

INTERNATIONAL STANDARD



**Adjustable speed electrical power drive systems –
Part 7-301: Generic interface and use of profiles for power drive systems –
Mapping of profile type 1 to network technologies**



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**Adjustable speed electrical power drive systems –
Part 7-301: Generic interface and use of profiles for power drive systems –
Mapping of profile type 1 to network technologies**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ADJUSTABLE SPEED ELECTRICAL POWER DRIVE SYSTEMS –

Part 7-301: Generic interface and use of profiles for power drive systems – Mapping of profile type 1 to network technologies

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International Standard IEC 61800-7-301 has been prepared by subcommittee SC 22G: Adjustable speed electric drive systems incorporating semiconductor power converters, of IEC technical committee TC 22: Power electronic systems and equipment.

This second edition cancels and replaces the first edition published in 2007. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- Additional mappings to communication systems are included (see Clause 6 and Clause 7).

The text of this standard is based on the following documents:

FDIS	Report on voting
22G/311/FDIS	22G/326/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 61800 series, under the general title *Adjustable speed electrical power drive systems*, can be found on the IEC website.

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INTRODUCTION

The IEC 61800 series is intended to provide a common set of specifications for adjustable speed electrical power drive systems.

IEC 61800-7 specifies profiles for power drive systems (PDS) and their mapping to existing communication systems by use of a generic interface model.

IEC 61800-7 describes a generic interface between control systems and power drive systems. This interface can be embedded in the control system. The control system itself can also be located in the drive (sometimes known as "smart drive" or "intelligent drive").

A variety of physical interfaces is available (analogue and digital inputs and outputs, serial and parallel interfaces, fieldbuses and networks). Profiles based on specific physical interfaces are already defined for some application areas (e.g. motion control) and some device classes (e.g. standard drives, positioner). The implementations of the associated drivers and application-programmers programming interfaces are proprietary and vary widely.

IEC 61800-7 defines a set of common drive control functions, parameters, and state machines or description of sequences of operation to be mapped to the drive profiles.

IEC 61800-7 provides a way to access functions and data of a drive that is independent of the used drive profile and communication interface. The objective is a common drive model with generic functions and objects suitable to be mapped on different communication interfaces. This makes it possible to provide common implementations of motion control (or velocity control or drive control applications) in controllers without any specific knowledge of the drive implementation.

There are several reasons to define a generic interface:

For a drive device manufacturer

- less effort to support system integrators;
- less effort to describe drive functions because of common terminology;
- the selection of drives does not depend on availability of specific support;

For a control device manufacturer

- no influence of bus technology;
- easy device integration;
- independent of a drive supplier;

For a system integrator

- less integration effort for devices;
- only one understandable way of modeling;
- independent of bus technology.

Much effort is needed to design a motion control application with several different drives and a specific control system. The tasks to implement the system software and to understand the functional description of the individual components may exhaust the project resources. In some cases, the drives do not share the same physical interface. Some control devices just support a single interface, which will not be supported by a specific drive. On the other hand, the functions and data structures are often specified with incompatibilities. This requires the system integrator to write special interfaces for the application software and this should not be his responsibility.

Some applications need device exchangeability or integration of new devices in an existing configuration. They are faced with different incompatible solutions. The efforts to ~~adopt~~ adapt a solution to a drive profile and to manufacturer-specific extensions may be unacceptable. This will reduce the degree of freedom to select a device best suited for this application to the selection of the unit, which will be available for a specific physical interface and supported by the controller.

IEC 61800-7-1 is divided into a generic part and several annexes as shown in Figure 1. The drive profile types for CiA® 402¹, CIP Motion™², PROFIdrive³ and SERCOS®-interface™⁴ are mapped to the generic interface in the corresponding annex. The annexes have been submitted by open international network or fieldbus organizations, which are responsible for the content of the related annex and use of the related trade marks.

-
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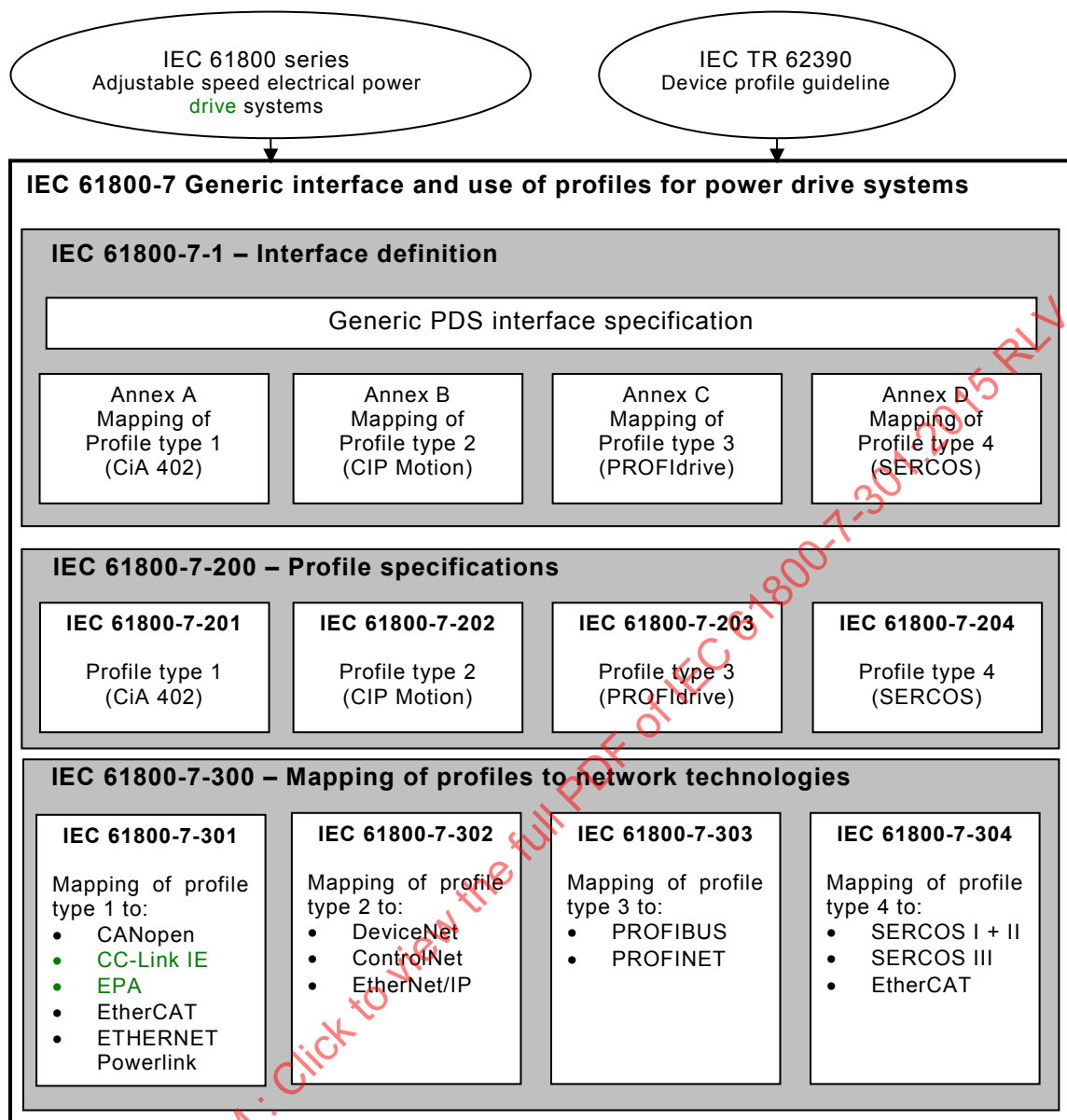
The different profile types 1, 2, 3, 4 are specified in IEC 61800-7-201, IEC 61800-7-202, IEC 61800-7-203 and IEC 61800-7-204.

This part of IEC 61800-7 specifies how the profile type 1 (CiA® 402) is mapped to the network technologies CANopen®⁵, ~~EtherCAT™~~, CC-Link IE® Field Network⁶, EPA™⁷, EtherCAT®⁸ and Ethernet Powerlink™⁹.

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IEC 61800-7-302, IEC 61800-7-303 and IEC 61800-7-304 specify how the profile types 2, 3 and 4 are mapped to different network technologies (such as EtherCAT®, DeviceNet™¹⁰, ControlNet™¹¹, EtherNet/IP™¹², PROFIBUS¹³, PROFINET¹⁴ and SERCOS®-interface).

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IEC

Figure 1 – Structure of IEC 61800-7

ADJUSTABLE SPEED ELECTRICAL POWER DRIVE SYSTEMS –

Part 7-301: Generic interface and use of profiles for power drive systems – Mapping of profile type 1 to network technologies

1 Scope

~~IEC 61800-7 specifies profiles for Power Drive Systems (PDS) and their mapping to existing communication systems by use of a generic interface model.~~

This part of IEC 61800 specifies the mapping of the profile type 1 (CiA 402) specified in IEC 61800-7-201 onto different network technologies.

The functions specified in this part of IEC 61800-7 are not intended to ensure functional safety. This requires additional measures according to the relevant standards, agreements and laws.

- CANopen, see Clause 5;
- CC-Link IE Field, see Clause 6;
- EPA, see Clause 7;
- EtherCAT, see Clause 8;
- ETHERNET Powerlink, see Clause 9.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61158-4-14, *Industrial communication networks – Fieldbus specifications – Part 4-14: Data-link layer protocol specification – Type 14 elements*

IEC 61158-5-12, *Industrial communication networks – Fieldbus specifications – Part 5-12 (Ed. 1.0): Application layer service definition – Type 12 elements*

IEC 61158-5-13, *Industrial communication networks – Fieldbus specifications – Part 5-13 (Ed. 1.0): Application layer service definition – Type 13 elements*

IEC 61158-5-14, *Industrial communication networks – Fieldbus specifications – Part 5-14: Application layer service definition – Type 14 elements*

IEC 61158-5-23, *Industrial communication networks – Fieldbus specifications – Part 5-23: Application layer service definition – Type 23 elements*

IEC 61158-6-12, *Industrial communication networks – Fieldbus specifications – Part 6-12 (Ed. 1.0): Application layer protocol specification – Type 12 elements*

IEC 61158-6-13, *Industrial communication networks – Fieldbus specifications – Part 6-13 (Ed. 1.0): Application layer protocol specification – Type 13 elements*

~~IEC 61800-7 (all parts), Adjustable speed electrical power drive systems – Generic interface and use of profiles for power drive systems~~

IEC 61158-6-14, *Industrial communication networks – Fieldbus specification – Part 6-14: Application layer protocol specification – Type 14 elements*

IEC 61158-6-23, *Industrial communication networks – Fieldbus specification – Part 6-23: Application layer protocol specification – Type 23 elements*

IEC 61800-7-201, *Adjustable speed electrical power drive systems – Part 7-201: Generic interface and use of profiles for power drive systems – Profile type 1 specification*

EN 50325-4, *Industrial communications subsystem based on ISO 11898 (CAN) for controller-device interfaces – Part 4: CANopen*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1

actual value

value of a variable **quantity** at a given instant

Note 1 to entry: Actual value ~~or actual variable are~~ is used in this document as input data of the application control program to monitor ~~feedback variables or other process~~ variables of the PDS (e.g. **feedback variables**).

[SOURCE: ~~IEV 351-21-02~~ IEC 61800-7-1:2015, 3.3.1.1]

3.1.2

application

software functional element specific to the solution of a problem in industrial-process measurement and control

Note 1 to entry: An application may be distributed among resources, and may communicate with other applications.

[SOURCE: ~~IEC/TR 62390:2005, 3.1.2, modified~~ IEC 61800-7-1:2015, 3.2.2]

3.1.3

attribute

property or characteristic of an entity

[SOURCE: ~~IEC/TR 62390:2005, 3.1.3~~ IEC 61800-7-1:2015, 3.2.3]

3.1.4

class

description of a set of objects that share the same attributes, operations, methods, relationships, and semantics

[SOURCE: ~~ISO/IEC 19501, modified~~ IEC 61800-7-1:2015, 3.2.5]

3.1.5

commands

set of commands from the application control program to the PDS to control the behavior of the PDS or functional elements of the PDS

Note 1 to entry: The behavior is reflected by states or operating modes.

Note 2 to entry: The different commands may be represented by one bit each.

[SOURCE: IEC 61800-7-1:2015, 3.3.1.3]

3.1.6

communication macrocycle

set of basic cycles needed for a configured communication activity in a macro network segment

3.1.7

configuration data

data for selecting functional units, assigning their location and defining their interconnections

3.1.8

control

purposeful action on or in a process to meet specified objectives

[SOURCE: ~~IEV 351-21-29~~ IEC 61800-7-1:2015, 3.2.6]

3.1.9

control device

physical unit that contains – in a module/subassembly or device – an application program to control the PDS

[SOURCE: IEC 61800-7-1:2015, 3.2.7]

3.1.10

data type

set of values together with a set of permitted operations

[SOURCE: ~~ISO/IEC 2382-15:1999, 15.04.01, modified~~ IEC 61800-7-1:2015, 3.2.8]

3.1.11

device

field device

<function blocks> networked independent physical entity of an industrial automation system capable of performing specified functions in a particular context and delimited by its interfaces

[SOURCE: ~~IEC 61499-1:2005, 3.30, modified~~ IEC 61800-7-1:2015, 3.2.9]

~~entity that performs control, actuating and/or sensing functions and interfaces to other such entities within an automation system~~

~~[ISO 15745-1:2003, 3.11]~~

3.1.12

device profile

representation of a device in terms of its parameters, parameter assemblies and behaviour according to a device model that describes the data and behaviour of the device as viewed through a network, independent from any network technology

~~NOTE This is a definition from IEC/TS 61915 which is extended by the addition of the device functional structure.~~

[SOURCE: ~~IEC 61390, 3.19, modified~~ IEC 61800-7-1:2015, 3.2.11]

3.1.13

entity

particular thing, such as a person, place, process, object, concept, association, or event

3.1.14

feedback variable

variable **quantity**, which represents the controlled variable and is returned to the comparing element

[SOURCE: ~~IEV 351-27-03~~ IEC 61800-7-1:2015, 3.2.12]

3.1.15

functional element

entity of software or software combined with hardware, capable of accomplishing a specified function of a device

Note 1 to entry: A functional element has an interface, associations to other functional elements and functions.

