# CiA Draft Standard Proposal 417-4


# *Application Profile for Lift Control Systems*

## Part 4: Detailed application object specification

**This is a draft standard proposal may be changed without notification.**

**Version 1.0.1**

**July 15, 2003**

# HISTORY

| Date | Changes |
|---|---|
| 2003-02-02 | part of car drive controller and drive unit revised |
| | included homing mode |
| 2003-02-03 | included position encoder |
| | included dynamic creation of objects ($6020_h$) |
| 2003-02-25 | add abort code 0800 $0000_h$ for access to object 6020h in the case that there are no more resources left |
| | changed for input groups ($6100_h$ to $611F_h$) – target stop that a value of $255_d$ is reserved (for consitency reasons) |
| | changed for input parameter 2 ($6140_h$ to $615F_h$) that events are measured per second |
| | changed the measurment of the scroll rate of output parameter 4 ($6280_h$ to $629F_h$) from 2 mm per second to 1/7 of the character height per second |
| 2003-03-10 | splited up configuration object doors into several configuration objects |
| 2003-03-17 | added and changed objects to be able to represent 4 position sensors in one device |
| 2003-04-07 | changed definition of “object creation” to create and destroy objects |
| 2003-04-15 | wording corrected |
| 2003-04-19 | final preperation |
| 2003-05-25 | corrected 4.2.2 index $6010_h$ -> $6001_h$ |
| | corrected 4.3.1 sub-index “mandatory, if input … implemented |
| | changed 4.4.1 roll rate -> scroll rate |
| | corrected 4.4.1 sub-index “mandatory, if output … implemented |
| 2003-07-15 | final corrections |

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# 1 Scope

This part of the application profile defines all application and configuration objects.

# 2 Normative references

The normative references given in part 1 shall apply also for part 4.

In addition, the following references shall apply:

/CiA402/ CiA DSP 402 V2.0, CANopen device profile for drives and motion control, July 2002.

/CiA406/ CiA DS 406 V3.0, CANopen device profile encoder, May 2002

# 3 Definitions, acronyms and abbreviations

The definitions, acronyms and abbreviations given in part 1 shall also apply for part 4.

# 4 Object dictionary

## 4.1 Introduction

### 4.1.1 Overview on object dictionary entries

Each physical device compliant with this application profile specification shall share the Object Dictionary entries from $6000_h$ to $9FFF_h$. These entries are common to all modules and each module only implements those objects relevant to its functions (virtual device). Within this range up to 8 lift-control applications can be realized. For a single lift-control application only the range $6000_h$ to $67FF_h$ is used. For multiple lift-control applications the object range $6000_h$ to $67FF_h$ shall be shifted as follows:

$6000_h$ to $67FF_h$ lift-control application 1

$6800_h$ to $6FFF_h$ lift-control application 2

$7000_h$ to $77FF_h$ lift-control application 3

$7800_h$ to $7FFF_h$ lift-control application 4

$8000_h$ to $87FF_h$ lift-control application 5

$8800_h$ to $8FFF_h$ lift-control application 6

$9000_h$ to $97FF_h$ lift-control application 7

$9800_h$ to $9FFF_h$ lift-control application 8

### 4.1.2 Application object attributes

*Object Description* and *Entry Description* attributes are specified in /CiA301/.

The *Category* and *Entry Category* attributes of objects indicate, if the object shall be implemented (Mandatory) or may be implemented (Optional); for detailed specifications see *part 2* of this application profile.

The *Access* attribute for an object is different for a device, which provides this objects by means of producer functionality (ro) or for devices which consume this object via PDO or SDO (rw). For detailed specifications see *part 2* of this application profile.

The *Default Value* attribute defines the value of an object with *Access* attribute of the value ‘rw’ after power-on.

### 4.1.3 Complex data type definitions

#### 4.1.3.1 Record $0080_h$: Dimension record

| Index | Sub-index | Dimension record | Data Type |
|---|---|---|---|
| $0080_h$ | $00_h$ | Number of entries | Unsigned8 |
| | $01_h$ | Notation index | Integer8 |
| | $02_h$ | Dimension index | Unsigned8 |

## 4.2 Objects related to the physical device

### 4.2.1 Supported virtual device types ($6000_h$)

This object indicates which virtual devices are implemented in the physical device (multiple virtual devices).

**Value definition**

The 16-bit virtual device type description is compliant to the additional information field in object $1000_h$.

**Object description**

| | |
|---|---|
| Index | $6000_h$ |
| Name | Supported virtual device types |
| Object Code | Array |
| Data Type | Unsigned16 |
| Category | Mandatory for all multiple virtual devices |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of supported virtual devices |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $1_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Virtual device type 1 |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | Unsigned16 |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Virtual device type 2 |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | Unsigned16 |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Virtual device type 3 |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | No |
| Value Range | Unsigned16 |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Virtual device type 254 |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | No |
| Value Range | Unsigned16 |
| Default Value | No |

### 4.2.2 Lift number ($6001_h$)

This object shall contain the number of the lift to wich that device is assigned. This object shall be supported for the following virtual devices:

- call controller,
- car door controller,
- car door unit,
- light barrier unit
- car position unit,
- car drive controller,
- car drive unit, and
- load measuring unit.

A device that represent several lifts shall set the corresponding bits.

**Value definition**

| 7 | | | | | | | 0 |
|---|---|---|---|---|---|---|---|
| Lift 8 | Lift 7 | Lift 6 | Lift 5 | Lift 4 | Lift 3 | Lift 2 | Lift 1 |
| MSB | | | | | | | LSB |

The lift shall be coded by setting the appropriate bit.

| Value | Description |
|---|---|
| $00_h$ | reserved |
| $01_h$ | Lift number 1 |
| $02_h$ | Lift number 2 |
| $04_h$ | Lift number 3 |
| $08_h$ | Lift number 4 |
| $10_h$ | Lift number 5 |
| $20_h$ | Lift number 6 |
| $40_h$ | Lift number 7 |
| $80_h$ | Lift number 8 |

According to the lift number the objects of the approriate virtual devices (see *CiA DSP 417-2*) shall be shifted by an offset of minus 1 multiplied by $0800_h$.

May a device is connected to a specific lift, e.g. car drive unit, it shall refuse to set more than one bits at the same time by an abort message.

May a device is representing several lifts, e.g. gateways, it has to set the appropriate bits and to represent the according objects in its object dictionary.

**Object description**

| | |
|---|---|
| Index | $6001_h$ |
| Name | Lift number |
| Object Code | Var |
| Data Type | Unsigned8 |
| Category | Conditional (*see description*) |

**Entry description**

| | |
|---|---|
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $01_h$ |

### 4.2.3 Virtual input mapping ($6010_h$)

This object shall contain the input data from one of the digital input group objects, which shall be transmitted as the very next.

**Value definition**

Same as defined in input group objects ($6100_h$ to $611F_h$).

**Object description**

| | |
|---|---|
| Index | $6010_h$ |
| Name | Virtual input mapping |
| Object Code | Var |
| Data Type | Unsigned48 |
| Category | Conditional if input groups are implemented |

**Entry description**

| | |
|---|---|
| Access | ro |
| PDO Mapping | Default |
| Value Range | See *value definition* |
| Default Value | 0000 0000 $00_h$ |

### 4.2.4 Virtual output mapping ($6011_h$)

This object shall contain the output data to be mapped into the digital output group objects, which has been received last.

**Value definition**

Same as in output group objects ($6200_h$ to $621F_h$).

**Object description**

| | |
|---|---|
| Index | $6011_h$ |
| Name | Virtual output mapping |
| Object Code | Var |
| Data Type | Unsigned48 |
| Category | Conditionally if output groups are implemented |

**Entry description**

| | |
|---|---|
| Access | rw |
| PDO Mapping | Default |
| Value Range | See *value definition* |
| Default Value | 0000 0000 $00_h$ |

### 4.2.5 Virtual sensor mapping ($6012_h$)

This object shall contain the sensor data from one of the sensor group objects, which shall be transmitted as the very next.

**Value definition**

Same as defined in sensor group objects ($6100_h$ to $611F_h$).

**Object description**

| | |
|---|---|
| Index | $6012_h$ |
| Name | Virtual sensor mapping |
| Object Code | Var |
| Data Type | Unsigned48 |
| Category | Conditional if sensor groups are implemented |

**Entry description**

| | |
|---|---|
| Access | ro |
| PDO Mapping | Default |
| Value Range | See *value definition* |
| Default Value | 0000 0000 $00_h$ |

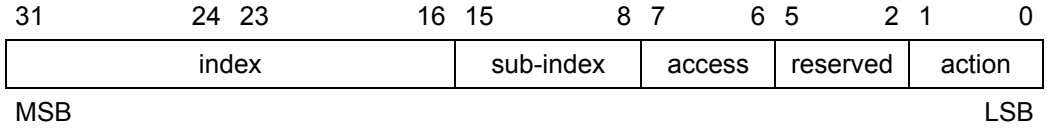
### 4.2.6 Object creation ($6020_h$)

This object shall be used to create an object with a specified index/sub-index. The functionality of the created object is defined according to its index/sub-index.

**Value definition**

The object creation shall be started by writing the desired index/sub-index as a value of datatype Unsigned32. An attempt to create an object that is not supported by the device shall be aborted (abort code 0609 $0030_h$ or 0800 $0000_h$). An attemp to create an object while no more resources are left shall be aborted (abort code 0504 $0005_h$ or 0800 $0000_h$).

An read access shall return the last successful created object.




*Access definition*

| Value | Definition |
|---|---|
| $0_h$ ($00xx_b$) | access as specified in the specification (default) |
| $1_h$ ($01xx_b$) | read only (ro) |
| $2_h$ ($10xx_b$) | write only (wo) |
| $3_h$ ($11xx_b$) | read / write (rw) |

*Action definition*

| Value | Definition |
|---|---|
| $0_h$ ($xx00_b$) | reserved |
| $1_h$ ($xx01_b$) | create object at appropriate index / sub-index |
| $2_h$ ($xx10_b$) | destroy object at appropriate index / sub-index |
| $3_h$ ($xx11_b$) | reserved |

**Object description**

| | |
|---|---|
| Index | $6020_h$ |
| Name | Object creation |
| Object Code | Var |
| Data Type | Unsigned32 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

## 4.3 Objects provided by input panel unit

### 4.3.1 Input groups ($6100_h$ to $611F_h$)

These objects shall contain data of the state, the assigned function and the function-depended parameters of a digital input group. One sub-index represents a single digital input. Each input group can manage up to 254 inputs. There may be addressed up to 32 x 254 digital inputs per lift-control application. If eight lift-control applications are implemented, there are available system-wide 65,024 digital inputs.

If the input changes, the application shall store the state of the virtual input in the corresponding sub-index and shall map the input data into the virtual input mapping ($6010_h$) object.

The structure of these objects shall be as follows:

| Byte 5 | Byte 4 | Byte 3 | Byte 2 | Byte 1 | Byte 0 |
|---|---|---|---|---|---|
| *Function data* | *Source door* | *Source panel* | *Source lift* | *Sub function* | *Basic function* |
| MSB | | | | | LSB |

**Value definition**

***Basic function***

The value of this field shall provide the *basic function* of a virtual input.

| Value | Description |
|---|---|
| $00_h$ | reserved |
| $01_h$ | Generic input |
| $02_h$ | Standard hall call request |
| $03_h$ | Low priority hall call request |
| $04_h$ | High priority hall call request |
| $05_h$ | Standard car call request |
| $06_h$ | Low priority car call request |
| $07_h$ | High priority car call request |
| $08_h$ | Standard destination call |
| $09_h$ | Low priority destination call |
| $0A_h$ | High priority destination call |
| $0B_h$ | Standard call to destination floor |
| $0C_h$ | Low priority call to destination floor |
| $0D_h$ | High priority call to destination floor |
| $0E_h$ | Special function |
| $0F_h$ | Access code upload request |
| $10_h$ | Speech connection request |
| $11_h$ | Area monitoring connection request |
| $12_h$ to $7F_h$ | reserved |
| $80_h$ to $FF_h$ | manufacturer-specific |

***Sub function***

The values of this field shall provide the *sub-function* of a virtual input.

The values of the *sub-function* field depending of the *basic function* value.

If the *basic function* value = $01_h$

The values of the sub-functions field are to be defined.

If the *basic function* value = $02_h$ to $04_h$

Value definitions of the sub-function field

| Bit 7 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|
| *reserved* | | *Hall call down* | *Hall call up* |
| MSB | | | LSB |

Bit 0 or bit 1 shall be set to 1 after the call button *Up* or *Down* has been pushed. Bit 0 and bit 1 shall be set to 1, if no direction is assigned to the call button.

If the *basic function* value = $05_h$ to $0D_h$

Value definitions of the sub-function field

| Bit 7 | Bit 0 |
|---|---|
| *target stop* | |
| MSB | LSB |

Bit 0 to bit 7 defines the values $1_d$ to $254_d$. This value describes, to which target stop the car has to drive after the car has arrived the source floor. Values $0_d$ and $255_d$ are reserved.

