Software manual
Mobile 3D Smart Sensor

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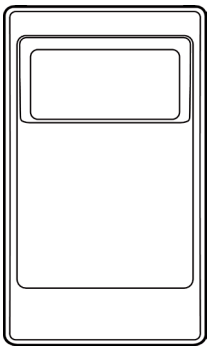
O3M151
O3M251
O3M161
O3M261

Object Detection



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Contents

1 About these instructions . . . 3
1.1 Symbols used . . . 3
1.2 Safety instructions . . . 3
1.3 Other applicable documents . . . 3

2 Smart Sensor . . . 4
2.1 Functions . . . 4
2.2 Measuring principle . . . 5
2.3 Operating check . . . 6
2.4 Installation position . . . 6

3 Object Detection . . . 7
3.1 Functions . . . 7
3.2 Possible applications . . . 7

4 Commissioning . . . 8

5 Application examples . . . 9
5.1 Area monitoring . . . 9
5.1.1 Introduction . . . 9
5.1.2 Attachment options . . . 10
5.1.3 Parametrisation . . . 12
5.1.4 Relevant output . . . 12
5.1.5 Operating property/performance . . . 12
5.2 Reflector tracking of marked driverless vehicles . . . 13
5.2.1 Introduction . . . 13
5.2.2 Attachment options . . . 13
5.2.3 Parametrisation . . . 13
5.2.4 Relevant output . . . 14
5.2.5 Operating property/performance . . . 14

6 Parameters . . . 15

7 Interface . . . 20
7.1 CANopen . . . 20
7.2 SAE J1939 . . . 37
7.2.1 Values of the column "Value table" . . . 67

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1 About these instructions

These instructions explain the 3D O3M151 Smart Sensor's function **Object Detection**.

For a detailed description of the device, please read the Operating instructions of the O3M151 sensor and the Programming manual of the ifm Vision Assistant. → "1.3 Other applicable documents"

1.1 Symbols used

► Instruction
> Reaction, result
→ Cross-reference

Important note
Failure to observe can result in malfunctions or faults.

Information
Additional note

1.2 Safety instructions

Read the Operating instructions before putting the device into operation. Make sure that the device is suitable for the applications concerned without restriction.

Disregarding operating instructions or technical information can result in injuries and/or damage.

1.3 Other applicable documents

Document	Description	Item No.
Device manual	Operating Instructions of O3M15x Sensors	706383
Programming manual	Operation instruction of the PC operating program ifm Vision Assistant for carrying out a program update and changing parameters	706384
Quick guide	Quick guide on operating the O3M15x sensor	80222723

The software and documents are available on the ifm homepage in the Download area. → www.ifm.com → my ifm → Download

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2 Smart Sensor

2.1 Functions

The O3M151 Smart Sensor is an optical system which measures the distance between the sensor and the next surface. An additional illumination unit illuminates the scene and the sensor process the light reflected by the surface.

The Smart Sensor is optimised and matched to requirements and needs on mobile driven machines. It is intended for use in outdoors and for difficult ambient light situations.

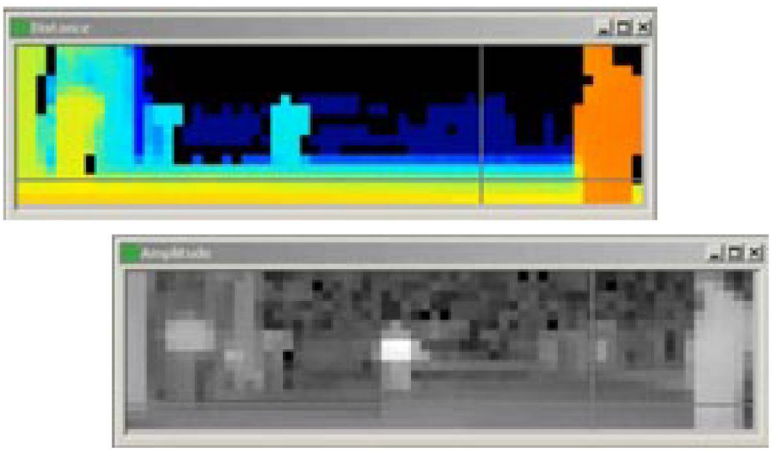
The principle is based on PMD technology for outputting 3D image data. In addition to new options for vehicle automation (AGV, automated guided vehicle), it also provides new assistance functions for automation tasks.

Communication is possible via Ethernet or CAN. System parametrisation and monitoring of the 3D data are carried out via the ifm Vision Assistant. → Ifm Vision Assistant programming manual

The pre-processed functional data are output via the CAN bus, with via CANopen or SAE J 1939.
→ Chapter "7 Interface" on Page 20

The Basic Function with functions such as measurement of minimum, maximum and average distance are available for simple distance tasks.

The Object Detection function provides for automatic object detection of up to 20 objects. This function can, for example, be used as a collision warning.



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2.2 Measuring principle

The device measures according to the light runtime method based on a phase measurement with modulated light.

Based on this principle, the following points must be taken into account during the measurements:

- Clean sensor window
  - Cleanliness is a basis for the reliable operation of optical sensors. Dirt or liquids reduce the light transmission and cause light scatter. This effect can affect the resolution and the measuring range of the sensor system.
  - Water droplets on the sensor glass can lead to unclear detection of the scene. The objects are detected as larger than they are in reality.

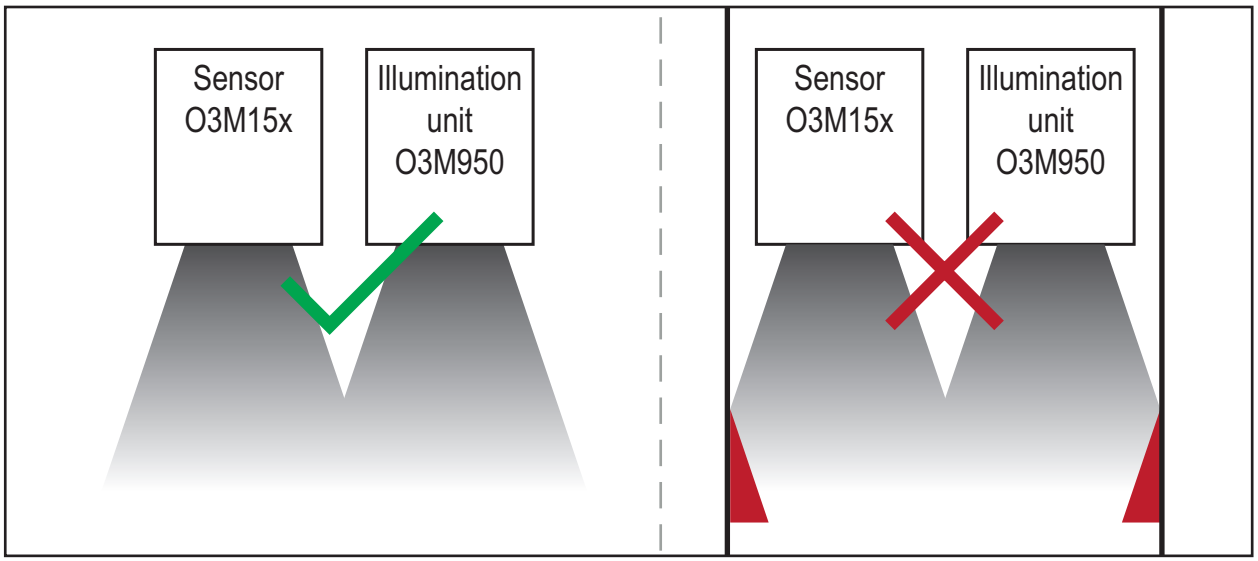
► Installation in areas of the system which become heavily soiled must be avoided.

► Keep sensor window clean.

- Illumination/Range
  - The measurement of objects is carried out based on the active illumination by the additional illumination unit. The emitted infrared light makes the sensor virtually independent of the ambient lighting conditions. In case of bright sunlight, restrictions in the system range can result due to increased signal noise.
  - The measurement range is dependent on the reflectivity of the object to be detected.
  - Due to the optical measuring principle the system performance can be considerably increased by using reflective materials (Factor 3).

- Clear in immediate vicinity
  - Objects in the immediate vicinity (1 m distance) can falsify the measured values of the sensor.
  - The wall on which the sensor is mounted should not be within the sensor area.

► Keep the illuminated area of the illumination unit in the immediate vicinity (up to 50 cm) of attached parts clear.



2.3 Operating check

With an optical system, detection faults can occur in case of poor visibility (e.g. under very dense fog, a great deal of dust, very heavy snowfall, etc.). The O3M151 Smart Sensor is equipped with sensory fault detection in the system and generates a message when faults occur.

- the "Blockage Detection" function actively detects relevant soiling, condensation on or icing-up of the sensor;
  (This function is not yet available with the SW Version OD 2.2.4 and OD 2.2.5. It will be possible to activate this function later in a firmware update.)
- The "Diffuse Scene" function actively detects diffuse faults, such as dense fog or clouds of dust in the sensor area.

Internal diagnosis of the hardware for faults → Operating instructions

- Application-specific solutions can result simply and especially conveniently with a controller (e.g. CR040X) or display (e.g CR108X) based on the functional output.
  There are special CODESYS libraries for receiving and interpreting the CAN signals of the O3M151 Smart Sensor. In addition, various application examples on a CODESYS basis are also available.
  → www.ifm.com → my ifm → Download

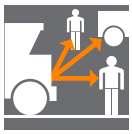
2.4 Installation position

The following aids are available for positioning the Smart Sensor in dependence on the application:

- Calculation tool for calculating the detection range
- ifm Vision Assistant operating software
- Technical data with performance and values of detection range→ Data sheet

3 Object Detection

3.1 Functions



Object detection

Reflector tracking

Collision prediction

Do not attach sensor at a height of under 50 cm.

Object detection

3D data are used via a CAN interface for object detection.

Up to 20 independent objects are detected and tracked from the measured distance values. A broad range of information is available for each object:

- Position and orientation in the space (x, y, z)
- Size of the object
- Relative speed of the object
- Qualitative evaluation (quality) of this information

Reflector detection

Reflectors can be used for marking and individual tracking of interesting objects. These are detected separately and with a greater range. Depending on the reflectivity, it is possible, for example, to use warning vests as reflectors.

Collision prediction

The Smart Sensor can predict potential collisions very accurately by evaluating the vehicle's own speed and its yaw rate.

This function offers a major advantage compared to collision warnings based purely on a distance measurement. In addition, the speed and direction of the own vehicle and objects are also taken into account.

(This function is not yet available with the SW Version OD 2.2.4 and OD 2.2.5. It will be possible to activate this function later in a firmware update.)

3.2 Possible applications

- Area monitoring with static attachment and with attachment to a vehicle (from several user-definable areas simultaneously)
- Marking, identification and specific tracking of reflected objects
- Vehicle automation (AGV: automated guided vehicle)
- Collision prediction

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4 Commissioning

The Smart Sensor can be operated with various functions.
For information on flashing the firmware → Ifm Vision Assistant programming manual

► Make sure that the correct firmware is loaded on the sensor.

► Carry out commissioning with the menu-guided ifm Vision Assistant PC operating program.

For additional instructions on the sensor update with the ifm Vision Assistant
→ Ifm Vision Assistant programming manual

5 Application examples

5.1 Area monitoring

5.1.1 Introduction

With static attachment and with attachment on a vehicle, the **Object Detection** function enables area monitoring of several user-defined areas simultaneously.

Functions:

- Monitoring of an area in front of a door or access point
- Control and/or signalling of opening via the controller based on the CAN sensor signals.
- Attachment to a vehicle and monitoring of areas in the driving path
- Selective distinction between normal and reflective objects
- Evaluation of the presence of the object in the sensor's field of vision
- Filtering of the objects by size and speed
- Monitoring of access to tunnel boring machines or to other accessible machines

When using an ifm controller or display, the included CODESYS module can be used to receive and interpret the CAN signals. CODESYS program examples of various applications are available in the Download area.
→ www.ifm.com → my ifm → Download

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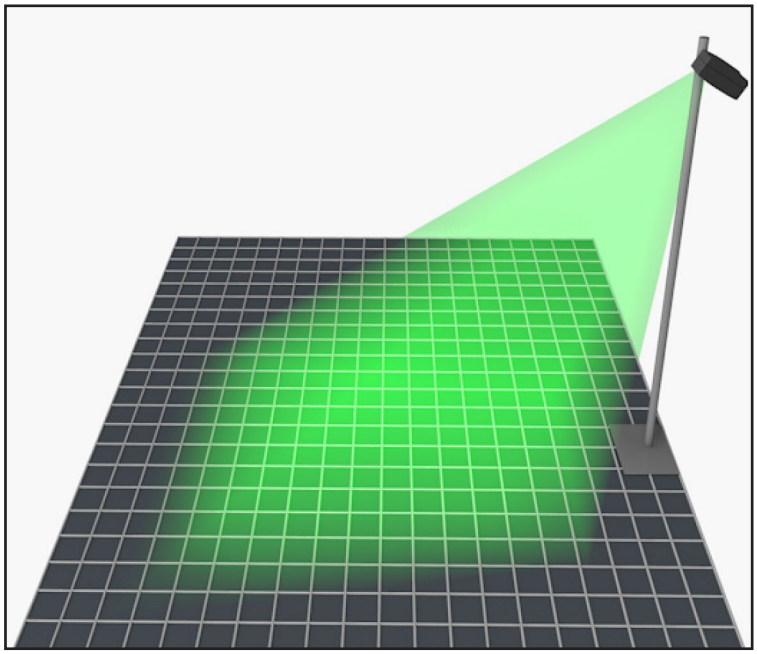
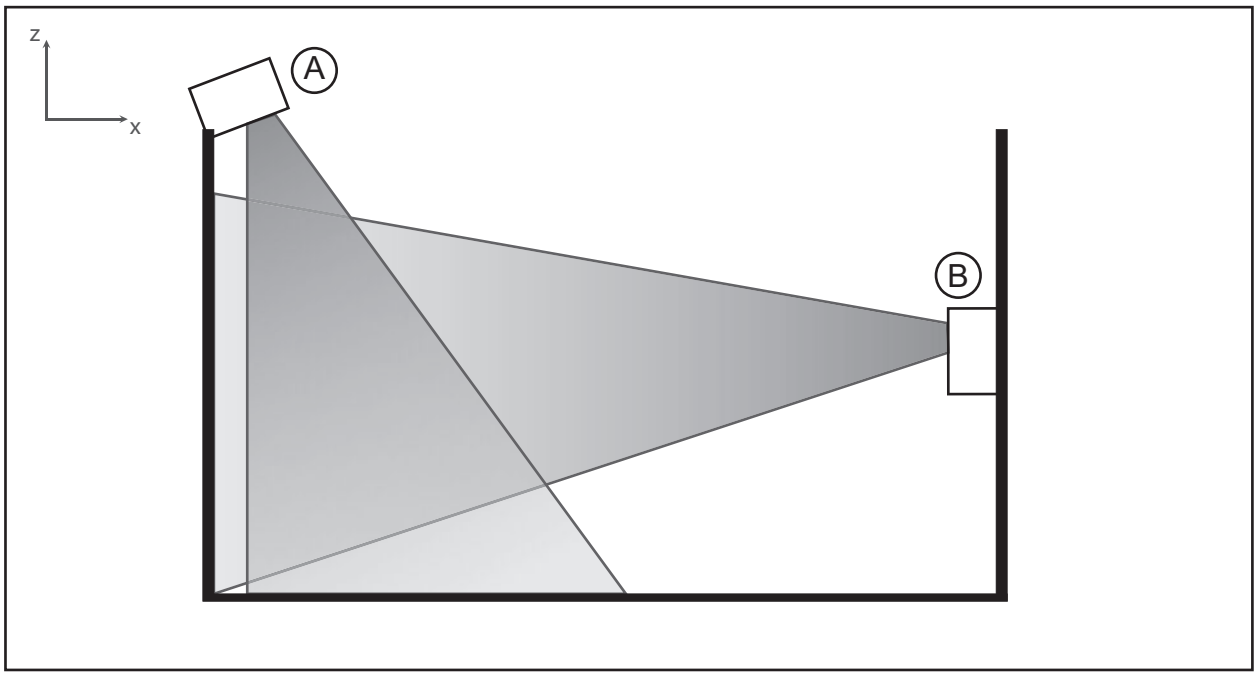
5.1.2 Attachment options

Static attachment



The Smart Sensor can be attached opposite or above the area to be monitored.



Attachment position of sensor for access monitoring, side view

A: Attachment from above
B: Frontal attachment

- Pos. A: Attachment a height of over 2 m

> Advantage: The sensor is in an overview position and the visible area is limited by the angle.

- Pos. B: Height between 50 cm and 1.50 m

> Advantage: The visible area is only limited by the system range.

> Disadvantage: The visible area can be blocked by a person.

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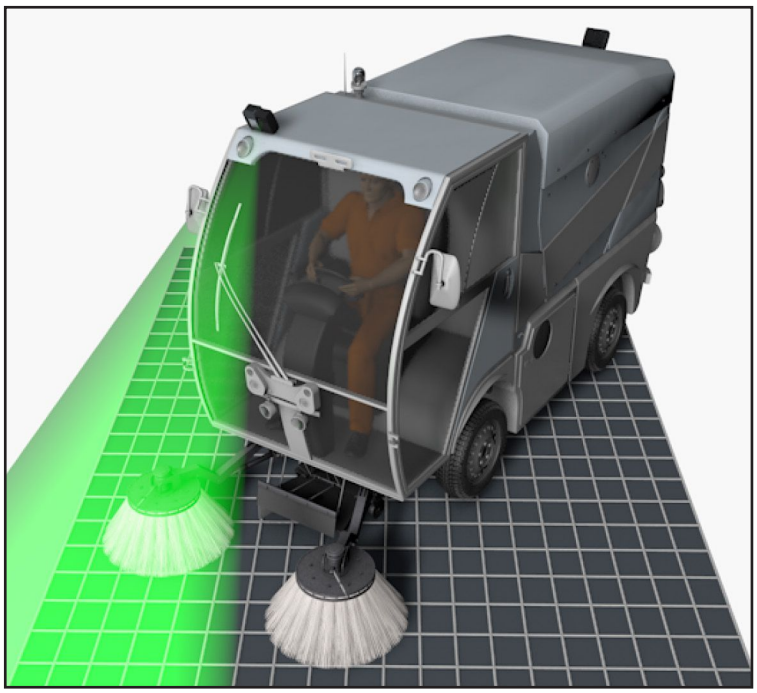
Attachment on vehicle

Automatic object tracking is also suitable for somewhat difficult and/or rough terrain. It recognises the next 20 objects (adjustable) next to the vehicle and passes on information such as the distance, size and position of each object to the machine controller.



The ***Object Detection*** function enables area monitoring by attaching the Smart Sensor to a vehicle.

► Mount the Smart Sensor tilted downward on the vehicle.

► Mounting position values in the ifm Vision Assistant operating software.

5.1.3 Parametrisation

There is a separate template/wizard for area monitoring
→ Ifm Vision Assistant programming manual

Object detection range (height)

A minimal and a maximal object detection height can be defined.

- The minimal height provides for a clear separation between the floor and the objects.
- The maximal height limits the object recognition in the height (height-adjustable objects).

> The minimal height (Zmin) should be set to 0,5 m and the maximal height (Zmax) should correspond to the vehicle height less a tolerance (~20 cm).

Frame rate

► Set the frame rate to 33 Hz.

Object detection type

► Set the Object Detection parameter to "Standard Mode". (Parameter ObjectListCust_objectDetectionVariant=0)
If a distinction is to be made between normal objects and objects with retro reflectors, the parameter ObjectListCust_objectDetectionVariant=1 can be set.

► Set noise suppression filter to "Level 2".

If the load on the CAN bus is too great, it can be reduced with the setting CAN output cycle Modulo. → Operating instructions

5.1.4 Relevant output

The CAN messages with the result values of the detected objects (e.g. position or relevant speed) can be received and interpreted on the controller used.

The objects are filtered via the object position for area monitoring. Objects which are located within a critical area result in a reaction, e.g. a warning signal or stopping of the vehicle.

The vehicle's own data are expected on the CAN bus (if parameter egodatamode=2, the data are not expected).

See Output → Chapter "7 Interface" on Page 20.

5.1.5 Operating property/performance

- The detection performance is dependent on the distance, size and reflectivity of an object.
- For attachment from above:
  The minimum detectable object height is dependent on the system parametrisation. Under the poorest conditions, this is 50 cm.
- For frontal attachment:
  The minimum range for the detection of persons in the monitoring area is 1 m to 15 m with normal ambient conditions.

5.2 Reflector tracking of marked driverless vehicles

5.2.1 Introduction

The **Object Detection** function enables marking and identification of objects with reflectors and their specific tracking.

Driverless transport systems (DTS) in harbour logistics can automatically detect and track other DTSs using the sensor. The distance between the DTSs can be defined depending on the speed difference.

In addition, it is possible to define areas in front of the vehicle and to monitor them for any desired objects.

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5.2.2 Attachment options

► Attach Smart Sensor horizontally on vehicle at a height between 50 cm and 1.50 m.

► Mark vehicles with reflectors.

► Mounting position values in the ifm Vision Assistant operating software.

5.2.3 Parametrisation

If the load on the CAN bus is too great, it can be reduced with the setting CAN output cycle Modulo. → Operating instructions

Frame rate

► Set the frame rate to 33 Hz.

Object detection type

► Set parameter (ObjectListCust_objectDetectionVariant=1) to "Reflector Detection".