Note 2 to entry: A functional element can be made out of function block(s), object(s) or parameter list(s).

[SOURCE: ~~IEC/TR 62390:2005, 3.1.12~~ IEC 61800-7-1:2015, 3.2.13]

3.1.16

input data

data transferred from an external source into a device, resource or functional element

[SOURCE: ~~IEC/TR 62390:2005, 3.1.14~~ IEC 61800-7-1:2015, 3.2.14]

3.1.17

interface

shared boundary between two entities defined by functional characteristics, signal characteristics, or other characteristics as appropriate

[SOURCE: ~~IEV 351-21-35, modified~~ IEC 61800-7-1:2015, 3.2.15]

3.1.18

mapping

set of values having defined correspondence with the quantities or values of another set

3.1.19

message

ordered series of octets intended to convey information

3.1.20

model

mathematical or physical representation of a system or a process, based with sufficient precision upon known laws, identification or specified suppositions

[SOURCE: ~~IEV 351-21-36~~ IEC 61800-7-1:2015, 3.2.17]

3.1.21

operating mode

characterization of the way and the extent to which the human operator intervenes in the control equipment

[SOURCE: ~~IEV 351-31-04~~ IEC 61800-7-1:2015, 3.2.18]

3.1.22

offset

number of octets from a specially designed position

3.1.23

output data

data originating in a device, resource or functional element and transferred from them to external systems

[SOURCE: ~~IEC/TR 62390:2005, 3.1.21~~ IEC 61800-7-1:2015, 3.2.19]

3.1.24

parameter

data element that represents device information that can be read from or written to a device, for example through the network or a local HMI

~~Note 1 — Adapted from IEC/TS 61915.~~

Note 1 to entry: A parameter is typically characterized by a parameter name, data type and access direction.

[SOURCE: ~~IEC/TR 62390:2005, 3.1.22, modified~~ IEC 61800-7-1:2015, 3.2.20]

3.1.25

profile

representation of a PDS interface in terms of its parameters, parameter assemblies and behavior according to a communication profile and a device profile

[SOURCE: IEC 61800-7-1:2015, 3.2.21, modified — Note 1 to entry is deleted]

3.1.26

set-point

value or variable used as output data of the application control program to control the PDS

[SOURCE: IEC 61800-7-1:2015, 3.3.1.5]

3.1.27

status

set of information from the PDS to the application control program reflecting the state or mode of the PDS or a functional element of the PDS

Note 1 to entry: The different status information may be coded with one bit each.

[SOURCE: IEC 61800-7-1:2015, 3.3.1.6]

3.1.28

type

hardware or software element which specifies the common attributes shared by all instances of the type

[SOURCE: ~~IEC/TR 62390:2005, 3.1.25~~ IEC 61800-7-1:2015, 3.2.23]

3.1.29 variable

software entity that may take different values, one at a time

Note 1 to entry: The values of a variable as well as of a parameter are usually restricted to a certain data type.

[SOURCE: ~~IEC/TR 62390:2005, 3.1.27~~ IEC 61800-7-1:2015, 3.2.25]

3.2 Abbreviated terms

APDU	application protocol data unit
AREP	application relationship end point
ASE	application service element
c	constant
CAN	controller area network
CiA	CAN in Automation
COB	communication object
ECSME	Type 14 communication scheduling management entity
EMCY	emergency message
EPA	Ethernet for Plant Automation
FAL	fieldbus application layer
FCS	frame check sequence
FRT	fast real-time
EM	(as a prefix) Type 14 management
FSA	finite state automaton
ID	identifier
IP	internet protocol
MOB	management object base
NMT	network management
PDO	process data object
PDS	power drive system
PDU	protocol data unit
ro	read-only
RPDO	receive ~~PDO~~ process data object
rw	read-write
SDO	service data object
SYNC	synchronization message
TIME	time message
TPDO	transmit process data object
wdc	watch dog counter

4 General

The following clauses specify the mapping of the CiA 402 drive profile onto different communication technologies:

- CANopen, see Clause 5
- CC-Link IE, see Clause 6
- EPA, see Clause 7
- EtherCAT, see Clause 8
- ETHERNET Powerlink, see Clause 9

5 Mapping to CANopen

5.1 Overview

This clause specifies the mapping of the CiA 402 drive profile onto CANopen network. In particular, the process data object (PDO) communication and mapping parameters are defined. In addition, this part of the IEC 61800-7 series defines the PDO mapping attribute for all objects defined in the CiA 402 drive profile (see IEC 61800-7-201).

5.2 Mapping of communication objects

COBs for real-time data transmission shall be mapped to process data object messages (PDOs). COBs for configuration data transmission shall be mapped to service data object message(s) (SDO). COBs for emergency information transmission shall be mapped to emergency messages (EMCY). COBs for network management commands shall be mapped to NMT messages. COB for network management state information may be mapped to heartbeat message or node guarding message. COB for synchronization may be mapped to sync message (SYNC). COB for system time distribution may be mapped to time message (TIME).

5.3 Communication parameter objects

5.3.1 General

The drive device shall implement the mandatory communication parameter objects as defined in EN 50325-4. The drive device may implement the optional communication parameter objects as defined in EN 50325-4.

The category and entry category attributes of an object indicate if the object shall be implemented (mandatory) or may be implemented (optional).

The object code and data type attributes are defined in detail in EN 50325-4. The data types used in Clause 5 are listed in Table 1. The data types used in the CiA 402 profile are defined in EN 50325-4. Therefore, no mapping is defined.

Table 1 – List of used data types

Data type	Reference
Unsigned8	EN 50325-4
Unsigned16	EN 50325-4
Unsigned32	EN 50325-4
Integer8	EN 50325-4
Integer16	EN 50325-4
Integer32	EN 50325-4
PDO commpar	EN 50325-4
PDO mapping	EN 50325-4

In the entry description, the access attribute indicating if an application object is read only (ro), read/write (rw), or constant (c) is defined. Read only indicates that this shall not be written via the bus; read/write allows to read and to write this object; and constant means that this object is not changed.

The default value attribute defines the factory setting value of an object with access attribute of the value 'rw' or 'c'.

5.3.2 Object 1000_h: Device type

This object is defined in IEC 61800-7-201 and EN 50325-4. Drive devices shall support either the generic PDO mapping or the type-specific PDO mapping. For devices supporting the generic PDO mapping (bit 22 in the additional information field shall be 0), the definitions given in Table 2 shall apply. For devices supporting the type-specific PDO mapping (bit 22 in the additional information field shall be 1) the definitions given in Table 3 shall apply. In Table 2 and Table 3 the symbol “*” means manufacturer-specific.

Table 2 – Additional information field for generic PDO mapping

Device	Additional information															
	Mode bits								Type							
	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Frequency converter	*	*	*	*	*	*	*	*	0	0	0	0	0	0	0	1
Servo drive	*	*	*	*	*	*	*	*	0	0	0	0	0	0	1	0
Stepper motor	*	*	*	*	*	*	*	*	0	0	0	0	0	1	0	0
Multiple device module	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table 3 – Additional information field for type-specific PDO mapping

Device	Additional information															
	Mode bits								Type							
	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Frequency converter	*	*	*	*	*	*	*	*	0	1	0	0	0	0	0	1
Servo drive	*	*	*	*	*	*	*	*	0	1	0	0	0	0	1	0
Stepper motor	*	*	*	*	*	*	*	*	0	1	0	0	0	1	0	0
Multiple device module	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

5.3.3 Object 1029_h: Error behavior

This object specifies to which NMT state the device shall be set (see EN 50325-4), when a communication error or a device-internal error is detected. The device-internal error shall be valid when the PDS FSA is in ~~Error~~ fault reaction active state (see IEC 61800-7-201).

Table 4 specifies the value definition, Table 5 specifies the object description, and Table 6 specifies the entry description.

Table 4 – Value definition

Value	Definition
00 _h	Enter NMT pre-operational state (only if current NMT state is operational)
01 _h	No NMT state change
02 _h	Enter NMT stopped state

Table 5 – Object description

Attribute	Value
Index	1029 _h
Name	Error behavior
Object code	Array
Data type	Unsigned8
Category	Optional

Table 6 – Entry description

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	01 _h to 02 _h
Default value	Manufacturer-specific
Sub-index	01 _h
Description	Communication error
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See Table 4
Default value	00 _h
Sub-index	02 _h
Description	Internal device error
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See Table 4
Default value	01 _h

5.3.4 Object 67FF_h: Single device type

The object at index 67FF_h and multiples with an offset of 800_h shall define the type of each device within one drive unit and its functionality. The object structure shall be the same as defined in object 1000_h (for details, see EN-50325-4).

5.4 Emergency message

When the drive device detects internally a failure, it may transmit an emergency message as defined in EN 50325-4. The emergency message may use the error codes as defined in EN 50325-4 or in IEC 61800-7-201.

5.5 Communication fault events

~~In addition to local drive device fault events, the following communication events shall cause a transition to the PDS FSA fault reaction state:~~

- ~~• NMT stopped state indication if the PDS FSA is in Operation enabled state or in Quick-stop state.~~
- ~~• NMT initialisation state indication if the PDS FSA is in Operation enabled state or in Quick-stop state.~~
- ~~• Heartbeat/Life guarding event indication if the PDS FSA is in Operation enabled state or in Quick-stop state.~~

These events are covered by IEC 61800-7-201 object 6007_h.

5.6 Sets of pre-defined PDOs

5.6.1 General

A drive device supporting more than one mode of operation may require more than one pre-defined PDO. Therefore several PDOs are pre-defined in respect to the different possible modes of operation for drive devices.

The PDO assignments defined hereafter shall be used for every axis of a multi-device module with an offset of 64. For example, the first PDO of the second axis gets the number 65. In this way, a drive device is able to support a maximum of 8 axes.

NOTE All PDOs of the second and following axes are disabled by default.

There are several sets of pre-defined PDOs. The PDO set for generic drive device is independent from the drive type. The PDO sets for specific drive devices are different for frequency converter, servo controller, and stepper motor.

All pre-defined RPDOs with transmission type of 255 shall immediately enter all mapped objects into the object dictionary.

All pre-defined TPDOs with transmission type of 255 shall be transmitted when entering the NMT operational state.

The PDO compar and the PDO mapping record definitions, and the value definitions of the PDO communication and mapping parameters are defined in EN 50325-4.

In general all PDO communication objects defined in EN 50325-4 can be used. The following sections describe only the default values of the PDO objects.

5.6.2 PDO set for generic drive device

5.6.2.1 Overview and introduction

The PDO set for generic drive device pre-defines eight RPDOs (see Table 7) and seven TPDOs (see Table 8). The TPDOs with transmission type of 255 shall be triggered when any mapped object is changing. The RPDOs with transmission type 255 shall immediately update all mapped objects.

Table 7 – Overview on RPDO

PDO	Support	Description
1	Mandatory	Controls PDS FSA
2	Optional	Controls PDS FSA and modes of operation
3	Optional	Controls PDS FSA and target position (pp)
4	Optional	Controls PDS FSA and target velocity (pv)
5	Optional	Controls PDS FSA and target torque (tq)
6	Optional	Controls PDS FSA and nominal speed (vl)
7	Optional	Controls PDS FSA and digital outputs
8	Optional	Controls PDS FSA and mode of operation (broadcast PDO)
9 to 16	Reserved	
17 to 64	Optional	Manufacturer-specific

Table 8 – Overview on TPDO

PDO	Support	Description
1	Mandatory	Specifies PDS FSA status
2	Optional	Specifies PDS FSA status and current mode of operation
3	Optional	Specifies PDS FSA status and current position (pp)
4	Optional	Specifies PDS FSA status and current velocity (pv)
5	Optional	Specifies PDS FSA status and current torque (tq)
6	Optional	Specifies PDS FSA status and current speed (vl)
7	Optional	Specifies PDS FSA status and digital inputs
8 to 16	Reserved	
17 to 64	Optional	Manufacturer-specific

5.6.2.2 RPDO 1

Table 9 specifies the object description and Table 10 specifies the entry description of the PDO communication parameters.

Table 9 – Object description of communication parameters

Attribute	Value
Index	1400 _h
Name	Receive PDO1 parameter
Object code	Record
Data type	PDO commpar
Category	Mandatory

Table 10 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if ~~PDO linking is supported~~ COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	0000 0200 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0 _d Manufacturer-specific

Table 11 specifies the object description and Table 12 specifies the entry description of the PDO mapping parameters.

Table 11 – Object description of mapping parameters

Attribute	Value
Index	1600 _h
Name	Receive PDO1 mapping
Object code	Record
Data type	PDO mapping
Category	Mandatory

Table 12 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	01 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.3 RPDO 2

Table 13 specifies the object description and Table 14 specifies the entry description of the PDO communication parameters.

