width of the detected lane marker	0 to 0.7	meters
laneMarkerType	Enum (uint8_t)	n/a	Lane marker type 0=DASHED 1=SOLID 2=UNDECIDED 3=DLM 4=BOTTS 5=DECEL 6=INVALID ASIL-B signal.	0 to 6	n/a
dLmType	Enum (uint8_t)	n/a	In case of double lane mark, what is the type of the DLM: 0=NOTDLM 1=SOLIDDASHED 2=DASHEDSOLID 3=SOLIDSOLID 4=DASHEDDASHED 5=UNDECIDED	0 to 5	n/a
decelType	Enum (uint8_t)	n/a	In case of deceleration what is the inner line type: 0=NOTDECEL 1=SOLID 2=DASHED 3=UNDECIDED 4=INVALID	0 to 4	n/a
laneMarkerColor	Enum (uint8_t)	n/a	The color of the detected lane marker. 0 = Unknown 1 = White 2 = Yellow 3 = Blue	0 to 3	n/a

[] Should Have]

10.7 eyeq_polynomial_model_t

✓ Approved, MAPC-67482 -

Name	eyeq_polynomial_model_t				
Type	Structure	Contents: Low level polynomial info used by road edge, road lane, road marker and vision barrier structures			
Member Name	Type	Array Size	Description	Range	Units
a0	real32_T	n/a	Road edge is modeled $y = a0 + a1*x + a2*x^2 + a3*x^3$ a0 := offset	-10 to 10	m
a1	real32_T	n/a	Road edge is modeled $y = a0 + a1*x + a2*x^2 + a3*x^3$ a1 := tan(heading)	-0.9 to 0.9	n/a
a2	real32_T	n/a	Road edge is modeled $y = a0 + a1*x + a2*x^2 + a3*x^3$ a2 := curvature/2	-0.01 to 0.01	1/m
a3	real32_T	n/a	Road edge is modeled $y = a0 + a1*x + a2*x^2 + a3*x^3$ a3 := curvature_rate/6	-0.00017 to 0.00017	1/m ²
startRange	real32_T	n/a	Minimal view range for the model. I.e., the minimum longitudinal distance for which the lateral distance polynomial is valid.	0 to 128	m
endRange	real32_T	n/a	Maximal view range for the model. I.e., the maximum longitudinal distance for which the lateral distance polynomial is valid (For a predicted polynomial, this value holds the maximum of the predicted polynomial).	0 to 128	m

[] Should Have]

10.8 eyeq_road_confidence_t

✓ Approved, MAPC-67484 -

Name	eyeq_road_confidence_t				
Type	structure	Contents: Confidence estimates. Used in eyeq_road_border_t and eyeq_road_marker_t.			
Member Name	Type	Array Size	Description	Range	Units
sConf	real32_T	n/a	SF confidence. The single frame probability of a line candidate to be a real lane mark. Evaluation score is from 0 (bad) to 1 (perfect). If invalid, the score is set to a negative value.	0 to 1	n/a
confidence	Enum (uint8_t)	n/a	Confidence level of the lanemark: 0,1 – Unavailable 2 – Predicted lanemark 3 – Detected lanemark	0 to 3	n/a

[] Should Have]

10.9 eyeq_transition_point_t

🔍 In Review, MAPC-67486 -

Name	eyeq_transition_point_t				
Type	structure	Contents: Transition point information. Used in eyeq_road_info_t			
Member Name	Type	Array Size	Description	Range	Units
transitionLongPosition	real32_T	n/a	The longitudinal position of the transition point	0 to 200	meters
transitionLatPosition	real32_T	n/a	The lateral position of the transition point	-50 to 50	meters
transitionType	uint8_t	n/a	0 = split 1 = merge	n/a	n/a
isValid	bitfield bit0	n/a	Info shouldn't be used if not valid	0 to 1	n/a
isStart	bitfield bit1	n/a	Is the point is a transition area starting or ending. 0 = End of Transition 1 = Start of Transition	0 to 1	n/a
transitionLineRole	Enum (uint8_t)	n/a	Position with respect to Host: 0 = None 1 = Host_Left 2 = Host_Right 3 = Next_Left_Left_Lanemark 4 = Next_Left_Right_Lanemark 5 = Next_Right_Left_Lanemark 6 = Next_Right_Right_Lanemark 7 = Left_Road_Edge 8 = Right_Road_Edge 9 = Reserved_1 10 = Reserved_2 11 = Reserved_3 12 = Reserved_4 13 = Reserved_5 14 = Reserved_6 15 = Reserved_7	0 to 15	n/a

[] Will not Have]

✓ Approved, MAPC-67487 - eyeq_transition_point_t [FOR SW5.0 and LATER RELEASES]

Name	eyeq_transition_point_t				
Type	structure	Contents: Transition point information. Used in eyeq_road_info_t			
Member Name	Type	Array Size	Description	Range	Units
transitionLongPosition	real32_T	n/a	The longitudinal position of the transition point	0 to 200	meters
transitionLatPosition	real32_T	n/a	The lateral position of the transition point	-50 to 50	meters
transitionProbability	real32_T	n/a	Transition probability	0 to 1	n/a
transitionType	uint8_t	n/a	0 = split 1 = merge	n/a	n/a
isStart	bitfield bit1	n/a	Is the point is a transition area starting or ending. 0 = End of Transition 1 = Start of Transition	0 to 1	n/a
transitionLineRole	Enum (uint8_t)	n/a	Position with respect to Host: 0 = None 1 = Host_Left 2 = Host_Right 3 = Next_Left_Left_Lanemark 4 = Next_Left_Right_Lanemark 5 = Next_Right_Left_Lanemark 6 = Next_Right_Right_Lanemark 7 = Left_Road_Edge 8 = Right_Road_Edge 9 = Reserved_1 10 = Reserved_2 11 = Reserved_3 12 = Reserved_4 13 = Reserved_5 14 = Reserved_6 15 = Reserved_7	0 to 15	n/a

[] Should Have]

11 Light Objects

All measurements are corrected and reported according to the current estimated camera alignment parameters.

11.1 eyeq_active_light_sensor_info_t [FOR SW2.2 and Earlier Releases]

eyeq_active_light_sensor_info_t -- SW 2.2

⚠ In Review, MAPC-67490 -

Name	eyeq_active_light_sensor_info_t				
Type	structure		Contents: High level scene characteristics, image info from AHBC and array of light spots from vision used in EYEQ_VIS_LIGHT_SENSOR_DATA_MSG (0xE1)		
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The time-stamp of the vehicle state data based on the sync pulse received from the EyeQ.	0 to 2 ⁶⁴ - 1	us
activeLightSpots	eyeq_active_light_spot_t	E_EYEQ_MAX_ACTIVE_LIGHT_SPOTS	List of active light spots. See information below on ordering of the spots within the array.	n/a	n/a
reflectiveSigns	eyeq_reflective_signs_t	E_EYEQ_MAX_REFLECTIVE_SIGNS	List of reflective signs.	n/a	n/a
frameIndex	uint32_t	n/a	The index of the vision frame used to update AHBC information.	0 to 4294967295	n/a
vehIndexUsed	uint32_t	n/a	The index of the vehicle state data used when calculating AHBC information.	0 to 4294967295	n/a
imageIndex	uint16_t	n/a	The index of the camera image used to update AHBC information.	0 to 65535	n/a
ahbcAvailable	Enum (uint8_t)	n/a	AHBC available or not (availability of technology) 0 = Off 1 = Partial 2 = Full	0 to 2	n/a
gridFrequency	uint8_t	n/a	Street lamp frequency used by the VFP. 0x00 = Undefined 0x01 = 50 Hz 0x02 = 60 Hz This value is stored across ignition cycles in NVM.	0 to 2	n/a
numOfActiveLightSpots	uint8_t	n/a	Number of active light spots	0 to E_EYEQ_MAX_ACTIVE_LIGHT_SPOTS	n/a
numOfReflectiveSigns	uint8_t	n/a	Number of reflective signs	0 to E_EYEQ_MAX_REFLECTIVE_SIGNS	n/a
clearFieldOfView	Enum (uint8_t)	n/a	Detection of clear field of detection: 0 = Unknown 1 = No Clear Field-Of-View 2 = Clear Field-Of-View	0 to 2	n/a
fogDetected	bitfield bit 0	n/a	0 = no fog detected 1 = fog detected	0 to 1	n/a
highwayDetected	bitfield bit 1	n/a	0 = no highway detected 1 = highway detected	0 to 1	n/a
villageDetected	bitfield bit 2	n/a	True if the host vehicle is driving in a village 0 = no village detected 1 = village detected	0 to 1	n/a
oncomingLaneNotDark	bitfield bit 3	n/a	Indication if oncoming lane is dark 0 = oncoming lane dark 1 = oncoming lane not dark	0 to 1	n/a
approachingJunction	bitfield bit 4	n/a	Indication when approaching a junction 0 = not approaching junction 1 = approaching junction	0 to 1	n/a
lightNoisyScene	bitfield bit 5	n/a	Indication if scene is noisy: 0 = no noisy scene 1 = noisy scene	0 to 1	n/a

[🔍] Will not Have]

[FOR SW3 thru SW5]


⚠ In Review, MAPC-67491 -

eyeq_active_light_sensor_info_t -- SW 3.0

Name	eyeq_active_light_sensor_info_t				
Type	structure		Contents: High level scene characteristics, image info from AHBC and array of light spots from vision used in EYEQ_VIS_LIGHT_SENSOR_DATA_MSG (0xE1)		
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The time-stamp of the vehicle state data based on the sync pulse received from the EyeQ.	0 to 2 ⁶⁴ - 1	us
activeLightSpots	eyeq_active_light_spot_t	E_EYEQ_MAX_ACTIVE_LIGHT_SPOTS	List of active light spots. See information below on ordering of the spots within the array.	n/a	n/a
reflectiveSigns	eyeq_reflective_signs_t	E_EYEQ_MAX_REFLECTIVE_SIGNS	List of reflective signs.	n/a	n/a
frameIndex	uint32_t	n/a	The index of the vision frame used to update AHBC information.	0 to 4294967295	n/a
vehIndexUsed	uint32_t	n/a	The index of the vehicle state data used when calculating AHBC information.	0 to 4294967295	n/a
imageIndex	uint16_t	n/a	The index of the camera image used to update AHBC information.	0 to 65535	n/a

ahbcAvailable	Enum (uint8_t)	n/a	AHBC available or not (availability of technology) 0 = Off 1 = Partial 2 = Full	0 to 2	n/a
gridFrequency	uint8_t	n/a	Street lamp frequency used by the VFP. 0x00 = Undefined 0x01 = 50 Hz 0x02 = 60 Hz STORED in NVM and sent in Init message as gridFrequency.	0 to 2	n/a
numOfActiveLightSpots	uint8_t	n/a	Number of active light spots	0 to E_EYEQ_MAX_ACTIVE_LIGHT_SPOTS	n/a
numOfReflectiveSigns	uint8_t	n/a	Number of reflective signs	0 to E_EYEQ_MAX_REFLECTIVE_SIGNS	n/a
clearFieldOfView	Enum (uint8_t)	n/a	Detection of clear field of detection: 0 = Unknown 1 = No Clear Field-Of-View 2 = Clear Field-Of-View	0 to 2	n/a
beamRequest	uint8_t	n/a	Camera requests AHBC 'ON' (based on driving situation like other vehicles, city-lights etc...) Coding 0 = OFF (high beam OFF) 1 = ON (high beam ON)	0 to 1	n/a
eventsDetected	bitfield	n/a	Bit 0 = No switch reason (Not Supported) Bit 1 = Oncoming Vehicle Bit 2 = Preceding Vehicle Bit 3 = Speed Limit Bit 4 = Ambient Light Bit 5 = Village Detection Bit 6 = Fog Detection Bit 7 = Highway ModeBit Bit 8 = Delay (hysteresis) Bit 9 = Oncoming lane not dark Bit 10 = Too many preceding Spots (not implemented) Bit 11 = Curve status Bit 12 = highSpeedStatus (not implemented) Bit 13 = Oncoming Vehicle Delay Bit 14 = Preceding Vehicle Delay Bit 15 = Village Detection Delay Note: Some bits may be set independent of high/low beam decision, e.g. oncoming vehicle, highway mode.		
fogDetected	bitfield bit 0	n/a	0= no fog detected 1= fog detected	0 to 1	n/a
highwayDetected	bitfield bit 1	n/a	0= no highway detected 1= highway detected	0 to 1	n/a
villageDetected	bitfield bit 2	n/a	True if the host vehicle is driving in a village 0= no village detected 1= village detected	0 to 1	n/a
oncomingLaneNotDark	bitfield bit 3	n/a	Indication if oncoming lane is dark 0 = oncoming lane dark 1 = oncoming lane not dark	0 to 1	n/a
approachingJunction	bitfield bit 4	n/a	Indication when approaching a junction: 0= not approaching junction	0 to 1	n/a

			1- approaching junction		
lightNoisyScene	bitfield bit 5	n/a	Indication if scene is noisy: 0 – no noisy scene 1 – noisy scene	0 to 1	n/a
lightCone	bitfield bit 6	n/a	Light cone detection: 0 = no light cone 1 = light cone detected	0 to 1	n/a

 Will not Have]

✓ Approved, MAPC-67492 - eyeq_active_light_sensor_info_t -- [\[FOR SW6 and Later Releases \]](#)

Name eyeq_active_light_sensor_info_t					
Type	structure		Contents: High level scene characteristics, image info from AHBC and array of light spots from vision used in EYEQ_VIS_LIGHT_SENSOR_DATA_MSG (0xE1)		
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The timestamp represents the effective time of these measurements in the Host time frame.	0 to 2 ⁶⁴ – 1	us
activeLightSpots	eyeq_active_light_spot_t	E_EYEQ_MAX_ACTIVE_LIGHT_SPOTS	List of active light spots. See information below on ordering of the spots within the array.	n/a	n/a
reflectiveSigns	eyeq_reflective_signs_t	E_EYEQ_MAX_REFLECTIVE_SIGNS	List of reflective signs.	n/a	n/a
frameIndex	uint32_t	n/a	The index of the vision frame used to update AHBC information.	0 to 4294967295	n/a
vehIndexUsed	uint32_t	n/a	The index of the vehicle state data used when calculating AHBC information.	0 to 4294967295	n/a
imageIndex	uint16_t	n/a	The index of the camera image used to update AHBC information.	0 to 65535	n/a
ahbcAvailable	Enum (uint8_t)	n/a	AHBC available or not (availability of technology) 0 = Off 1 = Partial 2 = Full	0 to 2	n/a
gridFrequency	uint8_t	n/a	Street lamp frequency used by the VFP. 0x00 = Undefined 0x01 = 50 Hz 0x02 = 60 Hz STORED in NVM and sent in Init message as gridFrequency.	0 to 2	n/a
numOfActiveLightSpots	uint8_t	n/a	Number of active light spots	0 to E_EYEQ_MAX_ACTIVE_LIGHT_SPOTS	n/a
numOfReflectiveSigns	uint8_t	n/a	Number of reflective signs	0 to E_EYEQ_MAX_REFLECTIVE_SIGNS	n/a
clearFieldOfView	Enum (uint8_t)	n/a	Detection of clear field of detection: 0 = Unknown 1 = No Clear Field-Of-View 2 = Clear Field-Of-View	0 to 2	n/a
beamRequest	uint8_t	n/a	Camera requests AHBC 'ON' (based on driving situation like other vehicles, city-lights etc...) Coding 0 = OFF (high beam OFF)	0 to 1	n/a

			1 = ON (high beam ON)		
inTunnel	Uint8_t	n/a	Indicates whether the Host vehicle is currently in a tunnel: 0=UNKNOWN 1=FALSE 2=TRUE	0 to 2	n/a
eventsDetected	bitfield	n/a	Bit 0 = No switch reason (Not Supported) Bit 1 = Oncoming Vehicle Bit 2 = Preceding Vehicle Bit 3 = Speed Limit Bit 4 = Ambient Light Bit 5 = Village Detection Bit 6 = Fog Detection Bit 7 = Highway ModeBit Bit 8 = Delay (hysteresis) Bit 9= Oncoming lane not dark Bit 10 = Too many preceding Spots (not implemented) Bit 11= Curve status Bit 12 = highSpeedStatus (not implemented) Bit 13 = Oncoming Vehicle Delay Bit 14 = Preceding Vehicle Delay Bit 15 = Village Detection Delay Note: Some bits may be set independent of high/low beam decision, e.g. oncoming vehicle, highway mode.		
fogDetected	bitfield bit 0	n/a	0= no fog detected 1= fog detected	0 to 1	n/a
highwayDetected	bitfield bit 1	n/a	0= no highway detected 1= highway detected	0 to 1	n/a
villageDetected	bitfield bit 2	n/a	True if the host vehicle is driving in a village 0= no village detected 1= village detected	0 to 1	n/a
oncomingLaneNotDark	bitfield bit 3	n/a	Indication if oncoming lane is dark 0 = oncoming lane dark 1= oncoming lane not dark	0 to 1	n/a
approachingJunction	bitfield bit 4	n/a	Indication when approaching a junction: 0- not approaching junction 1- approaching junction	0 to 1	n/a
lightNoisyScene	bitfield bit 5	n/a	Indication if scene is noisy: 0 – no noisy scene 1 – noisy scene	0 to 1	n/a
lightCone	bitfield bit 6	n/a	Light cone detection: 0 = no light cone 1 = light cone detected	0 to 1	n/a

The timestamp represents the effective time of these measurements in the Host time frame.