► Set noise suppression filter to "Level 2".

► Recommended number of objects which are transmitted via CAN: 12

5.2.4 Relevant output

The CAN messages with the result values of the detected objects (e.g. position or relevant speed) can be received and interpreted on the controller used.

The objects are filtered via the area position for area monitoring. Objects which are located within a critical area result in a reaction, e.g. a warning signal or stopping of the vehicle.

The vehicle's own data are expected on the CAN bus (if parameter egodatamode=2, the data are not expected).

See Output → Chapter "7 Interface" on Page 20.

5.2.5 Operating property/performance

- The detection performance is dependent on the distance, size and reflectivity of an object.

> Detection performance with reflectors: min. 1 m/max. 60 m

- The minimum range under typical conditions for the detection of persons in the monitoring area is 1 m to 15 m with normal ambient conditions.

> The relevant speed for this application is typically in the range of +/- 2 km/h

6 Parameters

The parameters can be changed and adjusted in function of the use of the sensor.

For details on the settings and parameters of the device
→ ifm Vision Assistant programming manual.

Parameter Name	Parameter Value	Param. Type	Param. Array Length	Min.	Max.	Param. Description	Vision Assistant
CycleTime	40	uint8	1	20	40	Internal cycle time of the camera (20ms/30ms/40ms). Every cycle time a new 3D image is captured and processed.	Application → Image Settings → Frame Rate (value as frequency instead of cycle time)
BeginHeatingTemperature	5	sint8	1	-128	127	Temperature at which the sensor window heating is turned on (in °C)	Device Settings → Window Heating On Temperature
StopHeatingTemperature	8	sint8	1	-128	127	Temperature at which the sensor window heating is turned off (in °C). Should be higher than turn on with hysteresis.	Is set by the system automatically as Begin Heating Temperature + 3 °C
CANBaudrate	250000	uint32	1	125000	1000000	CAN Baudrate of the sensor. Possible values 125kbs 250kbs 500kbs 1000kbs	CAN → Baudrate
MasterSlaveConfiguration	0	uint8	1	0	8	If multiple sensor are used with overlapping viewing areas and on the same CAN network they can be synchronized with this parameter. Not supported in firmware at SOP. Will be made available by firmware update.	Device Settings → Synchronisation of multiple sensors
CANMaxNumberOfObjects	8	uint8	1	0	20	Configuration of maximum number of objects in Object List available on CAN (J1939 only, CANOpen is configured with CANOpen Master)	CAN → Max Number of Objects
CANProtocol	0	uint8	1	0	1	CAN protocol: 0 = J1939, 1 = CANopen	CAN → CAN Protocol
CANopenNodeAddress	10	uint8	1	1	127	CANopen Node value (only in case of CANOpen)	CAN → Node ID
CANOutputCycleModulo	1	uint8	1	1	3	Defines the cycletime of can messages: every n-th camera cycle can messages are sent. With this setting the CAN bus load can be limited.	CAN → Output Cycle Modulo
J1939SourceAddress	239	uint8	1	1	253	J1939 source address (only in case of J1939)	CAN → Source Address
Ipv4AddressCamera	192 168 1 1	uint8	4	0	255	Ipv4 address of sensor	Ethernet → IP address
SubnetMask	255 255 255 0	uint8	4	0	255	Subnet mask of camera	Ethernet → Subnet Mask
Ipv4AddressDestination	255 255 255 255	uint8	4	0	255	Ipc4AddressDestination of the UDP packets	Ethernet → IP Destination
destinationUDPPort	42000	uint16	1	0	65535	Destination UDP port for the UDP packets	Ethernet → UDP Port

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Parameter Name	Parameter Value	Param. Type	Param. Array Length	Min.	Max.	Param. Description	Vision Assi-stant
EthernetOutputConfiguration	0	uint8	1	0	1	0 is customer output (up to 6MBit/s), 1 is ifm development de-bug output (up to 60MBit/s)	Only changeable if used for recording of sequen-ces. Monitor → Record Options → Debug Data On/Off
EthernetLoadConfiguration	1	uint8	1	1	4	EthernetOutput only every n-th system cycle	–
DistanceImageOnSwitch	1	uint8	1	0	1	Distace data over ether-net can be de-activated with this parameter. 0 is DistanceImage off, 1 is DistanceImage on. (If de-activated only functional results will be transmitted over ethernet)	Ethernet Settings → Di-stance Image On Switch
VehicleDim_xMin	-1	float32	1	-20	20	Vehicle dimension descrip-tion (in world coordinates), axis-parallel box on the ground plane. (Only necessary for intelligent crash prediction)	Template in Vision Assi-stant SW will be available with later update.
VehicleDim_xMax	1	float32	1	-20	20	Vehicle dimension descrip-tion (in world coordinates), axis-parallel box on the ground plane. (Only necessary for intelligent crash prediction)	Template in Vision Assi-stant SW will be available with later update.
VehicleDim_yMin	-1	float32	1	-20	20	Vehicle dimension descrip-tion (in world coordinates), axis-parallel box on the ground plane. (Only necessary for intelligent crash prediction)	Template in Vision Assi-stant SW will be available with later update.
VehicleDim_yMax	1	float32	1	-20	20	Vehicle dimension descrip-tion (in world coordinates), axis-parallel box on the ground plane. (Only necessary for intelligent crash prediction)	Template in Vision Assi-stant SW will be available with later update.
VehicleDim_zMax	2	float32	1	0	10	Vehicle dimension descrip-tion (in world coordinates), axis-parallel box on the ground plane. (Only necessary for intelligent crash prediction)	Template in Vision Assi-stant SW will be available with later update.
PMDExtrCalib_camCal_transX	0	float32	1	-10	10	Position of sensor in world: X translation [m]. Please refer to Manual O3M15x for details.	Calibration → follow instructions
PMDExtrCalib_camCal_transY	0	float32	1	-10	10	Position of sensor in world: Y translation [m]. Please refer to Manual O3M15x for details.	Calibration → follow instructions
PMDExtrCalib_camCal_transZ	1	float32	1	-10	10	Position of sensor in world: Z translation [m]. Please refer to Manual O3M15x for details.	Calibration → follow instructions
PMDExtrCalib_camCal_rotX	-1.57E+00	float32	1	-3.14	3.14	Orientation of sensor in world: X rotation [rad]	Calibration → follow instructions
PMDExtrCalib_camCal_rotY	1.57E+00	float32	1	-3.14	3.14	Orientation of sensor in world: Y rotation [rad]	Calibration → follow instructions
PMDExtrCalib_camCal_rotZ	0	float32	1	-3.14	3.14	Orientation of sensor in world: Z rotation [rad]	Calibration → follow instructions

Parameter Name	Parameter Value	Param. Type	Param. Array Length	Min.	Max.	Param. Description	Vision Assi-stant
PMDExtrCalib_IlluCal_transX	0.047	float32	1	-10	10	Position of illumination in world: X translation [m]. Please refer to Manual O3M15x for details.	Calibration → follow instructions
PMDExtrCalib_IlluCal_transY	0.085	float32	1	-10	10	Position of illumination in world: Y translation [m]. Please refer to Manual O3M15x for details.	Calibration → follow instructions
PMDExtrCalib_IlluCal_transZ	0.948	float32	1	-10	10	Position of illumination in world: Z translation [m]. Please refer to Manual O3M15x for details.	Calibration → follow instructions
ObjectListCust_sprayRemo-valSensitivity	0	uint8	1	0	3	Filters pixels for diffuse optical disturbances. 0=off; 1=weak; 2=medium; 3=strong	Application → Image Set-tings → Spray removal
ObjectListCust_pixelPlausibili-zationThresholds	2	uint8	1	0	2	Filters pixels for distance noise. 0=off; 1=weak; 2=medium; 3=strong	Application → Image Set-tings → Noise reduction filter
ObjectListCust_blockageSen-sitivity	0	uint8	1	0	3	Sensor can actively scan for blockage of screen (with e.g. ice, condensa-tion, dirt). Not supported in firmware at SOP. Will be made available by firmware update.	Application → Image Settings → Blockage detection
ObjectListCust_spatialFil-terXMin	-100	float32	1	-100	100	Spatial filter on the cartesi-an coordinates. Only pixels within this range will be ta-ken into account. Minimum value in x-direction.	Application → Image Set-tings → Expert Mode
ObjectListCust_spatialFilterX-Max	100	float32	1	-100	100	Spatial filter on the cartesi-an coordinates. Only pixels within this range will be taken into account. Maxi-mum value in x-direction.	Application → Image Set-tings → Expert Mode
ObjectListCust_spatialFilte-rYMin	-100	float32	1	-100	100	Spatial filter on the cartesi-an coordinates. Only pixels within this range will be ta-ken into account. Minimum value in y-direction.	Application → Image Set-tings → Expert Mode
ObjectListCust_spatialFilte-rYMax	100	float32	1	-100	100	Spatial filter on the cartesi-an coordinates. Only pixels within this range will be taken into account. Maxi-mum value in y-direction.	Application → Image Set-tings → Expert Mode
ObjectListCust_spatialFilter-ZMin	-100	float32	1	-100	100	Spatial filter on the cartesi-an coordinates. Only pixels within this range will be ta-ken into account. Minimum value in z-direction.	Application → Image Set-tings → Expert Mode
ObjectListCust_spatialFilter-ZMax	100	float32	1	-100	100	Spatial filter on the cartesi-an coordinates. Only pixels within this range will be taken into account. Maxi-mum value in z-direction.	Application → Image Set-tings → Expert Mode

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Parameter Name	Parameter Value	Param. Type	Param. Array Length	Min.	Max.	Param. Description	Vision Assistant
ObjectListCust_reflector-ThresholdValue	0	float32	1	0	1	Value for setting the reflectivity threshold to detect retroreflectors. The default setting 0 means high sensitivity for reflectors with possible detection of non-reflectors. The maximum setting of 1 means low sensitivity for reflectors.	Application → Image Settings → Reflector Threshold Value (4 possible values: Max, Med, Low, Min)
ObjectListCust_autocalibrationMode	0	uint8	1	0	42	Autocalibration Mode (0: disabled, 1: enabled); if ground is visible, small changes in rotation angles are corrected automatically	Application → Object Detection → Auto Calibration Mode
ObjectListCust_objectDetectionVariant	1	uint8	1	0	1	Object detection variant selection (0: standard object list (all objects are detected, no special tracking of reflectors, crash predictor can be used, 1: Retroreflector mode (all objects are detected, reflectors are specially tracked and priorized in output))	Application → Object Detection → Object Detection Type
ObjectListCust_ObjectDetectionZMin	0 5	float32	1	-10	10	Minimum z coordinate (height) for normal object detection. All objects below this threshhold are ignored ("can be driven over").	Application → Object Detection → Min Height of Detection
ObjectListCust_ObjectDetectionZMax	2	float32	1	-10	10	Maximum z coordinate (height) for normal object detection. All objects below this threshhold are ignored ("can be driven under", e.g. bridge).	Application → Object Detection → Max Height of Detection
ObjectListCust_CrashPredictorSensitivity	0	uint8	1	0	3	Customization of crash predictor (0: low sensitivity, 1: low sensitivity without "driver active" filter, 2: low sensitivity without filter heuristics, 3: high sensitivity (Only necessary for intelligent crash prediction)	Template in Vision Assistant SW will be available with later update.
ObjectListCust_EgoMotionDynamics	2	uint8	1	0	2	Characterization of ego motion dynamics for crash predictor (0: low dynamics, e.g. AGVs, 1: medium dynamics, e.g. construction vehicles, 2: high dynamics, e.g. cars) (Only necessary for intelligent crash prediction)	Template in Vision Assistant SW will be available with later update.
ObjectListCust_UseCaseApproach	1	uint8	1	0	1	Customization of UseCase approach for crash predictor (0: disabled, 1: enabled) (Only necessary for intelligent crash prediction)	Template in Vision Assistant SW will be available with later update.

Parameter Name	Parameter Value	Param. Type	Param. Array Length	Min.	Max.	Param. Description	Vision Assi-stant
ObjectListCust_accBrake	10	float32	1	0	30	Definition of brake accele-ration for crash predictor (Only necessary for intelli-gent crash prediction)	Template in Vision Assi-stant SW will be available with later update.
ObjectListCust_delayBrake	0.2	float32	1	0	2	Definition of brake delay for crash predictor (Only necessary for intelligent crash prediction)	Template in Vision Assi-stant SW will be available with later update.
ObjectListCust_egoVMin	0	float32	1	-200	200	Definition of minimal ego velocity for calculating crash events (Only neces-sary for intelligent crash prediction)	Template in Vision Assi-stant SW will be available with later update.
ObjectListCust_egoVMax	0	float32	1	-200	200	Definition of maximal ego velocity for calculating crash events (Only neces-sary for intelligent crash prediction)	Template in Vision Assi-stant SW will be available with later update.
ObjectListCust_EgoDataMode	2	uint8	1	0	2	"Enables ego velocity calculation and yaw rate input 0: ego velocity and Yaw Rate are taken into ac-count; 1: only ego velocity; 2: no data used. (Only necessary for intelligent crash prediction)"	Template in Vision Assi-stant SW will be available with later update.
AutoCalibParam_ numberOfPatterns	0	uint8	1	0	8	Number of patterns to be used for autocalibration (0,1 : autocalibration dis-abled). Specialautocalibra-tion mode for measuring the rotational angles based on reflector targets at defined positions. Number of reflectors used. Should be at least 3.	Template in Vision Assi-stant SW will be available with later update.
AutoCalibParam_xPattern	0	float32	8	-30	30	x coordinates [m] of the autocalibration patterns in relation to the defined world coordinate system.	Template in Vision Assi-stant SW will be available with later update.
AutoCalibParam_yPattern	0	float32	8	-30	30	y coordinates [m] of the autocalibration patterns in relation to the defined world coordinate system.	Template in Vision Assi-stant SW will be available with later update.
AutoCalibParam_zPattern	0	float32	8	-30	30	z coordinates [m] of the autocalibration patterns in relation to the defined world coordinate system.	Template in Vision Assi-stant SW will be available with later update.
AutoCalibParam_patternType	0	uint8	8	0	10	Type of the autocalibration patterns	Template in Vision Assi-stant SW will be available with later update.

UK

7 Interface

The output of the preprocessed function data occurs via CAN-Bus, either with the protocol CANopen or the protocol SAE J 1939.

7.1 CANopen

Object No.	Object Name	Sub Index No.	Parameter Name	Object Type	Access Type	Default Value	Low Limit	High Limit	Comment
1000	DeviceType			0x7	ro	0			Fixed to "0" (Zero) until there is an adequate CANopen profile available
1001	Error Register			0x7	ro				–
1003	Predefined Error Field			0x8					Index 0: Number of Errors is defined according the size of the error memory in the diagnosis.
1003		0	Number of Errors	0x7	rw	0	1	4	
1003		1	Standard Error Field	0x7	ro	0	1	4	
1003		2	Standard Error Field_2	0x7	ro	0	1	4	
1003		3	Standard Error Field_3	0x7	ro	0	1	4	
1003		4	Standard Error Field_4	0x7	ro	0	1	4	
1003		5	Standard Error Field_5	0x7	ro	0	1	4	
1003		6	Standard Error Field_6	0x7	ro	0	1	4	
1003		7	Standard Error Field_7	0x7	ro	0	1	4	
1003		8	Standard Error Field_8	0x7	ro	0	1	4	
1003		9	Standard Error Field_9	0x7	ro	0	1	4	
1003		A	Standard Error Field_a	0x7	ro	0	1	4	
1003		B	Standard Error Field_b	0x7	ro	0	1	4	
1003		C	Standard Error Field_c	0x7	ro	0	1	4	
1003		D	Standard Error Field_d	0x7	ro	0	1	4	
1003		E	Standard Error Field_e	0x7	ro	0	1	4	
1003		F	Standard Error Field_f	0x7	ro	0	1	4	
1003		10	Standard Error Field_10	0x7	ro	0	1	4	
1003		11	Standard Error Field_11	0x7	ro	0	1	4	
1003		12	Standard Error Field_12	0x7	ro	0	1	4	
1003		13	Standard Error Field_13	0x7	ro	0	1	4	
1005	COB ID SYNC			0x7	rw	0x00000080	0x00000080		–
1006	Communication Cycle Period			0x7	rw	0x00000000			–
1008	Manufacturer Device Name			0x7	const	O3D150			(No Index) should be filled at runtime with the article number ("Artikelnummer") of the camera. Device is Sensor: O3M150 Device is Smart Sensor: O3M151 (OD is the object detection variant)

UK

Object No.	Object Name	Sub Index No.	Parameter Name	Object Type	Access Type	Default Value	Low Limit	High Limit	Comment
1009	Manufacturer Hardware Version			0x7	const				(No Index) should be filled at runtime with the HW version of the camera
100A	Manufacturer Software Version			0x7	const				(No Index) should be filled at runtime with the Software version number and variant of the camera with <Major> <Minor> <Patchlevel> <Variant>
1010	Store Parameter Field			0x8					Index 01: Save all Parameters: this is the list of parameters to be stored to Flash memory: - TBD
1010		0	Number of entries	0x7	ro	1	1	4	
1010		1	Save all Parameters	0x7	rw	1	1	4	
1011	Restore Default Parameters			0x8					Index 01: Restore all Default Parameters: this is the list of parameters to be restored from Flash Memory: - TBD
1011		0	Number of entries	0x7	ro	1	1	4	
1011		1	Restore all Default Parameters	0x7	rw	1	1	4	
1014	COB ID EMCY			0x7	ro	$NODEID +0x80	0x00000080	0x00000100	–
1016	Consumer Heartbeat Time			0x8					–
1016		0	Number of entries	0x7	ro	1	1	4	
1016		1	Consumer Heartbeat Time	0x7	rw	0	1	4	
1017	Producer Heartbeat Time			0x7	rw	0			–
1018	Identity Object			0x9					Index 01: Vendor ID is 0x0069666D, this is the fixed ID for ifm electronic Index 02: Product Code : O3M150: 0x0020 0010 O3M151: 0x0020 0011 Index 03: Revision Number: should be filled at runtime with 0x00 <Major number> <Minor number> <Patch Level> of the SW Version. Index 04: Serial number: should be filled at runtime with the serial number of the camera.
1018		0	Number of entries	0x7	ro	4	1	4	
1018		1	Vendor Id	0x7	ro	0x0069666D	1	4	
1018		2	Product Code	0x7	ro	0	1	4	
1018		3	Revision number	0x7	ro	0	1	4	
1018		4	Serial number	0x7	ro	0	1	4	

Object No.	Object Name	Sub Index No.	Parameter Name	Object Type	Access Type	Default Value	Low Limit	High Limit	Comment
1400	Receive PDO Communication Parameter - EgoMotion			0x9					Objects 1400-1402, 1600-1602, 1800-1829: Index02 Transmission Type: 254 (Manufacturer defined): The mobile camera is typically running with internally defined time/ frequency. Thus it will send out the data (TPDOs) as available, typically with cycle time of 20 ms, 30 ms, 40 ms or multiple time: double or three times the cycle time.
1400		0	Number of entries	0x7	ro	2	0x02	0x05	
1400		1	COB ID	0x7	rw	$NODEID +0x200	0x00000080	0xFFFFFFFF	
1400		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1600	Receive PDO Mapping Parameter - EgoMotion			0x9					
1600		0	Number of entries	0x7	rw	3	0	3	
1600		1	PDO Mapping Entry - Wheel_ BasedVehicleSpeed	0x7	rw	0x23000110	0	3	
1600		2	PDO Mapping Entry - Driving_Direction	0x7	rw	0x23000208	0	3	
1600		3	PDO Mapping Entry - Yaw_Rate	0x7	rw	0x23000310	0	3	
1800	Transmit PDO Communication Parameter Object 0 - Part A			0x9					Objects 1800-1829 Transmit PDO Communication Parameter: For the first and second (real world) Object in the Object list the Transmission parameters are defined in such a way that the camera will immediately start to send out data when the communication state is set to "Operational". The camera will send out only 4 objects in default configuration. For the other (real world) Objects the settings are such that they are marked as invalid bit 31(valid bit) is set to "1". If these Objects are requested by a Network Master/ Configuration Master the according COB ID has to be set accordingly, especially the valid bit has to be set to "0".
1800		0	Number of entries	0x7	ro	3	0x03	0x03	
1800		1	COB ID	0x7	rw	$NODEID +0x40000180	0x00000080	0xFFFFFFFF	
1800		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1800		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1801	Transmit PDO Communication Parameter Object 0 - Part B			0x9					See Objects No. 1400/1600/1800
1801		0	Number of entries	0x7	ro	3	0x03	0x03	

UK

Object No.	Object Name	Sub Index No.	Parameter Name	Object Type	Access Type	Default Value	Low Limit	High Limit	Comment
1801		1	COB ID	0x7	rw	$NODEID +0x40000280	0x00000080	0xFFFFFFFF	See Objects No. 1400/1600/1800
1801		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1801		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1802	Transmit PDO Communication Parameter Object 1 - Part A			0x9					
1802		0	Number of entries	0x7	ro	3	0x03	0x03	
1802		1	COB ID	0x7	rw	$NODEID +0x40000380	0x00000080	0xFFFFFFFF	
1802		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1802		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1803	Transmit PDO Communication Parameter Object 1 - Part B			0x9					
1803		0	Number of entries	0x7	ro	3	0x03	0x03	
1803		1	COB ID	0x7	rw	$NODEID +0x40000480	0x00000080	0xFFFFFFFF	
1803		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1803		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1804	Transmit PDO Communication Parameter Object 2 - Part A			0x9					
1804		0	Number of entries	0x7	ro	3	0x03	0x03	
1804		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1804		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1804		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1805	Transmit PDO Communication Parameter Object 2 - Part B			0x9					
1805		0	Number of entries	0x7	ro	3	0x03	0x03	
1805		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1805		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1805		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1806	Transmit PDO Communication Parameter Object 3 - Part A			0x9					
1806		0	Number of entries	0x7	ro	3	0x03	0x03	
1806		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1806		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1806		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1807	Transmit PDO Communication Parameter Object 3 - Part B			0x9					

