

CiA 417



Application profile for lift control systems

Part 2: Virtual device definitions

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HISTORY

Date	Changes
2003-07-15	<i>Publication of version 1.0</i> as draft standard proposal
2010-02-01	<i>Publication of version 2.0</i> as draft standard proposal - Completely reviewed - PDO support reviewed and added - Supported application objects updated NOTE: Version 2.0 is partly incompatible to version 1.0
2011-02-02	<i>Publication of version 2.0</i> as public specification

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1 Scope

This set of CANopen application profile specifications describes the *CANopen Lift* control network system. It specifies the CANopen communication interfaces and the application functionality of several functional elements (virtual devices).

This application profile specification consists of several parts:

- Part 1 provides general definitions
- Part 2 specifies the functionality of the virtual devices
- Part 3 specifies the pre-defined PDOs
- Part 4 specifies the application objects

This part specifies for a single lift application (lift 1) the general communication parameter. It specifies also for each virtual device the supported application objects including the category, access, and default value attributes. It describes the supported Process Data Objects (PDO). In addition, the PDOs for the other lift application 2 to 8 are assigned correspondingly.

2 Normative references

The normative references given in part 1 apply for this part, too.

3 Definitions, acronyms and abbreviations

The definitions, acronyms and abbreviations given in part 1 apply for this part, too.

4 Operating principles

4.1 General

Each CANopen 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 devices and each device only implements those objects relevant to its functions (virtual device). The Object Dictionary entries from 6000_h to 60FF_h are related to the CANopen device and not to one of the lift-control applications. The Object Dictionary entries from 6100_h to 62FF_h are related to the VD input panel units; They do not belong to a specific lift-control.

It is possible to realize up to 8 lift-control applications in one CANopen device. For VDs belonging to the specific lift-control application 1 the range 6200_h to 67FE_h is used. For VDs belonging to other lift-control applications the object range 6200_h to 67FE_h shall be shifted as follows:

- 6200_h to 67FE_h lift-control application 1
- 6A00_h to 6FFE_h lift-control application 2
- 7200_h to 77FE_h lift-control application 3
- 7A00_h to 7FFE_h lift-control application 4
- 8200_h to 87FE_h lift-control application 5
- 8A00_h to 8FFE_h lift-control application 6
- 9200_h to 97FE_h lift-control application 7
- 9A00_h to 9FFF_h lift-control application 8

The TPDO and RPDO communication and mapping parameters as well as the pre-defined default CAN-IDs are specified in part 3 of this profile specification.

4.2 Control functions

In many lift control systems, all virtual control functions are implemented in a single CANopen device. Of course, it is possible to implement the different virtual control functions in several CANopen devices. The communication between the virtual controllers is not specified and therefore manufacturer-specific. This means additional manufacturer-specific SDO and PDO communication is necessary.

The VD call controller collects all PDOs provided by input panel units and it sends one single TPDO to all output panel units.

The VD car door controller receives door unit status information from all car door units by means of different PDOs and sends the door commands in a single TPDO to all car door units. It also collects all PDOs provided by the light barrier units and the car position sent by the car position unit.

The VD car drive controller send the drive commands to the car drive unit by means of PDO, and receives the car drive status also by means of a PDO. It also receives the car position and the load measurement by PDO from the car position unit respectively the load-measuring 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_n) shall be provided to the car drive unit using the Profile Velocity Mode; if there is an absolute encoder available, the *target position* (6420_n) shall be provided to the car drive unit using the Profile Position Mode.

The operation mode is selected by the *modes of operation* (6403_n). 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.

5 Object dictionary entries

5.1 General

Every CANopen device compliant with this application profile supports some general communication and application objects as well as virtual device specific application objects. It consists of one or more virtual devices as defined in /CiA301/. A virtual device shall not be distributed to several CANopen devices. Each virtual device supports a set of mandatory function-depending application objects and may implement additionally a variable set of optional application objects.

All objects are specified by means of object and entry description as defined in /CiA301/. The description attributes are defined in /CiA301/. The *category* attribute indicates, if an object shall be supported (*Mandatory*) or may be supported (*Optional*). The *access* attribute indicates, if an object is constant (*const*), read only (*ro*), read/write (*rw*) or write only (*wo*). *Read only* indicates that this object shall not be written via the bus; *read/write* allows to read and to write this object; and *write only* means that this object shall be not read via the bus. The *default value* attribute defines the behavior of (application) objects after power-on or NMT application reset.

The information given in clause 5.3 about application objects mapped into PDOs is informative.

5.2 General communication objects

5.2.1 General

CANopen devices compliant with this application profile use default values for some communication objects (1000_h to 1FFF_h), which are not specified in all details in /CiA301/. In the following chapters these default values are specified in detail.

