

September

# Mobileye 8 Connect

Technical user guide v0.1



For NTUT\_EVIL Only

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Approved by:	
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# Change Control

VERSION	DATE	UPDATED BY	ESSENCE OF THE CHANGE	APPROVED BY
0.1	03-Jan-21	Dov Korngut	First version	Dov Korngut
0.2	19-Feb-21	Dov Korngut	Fix protocols names	Dov Korngut
0.3	20-Feb-21	Dov Korngut	2.1.2-2.1.4	Dov Korngut
0.4	04-May-21	Dov Korngut	IMS4-2640 - Add Lateral Velocity to opObjects protocol Document fixed position of lane adjacent offsets	Dov Korngut
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1.0	03-Aug-22	Eran Levy	Additional description to Lanes_Host; Lanes_Adjacent; Objects_Signals	Eran Levy
1.6	13-Sep-22	Eran Levy	Objects – update info and added missing information	Eran Levy

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# 1. Introduction

The purpose of this document is to describe in detail the CAN output data from Mobileye 8 Connect system.

This document applies to code residing in the ME8 Aftermarket tree for version 4.19.6 and up.

# 2. Acronyms & Terminology

Term	Description
CIPV	Closest In-Path Vehicle - vehicle directly ahead of host vehicle in same lane
FOV	Field Of View - area visible to camera
VED	Vehicle Detection - Generic acronym for detecting vehicles in environment via sensors
LH	Lane Host
TSR	Traffic Sign Recognition - generic acronym for detection of road signs
VD	Vehicle Detection - use VED - generic acronym for detecting vehicles in environment using sensors
VRU	Vulnerable Road User - including pedestrians and cyclists
MCP	VRU with the highest chance to be hit
VR	View Range
NIV	Neighboring lane Impeding Vehicle
LKA	Lane Keeping and Guidance Assist



### 3. CAN output message overview

Message	Code	Description
Objects header	0x541	
Objects Signals A <i>i</i>	0x500 + <i>i</i> *3	0=< <i>i</i> =11
Objects Signals B <i>i</i>	0x501 + <i>i</i> *3	0=< <i>i</i> =11
Objects Signals C <i>i</i>	0x503 + <i>i</i> *3	0=< <i>i</i> =11
Lanes_Host_Header	0x76E	
Lanes_Host_0	0x770	
Lanes_Host_1	0x771	
Lanes_Host_2	0x772	
Lanes_Host_3	0x773	
Lanes_Adjacent_Header	0x782	
Lanes_Adjacent_1A	0x784	
Lanes_Adjacent_1B	0x785	
Lanes_Adjacent_2A	0x786	
Lanes_Adjacent_2B	0x787	
Lanes_Adjacent_3A	0x788	
Lanes_Adjacent_3B	0x789	
Lanes_Adjacent_4A	0x78A	
Lanes_Adjacent_4B	0x78B	
Fail_Safes	0x690	
Hazards_Header	0x486	

Hazards.UTC	0x487	
Hazards_0A	0x488	
Hazards_0B	0x489	
Hazards_1A	0x48A	
Hazards_1B	0x48B	
Hazards_2A	0x48C	
Hazards_2B	0x48D	
Hazards_3A	0x48E	
Hazards_3B	0x48F	

## 4. Message ID 0x541 Object header

### Message 0x541 - overview

DLC: 3

Bit	7 (MSB)	6	5	4	3	2	1	0 (LSB)
Byte 0	Sync_Frame_Index							
Byte 1	VD_CIPV_ID				Num_Of_Video_Obj			
Byte 2	Reserved	OBJ_VD_ Allow_Acc		VD_CIPV_Lost				

#### Sync\_Frame\_Index

- Type: Unsigned
- Meaning: synchronizes between the messages in the same frame
- Unit: counter

#### Num\_Of\_Video\_Obj

- Type: Unsigned
- Meaning: Number of recognized video objects in the scene (Veds, Peds, General Objects)
- Unit: counter