If the basic function value = $0E_h$

Value definitions of sub-function field

| Value | Description |
|---|---|
| $00_h$ | reserved |
| $01_h$ | Request fan 1 |
| $02_h$ | Request fan 2 |
| $03_h$ | Request load time 1 |
| $04_h$ | Request load time 2 |
| $05_h$ | Key lock 1 |
| $06_h$ | Key lock 2 |
| $07_h$ | Key lock 3 |
| $08_h$ | Key lock 4 |
| $09_h$ | Request door open |
| $0A_h$ | Request door close |
| $0B_h$ | Fire service enable |
| $0C_h$ | Fire service |
| $0D_h$ | Hall call disable |
| $0E_h$ | Attendant service |
| $0F_h$ | VIP service |
| $10_h$ | Out of order |
| $11_h$ | Bed passenger service |
| $12_h$ | Special service |
| $13_h$ | Service run |
| $14_h$ | Dogging service enable |
| $15_h$ | Dogging service up |
| $16_h$ | Dogging service down |
| $17_h$ to $FF_h$ | reserved |

If the basic function value = $0F_h$ to $11_h$

The values of the sub-functions field are to be defined.

***Function data***

The value of this field shall provide the input state of a virtual input.

| Bit 7 | Bit 6 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|---|
| *lock* | *reserved* | | *call request* | |
| MSB | | | | LSB |

For the sub-fields call request the following bit codes shall apply:

| Value | Description |
|---|---|
| $00_b$ | no call request |
| $01_b$ | call request |
| $10_b$ | functions is defect |
| $11_b$ | functions is not installed |

Bit 7 shall be set to 1 if the button or key-button has a locking function and shall be set to 0 if the button or key-button has not a locking function.

***Source lift***

The value of this field shall provide the number of the lift or the group of lifts to which the virtual device is assigned.

| Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|---|---|---|---|
| *Lift 8* | *Lift 7* | *Lift 6* | *Lift 5* | *Lift 4* | *Lift 3* | *Lift 2* | *Lift 1* |
| MSB | | | | | | | LSB |

| Value | Description |
|---|---|
| 0 | no request |
| 1 | request |

If the virtual device is assigned to the inside of a car, only one bit shall be set.

***Source panel***

The value of this field shall provide the floor number to which the virtual device is assigned.

| Bit 7 | Bit 0 |
|---|---|
| *Floor number* | |
| MSB | LSB |

Bit 0 to bit 7 defines the values $1_d$ to $254_d$. Value $255_d$ is reserved. In case the virtual device is assigned to car panel the value is $0_d$.

***Source door***

The value of this field shall provide the door number to which the virtual device is assigned.

| Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|---|---|---|---|
| *Source door 4* | *Source door 3* | *Source door 2* | *Source door 1* | *Dest. door 4* | *Dest. door 3* | *Dest. door 2* | *Dest. door 1* |
| MSB | | | | | | | LSB |

| Value | Description |
|---|---|
| 0 | no request |
| 1 | request |

The value of this field shall provide in bit 0 to 3 which door shall be opened when the car arrives at the destination target stop. In case the area of “Dest. door” is not used the value shall 0.

The value of this field shall provide in bit 4 to 7 the start door to which the virtual input is assigned.

**Object description**

| | |
|---|---|
| Index | $6100_h$ to $611F_h$ |
| Name | Input group 1 to Input group 32 |
| Object Code | Array |
| Data Type | Unsigned48 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of supported inputs |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Virtual input 1 |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Virtual input 2 |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

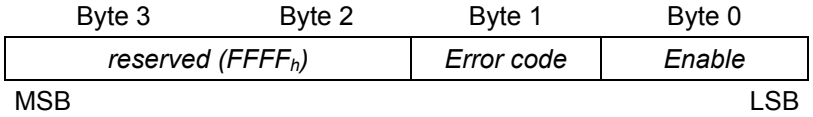
to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Virtual input 254 |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

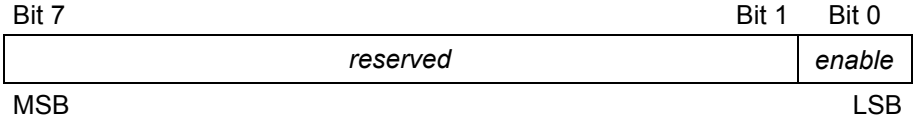
### 4.3.2 Input parameter 1 ($6120_h$ to $613F_h$)

These objects shall define the system behavior of the digital inputs. Object $6120_h$ corresponds to input group 1, object $6121_h$ corresponds to input group 2 etc.

**Value definition**




For the sub-field *enable* the following bit codes shall apply:




If bit 0 is set the virtual input shall be enabled. If bit 0 is not set the virtual input shall be disabled. Bit 1 to bit 7 are reserved for future use.

The sub-field *error code* provides the error status of its assigned virtual input.

If no sub-field is used the value shall be $FF_h$.

**Object description**

| | |
|---|---|
| Index | $6120_h$ to $613F_h$ |
| Name | Parameter 1 group 1 to Parameter 1 group 32 |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of supported inputs |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Parameter 1 input 1 |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Parameter 1 input 2 |
| Entry Category | Mandatory, if input 2 is implemented |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Parameter 1 input 254 |
| Entry Category | Mandatory, if input 254 is implemented |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.3.3 Input parameter 2 ($6140_h$ to $615F_h$)

These objects shall define the logical behavior of the digital inputs. Object $6140_h$ corresponds to input group 1, object $6141_h$ corresponds to input group 2 etc.

**Value definition**

| Byte 3 | Byte 2 | Byte 1 | Byte 0 |
|---|---|---|---|
| *reserved ($FF_h$)* | *Sending event* | *Limitation* | *reserved ($FF_h$)* |
| MSB | | | LSB |

The sub-field *limitation* provides the value how many input events per second are allowed. The value $00_h$ shall be reserved.

The sub-field *sending event* provides the value how many input events per second are necessary to start a message. The value $00_h$ shall be reserved.

If no sub-field is used the value shall be $FF_h$.

**Object description**

| | |
|---|---|
| Index | $6140_h$ to $615F_h$ |
| Name | Parameter 2 group 1 to Parameter 2 group 32 |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of supported inputs |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Parameter 2 input 1 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Parameter 2 input 2 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Parameter 2 input 254 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.3.4 Input parameter 3 ($6160_h$ to $617F_h$)

These objects shall define the physical behavior of the digital inputs. Object $6160_h$ corresponds to input group 1, object $6161_h$ corresponds to input group 2 etc.

**Value definition**

| Byte 3 | Byte 2 | Byte 1 | Byte 0 |
|---|---|---|---|
| *reserved ($FFFF_h$)* | | *Edge / polarity* | *Debounce time* |
| MSB | | | LSB |

The *debounce time* shall be given in milliseconds.

For the sub-fields *edge/priority* the following bit codes shall apply:

| Bit 7 | Bit 6 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|---|
| *polarity* | *reserved ($11111_b$)* | | *HL edge* | *LH edge* |
| MSB | | | | LSB |

If *LH edge* bit is set to 1, a low-to-high edge shall cause a mapping of the corresponding input to object $6010_h$. If *HL edge* bit is set to 1, a high-to-low edge shall cause a mapping of the corresponding input to object $6010_h$. *Polarity* bit shall be set to 1 if the corresponding input is inverted and shall be set to 0 if it is not inverted.

If no sub-field is used the value shall be $FF_h$.

**Object description**

| | |
|---|---|
| Index | $6160_h$ to $617F_h$ |
| Name | Parameter 3 group 1 to Parameter 3 group 32 |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of supported inputs |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Parameter 3 input 1 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Parameter 3 input 2 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

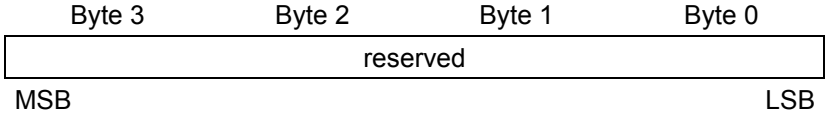
to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Parameter 3 input 254 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.3.5 Input parameter 4 ($6180_h$ to $619F_h$)

These objects are reserved. Object $6180_h$ corresponds to input group 1, object $6181_h$ corresponds to input group 2 etc.

**Value definition**




If no sub-field is used the value shall be $FF_h$.

**Object description**

| | |
|---|---|
| Index | $6180_h$ to $619F_h$ |
| Name | Parameter 4 group 1 to Parameter 4 group 32 |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of supported inputs |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Parameter 4 input 1 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Parameter 4 input 2 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Parameter 4 input 254 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

## 4.4 Objects provided by call controller

### 4.4.1 Output groups ($6200_h$) to ($621F_h$)

These objects shall contain data of the state, the assigned function and the function-depended parameters of a digital output group. One sub-index represents single digital output. Each output group can manage up to 254 outputs. There may be addressed up to 32 x 254 digital outputs per lift-control application. If eight lift-control applications are implemented, there are available system-wide 65,024 digital outputs.

The structure of these objects shall be as follows:

| Byte 5 | Byte 4 | Byte 3 | Byte 2 | Byte 1 | Byte 0 |
|---|---|---|---|---|---|
| *Function data* | *Destination door* | *Destination panel* | *Destination lift* | *Sub-function* | *Basic function* |
| MSB | | | | | LSB |

**Value definition**

***Basic function***

The value of this field shall provide the *basic function* of a virtual output.

| Value | Description |
|---|---|
| $00_h$ | reserved |
| $01_h$ | Generic output |
| $02_h$ | Standard hall call acknowledgement |
| $03_h$ | Low priority hall call acknowledgement |
| $04_h$ | High priority hall call acknowledgement |
| $05_h$ | Standard car call acknowledgement |
| $06_h$ | Low priority car call acknowledgement |
| $07_h$ | High priority car call acknowledgement |
| $08_h$ | Standard destination call acknowledgement |
| $09_h$ | Low priority destination call acknowledgement |
| $0A_h$ | High priority destination call acknowledgement |
| $0B_h$ | Standard call to destination floor acknowledgement |
| $0C_h$ | Low priority call to destination floor acknowledgement |
| $0D_h$ | High priority call to destination floor acknowledgement |
| $0E_h$ | Special function acknowledgement |
| $0F_h$ | Access code upload acknowledgement |
| $10_h$ | Speech connection acknowledgement |
| $11_h$ | Area monitoring connection acknowledgement |
| $12_h$ to $3F_h$ | reserved |
| $40_h$ | Position indicator |
| $41_h$ | Hall lantern |
| $42_h$ | Direction indication |
| $43_h$ | Special indication |
| $44_h$ | Arrival indication |
| $45_h$ | Operation data |

| Value | Description |
|---|---|
| $46_h$ | Publicity indication |
| $47_h$ to $7F_h$ | reserved |
| $80_h$ to $FF_h$ | manufacturer-specific |

***Sub-function***

The values of this field shall provide the *sub-function* of a virtual output.

The values of the *sub-function* field depending of the *basic function* value.

If the *basic function* value = $01_h$

The values of the sub-functions field are reserved.

If the *basic function* value = $02_h$ to $04_h$

Value definitions of the sub-function field

| Bit 7 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|
| *reserved* | | *Hall call down* | *Hall call up* |
| MSB | | | LSB |

The value of this field defines which virtual output has to process the message.

If the *basic function* value = $05_h$ to $0D_h$

Value definitions of the sub-function field

| Bit 7 | Bit 0 |
|---|---|
| *target stop acknowledgement* | |
| MSB | LSB |

Bit 0 to bit 7 defines the values $1_d$ to $254_d$. This value defines, which target stop button of a panel has to process the message. Value $255_d$ shall address all target stop buttons. Value $0_d$ is reserved.

If the *basic function* value = $0E_h$

Value definitions of sub-function field

| Value | Description |
|---|---|
| $00_h$ | reserved |
| $01_h$ | Request fan 1 acknowledgement |
| $02_h$ | Request fan 2 acknowledgement |
| $03_h$ | Request load time 1 acknowledgement |
| $04_h$ | Request load time 2 acknowledgement |
| $05_h$ | Request key lock 1 acknowledgement |
| $06_h$ | Request key lock 2 acknowledgement |
| $07_h$ | Request key lock 3 acknowledgement |
| $08_h$ | Request key lock 4 acknowledgement |
| $09_h$ | Request door open acknowledgement |
| $0A_h$ | Request door close acknowledgement |
| $0B_h$ | Fire service enable acknowledgement |
| $0C_h$ | Fire service acknowledgement |
| $0D_h$ | Hall call disable acknowledgement |

| Value | Description |
|---|---|
| $0E_h$ | Attendant service acknowledgement |
| $0F_h$ | VIP service acknowledgement |
| $10_h$ | Out of order acknowledgement |
| $11_h$ | Bed passenger service acknowledgement |
| $12_h$ | Special service acknowledgement |
| $13_h$ | Service run acknowledgement |
| $14_h$ | Dogging service enable acknowledgement |
| $15_h$ | Dogging service up acknowledgement |
| $16_h$ | Dogging service down acknowledgement |
| $17_h$ to $FF_h$ | reserved |

If the *basic function* value = $0F_h$ to $11_h$

The values of the sub-functions field are reserved.