5.2.2 Object 1000_h: Device type

This object describes the type of device and its functionality. The object and entry description are given in /CiA301/. Figure 1 specifies the *additional information* field. Table 1 defines the values for the *virtual device code* field.

If the device implements just one virtual device, the *additional information* field contains the virtual device code. If the device code is '0', the CANopen device implements more than only one virtual device. In this case, the object 6000_h contains the codes of all implemented virtual devices.

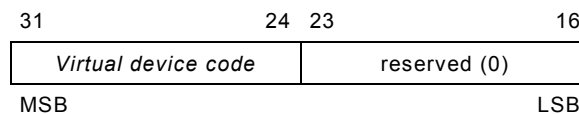


Figure 1 – Additional information field structure

Table 1 – Virtual device code values

Code	Virtual device function
00 _h	Multiple virtual device
01 _h	Call controller
02 _h	Input panel unit
03 _h	Output panel unit
04 _h	Car door controller
05 _h	Car door unit
06 _h	Car position unit
07 _h	Light barrier unit
08 _h	Car drive controller
09 _h	Car drive unit
0A _h	Load-measuring unit
0B _h	Remote data transmission unit
0C _h	reserved
<i>to</i>	
FF _h	reserved

5.2.3 Object 1001_h: Error register

The device profile specific bit in the error register is reserved for future use. The object and entry description are given in /CiA301/.

5.2.4 Object 1016_h: Consumer heartbeat times

This object shall be implemented, if the CANopen device receives event-triggered PDOs. It shall consume the heartbeats from all CANopen devices, which produces the received event-triggered PDOs. The consumer heartbeat times shall be set to 3 s by default. The reaction on a heartbeat event is not in the scope of this specification. The object and entry description are given in /CiA301/.

NOTE If a device receives from the call/drive/car door controller (with node-ID = 1) PDOs, it uses the sub-index 01_h to consume the corresponding Heartbeat (CAN-ID = 701_h).

5.2.5 Object 1017_h: Producer heartbeat time

This object shall be implemented. The heartbeat producer time shall be set to 1 s by default. The object and entry description are given in /CiA301/.

5.2.6 Object 1018_h: Identity

This object is mandatory and contains in sub-index 01_h the unique vendor-ID assigned by CiA. Sub-index 02_h to 04_h are optional. The object and entry description are given in /CiA301/.

5.2.7 Object 1029_h: Error behavior

This object specifies to which state the physical device shall be set, when a communication error or a device internal error is detected. Besides the specification given in /CiA301/ the following sub-indexes may be implemented optionally. If the entire object is not implemented the CANopen device shall behave as the default values define.

Table 2 specifies the values.

Table 2 – Value definition

Value	Definition
00 _h	Change to NMT state Pre-operational (only if currently in NMT state Operational)
01 _h	No change of the NMT state
02 _h	Change to NMT state Stopped

The object description and the entry description for sub-index 00_h and 01_h are given in /CiA301/. Table 3 specifies the entry description for sub-index 02_h.

Table 3 – Entry description for sub-index 02_h

Attribute	Value
Sub-index	02 _h
Description	Internal device error
Access	rw
Entry category	Optional
PDO mapping	No
Value range	00 _h to 02 _h
Default value	00 _h

5.3 Supported application objects, PDOs, and SDOs for lift-application 1

5.3.1 General

If a CANopen device implements one or several virtual devices, it supports all mandatory application objects as well as all mandatory PDOs to external virtual devices. In addition, it

implements depending on the desired device functionality optional application objects and optional PDOs.

If the CANopen device implements the corresponding TPDO and RPDO, the PDO is normally communicated device-internally and not via CAN. The virtual devices with control functions are normally implemented in the same CANopen device. When they are implemented in several CANopen devices, additional PDOs and SDOs are required. They are not purpose of this application profile. They are implemented manufacturer-specific.

5.3.2 General application objects

Every CANopen device compliant with this application profile may implement the application objects shown in Table 4. The *category*, *access*, and *default value* attributes shall be used.

Table 4 – General application objects

Index	Name	Cat.	Acc.	Default value
6000 _h	Supported virtual device types (NOTE 1)	C	rw	Manufacturer-specific
6001 _h	Lift number	O	rw	Manufacturer-specific
6005 _h	Lock/unlock parameters	O	rw	Manufacturer-specific
6008 _h	Specification version	O	const	Manufacturer-specific
600A _h	Virtual terminal interface (NOTE 2)	O	-	-
NOTE 1 Mandatory for CANopen devices supporting more than one virtual device, or which are configurable regarding the support lift applications.				
NOTE 2 Sub-index 01 _h is rw with a manufacturer-specific default value; sub-index 02 _h is ro with no default value. It is mandatory for car drive units and optional for all other virtual devices.				

Table 5 specifies the generic PDOs not related to any virtual device, which every CANopen device compliant to this application profile shall (category = M) and may (category = O) support.