The timestamp represents the effective time

of these measurements in the Host time frame.

[Should Have]

11.2 eyeq_active_light_spot_t

eyeq_active_light_spot_t -- SW 2.2

In Review, MAPC-67494 - [FOR SW2.2 and Previous Releases]

Name					
Type					
structure			Contents: Low level info on one light spot used in eyeq_active_light_sensor_info_t		
Member Name	Type	Array Size	Description	Range	Units
leftAngle	real32_t	n/a	Angle to the left border of the light object, relative to camera. Angles to the right of the sensor coordinate system are positive.	-0.838 to 0.838	Radians
rightAngle	real32_t	n/a	Angle to the right border of the light object, relative to camera. Angles to the right of the sensor coordinate system are positive.	-0.838 to 0.838	Radians
topAngle	real32_t	n/a	Angle to the top border of the light object, relative to camera. Angle below the horizon are positive.	-0.838 to 0.838	Radians
bottomAngle	real32_t	n/a	Angle to the bottom border of the light object, relative to camera. Angle below the horizon are positive.	-0.838 to 0.838	Radians
id	uint32_t	n/a	Unique ID for each active light spot.	0 to 2^32-1	n/a
longPos	uint16_t	n/a	Longitudinal position to the active light spot.	0 to 1200	m
pixelTop	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0, 0) – (1280, 960).	0 to 960	pixel
pixelBottom	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0, 0) – (1280, 960).	0 to 960	pixel
pixelLeft	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0, 0) – (1280, 960).	0 to 1280	pixel
pixelRight	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0, 0) – (1280, 960).	0 to 1280	pixel
classification	Enum (uint8_t)	n/a	The classification of the active light spot. 0 = None 1 = Headlamp 2 = Tail-lamp 3 = Pair of Headlamps 4 = Pair of Tail-lamps 5 = Truck Cabin Top Lights 6 = Weak Oncoming Pair of Headlamps OR Weak Oncoming Truck Cabin Top Lights or Weak Oncoming Single Headlamp (adding Weak Oncoming Single Headlamp for 3.18.1 bundle and later releases). 7 = Cluster of lamps	0 to 7	n/a

[Will not Have]

In Review, MAPC-67495 - [FOR SW3 and Previous Releases]

Name	eyeq_active_light_spot_t				
Type	structure			Contents: Low level info on one light spot used in eyeq_active_light_sensor_info_t	
Member Name	Type	Array Size	Description	Range	Units
leftAngle	real32_t	n/a	Angle to the left border of the light object, relative to camera. Angles to the right of the sensor coordinate system are positive.	-0.838 to 0.838	Radians
rightAngle	real32_t	n/a	Angle to the right border of the light object, relative to camera. Angles to the right of the sensor coordinate system are positive.	-0.838 to 0.838	Radians
topAngle	real32_t	n/a	Angle to the top border of the light object, relative to camera. Angle below the horizon are positive.	-0.838 to 0.838	Radians
bottomAngle	real32_t	n/a	Angle to the bottom border of the light object, relative to camera. Angle below the horizon are positive.	-0.838 to 0.838	Radians
id	uint32_t	n/a	Unique ID for each active light spot.	0 to 2^32-1	n/a
vdID	uint16_t	n/a	Vehicle ID of VD (Vehicle Detection) object, if available. 0 for no fusion with VD.	0 to 65535	n/a
longPos	uint16_t	n/a	Longitudinal position to the active light spot.	0 to 1200	m
pixelTop	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0, 0) – (1280, 960).	0 to 960	pixel
pixelBottom	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0, 0) – (1280, 960).	0 to 960	pixel
pixelLeft	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0, 0) – (1280, 960).	0 to 1280	pixel
pixelRight	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0, 0) – (1280, 960).	0 to 1280	pixel
classification	Enum (uint8_t)	n/a	The classification of the active light spot. 0 = None 1 = Headlamp 2 = Tail-lamp 3 = Pair of Headlamps 4 = Pair of Tail-lamps 5 = Truck Cabin Top Lights 6 = Weak Oncoming Pair of Headlamps OR Weak Oncoming Truck Cabin Top Lights or Weak Oncoming Single Headlamp (adding Weak Oncoming Single Headlamp for 3.18.1 bundle and later releases). 7 = Cluster of lamps	0 to 8	n/a
isTruck	bool	n/a	Indication if the VD object is a truck: 0 = not truck (or no VD object) 1 = truck	0 to 1	n/a

[] Will not Have]

✓ Approved, MAPC-67496 - eyeq_active_light_spot_t -- [FOR SW4.0 AND LATER RELEASES]

Name	eyeq_active_light_spot_t				
Type	structure			Contents: Low level info on one light spot used in eyeq_active_light_sensor_info_t	
Member Name	Type	Array Size	Description	Range	Units
leftAngle	real32_t	n/a	Angle to the left border of the light object, relative to camera. Angles to the right of the sensor coordinate system are positive.	-0.838 to 0.838	Radians
rightAngle	real32_t	n/a	Angle to the right border of the light object, relative to camera. Angles to the right of the sensor coordinate system are positive.	-0.838 to 0.838	Radians
topAngle	real32_t	n/a	Angle to the top border of the light object, relative to camera. Angle Above the horizon are positive.	-0.838 to 0.838	Radians
bottomAngle	real32_t	n/a	Angle to the bottom border of the light object, relative to camera. Angle Above the horizon are positive.	-0.838 to 0.838	Radians
id	uint32_t	n/a	Unique ID for each active light spot.	0 to 2^32-1	n/a
vdID	uint16_t	n/a	Vehicle ID of VD (Vehicle Detection) object, if available. 0 for no fusion with VD.	0 to 65535	n/a
longPos	uint16_t	n/a	Longitudinal position to the active light spot.	0 to 1200	m
pixelTop	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0, 0) – (1824, 960).	0 to 960	pixel
pixelBottom	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0, 0) – (1824, 960).	0 to 960	pixel
pixelLeft	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0, 0) – (1824, 960).	0 to 1824	pixel
pixelRight	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0, 0) – (1824, 960).	0 to 1824	pixel
classification	Enum (uint8_t)	n/a	The classification of the active light spot. 0 = None 1 = Headlamp 2 = Tail-lamp 3 = Pair of Headlamps 4 = Pair of Tail-lamps 5 = Truck Cabin Top Lights 6 = Weak Oncoming Pair of Headlamps OR Weak Oncoming Truck Cabin Top Lights or Weak Oncoming Single Headlamp (adding Weak Oncoming Single Headlamp for 3.18.1 bundle and later releases). 7 = Cluster of lamps 8 = Sidelong Light	0 to 8	n/a

isTruck	bool	n/a	Indication if the VD object is a truck: 0 = not truck (or no VD object) 1 = truck	0 to 1	n/a
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[Should Have]

Clustering Procedure:

1. Select the 7 objects which are farthest to the left. Report them as single object and do no clustering.
2. Select the 7 objects which are farthest to the right. Report them as single object and do no clustering
3. Combine all remaining objects in one cluster

If there are less than 15 objects no clustering will be carried out.

If there are 15 or more objects clustering will be done as follows:

- First 7 objects from the left side are categorized as single objects
- First 7 objects from the right side are also categorized as single objects
- If there is only 1 object left in the middle it's categorized as a single object
- If there are more than one object in the middle, they are clustered into one clustered object

11.3 eyeq_reflective_signs_t [FOR SW2.2 AND Later Releases]

✓ Approved, MAPC-67498 -

Name eyeq_reflective_signs_t					
Type	structure		Contents: Low level reflective signs used in eyeq_active_light_sensor_info_t		
Member Name	Type	Array Size	Description	Range	Units
lightSignLeftAngle	real32_T	n/a	Angle to the left border of the reflective sign, relative to the camera. Negative: left of the camera	-0.5 to 0.5	radians
lightSignRightAngle	real32_T	n/a	Angle to the right border of the reflective sign, relative to the camera. Negative: left of the camera	-0.5 to 0.5	radians
lightSignBottomAngle	real32_T	n/a	Angle to the bottom border of the reflective sign, relative to the camera. Negative: below horizon	-0.5 to 0.5	radians
lightSignTopAngle	real32_T	n/a	Angle to the top border of the reflective sign, relative to the camera. Negative: below horizon	-0.5 to 0.5	radians
lightSignID	uint32_t	n/a	Highly reflective sign ID Unique ID for each reflective sign. As new reflective signs are detected, the id counts counts up from 1 to 255 and then start again with 1. An ID of 0 means no object. 0x00: No object 0x01: Object ID1 0x02: Object ID2 0x03: Object ID3 ... 0x7F: Object ID127	0 to 255	SED
lightSignDistance	uint16_t	n/a	Highly reflective sign distance in meter	0 to 1000	meters
lightSignGlareLevelMax	uint8_t	n/a	Highly reflective sign glare level (maximum)	0 to 100	SED
lightSignGlareLevelCurrent	uint8_t	n/a	Highly reflective sign glare level (current)	0 to 100	SED

[Should Have]

12 Traffic Sign Recognition

12.1 eyeq_traffic_sign_info_t

✓ Approved, MAPC-67501 -

Name	eyeq_traffic_sign_info_t				
Type	Structure	Contents: High level traffic sign info sent in EYEQ_VIS_TRAFFIC_SIGNS_MSG (0xE2)			
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The time-stamp of the vehicle state data based on the sync pulse received from the EyeQ.	0 to $2^{64} - 1$	us
frameIndex	uint32_t	n/a	The index of the latest vision frame used to detect traffic sign information.	0 to 4294967295	n/a
vehIndexUsed	uint32_t	n/a	The index of the vehicle state data used when calculating traffic sign information.	0 to 4294967295	n/a
trafficSigns	eyeq_traffic_sign_t	E_EYEQ_MAX_TRAFFIC_SIGNS	Detected traffic signs.	n/a	n/a
roadMarkings	eyeq_road_marking_info_t	n/a	Road markings.	n/a	n/a
imageIndex	uint16_t	n/a	The index of the camera image used to update traffic sign information.	0 to 65535	n/a
currentMarket	Enum (uint8_t)	n/a	Detected TSR Secondary Market Information based on vision scenarios. 0=WORLD 1=EUROPE 2=GULF 3=USA 4=CANADA 5=JAPAN 6=CHINA 7=SOUTH_AFRICA 8=KOREA 9=AUSTRALIA 10=UK STORED in NVM and sent in Init message as regionCode.	0 to 10	n/a
numberTrafficSigns	uint8_t	n/a	Count of Traffic Signs to be reported this processing cycle.	0 to E_EYEQ_MAX_TRAFFIC_SIGNS	n/a

[] Should Have]

12.2 eyeq_traffic_sign_t

eyeq_traffic_sign_t -- **FOR SW3.0 and PREVIOUS RELEASES**

⚠ In Review, MAPC-67503 -

Name	eyeq_traffic_sign_t				
Type	structure	Contents: Low level traffic sign info used by eyeq_traffic_sign_info_t			
Member Name	Type	Array Size	Description	Range	Units
signLongPosition	real32_t	n/a	Longitudinal distance estimation from detected sign to sensor. Set to 127 when the distance is unknown.	0 to 127	meters
signLatPosition	real32_t	n/a	Lateral distance estimation from detected sign to sensor. A negative value indicates the sign is on the left and a positive value indicates the sign is on the right. Set to -128 when the distance is unknown.	-63 to 63	meters
signHeight	real32_t	n/a	Estimated height of sign relative to the sensor.	-16 to 16	meters
signConfidence	real32_t	n/a	The confidence in the certainty of the detected traffic sign and its information.	0 to 1	n/a
signMeasurementsConfidence	real32_t	n/a	The confidence of the estimated measurements (longitudinal distance, lateral distance and height). *** Under development ***	0 to 1	n/a
signSuppConfidence	real32_t	n/a	The confidence in the certainty of the detected supplementary signs and their information. *** Under development ***	0 to 1	n/a
signPositionBottom	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0,0) to (1280,960)	0 to 960	pixel
signPositionLeft	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0,0) to (1280,960)	0 to 1280	pixel
signPositionRight	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0,0) to (1280,960)	0 to 1280	pixel
signPositionTop	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0,0) to (1280,960)	0 to 960	pixel
signType	uint16_t	n/a	The detected sign from Appendix A.	0 to 414	n/a
signSupplementalType1	uint8_t	n/a	The detected supplemental sign from Appendix A.	0 to 255	n/a
signSupplementalType2	uint8_t	n/a	The detected supplemental sign from Appendix A.	0 to 255	n/a
signID	uint8_t	n/a	The unique ID assigned to this sign group. The actual ID is this number + 1.	0 to 19	n/a
signRelevantDecision	Enum (uint8_t)	n/a	0=RELEVANT_SIGN 1=HIGHWAY_EXIT_SIGN	0 to 10	n/a

			2=LANE_ASSIGNMENT_SIGN 3=PARRALEL_ROAD_SIGN 4=SIGN_ON_TURN 5=FAR_IRRELEVANT_SIGN 6=INTERNAL_SIGN_CONTRADICTION 7=ERROR_SIGN_CODE 8= CIPV_IN_FRONT 9= CONTRADICT_ARROW_SIGN 10=OTHER_FILTER_REASON		
signFilterType	Enum (uint8_t)	n/a	0=NO_SLI_FILTER, 1=IRRELEVANT_SIGN, 2=TRUCK_FILTER, 3=EMBEDDED_FILTER, 4=MINIMUM_FILTER, 5=ROAD_NUMBER_FILTER	0 to 5	n/a

Note: signType, signSupplementalType1 and signSupplementalType2 are defined in Appendix A. [] Will not Have]

✓ Approved, MAPC-67504 - eyeq_traffic_sign_t -- [FOR SW4 and LATER RELEASES]


Name eyeq_traffic_sign_t					
Type	structure	Contents: Low level traffic sign info used by eyeq_traffic_sign_info_t			
Member Name	Type	Array Size	Description	Range	Units
signLongPosition	real32_t	n/a	Longitudinal distance estimation from detected sign to sensor. Set to 127 when the distance is unknown.	0 to 127	meters
signLatPosition	real32_t	n/a	Lateral distance estimation from detected sign to sensor. A negative value indicates the sign is on the left and a positive value indicates the sign is on the right. Set to -128 when the distance is unknown.	-63 to 63	meters
signHeight	real32_t	n/a	Estimated height of sign relative to the sensor.	-16 to 16	meters
signConfidence	real32_t	n/a	The confidence in the certainty of the detected traffic sign and its information.	0 to 1	n/a
signSuppConfidence1	real32_t	n/a	The confidence in the certainty of the detected supplementary signs (signSupplementalType1) and their information.	0 to 1	n/a
signSuppConfidence2	real32_t	n/a	The confidence in the certainty of the detected supplementary signs (signSupplementalType2) and their information.	0 to 1	n/a
signPositionBottom	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0,0) to camera max (1280x960 or 1824x944)	0 to 960	pixel
signPositionLeft	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0,0) to camera max (1280x960 or 1824x944)	0 to 1824	pixel
signPositionRight	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0,0) to camera max (1280x960 or 1824x944)	0 to 1824	pixel
signPositionTop	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0,0) to camera max (1280x960 or 1824x944)	0 to 960	pixel
signType	uint16_t	n/a	The detected sign from Appendix A.	0 to 414	n/a
signSupplementalType1	uint8_t	n/a	The detected supplemental sign from Appendix A.	0 to 255	n/a
signSupplementalType2	uint8_t	n/a	The detected supplemental sign from Appendix A.	0 to 255	n/a
signID	uint8_t	n/a	The unique ID assigned to this sign group. The actual ID is this number + 1.	0 to 19	n/a
signRelevantDecision	Enum (uint8_t)	n/a	0=RELEVANT_SIGN 1=HIGHWAY_EXIT_SIGN 2=LANE_ASSIGNMENT_SIGN 3=PARRALEL_ROAD_SIGN 4=SIGN_ON_TURN 5=FAR_IRRELEVANT_SIGN 6=INTERNAL_SIGN_CONTRADICTION 7=ERROR_SIGN_CODE 8= CIPV_IN_FRONT 9= CONTRADICT_ARROW_SIGN 10=OTHER_FILTER_REASON	0 to 10	n/a
signFilterType	Enum (uint8_t)	n/a	0=NO_SLI_FILTER, 1=IRRELEVANT_SIGN, 2=TRUCK_FILTER, 3=EMBEDDED_FILTER, 4=MINIMUM_FILTER, 5=ROAD_NUMBER_FILTER	0 to 5	n/a