Object No.	Object Name	Sub Index No.	Parameter Name	Object Type	Access Type	Default Value	Low Limit	High Limit	Comment
1807		0	Number of entries	0x7	ro	3	0x03	0x03	See Objects No. 1400/1600/1800
1807		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1807		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1807		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1808	Transmit PDO Communication Parameter Object 4 - Part A			0x9					
1808		0	Number of entries	0x7	ro	3	0x03	0x03	
1808		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1808		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1808		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1809	Transmit PDO Communication Parameter Object 4 - Part B			0x9					
1809		0	Number of entries	0x7	ro	3	0x03	0x03	
1809		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1809		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1809		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
180A	Transmit PDO Communication Parameter Object 5 - Part A			0x9					
180A		0	Number of entries	0x7	ro	3	0x03	0x03	
180A		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
180A		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
180A		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
180B	Transmit PDO Communication Parameter Object 5 - Part B			0x9					
180B		0	Number of entries	0x7	ro	3	0x03	0x03	
180B		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
180B		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
180B		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
180C	Transmit PDO Communication Parameter Object 6 - Part A			0x9					
180C		0	Number of entries	0x7	ro	3	0x03	0x03	
180C		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
180C		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
180C		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	

UK

Object No.	Object Name	Sub Index No.	Parameter Name	Object Type	Access Type	Default Value	Low Limit	High Limit	Comment
180D	Transmit PDO Communication Parameter Object 6 - Part B			0x9					See Objects No. 1400/1600/1800
180D		0	Number of entries	0x7	ro	3	0x03	0x03	
180D		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
180D		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
180D		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
180E	Transmit PDO Communication Parameter Object 7 - Part A			0x9					
180E		0	Number of entries	0x7	ro	3	0x03	0x03	
180E		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
180E		2	Transmission Type	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
180E		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
180F	Transmit PDO Communication Parameter Object 7 - Part B			0x9					
180F		0	Number of entries	0x7	ro	3	0x03	0x03	
180F		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
180F		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
180F		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1810	Transmit PDO Communication Parameter Object 8 - Part A			0x9					
1810		0	Number of entries	0x7	ro	3	0x03	0x03	
1810		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1810		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1810		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1811	Transmit PDO Communication Parameter Object 8 - Part B			0x9					
1811		0	Number of entries	0x7	ro	3	0x03	0x03	
1811		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1811		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1811		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1812	Transmit PDO Communication Parameter Object 9 - Part A			0x9					
1812		0	Number of entries	0x7	ro	3	0x03	0x03	
1812		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	

Object No.	Object Name	Sub Index No.	Parameter Name	Object Type	Access Type	Default Value	Low Limit	High Limit	Comment
1812		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	See Objects No. 1400/1600/1800
1812		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1813	Transmit PDO Communication Parameter Object 9 - Part B			0x9					
1813		0	Number of entries	0x7	ro	3	0x03	0x03	
1813		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1813		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1813		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1814	Transmit PDO Communication Parameter Object 10 - Part A			0x9					
1814		0	Number of entries	0x7	ro	3	0x03	0x03	
1814		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1814		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1814		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1815	Transmit PDO Communication Parameter Object 10 - Part B			0x9					
1815		0	Number of entries	0x7	ro	3	0x03	0x03	
1815		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1815		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1815		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1816	Transmit PDO Communication Parameter Object 11 - Part A			0x9					
1816		0	Number of entries	0x7	ro	3	0x03	0x03	
1816		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1816		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1816		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1817	Transmit PDO Communication Parameter Object 11 - Part B			0x9					
1817		0	Number of entries	0x7	ro	3	0x03	0x03	
1817		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1817		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1817		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1818	Transmit PDO Communication Parameter Object 12 - Part A			0x9					
1818		0	Number of entries	0x7	ro	3	0x03	0x03	

UK

Object No.	Object Name	Sub Index No.	Parameter Name	Object Type	Access Type	Default Value	Low Limit	High Limit	Comment
1818		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	See Objects No. 1400/1600/1800
1818		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1818		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1819	Transmit PDO Communication Parameter Object 12 - Part B			0x9					
1819		0	Number of entries	0x7	ro	3	0x03	0x03	
1819		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1819		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1819		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
181A	Transmit PDO Communication Parameter Object 13 - Part A			0x9					
181A		0	Number of entries	0x7	ro	3	0x03	0x03	
181A		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
181A		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
181A		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
181B	Transmit PDO Communication Parameter Object 13 - Part B			0x9					
181B		0	Number of entries	0x7	ro	3	0x03	0x03	
181B		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
181B		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
181B		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
181C	Transmit PDO Communication Parameter Object 14 - Part A			0x9					
181C		0	Number of entries	0x7	ro	3	0x03	0x03	
181C		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
181C		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
181C		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
181D	Transmit PDO Communication Parameter Object 14 - Part B			0x9					
181D		0	Number of entries	0x7	ro	3	0x03	0x03	
181D		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
181D		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
181D		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
181E	Transmit PDO Communication Parameter Object 15 - Part A			0x9					

Object No.	Object Name	Sub Index No.	Parameter Name	Object Type	Access Type	Default Value	Low Limit	High Limit	Comment
181E		0	Number of entries	0x7	ro	3	0x03	0x03	See Objects No. 1400/1600/1800
181E		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
181E		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
181E		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
181F	Transmit PDO Communication Parameter Object 15 - Part B			0x9					
181F		0	Number of entries	0x7	ro	3	0x03	0x03	
181F		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
181F		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
181F		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1820	Transmit PDO Communication Parameter Object 16 - Part A			0x9					
1820		0	Number of entries	0x7	ro	3	0x03	0x03	
1820		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1820		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1820		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1821	Transmit PDO Communication Parameter Object 16 - Part B			0x9					
1821		0	Number of entries	0x7	ro	3	0x03	0x03	
1821		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1821		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1821		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1822	Transmit PDO Communication Parameter Object 17 - Part A			0x9					
1822		0	Number of entries	0x7	ro	3	0x03	0x03	
1822		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1822		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1822		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1823	Transmit PDO Communication Parameter Object 17 - Part B			0x9					
1823		0	Number of entries	0x7	ro	3	0x03	0x03	
1823		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1823		2	Transmission Type	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1823		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	

UK

Object No.	Object Name	Sub Index No.	Parameter Name	Object Type	Access Type	Default Value	Low Limit	High Limit	Comment
1824	Transmit PDO Communication Parameter Object 18 - Part A			0x9					
1824		0	Number of entries	0x7	ro	3	0x03	0x03	
1824		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1824		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1824		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1825	Transmit PDO Communication Parameter Object 18 - Part B			0x9					
1825		0	Number of entries	0x7	ro	3	0x03	0x03	
1825		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1825		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1825		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1826	Transmit PDO Communication Parameter Object 19 - Part A			0x9					
1826		0	Number of entries	0x7	ro	3	0x03	0x03	
1826		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	See Objects No. 1400/1600/1800
1826		2	Transmission Type	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1826		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1827	Transmit PDO Communication Parameter Object 19 - Part B			0x9					
1827		0	Number of entries	0x7	ro	3	0x03	0x03	
1827		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1827		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1827		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1828	Transmit PDO Communication Parameter - Crash_ Predictor_Info			0x9					
1828		0	Number of entries	0x7	ro	3	0x03	0x03	
1828		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1828		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1828		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
1829	Transmit PDO Communication Parameter - Global_ Information			0x9					
1829		0	Number of entries	0x7	ro	3	0x03	0x03	
1829		1	COB ID	0x7	rw	$NODEID +0xC0000000	0x00000080	0xFFFFFFFF	
1829		2	Transmission Type	0x7	rw	254	0x00000080	0xFFFFFFFF	
1829		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	
182A	Transmit PDO Communication Parameter - SyncMsg			0x9					See Objects No. 1400/1600/1800
182A		0	Number of entries	0x7	ro	3	0x03	0x03	
182A		1	COB ID	0x7	rw	0x80000000	0x00000080	0xFFFFFFFF	
182A		2	Transmission Type	0x7	rw	0x80000000	0x00000080	0xFFFFFFFF	
182A		3	Inhibit Time	0x7	rw	0x0000	0x00000080	0xFFFFFFFF	

Object No.	Object Name	Sub Index No.	Parameter Name	Object Type	Access Type	Default Value	Low Limit	High Limit	Comment
1A00	Transmit PDO Mapping Parameter Object 0 - Part A			0x9					–
1A00		0	Number of entries	0x7	rw	1	0	1	
1A00		1	PDO Mapping Entry	0x7	rw	0x21000140	0	1	
1A01	Transmit PDO Mapping Parameter Object 0 - Part B			0x9					–
1A01		0	Number of entries	0x7	rw	1	0	1	
1A01		1	PDO Mapping Entry	0x7	rw	0x21000240	0	1	
1A02	Transmit PDO Mapping Parameter Object 1 - Part A			0x9					–
1A02		0	Number of entries	0x7	rw	1	0	8	
1A02		1	PDO Mapping Entry	0x7	rw	0x21010140	0	8	
1A03	Transmit PDO Mapping Parameter Object 1 - Part B			0x9					–
1A03		0	Number of entries	0x7	rw	1	0	8	
1A03		1	PDO Mapping Entry	0x7	rw	0x21010240	0	8	
1A04	Transmit PDO Mapping Parameter Object 2 - Part A			0x9					–
1A04		0	Number of entries	0x7	rw	1	0	8	
1A04		1	PDO Mapping Entry	0x7	rw	0x21020140	0	8	
1A05	Transmit PDO Mapping Parameter Object 2 - Part B			0x9					–
1A05		0	Number of entries	0x7	rw	1	0	8	
1A05		1	PDO Mapping Entry	0x7	rw	0x21020240	0	8	
1A06	Transmit PDO Mapping Parameter Object 3 - Part A			0x9					–
1A06		0	Number of entries	0x7	rw	1	0	8	
1A06		1	PDO Mapping Entry	0x7	rw	0x21030140	0	8	
1A07	Transmit PDO Mapping Parameter Object 3 - Part B			0x9					–
1A07		0	Number of entries	0x7	rw	1	0	8	
1A07		1	PDO Mapping Entry	0x7	rw	0x21030240	0	8	
1A08	Transmit PDO Mapping Parameter Object 4 - Part A			0x9					–
1A08		0	Number of entries	0x7	rw	1	0	8	
1A08		1	PDO Mapping Entry	0x7	rw	0x21040140	0	8	
1A09	Transmit PDO Mapping Parameter Object 4 - Part B			0x9					–
1A09		0	Number of entries	0x7	rw	1	0	8	
1A09		1	PDO Mapping Entry	0x7	rw	0x21040240	0	8	

Object No.	Object Name	Sub Index No.	Parameter Name	Object Type	Access Type	Default Value	Low Limit	High Limit	Comment
1A0A	Transmit PDO Mapping Parameter Object 5 - Part A			0x9					–
1A0A		0	Number of entries	0x7	rw	1	0	8	
1A0A		1	PDO Mapping Entry	0x7	rw	0x21050140	0	8	
1A0B	Transmit PDO Mapping Parameter Object 5 - Part B			0x9					–
1A0B		0	Number of entries	0x7	rw	1	0	8	
1A0B		1	PDO Mapping Entry	0x7	rw	0x21050240	0	8	
1A0C	Transmit PDO Mapping Parameter Object 6 - Part A			0x9					–
1A0C		0	Number of entries	0x7	rw	1	0	8	
1A0C		1	PDO Mapping Entry	0x7	rw	0x21060140	0	8	
1A0D	Transmit PDO Mapping Parameter Object 6 - Part B			0x9					–
1A0D		0	Number of entries	0x7	rw	1	0	8	
1A0D		1	PDO Mapping Entry	0x7	rw	0x21060240	0	8	
1A0E	Transmit PDO Mapping Parameter Object 7 - Part A			0x9					–
1A0E		0	Number of entries	0x7	rw	1	0	8	
1A0E		1	PDO Mapping Entry	0x7	rw	0x21070140	0	8	
1A0F	Transmit PDO Mapping Parameter Object 7 - Part B			0x9					–
1A0F		0	Number of entries	0x7	rw	1	0	8	
1A0F		1	PDO Mapping Entry	0x7	rw	0x21070240	0	8	
1A10	Transmit PDO Mapping Parameter Object 8 - Part A			0x9					–
1A10		0	Number of entries	0x7	rw	1	0	8	
1A10		1	PDO Mapping Entry	0x7	rw	0x21080140	0	8	
1A11	Transmit PDO Mapping Parameter Object 8 - Part B			0x9					–
1A11		0	Number of entries	0x7	rw	1	0	8	
1A11		1	PDO Mapping Entry	0x7	rw	0x21080240	0	8	
1A12	Transmit PDO Mapping Parameter Object 9 - Part A			0x9					–
1A12		0	Number of entries	0x7	rw	1	0	8	
1A12		1	PDO Mapping Entry	0x7	rw	0x21090140	0	8	
1A13	Transmit PDO Mapping Parameter Object 9 - Part B			0x9					–
1A13		0	Number of entries	0x7	rw	1	0	8	
1A13		1	PDO Mapping Entry	0x7	rw	0x21090240	0	8	

UK

Object No.	Object Name	Sub Index No.	Parameter Name	Object Type	Access Type	Default Value	Low Limit	High Limit	Comment
1A14	Transmit PDO Mapping Parameter Object 10 - Part A			0x9					–
1A14		0	Number of entries	0x7	rw	1	0	8	
1A14		1	PDO Mapping Entry	0x7	rw	0x210a0140	0	8	
1A15	Transmit PDO Mapping Parameter Object 10 - Part B			0x9					–
1A15		0	Number of entries	0x7	rw	1	0	8	
1A15		1	PDO Mapping Entry	0x7	rw	0x210a0240	0	8	
1A16	Transmit PDO Mapping Parameter Object 11 - Part A			0x9					–
1A16		0	Number of entries	0x7	rw	1	0	8	
1A16		1	PDO Mapping Entry	0x7	rw	0x210b0140	0	8	
1A17	Transmit PDO Mapping Parameter Object 11 - Part B			0x9					–
1A17		0	Number of entries	0x7	rw	1	0	8	
1A17		1	PDO Mapping Entry	0x7	rw	0x210b0240	0	8	
1A18	Transmit PDO Mapping Parameter Object 12 - Part A			0x9					–
1A18		0	Number of entries	0x7	rw	1	0	8	
1A18		1	PDO Mapping Entry	0x7	rw	0x210c0140	0	8	
1A19	Transmit PDO Mapping Parameter Object 12 - Part B			0x9					–
1A19		0	Number of entries	0x7	rw	1	0	8	
1A19		1	PDO Mapping Entry	0x7	rw	0x210c0240	0	8	
1A1A	Transmit PDO Mapping Parameter Object 13 - Part A			0x9					–
1A1A		0	Number of entries	0x7	rw	1	0	8	
1A1A		1	PDO Mapping Entry	0x7	rw	0x210d0140	0	8	
1A1B	Transmit PDO Mapping Parameter Object 13 - Part B			0x9					–
1A1B		0	Number of entries	0x7	rw	1	0	8	
1A1B		1	PDO Mapping Entry	0x7	rw	0x210d0240	0	8	
1A1C	Transmit PDO Mapping Parameter Object 14 - Part A			0x9					–
1A1C		0	Number of entries	0x7	rw	1	0	8	
1A1C		1	PDO Mapping Entry	0x7	rw	0x210e0140	0	8	
1A1D	Transmit PDO Mapping Parameter Object 14 - Part B			0x9					–
1A1D		0	Number of entries	0x7	rw	1	0	8	
1A1D		1	PDO Mapping Entry	0x7	rw	0x210e0240	0	8	

Object No.	Object Name	Sub Index No.	Parameter Name	Object Type	Access Type	Default Value	Low Limit	High Limit	Comment
1A1E	Transmit PDO Mapping Parameter Object 15 - Part A			0x9					–
1A1E		0	Number of entries	0x7	rw	1	0	8	
1A1E		1	PDO Mapping Entry	0x7	rw	0x210f0140	0	8	
1A1F	Transmit PDO Mapping Parameter Object 15 - Part B			0x9					–
1A1F		0	Number of entries	0x7	rw	1	0	8	
1A1F		1	PDO Mapping Entry	0x7	rw	0x210f0240	0	8	
1A20	Transmit PDO Mapping Parameter Object 16 - Part A			0x9					–
1A20		0	Number of entries	0x7	rw	1	0	8	
1A20		1	PDO Mapping Entry	0x7	rw	0x21100140	0	8	
1A21	Transmit PDO Mapping Parameter Object 16 - Part B			0x9					–
1A21		0	Number of entries	0x7	rw	1	0	8	
1A21		1	PDO Mapping Entry	0x7	rw	0x21100240	0	8	
1A22	Transmit PDO Mapping Parameter Object 17 - Part A			0x9					–
1A22		0	Number of entries	0x7	rw	1	0	8	
1A22		1	PDO Mapping Entry	0x7	rw	0x21110140	0	8	
1A23	Transmit PDO Mapping Parameter Object 17 - Part B			0x9					–
1A23		0	Number of entries	0x7	rw	1	0	8	
1A23		1	PDO Mapping Entry	0x7	rw	0x21110240	0	8	
1A24	Transmit PDO Mapping Parameter Object 18 - Part A			0x9					–
1A24		0	Number of entries	0x7	rw	1	0	8	
1A24		1	PDO Mapping Entry	0x7	rw	0x21120140	0	8	
1A25	Transmit PDO Mapping Parameter Object 18 - Part B			0x9					–
1A25		0	Number of entries	0x7	rw	1	0	8	
1A25		1	PDO Mapping Entry	0x7	rw	0x21120240	0	8	
1A26	Transmit PDO Mapping Parameter Object 19 - Part A			0x9					–
1A26		0	Number of entries	0x7	rw	1	0	8	
1A26		1	PDO Mapping Entry	0x7	rw	0x21130140	0	8	
1A27	Transmit PDO Mapping Parameter Object 19 - Part B			0x9					–
1A27		0	Number of entries	0x7	rw	1	0	8	
1A27		1	PDO Mapping Entry	0x7	rw	0x21130240	0	8	

UK

Object No.	Object Name	Sub Index No.	Parameter Name	Object Type	Access Type	Default Value	Low Limit	High Limit	Comment
1A28	Transmit PDO Mapping Parameter - Crash_ Predictor_Info			0x9					–
1A28		0	Number of entries	0x7	rw	5	0	8	
1A28		1	PDO Mapping Entry - CP_obj_id	0x7	rw	0x22000108	0	8	
1A28		2	PDO Mapping Entry - CP_ttc	0x7	rw	0x22000208	0	8	
1A28		3	PDO Mapping Entry - CP_impact_ velocity	0x7	rw	0x22000310	0	8	
1A28		4	PDO Mapping Entry - CP_crash_ predicted	0x7	rw	0x22000408	0	8	
1A28		5	PDO Mapping Entry - Crash_Predictor_ Info_cnt	0x7	rw	0x22000508	0	8	
1A29	Transmit PDO Mapping Parameter - Global_ Information			0x9					–
1A29		0	Number of entries	0x7	rw	4	0	8	
1A29		1	PDO Mapping Entry - GLOB_master_ time	0x7	rw	0x22010120	0	8	
1A29		2	PDO Mapping Entry - GLOB_Sensor_ Available	0x7	rw	0x22010408	0	8	
1A29		3	PDO Mapping Entry - SwCtrl_OpMode	0x7	rw	0x22010308	0	8	
1A29		4	PDO Mapping Entry - Global_ Information_cnt	0x7	rw	0x22010408	0	8	
1A2A	Transmit PDO Mapping Parameter - SyncMsg			0x9					–
1A2A		0	Number of entries	0x7	rw	1	0	8	
1A2A		1	PDO Mapping Entry - KP_MasterTime_ LastTxTimeStamp	0x7	rw	0x22010308	0	8	
2100	Object 0			0x9					Objects 2100-2113 Mobile Camera Object: There are several signals coded in each Index Part. These signals are coded equal to the Signals in the SAE J1939 implementation. → „7.2 SAE J1939“
2100		0	NrOfObjects	0x7	ro	2	0	8	
2100		1	Part A	0x7	ro	2	0	8	
2100		2	Part B	0x7	ro	2	0	8	