#### VD\_CIPV\_ID

- Type: Unsigned
- Meaning: Represents the ID of the CIPV.
- Unit: counter

#### VD\_CIPV\_Lost

- Type: Unsigned

- Unit: ENUM
- Meaning: Reports a CIPV loss that cannot be explained to initiate a takeover request. State of the CIPV in terms of its loss
  - 0 – NO\_LOSS - There was no recent loss of CIPV
  - 1 – LOST\_TARGET\_FOV\_OUT - indicates the CIPV has left the image on the side OR in a sharp curve OR was cutting out of the host lane (i.e., naturally drop)
  - 2 – LOST\_TARGET\_FOV\_IN - indicated other cases where the CIPV was lost in the middle of the detection area without any plausible reason. Can happen in rare cases of very hilly terrains (the car disappears over the hill in the middle of the frame with no other CIPV candidates)

### OBJ\_VD\_Allow\_Acc

- Type: Unsigned
- Unit: ENUM
- Meaning: This signal is intended to suppress acceleration in stop and go ACC scenarios when we suspect something is in our way.
  - 0 – FREE\_SPACE
  - 1 – SPACE\_NOT\_FREE
  - 2 – FREE\_SPACE\_UNKNOWN

## 5. Message ID 0x500+i\*3 Objects\_Signals\_Ai

### Message 0x500+i\*3 overview

DLC: 7

Bit	7(MSB)	6	5	4	3	2	1	0(LSB)
Byte 0		Obj_ID_i						
Byte 1	OBJ_Width_i						Object_Class_i	
Byte 2	OBJ_Length_i							
Byte 3	Relative_Long_Velocity_i							
Byte 4								
Byte 5							OBJ_Lane_Assignment_i	
Byte 6	Reserved			Relative_Lat_Velocity_i				

#### Obj\_ID\_i

- Type: counter
- Meaning: ID Manager based ID

#### Object\_Class\_i

- Type: ENUM
- Meaning: Indicates the object type. Uncertain is outputted in case the probability that a vehicle is a truck is very similar to the probability that it is a car.
- 0 – car
- 1 – truck
- 2 – bike
- 3 – bicycle
- 4 – pedestrian
- 5 – general\_object
- 7 – uncertain\_vcl

### OBJ\_Width\_i

- Type: Unsigned
- Unit: Meter
- Meaning: PHYSICAL STATES:PS\_width
- Range: 0 -6.35
- Decoding: [hex]\*0.05

### OBJ\_Length\_i

- Type: Unsigned
- Unit: meter
- Meaning: PHYSICAL STATES:PS\_length
- Range: 0-25.5
- Decoding: [hex]\*0.05

### Relative\_Long\_Velocity\_i

- Type: Unsigned
- Unit: m/s
- Meaning: PHYSICAL STATES:PS\_longRelSpeed
- Range: (-120) – 130
- Offset: -120
- Decoding: [hex]\*0.05+offset

### OBJ\_Lane\_Assignment\_i

- Type: unsigned
- Unit: ENUM
- Meaning: LANE DATA:laneAssignment
  - 0 – Next Left Lane
  - 1 – Left Lane
  - 2 – Ego Lane
  - 3 – Right Lane
  - 4 – Next Right Lane
  - 5 – Not assigned

## Relative\_Lat\_Velocity\_i

- Type: Unsigned
- Unit: m/s
- Meaning: PHYSICAL STATES: PS\_laterSpeed
- Range: (-50) – 50
- Offset: -50
- Decoding: [hex]\*0.05+offset

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## 6. Message ID 0x501+i\*3 Object\_Signals\_Bi

### *Messages 0x501+i\*3 overview*

DLC: 6

Bit	7(MSB)	6	5	4	3	2	1	0(LSB)
Byte 0	Absolute_Long_Acc <sub><i>i</i></sub>							
Byte 1	Long_Distance <sub><i>i</i></sub>							
Byte 2								
Byte 3	Lateral_Distance <sub><i>i</i></sub>							
Byte 4	Long_Distance_M <sub><i>i</i></sub>							
Byte 5	Reserved							