Note: signType, signSupplementalType1 and signSupplementalType2 are defined in Appendix A. [] Will not Have]


✓ Approved, MAPC-67505 - eyeq_traffic_sign_t

Name eyeq_traffic_sign_t					
Type	structure	Contents: Low level traffic sign info used by eyeq_traffic_sign_info_t			
Member Name	Type	Array Size	Description	Range	Units
signLongPosition	real32_t	n/a	Longitudinal distance estimation from detected sign to sensor. Set to 127 when the distance is	0 to 127	meters


signLatPosition	real32_t	n/a	unknown. Lateral distance estimation from detected sign to sensor. A negative value indicates the sign is on the left and a positive value indicates the sign is on the right. Set to -128 when the distance is unknown.	-63 to 63	meters
signHeight	real32_t	n/a	Estimated height of sign relative to the sensor.	-16 to 16	meters
signConfidence	real32_t	n/a	The confidence in the certainty of the detected traffic sign and its information.	0 to 1	n/a
signSuppConfidence1	real32_t	n/a	The confidence in the certainty of the detected supplementary signs (signSupplementalType1) and their information. *** Under development ***	0 to 1	n/a
signSuppConfidence2	real32_t	n/a	The confidence in the certainty of the detected supplementary signs (signSupplementalType2) and their information. *** Under development ***	0 to 1	n/a
relevancyConfidence	real32_t	n/a	Relevancy confidence for speed-limit signs (evaluation signal)	0 to 1	n/a
signPositionBottom	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0,0) to camera max (1280x960 or 1824x944)	0 to 960	pixel
signPositionLeft	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0,0) to camera max (1280x960 or 1824x944)	0 to 1824	pixel
signPositionRight	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0,0) to camera max (1280x960 or 1824x944)	0 to 1824	pixel
signPositionTop	uint16_t	n/a	The rectangle coordinate relative to the left bottom corner of the processed image – in the image coordinate of between (0,0) to camera max (1280x960 or 1824x944)	0 to 960	pixel
signType	uint16_t	n/a	The detected sign from Appendix A.	0 to 414	n/a
signSupplementalType1	uint8_t	n/a	The detected supplemental sign from Appendix A.	0 to 255	n/a
signSupplementalType2	uint8_t	n/a	The detected supplemental sign from Appendix A.	0 to 255	n/a
signID	uint8_t	n/a	The unique ID assigned to this sign group. The actual ID is this number + 1.	0 to 19	n/a
signRelevantDecision	Enum (uint8_t)	n/a	0=RELEVANT_SIGN 1=HIGHWAY_EXIT_SIGN 2=LANE_ASSIGNMENT_SIGN 3=PARALLEL_ROAD_SIGN 4=SIGN_ON_TURN 5=FAR_IRRELEVANT_SIGN 6=INTERNAL_SIGN_CONTRADICTION 7=ERROR_SIGN_CODE 8= CIPV_IN_FRONT 9= CONTRADICT_ARROW_SIGN 10=OTHER_FILTER_REASON	0 to 10	n/a
signFilterType	Enum (uint8_t)	n/a	0=NO_SLI_FILTER, 1=IRRELEVANT_SIGN, 2=TRUCK_FILTER, 3=EMBEDDED_FILTER, 4=MINIMUM_FILTER, 5=ROAD_NUMBER_FILTER	0 to 5	n/a

Note: signType, signSupplementalType1 and signSupplementalType2 are defined in Appendix A
 Should Have]


12.3 eyeq_road_marking_info_t [for SW4.1 and earlier releases]

 Approved, MAPC-67507 -

Name	eyeq_road_marking_info_t				
Type	Structure	Contents: High level road marking info used in eyeq_traffic_sign_info_t			
Member Name	Type	Array Size	Description	Range	Units
roadMarkingStopLines	eyeq_road_marking_stopleveline_t	E_EYEQ_MAX_ROAD_MARKING_STOP_LINES	List of stop lines	n/a	n/a
roadMarkingArrows	eyeq_road_marking_arrow_t	E_EYEQ_MAX_ROAD_MARKING_ARROWS	List of road arrows	n/a	n/a
numberOfArrowsMarkings	uint8_t	n/a	The number of arrows markings	0-5	n/a
numberOfStopLinesMarkings	uint8_t	n/a	The number of stop line marking	0-4	n/a

 Will not Have]

12.4 eyeq_road_marking_info_t [FOR SW5.0 and LATER RELEASES]

 Approved, MAPC-67509 - eyeq_road_marking_info_t [FOR SW5.0 and LATER RELEASES]

Name	eyeq_road_marking_info_t				
Type	Structure	Contents: High level road marking info used in eyeq_traffic_sign_info_t			
Member Name	Type	Array Size	Description	Range	Units
roadMarkingStopLines	eyeq_road_marking_stopleveline_t	E_EYEQ_MAX_ROAD_MARKING_STOP_LINES	List of stop lines	n/a	n/a
roadMarkingArrows	eyeq_road_marking_arrow_t	E_EYEQ_MAX_ROAD_MARKING_ARROWS	List of road arrows	n/a	n/a
roadMarkingSpeedLimits	eyeq_road_marking_speedlimit_t	E_EYEQ_MAX_ROAD_MARKING_SPEED_LIMIT	List of road speed limit	n/a	n/a
roadMarkingCrossings	eyeq_road_marking_crossing_t	E_EYEQ_MAX_ROAD_MARKING_CROSSING	List of road crossing	n/a	n/a
numberOfArrowsMarkings	uint8_t	n/a	The number of arrows markings	0- E_EYEQ_MAX_ROAD_MARKING_ARROWS	n/a

numberOfStopLinesMarkings	uint8_t	n/a	The number of stop line marking	0- E_EYEQ_MAX_ROAD_MARKING_STOP_LINES	n/a
numberOfSpeedLimitMarkings	uint8_t	n/a	The number of road speed limit markings	0- E_EYEQ_MAX_ROAD_MARKING_SPEED_LIMIT	n/a
numberOfCrossingMarkings	uint8_t	n/a	The number of road crossing marking	0- E_EYEQ_MAX_ROAD_MARKING_CROSSING	n/a

[] Should Have]

12.5 eyeq_road_marking_arrow_t [FOR SW4.1 and EARLIER RELEASES]

✓ Approved, MAPC-67511 -

Name	eyeq_road_marking_arrow_t				
Type	Structure	Contents: Low level road marking 'Arrow' type info used in eyeq_road_marking_info_t			
Member Name	Type	Array Size	Description	Range	Units
arrowLatPosition	real32_t	n/a	The lateral distance to the center of the road arrow	-32 to +31	meters
arrowLongPosition	real32_t	n/a	The longitudinal distance to the center of the road arrow	-5 to 200	meters
confidence	real32_t	n/a	Probability that the object is actually a real road arrow	0 to 1	n/a
id	uint8_t	n/a	Arrow's id	0 to 255	n/a
arrowType	Enum (uint8_t)	n/a	The type of the arrow: 0 = ARROW_STRAIGHT 1 = ARROW_STRAIGHT_RIGHT 2 = ARROW_STRAIGHT_LEFT 3 = ARROW_RIGHT 4 = ARROW_LEFT 5 = ARROW_ONCOMING 6 = ARROW_CAR_POOL 7 = ARROW_STRAIGHT_LEFT_RIGHT 8 = ARROW_LEFT_RIGHT	0 to 8	n/a

[] Will not Have]

12.6 eyeq_road_marking_arrow_t [FOR SW5.0 and LATER RELEASES]

✓ Approved, MAPC-67513 - eyeq_road_marking_arrow_t [FOR SW5.0 and LATER RELEASES]

Name	eyeq_road_marking_arrow_t				
Type	Structure	Contents: Low level road marking 'Arrow' type info used in eyeq_road_marking_info_t			
Member Name	Type	Array Size	Description	Range	Units
arrowLatPosition	real32_t	n/a	The lateral distance to the center of the road arrow	-32 to +31	meters
arrowLongPosition	real32_t	n/a	The longitudinal distance to the center of the road arrow	-5 to 200	meters
confidence	real32_t	n/a	Probability that the object is actually a real road arrow	0 to 1	n/a
id	uint8_t	n/a	Arrow's id	0 to 255	n/a
arrowType	uint16_t	n/a	arrow Type (from Appendix A).	0 to 414	n/a

[] Should Have]

12.7 eyeq_road_marking_stopline_t [for sw4.1 and EARLIER Releases]

✓ Approved, MAPC-67515 -

Name	eyeq_road_marking_stopline_t				
Type	Structure	Contents: Low level road marking 'Stop Line' type info used in eyeq_road_marking_info_t			
Member Name	Type	Array Size	Description	Range	Units
lateralDistance	real32_t	n/a	The lateral distance to the center of the road arrow	-100 to +100	meters
longitudinalDistance	real32_t	n/a	The longitudinal distance to the center of the road arrow	-10 to +200	meters
confidence	real32_t	n/a	Probability that the object is actually a real stop line	0 to 1	n/a
angle	real32_t	n/a	Stop line angle in real world in radians. \ - positive angle, / - negative angle.	-3 to 3	rad
isRelevant	bool	n/a	Specify whether the stop line is relevant to the host vehicle.	0 to 1	n/a
stopLineStatus	Enum (uint8_t)	n/a	Is stop line location measurement based on location in image (status=1) or predicted based on vehicle motion (status=2) 0=Unknown 1=In_Image 2=Predicted	0 to 2	n/a
id	uint8_t	n/a	Stop line's id	0 to 255	n/a
stopLineType	Enum (uint8_t)	n/a	Type of stop line: 0=solid 8=Dashed 9=Triangular	0 to 9	n/a
stopLineColorType	Enum (uint8_t)	n/a	Color of stop line: 0=Green_Blue 1=White 2=Yellow_Orange_Red	0 to 2	n/a

[] Will not Have]

12.8 eyeq_road_marking_stopline_t [FOR SW5.0 and LATER RELEASES]

✓ Approved, MAPC-67517 - eyeq_road_marking_stopline_t [FOR SW5.0 and LATER RELEASES]

Name	eyeq_road_marking_stopline_t				
Type	Structure	Contents: Low level road marking 'Stop Line' type info used in eyeq_road_marking_info_t			
Member Name	Type	Array Size	Description	Range	Units
lateralDistance	real32_t	n/a	The lateral distance to the center of the road arrow	-100 to +100	meters
longitudinalDistance	real32_t	n/a	The longitudinal distance to the center of the road arrow	-10 to +200	meters
confidence	real32_t	n/a	Probability that the object is actually a real stop line	0 to 1	n/a
angle	real32_t	n/a	Stop line angle in real world in radians. \ - positive angle, / - negative angle.	-3 to 3	rad
isRelevant	bool	n/a	Specify whether the stop line is relevant to the host vehicle.	0 to 1	n/a

stopLineStatus	Enum (uint8_t)	n/a	Is stop line location measurement based on location in image (status=1) or predicted based on vehicle motion (status=2) 0=Unknown 1=In_Image 2=Predicted	0 to 2	n/a
id	uint8_t	n/a	Stop line' s id	0 to 255	n/a
stopLineType	uint16_t	n/a	stopLine type (from Appendix A).	0 to 414	n/a
stopLineColorType	Enum (uint8_t)	n/a	Color of stop line: 0=Green_Blue 1=White 2=Yellow Orange_Red	0 to 2	n/a

[] Should Have]

12.9 eyeq_road_marking_speedlimit_t [NEW FOR SW5.0 and LATER RELEASES]

✓ Approved, MAPC-67519 - eyeq_road_marking_speedlimit_t [NEW FOR SW5.0 and LATER RELEASES]

Name	eyeq_road_marking_speedlimit_t				
Type	Structure	Contents: Low level road speed limit marking info used in eyeq_road_marking_info_t			
Member Name	Type	Array Size	Description	Range	Units
speedLimitLatPosition	real32_t	n/a	The lateral distance to the center of the road speed limit	-32 to +31	meters
speedLimitLongPosition	real32_t	n/a	The longitudinal distance to the center of the road speed limit	-5 to 200	meters
confidence	real32_t	n/a	Probability that the object is actually a real road speed limit	0 to 1	n/a
id	uint8_t	n/a	Speed Limit' s id	0 to 255	n/a
speedLimitType	uint16_t	n/a	speedLimit type (from Appendix A).	0 to 414	n/a

[] Should Have]

12.10 eyeq_road_marking_crossing_t [NEW FOR SW5.0 and LATER RELEASES]

✓ Approved, MAPC-67521 - eyeq_road_marking_crossing_t [NEW FOR SW5.0 and LATER RELEASES]

Name	eyeq_road_marking_crossing_t				
Type	Structure	Contents: Low level road crossing marking info used in eyeq_road_marking_info_t			
Member Name	Type	Array Size	Description	Range	Units
crossingLatPosition	real32_t	n/a	The lateral distance to the center of the road crossing	-32 to +31	meters
crossingLongPosition	real32_t	n/a	The longitudinal distance to the center of the road crossing	-5 to 200	meters
confidence	real32_t	n/a	Probability that the object is actually a real road crossing	0 to 1	n/a
id	uint8_t	n/a	Crossing' s id	0 to 255	n/a
crossingType	uint16_t	n/a	crossing Type (from Appendix A).	0 to 414	n/a

[] Should Have]

12.11 eyeq_lane_decider_info_t

✓ Approved, MAPC-67523 - eyeq_lane_decider_info_t in EYEQ_VIS_ROAD_DATA_MSG will be implemented in SW7.0. Not used in any message.