If the *basic function* value = $40_h$

Value definitions of sub-function field

| Bit 7 | | | | | | Bit 0 |
|---|---|---|---|---|---|---|
| *floor data* | | | | | | |
| MSB | | | | | | LSB |

Bit 0 to Bit 7 define the values $1_d$ to $254_d$. This value defines the number of the floor, which has to be indicated by the display. The value $0_d$ is used to clear the display for floor data. The value $255_d$ is reserved.

If the *basic function* value = $41_h$ or $42_h$

Value definitions of sub-function field

| Bit 7 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|---|---|---|
| *reserved* | | *moving* | *left* | *right* | *down* | *up* |
| MSB | | | | | | LSB |

Bit 0 to bit 3 indicates the direction of an arrow, which is displayed on a physical device.

Bit 4 is set if the car is driving currently, and not set if the car is is not driving.

If the *basic function* value = $43_h$

Value definitions of sub-function field

| Value | Description |
|---|---|
| $00_h$ | Used for instruction -> all displays off |
| $01_h$ | No load |
| $02_h$ | Full load |
| $03_h$ | Over load |
| $04_h$ | Fire |

| Value | Description |
|---|---|
| $05_h$ | Fire brigade service |
| $06_h$ | Help is coming |
| $07_h$ | Special service |
| $08_h$ | Load time |
| $09_h$ | Occupied |
| $0A_h$ | Out of order |
| $09_h$ to $FF_h$ | reserved |

If the *basic function* value = $44_h$

Value definitions of sub-function field

| Bit 7 | ... | Bit 4 | Bit 3 | | Bit 0 |
|---|---|---|---|---|---|
| *reserved* | | | | *down* | *up* |
| MSB | | | | | LSB |

Bit 0 or bit 1 shall be set to 1 to force an output signal for the appropriate action. The tone of this output signal is manufacturer specific.

Bit 0 and bit 1 shall not be set at the very same time.

If the *basic function* value = $45_h$ to $46_h$

The value definitions of sub-function field are reserved.

***Function data***

The value of this field shall provide the output-state of a virtual output.

| Bit 7 | Bit 6 | ... | Bit 4 | Bit 3 | ... | Bit 1 | Bit 0 |
|---|---|---|---|---|---|---|---|
| *predicat.* | *property parameter* | | | *property* | | | *status* |
| MSB | | | | | | | LSB |

The following bit codes shall apply for the *status* sub-field:

| Value | Description |
|---|---|
| 0 | no data indicated |
| 1 | data indicated |

The sub field *property* indicate how the output shall work:

| Value | Description |
|---|---|
| $000_b$ | Default |
| $001_b$ | continuos |
| $010_b$ | impulse |
| $011_b$ | flashing |
| $100_b$ | color |
| $101_b$ | volume |
| $110_b$ | scroll rate |
| $111_b$ | reserved |

*Property parameter:*

| Value | Property | | | | | | |
|---|---|---|---|---|---|---|---|
| | default | continuos | impulse | flashing | color | volume | scroll rate |
| $000_b$ | reserved | reserved | 0.5 s | 10 Hz | white | min. | automatic |
| $001_b$ | reserved | reserved | 1 s | 7,5 Hz | yellow | vary | 1 line/s |
| $010_b$ | reserved | reserved | 1.5 s | 5 Hz | reserved | vary | 2 lines/s |
| $011_b$ | reserved | reserved | 2 s | 2 Hz | green | vary | 3 lines/s |
| $100_b$ | reserved | reserved | 3 s | 1.5 Hz | reserved | vary | 4 lines/s |
| $101_b$ | reserved | reserved | 5 s | 1 Hz | red | vary | 5 lines/s |
| $110_b$ | reserved | reserved | 10 s | 0.5 Hz | reserved | vary | 6 lines/s |
| $111_b$ | reserved | reserved | 15 s | 0.25 Hz | blue | max. | 7 lines/s |

A line shall be 1/7 of the height of a character.

*Predicate:*

| **Value** | **Description** |
|---|---|
| 1 | acknowledgement is affirmed |
| 0 | acknowledgement is not affirmed |

***Destination lift***

The value of this field shall provide the number of the lift or the group of lifts. The virtual device, which is assigned to this lift or lifts can process the message. The assignment of this number is application-specific.

| Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|---|---|---|---|
| *Lift 8* | *Lift 7* | *Lift 6* | *Lift 5* | *Lift 4* | *Lift 3* | *Lift 2* | *Lift 1* |
| MSB | | | | | | | LSB |

If the virtual device is assigned to the inside of a car, only one bit shall be set to 1.

***Destination panel***

The value of this field shall provide the floor number. The virtual device, which is assigned to this floor, can process the object.

| Bit 7 | | | | | | | Bit 0 |
|---|---|---|---|---|---|---|---|
| *Floor number* | | | | | | | |
| MSB | | | | | | | LSB |

Bit 0 to bit 7 defines the values $1_d$ to $255_d$. In case the virtual device is assigned to car panel the value is $0_d$. In case the virtual devices of all floors has to process the object, the value is $FF_h$.

***Destination door***

The value of this field shall provide the door number. The virtual device, which is assigned to this door, can process the object.

| Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|---|---|---|---|
| *Dest. door 4* | *Dest. door 3* | *Dest. door 2* | *Dest. door 1* | *Dest. button 4* | *Dest. button 3* | *Dest. button 2* | *Dest. button 1* |

MSB LSB

The value of this field shall provide in bit 0 to 3 the buttons (column of buttons), which is a reference to the door in the destination floor (destination floor by call request). The value of this field shall provide in bit 4 to bit 7 to which door the function is assigned.

**Object description**

| | |
|---|---|
| Index | $6200_h$ to 621F |
| Name | Output group 1 to Output group 32 |
| Object Code | Array |
| Data Type | Unsigned48 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of supported outputs |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Virtual output 1 |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 0000 0000 $00_h$ |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Virtual output 2 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 0000 0000 $00_h$ |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Virtual output 254 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 0000 0000 $00_h$ |

## 4.5 Objects provided by output panel unit

### 4.5.1 Output parameter 1 ($6220_h$ to $623F_h$)

These objects shall define the system behavior of the digital outputs. Object $6220_h$ corresponds to output group 1, object $6221_h$ corresponds to output group 2 etc.

**Value definition**

| Byte 3 | Byte 2 | Byte 1 | Byte 0 |
|---|---|---|---|
| *Default value* | *reserved ($FF_h$)* | *Error code* | *Enable* |
| MSB | | | LSB |

For the sub-field *enable* the following bit codes shall apply:

| Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|---|---|---|---|
| *reserved* | | | | | | | *enable* |
| MSB | | | | | | | LSB |

If bit 0 is set to 1 the virtual output shall be enabled. If bit 0 is reset to 0 the virtual output shall be disabled. Bit 1 to bit 7 are reserved for future use.

The sub-field *error code* shall provide the error status of the corresponding output. The values are reserved.

For the sub-field *lift assignment* the following bit codes shall apply:

| Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|---|---|---|---|
| *Lift 8* | *Lift 7* | *Lift 6* | *Lift 5* | *Lift 4* | *Lift 3* | *Lift 2* | *Lift 1* |
| MSB | | | | | | | LSB |

The sub-field *default value* shall provide the value of the data field of the corresponding output after power-on.

If no sub-field is used the value shall be $FF_h$.

**Object description**

| | |
|---|---|
| Index | $6220_h$ to $623F_h$ |
| Name | Parameter 1 group 1 to Parameter 1 group 32 |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of supported outputs |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Parameter 1 output 1 |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Parameter 1 output 2 |
| Entry Category | Mandatory, if output 2 is implemented |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Parameter 1 output 254 |
| Entry Category | Mandatory, if output 254 is implemented |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.5.2 Output parameter 2 ($6240_h$ to $625F_h$)

These objects shall define the logical behavior of the digital outputs. Object $6240_h$ corresponds to output group 1, object $6241_h$ corresponds to output group 2 etc.

**Value definition**

| Byte 3 | Byte 2 | Byte 1 | Byte 0 |
|---|---|---|---|
| *Impulse time* | *Reception event* | *Limitation* | *reserved ($FF_h$)* |
| MSB | | | LSB |

The sub-field *limitation* shall provide the value how many output events per second are allowed. The value $00_h$ is reserved.

The sub-field *reception event* provides the value how many messages are necessary to start an output event. The value $00_h$ is reserved.

The sub-field *Impulse time* provides the value in 1/10 seconds how long an output is activated after a message was processed. Within this time no message shall be processed at this output.

If no sub-field is used the value shall be $FF_h$.

**Object description**

| | |
|---|---|
| Index | $6240_h$ to $625F_h$ |
| Name | Parameter 2 group 1 to Parameter 2 group 32 |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of supported outputs |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Parameter 2 output 1 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Parameter 2 output 2 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Parameter 2 output 254 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.5.3 Output parameter 3 ($6260_h$ to $627F_h$)

These objects shall define the physical behavior of the digital outputs. Object $6260_h$ corresponds to output group 1, object $6261_h$ corresponds to output group 2 etc.

**Value definition**

| Byte 3 | Byte 2 | Byte 1 | Byte 0 |
|---|---|---|---|
| *reserved ($FFFF_h$)* | | *Polarity* | *reserved ($FF_h$)* |
| MSB | | | LSB |

For the sub-field *edge/polarity* the following bit codes shall apply:

| Bit 7 | Bit 6 | Bit 0 |
|---|---|---|
| *polarity* | *reserved ($1111111_b$)* | |
| MSB | | LSB |

If the *polarity* bit is set to 1 the corresponding output shall be inverted. If *polarity* bit is set to 0 the corresponding output shall not be inverted.

If no sub-field is used the value shall be $FF_h$.

**Object description**

| | |
|---|---|
| Index | $6260_h$ to $627F_h$ |
| Name | Parameter 3 group 1 to Parameter 3 group 32 |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of supported outputs |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Parameter 3 output 1 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Parameter 3 output 2 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Parameter 3 output 254 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.5.4 Output parameter 4 ($6280_h$ to $629F_h$)

These objects shall define the basic setting of the digital outputs. Object $6280_h$ corresponds to output group 1, object $6281_h$ corresponds to output group 2 etc.

**Value definition**

| Byte 3 | Byte 2 | Byte 1 | Byte 0 |
|---|---|---|---|
| *Intensity/Volume* | *Color* | *Scroll rate* | *Flash rate* |
| MSB | | | LSB |

The sub-field *flash rate* shall provide the frequency in 1/10 Hz of an output or of an indication at a display. A value of $00_h$ means the indication is always set.

The sub-field *scroll rate* provides the speed in 1/7 of the character height per second of an indication at a display.

The sub-field *color* is to be defined.

The sub-field *volume/intensity* provide the range of volume of acoustical indicators or the intensity of an optical indicator. The values range from $1_h$ (minimal volume or intensity) to $FE_h$ (maximum volume or intensity). The value $00_h$ is reserved.

If no sub-field is used the value shall be $FF_h$.

**Object description**

| | |
|---|---|
| Index | $6280_h$ to $629F_h$ |
| Name | Parameter 4 group 1 to Parameter 4 group 32 |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of supported outputs |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Parameter 4 output 1 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Parameter 4 output 2 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Parameter 4 output 254 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

## 4.6 Objects provided by car door controller

### 4.6.1 Door controlword ($6300_h$)

This object is mapped into the standard TPDOs of the car door controller virtual device. Up to four doors may be controlled. The sub-objects shall contain the following information.

| 15 12 | 11 10 | 9 8 | 7 6 | 5 4 | 3 2 | 1 0 |
|---|---|---|---|---|---|---|
| *Command* | *Door velocity* | *Motion detector* | *Finger protector* | *Door lock* | *Battery power* | *reserved ($11_b$)* |

MSB LSB

**Value definition**

*Command*

This field shall contain the command to be performed by the car door virtual device.

| Bit 15 | Bit 14 | Bit 13 | Bit 12 | Description |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | Close door without limit force |
| 0 | 0 | 0 | 1 | Close door with limit force |
| 0 | 0 | 1 | 0 | reserved |
| 0 | 0 | 1 | 1 | Open door without limit force |
| 0 | 1 | 0 | 0 | Open door with limit force |
| 0 | 1 | 0 | 1 | reserved |
| 0 | 1 | 1 | 0 | reserved |
| 0 | 1 | 1 | 1 | Stop door with without limit force |
| 1 | 0 | 0 | 0 | Stop door with limit force |
| 1 | 0 | 0 | 1 | reserved |
| to | | | | |
| 1 | 1 | 0 | 1 | reserved |
| 1 | 1 | 1 | 0 | Reset door |
| 1 | 1 | 1 | 1 | Do not care / take no action |

*Door velocity*

| Bit 11 | Bit 10 | Description |
|---|---|---|
| 0 | 0 | Move door with standard speed |
| 0 | 1 | Move door with reduced speed |
| 1 | 0 | reserved |
| 1 | 1 | do not care / take no action |

*Motion detector*

| Bit 9 | Bit 8 | Description |
|---|---|---|
| 0 | 0 | Enable motion detector |
| 0 | 1 | Disable motion detector |
| 1 | 0 | reserved |
| 1 | 1 | do not care / take no action |