Table 5 – Generic PDOs

PDO no.	Cat.	Mapped application objects (informative)
TPDO 2	O	MPDO
RPDO 2	O	MPDO (transmitted by node-ID = 1)
<i>to</i>		
RPDO 128	O	MPDO (transmitted by node-ID = 127)

5.3.3 Input panel unit

Table 6 lists all applications objects used by the VD input panel unit. The *category*, *access*, and *default value* attributes shall be used.

Table 6 – Input panel unit specific application objects

Index	Name	Cat.	Acc.	Default value
6002 _h	Floor number	O	rw	Manufacturer-specific
6003 _h	Door number	O	rw	Manufacturer-specific
6010 _h	Virtual input mapping	M	ro	No
6100 _h	Input group 1	M	ro	No
6101 _h	Input group 2	O	ro	No
.....
611F _h	Input group 32	O	ro	No

Index	Name	Cat.	Acc.	Default value
6120 _h	Input parameter 1 group 1	O	rw	Manufacturer-specific
6121 _h	Input parameter 1 group 2	O	rw	Manufacturer-specific
.....
613F _h	Input parameter 1 group 32	O	rw	Manufacturer-specific
6140 _h	Input parameter 2 group 1	O	rw	Manufacturer-specific
6141 _h	Input parameter 2 group 2	O	rw	Manufacturer-specific
.....
615F _h	Input parameter 2 group 32	O	rw	Manufacturer-specific
6160 _h	Input parameter 3 group 1	O	rw	Manufacturer-specific
6161 _h	Input parameter 3 group 2	O	rw	Manufacturer-specific
.....
617F _h	Input parameter 3 group 32	O	rw	Manufacturer-specific
6180 _h	Input parameter 4 group 1	O	rw	Manufacturer-specific
.....
619F _h	Input parameter 4 group 32	O	rw	Manufacturer-specific

Table 7 specifies, which PDOs the input panel unit shall (category = M) and may (category = O) support.

Table 7 – PDOs supported by the input panel unit

PDO no.	Cat.	Mapped application objects (informative)
TPDO 130	M	6010 00 _h

5.3.4 Output panel unit for lift 1

Table 8 lists all applications objects used by the VD output panel unit. The category, access, and default value attributes shall be used.

Table 8 – Output panel unit specific application objects

Index	Name	Cat.	Acc.	Default value
6002 _h	Floor number	O	rw	Manufacturer-specific
6003 _h	Door number	O	rw	Manufacturer-specific
6011 _h	Virtual output mapping	M	rw	00 0000 0000 _h
6200 _h	Output group 1	M	rw	Manufacturer-specific
6201 _h	Output group 2	O	rw	Manufacturer-specific
.....
621F _h	Output group 32	O	rw	Manufacturer-specific
6220 _h	Output parameter 1 group 1	O	rw	Manufacturer-specific
6221 _h	Output parameter 1 group 2	O	rw	Manufacturer-specific
.....
623F _h	Output parameter 1 group 32	O	rw	Manufacturer-specific
6240 _h	Output parameter 2 group 1	O	rw	Manufacturer-specific
6241 _h	Output parameter 2 group 2	O	rw	Manufacturer-specific
.....
625F _h	Output parameter 2 group 32	O	rw	Manufacturer-specific
6260 _h	Output parameter 3 group 1	O	rw	Manufacturer-specific
6261 _h	Output parameter 3 group 2	O	rw	Manufacturer-specific

Index	Name	Cat.	Acc.	Default value
.....
627F _h	Output parameter 3 group 32	O	rw	Manufacturer-specific
6280 _h	Output parameter 4 group 1	O	rw	Manufacturer-specific
6281 _h	Output parameter 4 group 2	O	rw	Manufacturer-specific
.....
629F _h	Output parameter 4 group 32	O	rw	Manufacturer-specific
62B0 _h	Text position indication	O	rw	Manufacturer-specific
62B1 _h	Text special indication	O	rw	Manufacturer-specific

Table 9 specifies, which PDOs the output panel unit shall (category = M) and may (category = O) support.

Table 9 – PDOs supported by the output panel unit

PDO no.	Cat.	Mapped application objects (informative)
RPDO 257	M	6011 00 _h

5.3.5 Call controller for lift 1

Table 10 lists all applications objects used by the call controller. The *category*, *access*, and *default value* attributes shall be used.

Table 10 – Call controller specific application objects

Index	Name	Cat.	Acc.	Default value
6010 _h	Virtual input mapping	M	rw	00 0000 0000 _h
6011 _h	Virtual output mapping	M	ro	No

Table 11 specifies, which PDOs the call controller shall (category = M) and may (category = O) support.