Name	eyeq_lane_decider_info_t				
Type	Structure	Contents: Lane decider info type			
Member Name	Type	Array Size	Description	Range	Units
hostLaneStatus	Enum (uint8_t)	n/a	Lane status: NO_LANE = 0, ONCOMING = 1, PRECEDING = 2, HARD_SHOULDER = 3, CARPOOL_PRECEDING = 4, CARPOOL_ONCOMING = 5, CARPOOL_UNKNOWN = 6, UNKNOWN_CLASS = 7	0 to 7	n/a
leftLaneStatus	Enum (uint8_t)	n/a	Lane status: NO_LANE = 0, ONCOMING = 1, PRECEDING = 2, HARD_SHOULDER = 3, CARPOOL_PRECEDING = 4, CARPOOL_ONCOMING = 5, CARPOOL_UNKNOWN = 6, UNKNOWN_CLASS = 7	0 to 7	n/a
leftLeftLaneStatus	Enum (uint8_t)	n/a	Lane status: NO_LANE = 0, ONCOMING = 1, PRECEDING = 2, HARD_SHOULDER = 3, CARPOOL_PRECEDING = 4, CARPOOL_ONCOMING = 5, CARPOOL_UNKNOWN = 6, UNKNOWN_CLASS = 7	0 to 7	n/a
rightLaneStatus	Enum (uint8_t)	n/a	Lane status: NO_LANE = 0, ONCOMING = 1, PRECEDING = 2, HARD_SHOULDER = 3, CARPOOL_PRECEDING = 4, CARPOOL_ONCOMING = 5, CARPOOL_UNKNOWN = 6, UNKNOWN_CLASS = 7	0 to 7	n/a
rightRightLaneStatus	Enum (uint8_t)	n/a	Lane status: NO_LANE = 0, ONCOMING = 1, PRECEDING = 2, HARD_SHOULDER = 3, CARPOOL_PRECEDING = 4, CARPOOL_ONCOMING = 5, CARPOOL_UNKNOWN = 6, UNKNOWN_CLASS = 7	0 to 7	n/a

[] Should Have]

13 Vision Objects

13.1.1 eyeq_vision_obstacles_info_t [FOR SW4.1 and EARLIER RELEASES]

✓ Approved, MAPC-67526 -

Type	Structure		Contents: High level vision obstacle info used in EYEQ_VIS_OBSTACLES_MSG (0xE4)		
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The time-stamp of the vehicle state data based on the sync pulse received from the EyeQ.	0 to $2^{64} - 1$	us
frameIndex	uint32_t	n/a	The index of the vision frame used to detect vision obstacles.	0 to 4294967295	n/a
vehIndexUsed	uint32_t	n/a	The index of the vehicle state data used when calculating obstacle information.	0 to 4294967295	
visObs	eyeq_vision_object_t	E_EYEQ_MAX_VISION_OBJECTS	Array of vision obstacles, including their states and measurements.	n/a	n/a
imageIndex	uint16_t	n/a	The index of the camera image used to update vision obstacle information.	0 to 65535	n/a

[] Will not Have]

13.2 eyeq_vision_obstacles_info_t [FOR SW5.0 and LATER RELEASES]

✓ Approved, MAPC-67528 - eyeq_vision_obstacles_info_t [FOR SW5.0 and LATER RELEASES]

Type	Structure		Contents: High level vision obstacle info used in EYEQ_VIS_OBSTACLES_MSG (0xE4)		
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The time-stamp of the vehicle state data based on the sync pulse received from the EyeQ.	0 to $2^{64} - 1$	us
frameIndex	uint32_t	n/a	The index of the vision frame used to detect vision obstacles.	0 to 4294967295	n/a
vehIndexUsed	uint32_t	n/a	The index of the vehicle state data used when calculating obstacle information.	0 to 4294967295	
crc_16	uint16_t	n/a	"Used to validate that no bits were corrupted in this safety critical message. Using CRC16 based on CRC-16 Ethernet protocol X16+X12+ X5+1 init value = 0xFFFFFFF. The CRC shall be calculated on the following 1. rollingFrameCount 2. visObs (complete) structs QM signal.	Crc_16	n/a
visObs	eyeq_vision_object_t	E_EYEQ_MAX_VISION_OBJECTS	Array of vision obstacles, including their states and measurements.	n/a	n/a
imageIndex	uint16_t	n/a	The index of the camera image used to update vision obstacle information.	0 to 65535	n/a
rollingFrameCount	uint8_t	n/a	Counter for ASIL-B signals.	0 to 255	n/a

[] Should Have]

13.2.1 eyeq_vision_object_t [FOR SW4.1 and EARLIER RELEASES]

✓ Approved, MAPC-67530 -

Type	Structure		Contents: vision object information used in eyeq_vision_obstacles_info_t		
Member Name	Type	Array Size	Description	Range	Units
physicalState	eyeq_object_physical_state_t	n/a	Object' s physical state	n/a	n/a
angularState	eyeq_object_angular_state_t	n/a	Object' s angular state	n/a	n/a
imageBox	eyeq_object_image_box_t	n/a	Object' s geometric representation. Used for visualization purposes.	n/a	n/a
mobilityState	eyeq_object_mobility_state_t	n/a	Object' s mobility state	n/a	n/a
confidence	real32_t	n/a	Probability that the object exists	0 to 1	n/a
id	uint16_t	n/a	Object ID Invalid Object == any ID outside of Range (default invalid object ID is 0).	1 to E_EYEQ_MAX_VISION_OBJECTS	n/a
age	uint16_t	n/a	How many frames passed since the target' s approval	0 to 65535	n/a
classification	Enum (uint8_t)	n/a	The classification of the object. 0=car 1=truck 2=bike (motorcycle) 3=bicycle 4=pedestrian 5= general object (not implemented) 6= animal (not implemented) 7= uncertain_vehicle	0 to 5	n/a
isCipv	Enum (uint8_t)	n/a	Is the target the CIPV. Applies only to vehicles. 0 = not relevant 1 = no CIPV 2 = CIPV	0 to 2	n/a
laneAssignment	Enum (int8_t)	n/a	The lane the target occupies: -2 = LEFT_NEXT_NEXT -1 = LEFT_NEXT 0 = EGO_LANE 1 = RIGHT_NEXT 2 = RIGHT_NEXT_NEXT 3 = UNKNOWN	-2 to 3	n/a
lightIndicators	eyeq_object_light_indicator_t	n/a	Object' s light indicators	n/a	n/a
isPredicted	bitfield bit0	n/a	A flag that the object is only predicted and not detected directly 0 = object not predicted 1 = object is predicted	0 to 1	n/a
isInDrivableArea	bitfield bit1	n/a	Is the target in a drivable area. 0 = not in drivable area 1 = in drivable area	0 to 1	n/a
isVeryClose	bitfield bit2	n/a	Is the target very close to the host. Meant for situations where the target is so close that it' s hard to measure its distance 0 = not very close 1 = very close	0 to 1	n/a

[] Will not Have]

13.2.2 eyeq_vision_object_t [FOR SW5.0 and LATER RELEASES]

✓ Approved, MAPC-67532 - eyeq_vision_object_t [FOR SW5.0 and LATER RELEASES]

Type	structure		Contents: vision object information used in eyeq_vision_obstacles_info_t		
Member Name	Type	Array Size	Description	Range	Units
physicalState	eyeq_object_physical_state_t	n/a	Object' s physical state	n/a	n/a
angularState	eyeq_object_angular_state_t	n/a	Object' s angular state	n/a	n/a
imageBox	eyeq_object_image_box_t	n/a	Object' s geometric representation. Used for visualization purposes.	n/a	n/a
mobilityState	eyeq_object_mobility_state_t	n/a	Object' s mobility state	n/a	n/a
confidence	real32_t	n/a	Probability that the object exists. ASIL-B signal.	0 to 1	n/a
ttc_const_vel	real32_T	n/a	Obstacle Time-To-Collision (TTC) with the front bumper of the Ego vehicle. Applies only to Pedestrians and only to FCW warnings The prediction is based on a constant velocity. Set to 7 seconds if no valid TTC value. May need constant accel, OEM to confirm.	0 to 7	s
id	uint16_t	n/a	Object ID Invalid Object == any ID outside of Range (default invalid object ID is 0). ASIL-B signal	1 to E_EYEQ_MAX_VISION_OBJECTS	n/a
age	uint16_t	n/a	How many frames passed since the target' s approval	0 to 65535	n/a
classification	Enum (uint8_t)	n/a	The classification of the object. 0=car 1=truck 2=bike (motorcycle) 3=bicycle 4=pedestrian 5= general object (not implemented) 6= animal (not implemented) 7= uncertain_vehicle ASIL-B signal.	0 to 5	n/a
isCipv	Enum (uint8_t)	n/a	Is the target the CIPV. Applies only to vehicles. 0 = not relevant 1 = no CIPV 2 = CIPV	0 to 2	n/a
laneAssignment	Enum (int8_t)	n/a	The lane the target occupies: -2 = LEFT_NEXT_NEXT -1 = LEFT_NEXT 0 = EGO_LANE 1 = RIGHT_NEXT 2 = RIGHT_NEXT_NEXT 3 = UNKNOWN	-2 to 3	n/a
lightIndicators	eyeq_object_light_indicator_t	n/a	Object' s light indicators	n/a	n/a
isPredicted	bitfield bit0	n/a	A flag that the object is only predicted and not detected directly 0 = object not predicted 1 = object is predicted	0 to 1	n/a
isInDrivableArea	bitfield bit1	n/a	Is the target in a drivable area. 0 = not in drivable area 1 = in drivable area	0 to 1	n/a
isVeryClose	bitfield bit2	n/a	Is the target very close to the host. Meant for situations where the target is so close that it' s hard to measure its distance 0 = not very close 1 = very close	0 to 1	n/a

[Should Have]

13.2.3 eyeq_vision_object_t [FOR SW8.1 and LATER RELEASES]

✓ Approved, MAPC-67534 - eyeq_vision_object_t [FOR SW8.1 and LATER RELEASES]

Type	structure		Contents: vision object information used in eyeq_vision_obstacles_info_t		
Member Name	Type	Array Size	Description	Range	Units
physicalState	eyeq_object_physical_state_t	n/a	Object' s physical state	n/a	n/a
angularState	eyeq_object_angular_state_t	n/a	Object' s angular state	n/a	n/a
imageBox	eyeq_object_image_box_t	n/a	Object' s geometric representation. Used for visualization purposes.	n/a	n/a
mobilityState	eyeq_object_mobility_state_t	n/a	Object' s mobility state	n/a	n/a
confidence	real32_t	n/a	Probability that the object exists. ASIL-B signal.	0 to 1	n/a
ttc_const_vel	real32_T	n/a	Obstacle Time-To-Collision (TTC) with the front bumper of the Ego vehicle. Applies only to Pedestrians and only to FCW warnings The prediction is based on a constant velocity. Set to 7 seconds if no valid TTC value. May need constant accel, OEM to confirm.	0 to 7	s
age	uint32_t	n/a	How many frames passed since the target' s approval	0 to FFFF FFFF	n/a
id	uint16_t	n/a	Object ID Invalid Object == any ID outside of Range (default invalid object ID is 0). ASIL-B signal	1 to E_EYEQ_MAX_VISION_OBJECTS	n/a
classification	Enum (uint8_t)	n/a	The classification of the object. 0=car 1=truck 2=bike (motorcycle) 3=bicycle 4=pedestrian 5= general object (not implemented)	0 to 5	n/a

			6= animal (not implemented) 7= uncertain_vehicle ASIL-B signal.		
isCipv	Enum (uint8_t)	n/a	Is the target the CIPV. Applies only to vehicles. 0 = not relevant 1 = no CIPV 2 = CIPV	0 to 2	n/a
laneAssignment	Enum (int8_t)	n/a	The lane the target occupies: -2 = LEFT_NEXT_NEXT -1 = LEFT_NEXT 0 = EGO_LANE 1 = RIGHT_NEXT 2 = RIGHT_NEXT_NEXT 3 = UNKNOWN	-2 to 3	n/a
lightIndicators	eyeq_object_light_indicator_t	n/a	Object' s light indicators	n/a	n/a
isPredicted	bitfield bit0	n/a	A flag that the object is only predicted and not detected directly 0 = object not predicted 1 = object is predicted	0 to 1	n/a
isInDrivableArea	bitfield bit1	n/a	Is the target in a drivable area. 0 = not in drivable area 1 = in drivable area	0 to 1	n/a
isVeryClose	bitfield bit2	n/a	Is the target very close to the host. Meant for situations where the target is so close that it' s hard to measure its distance 0 = not very close 1 = very close	0 to 1	n/a

[Should Have]

13.2.4 eyeq_vision_object_t [FOR SW8.4 and LATER RELEASES]

✓ Approved, MAPC-67536 - eyeq_vision_object_t[FOR SW8.4 and LATER RELEASES]

Type	structure	Contents: vision object information used in eyeq_vision_obstacles_info_t			
Member Name	Type	Array Size	Description	Range	Units
physicalState	eyeq_object_physical_state_t	n/a	Object' s physical state	n/a	n/a
angularState	eyeq_object_angular_state_t	n/a	Object' s angular state	n/a	n/a
imageBox	eyeq_object_image_box_t	n/a	Object' s geometric representation. Used for visualization purposes.	n/a	n/a
mobilityState	eyeq_object_mobility_state_t	n/a	Object' s mobility state	n/a	n/a
confidence	real32_t	n/a	Proabability that the object exists. ASIL-B signal.	0 to 1	n/a
ttc_const_vel	real32_T	n/a	Obstacle Time-To-Collision (TTC) with the front bumper of the Ego vehicle. Applies only to Pedestrians and only to FCW warnings The prediction is based on a constant velocity. Set to 7 seconds if no valid TTC value. May need constant accel, OEM to confirm.	0 to 7	s
age	uint32_t	n/a	How many frames passed since the target' s approval	0 to FFFF FFFF	n/a
id	uint16_t	n/a	Object ID Invalid Object == any ID outside of Range (default invalid object ID is 0). ASIL-B signal	1 to E_EYEQ_MAX_VISION_OBJECTS	n/a
crc_16	uint16_t	n/a	"Used to validate that no bits were corrupted in this safety critical message. Using CRC16 based on CRC-16 Ethernet protocol X16+X12+ X5+1 init value = 0xFFFF. The CRC shall be calculated on the following signals: 1. rollingFrameCount 2. confidence 3. classification 4. physicalState 5. angularState 6. id	crc_16	uint16_t
rollingFrameCount	uint8_t	n/a	Counter for ASIL-B signals	0 to 255	n/a
classification	Enum (uint8_t)	n/a	The classification of the object. 0=car 1=truck 2=bike (motorcycle) 3=bicycle 4=pedestrian 5= general object (not implemented)	0 to 5	n/a

			6= animal (not implemented) 7= uncertain_vehicle ASIL-B signal.		
isCipv	Enum (uint8_t)	n/a	Is the target the CIPV. Applies only to vehicles. 0 = not relevant 1 = no CIPV 2 = CIPV	0 to 2	n/a
laneAssignment	Enum (int8_t)	n/a	The lane the target occupies: -2 = LEFT_NEXT_NEXT -1 = LEFT_NEXT 0 = EGO_LANE 1 = RIGHT_NEXT 2 = RIGHT_NEXT_NEXT 3 = UNKNOWN	-2 to 3	n/a
lightIndicators	eyeq_object_light_indicator_t	n/a	Object' s light indicators	n/a	n/a
isPredicted	bitfield bit0	n/a	A flag that the object is only predicted and not detected directly 0 = object not predicted 1 = object is predicted	0 to 1	n/a
isInDrivableArea	bitfield bit1	n/a	Is the target in a drivable area. 0 = not in drivable area 1 = in drivable area	0 to 1	n/a
isVeryClose	bitfield bit2	n/a	Is the target very close to the host. Meant for situations where the target is so close that it' s hard to measure its distance 0 = not very close 1 = very close	0 to 1	n/a

[Should Have]

13.2.5 eyeq_vision_object_t [FOR SW9.0 and LATER RELEASES]

✓ Approved, MAPC-67538 - eyeq_vision_object_t

Type	structure	Contents: vision object information used in eyeq_vision_obstacles_info_t			
Member Name	Type	Array Size	Description	Range	Units
physicalState	eyeq_object_physical_state_t	n/a	Object' s physical state	n/a	n/a
angularState	eyeq_object_angular_state_t	n/a	Object' s angular state	n/a	n/a
imageBox	eyeq_object_image_box_t	n/a	Object' s geometric representation. Used for visualization purposes.	n/a	n/a
mobilityState	eyeq_object_mobility_state_t	n/a	Object' s mobility state	n/a	n/a
confidence	real32_t	n/a	Proabability that the object exists. ASIL-B signal.	0 to 1	n/a
ttc_const_vel	real32_T	n/a	Obstacle Time-To-Collision (TTC) with the front bumper of the Ego vehicle. Applies only to Pedestrians and only to FCW warnings The prediction is based on a constant velocity. Set to 7 seconds if no valid TTC value. May need constant accel, OEM to confirm.	0 to 7	s
age	uint32_t	n/a	How many frames passed since the target' s approval	0 to FFFF FFFF	n/a
id	uint16_t	n/a	Object ID Invalid Object == any ID outside of Range (default invalid object ID is 0). ASIL-B signal	1 to E_EYEQ_MAX_VISION_OBJECTS	n/a
crc_16	uint16_t	n/a	'Used to validate that no bits were corrupted in this safety critical message. Using CRC16 based on CRC-16 Ethernet protocol X16+X12+ X5+1 init value = 0xFFFF. The CRC shall be calculated on the following signals: 1. rollingFrameCount 2. confidence 3. classification 4. physicalState.width 5. physicalState.absoluteLongVelocity 6. physicalState.absoluteLatVelocity 7. physicalState.longDistance 8. physicalState.latDistance 9. angularState.angleRight 10. angularState.angleLeft 11. id	crc_16	uint16_t
rollingFrameCount	uint8_t	n/a	Counter for ASIL-B signals	0 to 255	n/a
			The classification of the object. 0= car 1=truck		

classification	Enum (uint8_t)	n/a	2=bike (motorcycle) 3=bicycle 4=pedestrian 5= general object (not implemented) 6= animal (not implemented) 7= uncertain_vehicle ASIL-B signal.	0 to 5	n/a
isCipv	Enum (uint8_t)	n/a	Is the target the CIPV. Applies only to vehicles. 0 = not relevant 1 = no CIPV 2 = CIPV	0 to 2	n/a
laneAssignment	Enum (int8_t)	n/a	The lane the target occupies: -2 = LEFT_NEXT_NEXT -1 = LEFT_NEXT 0 = EGO_LANE 1 = RIGHT_NEXT 2 = RIGHT_NEXT_NEXT 3 = UNKNOWN	-2 to 3	n/a
lightIndicators	eyeq_object_light_indicator_t	n/a	Object' s light indicators	n/a	n/a
isPredicted	bitfield bit0	n/a	A flag that the object is only predicted and not detected directly 0 = object not predicted 1 = object is predicted	0 to 1	n/a
isInDriveableArea	bitfield bit1	n/a	Is the target in a driveable area. 0 = not in driveable area 1 = in driveable area	0 to 1	n/a
isVeryClose	bitfield bit2	n/a	Is the target very close to the host. Meant for situations where the target is so close that it' s hard to measure its distance 0 = not very close 1 = very close	0 to 1	n/a