*Finger protector*

| Bit 7 | Bit 6 | Description |
|---|---|---|
| 0 | 0 | Enable finger protector |
| 0 | 1 | Disable finger protector |
| 1 | 0 | reserved |
| 1 | 1 | do not care / take no action |

*Door lock*

| Bit 5 | Bit 4 | Description |
|---|---|---|
| 0 | 0 | Enable door lock |
| 0 | 1 | Disable door lock |
| 1 | 0 | reserved |
| 1 | 1 | do not care / take no action |

*Battery power*

| Bit 3 | Bit 2 | Description |
|---|---|---|
| 0 | 0 | Battery power supply disabled |
| 0 | 1 | Battery power supply enabled |
| 1 | 0 | reserved |
| 1 | 1 | do not care / take no action |

**Object description**

| | |
|---|---|
| Index | $6300_h$ |
| Name | Door controlword |
| Object Code | Array |
| Data Type | Unsigned16 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $04_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Door 1 |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Default |
| Value Range | See *value definition* |
| Default Value | No ($FFFF_h$) |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Door 2 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Default |
| Value Range | See *value definitions* |
| Default Value | No ($FFFF_h$) |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Door 3 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Default |
| Value Range | See *value definitions* |
| Default Value | No ($FFFF_h$) |

| | |
|---|---|
| Sub-Index | $04_h$ |
| Description | Door 4 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Default |
| Value Range | See *value definitions* |
| Default Value | No ($FFFF_h$) |

## 4.7 Objects provided by car door

### 4.7.1 Door statusword ($6301_h$)

This object is mapped into the standard TPDO of the car door virtual device. The object shall contain the following information.

| 15 12 | 11 10 | 9 8 | 7 6 | 5 4 | 3 2 | 1 0 |
|---|---|---|---|---|---|---|
| *Status* | *Force limit* | *Motion detector* | *Finger protector* | *Door lock* | *Battery power* | *Safety contact* |

MSB LSB

**Value definition**

*Status*

This field shall contain the status delivered by the car door virtual device.

| Bit 15 | Bit 14 | Bit 13 | Bit 12 | Description |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | Door closed with torque |
| 0 | 0 | 0 | 1 | Door closed without torque |
| 0 | 0 | 1 | 0 | Closing |
| 0 | 0 | 1 | 1 | Door opened with torque |
| 0 | 1 | 0 | 0 | Door opened without torque |
| 0 | 1 | 0 | 1 | Opening |
| 0 | 1 | 1 | 0 | Re-opening |
| 0 | 1 | 1 | 1 | Stopped |
| 1 | 0 | 0 | 0 | reserved |
| to | | | | |
| 1 | 1 | 0 | 1 | reserved |
| 1 | 1 | 1 | 0 | Error indicator |
| 1 | 1 | 1 | 1 | not available / not installed |

*Force limit*

| Bit 11 | Bit 10 | Description |
|---|---|---|
| 0 | 0 | Force limit not reached |
| 0 | 1 | Force limit reached |
| 1 | 0 | Error indication |
| 1 | 1 | not available or not installed |

*Motion detector*

| Bit 9 | Bit 8 | Description |
|---|---|---|
| 0 | 0 | Motion not detected |
| 0 | 1 | Motion detected |
| 1 | 0 | Error indicator |
| 1 | 1 | not available or not installed |

*Finger protector*

| Bit 7 | Bit 6 | Description |
|---|---|---|
| 0 | 0 | No finger detected |
| 0 | 1 | Finger detected |
| 1 | 0 | Error indicator |
| 1 | 1 | not available or not installed |

*Door lock*

| Bit 5 | Bit 4 | Description |
|---|---|---|
| 0 | 0 | Door not locked |
| 0 | 1 | Door locked |
| 1 | 0 | Error indicator |
| 1 | 1 | not available or not installed |

*Safety contact*

| Bit 5 | Bit 4 | Description |
|---|---|---|
| 0 | 0 | Contact not closed |
| 0 | 1 | Contact closed |
| 1 | 0 | Error indicator |
| 1 | 1 | not available or not installed |

*Battery power*

| Bit 3 | Bit 2 | Description |
|---|---|---|
| 0 | 0 | No battery power used |
| 0 | 1 | Battery power used |
| 1 | 0 | Error indicator |
| 1 | 1 | not available or not installed |

**Object description**

| | |
|---|---|
| Index | $6301_h$ |
| Name | Door statusword |
| Object Code | Array |
| Data Type | Unsigned16 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $04_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Door 1 |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Default |
| Value Range | See *value definition* |
| Default Value | No ($FFFF_h$) |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Door 2 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Default |
| Value Range | See *value definitions* |
| Default Value | No ($FFFF_h$) |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Door 3 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Default |
| Value Range | See *value definitions* |
| Default Value | No ($FFFF_h$) |

| | |
|---|---|
| Sub-Index | $04_h$ |
| Description | Door 4 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Default |
| Value Range | See *value definitions* |
| Default Value | No ($FFFF_h$) |

### 4.7.2 Door position ($6302_h$)

This object contains the current position of up to four doors.

**Value definition**

The value is measured in mm between door closing edges. A value of $0000_h$ means door is closed, and $FFFF_h$ indicates not available or not requested.

**Object description**

| | |
|---|---|
| Index | $6302_h$ |
| Name | Door position |
| Object Code | Array |
| Data Type | Unsigned16 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $04_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Door 1 |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definition* |
| Default Value | No ($FFFF_h$) |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Door 2 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | No ($FFFF_h$) |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Door 3 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | No ($FFFF_h$) |

| | |
|---|---|
| Sub-Index | $04_h$ |
| Description | Door 4 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | No ($FFFF_h$) |

### 4.7.3 Door 1 configuration ($6304_h$)

This object contains configuration data of door 1. Additional manufacturer-specific configuration objects may be specified in the manufacturer-specific device profile area ($2000_h$ to $5FFF_h$). The door velocity profile parameter defines the velocity for the drive closing and opening the door. The door open width profile parameter defines the profile used to open the door. The door type parameter defines how the door opens. The light barrier event modus parameter defines how to react if this event occurs. The force limit reached modus parameter defines how to react if this event occurs. The finger protector modus defines how to react if this event occurs. The motion detection modus parameter defines how to react if this event occurs. The light barrier re-close parameter defines the time to re-close the door if the door has been re-opened by the light barrier. The closing force limit re-close parameter defines the time to re-close the door if the door has been re-opened by the closing force limit. The light barrier broken re-close parameter defines the time to re-close the door if the light barrier is broken. The lost of heartbeat parameter defines how to react if the heartbeat of the car door controller is missed.

**Value definition**

*Door velocity profile*

| Value | Description |
|---|---|
| $00_h$ | default velocity profile |
| $01_h$ to $FF_h$ | manufacturer-specific velocity profile |

*Door open width profile*

| Value | Descripttion |
|---|---|
| $00_h$ | default width profile |
| $01_h$ to $FF_h$ | manufacturer-specific velocity profile |

*Door type*

| Value | Description |
|---|---|
| $00_h$ | undefined |
| $01_h$ | center opening |
| $02_h$ | left side opening |
| $03_h$ | right side opening |
| $04_h$ to $FF_h$ | reserved |

*Light barrier event modus*

| Value | Description |
|---|---|
| $00_h$ | door virtual device sends only its status by PDO |
| $01_h$ | door virtual device re-opens its door |
| $02_h$ | door virtual device stops its door |
| $03_h$ to $FF_h$ | reserved |

*Force limit reached modus*

| Value | Description |
|---|---|
| $00_h$ | door virtual device sends only its status by PDO |
| $01_h$ | door virtual device re-opens its door |
| $02_h$ | door virtual device stops its door |
| $03_h$ to $FF_h$ | reserved |

*Finger protector modus*

| Value | Description |
|---|---|
| $00_h$ | door virtual device sends only its status by PDO |
| $01_h$ | door virtual device re-closes the door if the finger protector is active |
| $02_h$ | door virtual device stops the door |
| $03_h$ to $FF_h$ | reserved |

*Motion detection modus*

| Value | Description |
|---|---|
| $00_h$ | door virtual device sends only its status by PDO |
| $01_h$ | door virtual device re-opens the door as long as no more motion is detected |
| $02_h$ | door virtual device stops the door |
| $03_h$ to $FF_h$ | reserved |

*Light barrier re-close*

The value is given in 1 s per bit. A value of ‘0’ means the timer is disabled.

*Closing force limit re-close*

The value is given in 1 s per bit. A value of ‘0’ means the timer is disabled.

*Light barrier broken*

The value is given in 2 s per bit. A value of '0' means the timer is disabled.

*Lost of heartbeat*

| Value | Description |
|---|---|
| $00_h$ | door stops without torque |
| $01_h$ | door stops with torque |
| $02_h$ | door closes with reduced speed |
| $03_h$ to $FF_h$ | reserved |

**Object description**

| | |
|---|---|
| Index | $6304_h$ |
| Name | Door 1 configuration |
| Object Code | Array |
| Data Type | Unsigned8 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $0B_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Door velocity profile |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Door open width profile |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Door type |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $04_h$ |
| Description | Light barrier event modus |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $05_h$ |
| Description | Force limit reached modus |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $06_h$ |
| Description | Finger protector modus |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $07_h$ |
| Description | Motion detection modus |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $08_h$ |
| Description | Light barrier reclose |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $09_h$ |
| Description | Closing force limit reclose |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $0A_h$ |
| Description | Light barrier broken |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $0B_h$ |
| Description | Lost of heartbeat |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

### 4.7.4 Door 2 configuration ($6305_h$)

This object contains configuration data of door 2. Additional manufacturer-specific configuration objects may be specified in the manufacturer-specific device profile area ($2000_h$ to $5FFF_h$). For detailed description see Door 1 configuration ($6304_h$).

**Object description**

| | |
|---|---|
| Index | $6305_h$ |
| Name | Door 2 configuration |
| Object Code | Array |
| Data Type | Unsigned8 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number_of_entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $0B_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Door velocity profile |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Door open width profile |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| Sub-Index | $03_h$ |
|---|---|
| Description | Door type |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| Sub-Index | $04_h$ |
|---|---|
| Description | Light barrier event modus |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| Sub-Index | $05_h$ |
|---|---|
| Description | Force limit reached modus |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $00_h$ |

| Sub-Index | $06_h$ |
|---|---|
| Description | Finger protector modus |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| Sub-Index | $07_h$ |
|---|---|
| Description | Motion detection modus |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| Sub-Index | $08_h$ |
|---|---|
| Description | Light barrier reclose |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $09_h$ |
| Description | Closing force limit reclose |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $0A_h$ |
| Description | Light barrier broken |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $0B_h$ |
| Description | Lost of heartbeat |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

### 4.7.5 Door 3 configuration ($6306_h$)

This object contains configuration data of door 3. Additional manufacturer-specific configuration objects may be specified in the manufacturer-specific device profile area ($2000_h$ to $5FFF_h$). For detailed description see Door 1 configuration ($6304_h$).

**Object description**

| | |
|---|---|
| Index | $6306_h$ |
| Name | Door 3 configuration |
| Object Code | Array |
| Data Type | Unsigned8 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $0B_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Door velocity profile |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $00_h$ |

| Sub-Index | $02_h$ |
|---|---|
| Description | Door open width profile |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| Sub-Index | $03_h$ |
|---|---|
| Description | Door type |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| Sub-Index | $04_h$ |
|---|---|
| Description | Light barrier event modus |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| Sub-Index | $05_h$ |
|---|---|
| Description | Force limit reached modus |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $00_h$ |

| Sub-Index | $06_h$ |
|---|---|
| Description | Finger protector modus |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| Sub-Index | $07_h$ |
|---|---|
| Description | Motion detection modus |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $08_h$ |
| Description | Light barrier reclose |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $09_h$ |
| Description | Closing force limit reclose |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $0A_h$ |
| Description | Light barrier broken |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $0B_h$ |
| Description | Lost of heartbeat |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

### 4.7.6 Door 4 configuration ($6307_h$)

This object contains configuration data of door 4. Additional manufacturer-specific configuration objects may be specified in the manufacturer-specific device profile area ($2000_h$ to $5FFF_h$). For detailed description see Door 1 configuration ($6304_h$).