Object No.	Object Name	Sub Index No.	Parameter Name	Object Type	Access Type	Default Value	Low Limit	High Limit	Comment
2101	Object 1			0x9					See Objects No. 2100
2101		0	NrOfObjects	0x7	ro	2	0	8	
2101		1	Part A	0x7	ro	2	0	8	
2101		2	Part B	0x7	ro	2	0	8	
2102	Object 2			0x9					
2102		0	NrOfObjects	0x7	ro	2	0	8	
2102		1	Part A	0x7	ro	2	0	8	
2102		2	Part B	0x7	ro	2	0	8	
2103	Object 3			0x9					
2103		0	NrOfObjects	0x7	ro	2	0	8	
2103		1	Part A	0x7	ro	2	0	8	
2103		2	Part B	0x7	ro	2	0	8	
2104	Object 4			0x9					
2104		0	NrOfObjects	0x7	ro	2	0	8	
2104		1	Part A	0x7	ro	2	0	8	
2104		2	Part B	0x7	ro	2	0	8	
2105	Object 5			0x9					
2105		0	NrOfObjects	0x7	ro	2	0	8	
2105		1	Part A	0x7	ro	2	0	8	
2105		2	Part B	0x7	ro	2	0	8	
2106	Object 6			0x9					
2106		0	NrOfObjects	0x7	ro	2	0	8	
2106		1	Part A	0x7	ro	2	0	8	
2106		2	Part B	0x7	ro	2	0	8	
2107	Object 7			0x9					
2107		0	NrOfObjects	0x7	ro	2	0	8	
2107		1	Part A	0x7	ro	2	0	8	
2107		2	Part B	0x7	ro	2	0	8	
2108	Object 8			0x9					
2108		0	NrOfObjects	0x7	ro	2	0	8	
2108		1	Part A	0x7	ro	2	0	8	
2108		2	Part B	0x7	ro	2	0	8	
2109	Object 9			0x9					
2109		0	NrOfObjects	0x7	ro	2	0	8	
2109		1	Part A	0x7	ro	2	0	8	
2109		2	Part B	0x7	ro	2	0	8	

UK

Object No.	Object Name	Sub Index No.	Parameter Name	Object Type	Access Type	Default Value	Low Limit	High Limit	Comment
210A	Object 10			0x9					See Objects No. 2100
210A		0	NrOfObjects	0x7	ro	2	0	8	
210A		1	Part A	0x7	ro	2	0	8	
210A		2	Part B	0x7	ro	2	0	8	
210B	Object 11			0x9					
210B		0	NrOfObjects	0x7	ro	2	0	8	
210B		1	Part A	0x7	ro	2	0	8	
210B		2	Part B	0x7	ro	2	0	8	
210C	Object 12			0x9					
210C		0	NrOfObjects	0x7	ro	2	0	8	
210C		1	Part A	0x7	ro	2	0	8	
210C		2	Part B	0x7	ro	2	0	8	
210D	Object 13			0x9					
210D		0	NrOfObjects	0x7	ro	2	0	8	
210D		1	Part A	0x7	ro	2	0	8	
210D		2	Part B	0x7	ro	2	0	8	
210E	Object 14			0x9					
210E		0	NrOfObjects	0x7	ro	2	0	8	
210E		1	Part A	0x7	ro	2	0	8	
210E		2	Part B	0x7	ro	2	0	8	
210F	Object 15			0x9					
210F		0	NrOfObjects	0x7	ro	2	0	8	
210F		1	Part A	0x7	ro	2	0	8	
210F		2	Part B	0x7	ro	2	0	8	
2110	Object 16			0x9					
2110		0	NrOfObjects	0x7	ro	2	0	8	
2110		1	Part A	0x7	ro	2	0	8	
2110		2	Part B	0x7	ro	2	0	8	
2111	Object 17			0x9					
2111		0	NrOfObjects	0x7	ro	2	0	8	
2111		1	Part A	0x7	ro	2	0	8	
2111		2	Part B	0x7	ro	2	0	8	
2112	Object 18			0x9					
2112		0	NrOfObjects	0x7	ro	2	0	8	
2112		1	Part A	0x7	ro	2	0	8	
2112		2	Part B	0x7	ro	2	0	8	
2113	Object 19			0x9					
2113		0	NrOfObjects	0x7	ro	2	0	8	
2113		1	Part A	0x7	ro	2	0	8	
2113		2	Part B	0x7	ro	2	0	8	
2200	Crash_ Predictor_Info			0x9					This object contains several sub objects: Name Unit Value Table Comment CP_obj_id n/a <none> object id causing the crash CP_ttc s VtSig_CP_ttc time to collision for predicted crash CP_impact_velocity m/s VtSig_CP_ impact_velocity impact velocity for predicted crash CP_crash_predicted enum VtSig_CP_ crash_predicted Enum describing state of crash predictor:... Crash_Predictor_ Info_cnt <none>
2200		0	NrOfObjects	0x7	ro	5	0	8	
2200		1	CP_obj_id	0x7	ro	5	0	8	
2200		2	CP_ttc	0x7	ro	5	0	8	
2200		3	CP_impact_velocity	0x7	ro	5	0	8	
2200		4	CP_crash_predicted	0x7	ro	5	0	3	
2200		5	Crash_Predictor_ Info_cnt	0x7	ro	5	0	3	

Object No.	Object Name	Sub Index No.	Parameter Name	Object Type	Access Type	Default Value	Low Limit	High Limit	Comment
2201	Global_ Information			0x9					–
2201		0	NrOfObjects	0x7	ro	4	0	3	
2201		1	GLOB_master_time	0x7	ro	4	0	3	
2201		2	GLOB_sensor_ available	0x7	ro	4	0	3	
2201		3	SwCtrl_OpMode	0x7	ro	4	0	65	
2201		4	Global_Information_ cnt	0x7	ro	4	0	3	
2210	SyncMsg			0x9					–
2210		0	NrOfObjects	0x7	ro	1	0	3	
2210		1	MasterTime_ LastTxTimeStamp	0x7	ro	1	0	3	
2300	Ego_Motion			0x9					–
2300		0	NrOfObjects	0x7	ro	3	0	3	
2300		1	Wheel_ BasedVehicleSpeed	0x7	wo	3	0	3	
2300		2	Driving_Direction	0x7	wo	3	0	3	
2300		3	Yaw_Rate	0x7	wo	3	0	3	

UK

7.2 SAE J1939

The initial value is always "0".

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Constant_2D_ Calib_Da- ta_Mux	Constant_2D_ Calib_Data	0x4FF0AEF	Multiplexor	0	8	Unsigned	1	0	0	12			
IntrCalib_2D_fx	Constant_2D_ Calib_Data	0x4FF0AEF	Constant_2D_ Calib_Data_ Mux = 0x0	8	32	IEEE Float	1	0	0	0			
IntrCalib_2D_fy	Constant_2D_ Calib_Data	0x4FF0AEF	Constant_2D_ Calib_Data_ Mux = 0x1	8	32	IEEE Float	1	0	0	0			
IntrCalib_2D_ mx	Constant_2D_ Calib_Data	0x4FF0AEF	Constant_2D_ Calib_Data_ Mux = 0x2	8	32	IEEE Float	1	0	0	0			
IntrCalib_2D_ my	Constant_2D_ Calib_Data	0x4FF0AEF	Constant_2D_ Calib_Data_ Mux = 0x3	8	32	IEEE Float	1	0	0	0			
IntrCalib_2D_al- pha	Constant_2D_ Calib_Data	0x4FF0AEF	Constant_2D_ Calib_Data_ Mux = 0x4	8	32	IEEE Float	1	0	0	0			
IntrCalib_2D_k1	Constant_2D_ Calib_Data	0x4FF0AEF	Constant_2D_ Calib_Data_ Mux = 0x5	8	32	IEEE Float	1	0	0	0			
IntrCalib_2D_k2	Constant_2D_ Calib_Data	0x4FF0AEF	Constant_2D_ Calib_Data_ Mux = 0x6	8	32	IEEE Float	1	0	0	0			
IntrCalib_2D_k5	Constant_2D_ Calib_Data	0x4FF0AEF	Constant_2D_ Calib_Data_ Mux = 0x7	8	32	IEEE Float	1	0	0	0			
IntrCalib_2D_k3	Constant_2D_ Calib_Data	0x4FF0AEF	Constant_2D_ Calib_Data_ Mux = 0x8	8	32	IEEE Float	1	0	0	0			
IntrCalib_2D_k4	Constant_2D_ Calib_Data	0x4FF0AEF	Constant_2D_ Calib_Data_ Mux = 0x9	8	32	IEEE Float	1	0	0	0			
IntrCalib_2D_ center_tx	Constant_2D_ Calib_Data	0x4FF0AEF	Constant_2D_ Calib_Data_ Mux = 0xA	8	32	IEEE Float	1	0	0	0			
IntrCalib_2D_ center_ty	Constant_2D_ Calib_Data	0x4FF0AEF	Constant_2D_ Calib_Data_ Mux = 0xB	8	32	IEEE Float	1	0	0	0			

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
IntrCalib_2D_ center_tz	Constant_2D_ Calib_Data	0x4FF0AEF	Constant_2D_ Calib_Data_ Mux = 0xC	8	32	IEEE Float	1	0	0	0			
CP_obj_id	Crash_Predic-tor_Info	0x4FF02EF		0	8	Unsigned	1	0	0	255	n/a		object id causing the crash
CP_ttc	Crash_Predic-tor_Info	0x4FF02EF		8	8	Unsigned	0.04	0	0	6	s	VtSig_CP_ttc	time to collision for predicted crash
CP_impact_ve-locity	Crash_Predic-tor_Info	0x4FF02EF		16	9	Unsigned	0.1	0	0	30	m/s	VtSig_CP_im-pact_velocity	impact velocity for predicted crash
CP_crash_pre-dicted	Crash_Predic-tor_Info	0x4FF02EF		25	3	Unsigned	1	-2	-2	2	enum	VtSig_CP_ crash_predicted	
Crash_Predic-tor_Info_cnt	Crash_Predic-tor_Info	0x4FF02EF		30	2	Unsigned	1	0	0	2			
Variant	DBC_File_Ver-sion	0x4FFA0EF		0	8	Unsigned	1	0	0	0		VtSig_Variant	
Major	DBC_File_Ver-sion	0x4FFA0EF		8	8	Unsigned	1	0	0	255			
Minor	DBC_File_Ver-sion	0x4FFA0EF		16	8	Unsigned	1	0	0	255			
ProtectLamp-Status	DM1	0x18FECAFE		0	2	Unsigned	1	0	0	3			This lamp is used to relay trouble code information that is reporting a problem with a vehicle system that is most...
AmberWar-ningLampStatus	DM1	0x18FECAFE		2	2	Unsigned	1	0	0	3			This lamp is used to relay trouble code information that is reporting a problem with the vehicle system but the vehicle need...
RedStopLamp-State	DM1	0x18FECAFE		4	2	Unsigned	1	0	0	3			This lamp is used to relay trouble code in-formation that is of a severe en-ought condition that it warrants stopping the vehicle.
MalfunctionIn-dicatorLamp-Status	DM1	0x18FECAFE		6	2	Unsigned	1	0	0	3			A lamp used to relay only emissions-rela-ted trouble code information.
FlashProtect-Lamp	DM1	0x18FECAFE		8	2	Unsigned	1	0	0	3			This parameter provides the capability to flash the engine protect lamp (SPN 3041).
FlashAmber-WarningLamp	DM1	0x18FECAFE		10	2	Unsigned	1	0	0	3			This parameter provides the ca-pability to flash the AWL (SPN 3040).
FlashRedSto-pLamp	DM1	0x18FECAFE		12	2	Unsigned	1	0	0	3			This parameter provides the ca-pability to flash the RSL (SPN 3039).

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
FlashMalfuncIn-dicatorLamp	DM1	0x18FECAFE		14	2	Unsigned	1	0	0	3			This parameter provides the capability to flash the MIL (SPN 3038).
SPN1	DM1	0x18FECAFE		16	16	Unsigned	1	0	0	65536			SPN #1 (Conversion Version 4)
FailureModel-dentifier1	DM1	0x18FECAFE		32	5	Unsigned	1	0	0	0			The FMI defines the type of failure detected in the subsystem identified by an SPN.
SPN1High	DM1	0x18FECAFE		37	3	Unsigned	1	0	0	7			SPN #1 (Conversion Version 4)
Occurence-Count1	DM1	0x18FECAFE		40	7	Unsigned	1	0	0	126			The 7 bit occurrence count field contains the number of times a fault has gone from active to previously active.
SPNConversi-onMethod1	DM1	0x18FECAFE		47	1	Unsigned	1	0	0	1			
SPN2	DM1	0x18FECAFE		48	16	Unsigned	1	0	0	65536			SPN #2 (Conversion Version 4)
FailureModel-dentifier2	DM1	0x18FECAFE		64	5	Unsigned	1	0	0	0			The FMI defines the type of failure detected in the subsystem identified by an SPN.
SPN2High	DM1	0x18FECAFE		69	3	Unsigned	1	0	0	7			SPN #2 (Conversion Version 4)
Occurence-Count2	DM1	0x18FECAFE		72	7	Unsigned	1	0	0	126			The 7 bit occurrence count field contains the number of times a fault has gone from active to previously active.
SPNConversi-onMethod2	DM1	0x18FECAFE		79	1	Unsigned	1	0	0	1			
SPN3	DM1	0x18FECAFE		80	16	Unsigned	1	0	0	65536			SPN #3 (Conversion Version 4)
FailureModel-dentifier3	DM1	0x18FECAFE		96	5	Unsigned	1	0	0	0			The FMI defines the type of failure detected in the subsystem identified by an SPN.
SPN3High	DM1	0x18FECAFE		101	3	Unsigned	1	0	0	7			SPN #3 (Conversion Version 4)
Occurence-Count3	DM1	0x18FECAFE		104	7	Unsigned	1	0	0	126			The 7 bit occurrence count field contains the number of times a fault has gone from active to previously active.
SPNConversi-onMethod3	DM1	0x18FECAFE		111	1	Unsigned	1	0	0	1			

UK

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
SPN4	DM1	0x18FECAFE		112	16	Unsigned	1	0	0	65536			SPN #4 (Conversion Version 4)
FailureModeIdentifier4	DM1	0x18FECAFE		128	5	Unsigned	1	0	0	0			The FMI defines the type of failure detected in the subsystem identified by an SPN.
SPN4High	DM1	0x18FECAFE		133	3	Unsigned	1	0	0	7			SPN #4 (Conversion Version 4)
OccurenceCount4	DM1	0x18FECAFE		136	7	Unsigned	1	0	0	126			The 7 bit occurrence count field contains the number of times a fault has gone from active to previously active.
SPNConversionMethod4	DM1	0x18FECAFE		143	1	Unsigned	1	0	0	1			
SPN5	DM1	0x18FECAFE		144	16	Unsigned	1	0	0	65536			SPN #5 (Conversion Version 4)
FailureModeIdentifier5	DM1	0x18FECAFE		160	5	Unsigned	1	0	0	0			The FMI defines the type of failure detected in the subsystem identified by an SPN.
SPN5High	DM1	0x18FECAFE		165	3	Unsigned	1	0	0	7			SPN #5 (Conversion Version 4)
OccurenceCount5	DM1	0x18FECAFE		168	7	Unsigned	1	0	0	126			The 7 bit occurrence count field contains the number of times a fault has gone from active to previously active.
SPNConversionMethod5	DM1	0x18FECAFE		175	1	Unsigned	1	0	0	1			
ExtrCalib_2D_rot_x	Dynamic_2D_Calib_Data	0x4FF09EF		0	12	Unsigned	0.00174533	-345.575	-345.575	345.575	rad	VtSig_ExtrCalib_2D_rot_x	
ExtrCalib_2D_delta_tx	Dynamic_2D_Calib_Data	0x4FF09EF		12	8	Unsigned	0.01	-1.2	-1.2	1.2	m	VtSig_ExtrCalib_2D_delta_tx	
ExtrCalib_2D_rot_y	Dynamic_2D_Calib_Data	0x4FF09EF		20	12	Unsigned	0.00174533	-345.575	-345.575	345.575	rad	VtSig_ExtrCalib_2D_rot_y	
ExtrCalib_2D_delta_ty	Dynamic_2D_Calib_Data	0x4FF09EF		32	8	Unsigned	0.01	-1.2	-1.2	1.2	m	VtSig_ExtrCalib_2D_delta_ty	
ExtrCalib_2D_rot_z	Dynamic_2D_Calib_Data	0x4FF09EF		40	12	Unsigned	0.00174533	-345.575	-345.575	345.575	rad	VtSig_ExtrCalib_2D_rot_z	
ExtrCalib_2D_delta_tz	Dynamic_2D_Calib_Data	0x4FF09EF		52	8	Unsigned	0.01	-1.2	-1.2	1.2	m	VtSig_ExtrCalib_2D_delta_tz	
Dynamic_2D_Calib_Data_cnt	Dynamic_2D_Calib_Data	0x4FF09EF		62	2	Unsigned	1	0	0	3			

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
VehicleABS-Active	EBS21	0x1803FFFE		0	2	Unsigned	1	0	0	1			Signal indicating the ABS is active/passive.
VehicleRetarderCtrlActive	EBS21	0x1803FFFE		2	2	Unsigned	1	0	0	3			This signal indicates the active/passive state in all cases when the installed retarder is applied by the driver's demand or by other systems (brakes).
VehicleServiceBrakeActive	EBS21	0x1803FFFE		4	2	Unsigned	1	0	0	1			Signal indicating the service brake of the towed vehicle is active/passive, by observing the brake pressure.
AutomTowedVehBreakActive	EBS21	0x1803FFFE		6	2	Unsigned	1	0	0	1			Signal indicating the automatic towed vehicle braking is active/passive.
VDCActive	EBS21	0x1803FFFE		8	2	Unsigned	1	0	0	1			Signal which indicates that Vehicle Dynamic Control (VDC) is active/passive.
SupplyLineBrakingRequest	EBS21	0x1803FFFE		10	2	Unsigned	1	0	0	1			Signal indicating the trailer is requesting to be braked by the commercial vehicle by means of bleeding the pneumatic supply line.
Wheel_Based-VehicleSpeed	EBS21	0x1803FFFE		16	16	Unsigned	0.00390625	0	0	251	km/		Actual speed of the vehicle (positive value for forward and backward speed) calculated as the average of the wheel speeds of one axle influenced by slip and filtered by a frequency range of 5 Hz to 20 Hz.
ActualRetarder-PercTorque	EBS21	0x1803FFFE		32	8	Unsigned	1	-125	-125	125	%		Actual torque of the retarder as negative percentage of maximum.
WheelSpeed-DiffMainAxle	EBS21	0x1803FFFE		40	16	Unsigned	0.00390625	-125	-125	125	km/h		Difference between the wheel speed at the right side and and the left side of the main axle.
GLOB_master_time	Global_Information	0x4FF01EF		0	32	Unsigned	1	0	0	4,29E+14	µs		

UK

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
GLOB_sensor_available	Global_Information	0x4FF01EF		32	8	Unsigned	1	0	0	255	bit mask		BIT_INTERFERENCE_DETECTED (1u)...
Blockage_Status	Global_Information	0x4FF01EF		40	8	Unsigned	1	0	0	100	%	VtSig_Blockage_Status	
SwCtrl_OpMode	Global_Information	0x4FF01EF		48	6	Unsigned	1	0	0	63		VtSig_SwCtrl_OpMode	
Global_Information_cnt	Global_Information	0x4FF01EF		54	2	Unsigned	1	0	0	3			
SingleFrameDataLength	ISO15765_Funct	0x18DBFEFE	ProtocolCtrlInformation = 0x0 (Single frame)	0	4	Unsigned	1	0	0	7	Byte		
SN	ISO15765_Funct	0x18DBFEFE	ProtocolCtrlInformation = 0x2 (Consecutive frame)	0	4	Unsigned	1	0	0	15			
FlowStatus	ISO15765_Funct	0x18DBFEFE	ProtocolCtrlInformation = 0x3 (Flow control)	0	4	Unsigned	1	0	0	3		VtSig_FlowStatus	
ProtocolCtrlInformation	ISO15765_Funct	0x18DBFEFE	Multiplexor	4	4	Unsigned	1	0	0	3		VtSig_ProtocolCtrlInformation	
FirstFrameDataLength	ISO15765_Funct	0x18DBFEFE	ProtocolCtrlInformation = 0x1 (First frame)	8	12	Unsigned	1	0	0	4095	Byte		
BlockSize	ISO15765_Funct	0x18DBFEFE	ProtocolCtrlInformation = 0x3 (Flow control)	8	8	Unsigned	1	0	0	255			
SeparationTime	ISO15765_Funct	0x18DBFEFE	ProtocolCtrlInformation = 0x3 (Flow control)	16	8	Unsigned	1	0	0	255	ms		
SingleFrameDataLength	ISO15765_Phys	0x18DAFEFE	ProtocolCtrlInformation = 0x0 (Single frame)	0	4	Unsigned	1	0	0	7	Byte		
SN	ISO15765_Phys	0x18DAFEFE	ProtocolCtrlInformation = 0x2 (Consecutive frame)	0	4	Unsigned	1	0	0	15			
FlowStatus	ISO15765_Phys	0x18DAFEFE	ProtocolCtrlInformation = 0x3 (Flow control)	0	4	Unsigned	1	0	0	3		VtSig_FlowStatus	
ProtocolCtrlInformation	ISO15765_Phys	0x18DAFEFE	Multiplexor	4	4	Unsigned	1	0	0	3		VtSig_ProtocolCtrlInformation	
FirstFrameDataLength	ISO15765_Phys	0x18DAFEFE	ProtocolCtrlInformation = 0x1 (First frame)	8	12	Unsigned	1	0	0	4095	Byte		
BlockSize	ISO15765_Phys	0x18DAFEFE	ProtocolCtrlInformation = 0x3 (Flow control)	8	8	Unsigned	1	0	0	255			
SeparationTime	ISO15765_Phys	0x18DAFEFE	ProtocolCtrlInformation = 0x3 (Flow control)	16	8	Unsigned	1	0	0	255	ms		
Obj_0_vx	MoCa_Obj_0_A	0x4FF10EF		0	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_0_vx	relative velocity of object, x direction
Obj_0_Type	MoCa_Obj_0_A	0x4FF10EF		7	1	Unsigned	1	0	0	1	n/a		Type identifier of the object...