Table 11 – PDOs supported by the call controller

PDO no.	Cat.	Mapped application objects (informative)
TPDO 257	M	6011 00 _h
RPDO 130	O	6010 00 _h
<i>to</i>		
RPDO 256	O	6010 00 _h

5.3.6 Car door unit for lift 1

Table 12 lists all applications objects used by the VD car door unit. The category, access, and default value attributes shall be used.

Table 12 – Car door unit specific application objects

Index	Name	Cat.	Acc.	Default value
6003 _h	Door number	M	rw	Manufacturer-specific
6300 _h	Door controlword	M	rw	FFFF _h
6301 _h	Door statusword	M	ro	No
6302 _h	Door position	M	ro	No
6304 _h	Door configuration 1	O	rw	Manufacturer-specific
6305 _h	Door configuration 2	O	rw	Manufacturer-specific

Index	Name	Cat.	Acc.	Default value
6306 _h	Door configuration 3	O	rw	Manufacturer-specific
6307 _h	Door configuration 4	O	rw	Manufacturer-specific
6310 _h	Light barrier status	O	rw	FF _h

Table 13 specifies, which PDOs the car door unit shall (category = M) support; and which PDOs shall be supported if the related door (number 1 to 4) is controlled (category = C).

Table 13 – PDOs supported by the car door unit

PDO no.	Cat.	Mapped application objects (informative)
TPDO 267	C	6301 01 _h , 6302 01 _h
TPDO 269	C	6301 02 _h , 6302 02 _h
TPDO 271	C	6301 03 _h , 6302 03 _h
RPDO 265	M	6300 01 _h , 6300 02 _h , 6300 03 _h , 6300 04 _h (NOTE)
RPDO 268	O	6310 01 _h
RPDO 270	O	6310 02 _h
RPDO 272	O	6310 03 _h
NOTE If the door control unit doesn't support all doors, the related car door commands are substituted by dummy objects (0006 00 _h).		

5.3.7 Light barrier unit for lift 1

Table 14 lists all applications objects used by the VD light barrier unit. The category, access, and default value attributes shall be used.

Table 14 – Light barrier unit specific application objects

Index	Name	Cat.	Acc.	Default value
6003 _h	Door number	M	rw	Manufacturer-specific
6310 _h	Light barrier status	M	ro	No

Table 15 specifies, which PDOs the light barrier unit shall support, if the related door is protected (category = C).

Table 15 – PDOs supported by the light barrier unit

PDO no.	Cat.	Mapped application objects (informative)
TPDO 268	O	6310 01 _h
TPDO 270	O	6310 02 _h
TPDO 272	O	6310 03 _h

5.3.8 Car door controller for lift 1

Table 16 lists all applications objects used by the VD car door controller. The category, access, and default value attributes shall be used.

Table 16 – Car door controller specific application objects

Index	Name	Cat.	Acc.	Default value
6300 _h	Door controlword	M	ro	No
6301 _h	Door statusword	M	rw	FFFF _h
6302 _h	Door position	O	rw	FFFF _h
6310 _h	Light barrier status	O	rw	FF _h

Table 17 specifies, which PDOs the car door controller shall (category = M) and may (category = O) support.

Table 17 – PDOs supported by the car door controller

PDO no.	Cat.	Mapped application objects (informative)
TPDO 265	M	6300 01 _h , 6300 02 _h , 6300 03 _h , 6300 04 _h
RPDO 267	M	6301 01 _h , 6302 01 _h
RPDO 268	O	6310 01 _h
RPDO 269	O	6301 02 _h , 6302 02 _h
RPDO 270	O	6310 02 _h
RPDO 271	O	6301 03 _h , 6302 03 _h
RPDO 272	O	6310 03 _h

5.3.9 Car position unit for lift 1

NOTE Linear measuring sensor units should behave like rotational encoders as defined in /CiA406/.

Table 18 lists all applications objects used by the VD car position unit. The category, access, and default value attributes shall be used.

NOTE Linear measuring sensor units should behave like rotational encoders as defined in /CiA406/.

Table 18 – VD car position unit

Index	Name	Cat.	Acc.	Default value
6380 _h	Operating parameter	M	rw	Manufacturer-specific
6381 _h	Measuring units per revolution	O	rw	Manufacturer-specific
6382 _h	Preset value	O	rw	Manufacturer-specific
6383 _h	Position value	M	ro	No
6384 _h	Encoder measuring step settings position unit 1	O	rw	(1)
6385 _h	Encoder measuring step settings position unit 2	O	rw	(1)
6386 _h	Encoder measuring step settings position unit 3	O	rw	(1)
6387 _h	Encoder measuring step settings position unit 4	O	rw	(1)
6390 _h	Speed value car	O	ro	No
6391 _h	Acceleration value car	O	ro	No
63A0 _h	CAM state register position unit 1	O	ro	No
63A1 _h	CAM enable register position unit 1	O	rw	00 _h
63A2 _h	CAM polarity register position unit 1	O	rw	00 _h
63A3 _h	CAM state register position unit 2	O	ro	No
63A4 _h	CAM enable register position unit 2	O	rw	00 _h
63A5 _h	CAM polarity register position unit 2	O	rw	00 _h
63A6 _h	CAM state register position unit 3	O	ro	No
63A7 _h	CAM enable register position unit 3	O	rw	00 _h
63A8 _h	CAM polarity register position unit 3	O	rw	00 _h
63A9 _h	CAM state register position unit 4	O	ro	No
63AA _h	CAM enable register position unit 4	O	rw	00 _h
63AB _h	CAM polarity register position unit 4	O	rw	00 _h
63B0 _h	Area state register position unit 1	O	ro	No