Table 13 – Object description of communication parameters

Attribute	Value
Index	1401 _h
Name	Receive PDO2 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 14 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	~~rw~~ c
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if ~~PDO linking is supported~~ COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	(0000 0300 _h or 8000 0300 _h) + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0 _d Manufacturer-specific

Table 15 specifies the object description and Table 16 specifies the entry description of the PDO mapping parameters.

Table 15 – Object description of mapping parameters

Attribute	Value
Index	1601 _h
Name	Receive PDO2 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1401 _h is implemented

Table 16 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6060 0008 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.4 RPDO 3

Table 17 specifies the object description and Table 18 specifies the entry description of the PDO communication parameters.

Table 17 – Object description of communication parameters

Attribute	Value
Index	1402 _h
Name	Receive PDO3 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 18 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	~~rw~~ c
PDO mapping	No
Value range	See EN 50325-4
Default value	~~02_h~~ Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if ~~PDO linking is supported~~ COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	(0000 0400 _h or 8000 0400 _h) + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~0_d~~ Manufacturer-specific

Table 19 specifies the object description and Table 20 specifies the entry description of the PDO mapping parameters.

Table 19 – Object description of mapping parameters

Attribute	Value
Index	1602 _h
Name	Receive PDO3 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1402 _h is implemented

Table 20 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	607A 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.5 RPDO 4

Table 21 specifies the object description and Table 22 specifies the entry description of the PDO communication parameters.

Table 21 – Object description of communication parameters

Attribute	Value
Index	1403 _h
Name	Receive PDO4 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 22 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	rw c
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if PDO linking is supported COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	(0000 0500 _h or 8000 0500 _h) + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0 _h Manufacturer-specific

Table 23 specifies the object description and Table 24 specifies the entry description of the PDO mapping parameters.

Table 23 – Object description of mapping parameters

Attribute	Value
Index	1603 _h
Name	Receive PDO4 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1403 _h is implemented

Table 24 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	60FF 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.6 RPDO 5

Table 25 specifies the object description and Table 26 specifies the entry description of the PDO communication parameters.

Table 25 – Object description of communication parameters

Attribute	Value
Index	1404 _h
Name	Receive PDO5 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 26 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	rw c
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	8000 0000 _h
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0 _d Manufacturer-specific

Table 27 specifies the object description and Table 28 specifies the entry description of the PDO mapping parameters.

Table 27 – Object description of mapping parameters

Attribute	Value
Index	1604 _h
Name	Receive PDO5 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1404 _h is implemented

Table 28 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6071 0010 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.7 RPDO 6

Table 29 specifies the object description and Table 30 specifies the entry description of the PDO communication parameters.

Table 29 – Object description of communication parameters

Attribute	Value
Index	1405 _h
Name	Receive PDO6 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 30 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	rw c
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if PDO linking is supported COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	8000 0000 _h
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0 _d Manufacturer-specific

Table 31 specifies the object description and Table 32 specifies the entry description of the PDO mapping parameters.

Table 31 – Object description of mapping parameters

Attribute	Value
Index	1605 _h
Name	Receive PDO6 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1405 _h is implemented

Table 32 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6042 0010 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.8 RPDO 7

Table 33 specifies the object description and Table 34 specifies the entry description of the PDO communication parameters.

Table 33 – Object description of communication parameters

Attribute	Value
Index	1406 _h
Name	Receive PDO7 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 34 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	rw c
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	8000 0000 _h
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0 _d Manufacturer-specific

Table 35 specifies the object description and Table 36 specifies the entry description of the PDO mapping parameters.

Table 35 – Object description of mapping parameters

Attribute	Value
Index	1606 _h
Name	Receive PDO7 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1406 _h is implemented

Table 36 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	60FE 0120 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.9 RPDO 8

Table 37 specifies the object description and Table 38 specifies the entry description of the PDO communication parameters.

Table 37 – Object description of communication parameters

Attribute	Value
Index	1407 _h
Name	Receive PDO8 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 38 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	rw c
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	8000 0000 _h
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0 _d Manufacturer-specific

Table 39 specifies the object description and Table 40 specifies the entry description of the PDO mapping parameters.

Table 39 – Object description of mapping parameters

Attribute	Value
Index	1607 _h
Name	Receive PDO8 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1407 _h is implemented

Table 40 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6060 0008 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.10 TPDO 1

Table 41 specifies the object description and Table 42 specifies the entry description of the PDO communication parameters.

Table 41 – Object description of communication parameters

Attribute	Value
Index	1800 _h
Name	Transmit PDO1 parameter
Object code	Record
Data type	PDO commpar
Category	Mandatory

Table 42 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	~~rw~~ c
PDO mapping	No
Value range	See EN 50325-4
Default value	~~No~~ Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if ~~PDO linking is supported~~ COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	4000 0180 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 43 specifies the object description and Table 44 specifies the entry description of the PDO mapping parameters.

Table 43 – Object description of mapping parameters

Attribute	Value
Index	1A00 _h
Name	Transmit PDO1 mapping
Object code	Record
Data type	PDO mapping
Category	Mandatory

Table 44 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	01 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.11 TPDO 2

Table 45 specifies the object description and Table 46 specifies the entry description of the PDO communication parameters.

Table 45 – Object description of communication parameters

Attribute	Value
Index	1801 _h
Name	Transmit PDO2 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 46 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	~~ro~~ c
PDO mapping	No
Value range	See EN 50325-4
Default value	~~No~~ Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if ~~PDO linking is supported~~ COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	(4000 0280 _h or C000 0280 _h) + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~0~~ _d Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~0~~ _d Manufacturer-specific

Table 47 specifies the object description and Table 48 specifies the entry description of the PDO mapping parameters.

Table 47 – Object description of mapping parameters

Attribute	Value
Index	1A01 _h
Name	Transmit PDO2 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1801 _h is implemented

Table 48 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6061 0008 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.12 TPDO 3

Table 49 specifies the object description and Table 50 specifies the entry description of the PDO communication parameters.

Table 49 – Object description of communication parameters

Attribute	Value
Index	1802 _h
Name	Transmit PDO3 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 50 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	~~rw~~ c
PDO mapping	No
Value range	See EN 50325-4
Default value	~~No~~ Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if ~~PDO linking is supported~~ COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	(4000 0380 _h or C000 0380 _h) + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	1 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~0_d~~ Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~0_d~~ Manufacturer-specific

Table 51 specifies the object description and Table 52 specifies the entry description of the PDO mapping parameters.

Table 51 – Object description of mapping parameters

Attribute	Value
Index	1A02 _h
Name	Transmit PDO3 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1802 _h is implemented

Table 52 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6064 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.13 TPDO 4

Table 53 specifies the object description and Table 54 specifies the entry description of the PDO communication parameters.

Table 53 – Object description of communication parameters

Attribute	Value
Index	1803 _h
Name	Transmit PDO4 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 54 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	~~rw~~ c
PDO mapping	No
Value range	See EN 50325-4
Default value	~~No~~ Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if ~~PDO linking is supported~~ COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	(4000 0480 _h or C000 0480 _h) + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	1 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~0_d~~ Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~0_d~~ Manufacturer-specific

Table 55 specifies the object description and Table 56 specifies the entry description of the PDO mapping parameters.

Table 55 – Object description of mapping parameters

Attribute	Value
Index	1A03 _h
Name	Transmit PDO4 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1803 _h is implemented

Table 56 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	606C 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.14 TPDO 5

Table 57 specifies the object description and Table 58 specifies the entry description of the PDO communication parameters.

Table 57 – Object description of communication parameters

Attribute	Value
Index	1804 _h
Name	Transmit PDO5 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 58 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	~~rw~~ c
PDO mapping	No
Value range	See EN 50325-4
Default value	~~No~~ Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	C000 0000 _h
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	1 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~0_d~~ Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~0_d~~ Manufacturer-specific

Table 59 specifies the object description and Table 60 specifies the entry description of the PDO mapping parameters.

Table 59 – Object description of mapping parameters

Attribute	Value
Index	1A04 _h
Name	Transmit PDO5 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1804 _h is implemented

Table 60 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6077 0010 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.15 TPDO 6

Table 61 specifies the object description and Table 62 specifies the entry description of the PDO communication parameters.

Table 61 – Object description of communication parameters

Attribute	Value
Index	1805 _h
Name	Transmit PDO6 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 62 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	~~rw~~ c
PDO mapping	No
Value range	See EN 50325-4
Default value	~~No~~ Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	C000 0000 _h
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	1 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~0_d~~ Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~0_d~~ Manufacturer-specific

Table 63 specifies the object description and Table 64 specifies the entry description of the PDO mapping parameters.

Table 63 – Object description of mapping parameters

Attribute	Value
Index	1A05 _h
Name	Transmit PDO6 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1805 _h is implemented

Table 64 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6044 0010 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.16 TPDO 7

Table 65 specifies the object description and Table 66 specifies the entry description of the PDO communication parameters.

Table 65 – Object description of communication parameters

Attribute	Value
Index	1806 _h
Name	Transmit PDO7 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 66 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	C000 0000 _h
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0 _d Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0 _d Manufacturer-specific

Table 67 specifies the object description and Table 68 specifies the entry description of the PDO mapping parameters.

Table 67 – Object description of mapping parameters

Attribute	Value
Index	1A06 _h
Name	Transmit PDO7 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1806 _h is implemented

Table 68 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	60FD 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.3 PDO set for frequency converter

5.6.3.1 Overview and introduction

The PDO set for frequency converter pre-defines three RPDOs (see Table 69) and three TPDOs (see Table 70). The TPDOs with transmission type of 255 shall only be triggered when the mapped statusword is changing, other mapped objects shall not cause a PDO transmission. The RPDOs with transmission type 255 shall immediately update all mapped objects.

Table 69 – Overview on RPDO

PDO	Support	Description
1	Mandatory	Controls PDS FSA and vl target velocity
2	Optional	Manufacturer-specific
3	Optional	Manufacturer-specific
4 to 16	Reserved	
17 to 64	Optional	Manufacturer-specific

Table 70 – Overview on TPDO

PDO	Support	Description
1	Mandatory	Specifies PDS FSA status and vl velocity actual value
2	Optional	Manufacturer-specific
3	Optional	Manufacturer-specific
4 to 16	Reserved	
17 to 64	Optional	Manufacturer-specific

5.6.3.2 RPDO 1

Table 71 specifies the object description and Table 72 specifies the entry description of the PDO communication parameters.

Table 71 – Object description of communication parameters

Attribute	Value
Index	1400 _h
Name	Receive PDO1 parameter
Object code	Record
Data type	PDO commpar
Category	Mandatory

Table 72 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	~~rw~~ c
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if ~~PDO linking is supported~~ COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	0000 0200 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0 _d Manufacturer-specific

Table 73 specifies the object description and Table 74 specifies the entry description of the PDO mapping parameters.

Table 73 – Object description of mapping parameters

Attribute	Value
Index	1600 _h
Name	Receive PDO1 mapping
Object code	Record
Data type	PDO mapping
Category	Mandatory

Table 74 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6042 0010 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.3.3 RPDO 2

Table 75 specifies the object description and Table 76 specifies the entry description of the PDO communication parameters.

Table 75 – Object description of communication parameters

Attribute	Value
Index	1401 _h
Name	Receive PDO2 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 76 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	~~rw~~ c
PDO mapping	No
Value range	See EN 50325-4
Default value	~~02_h~~ Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~8000 0000~~ 0300 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~0_d~~ Manufacturer-specific

Table 77 specifies the object description and Table 78 specifies the entry description of the PDO mapping parameters.

Table 77 – Object description of mapping parameters

Attribute	Value
Index	1601 _h
Name	Receive PDO2 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1401 _h is implemented

Table 78 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.3.4 RPDO 3

Table 79 specifies the object description and Table 80 specifies the entry description of the PDO communication parameters.

Table 79 – Object description of communication parameters

Attribute	Value
Index	1402 _h
Name	Receive PDO3 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 80 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	~~rw~~ c
PDO mapping	No
Value range	See EN 50325-4
Default value	~~02_h~~ Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~8000~~ 0000 0400 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~0_d~~ Manufacturer-specific

Table 81 specifies the object description and Table 82 specifies the entry description of the PDO mapping parameters.

Table 81 – Object description of mapping parameters

Attribute	Value
Index	1602 _h
Name	Receive PDO3 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1402 _h is implemented

Table 82 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.3.5 TPDO 1

Table 83 specifies the object description and Table 84 specifies the entry description of the PDO communication parameters.

Table 83 – Object description of communication parameters

Attribute	Value
Index	1800 _h
Name	Transmit PDO1 parameter
Object code	Record
Data type	PDO commpar
Category	Mandatory

Table 84 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	~~rw~~ c
PDO mapping	No
Value range	See EN 50325-4
Default value	~~05_h~~ Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if PDO linking is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	4000 0180 _h + node ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 85 specifies the object description and Table 86 specifies the entry description of the PDO mapping parameters.

Table 85 – Object description of mapping parameters

Attribute	Value
Index	1A00 _h
Name	Transmit PDO1 mapping
Object code	Record
Data type	PDO mapping
Category	Mandatory

Table 86 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6044 0010 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.3.6 TPDO 2

Table 87 specifies the object description and Table 88 specifies the entry description of the PDO communication parameters.