UK

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Obj_0_vy	MoCa_Obj_0_A	0x4FF10EF		8	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_0_vy	relative velocity of object, y direction
Obj_0_ Measured	MoCa_Obj_0_A	0x4FF10EF		15	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_0_ Measured	Flag indicating that this object has been measured in actual frame
Obj_0_ay	MoCa_Obj_0_A	0x4FF10EF		16	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_0_ay	relative acceleration of object, y direction
Obj_0_ep	MoCa_Obj_0_A	0x4FF10EF		21	3	Unsigned	1	0	0	6	enum	VtSig_Obj_0_ep	existence probability, provided as an enum ...
Obj_0_ax	MoCa_Obj_0_A	0x4FF10EF		24	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_0_ax	relative acceleration of object, x direction
Obj_0_qvx	MoCa_Obj_0_A	0x4FF10EF		29	3	Unsigned	1	0	0	6	enum	VtSig_Obj_0_ qvx	quality of vx signal provided as an enum ...
Obj_0_az	MoCa_Obj_0_A	0x4FF10EF		32	4	Unsigned	1	-5	-5	5	m/s^2	VtSig_Obj_0_az	relative acceleration of object, z direction
Obj_0_Tra-ckAge	MoCa_Obj_0_A	0x4FF10EF		36	2	Unsigned	1	0	0	3	enum	VtSig_Obj_0_ TrackAge	Age of track, provided as an enum...
Obj_0_Id	MoCa_Obj_0_A	0x4FF10EF		38	8	Unsigned	1	0	0	255	n/a		id of object
Obj_0_zMin	MoCa_Obj_0_A	0x4FF10EF		46	11	Unsigned	0.02	-10	-10	30	m	VtSig_Obj_0_ zMin	minimum z coordinate of object
Obj_0_vz	MoCa_Obj_0_A	0x4FF10EF		57	5	Unsigned	0.5	-6	-6	6	m/s	VtSig_Obj_0_vz	relative velocity of object, z direction
Obj_0_A_cnt	MoCa_Obj_0_A	0x4FF10EF		62	2	Unsigned	1	0	0	3			Obj 0 part A message counter
Obj_0_dz	MoCa_Obj_0_B	0x4FF11EF		0	8	Unsigned	0.02	0	0	5	m	VtSig_Obj_0_dz	maximum z coordinate of object (zMax = zMin + dz, dz = zMax - zMin)
Obj_0_dy	MoCa_Obj_0_B	0x4FF11EF		8	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_0_dy	delta value of y coordinate of object's second point (y2 = y1 + dy, dy = y2 - y1)
Obj_0_dx	MoCa_Obj_0_B	0x4FF11EF		20	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_0_dx	delta value of x coordinate of object's second point (x2 = x1 + dx, dx = x2 - x1)
Obj_0_x1	MoCa_Obj_0_B	0x4FF11EF		32	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_0_x1	x coordinate of object's first point
Obj_0_y1	MoCa_Obj_0_B	0x4FF11EF		45	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_0_y1	y coordinate of object's first point
Obj_0_qvy	MoCa_Obj_0_B	0x4FF11EF		58	3	Unsigned	1	0	0	6	enum	VtSig_Obj_0_ qvy	quality of vy signal, provided as an enum ...
Obj_0_History	MoCa_Obj_0_B	0x4FF11EF		61	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_0_ History	Flag indicating that this object has been seen on bus
Obj_0_B_cnt	MoCa_Obj_0_B	0x4FF11EF		62	2	Unsigned	1	0	0	3			Obj 0 part B message counter
Obj_1_vx	MoCa_Obj_1_A	0x4FF12EF		0	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_1_vx	relative velocity of object, x direction

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Obj_1_Type	MoCa_Obj_1_A	0x4FF12EF		7	1	Unsigned	1	0	0	1	n/a		Type identifier of the object...
Obj_1_vy	MoCa_Obj_1_A	0x4FF12EF		8	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_1_vy	relative velocity of object, y direction
Obj_1_ Measured	MoCa_Obj_1_A	0x4FF12EF		15	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_1_ Measured	Flag indicating that this object has been measured in actual frame
Obj_1_ay	MoCa_Obj_1_A	0x4FF12EF		16	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_1_ay	relative acceleration of object, y direction
Obj_1_ep	MoCa_Obj_1_A	0x4FF12EF		21	3	Unsigned	1	0	0	6	enum	VtSig_Obj_1_ep	existence probability, provided as an enum ...
Obj_1_ax	MoCa_Obj_1_A	0x4FF12EF		24	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_1_ax	relative acceleration of object, x direction
Obj_1_qvx	MoCa_Obj_1_A	0x4FF12EF		29	3	Unsigned	1	0	0	6	enum	VtSig_Obj_1_ qvx	quality of vx signal provided as an enum ...
Obj_1_az	MoCa_Obj_1_A	0x4FF12EF		32	4	Unsigned	1	-5	-5	5	m/s^2	VtSig_Obj_1_az	relative acceleration of object, z direction
Obj_1_TrackAge	MoCa_Obj_1_A	0x4FF12EF		36	2	Unsigned	1	0	0	3	enum	VtSig_Obj_1_ TrackAge	Age of track, provided as an enum...
Obj_1_Id	MoCa_Obj_1_A	0x4FF12EF		38	8	Unsigned	1	0	0	255	n/a		id of object
Obj_1_zMin	MoCa_Obj_1_A	0x4FF12EF		46	11	Unsigned	0.02	-10	-10	30	m	VtSig_Obj_1_ zMin	minimum z coordinate of object
Obj_1_vz	MoCa_Obj_1_A	0x4FF12EF		57	5	Unsigned	0.5	-6	-6	6	m/s	VtSig_Obj_1_vz	relative velocity of object, z direction
Obj_1_A_cnt	MoCa_Obj_1_A	0x4FF12EF		62	2	Unsigned	1	0	0	3			Obj 1 part A message counter
Obj_1_dz	MoCa_Obj_1_B	0x4FF13EF		0	8	Unsigned	0.02	0	0	5	m	VtSig_Obj_1_dz	maximum z coordinate of object (zMax = zMin + dz, dz = zMax - zMin)
Obj_1_dy	MoCa_Obj_1_B	0x4FF13EF		8	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_1_dy	delta value of y coordinate of object's second point (y2 = y1 + dy, dy = y2 - y1)
Obj_1_dx	MoCa_Obj_1_B	0x4FF13EF		20	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_1_dx	delta value of x coordinate of object's second point (x2 = x1 + dx, dx = x2 - x1)
Obj_1_x1	MoCa_Obj_1_B	0x4FF13EF		32	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_1_x1	x coordinate of object's first point
Obj_1_y1	MoCa_Obj_1_B	0x4FF13EF		45	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_1_y1	y coordinate of object's first point
Obj_1_qvy	MoCa_Obj_1_B	0x4FF13EF		58	3	Unsigned	1	0	0	6	enum	VtSig_Obj_1_ qvy	quality of vy signal, provided as an enum ...
Obj_1_History	MoCa_Obj_1_B	0x4FF13EF		61	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_1_ History	Flag indicating that this object has been seen on bus
Obj_1_B_cnt	MoCa_Obj_1_B	0x4FF13EF		62	2	Unsigned	1	0	0	3			Obj 1 part B message counter

UK

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Obj_10_vx	MoCa_Obj_10_A	0x4FF24EF		0	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_10_vx	relative velocity of object, x direction
Obj_10_Type	MoCa_Obj_10_A	0x4FF24EF		7	1	Unsigned	1	0	0	1	n/a		Type identifier of the object...
Obj_10_vy	MoCa_Obj_10_A	0x4FF24EF		8	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_10_vy	relative velocity of object, y direction
Obj_10_Measured	MoCa_Obj_10_A	0x4FF24EF		15	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_10_Measured	Flag indicating that this object has been measured in actual frame
Obj_10_ay	MoCa_Obj_10_A	0x4FF24EF		16	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_10_ay	relative acceleration of object, y direction
Obj_10_ep	MoCa_Obj_10_A	0x4FF24EF		21	3	Unsigned	1	0	0	6	enum	VtSig_Obj_10_ep	existence probability, provided as an enum ...
Obj_10_ax	MoCa_Obj_10_A	0x4FF24EF		24	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_10_ax	relative acceleration of object, x direction
Obj_10_qvx	MoCa_Obj_10_A	0x4FF24EF		29	3	Unsigned	1	0	0	6	enum	VtSig_Obj_10_qvx	quality of vx signal provided as an enum ...
Obj_10_az	MoCa_Obj_10_A	0x4FF24EF		32	4	Unsigned	1	-5	-5	5	m/s^2	VtSig_Obj_10_az	relative acceleration of object, z direction
Obj_10_TrackAge	MoCa_Obj_10_A	0x4FF24EF		36	2	Unsigned	1	0	0	3	enum	VtSig_Obj_10_TrackAge	Age of track, provided as an enum...
Obj_10_Id	MoCa_Obj_10_A	0x4FF24EF		38	8	Unsigned	1	0	0	255	n/a		id of object
Obj_10_zMin	MoCa_Obj_10_A	0x4FF24EF		46	11	Unsigned	0.02	-10	-10	30	m	VtSig_Obj_10_zMin	minimum z coordinate of object
Obj_10_vz	MoCa_Obj_10_A	0x4FF24EF		57	5	Unsigned	0.5	-6	-6	6	m/s	VtSig_Obj_10_vz	relative velocity of object, z direction
Obj_10_A_cnt	MoCa_Obj_10_A	0x4FF24EF		62	2	Unsigned	1	0	0	3			Obj 10 part A message counter
Obj_10_dz	MoCa_Obj_10_B	0x4FF25EF		0	8	Unsigned	0.02	0	0	5	m	VtSig_Obj_10_dz	maximum z coordinate of object (zMax = zMin + dz, dz = zMax - zMin)
Obj_10_dy	MoCa_Obj_10_B	0x4FF25EF		8	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_10_dy	delta value of y coordinate of object's second point (y2 = y1 + dy, dy = y2 - y1)
Obj_10_dx	MoCa_Obj_10_B	0x4FF25EF		20	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_10_dx	delta value of x coordinate of object's second point (x2 = x1 + dx, dx = x2 - x1)
Obj_10_x1	MoCa_Obj_10_B	0x4FF25EF		32	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_10_x1	x coordinate of object's first point
Obj_10_y1	MoCa_Obj_10_B	0x4FF25EF		45	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_10_y1	y coordinate of object's first point
Obj_10_qvy	MoCa_Obj_10_B	0x4FF25EF		58	3	Unsigned	1	0	0	6	enum	VtSig_Obj_10_qvy	quality of vy signal, provided as an enum ...
Obj_10_History	MoCa_Obj_10_B	0x4FF25EF		61	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_10_History	Flag indicating that this object has been seen on bus

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Obj_10_B_cnt	MoCa_Obj_10_B	0x4FF25EF		62	2	Unsigned	1	0	0	3			Obj 10 part B message counter
Obj_11_vx	MoCa_Obj_11_A	0x4FF26EF		0	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_11_vx	relative velocity of object, x direction
Obj_11_Type	MoCa_Obj_11_A	0x4FF26EF		7	1	Unsigned	1	0	0	1	n/a		Type identifier of the object...
Obj_11_vy	MoCa_Obj_11_A	0x4FF26EF		8	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_11_vy	relative velocity of object, y direction
Obj_11_Measured	MoCa_Obj_11_A	0x4FF26EF		15	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_11_Measured	Flag indicating that this object has been measured in actual frame
Obj_11_ay	MoCa_Obj_11_A	0x4FF26EF		16	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_11_ay	relative acceleration of object, y direction
Obj_11_ep	MoCa_Obj_11_A	0x4FF26EF		21	3	Unsigned	1	0	0	6	enum	VtSig_Obj_11_ep	existence probability, provided as an enum ...
Obj_11_ax	MoCa_Obj_11_A	0x4FF26EF		24	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_11_ax	relative acceleration of object, x direction
Obj_11_qvx	MoCa_Obj_11_A	0x4FF26EF		29	3	Unsigned	1	0	0	6	enum	VtSig_Obj_11_qvx	quality of vx signal provided as an enum ...
Obj_11_az	MoCa_Obj_11_A	0x4FF26EF		32	4	Unsigned	1	-5	-5	5	m/s^2	VtSig_Obj_11_az	relative acceleration of object, z direction
Obj_11_TrackAge	MoCa_Obj_11_A	0x4FF26EF		36	2	Unsigned	1	0	0	3	enum	VtSig_Obj_11_TrackAge	Age of track, provided as an enum...
Obj_11_Id	MoCa_Obj_11_A	0x4FF26EF		38	8	Unsigned	1	0	0	255	n/a		id of object
Obj_11_zMin	MoCa_Obj_11_A	0x4FF26EF		46	11	Unsigned	0.02	-10	-10	30	m	VtSig_Obj_11_zMin	minimum z coordinate of object
Obj_11_vz	MoCa_Obj_11_A	0x4FF26EF		57	5	Unsigned	0.5	-6	-6	6	m/s	VtSig_Obj_11_vz	relative velocity of object, z direction
Obj_11_A_cnt	MoCa_Obj_11_A	0x4FF26EF		62	2	Unsigned	1	0	0	3			Obj 11 part A message counter
Obj_11_dz	MoCa_Obj_11_B	0x4FF27EF		0	8	Unsigned	0.02	0	0	5	m	VtSig_Obj_11_dz	maximum z coordinate of object (zMax = zMin + dz, dz = zMax - zMin)
Obj_11_dy	MoCa_Obj_11_B	0x4FF27EF		8	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_11_dy	delta value of y coordinate of object's second point (y2 = y1 + dy, dy = y2 - y1)
Obj_11_dx	MoCa_Obj_11_B	0x4FF27EF		20	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_11_dx	delta value of x coordinate of object's second point (x2 = x1 + dx, dx = x2 - x1)
Obj_11_x1	MoCa_Obj_11_B	0x4FF27EF		32	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_11_x1	x coordinate of object's first point
Obj_11_y1	MoCa_Obj_11_B	0x4FF27EF		45	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_11_y1	y coordinate of object's first point
Obj_11_qvy	MoCa_Obj_11_B	0x4FF27EF		58	3	Unsigned	1	0	0	6	enum	VtSig_Obj_11_qvy	quality of vy signal, provided as an enum ...

UK

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Obj_11_History	MoCa_Obj_11_B	0x4FF27EF		61	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_11_ History	Flag indicating that this object has been seen on bus
Obj_11_B_cnt	MoCa_Obj_11_B	0x4FF27EF		62	2	Unsigned	1	0	0	3			Obj 11 part B message counter
Obj_12_vx	MoCa_Obj_12_A	0x4FF28EF		0	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_12_ vx	relative velocity of object, x direction
Obj_12_Type	MoCa_Obj_12_A	0x4FF28EF		7	1	Unsigned	1	0	0	1	n/a		Type identifier of the object...
Obj_12_vy	MoCa_Obj_12_A	0x4FF28EF		8	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_12_ vy	relative velocity of object, y direction
Obj_12_ Measured	MoCa_Obj_12_A	0x4FF28EF		15	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_12_ Measured	Flag indica-ting that this object has been measured in actual frame
Obj_12_ay	MoCa_Obj_12_A	0x4FF28EF		16	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_12_ ay	relative accele-ration of object, y direction
Obj_12_ep	MoCa_Obj_12_A	0x4FF28EF		21	3	Unsigned	1	0	0	6	enum	VtSig_Obj_12_ ep	existence proba-bility, provided as an enum ...
Obj_12_ax	MoCa_Obj_12_A	0x4FF28EF		24	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_12_ ax	relative accele-ration of object, x direction
Obj_12_qvx	MoCa_Obj_12_A	0x4FF28EF		29	3	Unsigned	1	0	0	6	enum	VtSig_Obj_12_ qvx	quality of vx signal provided as an enum ...
Obj_12_az	MoCa_Obj_12_A	0x4FF28EF		32	4	Unsigned	1	-5	-5	5	m/s^2	VtSig_Obj_12_ az	relative accele-ration of object, z direction
Obj_12_Tra-ckAge	MoCa_Obj_12_A	0x4FF28EF		36	2	Unsigned	1	0	0	3	enum	VtSig_Obj_12_ TrackAge	Age of track, provided as an enum...
Obj_12_Id	MoCa_Obj_12_A	0x4FF28EF		38	8	Unsigned	1	0	0	255	n/a		id of object
Obj_12_zMin	MoCa_Obj_12_A	0x4FF28EF		46	11	Unsigned	0.02	-10	-10	30	m	VtSig_Obj_12_ zMin	minimum z coor-dinate of object
Obj_12_vz	MoCa_Obj_12_A	0x4FF28EF		57	5	Unsigned	0.5	-6	-6	6	m/s	VtSig_Obj_12_ vz	relative velocity of object, z direction
Obj_12_A_cnt	MoCa_Obj_12_A	0x4FF28EF		62	2	Unsigned	1	0	0	3			Obj 12 part A message counter
Obj_12_dz	MoCa_Obj_12_B	0x4FF29EF		0	8	Unsigned	0.02	0	0	5	m	VtSig_Obj_12_ dz	maximum z coordinate of object (zMax = zMin + dz, dz = zMax - zMin)
Obj_12_dy	MoCa_Obj_12_B	0x4FF29EF		8	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_12_ dy	delta value of y coordinate of object's second point (y2 = y1 + dy, dy = y2 - y1)
Obj_12_dx	MoCa_Obj_12_B	0x4FF29EF		20	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_12_ dx	delta value of x coordinate of object's second point (x2 = x1 + dx, dx = x2 - x1)
Obj_12_x1	MoCa_Obj_12_B	0x4FF29EF		32	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_12_ x1	x coordinate of object's first point
Obj_12_y1	MoCa_Obj_12_B	0x4FF29EF		45	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_12_ y1	y coordinate of object's first point

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Obj_12_qvy	MoCa_Obj_12_B	0x4FF29EF		58	3	Unsigned	1	0	0	6	enum	VtSig_Obj_12_ qvy	quality of vy signal, provided as an enum ...
Obj_12_History	MoCa_Obj_12_B	0x4FF29EF		61	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_12_ History	Flag indicating that this object has been seen on bus
Obj_12_B_cnt	MoCa_Obj_12_B	0x4FF29EF		62	2	Unsigned	1	0	0	3			Obj 12 part B message counter
Obj_13_vx	MoCa_Obj_13_A	0x4FF2AEF		0	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_13_ vx	relative velocity of object, x direction
Obj_13_Type	MoCa_Obj_13_A	0x4FF2AEF		7	1	Unsigned	1	0	0	1	n/a		Type identifier of the object...
Obj_13_vy	MoCa_Obj_13_A	0x4FF2AEF		8	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_13_ vy	relative velocity of object, y direction
Obj_13_ Measured	MoCa_Obj_13_A	0x4FF2AEF		15	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_13_ Measured	Flag indica-ting that this object has been measured in actual frame
Obj_13_ay	MoCa_Obj_13_A	0x4FF2AEF		16	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_13_ ay	relative accele-ration of object, y direction
Obj_13_ep	MoCa_Obj_13_A	0x4FF2AEF		21	3	Unsigned	1	0	0	6	enum	VtSig_Obj_13_ ep	existence proba-bility, provided as an enum ...
Obj_13_ax	MoCa_Obj_13_A	0x4FF2AEF		24	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_13_ ax	relative accele-ration of object, x direction
Obj_13_qvx	MoCa_Obj_13_A	0x4FF2AEF		29	3	Unsigned	1	0	0	6	enum	VtSig_Obj_13_ qvx	quality of vx signal provided as an enum ...
Obj_13_az	MoCa_Obj_13_A	0x4FF2AEF		32	4	Unsigned	1	-5	-5	5	m/s^2	VtSig_Obj_13_ az	relative accele-ration of object, z direction
Obj_13_Tra-ckAge	MoCa_Obj_13_A	0x4FF2AEF		36	2	Unsigned	1	0	0	3	enum	VtSig_Obj_13_ TrackAge	Age of track, provided as an enum...
Obj_13_Id	MoCa_Obj_13_A	0x4FF2AEF		38	8	Unsigned	1	0	0	255	n/a		id of object
Obj_13_zMin	MoCa_Obj_13_A	0x4FF2AEF		46	11	Unsigned	0.02	-10	-10	30	m	VtSig_Obj_13_ zMin	minimum z coor-dinate of object
Obj_13_vz	MoCa_Obj_13_A	0x4FF2AEF		57	5	Unsigned	0.5	-6	-6	6	m/s	VtSig_Obj_13_ vz	relative velocity of object, z direction
Obj_13_A_cnt	MoCa_Obj_13_A	0x4FF2AEF		62	2	Unsigned	1	0	0	3			Obj 13 part A message counter
Obj_13_dz	MoCa_Obj_13_B	0x4FF2BEF		0	8	Unsigned	0.02	0	0	5	m	VtSig_Obj_13_ dz	maximum z coordinate of object (zMax = zMin + dz, dz = zMax - zMin)
Obj_13_dy	MoCa_Obj_13_B	0x4FF2BEF		8	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_13_ dy	delta value of y coordinate of object's second point (y2 = y1 + dy, dy = y2 - y1)
Obj_13_dx	MoCa_Obj_13_B	0x4FF2BEF		20	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_13_ dx	delta value of x coordinate of object's second point (x2 = x1 + dx, dx = x2 - x1)
Obj_13_x1	MoCa_Obj_13_B	0x4FF2BEF		32	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_13_ x1	x coordinate of object's first point