Index	Name	Cat.	Acc.	Default value
63B1 _h	Area state register position unit 2	O	ro	No
63B2 _h	Area state register position unit 3	O	ro	No
63B3 _h	Area state register position unit 4	O	ro	No
63B4 _h	Work area low-limit position unit 1	O	rw	Manufacturer-specific
63B5 _h	Work area low-limit position unit 2	O	rw	Manufacturer-specific
63B6 _h	Work area low-limit position unit 3	O	rw	Manufacturer-specific
63B7 _h	Work area low-limit position unit 4	O	rw	Manufacturer-specific
63B8 _h	Work area high-limit position unit 1	O	rw	Manufacturer-specific
63B9 _h	Work area high-limit position unit 2	O	rw	Manufacturer-specific
63BA _h	Work area high-limit position unit 3	O	rw	Manufacturer-specific
63BB _h	Work area high-limit position unit 4	O	rw	Manufacturer-specific
63C0 _h	Operating status	M	ro	No
63C1 _h	Single-turn resolution	M	ro	No
63C2 _h	Number of distinguishable revolutions	M	ro	No
63C3 _h	Alarms and warnings	O	ro	No
63C4 _h	Supported warnings	O	ro	No
63C5 _h	Warnings	O	ro	No
63C6 _h	Supported alarms	O	ro	No
63C7 _h	Alarms	O	ro	No
63C8 _h	Operating time	O	ro	No
63C9 _h	Offset value	O	ro	No

(1) For sub-index 01_h and 02_h = 0000 0010_h; for sub-index 03_h = 0000 0001_h

Table 19 specifies, which PDOs the car position unit shall (category = M) and may (category = O) support.

Table 19 – PDOs supported by the car position unit

PDO no.	Cat.	Mapped application objects (informative)
TPDO 263	M	6383 01 _h
TPDO 264	O	6383 02 _h
TPDO 385	O	6383 03 _h
TPDO 386	O	6383 04 _h

5.3.10 Load-measuring unit for lift 1

Table 20 lists all applications objects used by the VD load-measuring unit. The category, access, and default value attributes shall be used.

Table 20 – VD load-measuring unit

Index	Name	Cat.	Acc.	Default value
6463 _h	Suspension	O	rw	Manufacturer-specific
6465 _h	Loads and weights	O	ro	No
6480 _h	Load value	M	ro	No
6481 _h	Load limits	M	rw	Manufacturer-specific
6482 _h	Load signalling	M	ro	No
6483 _h	Load signalling limits	M	rw	FFFF _h (all sub-indices)
6484 _h	Rope load	O	ro	No

Index	Name	Cat.	Acc.	Default value
6486 _h	Car reference weight	M	wo	FFFF _h

Table 21 specifies, which PDOs the load-measuring unit shall (category = M) and may (category = O) support.

Table 21 – PDOs supported by the load-measuring unit

PDO no.	Cat.	Mapped application objects (informative)
TPDO 258	M	6482 01 _h , 6480 01 _h

5.3.11 Car drive unit for lift 1

Table 22 lists all applications objects used by the VD car drive unit. The category, access, and default value attributes shall be used.