**Object description**

| | |
|---|---|
| Index | $6307_h$ |
| Name | Door 4 configuration |
| Object Code | Array |
| Data Type | Unsigned8 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $0B_h$ |
| Default Value | No |

| Sub-Index | $01_h$ |
|---|---|
| Description | Door velocity profile |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $00_h$ |

| Sub-Index | $02_h$ |
|---|---|
| Description | Door open width profile |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| Sub-Index | $03_h$ |
|---|---|
| Description | Door type |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| Sub-Index | $04_h$ |
|---|---|
| Description | Light barrier event modus |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| Sub-Index | $05_h$ |
|---|---|
| Description | Force limit reached modus |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $00_h$ |

| Sub-Index | $06_h$ |
|---|---|
| Description | Finger protector modus |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $07_h$ |
| Description | Motion detection modus |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $08_h$ |
| Description | Light barrier reclose |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $09_h$ |
| Description | Closing force limit reclose |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $0A_h$ |
| Description | Light barrier broken |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $0B_h$ |
| Description | Lost of heartbeat |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definitions* |
| Default Value | $00_h$ |

## 4.8 Objects provided by light barrier unit

### 4.8.1 Light barrier status ($6310_h$)

This object shall provide status information of the light barrier unit virtual device for up to four doors. The object shall contain the following information.

| 7 | 6 | 5 | 0 |
|---|---|---|---|
| *Status* | | *reserved ($111111_b$)* | |
| MSB | | | LSB |

**Value definition**

*Status*

| Bit 7 | Bit 6 | Description |
|---|---|---|
| 0 | 0 | No subject detected |
| 0 | 1 | Subject detected |
| 1 | 0 | Error indicator |
| 1 | 1 | not available / not installed |

**Object description**

| | |
|---|---|
| Index | $6310_h$ |
| Name | Light barrier status |
| Object Code | Array |
| Data Type | Unsigned8 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $04_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Door 1 |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Default |
| Value Range | See *value definition* |
| Default Value | $FF_h$ |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Door 2 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Default |
| Value Range | See *value definitions* |
| Default Value | $FF_h$ |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Door 3 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Default |
| Value Range | See *value definitions* |
| Default Value | $FF_h$ |

| | |
|---|---|
| Sub-Index | $04_h$ |
| Description | Door 4 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Default |
| Value Range | See *value definitions* |
| Default Value | $FF_h$ |

## 4.9 Objects provided by the car position unit

### 4.9.1 Operating parameter ($6380_h$)

This objects contains the current operation parameter of up to four position units.

**Value definition**

See object $6000_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $6380_h$ |
| Name | Operating parameter |
| Object Code | Array |
| Data Type | Unsigned16 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $04_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Position unit 1 |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Position unit 2 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Position unit 3 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $04_h$ |
| Description | Position unit 4 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.9.2 Measuring units per revolution ($6381_h$)

**Value definition**

See object $6001_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $6381_h$ |
| Name | Measuring units per revolution |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $04_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Position unit 1 |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Position unit 2 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Position unit 3 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $04_h$ |
| Description | Position unit 4 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.9.3 Preset value ($6382_h$)

**Value definition**

See object $6003_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $6382_h$ |
| Name | Preset value |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $04_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Position unit 1 |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Position unit 2 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Position unit 3 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $04_h$ |
| Description | Position unit 4 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.9.4 Position value ($6383_h$)

**Value definition**

See object $6004_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $6383_h$ |
| Name | Position value |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $04_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Position unit 1 |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Default |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Position unit 2 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Position unit 3 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $04_h$ |
| Description | Position unit 4 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definition* |
| Default Value | No |

### 4.9.5 Encoder measuring step settings position unit 1 ($6384_h$)

This object shall define the measuring step settings for the position value, speed value and acceleration value of position unit 1.

**Value definition**

Sub-index $01_h$ shall define the measuring step in mutiples of 10 µm.

Sub-index $02_h$ shall define the speed measuring step in mutiples of 0,1 mm/s.

Sub-index $03_h$ shall define the acceleration measuring step in mutiples of $1mm/s^2$

**Object description**

| | |
|---|---|
| Index | $6384_h$ |
| Name | Encoder measuring step settings position unit 1 |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $03_h$ |
| Default Value | $03_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Measuring step |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | Unsigned16 |
| Default Value | $10_d$ |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Speed measuring step |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | Unsigned16 |
| Default Value | $10_d$ |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Acceleration measuring step |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | Unsigned16 |
| Default Value | $1_d$ |

### 4.9.6 Encoder measuring step settings position unit 2 ($6385_h$)

This object shall define the measuring step settings for the position value, speed value and acceleration value of position unit 2.

**Value definition**

Sub-index $01_h$ shall define the measuring step in mutiples of 10 µm.

Sub-index $02_h$ shall define the speed measuring step in mutiples of 0,1 mm/s.

Sub-index $03_h$ shall define the acceleration measuring step in mutiples of $1mm/s^2$

**Object description**

| | |
|---|---|
| Index | $6385_h$ |
| Name | Encoder measuring step settings position unit 2 |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $03_h$ |
| Default Value | $03_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Measuring step |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | Unsigned16 |
| Default Value | $10_d$ |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Speed measuring step |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | Unsigned16 |
| Default Value | $10_d$ |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Acceleration measuring step |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | Unsigned16 |
| Default Value | $1_d$ |

### 4.9.7 Encoder measuring step settings position unit 3 ($6386_h$)

This object shall define the measuring step settings for the position value, speed value and acceleration value of position unit 3.

**Value definition**

Sub-index $01_h$ shall define the measuring step in mutiples of 10 µm.

Sub-index $02_h$ shall define the speed measuring step in mutiples of 0,1 mm/s.

Sub-index $03_h$ shall define the acceleration measuring step in mutiples of $1mm/s^2$

**Object description**

| | |
|---|---|
| Index | $6383_h$ |
| Name | Encoder measuring step settings position unit 3 |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $03_h$ |
| Default Value | $03_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Measuring step |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | Unsigned16 |
| Default Value | $10_d$ |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Speed measuring step |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | Unsigned16 |
| Default Value | $10_d$ |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Acceleration measuring step |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | Unsigned16 |
| Default Value | $1_d$ |

### 4.9.8 Encoder measuring step settings position unit 4 ($6387_h$)

This object shall define the measuring step settings for the position value, speed value and acceleration value of position unit 4.

**Value definition**

Sub-index $01_h$ shall define the measuring step in mutiples of 10 µm.

Sub-index $02_h$ shall define the speed measuring step in mutiples of 0,1 mm/s.

Sub-index $03_h$ shall define the acceleration measuring step in mutiples of $1mm/s^2$

**Object description**

| | |
|---|---|
| Index | $6387_h$ |
| Name | Encoder measuring step settings position unit 4 |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $03_h$ |
| Default Value | $03_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Measuring step |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | Unsigned16 |
| Default Value | $10_d$ |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Speed measuring step |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | Unsigned16 |
| Default Value | $10_d$ |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Acceleration measuring step |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | Unsigned16 |
| Default Value | $1_d$ |

### 4.9.9 Speed value car ($6390_h$)

This object shall define the output speed value. The speed measuring step is defined in object $6384_h$ sub-index $02_h$.

**Value definition**

| Speed value car | |
|---|---|
| Byte 0 | Byte 1 |
| $2^7$ to $2^0$ | $2^{15}$ to $2^8$ |

**Object description**

| | |
|---|---|
| Index | $6390_h$ |
| Name | Speed value car |
| Object Code | Array |
| Data Type | Integer16 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $04_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Position unit 1 |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Default |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Position unit 2 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Position unit 3 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $04_h$ |
| Description | Position unit 4 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definition* |
| Default Value | No |

### 4.9.10 Acceleration value car ($6391_h$)

This object shall define the output acceleration value. The acceleration measuring step is defined in object $6384_h$ sub-index $03_h$.

**Value definition**

| Acceleration value car | |
|---|---|
| Byte 0 | Byte 1 |
| $2^7$ to $2^0$ | $2^{15}$ to $2^8$ |

**Object description**

| | |
|---|---|
| Index | $6391_h$ |
| Name | Acceleration value car |
| Object Code | Array |
| Data Type | Integer16 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $1_h$ to $4_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Position unit 1 |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Default |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Position unit 2 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Position unit 3 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $04_h$ |
| Description | Position unit 4 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Optional |
| Value Range | See *value definition* |
| Default Value | No |

### 4.9.11 Area state register position unit 1 ($63B0_h$)

**Value definition**

See object $6400_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63B0_h$ |
| Name | Area state register position unit 1 |
| Object Code | Array |
| Data Type | Unsigned8 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of available channels |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Work area state channel 1 |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | Optional |
| Value Range | Unsigned8 |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Work area state channel 2 |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | Optional |
| Value Range | Unsigned8 |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Work area state channel 254 |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | Optional |
| Value Range | Unsigned8 |
| Default Value | No |

### 4.9.12 Area state register position unit 2 ($63B1_h$)

**Value definition**

See object $6400_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63B1_h$ |
| Name | Area state register position unit 2 |
| Object Code | Array |
| Data Type | Unsigned8 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of available channels |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Work area state channel 1 |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | Optional |
| Value Range | Unsigned8 |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Work area state channel 2 |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | Optional |
| Value Range | Unsigned8 |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Work area state channel 254 |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | Optional |
| Value Range | Unsigned8 |
| Default Value | No |

### 4.9.13 Area state register position unit 3 ($63B2_h$)

**Value definition**

See object $6400_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63B2_h$ |
| Name | Area state register position unit 3 |
| Object Code | Array |
| Data Type | Unsigned8 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of available channels |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Work area state channel 1 |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | Optional |
| Value Range | Unsigned8 |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Work area state channel 2 |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | Optional |
| Value Range | Unsigned8 |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Work area state channel 254 |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | Optional |
| Value Range | Unsigned8 |
| Default Value | No |

### 4.9.14 Area state register position unit 4 ($63B3_h$)

**Value definition**

See object $6400_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63B3_h$ |
| Name | Area state register position unit 4 |
| Object Code | Array |
| Data Type | Unsigned8 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of available channels |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Work area state channel 1 |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | Optional |
| Value Range | Unsigned8 |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Work area state channel 2 |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | Optional |
| Value Range | Unsigned8 |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Work area state channel 254 |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | Optional |
| Value Range | Unsigned8 |
| Default Value | No |

### 4.9.15 Work area lowlimit position unit 1 ($63B4_h$)

**Value definition**

See object $6401_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63B4_h$ |
| Name | Work area lowlimit position unit 1 |
| Object Code | Array |
| Data Type | Integer32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of available channels |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Work area lowlimit channel 1 |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Work area lowlimit channel 2 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Work area lowlimit channel 254 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

### 4.9.16 Work area lowlimit position unit 2 ($63B5_h$)

**Value definition**

See object $6401_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63B5_h$ |
| Name | Work area lowlimit position unit 2 |
| Object Code | Array |
| Data Type | Integer32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of available channels |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Work area lowlimit channel 1 |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Work area lowlimit channel 2 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Work area lowlimit channel 254 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

### 4.9.17 Work area lowlimit position unit 3 ($63B6_h$)

**Value definition**

See object $6401_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63B6_h$ |
| Name | Work area lowlimit position unit 3 |
| Object Code | Array |
| Data Type | Integer32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of available channels |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Work area lowlimit channel 1 |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Work area lowlimit channel 2 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Work area lowlimit channel 254 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

### 4.9.18 Work area lowlimit position unit 4 ($63B7_h$)

**Value definition**

See object $6401_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63B7_h$ |
| Name | Work area lowlimit position unit 4 |
| Object Code | Array |
| Data Type | Integer32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of available channels |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Work area lowlimit channel 1 |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Work area lowlimit channel 2 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Work area lowlimit channel 254 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

### 4.9.19 Work area highlimit position unit 1 ($63B8_h$)

**Value definition**

See object $6402_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63B8_h$ |
| Name | Work area highlimit position unit 1 |
| Object Code | Array |
| Data Type | Integer32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of available channels |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Work area highlimit channel 1 |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Work area highlimit channel 2 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Work area highlimit channel 254 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

### 4.9.20 Work area highlimit position unit 2 ($63B9_h$)

**Value definition**

See object $6402_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63B9_h$ |
| Name | Work area highlimit position unit 2 |
| Object Code | Array |
| Data Type | Integer32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of available channels |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Work area highlimit channel 1 |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Work area highlimit channel 2 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Work area highlimit channel 254 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

### 4.9.21 Work area highlimit position unit 3 ($63BA_h$)

**Value definition**

See object $6402_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63BA_h$ |
| Name | Work area highlimit position unit 3 |
| Object Code | Array |
| Data Type | Integer32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of available channels |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Work area highlimit channel 1 |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Work area highlimit channel 2 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Work area highlimit channel 254 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

### 4.9.22 Work area highlimit position unit 4 ($63BB_h$)

**Value definition**

See object $6402_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63BB_h$ |
| Name | Work area highlimit position unit 4 |
| Object Code | Array |
| Data Type | Integer32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of available channels |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Work area highlimit channel 1 |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Work area highlimit channel 2 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Work area highlimit channel 254 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | Integer32 |
| Default Value | No |

### 4.9.23 Operating status ($63C0_h$)

**Value definition**

See object $6500_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63C0_h$ |
| Name | Operating status |
| Object Code | Array |
| Data Type | Unsigned16 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $04_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Position unit 1 |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Position unit 2 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Position unit 3 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $04_h$ |
| Description | Position unit 4 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.9.24 Single turn resolution ($63C1_h$)

**Value definition**

See object $6501_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63C1_h$ |
| Name | Single turn resolution |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $04_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Position unit 1 |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Position unit 2 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Position unit 3 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $04_h$ |
| Description | Position unit 4 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.9.25 Number of distinguishable revolutions ($63C2_h$)

**Value definition**

See object $6502_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63C2_h$ |
| Name | Number of distinguishable revolutions |
| Object Code | Array |
| Data Type | Unsigned16 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $04_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Position unit 1 |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Position unit 2 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Position unit 3 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $04_h$ |
| Description | Position unit 4 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.9.26 Supported warnings ($63C4_h$)