[Should Have]

13.2.5.1 eyeq_object_light_indicator_t

Approved, MAPC-67540 -

Type	structure		Contents: lowest level object' s lights indicators used in eyeq_vision_object_t		
Member Name	Type	Array Size	Description	Range	Units
valid	bitfield bit0	n/a	0 = not valid 1 = valid ***Under Development**	0 to 1	n/a
brake	bitfield bit1	n/a	Brake light indicator	0 to 1	n/a
turnRight	bitfield bit2	n/a	Turn right indicator	0 to 1	n/a
turnLeft	bitfield bit3	n/a	Turn left indicator	0 to 1	n/a

[Should Have]

13.2.5.2 eyeq_object_mobility_state_t

Approved, MAPC-67542 -

Type	structure		Contents: lowest level object' s mobility state used in eyeq_vision_object_t		
Member Name	Type	Array Size	Description	Range	Units
motionStatus	Enum (uint8_t)	n/a	0=Unknown 1=moving 2=stationary 3=Stopped 4=Moving slowly	0 to 4	n/a
motionCategory	Enum (uint8_t)	n/a	0= Undefined 1=Passing 2=Passing in 3=Passing out 4=Close cut iin 5=Moving in 6=Moving out 7=Crossing 8= LTAP 9= RTAP 10= Moving 11=Preceding 12=Oncoming	0 to 12	n/a
motionOrientation	Enum (uint8_t)	n/a	0=Unknown 1=Drifting right 2=Crossing right 3=Oncoming drifting right 4=Oncoming 5=Oncoming drifting left 6=Crossing left 7=Drifting left 8=Preceding	0 to 8	n/a

[Should Have]

13.2.5.3 eyeq_object_physical_state_t

Approved, MAPC-67544 -

Type	structure		Contents: lowest level object physical state used in eyeq_vision_object_t		
Member Name	Type	Array Size	Description	Range	Units
width	real32_T	n/a	Vehicle' s width. Not supported for Peds	0.4 to 2.95	meter
widthStd	real32_T	n/a	Vehicle' s width STDEV. Not supported for Peds	0.4 to 2.95	meter
length	real32_T	n/a	Supported for vehicles and bicycles. Not supported for Peds	0 to 21	meter
lengthStd	real32_T	n/a	Supported for vehicles and bicycles.	0 to 10	meter

			Not supported for Peds		
height	real32_T	n/a	Object' s height	0 to 4.2	meter
heightStd	real32_T	n/a	Object' s height STDEV	0 to 2	meter
absoluteLongVelocity	real32_T	n/a	Object' s absolute longitudinal velocity	-65 to 65	m/s
absoluteLongVelocityStd	real32_T	n/a	Object' s absolute longitudinal velocity STDEV	-65 to 65	m/s
			Under Development		
absoluteLatVelocity	real32_T	n/a	Object' s absolute lateral velocity	-50 to 50	m/s
absoluteLatVelocityStd	real32_T	n/a	Object' s absolute lateral velocity STDEV	-50 to 50	m/s
			Under Development		
absoluteLongAcc	real32_T	n/a	Object' s absolute longitudinal acceleration	-13 to 13	m/s^2
absoluteLongAccStd	real32_T	n/a	Object' s absolute longitudinal acceleration STDEV	-13 to 13	m/s^2
			Under Development		
absoluteLatAcc	real32_T	n/a	Object' s absolute lateral acceleration	-11 to 8	m/s^2
absoluteLatAccStd	real32_T	n/a	Object' s absolute lateral acceleration STDEV	-11 to 8	m/s^2
longDistance	real32_T	n/a	Longitudinal distance to the middle of the Rear Left and Rear Right corners	-200 to 250	Meter
longDistanceStd	real32_T	n/a	Longitudinal distance STDEV to the middle of the Rear Left and Rear Right corners	-200 to 250	Meter
latDistance	real32_T	n/a	Lateral distance to the middle of the Rear Left and Rear Right corners	-100 to 100	Meter
latDistanceStd	real32_T	n/a	Lateral distance STDEV to the middle of the Rear Left and Rear Right corners	-100 to 100	Meter
heading	real32_t	n/a	Object' s heading compared to the host vehicle heading direction	-3.14 to 3.14	radians

[] Should Have]

13.2.5.4 eyeq_object_angular_state_t

Approved, MAPC-67546 -

Type	structure		Contents: lowest level object' s angular state used in eyeq_vision_object_t		
Member Name	Type	Array Size	Description	Range	Units
angleRight	real32_t	n/a	The angle between Z and the right side of the front / rear of the target (the visible one). The positive side is to the host' s right	-2 to 2	radians
angleRightStd	real32_t	n/a	The angle STDEV between Z and the right side of the front / rear of the target (the visible one). The positive side is to the host' s right	-2 to 2	radians
angleLeft	real32_t	n/a	The angle between Z and the left side of the front / rear of the target (the visible one). The positive side is to the host' s right	-2 to 2	radians
angleLeftStd	real32_t	n/a	The angle STDEV between Z and the left side of the front / rear of the target (the visible one). The positive side is to the host' s right	-2 to 2	radians
angleSide	real32_t	n/a	The angle between Z and the far visible edge – the visible edge of the front / rear of the target that is not visible.	-2 to 2	radians
			Not supported for pedestrians		
angleSideStd	real32_t	n/a	The angle STDEV between Z and the far visible edge – the visible edge of the front / rear of the target that is not visible. Might not be valid.	-2 to 2	radians
			Not supported for pedestrians		
			Under development		
angleMid	real32_t	n/a	The angle between Z and the middle of the front / rear of the target (the visible one). The positive side is to the host' s right	-2 to 2	radians
angleMidStd	real32_t	n/a	The angle STDEV between Z and the middle of the front / rear of the target (the visible one). The positive side is to the host' s right	-2 to 2	radians
angularSpeed	real32_t	n/a	The momentary angular speed	-2 to 2	Rad/sec
angularSpeedStd	real32_t	n/a	The momentary angular speed STDEV	-2 to 2	Rad/sec

[] Should Have]

13.2.5.5 eyeq_object_image_box_t

Approved, MAPC-67548 -

Type	structure		Contents: low level object' s geometric representation used in eyeq_vision_object_t		
Member Name	Type	Array Size	Description	Range	Units
rect	eyeq_rect_t		The front/rear rect of the visible side. Used for both vehicles and peds	n/a	n/a
verticalEdges	eyeq_vertical_edge_t	4	The vertical edges of the box:FR, FL, RR, RL. The edges that are not visible might not be valid Not used for Peds	n/a	n/a
visibleRect	Enum (uint8_t)	n/a	The visible rect of the car 0=Unknown 1=Front 2=Back Not used for Peds	0 to 2	n/a
visibleSide	Enum (uint8_t)	n/a	The visible side of the car 0=Unknown 1=Right 2=Left Not used for Peds	0 to 2	n/a

[] Should Have]

13.2.5.5.1 eyeq_vertical_edge_t

Approved, MAPC-67550 -

Type	structure		Contents: Lowest level vertical edge representation eyeq_object_image_box_t		
Member Name	Type	Array Size	Description	Range	Units
xCoord	int16_t	n/a	x coord in pixels relative to the image center with ¼ resolution (level 0)	(+/- 0.25 x image width)/2	pixels
yTopCoord	int16_t	n/a	y coord of top in pixels relative to the image center with ¼ resolution (level 0)	(+/- 0.25 x image height)/2	pixels
yBottomCoord	int16_t	n/a	y coord of bottom in pixels relative to the image center with ¼ resolution (level 0)	(+/- 0.25 x image height)/2	pixels
isOccluded	bitfield bit0	n/a	Is the edge occluded: 0 = not occluded 1 = occluded	0 to 1	n/a
valid	bitfield bit1	n/a	Validity of the data 0 = not valid 1 = valid	0 to 1	n/a

[] Should Have]

13.2.5.5.2 eyeq_rect_t

Approved, MAPC-67552 -

Type	structure		Contents: Lowest level 2D rectangular representation used in eyeq_object_image_box_t		
Member Name	Type	Array Size	Description	Range	Units
xLeftCoord	int16_t	n/a	x left coord reported in pixels with ¼ resolution (level 0)	(+/- 0.25 x image width)/2 from the image center.	pixels
xRightCoord	int16_t	n/a	x right coord reported in pixels with ¼ resolution (level 0)	(+/- 0.25 x image width)/2 from the image center.	pixels
yTopCoord	int8_t	n/a	y top coord reported in pixels with ¼ resolution (level 0)	(+/- 0.25 x image height)/2 from the image center.	pixels
yBottomCoord	int8_t	n/a	y bottom coord reported in pixels with ¼ resolution (level 0)	(+/- 0.25 x image height)/2 from the image center.	pixels

[] Should Have]

13.2.6 eyeq_vision_AEB_info_t (For SW4 and earlier releases)

✓ Approved, MAPC-67554 -

Name: eyeq_vision_AEB_info_t					
Type	structure	Contents: Vision only braking/warning signals used in EYEQ_VIS_AEB_INFO_MSG (0xE3)			
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The time-stamp of the vehicle state data based on the sync pulse received from the EyeQ. The timestamp represents the effective time for all information in this structure.	0 to $2^{64} - 1$	us
frameIndex	uint32_t	n/a	The index of the last vision frame used for the function decisions.	0 to 4294967295	n/a
vehIndexUsed	uint32_t	n/a	The index of the last vehicle state data used when making a vision only decision.	0 to 4294967295	n/a
visOnlyVRUBrake	uint32_t	n/a	When the Vision Subsystem determines the vehicle should apply brakes to prevent a collision with a Vulnerable Road Unit (VRU) obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0.	0 to 15	n/a
imageIndex	uint16_t	n/a	The index of the camera image used to update vision function information.	0 to 65535	n/a
visOnlyVRUWarning	uint8_t	n/a	When the Vision Subsystem determines the vehicle should warn the driver of a possible collision with a VRU obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0.	0 to 15	n/a
visOnlyVehWarning	uint8_t	n/a	When the Vision Subsystem determines the vehicle should warn the driver of a possible collision with a vehicle obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0.	0 to 15	n/a
visOnlyVRUPartialBrake	uint8_t	n/a	When the Vision Subsystem determines the vehicle should partially apply brakes to prevent a collision with a VRU obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0.	0 to 15	n/a
visOnlyVehPartialBrake	uint8_t	n/a	When the Vision Subsystem determines the vehicle should partially apply brakes to prevent a collision with a vehicle obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0.	0 to 15	n/a
visOnlyVehBrake	uint8_t	n/a	When the Vision Subsystem determines the vehicle should apply brakes to prevent a collision with a vehicle obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0.	0 to 15	n/a
visOnlyVehBrakeDBS	uint8_t	n/a	When the Forward Collision Estimation Subsystem determines the vehicle should apply brakes to prevent a collision with a vehicle obstacle, this member is set to the ID of the vision obstacle responsible for the threat. This request has NOT been confirmed by all vision AEB checks.	0 to 15	n/a
visOnlyPCAIWarning	uint8_t	n/a	When the Vision Subsystem determines the vehicle should apply a warning to prevent a collision with an oncoming vehicle obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0.	0-15	n/a
visOnlyPCAiPartialBrake	uint8_t	n/a	When the Vision Subsystem determines the vehicle should apply partial braking to prevent a collision with an oncoming vehicle obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0.	0-15	n/a
visOnlyPCAiBrake	uint8_t	n/a	When the Vision Subsystem determines the vehicle should apply brakes to prevent a collision with an oncoming vehicle obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0.	0-15	n/a
roadFreeDetection	Enum (uint8_t)	n/a	0=NO PENETRATION DETECTED 1= PENETRATION DETECTED 2= UNKNOWN	0-2	n/a

[] Will not Have]

13.2.7 eyeq_vision_AEB_info_t [FOR SW5.0]

✓ Approved, MAPC-67556 - eyeq_vision_AEB_info_t [FOR SW5.0 and LATER RELEASES]

Name: eyeq_vision_AEB_info_t					
Type: structure		Contents: Vision only braking/warning signals used in EYEQ_VIS_AEB_INFO_MSG (0xE3)			
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The time-stamp of the vehicle state data based on the sync pulse received from the EyeQ. The timestamp represents the effective time for all information in this structure.	0 to 2 ⁶⁴ - 1	us
frameIndex	uint32_t	n/a	The index of the last vision frame used for the function decisions.	0 to 4294967295	n/a
vehIndexUsed	uint32_t	n/a	The index of the last vehicle state data used when making a vision only decision.	0 to 4294967295	n/a
visOnlyVRUBrake	uint32_t	n/a	When the Vision Subsystem determines the vehicle should apply brakes to prevent a collision with a Vulnerable Road Unit (VRU) obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0.	0 to 15	n/a
crc_16	uint16_t	n/a	Used to validate that no bits were corrupted in this safety critical message. Using CRC16 based on CRC-16 Ethernet protocol X16+X12+X5+1 init value = 0xFFFFFFFF. The CRC shall be calculated on the following signals: 1. rollingFrameCount 2. visOnlyVRUBrake 3. visOnlyVehBrake 4. visOnlyPCABrake 5. visOnlyVRUPartialBrake 6. visOnlyVehPartialBrake 7. visOnlyPCAPartialBrake 7. visOnlyVehBrakeDBS	Crc_16	uint16_t
imageIndex	uint16_t	n/a	The index of the camera image used to update vision function information.	0 to 65535	n/a
rollingFrameCount	uint8_t	n/a	Counter for ASIL-B signals.	0 to 255	n/a
visOnlyVRUWarning	uint8_t	n/a	When the Vision Subsystem determines the vehicle should warn the driver of a possible collision with a VRU obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0.	0 to 15	n/a
visOnlyVehWarning	uint8_t	n/a	When the Vision Subsystem determines the vehicle should warn the driver of a possible collision with a vehicle obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0.	0 to 15	n/a
visOnlyVRUPartialBrake	uint8_t	n/a	When the Vision Subsystem determines the vehicle should partially apply brakes to prevent a collision with a VRU obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0. ASIL-B signal.	0 to 15	n/a
visOnlyVehPartialBrake	uint8_t	n/a	When the Vision Subsystem determines the vehicle should partially apply brakes to prevent a collision with a vehicle obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0. ASIL-B signal.	0 to 15	n/a
visOnlyVehBrake	uint8_t	n/a	When the Vision Subsystem determines the vehicle should apply brakes to prevent a collision with a vehicle obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0. ASIL-B signal.	0 to 15	n/a
visOnlyVehBrakeDBS	uint8_t	n/a	When the Forward Collision Estimation Subsystem determines the vehicle should apply brakes to prevent a collision with a vehicle obstacle, this member is set to the ID of the vision obstacle responsible for the threat. This request has NOT been confirmed by all vision AEB checks. ASIL-B signal.	0 to 15	n/a
visOnlyPCAWarning	uint8_t	n/a	When the Vision Subsystem determines the vehicle should apply a warning to prevent a collision with an oncoming vehicle obstacle, this member is	0-15	n/a

			set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0.		
visOnlyPCAIPartialBrake	uint8_t	n/a	When the Vision Subsystem determines the vehicle should apply partial braking to prevent a collision with an oncoming vehicle obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0.	0-15	n/a
visOnlyPCAIBrake	uint8_t	n/a	When the Vision Subsystem determines the vehicle should apply brakes to prevent a collision with an oncoming vehicle obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0.	0-15	n/a
roadFreeDetection	Enum (uint8_t)	n/a	0= NO PENETRATION DETECTED 1= PENETRATION DETECTED 2= UNKNOWN	0-2	n/a

[] Will not Have]

13.2.8 vision_AEB_info_t [FOR SW6.0 AND LATER RELEASES]

✓ Approved, MAPC-67558 - eyeq_vision_AEB_info_t [FOR SW6.0 and LATER RELEASES]