Table 87 – Object description of communication parameters

Attribute	Value
Index	1801 _h
Name	Transmit PDO2 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 88 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	rw c
PDO mapping	No
Value range	See EN 50325-4
Default value	05 _h Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if PDO linking is supported COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	C000 4000 0280 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 89 specifies the object description and Table 90 specifies the entry description of the PDO mapping parameters.

Table 89 – Object description of mapping parameters

Attribute	Value
Index	1A01 _h
Name	Transmit PDO2 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1801 _h is implemented

Table 90 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.3.7 TPDO 3

Table 91 specifies the object description and Table 92 specifies the entry description of the PDO communication parameters.

Table 91 – Object description of communication parameters

Attribute	Value
Index	1802 _h
Name	Transmit PDO3 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 92 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	~~ro~~ c
PDO mapping	No
Value range	See EN 50325-4
Default value	~~No~~ Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if ~~PDO linking is supported~~ COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	~~C000~~ 4000 0380 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 93 specifies the object description and Table 94 specifies the entry description of the PDO mapping parameters.

Table 93 – Object description of mapping parameters

Attribute	Value
Index	1A02 _h
Name	Transmit PDO3 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1802 _h is implemented

Table 94 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	No
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.4 PDO set for servo drive

5.6.4.1 Overview and introduction

The PDO set for servo drive pre-defines four RPDOs (see Table 95) and four TPDOs (see Table 96). The TPDOs with transmission type of 255 shall only be triggered when the mapped statusword is changing, other mapped objects shall not cause a PDO transmission. The RPDOs with transmission type 255 shall immediately update all mapped objects.

Table 95 – Overview on RPDO

PDO	Support	Description
1	Mandatory	Controls PDS FSA
2	Optional	Controls PDS FSA, target position (pp)
3	Optional	Controls PDS FSA and target velocity (pv)
4	Optional	Manufacturer-specific
5 to 16	Reserved	
17 to 64	Optional	Manufacturer-specific

Table 96 – Overview on TPDO

PDO	Support	Description
1	Mandatory	Specifies PDS FSA status
2	Optional	Specifies PDS FSA status and current position (pp)
3	Optional	Specifies PDS FSA status and current velocity (pv)
4	Optional	Manufacturer-specific
5 to 16	Reserved	
17 to 64	Optional	Manufacturer-specific

5.6.4.2 RPDO 1

Table 97 specifies the object description and Table 98 specifies the entry description of the PDO communication parameters.

Table 97 – Object description of communication parameters

Attribute	Value
Index	1400 _h
Name	Receive PDO1 parameter
Object code	Record
Data type	PDO commpar
Category	Mandatory

Table 98 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	rw c
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if ~~PDO linking is supported~~ COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	0000 0200 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0 _d Manufacturer-specific

Table 99 specifies the object description and Table 100 specifies the entry description of the PDO mapping parameters.

Table 99 – Object description of mapping parameters

Attribute	Value
Index	1600 _h
Name	Receive PDO1 mapping
Object code	Record
Data type	PDO mapping
Category	Mandatory

Table 100 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	01 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.4.3 RPDO 2

Table 101 specifies the object description and Table 102 specifies the entry description of the PDO communication parameters.

Table 101 – Object description of communication parameters

Attribute	Value
Index	1401 _h
Name	Receive PDO2 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 102 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	rw c
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	8000 0000 0300 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0 _d Manufacturer-specific

Table 103 specifies the object description and Table 104 specifies the entry description of the PDO mapping parameters.

Table 103 – Object description of mapping parameters

Attribute	Value
Index	1601 _h
Name	Receive PDO2 mapping
Object code	Record
Data type	PDO mapping
Category	Conditonal, if 1401 _h is implemented

Table 104 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	607A 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.4.4 RPDO 3

Table 105 specifies the object description and Table 106 specifies the entry description of the PDO communication parameters.

Table 105 – Object description of communication parameters

Attribute	Value
Index	1402 _h
Name	Receive PDO3 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 106 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	rw c
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	8000 0000 0400 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0 _d Manufacturer-specific

Table 107 specifies the object description and Table 108 specifies the entry description of the PDO mapping parameters.

Table 107 – Object description of mapping parameters

Attribute	Value
Index	1602 _h
Name	Receive PDO3 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1402 _h is implemented

Table 108 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	60FF 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.4.5 RPDO 4

Table 109 specifies the object description and Table 110 specifies the entry description of the PDO communication parameters.

Table 109 – Object description of communication parameters

Attribute	Value
Index	1403 _h
Name	Receive PDO4 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 110 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	rw c
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	8000 0000 0500 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0 _d Manufacturer-specific

Table 111 specifies the object description and Table 112 specifies the entry description of the PDO mapping parameters.

Table 111 – Object description of mapping parameters

Attribute	Value
Index	1603 _h
Name	Receive PDO4 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1403 _h is implemented

Table 112 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	~~No~~ Manufacturer-specific
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.4.6 TPDO 1

Table 113 specifies the object description and Table 114 specifies the entry description of the PDO communication parameters.

Table 113 – Object description of communication parameters

Attribute	Value
Index	1800 _h
Name	Transmit PDO1 parameter
Object code	Record
Data type	PDO commpar
Category	Mandatory

Table 114 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	~~rw~~ c
PDO mapping	No
Value range	See EN 50325-4
Default value	~~00_h~~ Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if ~~PDO linking is supported~~ COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	4000 0180 _h + node ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~0_d~~ Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~0_d~~ Manufacturer-specific

Table 115 specifies the object description and Table 116 specifies the entry description of the PDO mapping parameters.

Table 115 – Object description of mapping parameters

Attribute	Value
Index	1A00 _h
Name	Transmit PDO1 mapping
Object code	Record
Data type	PDO mapping
Category	Mandatory

Table 116 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	01 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.4.7 TPDO 2

Table 117 specifies the object description and Table 118 specifies the entry description of the PDO communication parameters.

Table 117 – Object description of communication parameters

Attribute	Value
Index	1801 _h
Name	Transmit PDO2 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 118 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	rw c
PDO mapping	No
Value range	See EN 50325-4
Default value	05 _h Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if PDO linking is supported COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	C000 4000 0280 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	100 _d

Table 119 specifies the object description and Table 120 specifies the entry description of the PDO mapping parameters.

Table 119 – Object description of mapping parameters

Attribute	Value
Index	1A01 _h
Name	Transmit PDO2 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1801 _h is implemented

Table 120 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6064 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.4.8 TPDO 3

Table 121 specifies the object description and Table 122 specifies the entry description of the PDO communication parameters.

Table 121 – Object description of communication parameters

Attribute	Value
Index	1802 _h
Name	Transmit PDO3 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 122 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	rw c
PDO mapping	No
Value range	See EN 50325-4
Default value	05 _h Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0000 4000 0380 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	100 _d

Table 123 specifies the object description and Table 124 specifies the entry description of the PDO mapping parameters.

Table 123 – Object description of mapping parameters

Attribute	Value
Index	1A02 _h
Name	Transmit PDO3 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1802 _h is implemented

Table 124 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	606C 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.4.9 TPDO 4

Table 125 specifies the object description and Table 126 specifies the entry description of the PDO communication parameters.

Table 125 – Object description of communication parameters

Attribute	Value
Index	1803 _h
Name	Transmit PDO4 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 126 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	rw c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0000 4000 0480 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 127 specifies the object description and Table 128 specifies the entry description of the PDO mapping parameters.

Table 127 – Object description of mapping parameters

Attribute	Value
Index	1A03 _h
Name	Transmit PDO4 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1803 _h is implemented

Table 128 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	No
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.5 PDO set for stepper motor

5.6.5.1 Overview and introduction

The PDO set for stepper motor pre-defines four RPDOs (see Table 129) and four TPDOs (see Table 130). The TPDOs with transmission type of 255 shall only be triggered when the

mapped statusword is changing, other mapped objects shall not cause a PDO transmission. The RPDOs with transmission type 255 shall update immediately all mapped objects.

Table 129 – Overview on RPDO

PDO	Support	Description
1	Mandatory	Controls PDS FSA
2	Optional	Controls PDS FSA, target position (pp)
3	Optional	Controls PDS FSA and target velocity (pv)
4	Optional	Manufacturer-specific
5 to 16	Reserved	
17 to 64	Optional	Manufacturer-specific

Table 130 – Overview on TPDO

PDO	Support	Description
1	Mandatory	Specifies PDS FSA status
2	Optional	Specifies PDS FSA status and current position (pp)
3	Optional	Specifies PDS FSA status and current velocity (pv)
4	Optional	Manufacturer-specific
5 to 16	Reserved	
17 to 64	Optional	Manufacturer-specific

5.6.5.2 RPDO 1

Table 131 specifies the object description and Table 132 specifies the entry description of the PDO communication parameters.

Table 131 – Object description of communication parameters

Attribute	Value
Index	1400 _h
Name	Receive PDO1 parameter
Object code	Record
Data type	PDO commpar
Category	Mandatory

Table 132 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	~~rw~~ c
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if ~~PDO linking is supported~~ COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	0000 0200 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0 _h Manufacturer-specific

Table 133 specifies the object description and Table 134 specifies the entry description of the PDO mapping parameters.

Table 133 – Object description of mapping parameters

Attribute	Value
Index	1600 _h
Name	Receive PDO1 mapping
Object code	Record
Data type	PDO mapping
Category	Mandatory

Table 134 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	01 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.5.3 RPDO 2

Table 135 specifies the object description and Table 136 specifies the entry description of the PDO communication parameters.

Table 135 – Object description of communication parameters

Attribute	Value
Index	1401 _h
Name	Receive PDO2 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 136 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	~~rw~~ c
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~8000~~ 0000 0300 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0 _d Manufacturer-specific

Table 137 specifies the object description and Table 138 specifies the entry description of the PDO mapping parameters.

Table 137 – Object description of mapping parameters

Attribute	Value
Index	1601 _h
Name	Receive PDO2 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1401 _h is implemented

Table 138 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	607A 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.5.4 RPDO 3

Table 139 specifies the object description and Table 140 specifies the entry description of the PDO communication parameters.

Table 139 – Object description of communication parameters

Attribute	Value
Index	1402 _h
Name	Receive PDO3 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 140 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	~~rw~~ c
PDO mapping	No
Value range	See EN 50325-4
Default value	~~02_h~~ Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~8000 0000~~ 0400 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~0_d~~ Manufacturer-specific

Table 141 specifies the object description and Table 142 specifies the entry description of the PDO mapping parameters.

Table 141 – Object description of mapping parameters

Attribute	Value
Index	1602 _h
Name	Receive PDO3 mapping
Object code	Record
Data type	PDO mapping
Category	Conditonal, if 1402 _h is implemented

Table 142 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	60FF 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.5.5 RPDO 4

Table 143 specifies the object description and Table 144 specifies the entry description of the PDO communication parameters.

Table 143 – Object description of communication parameters

Attribute	Value
Index	1403 _h
Name	Receive PDO4 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 144 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	rw c
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	8000 0000 0500 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0 _d B

Table 145 specifies the object description and Table 146 specifies the entry description of the PDO mapping parameters.

Table 145 – Object description of mapping parameters

Attribute	Value
Index	1603 _h
Name	Receive PDO4 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1403 _h is implemented

Table 146 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	No
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.5.6 TPDO 1

Table 147 specifies the object description and Table 148 specifies the entry description of the PDO communication parameters.

Table 147 – Object description of communication parameters

Attribute	Value
Index	1800 _h
Name	Transmit PDO1 parameter
Object code	Record
Data type	PDO commpar
Category	Mandatory

Table 148 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	~~rw~~ c
PDO mapping	No
Value range	See EN 50325-4
Default value	~~00_h~~ Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if ~~PDO linking is supported~~ COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	4000 0180 _h + node ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~0_d~~ Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~0_d~~ Manufacturer-specific

Table 149 specifies the object description and Table 150 specifies the entry description of the PDO mapping parameters.

Table 149 – Object description of mapping parameters

Attribute	Value
Index	1A00 _h
Name	Transmit PDO1 mapping
Object code	Record
Data type	PDO mapping
Category	Mandatory

Table 150 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	01 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.5.7 TPDO 2

Table 151 specifies the object description and Table 152 specifies the entry description of the PDO communication parameters.

Table 151 – Object description of communication parameters

Attribute	Value
Index	1801 _h
Name	Transmit PDO2 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 152 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	ro c
PDO mapping	No
Value range	See EN 50325-4
Default value	05 _h Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0000 4000 0280 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	100 _d

Table 153 specifies the object description and Table 154 specifies the entry description of the PDO mapping parameters.

Table 153 – Object description of mapping parameters

Attribute	Value
Index	1A01 _h
Name	Transmit PDO2 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1801 _h is implemented

Table 154 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6064 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.5.8 TPDO 3

Table 155 specifies the object description and Table 156 specifies the entry description of the PDO communication parameters.

Table 155 – Object description of communication parameters

Attribute	Value
Index	1802 _h
Name	Transmit PDO3 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 156 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	~~rw~~ c
PDO mapping	No
Value range	See EN 50325-4
Default value	05 _h Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	C000 4000 0380 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	100 _d

Table 157 specifies the object description and Table 158 specifies the entry description of the PDO mapping parameters.

Table 157 – Object description of mapping parameters

Attribute	Value
Index	1A02 _h
Name	Transmit PDO3 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1802 _h is implemented

Table 158 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	606C 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 159 specifies the object description and Table 160 specifies the entry description of the PDO communication parameters.

Table 159 – Object description of communication parameters

Attribute	Value
Index	1803 _h
Name	Transmit PDO4 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 160 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	~~ro~~ c
PDO mapping	No
Value range	See EN 50325-4
Default value	~~No~~ Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	~~C000~~ 4000 0480 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 161 specifies the object description and Table 162 specifies the entry description of the PDO mapping parameters.