#### Absolute\_Long\_Acc\_*i*

- Type: Unsigned
- Unit: m/s<sup>2</sup>
- Meaning: absoluteLongAcceleration 6.3.1.9
- Range: (-12.8) – 12.75
- Offset: -12.8
- Decoding: [hex]\*0.05 + offset

#### Long\_Distance\_*i*

- Type: Unsigned
- Unit: meter
- Meaning: PHYSICAL STATES:PS\_longDist from VD3D
- Range: 0-350
- Decoding: [hex]\*0.05



## Lateral\_Distance\_i

- Type: Unsigned
- Unit: meter
- Meaning: PHYSICAL STATES:PS\_latDist
- Range: (-102.4) – 102.3
- Offset: -102.4
- Factor: 0.05
- Decoding: [hex]\*0.05 + offset

## Long\_Distance\_M\_i

- Type: Unsigned
- Unit: Meter
- Meaning: PHYSICAL STATES: PS\_longDist from VD2D
  - Please note that the VD2D detects much less obstacles than VD3D, usually only for the first obstacle.
- Range: 0-350
- Decoding: [hex]\*0.05

## 7. Message ID 0x502+i\*3 Objects\_Signals\_Ci

### Message 0x502+i\*3 overview

- DLC: 7

Bit	7(MSB)	6	5	4	3	2	1	0(LSB)
Byte 0	Absolute_Speed_i							
Byte 1		OBJ_Motion_Status_i						
Byte 2		Light_indicator _validity_i	Turn_Indicator _Left_i	Turn_Indicator _Right_i	Brake_Light_i	OBJ_Motion_Category_i		
Byte 3	OBJ_Angle_Mid_i							
Byte 4								
Byte 5	OBJ_Angle_Rate_i							
Byte 6	Reserved							

#### Absolute\_Speed\_*i*

- Type: Unsigned:
- Unit: meter/sec
- Meaning: PHYSICAL STATES:PS\_targetSpeed
- Range: (-100) – 100
- Offset: -100
- Decoding: [hex]\*0.05 + offset

## OBJ\_Motion\_Status\_i

- Type: Unsigned
- Unit: ENUM
- Meaning: MOBILITY: Motion
  - 0 – Unknown
  - 1 – Moving
  - 2 – Stationary
  - 3 – Stopped
  - 4 – Moving Slowly

## OBJ\_Motion\_Category\_i

- Type: Unsigned
- Unit: ENUM
- Meaning: Relevant for VD only.
  - 0 – MC\_UNDEFINED - Undecided, or too far to be sure
  - 1 – MC\_PASSING - Target detected as passing in/out candidate with a very small or unknown relative motion
  - 2 – MC\_PASSING\_IN - Next Lane target overtaking host
  - 3 – MC\_PASSING\_OUT - Next Lane target overtaken by host
  - 4 – MC\_CLOSE\_CUT\_IN - Target cutting in at a close range
  - 5 – MC\_MOVING\_IN - Far range target entering the host lane
  - 6 – MC\_MOVING\_OUT - Target leaving the host lane
  - 7 – MC\_CROSSING - Target in movement orthogonally to the host
  - 8 – MC\_LTAP - Oncoming target operating left turn across the host path
  - 9 – MC\_RTAP - Oncoming target operating right turn across the host path
  - 10 – MC\_MOVING - Target moving and direction unknown (would rarely, if ever, be used)
  - 11 – MC\_PRECEEDING - Target moving in host's direction and none of the above
  - 12 – MC\_ONCOMING - Target moving opposed to host's direction and none of the above

## Brake\_Light\_i

- Type: Unsigned
- Unit: bool
- Meaning: This signal will only be valid when the object is the CIPV
  - 0 – Off
  - 1 – On

## Turn\_Indicator\_Right\_i

- Type: Unsigned
- Unit: bool
- Meaning: This signal will only be valid when the object is the CIPV
  - 0 – Off
  - 1 – On