UK

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Obj_13_y1	MoCa_Obj_13_B	0x4FF2BEF		45	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_13_y1	y coordinate of object's first point
Obj_13_qvy	MoCa_Obj_13_B	0x4FF2BEF		58	3	Unsigned	1	0	0	6	enum	VtSig_Obj_13_qvy	quality of vy signal, provided as an enum ...
Obj_13_History	MoCa_Obj_13_B	0x4FF2BEF		61	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_13_History	Flag indicating that this object has been seen on bus
Obj_13_B_cnt	MoCa_Obj_13_B	0x4FF2BEF		62	2	Unsigned	1	0	0	3			Obj 13 part B message counter
Obj_14_vx	MoCa_Obj_14_A	0x4FF2CEF		0	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_14_vx	relative velocity of object, x direction
Obj_14_Type	MoCa_Obj_14_A	0x4FF2CEF		7	1	Unsigned	1	0	0	1	n/a		Type identifier of the object...
Obj_14_vy	MoCa_Obj_14_A	0x4FF2CEF		8	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_14_vy	relative velocity of object, y direction
Obj_14_ Measured	MoCa_Obj_14_A	0x4FF2CEF		15	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_14_Measured	Flag indicating that this object has been measured in actual frame
Obj_14_ay	MoCa_Obj_14_A	0x4FF2CEF		16	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_14_ay	relative acceleration of object, y direction
Obj_14_ep	MoCa_Obj_14_A	0x4FF2CEF		21	3	Unsigned	1	0	0	6	enum	VtSig_Obj_14_ep	existence probability, provided as an enum ...
Obj_14_ax	MoCa_Obj_14_A	0x4FF2CEF		24	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_14_ax	relative acceleration of object, x direction
Obj_14_qvx	MoCa_Obj_14_A	0x4FF2CEF		29	3	Unsigned	1	0	0	6	enum	VtSig_Obj_14_qvx	quality of vx signal provided as an enum ...
Obj_14_az	MoCa_Obj_14_A	0x4FF2CEF		32	4	Unsigned	1	-5	-5	5	m/s^2	VtSig_Obj_14_az	relative acceleration of object, z direction
Obj_14_TrackAge	MoCa_Obj_14_A	0x4FF2CEF		36	2	Unsigned	1	0	0	3	enum	VtSig_Obj_14_TrackAge	Age of track, provided as an enum...
Obj_14_Id	MoCa_Obj_14_A	0x4FF2CEF		38	8	Unsigned	1	0	0	255	n/a		id of object
Obj_14_zMin	MoCa_Obj_14_A	0x4FF2CEF		46	11	Unsigned	0.02	-10	-10	30	m	VtSig_Obj_14_zMin	minimum z coordinate of object
Obj_14_vz	MoCa_Obj_14_A	0x4FF2CEF		57	5	Unsigned	0.5	-6	-6	6	m/s	VtSig_Obj_14_vz	relative velocity of object, z direction
Obj_14_A_cnt	MoCa_Obj_14_A	0x4FF2CEF		62	2	Unsigned	1	0	0	3			Obj 14 part A message counter
Obj_14_dz	MoCa_Obj_14_B	0x4FF2DEF		0	8	Unsigned	0.02	0	0	5	m	VtSig_Obj_14_dz	maximum z coordinate of object (zMax = zMin + dz, dz = zMax - zMin)
Obj_14_dy	MoCa_Obj_14_B	0x4FF2DEF		8	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_14_dy	delta value of y coordinate of object's second point (y2 = y1 + dy, dy = y2 - y1)
Obj_14_dx	MoCa_Obj_14_B	0x4FF2DEF		20	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_14_dx	delta value of x coordinate of object's second point (x2 = x1 + dx, dx = x2 - x1)

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Obj_14_x1	MoCa_Obj_14_B	0x4FF2DEF		32	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_14_x1	x coordinate of object's first point
Obj_14_y1	MoCa_Obj_14_B	0x4FF2DEF		45	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_14_y1	y coordinate of object's first point
Obj_14_qvy	MoCa_Obj_14_B	0x4FF2DEF		58	3	Unsigned	1	0	0	6	enum	VtSig_Obj_14_qvy	quality of vy signal, provided as an enum ...
Obj_14_History	MoCa_Obj_14_B	0x4FF2DEF		61	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_14_History	Flag indicating that this object has been seen on bus
Obj_14_B_cnt	MoCa_Obj_14_B	0x4FF2DEF		62	2	Unsigned	1	0	0	3			Obj 14 part B message counter
Obj_15_vx	MoCa_Obj_15_A	0x4FF2EEF		0	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_15_vx	relative velocity of object, x direction
Obj_15_Type	MoCa_Obj_15_A	0x4FF2EEF		7	1	Unsigned	1	0	0	1	n/a		Type identifier of the object...
Obj_15_vy	MoCa_Obj_15_A	0x4FF2EEF		8	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_15_vy	relative velocity of object, y direction
Obj_15_Measured	MoCa_Obj_15_A	0x4FF2EEF		15	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_15_Measured	Flag indicating that this object has been measured in actual frame
Obj_15_ay	MoCa_Obj_15_A	0x4FF2EEF		16	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_15_ay	relative acceleration of object, y direction
Obj_15_ep	MoCa_Obj_15_A	0x4FF2EEF		21	3	Unsigned	1	0	0	6	enum	VtSig_Obj_15_ep	existence probability, provided as an enum ...
Obj_15_ax	MoCa_Obj_15_A	0x4FF2EEF		24	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_15_ax	relative acceleration of object, x direction
Obj_15_qvx	MoCa_Obj_15_A	0x4FF2EEF		29	3	Unsigned	1	0	0	6	enum	VtSig_Obj_15_qvx	quality of vx signal provided as an enum ...
Obj_15_az	MoCa_Obj_15_A	0x4FF2EEF		32	4	Unsigned	1	-5	-5	5	m/s^2	VtSig_Obj_15_az	relative acceleration of object, z direction
Obj_15_TrackAge	MoCa_Obj_15_A	0x4FF2EEF		36	2	Unsigned	1	0	0	3	enum	VtSig_Obj_15_TrackAge	Age of track, provided as an enum...
Obj_15_Id	MoCa_Obj_15_A	0x4FF2EEF		38	8	Unsigned	1	0	0	255	n/a		id of object
Obj_15_zMin	MoCa_Obj_15_A	0x4FF2EEF		46	11	Unsigned	0.02	-10	-10	30	m	VtSig_Obj_15_zMin	minimum z coordinate of object
Obj_15_vz	MoCa_Obj_15_A	0x4FF2EEF		57	5	Unsigned	0.5	-6	-6	6	m/s	VtSig_Obj_15_vz	relative velocity of object, z direction
Obj_15_A_cnt	MoCa_Obj_15_A	0x4FF2EEF		62	2	Unsigned	1	0	0	3			Obj 15 part A message counter
Obj_15_dz	MoCa_Obj_15_B	0x4FF2FEF		0	8	Unsigned	0.02	0	0	5	m	VtSig_Obj_15_dz	maximum z coordinate of object (zMax = zMin + dz, dz = zMax - zMin)
Obj_15_dy	MoCa_Obj_15_B	0x4FF2FEF		8	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_15_dy	delta value of y coordinate of object's second point (y2 = y1 + dy, dy = y2 - y1)

UK

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Obj_15_dx	MoCa_Obj_15_B	0x4FF2FEF		20	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_15_dx	delta value of x coordinate of object's second point (x2 = x1 + dx, dx = x2 - x1)
Obj_15_x1	MoCa_Obj_15_B	0x4FF2FEF		32	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_15_x1	x coordinate of object's first point
Obj_15_y1	MoCa_Obj_15_B	0x4FF2FEF		45	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_15_y1	y coordinate of object's first point
Obj_15_qvy	MoCa_Obj_15_B	0x4FF2FEF		58	3	Unsigned	1	0	0	6	enum	VtSig_Obj_15_qvy	quality of vy signal, provided as an enum ...
Obj_15_History	MoCa_Obj_15_B	0x4FF2FEF		61	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_15_History	Flag indicating that this object has been seen on bus
Obj_15_B_cnt	MoCa_Obj_15_B	0x4FF2FEF		62	2	Unsigned	1	0	0	3			Obj 15 part B message counter
Obj_16_vx	MoCa_Obj_16_A	0x4FF30EF		0	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_16_vx	relative velocity of object, x direction
Obj_16_Type	MoCa_Obj_16_A	0x4FF30EF		7	1	Unsigned	1	0	0	1	n/a		Type identifier of the object...
Obj_16_vy	MoCa_Obj_16_A	0x4FF30EF		8	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_16_vy	relative velocity of object, y direction
Obj_16_Measured	MoCa_Obj_16_A	0x4FF30EF		15	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_16_Measured	Flag indicating that this object has been measured in actual frame
Obj_16_ay	MoCa_Obj_16_A	0x4FF30EF		16	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_16_ay	relative acceleration of object, y direction
Obj_16_ep	MoCa_Obj_16_A	0x4FF30EF		21	3	Unsigned	1	0	0	6	enum	VtSig_Obj_16_ep	existence probability, provided as an enum ...
Obj_16_ax	MoCa_Obj_16_A	0x4FF30EF		24	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_16_ax	relative acceleration of object, x direction
Obj_16_qvx	MoCa_Obj_16_A	0x4FF30EF		29	3	Unsigned	1	0	0	6	enum	VtSig_Obj_16_qvx	quality of vx signal provided as an enum ...
Obj_16_az	MoCa_Obj_16_A	0x4FF30EF		32	4	Unsigned	1	-5	-5	5	m/s^2	VtSig_Obj_16_az	relative acceleration of object, z direction
Obj_16_TrackAge	MoCa_Obj_16_A	0x4FF30EF		36	2	Unsigned	1	0	0	3	enum	VtSig_Obj_16_TrackAge	Age of track, provided as an enum...
Obj_16_Id	MoCa_Obj_16_A	0x4FF30EF		38	8	Unsigned	1	0	0	255	n/a		id of object
Obj_16_zMin	MoCa_Obj_16_A	0x4FF30EF		46	11	Unsigned	0.02	-10	-10	30	m	VtSig_Obj_16_zMin	minimum z coordinate of object
Obj_16_vz	MoCa_Obj_16_A	0x4FF30EF		57	5	Unsigned	0.5	-6	-6	6	m/s	VtSig_Obj_16_vz	relative velocity of object, z direction
Obj_16_A_cnt	MoCa_Obj_16_A	0x4FF30EF		62	2	Unsigned	1	0	0	3			Obj 16 part A message counter
Obj_16_dz	MoCa_Obj_16_B	0x4FF31EF		0	8	Unsigned	0.02	0	0	5	m	VtSig_Obj_16_dz	maximum z coordinate of object (zMax = zMin + dz, dz = zMax - zMin)

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Obj_16_dy	MoCa_Obj_16_B	0x4FF31EF		8	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_16_dy	delta value of y coordinate of object's second point (y2 = y1 + dy, dy = y2 - y1)
Obj_16_dx	MoCa_Obj_16_B	0x4FF31EF		20	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_16_dx	delta value of x coordinate of object's second point (x2 = x1 + dx, dx = x2 - x1)
Obj_16_x1	MoCa_Obj_16_B	0x4FF31EF		32	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_16_x1	x coordinate of object's first point
Obj_16_y1	MoCa_Obj_16_B	0x4FF31EF		45	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_16_y1	y coordinate of object's first point
Obj_16_qvy	MoCa_Obj_16_B	0x4FF31EF		58	3	Unsigned	1	0	0	6	enum	VtSig_Obj_16_qvy	quality of vy signal, provided as an enum ...
Obj_16_History	MoCa_Obj_16_B	0x4FF31EF		61	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_16_History	Flag indicating that this object has been seen on bus
Obj_16_B_cnt	MoCa_Obj_16_B	0x4FF31EF		62	2	Unsigned	1	0	0	3			Obj 16 part B message counter
Obj_17_vx	MoCa_Obj_17_A	0x4FF32EF		0	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_17_vx	relative velocity of object, x direction
Obj_17_Type	MoCa_Obj_17_A	0x4FF32EF		7	1	Unsigned	1	0	0	1	n/a		Type identifier of the object...
Obj_17_vy	MoCa_Obj_17_A	0x4FF32EF		8	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_17_vy	relative velocity of object, y direction
Obj_17_ Measured	MoCa_Obj_17_A	0x4FF32EF		15	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_17_Measured	Flag indicating that this object has been measured in actual frame
Obj_17_ay	MoCa_Obj_17_A	0x4FF32EF		16	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_17_ay	relative acceleration of object, y direction
Obj_17_ep	MoCa_Obj_17_A	0x4FF32EF		21	3	Unsigned	1	0	0	6	enum	VtSig_Obj_17_ep	existence probability, provided as an enum ...
Obj_17_ax	MoCa_Obj_17_A	0x4FF32EF		24	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_17_ax	relative acceleration of object, x direction
Obj_17_qvx	MoCa_Obj_17_A	0x4FF32EF		29	3	Unsigned	1	0	0	6	enum	VtSig_Obj_17_qvx	quality of vx signal provided as an enum ...
Obj_17_az	MoCa_Obj_17_A	0x4FF32EF		32	4	Unsigned	1	-5	-5	5	m/s^2	VtSig_Obj_17_az	relative acceleration of object, z direction
Obj_17_TrackAge	MoCa_Obj_17_A	0x4FF32EF		36	2	Unsigned	1	0	0	3	enum	VtSig_Obj_17_TrackAge	Age of track, provided as an enum...
Obj_17_Id	MoCa_Obj_17_A	0x4FF32EF		38	8	Unsigned	1	0	0	255	n/a		id of object
Obj_17_zMin	MoCa_Obj_17_A	0x4FF32EF		46	11	Unsigned	0.02	-10	-10	30	m	VtSig_Obj_17_zMin	minimum z coordinate of object
Obj_17_vz	MoCa_Obj_17_A	0x4FF32EF		57	5	Unsigned	0.5	-6	-6	6	m/s	VtSig_Obj_17_vz	relative velocity of object, z direction
Obj_17_A_cnt	MoCa_Obj_17_A	0x4FF32EF		62	2	Unsigned	1	0	0	3			Obj 17 part A message counter

UK

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Obj_17_dz	MoCa_Obj_17_B	0x4FF33EF		0	8	Unsigned	0.02	0	0	5	m	VtSig_Obj_17_dz	maximum z coordinate of object (zMax = zMin + dz, dz = zMax - zMin)
Obj_17_dy	MoCa_Obj_17_B	0x4FF33EF		8	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_17_dy	delta value of y coordinate of object's second point (y2 = y1 + dy, dy = y2 - y1)
Obj_17_dx	MoCa_Obj_17_B	0x4FF33EF		20	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_17_dx	delta value of x coordinate of object's second point (x2 = x1 + dx, dx = x2 - x1)
Obj_17_x1	MoCa_Obj_17_B	0x4FF33EF		32	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_17_x1	x coordinate of object's first point
Obj_17_y1	MoCa_Obj_17_B	0x4FF33EF		45	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_17_y1	y coordinate of object's first point
Obj_17_qvy	MoCa_Obj_17_B	0x4FF33EF		58	3	Unsigned	1	0	0	6	enum	VtSig_Obj_17_qvy	quality of vy signal, provided as an enum ...
Obj_17_History	MoCa_Obj_17_B	0x4FF33EF		61	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_17_History	Flag indicating that this object has been seen on bus
Obj_17_B_cnt	MoCa_Obj_17_B	0x4FF33EF		62	2	Unsigned	1	0	0	3			Obj 17 part B message counter
Obj_18_vx	MoCa_Obj_18_A	0x4FF34EF		0	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_18_vx	relative velocity of object, x direction
Obj_18_Type	MoCa_Obj_18_A	0x4FF34EF		7	1	Unsigned	1	0	0	1	n/a		Type identifier of the object...
Obj_18_vy	MoCa_Obj_18_A	0x4FF34EF		8	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_18_vy	relative velocity of object, y direction
Obj_18_ Measured	MoCa_Obj_18_A	0x4FF34EF		15	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_18_ Measured	Flag indicating that this object has been measured in actual frame
Obj_18_ay	MoCa_Obj_18_A	0x4FF34EF		16	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_18_ay	relative acceleration of object, y direction
Obj_18_ep	MoCa_Obj_18_A	0x4FF34EF		21	3	Unsigned	1	0	0	6	enum	VtSig_Obj_18_ep	existence probability, provided as an enum ...
Obj_18_ax	MoCa_Obj_18_A	0x4FF34EF		24	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_18_ax	relative acceleration of object, x direction
Obj_18_qvx	MoCa_Obj_18_A	0x4FF34EF		29	3	Unsigned	1	0	0	6	enum	VtSig_Obj_18_qvx	quality of vx signal provided as an enum ...
Obj_18_az	MoCa_Obj_18_A	0x4FF34EF		32	4	Unsigned	1	-5	-5	5	m/s^2	VtSig_Obj_18_az	relative acceleration of object, z direction
Obj_18_TrackAge	MoCa_Obj_18_A	0x4FF34EF		36	2	Unsigned	1	0	0	3	enum	VtSig_Obj_18_TrackAge	Age of track, provided as an enum...
Obj_18_Id	MoCa_Obj_18_A	0x4FF34EF		38	8	Unsigned	1	0	0	255	n/a		id of object
Obj_18_zMin	MoCa_Obj_18_A	0x4FF34EF		46	11	Unsigned	0.02	-10	-10	30	m	VtSig_Obj_18_zMin	minimum z coordinate of object
Obj_18_vz	MoCa_Obj_18_A	0x4FF34EF		57	5	Unsigned	0.5	-6	-6	6	m/s	VtSig_Obj_18_vz	relative velocity of object, z direction

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Obj_18_A_cnt	MoCa_Obj_18_A	0x4FF34EF		62	2	Unsigned	1	0	0	3			Obj 18 part A message counter
Obj_18_dz	MoCa_Obj_18_B	0x4FF35EF		0	8	Unsigned	0.02	0	0	5	m	VtSig_Obj_18_dz	maximum z coordinate of object (zMax = zMin + dz, dz = zMax - zMin)
Obj_18_dy	MoCa_Obj_18_B	0x4FF35EF		8	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_18_dy	delta value of y coordinate of object's second point (y2 = y1 + dy, dy = y2 - y1)
Obj_18_dx	MoCa_Obj_18_B	0x4FF35EF		20	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_18_dx	delta value of x coordinate of object's second point (x2 = x1 + dx, dx = x2 - x1)
Obj_18_x1	MoCa_Obj_18_B	0x4FF35EF		32	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_18_x1	x coordinate of object's first point
Obj_18_y1	MoCa_Obj_18_B	0x4FF35EF		45	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_18_y1	y coordinate of object's first point
Obj_18_qvy	MoCa_Obj_18_B	0x4FF35EF		58	3	Unsigned	1	0	0	6	enum	VtSig_Obj_18_qvy	quality of vy signal, provided as an enum ...
Obj_18_History	MoCa_Obj_18_B	0x4FF35EF		61	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_18_History	Flag indicating that this object has been seen on bus
Obj_18_B_cnt	MoCa_Obj_18_B	0x4FF35EF		62	2	Unsigned	1	0	0	3			Obj 18 part B message counter
Obj_19_vx	MoCa_Obj_19_A	0x4FF36EF		0	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_19_vx	relative velocity of object, x direction
Obj_19_Type	MoCa_Obj_19_A	0x4FF36EF		7	1	Unsigned	1	0	0	1	n/a		Type identifier of the object...
Obj_19_vy	MoCa_Obj_19_A	0x4FF36EF		8	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_19_vy	relative velocity of object, y direction
Obj_19_Measured	MoCa_Obj_19_A	0x4FF36EF		15	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_19_Measured	Flag indicating that this object has been measured in actual frame
Obj_19_ay	MoCa_Obj_19_A	0x4FF36EF		16	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_19_ay	relative acceleration of object, y direction
Obj_19_ep	MoCa_Obj_19_A	0x4FF36EF		21	3	Unsigned	1	0	0	6	enum	VtSig_Obj_19_ep	existence probability, provided as an enum ...
Obj_19_ax	MoCa_Obj_19_A	0x4FF36EF		24	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_19_ax	relative acceleration of object, x direction
Obj_19_qvx	MoCa_Obj_19_A	0x4FF36EF		29	3	Unsigned	1	0	0	6	enum	VtSig_Obj_19_qvx	quality of vx signal provided as an enum ...
Obj_19_az	MoCa_Obj_19_A	0x4FF36EF		32	4	Unsigned	1	-5	-5	5	m/s^2	VtSig_Obj_19_az	relative acceleration of object, z direction
Obj_19_TrackAge	MoCa_Obj_19_A	0x4FF36EF		36	2	Unsigned	1	0	0	3	enum	VtSig_Obj_19_TrackAge	Age of track, provided as an enum...
Obj_19_Id	MoCa_Obj_19_A	0x4FF36EF		38	8	Unsigned	1	0	0	255	n/a		id of object
Obj_19_zMin	MoCa_Obj_19_A	0x4FF36EF		46	11	Unsigned	0.02	-10	-10	30	m	VtSig_Obj_19_zMin	minimum z coordinate of object