Table 22 – VD car drive unit

Index	Name	Cat.	Acc.	Default value
6383 _h	Position value	O	rw	FFFF FFFF _h
6400 _h	Controlword	M	rw	0000 _h
6401 _h	Statusword	M	ro	No
6402 _h	Control option codes	O	rw	Manufacturer-specific
6403 _h	Modes of operation	M	rw	Manufacturer-specific
6404 _h	Modes of operation display	M	ro	No
6405 _h	Motion profile type	O	rw	Manufacturer-specific
6406 _h	Control effort	O	ro	No
6407 _h	Position actual value	O	ro	No
6408 _h	Max velocity and speed	O	rw	Manufacturer-specific
6409 _h	Max acceleration and deceleration	O	rw	Manufacturer-specific
640A _h	Quick stop deceleration	O	rw	Manufacturer-specific
640B _h	Profile acceleration and deceleration	O	rw	Manufacturer-specific
640C _h	Profile jerk use	O	rw	Manufacturer-specific
640D _h	Profile jerk	O	rw	Manufacturer-specific
6414 _h	Position encoder resolution	O	rw	Manufacturer-specific
6415 _h	Velocity encoder resolution	O	rw	Manufacturer-specific
6416 _h	Gear ratio	O	rw	Manufacturer-specific
6417 _h	Feed constant	O	rw	Manufacturer-specific
641E _h	Polarity	O	rw	Manufacturer-specific
641F _h	Position conversion	O	rw	0000 _h
6420 _h	Target position	O	rw	Manufacturer-specific
6421 _h	Position range limit	O	rw	Manufacturer-specific
6422 _h	Software position limit	O	rw	Manufacturer-specific
6423 _h	Profile velocity	O	rw	0000 _h
6424 _h	End velocity	O	rw	Manufacturer-specific
6428 _h	Home offset	O	rw	Manufacturer-specific
6430 _h	Target velocity	M	rw	0000 _h
6431 _h	Velocity sensor actual value	O	ro	No
6432 _h	Velocity demand value	O	ro	No
6433 _h	Velocity actual value	O	ro	No

Index	Name	Cat.	Acc.	Default value
6434 _h	Sensor selection code	O	rw	Manufacturer-specific
6435 _h	Velocity window	O	rw	Manufacturer-specific
6436 _h	Velocity threshold	O	rw	Manufacturer-specific
6437 _h	Max slippage	O	rw	Manufacturer-specific
6440 _h	Motor type	O	rw	Manufacturer-specific
6441 _h	Motor rated speed	O	rw	Manufacturer-specific
6442 _h	Motor rated frequency	O	rw	Manufacturer-specific
6443 _h	Motor pole pairs	O	rw	Manufacturer-specific
6444 _h	Motor rated current	O	rw	Manufacturer-specific
6445 _h	Motor rated voltage	O	rw	Manufacturer-specific
6446 _h	Motor rated power	O	rw	Manufacturer-specific
6447 _h	Motor connection mode	O	rw	Manufacturer-specific
6448 _h	Motor cos phi	O	rw	Manufacturer-specific
6449 _h	Motor max current	O	rw	Manufacturer-specific
644A _h	Motor rated field current	O	rw	Manufacturer-specific
644B _h	Motor phase resistance	O	rw	Manufacturer-specific
644C _h	Motor phase inductance	O	rw	Manufacturer-specific
6450 _h	Motor encoder type	O	rw	Manufacturer-specific
6451 _h	Motor encoder resolution	O	rw	Manufacturer-specific
6452 _h	Motor encoder alignment angle	O	rw	Manufacturer-specific
6460 _h	Lift installation speed	O	rw	Manufacturer-specific
6461 _h	Motor rpm at lift installation speed	O	rw	Manufacturer-specific
6462 _h	Sheave diameter	O	rw	Manufacturer-specific
6463 _h	Suspension	O	rw	Manufacturer-specific
6464 _h	Gear ratio	O	rw	Manufacturer-specific
6465 _h	Loads and weights	O	rw	Manufacturer-specific
6466 _h	Delay times	O	rw	Manufacturer-specific
6467 _h	Monitoring bits	O	rw	Manufacturer-specific
6468 _h	Drive switching frequency	O	rw	Manufacturer-specific
6480 _h	Load value	O	rw	FFFF _h
6482 _h	Load signalling	O	rw	0000 _h

Table 23 specifies, which PDOs the car drive unit shall (category = M) and may (category = O) support.

Table 23 – PDOs supported by the car drive unit

PDO no.	Cat.	Mapped application objects (informative)
TPDO 260	M	6401 00 _h , 6404 00 _h , 67FE 00 _h , 6433 00 _h
TPDO 262	O	6406 00 _h
RPDO 258	O	6482 01 _h , 6480 01 _h
RPDO 259	M	6400 00 _h , 6403 00 _h , 0005 00 _h , 6430 00 _h
RPDO 261	O	6420 00 _h , 6423 00 _h
RPDO 263	C	6383 01 _h (NOTE)
NOTE Mandatory, if Profile Position Mode is used.		

5.3.12 Car drive controller for lift 1

Table 24 lists all applications objects used by the VD car drive controller. The category, access, and default value attributes shall be used.

Table 24 – VD car drive controller

Index	Name	Cat.	Acc.	Default value
6302 _h	Door position	O	rw	FFFF _h
6383 _h	Position value (NOTE)	C	rw	FFFF FFFF _h
6390 _h	Speed value car	O	rw	0000 _h
6391 _h	Acceleration value car	O	rw	0000 _h
6400 _h	Controlword	M	ro	No
6401 _h	Statusword	M	rw	0000 _h
6403 _h	Modes of operation	O	ro	No
6404 _h	Modes of operation display	O	rw	0000 _h
6406 _h	Control effort	O	rw	0000 _h
6407 _h	Position actual value	O	rw	FFFF _h
6420 _h	Target position	O	ro	No
6430 _h	Target velocity	O	ro	No
6433 _h	Velocity actual value	O	rw	0000 _h
6480 _h	Load value	O	rw	FFFF _h
6482 _h	Load signalling	O	rw	(1)
(1) Sub-index 01 _h = 0000 _h , sub-index 02 _h = manufacturer-specific				
NOTE Mandatory, if Profile Position Mode is used.				