**Value definition**

see object $6506_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63C4_h$ |
| Name | Supported warnings |
| Object Code | Array |
| Data Type | Unsigned16 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $04_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Position unit 1 |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Position unit 2 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Position unit 3 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $04_h$ |
| Description | Position unit 4 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.9.27 Warnings ($63C5_h$)

**Value definition**

see object $6505_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63C5_h$ |
| Name | Warnings |
| Object Code | Array |
| Data Type | Unsigned16 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $04_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Position unit 1 |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Position unit 2 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Position unit 3 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $04_h$ |
| Description | Position unit 4 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.9.28 Supported alarms ($63C6_h$)

**Value definition**

see object $6504_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63C6_h$ |
| Name | Supported alarms |
| Object Code | Array |
| Data Type | Unsigned16 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $04_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Position unit 1 |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Position unit 2 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Position unit 3 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $04_h$ |
| Description | Position unit 4 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.9.29 Alarms ($63C7_h$)

**Value definition**

see object $6503_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63C7_h$ |
| Name | Alarms |
| Object Code | Array |
| Data Type | Unsigned16 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $04_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Position unit 1 |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Position unit 2 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Position unit 3 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $04_h$ |
| Description | Position unit 4 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.9.30 Operating time ($63C8_h$)

**Value definition**

See object $6508_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63C8_h$ |
| Name | Operating time |
| Object Code | Var |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $04_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Position unit 1 |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Position unit 2 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Position unit 3 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $04_h$ |
| Description | Position unit 4 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.9.31 Offset value ($63C9_h$)

**Value definition**

See object $6509_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63C9_h$ |
| Name | Offset value |
| Object Code | Var |
| Data Type | Integer16 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $04_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Position unit 1 |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Position unit 2 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Position unit 3 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $04_h$ |
| Description | Position unit 4 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.9.32 Module identification position unit 1 ($63D0_h$)

**Value definition**

See object $650A_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63D0_h$ |
| Name | Module identification position unit 1 |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $03_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Manufacturer offset value |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $0000\ 0000_h$ |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Manufacturer minimum position value |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Manufacturer maximum position value |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.9.33 Module identification position unit 2 ($63D1_h$)

**Value definition**

See object $650A_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63D1_h$ |
| Name | Module identification position unit 2 |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $03_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Manufacturer offset value |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $0000\ 0000_h$ |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Manufacturer minimum position value |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Manufacturer maximum position value |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.9.34 Module identification position unit 3 ($63D2_h$)

**Value definition**

See object $650A_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63D2_h$ |
| Name | Module identification position unit 3 |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $03_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Manufacturer offset value |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $0000\ 0000_h$ |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Manufacturer minimum position value |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Manufacturer maximum position value |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.9.35 Module identification position unit 4 ($63D3_h$)

**Value definition**

See object $650A_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63D3_h$ |
| Name | Module identification position unit 4 |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $03_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Manufacturer offset value |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $0000\ 0000_h$ |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Manufacturer minimum position value |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Manufacturer maximum position value |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

## 4.10 Object provided by the position CAM unit

### 4.10.1 CAM state register ($63A0_h$)

**Value definition**

See object $6300_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63A0_h$ |
| Name | CAM state register |
| Object Code | Array |
| Data Type | Unsigned8 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of available channels |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | CAM state channel 1 |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | Optional |
| Value Range | Unsigned8 |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | CAM state channel 2 |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | Optional |
| Value Range | Unsigned8 |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | CAM state channel 254 |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | Optional |
| Value Range | Unsigned8 |
| Default Value | No |

### 4.10.2 CAM enable register ($63A1_h$)

**Value definition**

See object $6301_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63A1_h$ |
| Name | CAM enable register |
| Object Code | Array |
| Data Type | Unsigned8 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of available channels |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | CAM enable channel 1 |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | Optional |
| Value Range | Unsigned8 |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | CAM enable channel 2 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | Optional |
| Value Range | Unsigned8 |
| Default Value | $00_h$ |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | CAM enable channel 254 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | Optional |
| Value Range | Unsigned8 |
| Default Value | $00_h$ |

### 4.10.3 CAM polarity register ($63A2_h$)

**Value definition**

See object $6302_h$ in /CiA406/.

**Object description**

| | |
|---|---|
| Index | $63A2_h$ |
| Name | CAM polarity register |
| Object Code | Array |
| Data Type | Unsigned8 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of available channels |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | CAM polarity channel 1 |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | Optional |
| Value Range | Unsigned8 |
| Default Value | $00_h$ |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | CAM polarity channel 2 |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | Optional |
| Value Range | Unsigned8 |
| Default Value | $00_h$ |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | CAM state channel 254 |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | Optional |
| Value Range | Unsigned8 |
| Default Value | $00_h$ |

## 4.11 Objects provided by car drive controller and car drive unit

The car drive controller and the car drive unit are based on /CiA402/. (*Note:* There are some additional objects necessary for lift applications that are not specified in /CiA402/). If there is no absolute encoder available, the *target velocity* ($6430_h$) shall be provided to the car drive unit using the Profile Velocity Mode; if there is an absolute encoder available, the *target position* ($6420_h$) shall be provided to the car drive unit using the Profile Position Mode.

The operation mode is selected by the *modes of operation* ($6403_h$). In case of velocity-controlled drives the Profile Velocity Mode shall be used. The objects for the velocity profile are stored in the drive unit and may be configured by the drive controller. Due to safety reasons, the configuration is not allowed in Operation Enable state of the drive unit.

The drive unit state machine is controlled by the *controlword* ($6400_h$). Drive-specific functions such as motor relays are operated locally in the drive unit. Motion is determined by a *target velocity* unequal 0. Direction is indicated by the sign of *target velocity*; positive values shall indicate upward motion of the car. Sense of rotation depends on mounting position.

Depending on the given target velocity and the velocity profile curve parameters, the drive unit calculates the *control effort* ($6406_h$). Reaching the target floor-switch the controller shall give the *end velocity* ($6424_h$) as new target velocity. Giving a target velocity of 0 shall terminate the drive. The drive unit shall indicate reaching the target velocity in the 10th bit of the *statusword* (6401h).

In case of position-controlled drives the Profile Position Mode shall be used. To configure the position profile curve the same parameters as for the velocity profile curve are used. After setting a new position, the drive unit calculates the curve and starts motion. During motion the drive controller may change target position. If the control_effort allows stopping at the new target position, this shall be indicated in the 12th bit of the *statusword*. If the drive cannot stop at the new target position, the drive unit shall move to the previous target position. Reaching a *target position* shall be indicated in the 10th bit of the *statusword*.

### 4.11.1 Motion device control functions

#### 4.11.1.1 Controlword ($6400_h$)

**Value definition**

See object $6040_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6400_h$ |
| Name | Controlword |
| Object Code | Var |
| Data Type | Unsigned16 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Possible |
| Value Range | See *value definition* |
| Default Value | No |

#### 4.11.1.2 Statusword ($6401_h$)

**Value definition**

See object $6041_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6401_h$ |
| Name | Statusword |
| Object Code | Var |
| Data Type | Unsigned16 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Possible |
| Value Range | See *value definition* |
| Default Value | No |

#### 4.11.1.3 Control option codes ($6402_h$)

This object shall be a collection of objects as defined in /CiA402/.

**Value definition**

The value definition of sub-index $01_h$ is as defined in object $605B_h$ in /CiA402/.

The value definition of sub-index $02_h$ is as defined in object $605C_h$ in /CiA402/.

The value definition of sub-index $03_h$ is as defined in object $605A_h$ in /CiA402/.

The value definition of sub-index $04_h$ is as defined in object $605D_h$ in /CiA402/.

The value definition of sub-index $05_h$ is as defined in object $605E_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6402_h$ |
| Name | Control option codes |
| Object Code | Array |
| Data Type | Integer16 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $05_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Shutdown option code |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $0000_h$ |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Disable operation option code |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $0001_h$ |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Quick stop option code |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $0002_h$ |

| | |
|---|---|
| Sub-Index | $04_h$ |
| Description | Halt option code |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $0001_h$ |

| | |
|---|---|
| Sub-Index | $05_h$ |
| Description | Fault reaction option code |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $0002_h$ |

#### 4.11.1.4 Modes of operation ($6403_h$)

**Value definition**

See object $6060_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6403_h$ |
| Name | Modes of operation |
| Object Code | Var |
| Data Type | Integer8 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Possible |
| Value Range | See *value definition* |
| Default Value | No |

#### 4.11.1.5 Modes of operation display ($6404_h$)

**Value definition**

See object $6061_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6404_h$ |
| Name | Modes of operation display |
| Object Code | Var |
| Data Type | Integer8 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Possible |
| Value Range | See *value definition* |
| Default Value | No |

#### 4.11.1.6 Motion profile type ($6405_h$)

**Value definition**

See object $6086_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6405_h$ |
| Name | Motion profile type |
| Object Code | Var |
| Data Type | Integer16 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Possible |
| Value Range | See *value definition* |
| Default Value | No |

#### 4.11.1.7 Control effort ($6406_h$)

The object description is given in /CiA402/.

**Value definition**

See object $60FA_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6406_h$ |
| Name | Control_effort |
| Object Code | Var |
| Data Type | Integer32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Possible |
| Value Range | See *value definitions* |
| Default Value | No |

#### 4.11.1.8 Max velocity and speed ($6408_h$)

This object shall be a collection of limitations of the car drive unit.

**Value definition**

The value definition of sub-index $01_h$ is as defined in object $607F_h$ in /CiA402/.

The value definition of sub-index $02_h$ is as defined in object $6080_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6408_h$ |
| Name | Max velocity and speed |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $02_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Max profile velocity |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Max motor speed |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

#### 4.11.1.9 Max acceleration and deceleration ($6409_h$)

This object shall be a collection of limitations of the car drive unit.

**Value definition**

The value description of sub-index $01_h$ is as defined in object $60C5_h$ in /CiA402/.

The value description of sub-index $02_h$ is as defined in object $60C6_h$ in /CiA402/, if implemented. If sub-index $02_h$ is not implemented, the value of sub-index $01_h$ applies fo sub-index $02_h$.

**Object description**

| | |
|---|---|
| Index | $6409_h$ |
| Name | Max acceleration and deceleration |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $02_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Max acceleration |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Max deceleration |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

#### 4.11.1.10 Quick stop deceleration ($640C_h$)

**Value definition**

See object $6085_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $640A_h$ |
| Name | Quick stop deceleration |
| Object Code | Var |
| Data Type | Unsigned32 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Access | rw |
| PDO Mapping | Possible |
| Value Range | See *value definition* |
| Default Value | No |

#### 4.11.1.11 Profile acceleration and deceleration ($640B_h$)

This object shall be a collection of parameters of the car drive unit.

**Value definition**

The value description of sub-index $01_h$ is as defined in object $6083_h$ in /CiA402/.

The value description of sub-index $02_h$ is as defined in object $6084_h$ in /CiA402/, if implemented. If sub-index $02_h$ is not implemented, the value of sub-index $01_h$ applies for sub-index $02_h$.

**Object description**

| | |
|---|---|
| Index | $640B_h$ |
| Name | Profile acceleration and deceleration |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $02_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Profile acceleration |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Profile deceleration |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

#### 4.11.1.12 Profile jerk use ($640C_h$)

This object shall define the number of parameters of object $640D_h$ that are used for the jerk during profile movement.

**Value definition**

The value has to be a value between $00_h$ and $06_h$. The value of $00_h$ shall disable the use of jerk during profile movement. Other possible values see object $640D_h$.

If this obeject is not implemented the sub-index $00_h$ of object $640D_h$ applies to this value.

**Object description**

| | |
|---|---|
| Index | $640C_h$ |
| Name | Profile jerk use |
| Object Code | Var |
| Data Type | Unsigned8 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Access | rw |
| PDO Mapping | No |
| Value Range | $00_h$, $01_h$, $02_h$, $04_h$, $06_h$ |
| Default Value | No |

#### 4.11.1.13 Profile jerk ($640D_h$)

This object shall be a collection of parameters used during profile movement.