## Turn\_Indicator\_Left\_i

- Type: Unsigned
- Unit: bool
- Meaning: This signal will only be valid when the object is the CIPV
  - 0 – Off
  - 1 – On

## Light\_indicator\_validity\_i

- Type: Unsigned
- Unit: bool
- Meaning: VLL\_INFO:Valid
  - 0 – False
  - 1 – True

## OBJ\_Angle\_Mid\_i

- Type: Unsigned
- Unit: rad
- Meaning: ANGULAR STATES: angleMid
- Range: (-1.571) – 1.57
- Offset: -1.571
- Decoding: [hex]\* 0.0002 + offset

## OBJ\_Angle\_Rate\_i

- Type: Unsigned
- Unit: rad/s
- Range: (-2.234) – 2.2318
- Offset: -2.234
- Factor: 0.002
- Decoding: [hex]\*0.002 + offset

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## 8. Message ID 0x76E Lanes\_Host\_Header

### Message 0x76E overview

- DLC:1

Bit	7(MSB)	6	5	4	3	2	1	0(LSB)
Byte 0	Reserved							Is_Construction_ Area

#### Is\_Construction\_Area

- Type: bool
- Meaning: True if this is a construction area scene.
  - 0 – FALSE
  - 1 – TRUE

## 9. Message ID 0x770 Lanes+Host\_0 and Message 0x772 Lanes\_Host\_2

### Message 0x770; 0x772 overview

- DLC: 6

Bit	7(MSB)	6	5	4	3	2	1	0(LSB)
Byte 0		LH_Confidence						
Byte 1				LH_Side		LH_Lanemark_Type		
Byte 2	LH_VR_Start							
Byte 3								
Byte 4	LH_VR_End							
Byte 5	Reserved							

#### LH\_Confidence

- Type: Unsigned
- Meaning: Confidence of lane mark

#### LH\_Lanemark\_Type

- Type: Unsigned
- Unit: ENUM
- Meaning: Lane Mark Type Classification (first segment only)
  - 0 – UNDECIDED
  - 1 – SOLID
  - 2 – DASHED
  - 3 – DLM
  - 4 – BOTTS
  - 5 – DECELERATION
  - 6 – HOV\_LANE

## LH\_Side

- Type: Unsigned
- Unit: ENUM
- Meaning: Lane mark side
  - 0 – UNKNOWN
  - 1 – LEFT
  - 2 – RIGHT

## LH\_VR\_Start

- Type: Unsigned
- Unit: meter
- Meaning: Start of longitudinal view range of lane mark.
- Range: 0 – 200
- Decoding: [hex] \* 0.01

## LH\_VR\_End

- Type: Unsigned
- Unit: meter
- Meaning: End of longitudinal view range of lane mark.
- Range: 0 – 200
- Decoding: [hex] \* 0.01



## 10. Message ID 0x771 Lanes+Host\_1 and Message 0x773 Lanes\_Host\_3

### Message 0x771; 0x773 overview

- DLC: 7

Bit	7(MSB)	6	5	4	3	2	1	0(LSB)
Byte 0	LH_C0							
Byte 1	LH_C1							
Byte 2								
Byte 3	LH_C2							
Byte 4								
Byte 5	LH_C3							
Byte 6	Reserved							

#### LH\_C0

- Type: meter
- Meaning: Ci is coefficient corresponding to variable with power of 'i'.

#### LH\_C1

- Type: rad
- Meaning: Ci is coefficient corresponding to variable with power of 'i'.

#### LH\_C2

- Type: 1/m
- Meaning: Ci is coefficient corresponding to variable with power of 'i'.

#### LH\_C3

- Type: 1/m<sup>2</sup>
- Meaning: Ci is coefficient corresponding to variable with power of 'i'.

## 11. Message ID 0x782 Lanes\_Adjacent\_Header

### CAN Parameters

- The messages are transmitted in an 11bit CAN header format.
- The default baud rate is 500Kbps.
- The CAN message is transmitted approximately every 27-110ms.