Name		eyeq_vision_AEB_info_t			
Type		structure			
		Contents: Vision only braking/warning signals used in EYEQ_VIS_AEB_INFO_MSG (0xE3)			
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	The timestamp represents the effective time of these measurements in the Host time frame.	0 to $2^{64} - 1$	us
frameIndex	uint32_t	n/a	The index of the last vision frame used for the function decisions.	0 to 4294967295	n/a
vehIndexUsed	uint32_t	n/a	The index of the last vehicle state data used when making a vision only decision.	0 to 4294967295	n/a
crc_16	uint16_t	n/a	*Used to validate that no bits were corrupted in this safety critical message. Using CRC16 based on CRC-16 Ethernet protocol X16+X12+ X5+1 init value = 0xFFFF. The CRC shall be calculated on the following signals: 1. rollingFrameCount 2. visOnlyVRUBrake 3. visOnlyVehBrake 4. visOnlyPCAIBrake 5. visOnlyVRUPartialBrake 6. visOnlyVehPartialBrake 7. visOnlyPCAIPartialBrake 7. visOnlyVehBrakeDBS	Crc_16	uint16_t
imageIndex	uint16_t	n/a	The index of the camera image used to update vision function information.	0 to 65535	n/a
rollingFrameCount	uint8_t	n/a	Counter for ASIL – B signals.	0 to 255	n/a
visOnlyVRUBrake	uint8_t	n/a	When the Vision Subsystem determines the vehicle should apply brakes to prevent a collision with a Vulnerable Road Unit (VRU) obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0. ASIL-B signal.	0 to 15	n/a
visOnlyVRUWarning	uint8_t	n/a	When the Vision Subsystem determines the vehicle should warn the driver of a possible collision with a VRU obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0.	0 to 15	n/a
visOnlyVehWarning	uint8_t	n/a	When the Vision Subsystem determines the vehicle should warn the driver of a possible collision with a vehicle obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0.	0 to 15	n/a
visOnlyVRUPartialBrake	uint8_t	n/a	When the Vision Subsystem determines the vehicle should partially apply brakes to prevent a collision with a VRU obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0. ASIL-B signal.	0 to 15	n/a
visOnlyVehPartialBrake	uint8_t	n/a	When the Vision Subsystem determines the vehicle should partially apply brakes to prevent a collision with a vehicle obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0. ASIL-B signal.	0 to 15	n/a

visOnlyVehBrake	uint8_t	n/a	When the Vision Subsystem determines the vehicle should apply brakes to prevent a collision with a vehicle obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0. ASIL-B signal.	0 to 15	n/a
visOnlyVehBrakeDBS	uint8_t	n/a	When the Forward Collision Estimation Subsystem determines the vehicle should apply brakes to prevent a collision with a vehicle obstacle, this member is set to the ID of the vision obstacle responsible for the threat. This request has NOT been confirmed by all vision AEB checks. ASIL-B signal.	0 to 15	n/a
visOnlyPCAIWarning	uint8_t	n/a	When the Vision Subsystem determines the vehicle should apply a warning to prevent a collision with an oncoming vehicle obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0.	0-15	n/a
visOnlyPCAIPartialBrake	uint8_t	n/a	When the Vision Subsystem determines the vehicle should apply partial braking to prevent a collision with an oncoming vehicle obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0. ASIL-B signal.	0-15	n/a
visOnlyPCAIBrake	uint8_t	n/a	When the Vision Subsystem determines the vehicle should apply brakes to prevent a collision with an oncoming vehicle obstacle, this member is set to the ID of the vision obstacle responsible for the threat. When there is no threat, the member value is set to 0. ASIL-B signal.	0-15	n/a
roadFreeDetection	Enum (uint8_t)	n/a	0=NO PENETRATION DETECTED 1= PENETRATION DETECTED 2= UNKNOWN	0-2	n/a

[Should Have]

14 Suspension Road Preview

14.1 eyeq_vision_srp_info_t

Approved, MAPC-67561 -

Name: eyeq_vision_srp_info_t					
Name Type	Structure	Contents: Suspension Road Preview data sent in EyeQ Vision SRP Message (0xE6)			
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	For the vision measurements provided, the timestamp represents the effective time of the measurements.	0 to 2 ⁶⁴ - 1	us
leftWheelDataPoints	eyeq_srp_datapoint_info_t	EYE_Q_MAX_SRP_DATA_POINTS	Estimates for the left barrier.	n/a	n/a
rightWheelDataPoints	eyeq_srp_datapoint_info_t	EYE_Q_MAX_SRP_DATA_POINTS	Estimates for the right barrier.	n/a	n/a
frameIndex	uint32_t	n/a	The index of the vision frame used to detect barrier objects.	0 to 4294967295	n/a
vehIndexUsed	uint32_t	n/a	The index of the last vehicle state data used when making a vision only decision.	0 to 4294967295	n/a
vehicleVelocity	real32_T	n/a	Ego vehicle velocity. This does not take into account the speed compensation factor calculated by the radar unless agreed by ME/Aptiv for a specific application.	-20 to 100	m/s
imageIndex	uint16_t	n/a	The index of the camera image used to update barrier information.	0 to 65535	n/a
frameValid	bool	n/a	0 = frame not valid 1 = frame valid	0 to 1	n/a

[] Will not Have]

14.2 eyeq_srp_datapoint_info_t

✓ Approved, MAPC-67563 -

Name: eyeq_srp_datapoint_info_t					
Type	structure		Contents: Height or depth of road bump used in SRP info_t		
Member Name	Type	Array Size	Description	Range	Units
height	real32_T	n/a	Height of data point. Resolution: 0.05m	-32cm – 32cm	cm
conf	uint8_t	n/a	The confidence measure for each data point	0-15	n/a

[] Will not Have]

15 Safety Diagnostics

15.1 eyeq_vision_safety_diagnostic_info_t [NEW FOR SW5.0 and LATER RELEASES]

✓ Approved, MAPC-67566 - eyeq_vision_safety_diagnostic_info_t [NEW FOR SW5.0 and LATER RELEASES]

Name: eyeq_vision_safety_diagnostic_info_t					
Type	Structure		Contents: safety diagnostics		
Member Name	Type	Array Size	Description	Range	Units
timestamp_us	uint64_t	n/a	For the vision signals provided, the timestamp represents the effective time for all information in this structure.	0 to 264 – 1	us
frameIndex	uint32_t	n/a	The index of the last vision frame used for the function decisions.	0 to 4294967295	n/a
vehIndexUsed	uint32_t	n/a	The index of the last vehicle state data used when making a vision only decision.	0 to 4294967295	n/a
crc_16	uint_16	n/a	Used to validate that no bits were corrupted in this safety critical message. Using CRC16 based on CRC-16 Ethernet protocol X16+ X12+ X5+ 1. init value = 0xFFFFFFFF The CRC shall be calculated on the following signals in this order: 1. rollingFrameCount 2. safety_Diagnostic_Manager array 3. challenge_Response array 4. challengeIdentifier	0 to 65535	n/a
rollingFrameCount	uint8_t	n/a	Counter for ASIL – B signals.	0 to 255	n/a
safety_Diagnostic_Manager	bool	E_EYEQ_MAX_SAFETY_DIAGNOSTIC_MSG	INDEX DEFINITIONS: 4 = Unacceptable yaw or horizon error. 6 = AEB signal integrity error. 7 = AEB signal integrity error. 9 = AEB signal integrity error. 11= Input safety signals CRC does not match. 18 = Image data integrity failure at runtime. 13 = Last valid message associated with ego data signal is older than aximum allowed latency. 18 = Image data integrity failure at runtime. 21 = SDM - CAMERA_HEIGHT_LIMIT_EXCEEDED 24 = CCFT_Diff_Results 25 = AEB signal integrity error. 26 = Code integrity failure at runtime. 27 = AEB signal integrity error. 29 = Input signals data rolling frame counter (RFC) mismatch. 30 = Imager communication failure. 31 = Data integrity failure at runtime. 32 = input signals storage corruption. 33 = ROAD_LANE_DISQUALIFICATION_FAILED. 34 = CORRUPTED_VEHICLE_INFO_INPUT_SIGNALS. 35 = VD measurements integrity failure. 36 = VD measurements integrity failure. 37 = VD measurements integrity failure. 38 = Ped measurements integrity failure. 39 = Ped measurements integrity failure. 40 = Ped measurements integrity failure. 42 = ROAD_PREDICTION_VALIDATION. 44= ROAD_SANITY_CORRECTION_VALIDATION 45 = ROAD_SFCONF_VALIDATION. 48 = ALGO_PITCH_MISMATCH. 49 = Data path integrity failure. 50 = Neural network integrity failure. 51 = Ped measurements integrity failure. 52 = VD measurements integrity failure. 53 = SDM - DBS_OVERLAP_FAULT 54 = Accelerator STL failure. ALL OTHER INDEXES ARE N/A	0 to 1	n/a
challenge_Response	uint_8	4	This is a Challenge Response. QM signal	0 to 255	n/a
challenge_Identifier	uint_8	n/a	This is a challenge identifier. QM signal	0 to 255	n/a

[] Should Have]

16 APPENDIX A: Traffic Sign Enumerations

```
typedef enum {  
    E_EYEQ_TSR_e_std_10    = 0,  
    E_EYEQ_TSR_e_std_20    = 1,  
    E_EYEQ_TSR_e_std_30    = 2,  
    E_EYEQ_TSR_e_std_40    = 3,  
    E_EYEQ_TSR_e_std_50    = 4,  
    E_EYEQ_TSR_e_std_60    = 5,  
    E_EYEQ_TSR_e_std_70    = 6,  
    E_EYEQ_TSR_e_std_80    = 7,  
    E_EYEQ_TSR_e_std_90    = 8,  
    E_EYEQ_TSR_e_std_100   = 9,  
    E_EYEQ_TSR_e_std_110   = 10,  
    E_EYEQ_TSR_e_std_120   = 11,  
    E_EYEQ_TSR_e_std_130   = 12,  
    E_EYEQ_TSR_e_std_140   = 13,  
  
    E_EYEQ_TSR_e_lgt_10     = 28,  
}
```

E_EYEQ_TSR_e_lgt_20 = 29,
 E_EYEQ_TSR_e_lgt_30 = 30,
 E_EYEQ_TSR_e_lgt_40 = 31,
 E_EYEQ_TSR_e_lgt_50 = 32,
 E_EYEQ_TSR_e_lgt_60 = 33,
 E_EYEQ_TSR_e_lgt_70 = 34,
 E_EYEQ_TSR_e_lgt_80 = 35,
 E_EYEQ_TSR_e_lgt_90 = 36,
 E_EYEQ_TSR_e_lgt_100 = 37,
 E_EYEQ_TSR_e_lgt_110 = 38,
 E_EYEQ_TSR_e_lgt_120 = 39,
 E_EYEQ_TSR_e_lgt_130 = 40,
 E_EYEQ_TSR_e_lgt_140 = 41,

 E_EYEQ_TSR_e_atPedestriansCrossing = 52,

 E_EYEQ_TSR_e_std_end_general = 64,
 E_EYEQ_TSR_e_lgt_end_general = 65,

 E_EYEQ_TSR_e_hwe_announcement_1 = 67,
 E_EYEQ_TSR_e_hwe_announcement_2 = 68,
 E_EYEQ_TSR_e_hwe_announcement_3 = 69,

 E_EYEQ_TSR_e_circ_traf_sign_ts_unknown = 70,

 E_EYEQ_TSR_e_ausfahrt = 78,
 E_EYEQ_TSR_e_std_end_ded_two_digits = 79,
 E_EYEQ_TSR_e_std_end_ded_three_digits = 80,

 E_EYEQ_TSR_e_lgt_end_ded_two_digits = 81,
 E_EYEQ_TSR_e_lgt_end_ded_three_digits = 82,

 E_EYEQ_TSR_e_std_obstruction_fishboneleft = 92,
 E_EYEQ_TSR_e_std_obstruction_fishboneright = 93,
 E_EYEQ_TSR_e_std_obstruction_thin = 94,

 E_EYEQ_TSR_e_std_5 = 100,
 E_EYEQ_TSR_e_std_15 = 101,
 E_EYEQ_TSR_e_std_25 = 102,
 E_EYEQ_TSR_e_std_35 = 103,
 E_EYEQ_TSR_e_std_45 = 104,
 E_EYEQ_TSR_e_std_55 = 105,
 E_EYEQ_TSR_e_std_65 = 106,
 E_EYEQ_TSR_e_std_75 = 107,
 E_EYEQ_TSR_e_std_85 = 108,
 E_EYEQ_TSR_e_std_95 = 109,
 E_EYEQ_TSR_e_std_105 = 110,
 E_EYEQ_TSR_e_std_115 = 111,
 E_EYEQ_TSR_e_std_125 = 112,
 E_EYEQ_TSR_e_std_135 = 113,
 E_EYEQ_TSR_e_std_145 = 114,
 E_EYEQ_TSR_e_lgt_5 = 115,
 E_EYEQ_TSR_e_lgt_15 = 116,
 E_EYEQ_TSR_e_lgt_25 = 117,
 E_EYEQ_TSR_e_lgt_35 = 118,
 E_EYEQ_TSR_e_lgt_45 = 119,
 E_EYEQ_TSR_e_lgt_55 = 120,
 E_EYEQ_TSR_e_lgt_65 = 121,
 E_EYEQ_TSR_e_lgt_75 = 122,
 E_EYEQ_TSR_e_lgt_85 = 123,
 E_EYEQ_TSR_e_lgt_95 = 124,
 E_EYEQ_TSR_e_lgt_105 = 125,
 E_EYEQ_TSR_e_lgt_115 = 126,
 E_EYEQ_TSR_e_lgt_125 = 127,

 E_EYEQ_TSR_e_reverseCurveLeft = 95,
 E_EYEQ_TSR_e_reverseCurveRight = 96,
 E_EYEQ_TSR_e_sharpCurveLeft = 97,
 E_EYEQ_TSR_e_sharpCurveRight = 98,

 E_EYEQ_TSR_e_bewareOfSnow = 131,
 E_EYEQ_TSR_e_bicycleCrossing = 132,
 E_EYEQ_TSR_e_children = 134,
 E_EYEQ_TSR_e_congestionHazard = 135,
 E_EYEQ_TSR_e_curveLeft = 136,
 E_EYEQ_TSR_e_curveRight = 137,
 E_EYEQ_TSR_e_domesticAnimalsCrossing = 138,
 E_EYEQ_TSR_e_doubleCurveLeft = 139,
 E_EYEQ_TSR_e_doubleCurveRight = 140,
 E_EYEQ_TSR_e_drawBridge = 141,
 E_EYEQ_TSR_e_fallingRocks = 142,
 E_EYEQ_TSR_e_generalDanger = 143,
 E_EYEQ_TSR_e_guardedRailwayCrossing = 144,
 E_EYEQ_TSR_e_looseGravel = 147,
 E_EYEQ_TSR_e_pedestrians = 149,
 E_EYEQ_TSR_e_pedestriansCrossing = 150,
 E_EYEQ_TSR_e_roadWorkAhead = 153,
 E_EYEQ_TSR_e_roadNarrows = 154,
 E_EYEQ_TSR_e_roadNarrowsLeft = 155,
 E_EYEQ_TSR_e_roadNarrowsRight = 156,
 E_EYEQ_TSR_e_roadWork = 157,
 E_EYEQ_TSR_e_roughRoad = 158,
 E_EYEQ_TSR_e_roundabout = 159,
 E_EYEQ_TSR_e_slipperyWhenWet = 160,
 E_EYEQ_TSR_e_steepDowngrade = 161,
 E_EYEQ_TSR_e_steepUpgrade = 162,
 E_EYEQ_TSR_e_strongCrossWind = 163,
 E_EYEQ_TSR_e_trafficSignals = 164,
 E_EYEQ_TSR_e_twoWayTraffic = 165,
 E_EYEQ_TSR_e_unguardedRailwayCrossing = 166,
 E_EYEQ_TSR_e_wildAnimalCrossing = 167,
 E_EYEQ_TSR_e_yield = 168,
 E_EYEQ_TSR_e_priorityRoad = 169,
 E_EYEQ_TSR_e_endOfPriorityRoad = 170,
 E_EYEQ_TSR_e_std_motorWay = 171,
 E_EYEQ_TSR_e_std_endOfMotorWay = 172,
 E_EYEQ_TSR_e_std_expressWay = 173,
 E_EYEQ_TSR_e_std_endOfExpressWay = 174,
 E_EYEQ_TSR_e_std_residentialArea = 175,
 E_EYEQ_TSR_e_std_endOfResidentialArea = 176,
 E_EYEQ_TSR_e_std_cityEntrance = 177,
 E_EYEQ_TSR_e_std_cityEntranceCombined = 178,