UK

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Obj_19_vz	MoCa_Obj_19_A	0x4FF36EF		57	5	Unsigned	0.5	-6	-6	6	m/s	VtSig_Obj_19_vz	relative velocity of object, z direction
Obj_19_A_cnt	MoCa_Obj_19_A	0x4FF36EF		62	2	Unsigned	1	0	0	3			Obj 19 part A message counter
Obj_19_dz	MoCa_Obj_19_B	0x4FF37EF		0	8	Unsigned	0.02	0	0	5	m	VtSig_Obj_19_dz	maximum z coordinate of object (zMax = zMin + dz, dz = zMax - zMin)
Obj_19_dy	MoCa_Obj_19_B	0x4FF37EF		8	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_19_dy	delta value of y coordinate of object's second point (y2 = y1 + dy, dy = y2 - y1)
Obj_19_dx	MoCa_Obj_19_B	0x4FF37EF		20	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_19_dx	delta value of x coordinate of object's second point (x2 = x1 + dx, dx = x2 - x1)
Obj_19_x1	MoCa_Obj_19_B	0x4FF37EF		32	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_19_x1	x coordinate of object's first point
Obj_19_y1	MoCa_Obj_19_B	0x4FF37EF		45	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_19_y1	y coordinate of object's first point
Obj_19_qvy	MoCa_Obj_19_B	0x4FF37EF		58	3	Unsigned	1	0	0	6	enum	VtSig_Obj_19_qvy	quality of vy signal, provided as an enum ...
Obj_19_History	MoCa_Obj_19_B	0x4FF37EF		61	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_19_History	Flag indicating that this object has been seen on bus
Obj_19_B_cnt	MoCa_Obj_19_B	0x4FF37EF		62	2	Unsigned	1	0	0	3			Obj 19 part B message counter
Obj_2_vx	MoCa_Obj_2_A	0x4FF14EF		0	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_2_vx	relative velocity of object, x direction
Obj_2_Type	MoCa_Obj_2_A	0x4FF14EF		7	1	Unsigned	1	0	0	1	n/a		Type identifier of the object...
Obj_2_vy	MoCa_Obj_2_A	0x4FF14EF		8	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_2_vy	relative velocity of object, y direction
Obj_2_ Measured	MoCa_Obj_2_A	0x4FF14EF		15	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_2_ Measured	Flag indicating that this object has been measured in actual frame
Obj_2_ay	MoCa_Obj_2_A	0x4FF14EF		16	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_2_ay	relative acceleration of object, y direction
Obj_2_ep	MoCa_Obj_2_A	0x4FF14EF		21	3	Unsigned	1	0	0	6	enum	VtSig_Obj_2_ep	existence probability, provided as an enum ...
Obj_2_ax	MoCa_Obj_2_A	0x4FF14EF		24	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_2_ax	relative acceleration of object, x direction
Obj_2_qvx	MoCa_Obj_2_A	0x4FF14EF		29	3	Unsigned	1	0	0	6	enum	VtSig_Obj_2_ qvx	quality of vx signal provided as an enum ...
Obj_2_az	MoCa_Obj_2_A	0x4FF14EF		32	4	Unsigned	1	-5	-5	5	m/s^2	VtSig_Obj_2_az	relative acceleration of object, z direction
Obj_2_TrackAge	MoCa_Obj_2_A	0x4FF14EF		36	2	Unsigned	1	0	0	3	enum	VtSig_Obj_2_ TrackAge	Age of track, provided as an enum...
Obj_2_Id	MoCa_Obj_2_A	0x4FF14EF		38	8	Unsigned	1	0	0	255	n/a		id of object

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Obj_2_zMin	MoCa_Obj_2_A	0x4FF14EF		46	11	Unsigned	0.02	-10	-10	30	m	VtSig_Obj_2_ zMin	minimum z coor-dinate of object
Obj_2_vz	MoCa_Obj_2_A	0x4FF14EF		57	5	Unsigned	0.5	-6	-6	6	m/s	VtSig_Obj_2_vz	relative velocity of object, z direction
Obj_2_A_cnt	MoCa_Obj_2_A	0x4FF14EF		62	2	Unsigned	1	0	0	3			Obj 2 part A message counter
Obj_2_dz	MoCa_Obj_2_B	0x4FF15EF		0	8	Unsigned	0.02	0	0	5	m	VtSig_Obj_2_dz	maximum z coordinate of object (zMax = zMin + dz, dz = zMax - zMin)
Obj_2_dy	MoCa_Obj_2_B	0x4FF15EF		8	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_2_dy	delta value of y coordinate of object's second point (y2 = y1 + dy, dy = y2 - y1)
Obj_2_dx	MoCa_Obj_2_B	0x4FF15EF		20	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_2_dx	delta value of x coordinate of object's second point (x2 = x1 + dx, dx = x2 - x1)
Obj_2_x1	MoCa_Obj_2_B	0x4FF15EF		32	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_2_x1	x coordinate of object's first point
Obj_2_y1	MoCa_Obj_2_B	0x4FF15EF		45	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_2_y1	y coordinate of object's first point
Obj_2_qvy	MoCa_Obj_2_B	0x4FF15EF		58	3	Unsigned	1	0	0	6	enum	VtSig_Obj_2_ qvy	quality of vy signal, provided as an enum ...
Obj_2_History	MoCa_Obj_2_B	0x4FF15EF		61	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_2_ History	Flag indicating that this object has been seen on bus
Obj_2_B_cnt	MoCa_Obj_2_B	0x4FF15EF		62	2	Unsigned	1	0	0	3			Obj 2 part B message counter
Obj_3_vx	MoCa_Obj_3_A	0x4FF16EF		0	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_3_vx	relative velocity of object, x direction
Obj_3_Type	MoCa_Obj_3_A	0x4FF16EF		7	1	Unsigned	1	0	0	1	n/a		Type identifier of the object...
Obj_3_vy	MoCa_Obj_3_A	0x4FF16EF		8	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_3_vy	relative velocity of object, y direction
Obj_3_ Measured	MoCa_Obj_3_A	0x4FF16EF		15	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_3_ Measured	Flag indica-ting that this object has been measured in actual frame
Obj_3_ay	MoCa_Obj_3_A	0x4FF16EF		16	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_3_ay	relative accele-ration of object, y direction
Obj_3_ep	MoCa_Obj_3_A	0x4FF16EF		21	3	Unsigned	1	0	0	6	enum	VtSig_Obj_3_ep	existence proba-bility, provided as an enum ...
Obj_3_ax	MoCa_Obj_3_A	0x4FF16EF		24	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_3_ax	relative accele-ration of object, x direction
Obj_3_qvx	MoCa_Obj_3_A	0x4FF16EF		29	3	Unsigned	1	0	0	6	enum	VtSig_Obj_3_ qvx	quality of vx signal provided as an enum ...
Obj_3_az	MoCa_Obj_3_A	0x4FF16EF		32	4	Unsigned	1	-5	-5	5	m/s^2	VtSig_Obj_3_az	relative accele-ration of object, z direction
Obj_3_Tra-ckAge	MoCa_Obj_3_A	0x4FF16EF		36	2	Unsigned	1	0	0	3	enum	VtSig_Obj_3_ TrackAge	Age of track, provided as an enum...

UK

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Obj_3_Id	MoCa_Obj_3_A	0x4FF16EF		38	8	Unsigned	1	0	0	255	n/a		id of object
Obj_3_zMin	MoCa_Obj_3_A	0x4FF16EF		46	11	Unsigned	0.02	-10	-10	30	m	VtSig_Obj_3_ zMin	minimum z coordinate of object
Obj_3_vz	MoCa_Obj_3_A	0x4FF16EF		57	5	Unsigned	0.5	-6	-6	6	m/s	VtSig_Obj_3_vz	relative velocity of object, z direction
Obj_3_A_cnt	MoCa_Obj_3_A	0x4FF16EF		62	2	Unsigned	1	0	0	3			Obj 3 part A message counter
Obj_3_dz	MoCa_Obj_3_B	0x4FF17EF		0	8	Unsigned	0.02	0	0	5	m	VtSig_Obj_3_dz	maximum z coordinate of object (zMax = zMin + dz, dz = zMax - zMin)
Obj_3_dy	MoCa_Obj_3_B	0x4FF17EF		8	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_3_dy	delta value of y coordinate of object's second point (y2 = y1 + dy, dy = y2 - y1)
Obj_3_dx	MoCa_Obj_3_B	0x4FF17EF		20	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_3_dx	delta value of x coordinate of object's second point (x2 = x1 + dx, dx = x2 - x1)
Obj_3_x1	MoCa_Obj_3_B	0x4FF17EF		32	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_3_x1	x coordinate of object's first point
Obj_3_y1	MoCa_Obj_3_B	0x4FF17EF		45	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_3_y1	y coordinate of object's first point
Obj_3_qvy	MoCa_Obj_3_B	0x4FF17EF		58	3	Unsigned	1	0	0	6	enum	VtSig_Obj_3_ qvy	quality of vy signal, provided as an enum ...
Obj_3_History	MoCa_Obj_3_B	0x4FF17EF		61	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_3_ History	Flag indicating that this object has been seen on bus
Obj_3_B_cnt	MoCa_Obj_3_B	0x4FF17EF		62	2	Unsigned	1	0	0	3			Obj 3 part B message counter
Obj_4_vx	MoCa_Obj_4_A	0x4FF18EF		0	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_4_vx	relative velocity of object, x direction
Obj_4_Type	MoCa_Obj_4_A	0x4FF18EF		7	1	Unsigned	1	0	0	1	n/a		Type identifier of the object...
Obj_4_vy	MoCa_Obj_4_A	0x4FF18EF		8	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_4_vy	relative velocity of object, y direction
Obj_4_ Measured	MoCa_Obj_4_A	0x4FF18EF		15	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_4_ Measured	Flag indicating that this object has been measured in actual frame
Obj_4_ay	MoCa_Obj_4_A	0x4FF18EF		16	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_4_ay	relative acceleration of object, y direction
Obj_4_ep	MoCa_Obj_4_A	0x4FF18EF		21	3	Unsigned	1	0	0	6	enum	VtSig_Obj_4_ep	existence probability, provided as an enum ...
Obj_4_ax	MoCa_Obj_4_A	0x4FF18EF		24	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_4_ax	relative acceleration of object, x direction
Obj_4_qvx	MoCa_Obj_4_A	0x4FF18EF		29	3	Unsigned	1	0	0	6	enum	VtSig_Obj_4_ qvx	quality of vx signal provided as an enum ...

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Obj_4_az	MoCa_Obj_4_A	0x4FF18EF		32	4	Unsigned	1	-5	-5	5	m/s^2	VtSig_Obj_4_az	relative accelerration of object, z direction
Obj_4_TrackAge	MoCa_Obj_4_A	0x4FF18EF		36	2	Unsigned	1	0	0	3	enum	VtSig_Obj_4_TrackAge	Age of track, provided as an enum...
Obj_4_Id	MoCa_Obj_4_A	0x4FF18EF		38	8	Unsigned	1	0	0	255	n/a		id of object
Obj_4_zMin	MoCa_Obj_4_A	0x4FF18EF		46	11	Unsigned	0.02	-10	-10	30	m	VtSig_Obj_4_zMin	minimum z coordinate of object
Obj_4_vz	MoCa_Obj_4_A	0x4FF18EF		57	5	Unsigned	0.5	-6	-6	6	m/s	VtSig_Obj_4_vz	relative velocity of object, z direction
Obj_4_A_cnt	MoCa_Obj_4_A	0x4FF18EF		62	2	Unsigned	1	0	0	3			Obj 4 part A message counter
Obj_4_dz	MoCa_Obj_4_B	0x4FF19EF		0	8	Unsigned	0.02	0	0	5	m	VtSig_Obj_4_dz	maximum z coordinate of object (zMax = zMin + dz, dz = zMax - zMin)
Obj_4_dy	MoCa_Obj_4_B	0x4FF19EF		8	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_4_dy	delta value of y coordinate of object's second point (y2 = y1 + dy, dy = y2 - y1)
Obj_4_dx	MoCa_Obj_4_B	0x4FF19EF		20	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_4_dx	delta value of x coordinate of object's second point (x2 = x1 + dx, dx = x2 - x1)
Obj_4_x1	MoCa_Obj_4_B	0x4FF19EF		32	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_4_x1	x coordinate of object's first point
Obj_4_y1	MoCa_Obj_4_B	0x4FF19EF		45	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_4_y1	y coordinate of object's first point
Obj_4_qvy	MoCa_Obj_4_B	0x4FF19EF		58	3	Unsigned	1	0	0	6	enum	VtSig_Obj_4_qvy	quality of vy signal, provided as an enum ...
Obj_4_History	MoCa_Obj_4_B	0x4FF19EF		61	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_4_History	Flag indicating that this object has been seen on bus
Obj_4_B_cnt	MoCa_Obj_4_B	0x4FF19EF		62	2	Unsigned	1	0	0	3			Obj 4 part B message counter
Obj_5_vx	MoCa_Obj_5_A	0x4FF1AEF		0	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_5_vx	relative velocity of object, x direction
Obj_5_Type	MoCa_Obj_5_A	0x4FF1AEF		7	1	Unsigned	1	0	0	1	n/a		Type identifier of the object...
Obj_5_vy	MoCa_Obj_5_A	0x4FF1AEF		8	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_5_vy	relative velocity of object, y direction
Obj_5_Measured	MoCa_Obj_5_A	0x4FF1AEF		15	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_5_Measured	Flag indicating that this object has been measured in actual frame
Obj_5_ay	MoCa_Obj_5_A	0x4FF1AEF		16	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_5_ay	relative accelerration of object, y direction
Obj_5_ep	MoCa_Obj_5_A	0x4FF1AEF		21	3	Unsigned	1	0	0	6	enum	VtSig_Obj_5_ep	existence probability, provided as an enum ...
Obj_5_ax	MoCa_Obj_5_A	0x4FF1AEF		24	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_5_ax	relative accelerration of object, x direction

UK

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Obj_5_qvx	MoCa_Obj_5_A	0x4FF1AEF		29	3	Unsigned	1	0	0	6	enum	VtSig_Obj_5_ qvx	quality of vx signal provided as an enum ...
Obj_5_az	MoCa_Obj_5_A	0x4FF1AEF		32	4	Unsigned	1	-5	-5	5	m/s^2	VtSig_Obj_5_az	relative accele-ration of object, z direction
Obj_5_Tra-ckAge	MoCa_Obj_5_A	0x4FF1AEF		36	2	Unsigned	1	0	0	3	enum	VtSig_Obj_5_ TrackAge	Age of track, provided as an enum...
Obj_5_Id	MoCa_Obj_5_A	0x4FF1AEF		38	8	Unsigned	1	0	0	255	n/a		id of object
Obj_5_zMin	MoCa_Obj_5_A	0x4FF1AEF		46	11	Unsigned	0.02	-10	-10	30	m	VtSig_Obj_5_ zMin	minimum z coor-dinate of object
Obj_5_vz	MoCa_Obj_5_A	0x4FF1AEF		57	5	Unsigned	0.5	-6	-6	6	m/s	VtSig_Obj_5_vz	relative velocity of object, z direction
Obj_5_A_cnt	MoCa_Obj_5_A	0x4FF1AEF		62	2	Unsigned	1	0	0	3			Obj 5 part A message counter
Obj_5_dz	MoCa_Obj_5_B	0x4FF1BEF		0	8	Unsigned	0.02	0	0	5	m	VtSig_Obj_5_dz	maximum z coordinate of object (zMax = zMin + dz, dz = zMax - zMin)
Obj_5_dy	MoCa_Obj_5_B	0x4FF1BEF		8	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_5_dy	delta value of y coordinate of object's second point (y2 = y1 + dy, dy = y2 - y1)
Obj_5_dx	MoCa_Obj_5_B	0x4FF1BEF		20	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_5_dx	delta value of x coordinate of object's second point (x2 = x1 + dx, dx = x2 - x1)
Obj_5_x1	MoCa_Obj_5_B	0x4FF1BEF		32	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_5_x1	x coordinate of object's first point
Obj_5_y1	MoCa_Obj_5_B	0x4FF1BEF		45	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_5_y1	y coordinate of object's first point
Obj_5_qvy	MoCa_Obj_5_B	0x4FF1BEF		58	3	Unsigned	1	0	0	6	enum	VtSig_Obj_5_ qvy	quality of vy signal, provided as an enum ...
Obj_5_History	MoCa_Obj_5_B	0x4FF1BEF		61	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_5_ History	Flag indicating that this object has been seen on bus
Obj_5_B_cnt	MoCa_Obj_5_B	0x4FF1BEF		62	2	Unsigned	1	0	0	3			Obj 5 part B message counter
Obj_6_vx	MoCa_Obj_6_A	0x4FF1CEF		0	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_6_vx	relative velocity of object, x direction
Obj_6_Type	MoCa_Obj_6_A	0x4FF1CEF		7	1	Unsigned	1	0	0	1	n/a		Type identifier of the object...
Obj_6_vy	MoCa_Obj_6_A	0x4FF1CEF		8	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_6_vy	relative velocity of object, y direction
Obj_6_ Measured	MoCa_Obj_6_A	0x4FF1CEF		15	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_6_ Measured	Flag indica-ting that this object has been measured in actual frame
Obj_6_ay	MoCa_Obj_6_A	0x4FF1CEF		16	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_6_ay	relative accele-ration of object, y direction
Obj_6_ep	MoCa_Obj_6_A	0x4FF1CEF		21	3	Unsigned	1	0	0	6	enum	VtSig_Obj_6_ep	existence proba-bility, provided as an enum ...

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Obj_6_ax	MoCa_Obj_6_A	0x4FF1CEF		24	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_6_ax	relative accele-ration of object, x direction
Obj_6_qvx	MoCa_Obj_6_A	0x4FF1CEF		29	3	Unsigned	1	0	0	6	enum	VtSig_Obj_6_ qvx	quality of vx signal provided as an enum ...
Obj_6_az	MoCa_Obj_6_A	0x4FF1CEF		32	4	Unsigned	1	-5	-5	5	m/s^2	VtSig_Obj_6_az	relative accele-ration of object, z direction
Obj_6_Tra-ckAge	MoCa_Obj_6_A	0x4FF1CEF		36	2	Unsigned	1	0	0	3	enum	VtSig_Obj_6_ TrackAge	Age of track, provided as an enum...
Obj_6_Id	MoCa_Obj_6_A	0x4FF1CEF		38	8	Unsigned	1	0	0	255	n/a		id of object
Obj_6_zMin	MoCa_Obj_6_A	0x4FF1CEF		46	11	Unsigned	0.02	-10	-10	30	m	VtSig_Obj_6_ zMin	minimum z coor-dinate of object
Obj_6_vz	MoCa_Obj_6_A	0x4FF1CEF		57	5	Unsigned	0.5	-6	-6	6	m/s	VtSig_Obj_6_vz	relative velocity of object, z direction
Obj_6_A_cnt	MoCa_Obj_6_A	0x4FF1CEF		62	2	Unsigned	1	0	0	3			Obj 6 part A message counter
Obj_6_dz	MoCa_Obj_6_B	0x4FF1DEF		0	8	Unsigned	0.02	0	0	5	m	VtSig_Obj_6_dz	maximum z coordinate of object (zMax = zMin + dz, dz = zMax - zMin)
Obj_6_dy	MoCa_Obj_6_B	0x4FF1DEF		8	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_6_dy	delta value of y coordinate of object's second point (y2 = y1 + dy, dy = y2 - y1)
Obj_6_dx	MoCa_Obj_6_B	0x4FF1DEF		20	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_6_dx	delta value of x coordinate of object's second point (x2 = x1 + dx, dx = x2 - x1)
Obj_6_x1	MoCa_Obj_6_B	0x4FF1DEF		32	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_6_x1	x coordinate of object's first point
Obj_6_y1	MoCa_Obj_6_B	0x4FF1DEF		45	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_6_y1	y coordinate of object's first point
Obj_6_qvy	MoCa_Obj_6_B	0x4FF1DEF		58	3	Unsigned	1	0	0	6	enum	VtSig_Obj_6_ qvy	quality of vy signal, provided as an enum ...
Obj_6_History	MoCa_Obj_6_B	0x4FF1DEF		61	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_6_ History	Flag indicating that this object has been seen on bus
Obj_6_B_cnt	MoCa_Obj_6_B	0x4FF1DEF		62	2	Unsigned	1	0	0	3			Obj 6 part B message counter
Obj_7_vx	MoCa_Obj_7_A	0x4FF1EEF		0	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_7_vx	relative velocity of object, x direction
Obj_7_Type	MoCa_Obj_7_A	0x4FF1EEF		7	1	Unsigned	1	0	0	1	n/a		Type identifier of the object...
Obj_7_vy	MoCa_Obj_7_A	0x4FF1EEF		8	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_7_vy	relative velocity of object, y direction
Obj_7_ Measured	MoCa_Obj_7_A	0x4FF1EEF		15	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_7_ Measured	Flag indica-ting that this object has been measured in actual frame
Obj_7_ay	MoCa_Obj_7_A	0x4FF1EEF		16	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_7_ay	relative accele-ration of object, y direction