### Message 0x782 overview

- DLC:1

Bit	7(MSB)	6	5	4	3	2	1	0(LSB)
Byte 0	Lanes_Adjacent_Count				Reserved			

#### Lanes\_Adjacent\_Count

- Type: Unsigned:
- Unit: counter
- Meaning: number of lines supported by this protocol.

## 12. Message ID 0x784 Lanes\_Adjacent\_1A and Message 0x786 Lanes\_Adjacent\_2A and Message 0x788 Lanes\_Adjacent\_3A and Message 0x78A Lanes\_Adjacent\_4A

### Message 0x784; 0x786; 0x788; 78A overview

DLC: 6

Bit	7(MSB)	6	5	4	3	2	1	0(LSB)
Byte 0	Adjacent_Confidence_ <i>i</i>				Adjacent_Type_ <i>i</i>			
Byte 1								
Byte 2	Adjacent_View_Range_Start_ <i>i</i>							
Byte 3								
Byte 4	Adjacent_View_Range_End_ <i>i</i>							
Byte 5	Reserved			Adjacent_Line_Role_ <i>i</i>				

#### Adjacent\_Type\_*i*

- Type: Unsigned
- Unit: ENUM
- Meaning: ENUM of Lane Mark Type Classification.
  - 0 – UNDECIDED
  - 1 – SOLID
  - 2 – DASHED
  - 3 – DLM
  - 4 – BOTTS
  - 5 – HOV\_LANE

### Adjacent\_Confidence\_i

- Type: Unsigned
- Unit: conf
- Meaning: Confidence of lane mark.
- Decoding: [hex] \* 0.01

### Adjacent\_View\_Range\_Start\_i

- Type: Unsigned:
- Unit: m
- Meaning: Start of longitudinal view range of lane mark.
- Range: 0 – 200
- Decoding: [hex] \* 0.01

### Adjacent\_View\_Range\_End\_i

- Type: Unsigned:
- Unit: m
- Meaning: End of longitudinal view range of lane mark.
- Range: 0 – 200
- Decoding: [hex] \* 0.01

### Adjacent\_Line\_Role\_i

- Type: Unsigned
- Unit: ENUM
- Meaning: The role of the lane mark relative to the host vehicle. Commonly the host left boundary is also the right boundary of the next left lane (and the host right boundary is also the left boundary of the next right lane).
  - 0 – NONE
  - 1 – LEFT LEFT LANEMARK
  - 2 – LEFT RIGHT LANEMARK
  - 3 – RIGHT LEFT LANEMARK
  - 4 – RIGHT RIGHT LANEMARK

### 13. Message ID 0x785 Lanes\_Adjacent\_1B and Message 0x787 Lanes\_Adjacent\_2B and Message 0x789 Lanes\_Adjacent\_3B and Message 0x78B Lanes\_Adjacent\_4B

#### Message 0x785; 0x787; 0x789; 78B overview

##### General guidelines:

- Lanes\_Adjacent\_1B (0x785) is always addressing adjacent line left-left lane-mark
- Lanes\_Adjacent\_2B (0x787) is always addressing adjacent line left-right lane-mark
- Lanes\_Adjacent\_3B (0x789) is always addressing adjacent line right-left lane-mark
- Lanes\_Adjacent\_4B (0x78B) is always addressing adjacent line right-right lane-mark
- DLC: 7

Bit	7(MSB)	6	5	4	3	2	1	0(LSB)
Byte 0	Adjacent_Line_C0_ <i>i</i>							
Byte 1	Adjacent_Line_C1_ <i>i</i>							
Byte 2								
Byte 3	Adjacent_Line_C2_ <i>i</i>							
Byte 4								
Byte 5	Adjacent_Line_C3_ <i>i</i>							
Byte 6	<i>Reserved</i>							