 E_EYEQ_TSR_e_stopAhead = 196,
 E_EYEQ_TSR_e_looseShoulder = 197,

```

E_EYEQ_TSR_e_std_no_entrance = 199,
E_EYEQ_TSR_e_std_np_start = 200,
E_EYEQ_TSR_e_std_np_end = 201,
E_EYEQ_TSR_e_std_np_truck_start = 202,
E_EYEQ_TSR_e_std_np_truck_end = 203,
E_EYEQ_TSR_e_ca_road_con_xmiles = 204,
E_EYEQ_TSR_e_ca_end_road_work = 205,
E_EYEQ_TSR_e_ca_end_construction = 206,

E_EYEQ_TSR_e_std_noTurn_on_red = 46,

E_EYEQ_TSR_e_std_stopSign = 210,
E_EYEQ_TSR_e_bump = 217,
E_EYEQ_TSR_e_end_school_zone = 218,
E_EYEQ_TSR_e_std_CityEntrance_Black_BG = 219,
E_EYEQ_TSR_e_lgt_np_start = 220,
E_EYEQ_TSR_e_lgt_np_end = 221,
E_EYEQ_TSR_e_std_BuiltUpArea = 222,
E_EYEQ_TSR_e_std_endOfBuiltUpArea = 223,
E_EYEQ_TSR_e_std_roundabout = 224,
E_EYEQ_TSR_e_lgt_np_truck_start = 225,
E_EYEQ_TSR_e_lgt_np_truck_end = 226,

E_EYEQ_TSR_e_riverBank = 228,
E_EYEQ_TSR_e_std_endOfCityEntrance = 229,

E_EYEQ_TSR_e_std_arrow_straight = 240,
E_EYEQ_TSR_e_std_arrow_right = 241,
E_EYEQ_TSR_e_std_arrow_left = 242,
E_EYEQ_TSR_e_std_arrow_rightAhead = 243,
E_EYEQ_TSR_e_std_arrow_leftAhead = 244,
E_EYEQ_TSR_e_std_arrow_noLeft = 245,
E_EYEQ_TSR_e_std_arrow_noRight = 246,
E_EYEQ_TSR_e_std_arrow_KeepLeft = 247,
E_EYEQ_TSR_e_std_arrow_KeepRight = 248,
E_EYEQ_TSR_e_std_arrow_eitherSide = 249,
E_EYEQ_TSR_e_std_roadClosed = 250,
E_EYEQ_TSR_e_std_cone = 251,
E_EYEQ_TSR_e_std_barrel = 252,
E_EYEQ_TSR_e_std_obstruction_left = 253,
E_EYEQ_TSR_e_std_obstruction_right = 254,
E_EYEQ_TSR_e_std_invalid = 255,

E_EYEQ_TSR_e_car_limit = 23,
E_EYEQ_TSR_e_carUpMotorDownDiagonal = 24,
E_EYEQ_TSR_e_minimum_SL = 25,

E_EYEQ_TSR_e_LeftOrStraight = 27,
E_EYEQ_TSR_e_rightOrStraight = 45,

E_EYEQ_TSR_e_Oncoming_Priority = 47,

E_EYEQ_TSR_e_BicycleLane = 256,

E_EYEQ_TSR_e_PedestrianLane = 59,

E_EYEQ_TSR_e_SharedLane = 62,
E_EYEQ_TSR_e_SharedSeparateLane = 63,

E_EYEQ_TSR_e_trucksOnly = 265,
E_EYEQ_TSR_e_weightLimit = 266,
E_EYEQ_TSR_e_widthLimit = 267,
E_EYEQ_TSR_e_motorUpCarDown = 268,

E_EYEQ_TSR_e_std_Load_Limit = 302,
E_EYEQ_TSR_e_std_Bus_Lane = 303,
E_EYEQ_TSR_e_std_Tram_Lane = 304,
E_EYEQ_TSR_e_std_End_Bus_Lane = 305,
E_EYEQ_TSR_e_std_End_Bicycle_Lane = 306,
E_EYEQ_TSR_e_std_No_straight = 307,

E_EYEQ_TSR_e_elecOff = 399,
) eyeq_signType_e;

```

```

/* ***** */
/*
 * Definition of supplemental traffic signs
 */
/* ***** */
typedef enum {
    E_EYEQ_TSR_e_none = 0,
    E_EYEQ_TSR_e_rain = 1,
    E_EYEQ_TSR_e_snow = 2,
    E_EYEQ_TSR_e_trailer = 3,
    E_EYEQ_TSR_e_time = 4,
    E_EYEQ_TSR_e_Arrow_left = 5,
    E_EYEQ_TSR_e_Arrow_right = 6,
    E_EYEQ_TSR_e_BendArrow_left = 7,
    E_EYEQ_TSR_e_BendArrow_right = 8,
    E_EYEQ_TSR_e_truck = 9,
    E_EYEQ_TSR_e_distance_arrow = 10,
    E_EYEQ_TSR_e_weight = 11,
    E_EYEQ_TSR_e_distance_in = 12,
    E_EYEQ_TSR_e_tractor = 13,
    E_EYEQ_TSR_e_snow_rain = 14,
    E_EYEQ_TSR_e_school = 15,
    E_EYEQ_TSR_e_rain_cloud = 16,
    E_EYEQ_TSR_e_fog = 17,
    E_EYEQ_TSR_e_hazardous_materials = 18,
    E_EYEQ_TSR_e_night = 19,
    E_EYEQ_TSR_e_supp_sign_generic = 20,
    E_EYEQ_TSR_e_rappel = 21,
    E_EYEQ_TSR_e_zone = 22,
    E_EYEQ_TSR_e_ramp = 23,
    E_EYEQ_TSR_e_end = 24,
    E_EYEQ_TSR_e_exit = 25,
    E_EYEQ_TSR_e_advisory = 26,
    E_EYEQ_TSR_e_minimum = 27,
    E_EYEQ_TSR_e_reduced_ahead = 28,
    E_EYEQ_TSR_e_distance_stop = 29,
    E_EYEQ_TSR_e_par_verglas = 30,
    E_EYEQ_TSR_e_ahead = 31,

```

E_EYEQ_TSR_e_area = 32,
 E_EYEQ_TSR_e_road_work_au = 33,
 E_EYEQ_TSR_e_arrow_bidirectional = 34,
 E_EYEQ_TSR_e_work_zone = 35,
 E_EYEQ_TSR_e_distance_in_for = 36,
 E_EYEQ_TSR_e_zone_end = 37,
 E_EYEQ_TSR_e_suppl_end_school_zone = 38,
 E_EYEQ_TSR_e_suppl_camera = 39,
 E_EYEQ_TSR_e_larmschutz = 40,
 E_EYEQ_TSR_e_car = 41,
 E_EYEQ_TSR_e_shared_zone = 42,
 E_EYEQ_TSR_e_suppl_bump = 43,
 E_EYEQ_TSR_e_snow_rain_dis_arrow = 44,
 E_EYEQ_TSR_e_snow_truck = 45,
 E_EYEQ_TSR_e_motorcycle = 46,
 E_EYEQ_TSR_e_time_school = 47,
 E_EYEQ_TSR_e_truck_bus = 48
) eyeq_signSupplementalType_e;

17 APPENDIX A: Traffic Sign Enumerations (continued)

eyeq_sign Type is listed in the "Mobileye Internal Enum Name" column below.

Enum Value	Family	Sign Semantic Name	Mobileye Internal Enum Name
0	SLI_Explicit	Speed Limit 10	e_std_10
1	SLI_Explicit	Speed Limit 20	e_std_20
2	SLI_Explicit	Speed Limit 30	e_std_30
3	SLI_Explicit	Speed Limit 40	e_std_40
4	SLI_Explicit	Speed Limit 50	e_std_50
5	SLI_Explicit	Speed Limit 60	e_std_60
6	SLI_Explicit	Speed Limit 70	e_std_70
7	SLI_Explicit	Speed Limit 80	e_std_80
8	SLI_Explicit	Speed Limit 90	e_std_90
9	SLI_Explicit	Speed Limit 100	e_std_100
10	SLI_Explicit	Speed Limit 110	e_std_110
11	SLI_Explicit	Speed Limit 120	e_std_120
12	SLI_Explicit	Speed Limit 130	e_std_130
13	SLI_Explicit	Speed Limit 140	e_std_140
23	Prohibitory	Car Limit	e_car_limit
24	Prohibitory	Car Motorcycle Limit	e_carUpMotorDownDiagonal
25	SLI_Explicit	Minimum Sign	e_minimum_Sl
27	Mandatory	Left or Straight Arrow	e_leftOrStraight
28	SLI_Explicit	Electronic Speed Limit 10	e_lgt_10
29	SLI_Explicit	Electronic Speed Limit 20	e_lgt_20
30	SLI_Explicit	Electronic Speed Limit 30	e_lgt_30
31	SLI_Explicit	Electronic Speed Limit 40	e_lgt_40
32	SLI_Explicit	Electronic Speed Limit 50	e_lgt_50
33	SLI_Explicit	Electronic Speed Limit 60	e_lgt_60
34	SLI_Explicit	Electronic Speed Limit 70	e_lgt_70
35	SLI_Explicit	Electronic Speed Limit 80	e_lgt_80
36	SLI_Explicit	Electronic Speed Limit 90	e_lgt_90
37	SLI_Explicit	Electronic Speed Limit 100	e_lgt_100
38	SLI_Explicit	Electronic Speed Limit 110	e_lgt_110
39	SLI_Explicit	Electronic Speed Limit 120	e_lgt_120
40	SLI_Explicit	Electronic Speed Limit 130	e_lgt_130
41	SLI_Explicit	Electronic Speed Limit 140	e_lgt_140
45	Mandatory	Right or Straight Arrow	e_rightOrStraight
46	Mandatory	No Turn On Red	e_std_noTurn_on_red
47	Prohibitory	Oncoming Priority	e_Oncoming_Priority
48	Prohibitory	No U turn	e_noU_Turn
51	Warning	End of Children	e_endOfChildren
52	Information	Pedestrian Crossing	e_atPedestriansCrossing
53	Information	AT_BUMP	e_rectBump
54	Warning	Divided Highway	e_dividedHighWay
57	Warning	Low Clearance	e_lowClearance
59	Mandatory	Pedestrian Lane	e_PedestrianLane
60	Prohibitory	Pedestrian Limit	e_pedLimit
61	Prohibitory	Pedestrian Limit Diagonal	e_pedLimitDiagonal
62	Mandatory	Shared Lane	e_SharedLane
63	Mandatory	Shared Separate Lane	e_SharedSeparateLane
64	SLI_Explicit	End General	e_std_end_general
65	SLI_Explicit	Electronic End General	e_lgt_end_general
66	Information	End of Diversion	e_endOfDiversion
77	No Parking Stopping	End No Parking Zone	e_std_end_noParking_zone
78	Information	AUSFAHRT	e_ausfahrt
79	SLI_Explicit	End of Speed Limit 2 Digits	e_std_end_ded_two_digits
80	SLI_Explicit	End of Speed Limit 3 Digits	e_std_end_ded_three_digits
81	SLI_Explicit	LED End of Speed Limit 2 Digits	e_lgt_end_ded_two_digits
82	SLI_Explicit	LED End of Speed Limit 3 Digits	e_lgt_end_ded_three_digits
95	Warning	Reverse Curve Left	e_reverseCurveLeft
96	Warning	Reverse Curve Right	e_reverseCurveRight
97	Warning	Turn Left	e_sharpCurveLeft
98	Warning	Turn Right	e_sharpCurveRight
100	SLI_Explicit	Speed Limit 5	e_std_5
101	SLI_Explicit	Speed Limit 15	e_std_15
102	SLI_Explicit	Speed Limit 25	e_std_25
103	SLI_Explicit	Speed Limit 35	e_std_35
104	SLI_Explicit	Speed Limit 45	e_std_45
105	SLI_Explicit	Speed Limit 55	e_std_55
106	SLI_Explicit	Speed Limit 65	e_std_65
107	SLI_Explicit	Speed Limit 75	e_std_75
108	SLI_Explicit	Speed Limit 85	e_std_85
109	SLI_Explicit	Speed Limit 95	e_std_95
110	SLI_Explicit	Speed Limit 105	e_std_105
111	SLI_Explicit	Speed Limit 115	e_std_115
112	SLI_Explicit	Speed Limit 125	e_std_125
113	SLI_Explicit	Speed Limit 135	e_std_135
114	SLI_Explicit	Speed Limit 145	e_std_145
115	SLI_Explicit	LED Speed Limit 5	e_lgt_5
116	SLI_Explicit	LED Speed Limit 15	e_lgt_15
117	SLI_Explicit	LED Speed Limit 25	e_lgt_25
118	SLI_Explicit	LED Speed Limit 35	e_lgt_35
119	SLI_Explicit	LED Speed Limit 45	e_lgt_45
120	SLI_Explicit	LED Speed Limit 55	e_lgt_55
121	SLI_Explicit	LED Speed Limit 65	e_lgt_65

122	SLI Explicit	LED Speed Limit 75	e lgt 75
123	SLI Explicit	LED Speed Limit 85	e lgt 85
124	SLI Explicit	LED Speed Limit 95	e lgt 95
125	SLI Explicit	LED Speed Limit 105	e lgt 105
126	SLI Explicit	LED Speed Limit 115	e lgt 115
127	SLI Explicit	LED Speed Limit 125	e lgt 125
131	Warning	Triangular Beware Of Snow	e bewareOfSnow
132	Warning	Triangular Bicycle Crossing	e bicycleCrossing
133	Warning	Triangular Buses	e buses trams
134	Warning	Triangular Children	e children
135	Warning	Triangular Congestion Hazard	e congestionHazard
136	Warning	Curve Left	e curveLeft
137	Warning	Warning Curve Right	e curveRight
139	Warning	Warning Double Curve Left	e doubleCurveLeft
140	Warning	Warning Double Curve Right	e doubleCurveRight
141	Warning	Warning Draw Bridge	e drawBridge
142	Warning	Warning Falling Rocks	e fallingRocks
143	Warning	Warning General Danger	e generalDanger
144	Warning	Warning Guarded Railway Crossing	e guardedRailwayCrossing
145	Warning	Warning Intersection	e intersection
146	Warning	Warning Left Merge	e leftMerge
147	Warning	Warning Loose Gravel	e looseGravel
148	Warning	Warning Low Flying Aircraft	e lowFlyingAircraft
149	Warning	Warning Pedestrians	e pedestrians
150	Warning	Warning Pedestrians Crossing	e pedestriansCrossing
151	Warning	Warning Priority	e priority
152	Warning	Warning Right Merge	e rightMerge
153	Warning	Warning Construction Area Ahead	e roadWorkAhead
154	Warning	Warning Road Narrows	e roadNarrows
155	Warning	Warning Road Narrows Left	e roadNarrowsLeft
156	Warning	Warning Road Narrows Right	e roadNarrowsRight
157	Warning	Warning Road Work	e roadWork
158	Warning	Warning Rough Road	e roughRoad
159	Warning	Warning Roundabout	e roundabout
160	Warning	Warning Slippery When Wet	e slipperyWhenWet
161	Warning	Warning Steep Downgrade	e steepDowngrade
162	Warning	Warning Steep Upgrade	e steepUpgrade
163	Warning	Warning Strong Cross Wind	e strongCrossWind
164	Warning	Warning Traffic Signals	e trafficSignals
165	Warning	Warning Two Way Traffic	e twoWayTraffic
166	Warning	Warning Unguarded Railway Crossing	e unguardedRailwayCrossing
167	Warning	Warning Wild Animal Crossing	e wildAnimalCrossing
168	Yield	Triangular Yield	e yield
169	Priority	Priority Road	e priorityRoad
170	Priority	End Of Priority Road	e endOfPriorityRoad
171	SLI Implicit	Motorway Begin	e std. motorWay
172	SLI Implicit	Regular End Of Motorway	e std. endOfMotorWay
173	SLI Implicit	Expressway Begin	e std. expressWay
174	SLI Implicit	Expressway End	e std. endOfExpressWay
175	SLI Implicit	Playground (Residential) Area Begin	e std. residentialArea
176	SLI Implicit	End Of Playground (Residential) Area	e std. endOfResidentialArea
177	SLI Implicit	City Entrance	e std. cityEntrance
178	SLI Implicit	Combined City Exit	e std. cityEntranceCombined
180	Warning	Warning Additional Left	e addLeft
181	Warning	Warning Additional Right	e addRight
182	Warning	Warning Left Lane Ends	e laneEndsLeft
183	Warning	Warning Right Lane Ends	e laneEndsRight
184	Warning	Warning Exit Right	e exitRight
185	Warning	Triangular City Entrance China	e cityEntranceCN
186	Warning	Camera	e camera
187	Warning	Warning Lane Merge Left	e laneMergeLeftTxt
188	Warning	Warning Lane Merge Left	e laneMergeRightTxt
189	Information	Priority Oncoming	e RectOncomingPriority
190	Warning	Warning Lane split Right	e laneSplitRight
191	Warning	Warning Winding Left	e windingLeft
192	Warning	Warning Winding Right	e windingRight
193	Warning	Warning Side Road Left	e SideRoadLeft
194	Warning	Warning USA Side Road Right	e SideRoadRight
195	Warning	Warning Thru Traffic Merge Txt	e thruTrafficMerge
196	Warning	Warning Stop Ahead	e stopAhead
197	Warning	Warning Loose Shoulder	e LooseShoulder
199	No Entrance	No Entrance	e std. no. entrance
200	No Passing	No Passing Start	e std. np. start
201	No Passing	End Of No Passing	e std. np. end
202	No Passing	No Passing Truck Start	e std. np. truck start
203	No Passing	End Of No Passing Truck	e std. np. truck end
205	Information	End Road Works Txt	e ca. end. road. work
206	Information	End Construction	e ca. end. construction
210	Stop	Stop Sign	e std. stopSign
211	Prohibitory	Truck Limit	e std. truckLimit
212	Warning	Warning Cross Roads	e crossRoads
213	Warning	Warning Side Road	e SideRoad
214	Warning	Warning Road Work Ahead Text	e roadWorkAheadTxt
215	Warning	Warning Road Construction Ahead Text	e roadConstructionAheadTxt
217	Warning	Warning Bump	e bump
218	Information	End School Zone	e end. school. zone
219	SLI Implicit	City Entrance Black Background	e std. CityEntrance Black BG
220	No Passing	LED No Passing	e lgt. np. start
221	No Passing	LED No Passing End	e lgt. np. end
222	SLI Implicit	Built Up Area	e std. BuiltUpArea
223	SLI Implicit	End of Built Up Area	e std. endOfBuiltUpArea
224	Mandatory	Roundabout	e std. roundabout
225	No Passing	LED No Passing Truck	e lgt. np. truck start
226	No Passing	LED No Passing Truck End	e lgt. np. truck end
229	SLI Implicit	End Of City	e std. endOfCityEntrance
240	Mandatory	Arrow Straight	e std. arrow. straight
241	Mandatory	Arrow Right	e std. arrow. right
242	Mandatory	Arrow Left	e std. arrow. left
243	Mandatory	Arrow Right Ahead	e std. arrow. rightAhead
244	Mandatory	Arrow Left Ahead	e std. arrow. leftAhead
245	Prohibitory	Arrow No Left	e std. arrow. noLeft
246	Prohibitory	Arrow No Right	e std. arrow. noRight
247	Mandatory	Arrow Keep Left	e std. arrow. KeepLeft