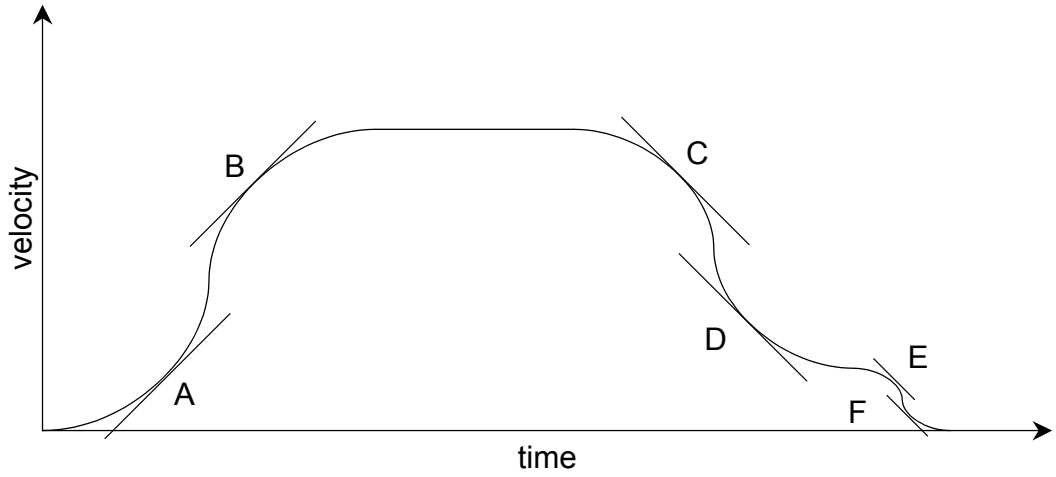



**Figure 1 - Velocity - time diagram for use with jerk**

**Value definition**

If object $640C_h$ is implemented and has a value of $01_h$, or if object $640C_h$ is not implemented and object $640D_h$ sub-index $00_h$ has a value of $01_h$:

**Table 1 - Number of jerk parameters used = 1**

| Position according to Figure 1 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| **Sub-index assigned** | $01_h$ | $01_h$ | $01_h$ | $01_h$ | - | - |

If object $640C_h$ is implemented and has a value of $02_h$, or if object $640C_h$ is not implemented and object $640D_h$ sub-index $00_h$ has a value of $02_h$:

**Table 2 - Number of jerk parameters used = 2**

| Position according to Figure 1 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| **Sub-index assigned** | $01_h$ | $01_h$ | $02_h$ | $02_h$ | - | - |

If object $640C_h$ is implemented and has a value of $04_h$, or if object $640C_h$ is not implemented and object $640D_h$ sub-index $00_h$ has a value of $04_h$:

**Table 3 - Number of jerk parameters used = 4**

| Position according to Figure 1 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| **Sub-index assigned** | $01_h$ | $03_h$ | $02_h$ | $04_h$ | - | - |

If object $640C_h$ is implemented and has a value of $06_h$, or if object $640C_h$ is not implemented and object $640D_h$ sub-index $00_h$ has a value of $06_h$:

**Table 4 - Number of jerk parameters used = 6**

| Position according to Figure 1 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| **Sub-index assigned** | $01_h$ | $03_h$ | $02_h$ | $04_h$ | $05_h$ | $06_h$ |

**Object description**

| | |
|---|---|
| Index | $640D_h$ |
| Name | Profile jerk |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$, $02_h$, $04_h$, $06_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Profile jerk 1 |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Profile jerk 2 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $06_h$ |
| Description | Profile jerk 6 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.11.2 Motor data ($640F_h$)

This shall contain as much as possible information about the connected motor. The structure of this record is described in the drive manufacturer's handbook.

**Value definition**

All values are manufacturer-specific.

**Object description**

| | |
|---|---|
| Index | $640F_h$ |
| Name | Motor data |
| Object Code | Record |
| Data Type | Manufacturer-specific |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | manufacturer-specific |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | manufacturer-specific |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | manufacturer-specific |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | manufacturer-specific |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | manufacturer-specific |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | manufacturer-specific |
| Default Value | No |

### 4.11.3 Motion factor group

#### 4.11.3.1 Position dimension ($6410_h$)

This object shall be a collection of configuration parameters of the car drive unit.

**Value definition**

The value definition of sub-index $01_h$ shall be as defined in object $6089_h$ in /CiA402/.

The value definition of sub-index $02_h$ shall be as defined in object $608A_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6410_h$ |
| Name | Position dimension |
| Object Code | Record |
| Data Type | Dimension record |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $02_h$ |
| Default Value | $02_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Position notation index |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 0 |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Position dimension index |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

#### 4.11.3.2 Velocity dimension ($6411_h$)

This object shall be a collection of configuration parameters of the car drive unit.

**Value definition**

The value definition of sub-index $01_h$ shall be as defined in object $608B_h$ in /CiA402/.

The value definition of sub-index $02_h$ shall be as defined in object $608C_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6411_h$ |
| Name | Velocity dimension |
| Object Code | Record |
| Data Type | Dimension record |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $02_h$ |
| Default Value | $02_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Velocity notation index |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 0 |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Velocity dimension index |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

#### 4.11.3.3 Acceleration dimension ($6412_h$)

This object shall be a collection of configuration parameters of the car drive unit.

**Value definition**

The value definition of sub-index $01_h$ shall be as defined in object $608D_h$ in /CiA402/.

The value definition of sub-index $02_h$ shall be as defined in object $608E_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6412_h$ |
| Name | Acceleration dimension |
| Object Code | Record |
| Data Type | Dimension record |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $02_h$ |
| Default Value | $02_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Acceleration notation index |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 0 |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Acceleration dimension index |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

#### 4.11.3.4 Jerk dimension ($6413_h$)

This object shall be a collection of configuration parameters of the car drive unit.

**Object description**

| | |
|---|---|
| Index | $6413_h$ |
| Name | Jerk dimension |
| Object Code | Record |
| Data Type | Dimension record |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $02_h$ |
| Default Value | $02_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Jerk notation index |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 0 |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Jerk dimension index |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

#### 4.11.3.5 Position encoder resolution ($6414_h$)

This object shall be a collection of configuration parameters of the car drive unit.

**Value definition**

See object $608F_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6414_h$ |
| Name | Position encoder resolution |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $02_h$ |
| Default Value | $02_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Encoder increments |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 1 |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Motor revolutions |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 1 |

#### 4.11.3.6 Velocity encoder resolution ($6415_h$)

This object shall be a collection of configuration parameters of the car drive unit.

**Value definition**

See object $6090_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6415_h$ |
| Name | Velocity encoder resolution |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $02_h$ |
| Default Value | $02_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Encoder increments per second |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 1 |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Motor revolutions per second |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 1 |

#### 4.11.3.7 Gear ration ($6416_h$)

This object shall be a collection of configuration parameters of the car drive unit.

**Value definition**

See object $6091_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6416_h$ |
| Name | Gear ration |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $02_h$ |
| Default Value | $02_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Motor revolutions |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 1 |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Shaft revolutions |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 1 |

#### 4.11.3.8 Feed constant ($6417_h$)

This object shall be a collection of configuration parameters of the car drive unit.

**Value definition**

See object $6092_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6417_h$ |
| Name | Feed constant |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $02_h$ |
| Default Value | $02_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Feed |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 1 |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Shaft revolutions |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 1 |

#### 4.11.3.9 Position factor ($6418_h$)

This object shall be a collection of configuration parameters of the car drive unit.

**Value definition**

See object $6093_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6418_h$ |
| Name | Position factor |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $02_h$ |
| Default Value | $02_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Numerator |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 1 |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Feed constant |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 1 |

#### 4.11.3.10 Velocity encoder factor ($6419_h$)

This object shall be a collection of configuration parameters of the car drive unit.

**Value definition**

See object $6094_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6419_h$ |
| Name | Velocity encoder factor |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $02_h$ |
| Default Value | $02_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Numerator |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 1 |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Divisor |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 1 |

#### 4.11.3.11 Velocity factor 1 ($641A_h$)

This object shall be a collection of configuration parameters of the car drive unit.

**Value definition**

See object $6095_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $641A_h$ |
| Name | Velocity factor 1 |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $02_h$ |
| Default Value | $02_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Numerator |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 1 |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Divisor |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 1 |

#### 4.11.3.12 Velocity factor 2 ($641B_h$)

This object shall be a collection of configuration parameters of the car drive unit.

**Value definition**

See object $6096_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $641B_h$ |
| Name | Velocity factor 2 |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $02_h$ |
| Default Value | $02_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Numerator |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 1 |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Divisor |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 1 |

#### 4.11.3.13 Acceleration factor ($641C_h$)

This object shall be a collection of configuration parameters of the car drive unit.

**Value definition**

See object $6097_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $641C_h$ |
| Name | Acceleration factor |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $02_h$ |
| Default Value | $02_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Numerator |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 1 |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Divisor |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 1 |

#### 4.11.3.14 Jerk factor ($641D_h$)

This object shall be a collection of configuration parameters of the car drive unit. The jerk factor converts the jerk into the internal format.

**Object description**

| | |
|---|---|
| Index | $641D_h$ |
| Name | Jerk factor |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $02_h$ |
| Default Value | $02_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Numerator |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 1 |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Divisor |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 1 |

#### 4.11.3.15 Polarity ($641E_h$)

**Value definition**

See object $607E_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $641E_h$ |
| Name | Polarity |
| Object Code | Var |
| Data Type | Unsigned8 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $00_h$ |

### 4.11.4 Motion profile position mode

#### 4.11.4.1 Target position ($6420_h$)

**Value definition**

See object $607A_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6420_h$ |
| Name | Target position |
| Object Code | Var |
| Data Type | Integer32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Possible |
| Value Range | See *value definition* |
| Default Value | No |

#### 4.11.4.2 Position range limit ($6421_h$)

**Value definition**

See object $607B_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6421_h$ |
| Name | Position range limit |
| Object Code | Array |
| Data Type | Integer32 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $02_h$ |
| Default Value | $02_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Min position range limit |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $-2^{31}$ |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Max position range limit |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $2^{31} - 1$ |

#### 4.11.4.3 Software position limit ($6422_h$)

**Value definition**

See object $607D_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6422_h$ |
| Name | Software position limit |
| Object Code | Array |
| Data Type | Integer32 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $02_h$ |
| Default Value | $02_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Min position limit |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 1 |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Max position limit |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | 1 |

#### 4.11.4.4 Profile velocity ($6423_h$)

**Value definition**

See object $6081_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6423_h$ |
| Name | Profile velocity |
| Object Code | Var |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $0000\ 0001_h$ |

#### 4.11.4.5 End velocity ($6424_h$)

**Value definition**

See object $6082_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6424_h$ |
| Name | End velocity |
| Object Code | Var |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $0000\ 0001_h$ |

### 4.11.5 Motion profile homing mode

#### 4.11.5.1 Home offset ($6428_h$)

**Value definition**

See object $607C_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6428_h$ |
| Name | Home offset |
| Object Code | Var |
| Data Type | Integer32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Possible |
| Value Range | See *value definition* |
| Default Value | 0000 $0000_h$ |

### 4.11.6 Motion profile velocity mode

#### 4.11.6.1 Target velocity ($6430_h$)

**Value definition**

See object $60FF_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6430_h$ |
| Name | Target velocity |
| Object Code | Var |
| Data Type | Integer32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Possible |
| Value Range | See *value definition* |
| Default Value | No |

#### 4.11.6.2 Velocity sensor actual value ($6431_h$)

**Value definition**

See object $6069_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6431_h$ |
| Name | Velocity sensor actual value |
| Object Code | Var |
| Data Type | Integer32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Possible |
| Value Range | See *value definition* |
| Default Value | No |

#### 4.11.6.3 Velocity demand value ($6432_h$)

**Value definition**

See object $606B_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6432_h$ |
| Name | Velocity demand value |
| Object Code | Var |
| Data Type | Integer32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Possible |
| Value Range | See *value definition* |
| Default Value | No |

#### 4.11.6.4 Velocity actual value ($6433_h$)

**Value definition**

See object $606C_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6433_h$ |
| Name | Velocity actual value |
| Object Code | Var |
| Data Type | Integer32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Possible |
| Value Range | See *value definition* |
| Default Value | No |

#### 4.11.6.5 Sensor selection code ($6434_h$)

**Value definition**

See object $606A_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6434_h$ |
| Name | Sensor selection code |
| Object Code | Var |
| Data Type | Integer16 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

#### 4.11.6.6 Velocity window ($6435_h$)

This object shall be a collection of configuration parameters of the car drive unit.

**Value definition**

The value definition of sub-index $01_h$ shall be as defined in object $606D_h$ in /CiA402/.

The value definition of sub-index $02_h$ shall be as defined in object $606E_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6435_h$ |
| Name | Velocity window |
| Object Code | Array |
| Data Type | Integer32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $02_h$ |
| Default Value | $02_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Velocity window |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Velocity window time |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

#### 4.11.6.7 Velocity threshold ($6436_h$)

This object shall be a collection of configuration parameters of the car drive unit.

**Value definition**

The value definition of sub-index $01_h$ shall be as defined in object $606F_h$ in /CiA402/.

The value definition of sub-index $02_h$ shall be as defined in object $6070_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6436_h$ |
| Name | Velocity threshold |
| Object Code | Array |
| Data Type | Integer32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $02_h$ |
| Default Value | $02_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Velocity threshold |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Velocity threshold time |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

#### 4.11.6.8 Max slippage ($6437_h$)

**Value definition**

See object $60F8_h$ in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6437_h$ |
| Name | Max slippage |
| Object Code | Var |
| Data Type | Integer32 |
| Category | Optional |

**Entry description**

| | |
|---|---|
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

#### 4.11.6.9 Velocity control parameter set ($6438_h$)

**Value definition**

See object 60F9h in /CiA402/.

**Object description**

| | |
|---|---|
| Index | $6438_h$ |
| Name | Velocity control parameter set |
| Object Code | Array |
| Data Type | Unsigned16 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $02_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Gain |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | $T_i$ – integration time constant |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Velocity demand value |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Velocity demand value |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

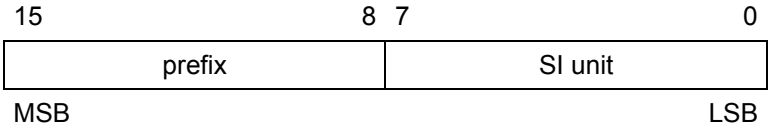
## 4.12 Objects provided by the load measuring unit

### 4.12.1 Load value ($6480_h$)

**Value description**

The load value shall be the absolut value of the load given in mutiples of the given SI unit. The load value of $FFFF_h$ shall be an error value that is applied, if the sensor is in error state or does not have an actual value. If the SI unit is not supported, then the load shall be in mutiples of *kg*.