Table 161 – Object description of mapping parameters

Attribute	Value
Index	1A03 _h
Name	Transmit PDO4 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1803 _h is implemented

Table 162 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	~~No~~ Manufacturer-specific
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.7 PDO mapping attributes

The objects defined in the CiA 402 drive profile (see IEC 61800-7-201) shall use the PDO mapping attributes as given in Table 163.

Table 163 – PDO mapping attributes of CiA 402 objects

Index/sub-index	Object name	PDO mapping
6007 00 _h	Abort connection option code	No
603F 00 _h	Error code	Yes TPDO
6040 00 _h	Controlword	Yes RPDO
6041 00 _h	Statusword	Yes TPDO
6042 00 _h	vl target velocity	Yes RPDO
6043 00 _h	vl velocity demand	Yes TPDO
6044 00 _h	vl velocity actual-effort value	Yes TPDO
6046 00 _h	vl velocity min max amount – highest sub-index supported	No
6046 01 _h	vl velocity min max amount – vl velocity min amount	Yes RPDO
6046 02 _h	vl velocity min max amount – vl velocity max amount	Yes RPDO
6047 00 _h	vl velocity min max – highest sub-index supported	No
6047 01 _h	vl velocity min max – vl velocity min pos	Yes
6047 02 _h	vl velocity min max – vl velocity max pos	Yes
6047 03 _h	vl velocity min max – vl velocity min neg	Yes
6047 04 _h	vl velocity min max – vl velocity max neg	Yes
6048 00 _h	vl velocity acceleration – highest sub-index supported	No
6048 01 _h	vl velocity acceleration – delta speed	Yes RPDO
6048 02 _h	vl velocity acceleration – delta time	Yes RPDO
6049 00 _h	vl velocity deceleration – highest sub-index supported	No
6049 01 _h	vl velocity deceleration – delta speed	Yes RPDO
6049 02 _h	vl velocity deceleration – delta time	Yes RPDO
604A 00 _h	vl velocity quick stop – highest sub-index supported	No
604A 01 _h	vl velocity quick stop – delta speed	Yes RPDO
604A 02 _h	vl velocity quick stop – delta time	Yes RPDO
604B 00 _h	vl set-point factor – highest sub-index supported	No
604B 01 _h	vl set-point factor – vl set-point factor numerator	Yes RPDO
604B 02 _h	vl set-point factor – vl set-point factor denominator	Yes RPDO
604C 00 _h	vl dimension factor – highest sub-index supported	No
604C 01 _h	vl dimension factor – vl dimension factor numerator	Yes RPDO
604C 02 _h	vl dimension factor – vl dimension factor denominator	Yes RPDO
6050 00 _h	vl slow down time	Yes
6051 00 _h	vl quick stop time	Yes
6052 00 _h	vl nominal percentage	Yes
6053 00 _h	vl percentage demand	Yes
6054 00 _h	vl actual percentage	Yes
6055 00 _h	vl manipulated percentage	Yes
6056 00 _h	vl velocity motor min max amount – highest sub-index supported	No
6056 01 _h	vl velocity motor min max amount – vl velocity motor min amount	Yes
6056 02 _h	vl velocity motor min max amount – vl velocity motor max amount	Yes
6057 00 _h	vl velocity motor min max – highest sub-index supported	No
6057 01 _h	vl velocity motor min max – vl velocity motor min pos	Yes
6057 02 _h	vl velocity motor min max – vl velocity motor max pos	Yes
6057 03 _h	vl velocity motor min max – vl velocity motor min neg	Yes
6057 04 _h	vl velocity motor min max – vl velocity motor max neg	Yes
6058 00 _h	vl frequency motor min max amount – highest sub-index supported	No
6058 01 _h	vl frequency motor min max amount – vl frequency motor min amount	Yes
6058 02 _h	vl frequency motor min max amount – vl frequency motor max amount	Yes
6059 00 _h	vl frequency motor min max – highest sub-index supported	No
6059 01 _h	vl frequency motor min max – vl frequency motor min pos	Yes

Index/sub-index	Object name	PDO mapping
6059 02 _h	~~v/ frequency motor min max — v/ frequency motor max pos~~	~~Yes~~
6059 03 _h	~~v/ frequency motor min max — v/ frequency motor min neg~~	~~Yes~~
6059 04 _h	~~v/ velocity min max — v/ velocity max neg~~	~~Yes~~
605A 00 _h	Quick stop option code	No
605B 00 _h	Shutdown option code	No
605C 00 _h	Disable operation option code	No
605D 00 _h	Halt option code	No
605E 00 _h	Fault reaction option code	No
6060 00 _h	Modes of operation	Yes RPDO
6061 00 _h	Modes of operation display	Yes TPDO
6062 00 _h	Position demand value	Yes TPDO
6063 00 _h	Position actual internal value	Yes TPDO
6064 00 _h	Position actual value	Yes TPDO
6065 00 _h	Following error window	Yes RPDO
6066 00 _h	Following error time out	Yes RPDO
6067 00 _h	Position window	Yes RPDO
6068 00 _h	Position window time	Yes RPDO
6069 00 _h	Velocity sensor actual value	Yes TPDO
606A 00 _h	Sensor selection code	Yes RPDO
606B 00 _h	Velocity demand value	Yes TPDO
606C 00 _h	Velocity actual value	Yes TPDO
606D 00 _h	Velocity window	Yes RPDO
606E 00 _h	Velocity window time	Yes RPDO
606F 00 _h	Velocity threshold	Yes RPDO
6070 00 _h	Velocity threshold time	Yes RPDO
6071 00 _h	Target torque	Yes RPDO
6072 00 _h	Max torque	Yes RPDO
6073 00 _h	Max current	Yes RPDO
6074 00 _h	Torque demand	Yes TPDO
6075 00 _h	Motor rated current	Yes No
6076 00 _h	Motor rated torque	Yes No
6077 00 _h	Torque actual value	Yes TPDO
6078 00 _h	Current actual value	Yes TPDO
6079 00 _h	DC link circuit voltage	Yes RPDO
607A 00 _h	Target position	Yes RPDO
607B 00 _h	Position range limit – highest sub-index supported	No
607B 01 _h	Position range limit – min position range limit	Yes RPDO
607B 02 _h	Position range limit – max position range limit	Yes RPDO
607C 00 _h	Home offset	Yes RPDO
607D 00 _h	Software position limit – highest sub-index supported	No
607D 01 _h	Software position limit – min position limit	Yes RPDO
607D 02 _h	Software position limit – max position limit	Yes RPDO
607E 00 _h	Polarity	RPDO
607F 00 _h	Max profile velocity	Yes RPDO
6080 00 _h	Max motor speed	Yes RPDO
6081 00 _h	Profile velocity	Yes RPDO
6082 00 _h	End velocity	Yes RPDO
6083 00 _h	Profile acceleration	Yes RPDO
6084 00 _h	Profile deceleration	Yes RPDO
6085 00 _h	Quick stop deceleration	Yes RPDO
6086 00 _h	Motion profile type	Yes RPDO
6087 00 _h	Torque slope	Yes RPDO
6088 00 _h	Torque profile type	Yes RPDO
608F 00 _h	Position encoder resolution – highest sub-index supported	No
608F 01 _h	Position encoder resolution – encoder increments	RPDO
608F 02 _h	Position encoder resolution – motor revolutions	RPDO
6090 00 _h	Velocity encoder resolution – highest sub-index supported	No
6090 01 _h	Velocity encoder resolution – encoder increments per second	RPDO

Index/sub-index	Object name	PDO mapping
6090 02 _h	Velocity encoder resolution – motor revolutions per second	RPDO
6091 00 _h	Gear ratio – highest sub-index supported	No
6091 01 _h	Gear ratio – motor revolutions	RPDO
6091 02 _h	Gear ratio – shaft revolutions	RPDO
6092 00 _h	Feed constant – highest sub-index supported	No
6092 01 _h	Feed constant – feed	RPDO
6092 02 _h	Feed constant – shaft revolutions	RPDO
6098 00 _h	Homing method	Yes RPDO
6099 00 _h	Homing speeds – highest sub-index supported	No
6099 01 _h	Homing speeds – speed during search for switch	Yes RPDO
6099 02 _h	Homing speeds – speed during search for zero	Yes RPDO
609A 00 _h	Homing acceleration	Yes RPDO
60A3 00 _h	Profile jerk use	No
60A4 00 _h	Profile jerk – highest sub-index supported	No
60A4 01 _h to 06 _h	Profile jerk – profile jerk 1 to profile jerk 6	No
60B0 00 _h	Add position value Position offset	Yes RPDO
60B1 00 _h	Add velocity value Velocity offset	Yes RPDO
60B2 00 _h	Add torque value Torque offset	Yes RPDO
60B8 00 _h	Touch probe mode	Yes RPDO
60B9 00 _h	Touch probe status	Yes TPDO
60BA 00 _h	Touch probe pos1 pos-value 1 positive edge	Yes TPDO
60BB 00 _h	Touch probe pos1 neg-value 1 negative edge	Yes TPDO
60BC 00 _h	Touch probe pos2 pos-value 2 positive edge	Yes TPDO
60BD 00 _h	Touch probe pos2 neg-value 2 negative edge	Yes TPDO
60C0 00 _h	Interpolation sub mode select	RPDO
60C1 00 _h	Interpolation data record – highest sub-index supported	No
60C1 01 _h to FE _h	Interpolation data record – 2 nd set-point to 254 th set-point	RPDO
60C2 00 _h	Interpolation time period – highest sub-index supported	No
60C2 01 _h	Interpolation time period – interpolation time period value	RPDO
60C2 02 _h	Interpolation time period – interpolation time index	RPDO
60C4 00 _h	Interpolation data configuration – highest sub-index supported	No
60C4 01 _h	Interpolation data configuration – maximum buffer size	No
60C4 02 _h	Interpolation data configuration – actual buffer size	RPDO
60C4 03 _h	Interpolation data configuration – buffer organisation	RPDO
60C4 04 _h	Interpolation data configuration – buffer position	RPDO
60C4 05 _h	Interpolation data configuration – size of data record	RPDO
60C4 06 _h	Interpolation data configuration – buffer clear	RPDO
60C5 00 _h	Max acceleration	Yes RPDO
60C6 00 _h	Max deceleration	Yes RPDO
60D0 00 _h	Touch probe source	No
60D1 00 _h	Touch probe time stamp 1 positive value	TPDO
60D2 00 _h	Touch probe time stamp 1 negative value	TPDO
60D3 00 _h	Touch probe time stamp 2 positive value	TPDO
60D4 00 _h	Touch probe time stamp 2 negative value	TPDO
60D5 00 _h	Touch probe 1 positive edge counter	TPDO
60D6 00 _h	Touch probe 1 negative edge counter	TPDO
60D7 00 _h	Touch probe 2 positive edge counter	TPDO
60D8 00 _h	Touch probe 2 negative edge counter	TPDO
60E0 00 _h	Positive torque limit value	RPDO
60E1 00 _h	Negative torque limit value	RPDO
60E3 00 _h	Supported homing methods	No
60E4 00 _h	Additional position actual value, highest sub-index supported	No
60E4 01 _h to FE _h	1st to 254th additional position actual value	TPDO
60E5 00 _h	Additional velocity actual value, highest sub-index supported	No
60E5 01 _h to FE _h	1st to 254th additional velocity actual value	TPDO
60E6 00 _h	Additional position encoder resolution – encoder increments, highest sub-index supported	No
60E6 01 _h to FE _h	1st to 254th additional position encoder resolution – encoder increments	RPDO
60E7 00 _h	Additional velocity encoder resolution – encoder increments per second, highest sub-index supported	No

Index/sub-index	Object name	PDO mapping
60E7 01 _h to FE _h	1st to 254th additional velocity encoder resolution – encoder increments per second	RPDO
60E8 00 _h	Additional gear ratio – motor shaft revolutions, highest sub-index supported	No
60E8 01 _h to FE _h	1st to 254th additional gear ratio – motor shaft revolutions	RPDO
60E9 00 _h	Additional feed constant – feed, highest sub-index supported	No
60E9 01 _h to FE _h	1st to 254th additional feed constant – feed	RPDO
60EA 00 _h	Commutation angle	RPDO
60EB 00 _h	Additional position encoder resolution – motor revolutions, highest sub-index supported	No
60EB 01 _h to FE _h	1st to 254th additional position encoder resolution – motor revolutions	RPDO
60EC 00 _h	Additional velocity encoder resolution – motor revolutions per second, highest sub-index supported	No
60EC 01 _h to FE _h	1st to 254th additional velocity encoder resolution – motor revolutions per second	RPDO
60ED 00 _h	Additional gear ratio – driving shaft revolutions, highest sub-index supported	No
60ED 01 _h to FE _h	1st to 254th additional gear ratio – driving shaft revolutions	RPDO
60EE 00 _h	Additional feed constant – driving shaft revolutions, highest sub-index supported	No
60EE 01 _h to FE _h	1st to 254th additional feed constant – driving shaft revolutions	RPDO
60F2 00 _h	Positioning option code	Yes RPDO
60F3 00 _h	Max slippage (frequency)	Yes RPDO
60F4 00 _h	Following error actual value	Yes TPDO
60F8 00 _h	Max slippage (velocity)	Yes RPDO
60FA 00 _h	Control effort	Yes TPDO
60FC 00 _h	Position demand internal value	Yes TPDO
60FD 00 _h	Digital inputs	TPDO
60FE 00 _h	Digital output – highest sub-index supported	No
60FE 01 _h	Digital output – physical outputs	RPDO
60FE 02 _h	Digital output – bit mask	RPDO
60FF 00 _h	Target velocity	Yes RPDO
6402 00 _h	Motor type	Yes No
6403 00 _h	Motor catalogue number	No
6404 00 _h	Motor manufacturer	No
6405 00 _h	http motor catalogue address	No
6406 00 _h	Motor calibration date	Yes No
6407 00 _h	Motor service period	Yes No
6502 00 _h	Supported drive modes	Yes TPDO
6503 00 _h	Drive catalogue number	No
6505 00 _h	http drive catalogue address	No
67FE 00 _h	Version number	No
67FF 00 _h	Single device type	No

6 Mapping to CC-Link IE Field Network

6.1 Overview

This clause specifies the mapping of the CiA 402 drive profile onto CC-Link IE Field Network. In particular, the process data object (PDO) communication and mapping parameter are defined.