### Adjacent\_Line\_C0\_i

- Type: Unsigned
- Unit: Meter
- Meaning: Ci is coefficient corresponding to variable with power of 'i'.
- Range: (-10) – 10
- Offset: -10
- Decoding: [hex]\*0.01 + offset

### Adjacent\_Line\_C1\_i

- Type: Unsigned
- Unit: rad
- Meaning: Ci is coefficient corresponding to variable with power of 'i'.
- Range: (-0.357) – 0.357
- Offset: -0.357
- Decoding: [hex]\*0.000977 + offset

### Adjacent\_Line\_C2\_i

- Type: Unsigned
- Unit: 1/m
- Meaning: Ci is coefficient corresponding to variable with power of 'i'.
- Range: (-0.032) – 0.032
- Offset: -0.032
- Decoding: [hex]\* 9.77e-07 + offset

### Adjacent\_Line\_C3\_i

- Type: Unsigned
- Unit: 1/m<sup>2</sup>
- Meaning: Ci is coefficient corresponding to variable with power of 'i'.
- Range: (-0.000122) – 0.000122
- Offset: -0.000122
- Decoding: [hex]\* 3.73e-09 + offset

## 14. Message ID 0x690 Fail\_Safes

### Message 0x690 overview

- DLC: 8

Bit	7(MSB)	6	5	4	3	2	1	0(LSB)
Byte 0	Protocol_Version							
Byte 1	Sync_Frame_Index							
Byte 2	FS_Splashes		FS_Fog		FS_Rain		FS_ Free_Sight	
Byte 3	FS_Low_Sun			FS_Sun_Ray				
Byte 4	FS_Full_ Blockage		FS_Partial_ Blockage			FS_Blur_ Image		
Byte 5	FS_Out_ Of_Focus		FS_Out_ Of_Calib		FS_Frozen_ Windshield			
Byte 6	FS_TSR_Out_OF_Calib							
Byte 7	Reserved							

#### Protocol\_Version

- Type: NA
- Meaning: Version number of the failsafe message.

#### Sync\_Frame\_Index

- Type: counter
- Meaning: sync ID to be used to sync between signals in the system.

## FS\_Free\_Sight

- Type: bool
- Meaning: The FOV is split to 6 different regions. Once an object (Lanes/ VD/ PED/ TSR) is detected in every one of the regions the freeSight signal is set to true.
  - 0 – FALSE
  - 1 – TRUE

## FS\_Rain

- Type: ENUM
- Meaning: Detection of rain or similar precipitation.
  - 0 – NOT\_READY
  - 1 – NONE
  - 2 – 25 (LOW)
  - 3 – 50 (MEDIUM)
  - 4 – 75 (HIGH)
  - 5 – 99 (UNKNOWN)

## FS\_Fog

- Type: ENUM
- Meaning: Detection of fog.
  - 0 – NOT\_READY
  - 1 – NONE
  - 2 – 25 (LOW)
  - 3 – 50 (MEDIUM)
  - 4 – 75 (HIGH)
  - 5 – 99 (UNKNOWN)

## FS\_Splashes

- Type: ENUM
- Meaning: We cannot detect the lower edges of vehicles due to water spray aka splashes.
  - 0 – NOT\_READY
  - 1 – NONE
  - 2 – 25 (LOW)
  - 3 – 50 (MEDIUM)



- 4 – 75 (HIGH)
- 5 – 99 (UNKNOWN)

## FS\_Sun\_Ray

- Type: ENUM
- Meaning: A strong glare due to micro scratches on the windshield.
  - 0 – NOT\_READY
  - 1 – NONE
  - 2 – 25 (LOW)
  - 3 – 50 (MEDIUM)
  - 4 – 75 (HIGH)
  - 5 – 99 (UNKNOWN)

## FS\_Low\_Sun

- Type: ENUM
- Meaning: Sun glare which disrupts the image. The sun appears over the FOE.
  - 0 – NOT\_READY
  - 1 – NONE
  - 2 – 25 (LOW)
  - 3 – 50 (MEDIUM)
  - 4 – 75 (HIGH)
  - 5 – 99 (UNKNOWN)