UK

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Obj_7_ep	MoCa_Obj_7_A	0x4FF1EEF		21	3	Unsigned	1	0	0	6	enum	VtSig_Obj_7_ep	existence probability, provided as an enum ...
Obj_7_ax	MoCa_Obj_7_A	0x4FF1EEF		24	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_7_ax	relative acceleration of object, x direction
Obj_7_qvx	MoCa_Obj_7_A	0x4FF1EEF		29	3	Unsigned	1	0	0	6	enum	VtSig_Obj_7_qvx	quality of vx signal provided as an enum ...
Obj_7_az	MoCa_Obj_7_A	0x4FF1EEF		32	4	Unsigned	1	-5	-5	5	m/s^2	VtSig_Obj_7_az	relative acceleration of object, z direction
Obj_7_TrackAge	MoCa_Obj_7_A	0x4FF1EEF		36	2	Unsigned	1	0	0	3	enum	VtSig_Obj_7_TrackAge	Age of track, provided as an enum...
Obj_7_Id	MoCa_Obj_7_A	0x4FF1EEF		38	8	Unsigned	1	0	0	255	n/a		id of object
Obj_7_zMin	MoCa_Obj_7_A	0x4FF1EEF		46	11	Unsigned	0.02	-10	-10	30	m	VtSig_Obj_7_zMin	minimum z coordinate of object
Obj_7_vz	MoCa_Obj_7_A	0x4FF1EEF		57	5	Unsigned	0.5	-6	-6	6	m/s	VtSig_Obj_7_vz	relative velocity of object, z direction
Obj_7_A_cnt	MoCa_Obj_7_A	0x4FF1EEF		62	2	Unsigned	1	0	0	3			Obj 7 part A message counter
Obj_7_dz	MoCa_Obj_7_B	0x4FF1FEF		0	8	Unsigned	0.02	0	0	5	m	VtSig_Obj_7_dz	maximum z coordinate of object (zMax = zMin + dz, dz = zMax - zMin)
Obj_7_dy	MoCa_Obj_7_B	0x4FF1FEF		8	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_7_dy	delta value of y coordinate of object's second point (y2 = y1 + dy, dy = y2 - y1)
Obj_7_dx	MoCa_Obj_7_B	0x4FF1FEF		20	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_7_dx	delta value of x coordinate of object's second point (x2 = x1 + dx, dx = x2 - x1)
Obj_7_x1	MoCa_Obj_7_B	0x4FF1FEF		32	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_7_x1	x coordinate of object's first point
Obj_7_y1	MoCa_Obj_7_B	0x4FF1FEF		45	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_7_y1	y coordinate of object's first point
Obj_7_qvy	MoCa_Obj_7_B	0x4FF1FEF		58	3	Unsigned	1	0	0	6	enum	VtSig_Obj_7_qvy	quality of vy signal, provided as an enum ...
Obj_7_History	MoCa_Obj_7_B	0x4FF1FEF		61	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_7_History	Flag indicating that this object has been seen on bus
Obj_7_B_cnt	MoCa_Obj_7_B	0x4FF1FEF		62	2	Unsigned	1	0	0	3			Obj 7 part B message counter
Obj_8_vx	MoCa_Obj_8_A	0x4FF20EF		0	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_8_vx	relative velocity of object, x direction
Obj_8_Type	MoCa_Obj_8_A	0x4FF20EF		7	1	Unsigned	1	0	0	1	n/a		Type identifier of the object...
Obj_8_vy	MoCa_Obj_8_A	0x4FF20EF		8	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_8_vy	relative velocity of object, y direction
Obj_8_Measured	MoCa_Obj_8_A	0x4FF20EF		15	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_8_Measured	Flag indicating that this object has been measured in actual frame

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Obj_8_ay	MoCa_Obj_8_A	0x4FF20EF		16	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_8_ay	relative accele-ration of object, y direction
Obj_8_ep	MoCa_Obj_8_A	0x4FF20EF		21	3	Unsigned	1	0	0	6	enum	VtSig_Obj_8_ep	existence proba-bility, provided as an enum ...
Obj_8_ax	MoCa_Obj_8_A	0x4FF20EF		24	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_8_ax	relative accele-ration of object, x direction
Obj_8_qvx	MoCa_Obj_8_A	0x4FF20EF		29	3	Unsigned	1	0	0	6	enum	VtSig_Obj_8_ qvx	quality of vx signal provided as an enum ...
Obj_8_az	MoCa_Obj_8_A	0x4FF20EF		32	4	Unsigned	1	-5	-5	5	m/s^2	VtSig_Obj_8_az	relative accele-ration of object, z direction
Obj_8_Tra-ckAge	MoCa_Obj_8_A	0x4FF20EF		36	2	Unsigned	1	0	0	3	enum	VtSig_Obj_8_ TrackAge	Age of track, provided as an enum...
Obj_8_Id	MoCa_Obj_8_A	0x4FF20EF		38	8	Unsigned	1	0	0	255	n/a		id of object
Obj_8_zMin	MoCa_Obj_8_A	0x4FF20EF		46	11	Unsigned	0.02	-10	-10	30	m	VtSig_Obj_8_ zMin	minimum z coor-dinate of object
Obj_8_vz	MoCa_Obj_8_A	0x4FF20EF		57	5	Unsigned	0.5	-6	-6	6	m/s	VtSig_Obj_8_vz	relative velocity of object, z direction
Obj_8_A_cnt	MoCa_Obj_8_A	0x4FF20EF		62	2	Unsigned	1	0	0	3			Obj 8 part A message counter
Obj_8_dz	MoCa_Obj_8_B	0x4FF21EF		0	8	Unsigned	0.02	0	0	5	m	VtSig_Obj_8_dz	maximum z coordinate of object (zMax = zMin + dz, dz = zMax - zMin)
Obj_8_dy	MoCa_Obj_8_B	0x4FF21EF		8	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_8_dy	delta value of y coordinate of object's second point (y2 = y1 + dy, dy = y2 - y1)
Obj_8_dx	MoCa_Obj_8_B	0x4FF21EF		20	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_8_dx	delta value of x coordinate of object's second point (x2 = x1 + dx, dx = x2 - x1)
Obj_8_x1	MoCa_Obj_8_B	0x4FF21EF		32	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_8_x1	x coordinate of object's first point
Obj_8_y1	MoCa_Obj_8_B	0x4FF21EF		45	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_8_y1	y coordinate of object's first point
Obj_8_qvy	MoCa_Obj_8_B	0x4FF21EF		58	3	Unsigned	1	0	0	6	enum	VtSig_Obj_8_ qvy	quality of vy signal, provided as an enum ...
Obj_8_History	MoCa_Obj_8_B	0x4FF21EF		61	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_8_ History	Flag indicating that this object has been seen on bus
Obj_8_B_cnt	MoCa_Obj_8_B	0x4FF21EF		62	2	Unsigned	1	0	0	3			Obj 8 part B message counter
Obj_9_vx	MoCa_Obj_9_A	0x4FF22EF		0	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_9_vx	relative velocity of object, x direction
Obj_9_Type	MoCa_Obj_9_A	0x4FF22EF		7	1	Unsigned	1	0	0	1	n/a		Type identifier of the object...
Obj_9_vy	MoCa_Obj_9_A	0x4FF22EF		8	7	Unsigned	0.5	-30	-30	30	m/s	VtSig_Obj_9_vy	relative velocity of object, y direction

UK

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Obj_9_ Measured	MoCa_Obj_9_A	0x4FF22EF		15	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_9_ Measured	Flag indicating that this object has been measured in actual frame
Obj_9_ay	MoCa_Obj_9_A	0x4FF22EF		16	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_9_ay	relative acceleration of object, y direction
Obj_9_ep	MoCa_Obj_9_A	0x4FF22EF		21	3	Unsigned	1	0	0	6	enum	VtSig_Obj_9_ep	existence probability, provided as an enum ...
Obj_9_ax	MoCa_Obj_9_A	0x4FF22EF		24	5	Unsigned	1	-10	-10	10	m/s^2	VtSig_Obj_9_ax	relative acceleration of object, x direction
Obj_9_qvx	MoCa_Obj_9_A	0x4FF22EF		29	3	Unsigned	1	0	0	6	enum	VtSig_Obj_9_ qvx	quality of vx signal provided as an enum ...
Obj_9_az	MoCa_Obj_9_A	0x4FF22EF		32	4	Unsigned	1	-5	-5	5	m/s^2	VtSig_Obj_9_az	relative acceleration of object, z direction
Obj_9_TrackAge	MoCa_Obj_9_A	0x4FF22EF		36	2	Unsigned	1	0	0	3	enum	VtSig_Obj_9_ TrackAge	Age of track, provided as an enum...
Obj_9_Id	MoCa_Obj_9_A	0x4FF22EF		38	8	Unsigned	1	0	0	255	n/a		id of object
Obj_9_zMin	MoCa_Obj_9_A	0x4FF22EF		46	11	Unsigned	0.02	-10	-10	30	m	VtSig_Obj_9_ zMin	minimum z coordinate of object
Obj_9_vz	MoCa_Obj_9_A	0x4FF22EF		57	5	Unsigned	0.5	-6	-6	6	m/s	VtSig_Obj_9_vz	relative velocity of object, z direction
Obj_9_A_cnt	MoCa_Obj_9_A	0x4FF22EF		62	2	Unsigned	1	0	0	3			Obj 9 part A message counter
Obj_9_dz	MoCa_Obj_9_B	0x4FF23EF		0	8	Unsigned	0.02	0	0	5	m	VtSig_Obj_9_dz	maximum z coordinate of object (zMax = zMin + dz, dz = zMax - zMin)
Obj_9_dy	MoCa_Obj_9_B	0x4FF23EF		8	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_9_dy	delta value of y coordinate of object's second point (y2 = y1 + dy, dy = y2 - y1)
Obj_9_dx	MoCa_Obj_9_B	0x4FF23EF		20	12	Unsigned	0.02	-40	-40	40	m	VtSig_Obj_9_dx	delta value of x coordinate of object's second point (x2 = x1 + dx, dx = x2 - x1)
Obj_9_x1	MoCa_Obj_9_B	0x4FF23EF		32	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_9_x1	x coordinate of object's first point
Obj_9_y1	MoCa_Obj_9_B	0x4FF23EF		45	13	Unsigned	0.02	-80	-80	80	m	VtSig_Obj_9_y1	y coordinate of object's first point
Obj_9_qvy	MoCa_Obj_9_B	0x4FF23EF		58	3	Unsigned	1	0	0	6	enum	VtSig_Obj_9_ qvy	quality of vy signal, provided as an enum ...
Obj_9_History	MoCa_Obj_9_B	0x4FF23EF		61	1	Unsigned	1	0	0	1	n/a	VtSig_Obj_9_ History	Flag indicating that this object has been seen on bus
Obj_9_B_cnt	MoCa_Obj_9_B	0x4FF23EF		62	2	Unsigned	1	0	0	3			Obj 9 part B message counter
Parameter-GroupNumber	RQST	0x18EAFEFE		0	24	Unsigned	1	0	0	1,68E+12			PGN which is requested by Request2 message

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
Parameter-GroupNumber	RQST2	0x18C9FEFE		0	24	Unsigned	1	0	0	1,68E+12			PGN which is requested by Request2 message
UseTransfer-Mode	RQST2	0x18C9FEFE		24	2	Unsigned	1	0	0	3			Requester is to respond via the Transfer PGN
Standby_Con-trol	Standby_Control	0x4FF0FFE		0	1	Unsigned	1	0	0	1		VtSig_Stand-by_Control	
Mastertime_ LastTxTime-Stamp	SyncMsg	0x4FF00EF		0	32	Unsigned	1	0	0	4,29E+14	us		
Driver1Working-State	TCO1	0xCFE6CFE		0	3	Unsigned	1	0	0	7			State of work of the driver.
Driver2Working-State	TCO1	0xCFE6CFE		3	3	Unsigned	1	0	0	7			State of work of the driver.
DriveRecognize	TCO1	0xCFE6CFE		6	2	Unsigned	1	0	0	3			Indicates whether motion of the vehicle is detected or not.
Driver1TimeRe-latedStates	TCO1	0xCFE6CFE		8	4	Unsigned	1	0	0	15			Indicates if the driver approaches or exceeds working time limits (or other limits).
DriverCardDri-ver1	TCO1	0xCFE6CFE		12	2	Unsigned	1	0	0	3			
Overspeed	TCO1	0xCFE6CFE		14	2	Unsigned	1	0	0	3			Indicates whether the vehicle is exceeding the legal speed limit set in the tachograph.
Driver2TimeRe-latedStates	TCO1	0xCFE6CFE		16	4	Unsigned	1	0	0	15			Indicates if the driver approaches or exceeds working time limits (or other limits).
DriverCardDri-ver2	TCO1	0xCFE6CFE		20	2	Unsigned	1	0	0	3			
SystemEvent	TCO1	0xCFE6CFE		24	2	Unsigned	1	0	0	3			Indicates that a tachograph event has occurred.
HandlingInfor-mation	TCO1	0xCFE6CFE		26	2	Unsigned	1	0	0	3			Indicates that handling information is present.
TachographPer-formance	TCO1	0xCFE6CFE		28	2	Unsigned	1	0	0	3			
DirectionIndi-cator	TCO1	0xCFE6CFE		30	2	Unsigned	1	0	0	3			Indicates the direction of the vehicle.
TachographOut-putShaftSpeed	TCO1	0xCFE6CFE		32	16	Unsigned	0.125	0	0	8031.88	rpm		Calculated speed of the transmission output shaft.
TachographVe-hicleSpeed	TCO1	0xCFE6CFE		48	16	Unsigned	0.00390625	0	0	250.996	km/h		Speed of the vehicle registered by the tachograph.
ControlByte	TPCM	0x18ECFEFE	Multiplexor	0	8	Unsigned	1	0	0	255		VtSig_Control-Byte	

UK

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
TotalMessage-Size	TPCM	0x18ECFEFE	ControlByte = 0x10 (RTS)	8	16	Unsigned	1	0	0	64255	counts		
NumberOfPa-cketsThatCan-BeSent	TPCM	0x18ECFEFE	ControlByte = 0x11 (CTS)	8	8	Unsigned	1	0	0	255			
TotalMessage-SizeEoMA	TPCM	0x18ECFEFE	ControlByte = 0x13 (EoMA)	8	16	Unsigned	1	0	0	64255	counts		
TotalMessage-SizeBAM	TPCM	0x18ECFEFE	ControlByte = 0x20 (BAM)	8	16	Unsigned	1	0	0	64255	counts		
ConnectionAb-ortReason	TPCM	0x18ECFEFE	ControlByte = 0xFF (Abort)	8	8	Unsigned	1	0	0	255			
NextPa-cketNumberTo-BeSent	TPCM	0x18ECFEFE	ControlByte = 0x11 (CTS)	16	8	Unsigned	1	0	0	255			
TotalNumberOf-Packets	TPCM	0x18ECFEFE	ControlByte = 0x10 (RTS)	24	8	Unsigned	1	0	0	255			
TotalNumberOf-PacketsEoMA	TPCM	0x18ECFEFE	ControlByte = 0x13 (EoMA)	24	8	Unsigned	1	0	0	255			
TotalNumberOf-PacketsBAM	TPCM	0x18ECFEFE	ControlByte = 0x20 (BAM)	24	8	Unsigned	1	0	0	255			
Maxi-mumNumberOf-Packets	TPCM	0x18ECFEFE	ControlByte = 0x10 (RTS)	32	8	Unsigned	1	0	0	255			
PGNumber	TPCM	0x18ECFEFE		40	24	Unsigned	1	0	0	1,68E+12		VtSig_ PGNumber	
Sequen-ceNumber	TPDT	0x18EBFEFE		0	8	Unsigned	1	0	0	252			
SteerWhee-lAngle	VDC2	0x18F009FE		0	16	Unsigned	0.000976563	-31.374	-31.374	31.374	rad		The main operator`s stee-ring wheel angle (on the steering column, not the actual wheel angle).
SteerWheel-TurnCounter	VDC2	0x18F009FE		16	6	Unsigned	1	-32	-32	29	turns		Indicates number of steering wheel turns, absolute position or relative position at ignition on.
SteerWheelAn-gleSensorType	VDC2	0x18F009FE		22	2	Unsigned	1	0	0	3			
YawRate	VDC2	0x18F009FE		24	16	Unsigned	0.00012207	-3.92	-3.92	3,92	rad/s		Indicates the ro-tation about the vertical axis.
LateralAccele-ration	VDC2	0x18F009FE		40	16	Unsigned	0.000488281	-15.687	-15.687	15.687	m/s²		Indicates a late-ral acceleration of the vehicle.
LongitudinalAc-celeration	VDC2	0x18F009FE		56	8	Unsigned	0.1	-12.5	-12.5	12.5	m/s²		Indicates the longitudinal acceleration of the vehicle.
XCP_CRO	XCP_CRO	0x7FE		0	64	Unsigned	1	0	0	0			
XCP_DTO	XCP_DTO	0x7FF		0	64	Unsigned	1	0	0	0	bool		

Name	Message	Message ID	Multiplexing/ Group	Start bit	Length [bit]	Value type	Factor	Offset	Minimum	Maximum	Unit	Value table	Comment
PGNofRequ-stedInformation	XFER	0x18CAFEFE		0	24	Unsigned	1	0	0	1,68E+12			PGN associated with this transfer message
LengthOfDa-taForTheRe-portedPGN	XFER	0x18CAFEFE		24	8	Unsigned	1	0	0	255			Length of data reported with the associated PGN via the Transfer PGN.
ShrtNameOfAc-tualReporting-Device	XFER	0x18CAFEFE		32	32	Unsigned	1	0	0	0	(2^32 - 1)		Short name of reporting device of the requested PGN via the Transfer PGN.

7.2.1 Values of the column "Value table"

Value table	Value	Meaning
VtSig_SwCtrl_OpMode	0x11	INIT
	0x12	STARTUP
	0x13	DSP_BOOT
	0x14	SELFTEST
	0x15	WAIT_DSP_BOOTED
	0x17	PARAMETRIZING
	0x20	RUN_SUPER_STATE
	0x21	LIMITED_RUN
	0x22	RUN
	0x23	STANDBY
	0x31	EMERGENCY
VtSig_Global_sensor_available	1u	BIT_INTERFERENCE_DETECTED
	2u	BIT_SPRAY_DETECTION
	4u	BIT_TRACKING_ERROR
	8u	BIT_INVALID_CAM_ORIENTATION
	16u	BIT_SIGNAL_PATH_MONITORING
	32u	BIT_INTERNAL_ERROR
	64u	BIT_BLOCKAGE_DETECTED
	128u	BIT_FORCE_CALIBRATION_RESET
	(bitwise "OR" possible)	
Values for SubObject DirectionIndicator	0x0	Forward
	0x1	Reverse
	0x2	Error
	0x3	NotAvailable
VtSig_CP_ttc	-1	Down time after predicted crash
	0	No crash predicted
	1	Crash predicted
VtSig_CP_impact_velocity	511u	Error
	510u	Out of upper bound
	509u	Out of lower bound
VtSig_CP_crash_predicted	3	Error
	2	Crash predicted
	1	No crash predicted
	0	Down time after predicted crash
VtSig_Obj_0_qvx	6	[0.95..1.0]
	5	[0.90..0.95]
	4	[0.85..0.90]
	3	[0.75..0.85]
	2	[0.50..0.75]
	1	[0.25..0.50]
	0	[0.00..0.25]
VtSig_Obj_0_Measured	1	Measured in current frame
	0	Not measured in current frame
VtSig_Obj_0_ax	31	Error
	30	Out of upper bound
	29	Out of lower bound

UK

Value table	Value	Meaning
VtSig_Obj_0_az	15	Error
	14	Out of upper bound
	13	Out of lower bound
VtSig_Obj_0_ay	31	Error
	30	Out of upper bound
	29	Out of lower bound
VtSig_Obj_0_ep	6	[0.95..1.0]
	5	[0.90..0.95]
	4	[0.85..0.90]
	3	[0.75..0.85]
	2	[0.50..0.75]
	1	[0.25..0.50]
	0	[0.00..0.25]
VtSig_Obj_0_TrackAge	0	[0..2] frames
	1	[3..12] frames
	2	[13..25] frames
	3	> 25 frames
VtSig_Obj_0_zMin	2047	Error
	2046	Out of upper bound
	2045	Out of lower bound
VtSig_Obj_0_vz	31	Error
	30	Out of upper bound
	29	Out of lower bound
VtSig_Obj_0_vy	127	Error
	126	Out of upper bound
	125	Out of lower bound
VtSig_Obj_0_vx	127	Error
	126	Out of upper bound
	125	Out of lower bound
VtSig_Obj_0_History	1	Object seen
	0	Object not seen
VtSig_Obj_0_qvy	6	[0.95..1.0]
	5	[0.90..0.95]
	4	[0.85..0.90]
	3	[0.75..0.85]
	2	[0.50..0.75]
	1	[0.25..0.50]
	0	[0.00..0.25]
VtSig_Obj_0_dz	255	Error
	254	Out of upper bound
	253	Out of lower bound
VtSig_Obj_0_dy	4095	Error
	4094	Out of upper bound
	4093	Out of lower bound
VtSig_Obj_0_y1	8191	Error
	8190	Out of upper bound
	8189	Out of lower bound

Value table	Value	Meaning
VtSig_Obj_0_dx	4095	Error
	4094	Out of upper bound
	4093	Out of lower bound
VtSig_Obj_0_x1	8191	Error
	8190	Out of upper bound
	8189	Out of lower bound
VtSig_ExtrCalib_2D_rot	0xFFF	Error
	0xFFE	Out of upper bound
	0xFFD	Out of lower bound
VtSig_ExtrCalib_2D_delta_t	0xFF	Error
	0xFE	Out of upper bound
	0xFD	Out of lower bound
VtSig_Standby_Control	0x0	Standby mode off
	0x1	Standby mode on