6.2 Device model

On CC-Link IE Field Network, each device has the object dictionary (OD) as an internal database. The OD structure is specified in Table 164. All objects shall be accessible by the 24-bit CANopen address (16-bit index + 8-bit sub-index).

Table 164 – Object dictionary structure

Index	Object	Reference
0000 _h to 0FFF _h	Data type	IEC 61158-5-23
1000 _h to 1FFF _h	Communication parameter	IEC 61158-5-23
2000 _h to 5FFF _h	Manufacturer-specific	–
6000 _h to 9FFF _h	Profile-specific	IEC 61800-7-201

NOTE CC-Link IE Field devices can also implement multi axes.

6.3 Mapping of communication objects

6.3.1 General

COBs for real-time data transmission shall be mapped to process data object messages (PDOs) using the cyclic data transmission services. COBs for configuration data transmission shall be mapped to service data object message(s) (SDOs) using the acyclic data transmission services. COBs for synchronization may be mapped to synchronization services.

6.3.2 The detailed mapping of communication objects

The PDO shall be implemented as Write service in Cyclic Data ASE (see IEC 61158-5-23). RPDO shall be placed to cycData field in cyclicDataRWw-PDU. TPDO shall be placed to cycData field in cyclicDataWRr-PDU. CyclicDataRWw-PDU and cyclicDataWRr-PDU shall have the same structure as F-CyclicData-PDU (see IEC 61158-6-23).

SDO shall be implemented as AC Data service in Acyclic Data ASE (see IEC 61158-5-23). The structure of data for AC Data is described as below:

- Read Object
- Write Object

Read Object is provided to download SDO based on index, sub-index, and data. Write Object is provided to upload SDO based on index, sub-index, and data. In detail, index, sub-index, and data are placed in the field of objectIndex, objectSubIndex, and data field respectively in FieldMotionSpecificTransient (see 6.3.3.1).

6.3.3 FAL syntax description

6.3.3.1 FALPDU type F abstract syntax

In general, the definitions of FALPDU type F abstract syntax are defined in IEC 61158-6-23. In this clause the extended definitions of FALPDU type F regarding the mapping of CiA 402 are described.

```

FieldMotionSpecificTransient ::= SEQUENCE {
    command                TraCommand,
    subCommand              TraSubCommand,
    fMSTraData              CHOICE {
        setCycleTime        [721] TraSysSetCycleTime,
        readObject           [723] TraSysReadObject,
        writeObject          [724] TraSysWriteObject,
        ...
    }
}

```

```

TraSysSetCycleTime ::= CHOICE {
    setCycleTimeRequest      [0]
        SEQUENCE {
            ctCycle           Unsigned8,
            syCycle           Unsigned8,
            reserved          OCTET STRING (SIZE (8))
        },
    setCycleTimeResponse     [1]
        SEQUENCE {
            ctCycle           Unsigned8,
            syCycle           Unsigned8,
            result            Unsigned8,
            wdcSupport        Unsigned8,
            reserved1         OCTET STRING (SIZE (2)),
            wdcDIIndex        Unsigned16,
            wdcDISubIndex     Unsigned8,
            reserved2         OCTET STRING (SIZE (1)),
            wdcUIIndex        Unsigned16,
            wdcUISubIndex     Unsigned8,
            reserved3         OCTET STRING (SIZE (1)),
            wdcDIOffset       Unsigned16,
            wdcUIOffset       Unsigned16
        }
}

```

```

TraSysReadObject ::= CHOICE {
    readObjectRequest        [0] SEQUENCE {
        objectIndex          Unsigned16,
        objectSubIndex       Unsigned8,
        reserved1            OCTET STRING (SIZE (1)),
        reserved2            OCTET STRING (SIZE (6))
    },
    readObjectResponse       [1] SEQUENCE {
        objectIndex          Unsigned16,
        objectSubIndex       Unsigned8,
        objectDataType       Unsigned8,
        objectDataSize       Unsigned16,
        sdoAbortCode         Unsigned32,
        data                 OCTET STRING (SIZE (0 to 1454))
    }
}

```

```

TraSysWriteObject ::= CHOICE {
    readObjectRequest      [0] SEQUENCE {
        objectIndex        Unsigned16,
        objectSubIndex      Unsigned8,
        objectDataType      Unsigned8,
        objectDataSize      Unsigned16,
        data                OCTET STRING (SIZE (4 to 1458))
    },
    readObjectResponse     [1] SEQUENCE {
        objectIndex        Unsigned16,
        objectSubIndex      Unsigned8,
        reserved1           OCTET STRING (SIZE (1)),
        reserved2           OCTET STRING (SIZE (2)),
        sdoAbortCode        Unsigned32
    }
}

```

6.3.3.2 Data type assignments for type F

See IEC 61158-6-23.

6.3.4 FAL transfer syntax

6.3.4.1 FALPDU type F elements encoding

In general, the definitions of FALPDU type F elements encoding are defined in IEC 61158-6-23. In this clause the extended definitions of FALPDU type F regarding the mapping of CiA 402 are described.

6.3.4.2 FieldMotionSpecificTransient

This field is contained in the transient data field in Transient1-PDU (see IEC 61158-5-23). The structure of the FieldMotionSpecificTransient is shown in Table 165.

Table 165 – FieldMotionSpecificTransient

Field	Description
command	This field specifies the type of field-motion-specific command. The value for each dataType and dataSubType are in accordance with Table 166.
subCommand	This field specifies the sub-command type. The values for each command are in accordance with Table 167.
fMSTraData	This field specifies the field-motion-specific data. The structure of this field differs according to the command and subCommand. For the command, refer to Table 166. For the subCommand, refer to Table 167. The structure of the Read Object Request is shown in Table 173. The structure of the Read Object Response is shown in Table 174. The structure of the Write Object Request is shown in Table 175. The structure of the Write Object Response is shown in Table 176.

Table 166 – command (dataType: 08_h, dataSubType: 0002_h)

Value	Description
00 _h	Not applicable
01 _h	SetCycleTime
02 _h	Read Object
03 _h	Write Object
04 _h to FF _h	Reserved for future use

Table 167 – subCommand type for each command type

Value of command	Value	Description
01 _h	00 _h	Request
02 _h	00 _h	Request
	80 _h	Response
03 _h	00 _h	Request
	80 _h	Response

The structure of setCycleTimeRequest is shown in Table 168.

Table 168 – Structure of setCycleTimeRequest

Field	Description
ctCycle	This field specifies the communication cycle time. The value is in accordance with Table 169.
syCycle	This field specifies the synchronization cycle time. The value is in accordance with Table 170.
reserved	Reserved for future use. The value of each octet is 00 _h .

The ctCycle is shown in Table 169.

Table 169 – ctCycle

Value	Description
00 _h to 01 _h	Reserved for future use
02 _h	27 µs
03 _h	55 µs
04 _h	111 µs
05 _h	222 µs
06 _h	444 µs
07 _h	888 µs
08 _h	1 777 µs
09 _h	3 555 µs
0A _h to 11 _h	Reserved for future use
12 _h	31,2 µs
13 _h	62,5 µs
14 _h	125 µs
15 _h	250 µs
16 _h	500 µs
17 _h	1 000 µs
18 _h	2 000 µs
19 _h	4 000 µs
1A _h to FF _h	Reserved for future use

The syCycle is shown in Table 170.

Table 170 – syCycle

Value	Description
00 _h	Asynchronous
01 _h	Reserved for future use
02 _h	27 µs
03 _h	55 µs
04 _h	111 µs
05 _h	222 µs
06 _h	444 µs
07 _h	888 µs
08 _h	1 777 µs
09 _h	3 555 µs
0A _h to 11 _h	Reserved for future use
12 _h	31,2 µs
13 _h	62,5 µs
14 _h	125 µs
15 _h	250 µs
16 _h	500 µs
17 _h	1 000 µs
18 _h	2 000 µs
19 _h	4 000 µs
1A _h to FF _h	Reserved for future use

The structure of the setCycleTimeResponse is shown in Table 171.

Table 171 – Structure of setCycleTimeResponse

Field	Description
ctCycle	This field specifies the communication cycle time. The value is in accordance with Table 169.
syCycle	This field specifies the synchronization cycle time. The value is in accordance Table 170.
result	This field specifies the result of setCycleTimeRequest. The value is in accordance with Table 172.
wdcSupport	This field specifies the watch dog counter (wdc) function support. 00 _h indicates disabled, 01 _h indicates enabled.
reserved1	Reserved for future use. The value of each octet is 00 _h .
wdcDIIndex	This field specifies the index of wdc used in communication from the controller to the drive.
wdcDISubIndex	This field specifies the sub-index of wdc used in communication from the controller to the drive.
reserved2	Reserved for future use. The value of each octet is 00 _h .
wdcUIIndex	This field specifies the index of wdc used in communication from the drive to the controller.
wdcUISubIndex	This field specifies the sub-index of wdc used in communication from the drive to the controller.
reserved3	Reserved for future use. The value of each octet is 00 _h .
wdcDIOffset	This field specifies the shared memory offset of wdc used in communication from the controller to the drive.
wdcUIOffset	This field specifies the shared memory offset of wdc used in communication from the drive to the controller.

Table 172 – Result

Value	Description
00 _h	Accept ctCycle and syCycle
01 _h	Accept ctCycle and reject syCycle
02 _h to 0F _h	Reserved for future use.
10 _h	Reject ctCycle and accept syCycle
11 _h	Reject ctCycle and syCycle
12 _h to FF _h	Reserved for future use.

Table 173 – Structure of readObjectRequest

Field	Description
objectIndex	This field specifies the index in the object dictionary.
objectSubIndex	This field specifies the sub-index in the object entry description.
reserved1	Reserved for future use. The value of each octet is 00 _h .
reserved2	Reserved for future use. The value of each octet is 00 _h .

Table 174 – Structure of readObjectResponse

Field	Description
objectIndex	This field specifies the index in the object dictionary.
objectSubIndex	This field specifies the sub-index in the object entry description.
objectDataType	This field specifies the data type of target object.
objectDataSize	This field specifies the number of octets if data type is visible string.
sdoAbortCode	This field specifies the SDO abort code.
data	This field specifies the object value.

Table 175 – Structure of writeObjectRequest

Field	Description
objectIndex	This field specifies the index in the object dictionary.
objectSubIndex	This field specifies the sub-index in the object entry description.
objectDataType	This field specifies the data type of target object.
objectDataSize	This field specifies the number of octets if data type is visible string.
data	This field specifies the object value.

Table 176 – Structure of writeObjectResponse

Field	Description
objectIndex	This field specifies the index in the object dictionary.
objectSubIndex	This field specifies the sub-index in the object entry description.
reserved1	Reserved for future use. The value of each octet is 00 _h .
reserved2	Reserved for future use. The value of each octet is 00 _h .
sdoAbortCode	This field specifies the SDO abort code.

6.4 Communication parameter objects

6.4.1 General

The drive device shall implement the mandatory communication parameter as defined in IEC 61158-5-23. The drive device may implement the optional communication parameter as defined in IEC 61158-5-23.

The category and entry category attributes of an object indicate if the object shall be implemented (mandatory) or may be implemented (optional).

The data type attributes are defined in detail in IEC 61158-5-23. The data types used in this profile are listed in Table 177.

Table 177 – List of used data types

Data type	Reference
UNSIGNED8	IEC 61158-5-23
UNSIGNED16	IEC 61158-5-23
UNSIGNED32	IEC 61158-5-23
INTEGER8	IEC 61158-5-23
INTEGER16	IEC 61158-5-23
INTEGER32	IEC 61158-5-23
Visible string	IEC 61158-5-23

In the entry description, the access attribute is defined, indicating if an application object is read only (ro), read/write (rw) or write only (wo). Read only indicates that this shall not be written via the bus; read/write allows to read and to write this object; and write only means that this application object shall be not read via the bus.

The default value attribute defines the value of an object with access attribute of the value 'rw' after power-on or application reset.

6.4.2 Object 1000_h: Device type

See 5.3.2.

6.5 Sets of pre-defined PDOs

6.5.1 General

Only the PDO set for generic drive devices is supported. The communication parameter objects (object 1400_h to 1407_h and object 1800_h to 1807_h) are not used.

6.5.2 PDO set for generic drive device

6.5.2.1 Overview and introduction

The PDO set for a generic drive device pre-defines one object in the RPDO (see Table 178) and one object in the TPDO (see Table 179).