## FS\_Blur\_Image

- Type: ENUM
- Meaning: Issued when visibility on the image is lowered such that detection of objects inside the Danger Zone (in-path and next lanes up-to some level) cannot be fully performed.
  - 0 – NOT\_READY
  - 1 – NONE
  - 2 – 25 (LOW)
  - 3 – 50 (MEDIUM)
  - 4 – 75 (HIGH)
  - 5 – 99 (UNKNOWN)

## FS\_Partial\_Blockage

- Type: ENUM
- Meaning: Low visibility due to partially covered lens.
  - 0 – NOT\_READY
  - 1 – NONE
  - 2 – 25 (LOW)
  - 3 – 50 (MEDIUM)
  - 4 – 75 (HIGH)
  - 5 – 99 (UNKNOWN)

## FS\_Full\_Blockage

- Type: ENUM
- Meaning: Takes 50 frames with no edges. Recovery is very quick (max 50 frames). Will be on when standing at night with no headlights.
  - 0 – NOT\_READY
  - 1 – NONE
  - 2 – 25 (LOW)
  - 3 – 50 (MEDIUM)
  - 4 – 75 (HIGH)
  - 5 – 99 (UNKNOWN)

## FS\_Frozen\_Windshield

- Type: ENUM
- Meaning: Significant failsafe indicating the windshield is frozen and this will impact all technologies.
  - 0 – NOT\_READY
  - 1 – NONE
  - 2 – 25 (LOW)
  - 3 – 50 (MEDIUM)
  - 4 – 75 (HIGH)
  - 5 – 99 (UNKNOWN)

## FS\_Out\_Of\_Calib

- Type: ENUM
- Meaning: The vision detected that the calibration is wrong (Auto Fix).
  - 0 – NOT\_READY
  - 1 – NONE
  - 2 – 25 (LOW)
  - 3 – 50 (MEDIUM)
  - 4 – 75 (HIGH)
  - 5 – 99 (UNKNOWN)

## FS\_Out\_Of\_Focus

- Type: ENUM
- Meaning: The vision detected that the focus calibration is wrong.
  - 0 – NOT\_READY
  - 1 – NONE
  - 2 – 25 (LOW)
  - 3 – 50 (MEDIUM)
  - 4 – 75 (HIGH)
  - 5 – 99 (UNKNOWN)

## FS\_TSR\_Out\_OF\_Calib

- Type: BITWISE
- Meaning: Specific TSR Out of Calib Signal.
  - 0 – NONE
  - 1 – TSR\_OUT\_OF\_CALIB
  - 2 – TSR\_OUT\_OF\_CALIB\_AEB
  - 4 – TSR\_OUT\_OF\_CALIB\_YAW
  - 8 – TSR\_OUT\_OF\_CALIB\_HORIZON

## 15. Message ID 0x486 Hazards\_Header

### Message 0x486 overview

- DLC: 6

Bit	7(MSB)	6	5	4	3	2	1	0(LSB)
Byte 0	Protocol_Version							
Byte 1	imageTimestamp							
Byte 2								
Byte 3								
Byte 4								
Byte 5	Valid_Frame		Num_Hazards_Objects					

#### Protocol\_Version

- Type: counter
- Meaning: Denotes the protocol version.

#### imageTimestamp

- Type: milliseconds
- Meaning: The time in which the image was grabbed, in external clock time.

#### Num\_Hazards\_Objects

- Type: counter
- Meaning: Number of hazards reported in hazards protocol.

#### Valid\_Frame

- Type: bool
- Meaning: If frame is not valid, data is not to be used.

## 16. Message ID 0x487 Hazards\_UTC

### Message 0x487 overview

- DLC: 7

Bit	7(MSB)	6	5	4	3	2	1	0(LSB)
Byte 0	UTC_Timestamp							
Byte 1								
Byte 2								
Byte 3								
Byte 4								
Byte 5								
Byte 6								

#### UTC\_Timestamp

- Type: microseconds
- Meaning: UTC timestamp. If unavailable, an external clock time, which is used in meSyncProtocol3, will take effect. Otherwise, an internal (ME) clock will be outputted.