248	Mandatory	Arrow Keep Right	e_std_arrow_KeepRight
249	Mandatory	Arrow Either Side	e_std_arrow_eitherSide
250	Noentrance	Road Closed	e_std_roadClosed
256	Mandatory	Bicycle Lane	e_BicycleLane
257	Prohibitory	Bicycle Limit	e_bicycleLimit
258	Prohibitory	Bus Limit	e_busLimit
259	Prohibitory	Hazardous Truck Limit	e_hazardousTruckLimit
260	Prohibitory	Height Limit	e_heightLimit
262	No Parking Stopping	Parking	e_parking
263	Prohibitory	Pedestrian Diagonal Bicycle	e_pedBicycleLimit
265	Mandatory	Trucks Only	e_trucksOnly
266	Prohibitory	Weight Limit	e_weightLimit
267	Prohibitory	Width Limit	e_widthLimit
268	Prohibitory	Motor Up Car Down	e_motorUpCarDown
269	Prohibitory	Low Emission Zone	e_lowEmissionZone
270	Prohibitory	End Of Low Emission Zone	e_endOfLowEmissionZone
271	Prohibitory	Toll Road	e_tollRoad
301	Mandatory	Keep Distance	e_std_Keep_Distance
302	Mandatory	Load Limit	e_std_Load_Limit
303	Mandatory	Bus Lane	e_std_Bus_Lane
304	Mandatory	Tram Lane	e_std_Tram_Lane
305	Mandatory	Bus Lane End	e_std_End_Bus_Lane
307	Mandatory	No Straight	e_std_No_straight
308	Mandatory	U Turn	e_std_U_Turn
309	Information	Toll Road End	e_std_End_tollRoad
312	Information	End of Hazardous Truck Limit	e_std_End_Limit_HazardousTruck
313	Information	Toll Japan Electronic	e_std_etcJP
314	Information	Toll Japan electronic and Manual	e_std_etcTollJP
315	Information	Toll Japan Manual	e_std_tollJP
316	Information	Construction arrow right	e_std_arrowRightJP
317	Information	Construction arrow left	e_std_arrowLeftJP
319	Information	Roadwork Japan	e_std_roadworkJP
320	Information	Construction right/left Japan	e_std_construction_rightJP
321	Information	Roadwork electronic sign Japan	e_std_roadwork_electJP
322	Information	Roadwork right Japan	e_std_roadwork_rightJP
325	Information	one way	e_std_one_way
326	Information	end of one way	e_std_endof_one_way
340	Warning	Exit Left	e_exitLeft
342	Warning	Pass Left or Right	e_pass_left_or_right
344	Mandatory	Slow (Korea Only)	e_korea_slow
350	Warning	Warning School Zone	e_school_zone
351	Warning	School Bus Stop Ahead	e_school_bus_stop_ahead
353	Warning	Be Prepared to Stop	e_prepared_to_stop
359	Warning	Hairpin Turn Left	e_hairpinToLeft
360	Warning	Lane Split Left	e_laneSplitLeft
361	Warning	Hairpin Turn Right	e_hairpinToRight
362	Warning	T Road	e_T_Roads
366	Warning	Reverse Curve Left 2 lanes	e_2_lanesReverse_left
367	Warning	Reverse Curve Right 2 lanes	e_2_lanesReverse_right
368	Warning	Reverse Curve Left 3 lanes	e_3_lanesReverse_left
369	Warning	Reverse Curve Right 3 lanes	e_3_lanesReverse_right
370	Warning	Merge to Main From Right	e_MergeToMainFromRight
372	Warning	Offset Roads Right Left	e_offset_roads_Right_Left
373	Warning	Offset Roads Left Right	e_offset_roads_Left_Right
374	Warning	Railway Crossing Left	e_railWayCrossingOnLeft
375	Warning	Railway Crossing Right	e_railWayCrossingOnRight
376	Warning	Thru Traffic Merge Left	e_thruTrafficMergeLeft
377	Warning	Thru Traffic Merge Right	e_thruTrafficMergeRight
378	Warning	Share Road Pedestrians Bicycle	e_ShareRoadsPedestBikes
379	Warning	Share Road Cars Bicycle	e_ShareRoadsCarsBikes
392	Warning	Sharp Deviation Left	e_sharp_deviation_left
393	Warning	Sharp Deviation Right	e_sharp_deviation_right
394	Warning	Exit Chinese	e_exit_chinese
395	Warning	Level Crossing	e_level_crossing

arrow Type

Enum Value	Sign Semantic Name	Mobileye Internal Enum Name
14	road Arrow Straight	e_std_roadArrowStraight
15	road Arrow Straight Right	e_std_roadArrowStraightRight
16	road Arrow Straight Left	e_std_roadArrowStraightLeft
17	road Arrow Right	e_std_roadArrowRight
18	road Arrow Left	e_std_roadArrowLeft
19	road Arrow Oncoming	e_std_roadArrowOncoming
276	Road Arrow Straight Left Right	e_std_roadArrowStraightLeftRight
279	Road Arrow Left Right	e_std_roadArrowLeftRight

stopLine Type

Enum Value	Sign Semantic Name	Mobileye Internal Enum Name
284	Road Solid Stop Line	e_std_roadStopLine
285	Road Dashed Stop Line	e_std_roadDashedStopLine
286	Road Double Solid Stop Line	e_std_roadDoubleStopLine
287	Road Dashed Solid Stop Line	e_std_roadDashedSolidStopLine
288	Road Solid Dashed Stop Line	e_std_roadSolidDashedStopLine
289	Road Double Dashed Stop Line	e_std_roadDoubleDashedStopLine
290	Road Triangular Stop Line	e_std_roadTriangularStopLine

crossing Type

Enum Value	Sign Semantic Name	Mobileye Internal Enum Name
291	Road Zebra Crossing	e_std_roadZebraCrossing
292	Road Solid Crossing	e_std_roadSolidCrossing
293	Road Dashed Crossing	e_std_roadDashedCrossing

speedLimit Type

Enum Value	Sign Semantic Name	Mobileye Internal Enum Name
400	Road Speed Limit 10	e_std_roadSpeedLimit_10
401	Road Speed Limit 100	e_std_roadSpeedLimit_100
402	Road Speed Limit 110	e_std_roadSpeedLimit_110
403	Road Speed Limit 120	e_std_roadSpeedLimit_120
404	Road Speed Limit 20	e_std_roadSpeedLimit_20
405	Road Speed Limit 30	e_std_roadSpeedLimit_30
406	Road Speed Limit 40	e_std_roadSpeedLimit_40
407	Road Speed Limit 50	e_std_roadSpeedLimit_50

408	Road Speed Limit 60	e_std_roadSpeedLimit_60
409	Road Speed Limit 70	e_std_roadSpeedLimit_70
410	Road Speed Limit 80	e_std_roadSpeedLimit_80
411	Road Speed Limit 90	e_std_roadSpeedLimit_90

18 APPENDIX B: EDR Settings

Settings	AR0220 100deg				AR0138 52deg			
Number of LB	4				4			
Number of BB	4				4			
LB Settings	LB1	LB2	LB3	LB4	LB1	LB2	LB3	LB4
preFrameNum*	2	2	2	2	2	2	2	2
postFrameNum*	4	4	4	4	4	4	4	4
logAsPGM	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
logTimeout	1000	1000	1000	1000	1000	1000	1000	1000
postLogTimeout	1000	1000	1000	1000	1000	1000	1000	1000
logTheEventImage	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Resolution-height	120	120	120	120	120	120	120	120
Resolution-width	160	160	160	160	160	160	160	160

19 APPENDIX C: CRC-16 Reference

✓ Approved, MAPC-67571 - APPENDIX C: CRC-16 Reference

CRC-16' s shall be implemented in accordance with the following:

CRC-16 Ethernet protocol X16+X12+ X5+1 init value = 0xFFFF.

[?] Should Have]

20 APPENDIX D: GPIO Definitions

EYEQ4 GPIO DEFINITIONS for ADAS ECU						
Feb/26/2023 JDB						
Root Diagnostics						
Schematics Label	GPIO	BALL	Root Diagnostics Encoding			
EYEQA_AURIS_ROOT_0	GPIO_A15	AD30	EYEQA_AURIS_ROOT_0	EYEQA_AURIS_ROOT_1	EYEQA_AURIS_ROOT_2	Dependent Root Status
EYEQA_AURIS_ROOT_1	GPIO_A16	AD30	0	0	0	0 = Not Used (Signal value)
EYEQA_AURIS_ROOT_2	GPIO_A17	AD30	0	0	1	1 = BOOT
EYEQA_AURIS_ROOT_3	GPIO_A18	AD30	0	1	0	2 = Root authentication
			0	1	1	3 = OS/Kernel authentication & testing
			1	0	0	4 = OS/Kernel test
			1	0	1	5 = Application authentication
			1	1	0	6 = Not Used
			1	1	1	7 = Not Used
Hardware I/O's						
Hardware I/O Encoding						
Schematics Label	GPIO	BALL	EYEQA_GPIO_A4	EYEQA_GPIO_A1	EYEQA_GPIO_A2	EYEQA_GPIO_A1
EYEQA_GPIO_A1	GPIO_A11	AD10	0	0	0	0 = Not Used
EYEQA_GPIO_A2	GPIO_A12	AD10	0	0	1	1 = I2C I/O
EYEQA_GPIO_A3	GPIO_A13	AD10	0	1	0	2 = I2C I/O
EYEQA_GPIO_A4	GPIO_A14	AD10	0	1	1	3 = I2C I/O
			0	1	0	4 = I2C I/O
			0	1	1	5 = I2C I/O
			0	1	1	6 = I2C I/O
			0	1	1	7 = I2C I/O
Core Dump						
Schematics Label	GPIO	BALL	Core Dump Encoding			
EYEQA_AURIS_ROOT_3	GPIO_A18	AD30	0 = No Core Dump in Progress	1 = Core Dump in Progress		
Camera Select						
Schematics Label	GPIO	BALL	Camera Select Encoding			
AURIS_EYEQA_STARTUP	GPIO_A16	AD30	0 = Normal I/O	1 = Wake I/O		
ERROUT						
Schematics Label	GPIO	BALL	ERROUT Encoding			
EYEQA_AURIS_ERROUT	ERROUT	AC10	0 = NO ERRORS	1 = ERRORS, Report Error		
TimedSync						
Schematics Label	GPIO	BALL	TimedSync Encoding			
EYEQA_AURIS_SYNC	GPIO_A17	AD30	Defined in ModuleType TimedSync document			

21 Alignment NVM Table

	horizonKA	yawKA	rollAngleKA	camerasAlignmentValidKA
TAC	update	update	update	update
SPC	update	update	set to be 0	update
Autofix	update	update	do not	update

In the case of "update", update these NVM parameters only when TAC, SPC or Autofix is successfully completed.

22 APPENDIX E: Intrinsic Calibration EEPROM DATA

Intrinsic Cal Block From EEPROM to the EyeQ4						
NAME	STARTBIT	LENGTH	TYPE	EXAMPLE DEFAULT VALUE	DIVIDE BY FACTOR	VALUE TO WRITE TO EEPROM (truncate ints)
HEXADECIMAL VALUE TO WRITE TO EEPROM						
CCAM_Num_Of_distorParams_m	0	4	UINT	11	1	11
Reserved_1	4	4	UINT	0	1	0
CCAM_camK1_FocalLengthX_m	8	16	UINT	1502.6	0.0625	24041
CCAM_K2_FocalLengthY_m	24	16	UINT	1502.7	0.0625	24043
CCAM_K3_Skew_m	40	16	UINT	0	0.0625	0
CCAM_K4_PrincipalPointX_m	56	16	UINT	919.4	0.0625	14710
CCAM_K5_PrincipalPointY_m	72	16	UINT	474.9	0.0625	7598
CCAM_distortionModelType_m	88	8	UINT	3	1	3
CCAM_CODX_m	96	16	UINT	916.1	0.0625	14657
CCAM_CODY_m	112	16	UINT	470.8	0.0625	7532
CCAM_distorParams_m_0	128	32	IEEE Float	-0.0008	1	-0.000762153
CCAM_distorParams_m_1	160	32	IEEE Float	0.00077	1	0.000774594
CCAM_distorParams_m_2	192	32	IEEE Float	-0.0012	1	-0.001215783
CCAM_distorParams_m_3	224	32	IEEE Float	0.00149	1	0.001487369
CCAM_distorParams_m_4	256	32	IEEE Float	-0.0016	1	-0.001594016
CCAM_distorParams_m_5	288	32	IEEE Float	0.0016	1	0.001597705
CCAM_distorParams_m_6	320	32	IEEE Float	-0.0015	1	-0.001545222
CCAM_distorParams_m_7	352	32	IEEE Float	0.00146	1	0.001461674
CCAM_distorParams_m_8	384	32	IEEE Float	-0.0014	1	-0.001359252
CCAM_distorParams_m_9	416	32	IEEE Float	0.00124	1	0.001241691
CCAM_distorParams_m_10	448	32	IEEE Float	-0.0011	1	-0.001103006
CCAM_distorParams_m_11	480	32	IEEE Float	0	1	0
CCAM_distorParams_m_12	512	32	IEEE Float	0	1	0
CCAM_distorParams_m_13	544	32	IEEE Float	0	1	0
CCAM_distorParams_m_14	576	32	IEEE Float	0	1	0
CALCULATED CRC-16	608	16	UINT	N/A	N/A	
CRC-16 Ethernet protocol X16+X12+ X5+1 init value = 0xFFFFFFF						

I: Short Term Intrinsic Cals, March 2019

II: Long Term Intrinsic Cals (Updated for Manufacturing compliance) April 2019

Main flash – 64MB

Main flash – 128MB

END