Table 178 – Overview on object in RPDO

Object	Support	Description
1	Mandatory	Controls PDS FSA

Table 179 – Overview on object in TPDO

Object	Support	Description
1	Mandatory	Specifies PDS FSA status

6.5.2.2 RPDO

Table 180 specifies the object description and Table 181 specifies the entry description of the PDO mapping parameters.

Table 180 – Object description of mapping parameters

Attribute	Value
Index	1600 _h
Name	Receive PDO mapping
Object code	Record
Data type	PDO mapping
Category	Mandatory

Table 181 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	See IEC 61158-6-23
PDO mapping	No
Value range	See IEC 61158-6-23
Default value	00 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	See IEC 61158-6-23
PDO mapping	No
Value range	See IEC 61158-6-23
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	See IEC 61158-6-23
PDO mapping	No
Value range	See IEC 61158-6-23
Default value	6060 0008 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	See IEC 61158-6-23
PDO mapping	No
Value range	See IEC 61158-6-23
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	See IEC 61158-6-23
PDO mapping	No
Value range	See IEC 61158-6-23
Default value	Manufacturer-specific

6.5.2.3 TPDO

Table 182 specifies the object description and Table 183 specifies the entry description of the PDO mapping parameters.

Table 182 – Object description of mapping parameters

Attribute	Value
Index	1A00 _h
Name	Transmit PDO mapping
Object code	Record
Data type	PDO mapping
Category	Mandatory

Table 183 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	See IEC 61158-6-23
PDO mapping	No
Value range	See IEC 61158-6-23
Default value	00 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	See IEC 61158-6-23
PDO mapping	No
Value range	See IEC 61158-6-23
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	See IEC 61158-6-23
PDO mapping	No
Value range	See IEC 61158-6-23
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	See IEC 61158-6-23
PDO mapping	No
Value range	See IEC 61158-6-23
Default value	Manufacturer-specific

6.6 PDO mapping attributes

Same as in 5.7.

7 Mapping to EPA

7.1 Overview

This clause specifies the mapping of the CiA 402 drive profile onto EPA. The data types used in this profile are listed in Table 184.

Table 184 – List of used data types

Data type	Reference
Boolean	IEC 61158-5-14
Unsigned8	IEC 61158-5-14
Unsigned16	IEC 61158-5-14
Unsigned32	IEC 61158-5-14
Unsigned64	IEC 61158-5-14
Int8	IEC 61158-5-14
Int16	IEC 61158-5-14
Int32	IEC 61158-5-14
Int64	IEC 61158-5-14
Real	IEC 61158-5-14
VisualString	IEC 61158-5-14
OctetString	IEC 61158-5-14
PrecisionTimeDifference	IEC 61158-5-14
ErrorType	IEC 61158-5-14

7.2 Device module

7.2.1 Overview

The EPA drive system consists of a controller and a number of drive devices, also the motors are included. The system can support 1 to 254 drive devices and its structure is shown in Figure 2.

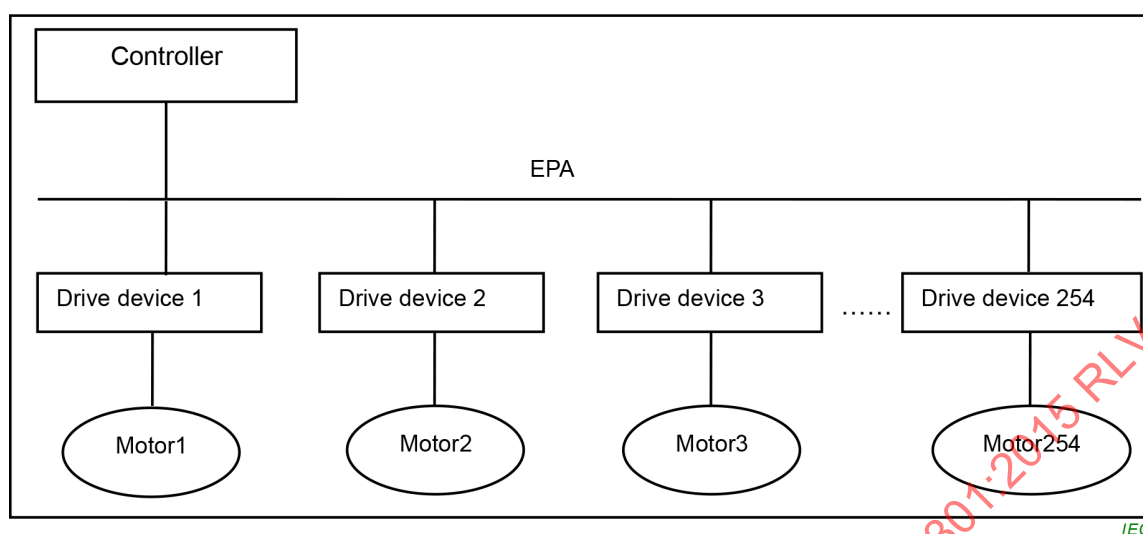


Figure 2 – Structure of EPA drive system

IP address is used as logical address to mark different drive devices, but it has not the same meaning as IP address in IEEE 802.3.

The PDO set for a generic drive device pre-defines seven RPDOs (see Table 185) and seven TPDOs (see Table 186).

Table 185 – Overview on RPDO

PDO	Support	Description
1	Mandatory	Controls PDS FSA
2	Optional	Mode of operation
3	Optional	Target position
4	Optional	Target velocity
5	Optional	Target torque
6	Optional	Nominal speed
7	Optional	Digital outputs
8 to 16	Reserved	
17 to 64	Optional	Manufacturer-specific

Table 186 – Overview on TPDO

PDO	Support	Description
1	Mandatory	Specifies PDS FSA status
2	Optional	Current mode of operation
4	Optional	Current velocity
5	Optional	Current torque
6	Optional	Current speed
7	Optional	Digital inputs
8 to 16	Reserved	
17 to 64	Optional	Manufacturer-specific

7.2.2 Additional definition for mapping to CiA 402

EPA communication system has defined its own management object base (MOB) to organize all the management objects (see IEC 61158-5-14) used in FAL management entity. The MOB is a two-dimension table, as shown in Table 187. Each object has a unique identifier ObjectID.

For mapping profile type 1 to EPA, objects such as CiA 402 mapping object header, CiA 402 mapping object and CiA 402 mapping parameter object, Event object Header, Event object and FRT link object are additionally defined, as shown in the gray-highlighted part of Table 187.

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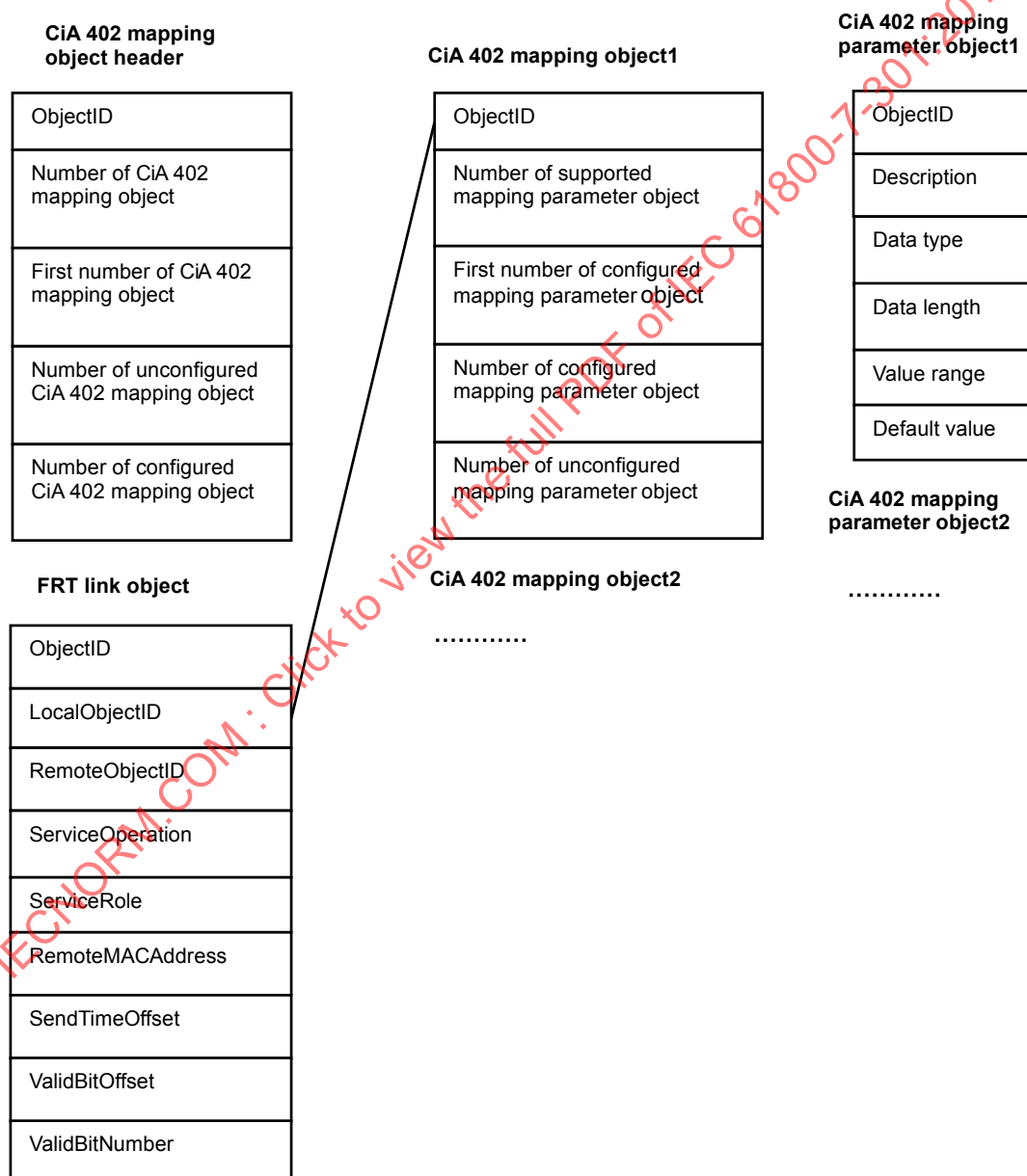
Table 187 – Management object base

Object	ObjectID	Illustration
MOB header	1	Device management object base header object
Device descriptor	2	Device descriptor object
Time synchronization	3	Time synchronization object
Max response time	4	Confirmed service Max response time
Communication schedule management	5	Communication schedule management object
Device application information	6	Device application information object
FB application information header	7	Function block application information header
Link object header	8	Link object header
Domain application object header	9	Domain application object header
FRT link object header	10	FRT link object header
CiA 402 mapping object header	11	CiA 402 mapping object header
Event object header	12	Event object header
	13 to 999	Reserved
CiA 402 mapping object 1	1000	CiA 402 mapping object 1
CiA 402 mapping object 2	1001	CiA 402 mapping object 2
	Increased number in turn	
Event object 1	1300	Event object 1
Event object 2	1301	Event object 2
	1302 to 1599	Reserved
CiA 402 mapping parameter object 1	1600	CiA 402 mapping parameter object 1
CiA 402 mapping parameter object 2	1601	CiA 402 mapping parameter object 2
	Increased number in turn	
FB application information 1	2000	Function block application information 1
FB application information 2	2001	Function block application information 2
	Increased number in turn	
Domain application object 1	4000	Domain application object 1
Domain application object 2	4001	Domain application object 2
	Increased number in turn	
Link object 1	5000	Link object 1
Link object 2	5001	Link object 2
	Increased number in turn	
FRT link object 1	7000	FRT link object 1
FRT link object 2	7001	FRT link object 2
	Increased number in turn	

7.2.3 CiA 402 mapping module

Using the additional defined CiA 402 mapping object header, CiA 402 mapping object, CiA 402 mapping parameter object, and FRT link object (see IEC 61158-5-14), CiA 402 can be mapped onto EPA. The relationship between the objects is shown in Figure 3.

After configuration, the communication relationships between different drive devices are determined. Using CiA 402 mapping object header, where the key attribute is Object, the location and offset of the mapping objects in the memory can be determined. Then using CiA mapping object and FRT link object, where the key attribute are ObjectID and LocalObjectID, the location and offset of the mapping parameter objects and the ServiceRole and ServiceOperation can be further determined. After that, using CiA 402 mapping parameter object, where the key attribute is ObjectID, the mapping parameter can be determined.



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Figure 3 – CiA 402 mapping structure

7.2.4 FAL management object for CiA 402 mapping

7.2.4.1 CiA 402 mapping object header class

7.2.4.1.1 Formal model

ASE:	FAL MANAGEMENT ASE
CLASS:	CiA 402 MAPPING OBJECT HEADER
CLASS ID:	Not used
PARENT CLASS:	TOP
ATTRIBUTES:	
1.	(m) Key attribute: ObjectID
2.	(m) Attribute: Number of CiA 402 mapping object
3.	(m) Attribute: First number of CiA 402 mapping object
4.	(m) Attribute: Number of configured CiA 402 mapping object
5.	(m) Attribute: Number of unconfigured CiA 402 mapping object
SERVICES:	
1.	(o) OpService: FTRRead

7.2.4.1.2 Attributes

ObjectID

This attribute identifies the CiA 402 mapping object header in MOB. Its value is 11.

Number of CiA 402 mapping object

This attribute indicates the number of CiA 402 mapping objects in MOB.

First number of CiA 402 mapping object

This attribute indicates the first number of the CiA 402 mapping object in MOB.

Number of configured CiA 402 mapping object

This attribute indicates the number of CiA 402 mapping objects configured by users.