## 17. Message ID 0x488 Lanes\_Adjacent\_0A and Message 0x48A Lanes\_Adjacent\_1A and Message 0x48C Lanes\_Adjacent\_2A and Message 0x48E Lanes\_Adjacent\_3A

### Message 0x488; 0x48A; 0x48C; 48Eoverview

- DLC: 8

Bit	7(MSB)	6	5	4	3	2	1	0(LSB)
Byte 0	HZD_ID							
Byte 1	HZD_ExistenceProb							
Byte 2								
Byte 3	HZD_Lateral_Position							
Byte 4								
Byte 5	HZD_Longitudinal_Position							
Byte 6	HZD_Vertical_Position							
Byte 7								

#### HZD\_ID

- Type: counter
- Meaning: The hazard element ID.

#### HZD\_ExistenceProb

- Type: NA
- Meaning: Probability of presence of hazard.

### HZD\_Lateral\_Position

- Type: m
- Meaning: Lateral position of hazard in defined CS.

### HZD\_Longitudinal\_Position

- Type: m
- Meaning: Longitudinal position of hazard in defined CS.

### HZD\_Vertical\_Position

- Type: m
- Meaning: Vertical position of hazard in defined CS.

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## 18. Message ID 0x489 Lanes\_Adjacent\_0B and Message 0x48B Lanes\_Adjacent\_1B and Message 0x48D Lanes\_Adjacent\_2B and Message 0x48F Lanes\_Adjacent\_3B

### CAN Parameters

- The messages are transmitted in an 11bit CAN header format.
- The default baud rate is 500Kbps.
- The CAN message is transmitted approximately every 27-110ms.

### Message 0x489; 0x48B; 0x48D; 48F overview

- DLC: 5

Bit	7(MSB)	6	5	4	3	2	1	0(LSB)
Byte 0	HZD_Height							
Byte 1	HZD_Width							
Byte 2								
Byte 3	HZD_Lateral_STD							
Byte 4	HZD_Longitudinal_STD							

#### HZD\_Height

- Type: m
- Meaning: Height of hazard object.

#### HZD\_Width

- Type: m
- Meaning: Width of hazard object.



### HZD\_Lateral\_STD

- Type: NA
- Meaning: Standard deviation of lateral position.

### HZD\_Longitudinal\_STD

- Type: NA
- Meaning: Standard deviation of longitudinal position.

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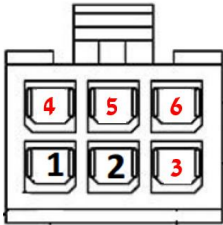
## 19. Physical connection (EyeWatch8)

Mobileye 8 connect CAN interface is in the unit`s main cable and labeled as "EyeWatch8". The default baud rate is 500Kbps and **cannot be modified**.

### Note

Compatible connectors and other connections methods to EyeWatch8 connector are not supplied by Mobileye.

Mobileye 8 Connect – EyeWatch8 pin layout (CAN-A port):

Pin number	Function	Connector Front view
#1	CAN High	
#2	CAN Low	
#3	RS485 GND	
#4	Ignition	
#5	5VDC	
#6	BAT+	

### Note






Insert Due to the pin layout functionality of Mobileye 8 CAN A connector, it is up to the integrator to pay attention to avoid damaging the integration 3rd party device.

Mobileye recommend using the below cable (CAB000743 – sold separately) when integrating with a 3rd party device.



## 20. DBC

To download the DBC for each protocol, please click the relevant file below:

Protocol	file
Fail_Safes	 opFailsafes.dbc
Objects	 opObjects.dbc
Lanes_Host	 opLanesHost.dbc
Lanes_Adjacent	 opLanesAdjacent.d bc
Hazards	 opHazards.dbc