Table 25 specifies, which PDOs the car drive controller shall (category = M) and may (category = O) support.

Table 25 – PDOs supported by the car drive controller

PDO no.	Cat.	Mapped application objects (informative)
TPDO 259	M	6400 00 _h , 6403 00 _h , 67FE 00 _h , 6430 00 _h
TPDO 261	M	6420 00 _h , 6423 00 _h
RPDO 258	O	6482 01 _h , 6480 01 _h
RPDO 260	M	6401 00 _h , 6404 00 _h , 0005 00 _h , 6433 00 _h
RPDO 262	M	6406 00 _h
RPDO 263	M	6383 01 _h
RPDO 264	O	6383 02 _h
RPDO 267	M	6301 01 _h , 6302 01 _h
RPDO 269	O	6301 02 _h , 6302 02 _h
RPDO 271	O	6301 03 _h , 6302 03 _h
RPDO 385	O	6383 03 _h
RPDO 386	O	6383 04 _h

5.3.13 Remote data transmission unit for lift 1

This VD may receive all PDOs and needs to implement the mapped parameters in its object dictionary.

5.4 Supported application objects, PDOs, and SDOs for lift-application 2 to 8

5.4.1 General

Lift-application 2 to 8 use the same application objects in the range of 6200_h to 67FE_h as lift-application 1. However, they are offset as specified in clause 4.1. The used PDO numbers are given in the following chapters. The PDO numbers correspond to the indexes of the PDO communication and PDO mapping parameters as defined in /CiA301/. Of course, the objects mapped into the PDOs of lift-control application 2 to 8 are offset.

The transmitted MPDO (TPDO 2) and received MPDOs (RPDO 2 to RPDO 127) are related to the CANopen device and not to a specific lift-control application. The PDOs of the VD input are also not related to a specific lift-control application.

5.4.2 Output panel units for lift 2 to lift 8

Table 26 specifies the PDOs for the output panel units of lift-control application 2 to 8.

Table 26 – Output panel unit PDOs

Lift 2	Lift 3	Lift 4	Lift 5	Lift 6	Lift 7	Lift 8
RPDO 273	RPDO 289	RPDO 305	RPDO 321	RPDO 337	RPDO 353	RPDO 369

5.4.3 Call controllers for lift 2 to lift 8

Table 27 specifies the PDOs for the call controllers of lift-control application 2 to 8.

Table 27 – Call controller PDOs

Lift 2	Lift 3	Lift 4	Lift 5	Lift 6	Lift 7	Lift 8
TPDO 273	TPDO 289	TPDO 305	TPDO 321	TPDO 337	TPDO 353	TPDO 369
RPDO 130						
<i>to</i>						
RPDO 256						

5.4.4 Car door units for lift 2 to lift 8

Table 28 specifies the PDOs for the car door units of lift-control application 2 to 8.

Table 28 – Car door unit PDOs

Lift 2	Lift 3	Lift 4	Lift 5	Lift 6	Lift 7	Lift 8
TPDO 283	TPDO 299	TPDO 315	TPDO 331	TPDO 347	TPDO 363	TPDO 379
TPDO 285	TPDO 301	TPDO 317	TPDO 333	TPDO 349	TPDO 365	TPDO 381
TPDO 287	TPDO 303	TPDO 319	TPDO 335	TPDO 351	TPDO 367	TPDO 383
RPDO 281	RPDO 297	RPDO 313	RPDO 329	RPDO 345	RPDO 361	RPDO 377

5.4.5 Light barrier units for lift 2 to lift 8

Table 29 specifies the PDOs for the light barrier units of lift-control application 2 to 8.

Table 29 – Car light barrier unit PDOs

Lift 2	Lift 3	Lift 4	Lift 5	Lift 6	Lift 7	Lift 8
TPDO 284	TPDO 300	TPDO 316	TPDO 332	TPDO 348	TPDO 364	TPDO 380
TPDO 286	TPDO 302	TPDO 318	TPDO 334	TPDO 350	TPDO 366	TPDO 382

Lift 2	Lift 3	Lift 4	Lift 5	Lift 6	Lift 7	Lift 8
TPDO 288	TPDO 304	TPDO 320	TPDO 336	TPDO 352	TPDO 368	TPDO 384

5.4.6 Car door controllers for lift 2 to lift 8

Table 30 specifies the PDOs for the car door controllers of lift-control application 2 to 8.