*SI unit*




**Object description**

| | |
|---|---|
| Index | $6480_h$ |
| Name | Load value |
| Object Code | Array |
| Data Type | Unsigned16 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $02_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Absolute load value |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Default |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | SI unit |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $0002_h$ |

### 4.12.2 Load limits ($6481_h$)

**Value description**

The highlimit and the lowlimit value for the absolute load value shall be given in the same unit as the aboslute load value itself.

**Object description**

| | |
|---|---|
| Index | $6481_h$ |
| Name | Load limits |
| Object Code | Array |
| Data Type | Unsigned16 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $02_h$ |
| Default Value | $02_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Lowlimit |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Highlimit |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.12.3 Load signaling ($6482_h$)

The object shall be used to signal measuring values of the load measuring system. Such a signal includes signaling of zero load, norm load, full load, and overload. For every of these situations a limit shall be given (see object $6483_h$). Anytime the limit will be reached by the absolute load value the appropriate signal is caused. The limit is given in the same unit as the absolute load value.

**Value description**

*Load signal*

| 7 … 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|
| reserved | Overload | Full load | Norm load | Zero load |

MSB LSB

0 - limit not reached 1 - limit reached

*Load signal interrupt*

| 7 … 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|
| reserved | Overload | Full load | Norm load | Zero load |

MSB LSB

0 - do not generate interrupt 1 - generate interrupt

**Object description**

| | |
|---|---|
| Index | $6482_h$ |
| Name | Load signaling |
| Object Code | Array |
| Data Type | Unsigned8 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $02_h$ |
| Default Value | $02_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Load signal |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | Default |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Load signal interrupt |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | $0F_h$ |

### 4.12.4 Load signaling limits ($6483_h$)

The object shall be used in conjunction with the object load signaling. The object shall specify the limits used for the signals.

**Value description**

The limits are given in the same unit as the absolute load value. The value $FFFF_h$ shall indicate an unused limit.

**Object description**

| | |
|---|---|
| Index | $6483_h$ |
| Name | Load signaling limits |
| Object Code | Array |
| Data Type | Unsigned16 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $04_h$ |
| Default Value | $04_h$ |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Zero load limit |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Norm load limit |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $03_h$ |
| Description | Full load limit |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | 04 |
| Description | Overload limit |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.12.5 Rope load ($6484_h$)

The object shall apply for load measuring systems that are used where several ropes apply to the same car. It shall be used to measure the load for each rope.

**Value description**

The load value for each rope shall be given in the same unit as the absolute load value.

**Object description**

| | |
|---|---|
| Index | $6484_h$ |
| Name | Rope load |
| Object Code | Array |
| Data Type | Unsigned16 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of ropes |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $1_d$ to $254_d$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Rope 1 |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Rope 2 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

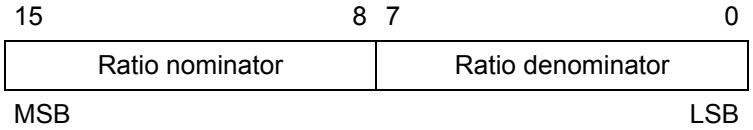
to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Rope 254 |
| Entry Category | Optional |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.12.6 Load measuring system configuration ($6485_h$)

**Value description**

*Rope ratio*




**Object description**

| | |
|---|---|
| Index | $6485_h$ |
| Name | Load measuring system configuration |
| Object Code | Array |
| Data Type | Unsigned16 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of entries |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Rope ratio |
| Entry Category | Mandatory |
| Access | See *CiA DSP 417-2* |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

## 4.13 Objects provided by the sensor unit

### 4.13.1 Sensor groups ($6500_h$ to $651F_h$)

These objects shall contain data of the state, the assigned function and the function-depended parameters of a sensor group. One sub-index represents a single sensor input. Each sensor group can manage up to 254 sensor signals. There may be addressed up to 32 x 254 sensor signals per lift-control application. If eight lift-control applications are implemented, there are available system-wide 65,024 sensor signals.

If the sensor signal changes, the application shall store the state of the virtual sensor signal in the corresponding sub-index and shall map the sensor data into the virtual input mapping ($6012_h$) object.

The structure of these objects shall be as follows:

| Byte 5 | Byte 4 | Byte 3 | Byte 2 | Byte 1 | Byte 0 |
|---|---|---|---|---|---|
| *Function data* | | *Source position* | *Source floor* | *Source lift* | *Basic function* |
| MSB | | | | | LSB |

**Value definition**

***Basic function***

The value of this field shall provide the *basic function* of a virtual input.

| Value | Description |
|---|---|
| $00_h$ | reserved |
| $01_h$ | Generic sensor |
| $02_h$ | Glas sensor |
| $03_h$ | Smoke sensor |
| $04_h$ | Damage sensor |
| $05_h$ | Pressure sensor |
| $06_h$ | Temperature sensor |
| $07_h$ to $7F_h$ | reserved |
| $80_h$ to $FF_h$ | manufacturer-specific |

***Function data***

The values of this field shall provide the *function data* of a virtual input.

The values of the *function data* field depending of the *basic function* value.

If the *basic function* value = $01_h$

The values of the *function data* field are reserved.

If the *basic function* value = $02_h$ to $04_h$

Value definitions of the *function data* field

| Bit 15 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|
| *reserved (1111 1111 1111 $11_b$)* | | *Sensor signal* | |
| MSB | | | LSB |

For the sub-fields *sensor signal* the following bit codes shall apply:

| Value | Description |
|---|---|
| $00_b$ | no signal set |
| $01_b$ | signal set |
| $10_b$ | sensor is defect |
| $11_b$ | sensor is not installed |

If the *basic function* value = $05_h$ to $06_h$

Value definitions of the *function data* field

| Bit 15 | | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|---|
| *Sensor value* | | | *Sensor signal* | |
| MSB | | | | LSB |

For the sub-fields *sensor signal* the following bit codes shall apply:

| Value | Description |
|---|---|
| $00_b$ | no signal set |
| $01_b$ | signal set |
| $10_b$ | sensor is defect |
| $11_b$ | sensor is not installed |

The sub-field sensor value shall be signed left adjusted 14-bit value in mutiples of the SI unit (see *sensor parameter*).

If the basic function value = $07_h$ to $11_h$

The values of the function data field are reserved.

***Source lift***

The value of this field shall provide the number of the lift or the group of lifts to which the virtual device is assigned.

| Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|---|---|---|---|
| *Lift 8* | *Lift 7* | *Lift 6* | *Lift 5* | *Lift 4* | *Lift 3* | *Lift 2* | *Lift 1* |
| MSB | | | | | | | LSB |

| Value | Description |
|---|---|
| 0 | no request |
| 1 | request |

If the virtual device is assigned to the inside of a car, only one bit shall be set.

***Source floor***

The value of this field shall provide the floor number to which the virtual device is assigned.

| Bit 7 | | | | | | | Bit 0 |
|---|---|---|---|---|---|---|---|
| *Floor number* | | | | | | | |
| MSB | | | | | | | LSB |

Bit 0 to bit 7 defines the values $1_d$ to $254_d$. Value $255_d$ is reserved. In case the virtual device is assigned to car the value is $0_d$.

***Source position***

The value of this field shall provide the position to which the virtual device is assigned.

| Value | Description |
|---|---|
| $00_h$ to $7F_h$ | reserved |
| $80_h$ to $FF_h$ | manufacturer specific |

**Object description**

| | |
|---|---|
| Index | $6500_h$ to $651F_h$ |
| Name | Sensor group 1 to Sensor group 32 |
| Object Code | Array |
| Data Type | Unsigned48 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of supported sensors |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Virtual sensor 1 |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Virtual sensor 2 |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Virtual sensor 254 |
| Entry Category | Optional |
| Access | ro |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

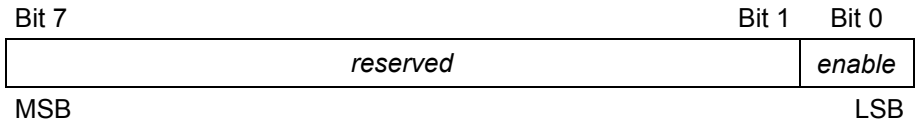
### 4.13.2 Sensor parameter 1 ($6520_h$ to $653F_h$)

These objects shall define the system behavior of the sensors. Object $6520_h$ corresponds to sensor group 1, object $6521_h$ corresponds to sensor group 2 etc.

**Value definition**

| Byte 3 | Byte 2 | Byte 1 | Byte 0 |
|---|---|---|---|
| *reserved ($FFFF_h$)* | | *Error code* | *Enable* |
| MSB | | | LSB |

For the sub-field *enable* the following bit codes shall apply:




If bit 0 is set the virtual sensor shall be enabled. If bit 0 is not set the virtual sensor shall be disabled. Bit 1 to bit 7 are reserved for future use.

The sub-field *error code* provides the error status of its assigned virtual sensor.

If no sub-field is used the value shall be $FF_h$.

**Object description**

| | |
|---|---|
| Index | $6520_h$ to $653F_h$ |
| Name | Parameter 1 group 1 to Parameter 1 group 32 |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of supported sensors |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Parameter 1 sensor 1 |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Parameter 1 sensor 2 |
| Entry Category | Mandatory, if sensor group 2 is implemented |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Parameter 1 sensor 254 |
| Entry Category | Mandatory, if sensor group 254 is implemented |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.13.3 Sensor parameter 2 ($6540_h$ to $655F_h$)

These objects shall define the logical behavior of the sensors. Object $6540_h$ corresponds to sensor group 1, object $6541_h$ corresponds to sensor group 2 etc.

**Value definition**

| Byte 3 | Byte 2 | Byte 1 | Byte 0 |
|---|---|---|---|
| *reserved ($FF_h$)* | *Sending event* | *Limitation* | *reserved ($FF_h$)* |
| MSB | | | LSB |

The sub-field *limitation* provides the value how many sensor events per second are allowed. The value $00_h$ shall be reserved.

The sub-field *sending event* provides the value how many sensor events per second are necessary to start a message. The value $00_h$ shall be reserved.

If no sub-field is used the value shall be $FF_h$.

**Object description**

| | |
|---|---|
| Index | $6540_h$ to $655F_h$ |
| Name | Parameter 2 group 1 to Parameter 2 group 32 |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of supported sensors |
| Entry Category | Mandatory |
| Access | ro |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Parameter 2 sensor 1 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Parameter 2 sensor 2 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Parameter 2 sensor 254 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

### 4.13.4 Sensor parameter 3 ($6560_h$ to $657F_h$)

These objects shall define the physical behavior of the sensors. Object $6560_h$ corresponds to sensor group 1, object $6561_h$ corresponds to sensor group 2 etc.

**Value definition**

| Byte 3 | Byte 2 | Byte 1 | Byte 0 |
|---|---|---|---|
| *prefix* | *SI unit* | *Edge / polarity* | *Debounce time* |
| MSB | | | LSB |

The *debounce time* shall be given in milliseconds.

For the sub-fields *edge/priority* the following bit codes shall apply:

| Bit 7 | Bit 6 | Bit 2 | Bit 1 | Bit 0 |
|---|---|---|---|---|
| *polarity* | *reserved ($11111_b$)* | | *HL edge* | *LH edge* |
| MSB | | | | LSB |

If *LH edge* bit is set to 1, a low-to-high edge shall cause a mapping of the corresponding input to object $6010_h$. If *HL edge* bit is set to 1, a high-to-low edge shall cause a mapping of the corresponding input to object $6010_h$. *Polarity* bit shall be set to 1 if the corresponding input is inverted and shall be set to 0 if it is not inverted.

If no sub-field is used the value shall be $FF_h$.

The sub-fields SI unit and prefix shall only apply for specific types of sensors (basic function = $05_h$ to $06_h$). If it is not used the value shall be $FFFF_h$

**Object description**

| | |
|---|---|
| Index | $6560_h$ to $657F_h$ |
| Name | Parameter 3 group 1 to Parameter 3 group 32 |
| Object Code | Array |
| Data Type | Unsigned32 |
| Category | See *CiA DSP 417-2* |

**Entry description**

| | |
|---|---|
| Sub-Index | $00_h$ |
| Description | Number of supported sensors |
| Entry Category | Mandatory |
| Access | rw |
| PDO Mapping | No |
| Value Range | $01_h$ to $FE_h$ |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $01_h$ |
| Description | Parameter 3 sensor 1 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

| | |
|---|---|
| Sub-Index | $02_h$ |
| Description | Parameter 3 sensor 2 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |

to

| | |
|---|---|
| Sub-Index | $FE_h$ |
| Description | Parameter 3 sensor 254 |
| Entry Category | Optional |
| Access | rw |
| PDO Mapping | No |
| Value Range | See *value definition* |
| Default Value | No |