Table 30 – Car door controller PDOs

Lift 2	Lift 3	Lift 4	Lift 5	Lift 6	Lift 7	Lift 8
TPDO 281	TPDO 297	TPDO 313	TPDO 329	TPDO 345	TPDO 361	TPDO 377
RPDO 283	RPDO 299	RPDO 315	RPDO 331	RPDO 347	RPDO 363	RPDO 379
RPDO 284	RPDO 300	RPDO 316	RPDO 332	RPDO 348	RPDO 364	RPDO 380
RPDO 285	RPDO 301	RPDO 317	RPDO 333	RPDO 349	RPDO 365	RPDO 381
RPDO 286	RPDO 302	RPDO 318	RPDO 334	RPDO 350	RPDO 366	RPDO 382
RPDO 287	RPDO 303	RPDO 319	RPDO 335	RPDO 351	RPDO 367	RPDO 383
RPDO 288	RPDO 304	RPDO 320	RPDO 336	RPDO 352	RPDO 368	RPDO 384

5.4.7 Load-measuring units for lift 2 to lift 8

Table 31 specifies the PDOs for the load-measuring units of lift-control application 2 to 8.

Table 31 – Load-measuring unit PDOs

Lift 2	Lift 3	Lift 4	Lift 5	Lift 6	Lift 7	Lift 8
TPDO 274	TPDO 290	TPDO 306	TPDO 322	TPDO 338	TPDO 354	TPDO 370

5.4.8 Car position units for lift 2 to lift 8

Table 32 specifies the PDOs for the car position units of lift-control application 2 to 8.

Table 32 – Car position unit PDOs

Lift 2	Lift 3	Lift 4	Lift 5	Lift 6	Lift 7	Lift 8
TPDO 279	TPDO 295	TPDO 311	TPDO 327	TPDO 343	TPDO 359	TPDO 375
TPDO 280	TPDO 296	TPDO 312	TPDO 328	TPDO 344	TPDO 360	TPDO 376
TPDO 401	TPDO 417	TPDO 433	TPDO 449	TPDO 465	TPDO 481	TPDO 497
TPDO 402	TPDO 418	TPDO 434	TPDO 450	TPDO 466	TPDO 482	TPDO 498

5.4.9 Car drive units for lift 2 to lift 8

Table 33 specifies the PDOs for the car drive units of lift-control application 2 to 8.

Table 33 – Car drive unit PDOs

Lift 2	Lift 3	Lift 4	Lift 5	Lift 6	Lift 7	Lift 8
TPDO 276	TPDO 292	TPDO 308	TPDO 324	TPDO 33A	TPDO 356	TPDO 372
TPDO 278	TPDO 294	TPDO 30A	TPDO 326	TPDO 33C	TPDO 358	TPDO 374
RPDO 274	RPDO 290	RPDO 306	RPDO 322	RPDO 338	RPDO 354	RPDO 370
RPDO 275	RPDO 291	RPDO 307	RPDO 323	RPDO 339	RPDO 355	RPDO 371
RPDO 277	RPDO 293	RPDO 309	RPDO 325	RPDO 33B	RPDO 357	RPDO 373
RPDO 279	RPDO 295	RPDO 311	RPDO 327	RPDO 343	RPDO 359	RPDO 375
RPDO 280	RPDO 296	RPDO 312	RPDO 328	RPDO 344	RPDO 360	RPDO 376

5.4.10 Car drive controllers for lift 2 to lift 8

Table 34 specifies the PDOs for the car drive controllers of lift-control application 2 to 8.

Table 34 – Car drive controller PDOs

Lift 2	Lift 3	Lift 4	Lift 5	Lift 6	Lift 7	Lift 8
TPDO 275	TPDO 291	TPDO 307	TPDO 323	TPDO 339	TPDO 355	TPDO 371
TPDO 277	TPDO 293	TPDO 309	TPDO 325	TPDO 33B	TPDO 357	TPDO 373
RPDO 274	RPDO 290	RPDO 306	RPDO 322	RPDO 338	RPDO 354	RPDO 370
RPDO 276	RPDO 292	RPDO 308	RPDO 324	RPDO 33A	RPDO 356	RPDO 372
RPDO 278	RPDO 294	RPDO 30A	RPDO 326	RPDO 33C	RPDO 358	RPDO 374
RPDO 279	RPDO 295	RPDO 311	RPDO 327	RPDO 343	RPDO 359	RPDO 375
RPDO 280	RPDO 296	RPDO 312	RPDO 328	RPDO 344	RPDO 360	RPDO 376
RPDO 401	RPDO 417	RPDO 433	RPDO 449	RPDO 465	RPDO 481	RPDO 497
RPDO 402	RPDO 418	RPDO 434	RPDO 450	RPDO 466	RPDO 482	RPDO 498