Number of unconfigured CiA 402 mapping object

This attribute indicates the number of unconfigured CiA 402 mapping objects.

7.2.4.1.3 Services

FTRRead

The optional service allows the user to read the attributes of CiA 402 mapping object header class.

7.2.4.2 CiA 402 mapping object class

7.2.4.2.1 Formal model

ASE:	FAL MANAGEMENT ASE
CLASS:	CiA 402 MAPPING OBJECT
CLASS ID:	Not used
PARENT CLASS:	TOP
ATTRIBUTES:	
1.	(m) Key attribute: ObjectID
2.	(m) Attribute: Number of supported mapping parameter object
3.	(m) Attribute: First number of configured mapping parameter object
4.	(m) Attribute: Number of configured mapping parameter object
5.	(m) Attribute: Number of unconfigured mapping parameter object
SERVICES:	
1.	(o) OpService: FTRRead

7.2.4.2.2 Attributes

ObjectID

This attribute identifies the CiA 402 mapping object in MOB.

Number of supported mapping parameter object

This attribute indicates the number of supported mapping parameter objects.

First number of configured mapping parameter object

This attribute indicates the first number of the mapping parameter object configured by users.

Number of configured mapping parameter object

This attribute indicates the number of mapping parameter objects configured by users.

Number of unconfigured mapping parameter object

This attribute indicates the number of unconfigured mapping parameter objects.

7.2.4.2.3 Services

FRTRead

The optional service allows the user to read the attributes of CiA 402 mapping object class.

7.2.4.3 CiA 402 mapping parameter object class

7.2.4.3.1 Formal model

ASE:		FAL MANAGEMENT ASE	
CLASS:		CiA 402 MAPPING PARAMETER OBJECT	
CLASS ID:		Not used	
PARENT CLASS:		TOP	
ATTRIBUTES:			
1.	(m)	Key attribute:	ObjectID
2.	(m)	Attribute:	Description
3.	(m)	Attribute:	Data type
4.	(m)	Attribute:	Data length
5.	(m)	Attribute:	Value range
6.	(m)	Attribute:	Default value
SERVICES:			
1.	(o)	OpService:	FRTRead
2.	(o)	OpService:	FRTWrite

7.2.4.3.2 Attributes

ObjectID

This attribute identifies CiA 402 mapping parameter object in MOB.

Description

This attribute indicates the description of the parameter.

Data type

This attribute indicates the data type of the parameter.

Data length

This attribute indicates the data length of the parameter.

Value range

This attribute indicates the value range of the parameter.

Default value

This attribute indicates the default value of the parameter.

7.2.4.3.3 Services

FRTRead

The optional service allows the user to read the attributes of CiA 402 mapping parameter object class.

FRTWrite

The optional service allows the user to configure the attributes of CiA 402 mapping parameter object class.

7.2.4.4 FRT link object class

7.2.4.4.1 Formal model

ASE:		FAL MANAGEMENT ASE	
CLASS:		FRT LINK OBJECT	
CLASS ID:		Not used	
PARENT CLASS:		TOP	
ATTRIBUTES:			
1.	(m)	Key attribute:	ObjectID
2.	(m)	Attribute:	LocalObjectID
3.	(m)	Attribute:	RemoteObjectID
4.	(m)	Attribute:	ServiceOperation
5.	(m)	Attribute:	ServiceRole
6.	(m)	Attribute:	RemoteMACAddress
7.	(m)	Attribute:	SendTimeOffset
8.	(m)	Attribute:	ValidBitOffset
9.	(m)	Attribute:	ValidBitNumber
SERVICES:			
1.	(o)	OpsService:	FRTRead
2.	(o)	OpsService:	FRTWrite

7.2.4.4.2 Attributes

ObjectID

This attribute identifies the FRT link object in MOB. The ObjectID number of the FRT link object should be appointed in series.

LocalObjectID

This attribute identifies the local variant object.

RemoteObjectID

This attribute identifies the remote variant object.

ServiceOperation

This attribute specifies the application service to be used in the relevant communication relationship.

- 0: local link, no application service is used
- 1 through 17: the ServiceID of the Type 14 application services is used
- Others: invalid service

ServiceRole

This attribute defines the AREP role of the local device in the communication process.

- 0: sender, indicating that the AREP role of the local device is client or publisher
- 1: receiver, indicating that the AREP role of the local device is server or subscriber

Others: link object is invalid, and FF_h indicates that the link object is not configured or the link object has been deleted

RemoteMACAddress

This attribute identifies the MAC address of the remote device.

SendTimeOffset

This attribute defines the time offset when the relevant message should be sent from the start time of a communication macrocycle. This attribute is valid when the ServiceID is 12_h (FRTVariableDistribute) and the ServiceRole is 0.

ValidBitOffset

This attribute defines the bit offset when the relevant message should be sent or received from the start time of field of Data in FRTVariableDistribute service. This attribute is valid when ServiceID is 12_h (FRTVariableDistribute).

ValidBitNumber

This attribute defines the bit number when the relevant message should be sent or received from the start time of field of Data in FRTVariableDistribute service. This attribute is valid when ServiceID is 12_h (FRTVariableDistribute).

7.2.4.4.3 Service

FRTRead

This optional service permits users to read the attributes of the FRT link object.

FRTWrite

This optional service permits users to configure the attributes of the FRT link object.

7.2.4.5 Event object class

7.2.4.5.1 Formal model

ASE:	FAL MANAGEMENT ASE		
CLASS:	Event object		
CLASS ID:	Not used		
PARENT CLASS:	TOP		
ATTRIBUTES:			
1.	(m)	Key attribute:	ObjectID
2.	(m)	Attribute:	Error code
SERVICES:			
1.	(o)	OpsService:	EventReport service
2.	(o)	OpsService:	AcknowledgeEventReport service

7.2.4.5.2 Attributes

ObjectID

This attribute indicates the identifier of the Event object in MOB.

Error code

This attribute shall provide the error code of the last error which occurred in the drive device. The error code is defined in IEC 61800-7-201.

7.2.4.5.3 Services

EventReport

This optional service allows the server to notify one or more event.

AcknowledgeEventReport

This optional service enables a client to acknowledge several event occurrences.

7.2.4.6 Event header object class

7.2.4.6.1 Formal model

ASE:		FAL MANAGEMENT ASE	
CLASS:		Event header object	
CLASS ID:		Not used	
PARENT CLASS:		TOP	
ATTRIBUTES:			
1.	(m)	Key attribute:	ObjectID
2.	(m)	Attribute:	LocalEventObjectID
3.	(m)	Attribute:	Number of configured Event objects
4.	(m)	Attribute:	Number of unconfigured Event objects
SERVICES:			
1.	(o)	OpsService:	EventReport service
2.	(o)	OpsService:	AcknowledgeEventReport service

7.2.4.6.2 Attributes

ObjectID

This attribute indicates the identifier of the Event header object in MOB.

LocalEventObjectID

This attribute identifies the Event object that is assigned to the local drive device.

Number of configured Event objects

This attribute provides the number of configured Event objects.

Number of unconfigured Event objects

This attribute provides the number of unconfigured Event objects.

7.2.4.6.3 Services

EventReport

This optional service allows the server to notify one or more event.

AcknowledgeEventReport

This optional service enables a client to acknowledge several event occurrences.

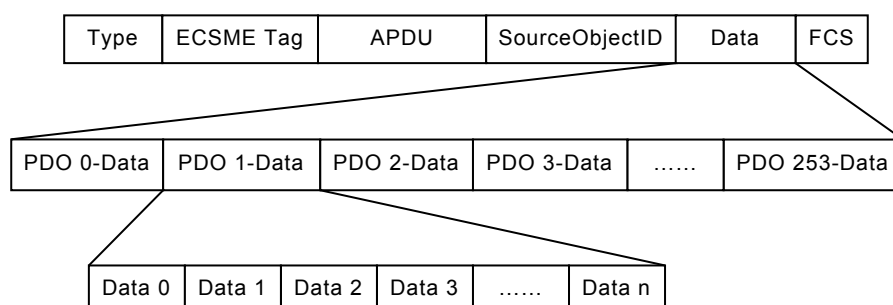
7.3 PDOs mapping on cyclic PDU transmission

7.3.1 Overview

CiA 402 PDOs as defined in IEC 61800-7-201 can be transmitted using the cyclic PDU service FRTVariableDistribute (see IEC 61158-6-14).

Figure 4 describes the mapping of CiA 402 PDOs to the PDU of the FRTVariableDistribute service.

In Figure 4, the format of the ECSME tag is defined in IEC 61158-4-14 and the format of the APDU header is defined in IEC 61158-6-14. The data area of the FRTVariableDistribute service is made up of PDO-Data sets. Different PDO-Data sets are dedicated for different devices. A PDO-Data set is composed of Data 0 to Data n. Data 0 to Data n are defined in the Type 14 CiA 402 mapping object.



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Figure 4 – Format of Type 14 PDU for FRT application

7.3.2 Configuration

7.3.2.1 General

Table 188 describes the link relationship between the sending devices and receiving devices. The sending data can be packeted according to the FRT link object. The receiving data shall be analyzed according to the FRT link object.

Table 188 – Definition of Type 14 FRT link object

No	Parameter name	Read/write property	Data type	Octet offset	Octet length	Description
1	ObjectID	Read only	Unsigned16	0	2	The index of Type 14 link object in the MOB
2	LocalObjectID	Read/write	Unsigned16	2	2	The index for local mapping parameters
3	RemoteObjectID	Read/write	Unsigned16	4	2	ID of the remote element object
4	ServiceOperation	Read/write	Unsigned8	6	1	Type 14 ServiceID used by the link object
5	ServiceRole	Read/write	Unsigned8	7	1	Role of the local object in the communication process
6	RemoteMACAddress	Read/write	Unsigned32	8	4	MAC address of the remote device; if local and destination FB instance objects are in the same Type 14 device, then this property can be ignored; if the Type 14 service uses the broadcast or the multicast method, then this property should be the broadcast or the multicast group address.
7	SendTimeOffset	Read/write	PrecisionTime Difference	12	8	Time offset when sending periodic packet from the start time of a communication macrocycle. Its data type is 4 octets of the TimeDifference. The unit is nanoseconds.
8	ValidBitOffset	Read/write	Unsigned16	20	4	The bit offset when the relevant message should be sent or received from the start time of the field of Data in FRTVariableDistribute service
9	ValidBitNumber	Read/write	Unsigned16	24	4	The bit number when the relevant message should be sent or received from the start time of the field of Data in FRTVariableDistribute service

7.3.2.2 Description of configuration for sending

7.3.2.2.1 Peer-to-peer sending

LocalObjectID shall be configured as the ObjectID of Type 14 CiA 402 mapping object of the local device.

RemoteObjectID shall be configured as the ObjectID of Type 14 CiA 402 mapping object of the receiver.

ServiceOperation shall be configured as the FRTVariableDistribute service.

ServiceRole shall be configured as the sender.

RemoteMACAddress shall be configured as the MAC address of the receiver.

SendTimeOffset shall be configured as the time of sending data.

ValidBitOffset shall be configured as the offset of the PDU data.

ValidBitNumber shall be configured as the total length of the sent data.

7.3.2.2.2 Multicast sending

LocalObjectID shall be configured as the ObjectID of Type 14 CiA 402 mapping object of the local device.

RemoteObjectID shall be configured as the ObjectID of Type 14 CiA 402 mapping object of the receiver.

ServiceOperation shall be configured as the FRTVariableDistribute service.

ServiceRole shall be configured as the sender.

RemoteMACAddress shall be configured as the Multicast MAC address of the receiver.

SendTimeOffset shall be configured as the time of sending data.

ValidBitOffset shall be configured as the offset of the PDU data.

ValidBitNumber shall be configured as the total length of the sent data.

7.3.2.3 Description of configuration for receiving

LocalObjectID shall be configured as the ObjectID of Type 14 CiA 402 mapping object of the local device.

RemoteObjectID shall be configured as the ObjectID of Type 14 CiA 402 mapping object of the sender.

ServiceOperation shall be configured as the FRTVariableDistribute service.

ServiceRole shall be configured as the receiver.

RemoteMACAddress shall be configured as the MAC address of the sender.

SendTimeOffset is unused.

ValidBitOffset shall be configured as the offset of the PDU data.

ValidBitNumber shall be configured as the length of the receiving data.

7.3.3 Procedure of sending PDOs

The procedure of sending PDUs of the FRT application is as follows.

Step 1: Searching out the sender in the FRT link object

Search for the sender beginning from the First number of FRT link object in the FRT link object header by checking the ServiceRole.

Step 2: Getting Type 14 CiA 402 mapping object location

The Type 14 CiA 402 mapping object would be located through the LocalObjectID of the FRT link object found in step 1.

Step 3: Getting Type 14 CiA 402 mapping parameter object

The first number of the CiA 402 mapping parameter object shall be located through the First number of CiA402 mapping parameter object and Number of configured mapping parameter object in the Type 14 CiA 402 mapping object.

Step 4: Packeting FRT PDU data

PDU data for FRT application is filled with the data values of the Type 14 CiA 402 mapping parameter object in step 3. The SourceObjectID for the PDU of the FRT application is filled with the LocalObjectID in step 1.

7.3.4 Procedure of receiving PDOs

The procedure of receiving PDUs of the FRT application is as follows.

Step 1: Getting parameters from the FRT application PDU

SourceObjectID and SourceMACAddress shall be extracted from the FRT application PDU.

Step 2: Getting ServiceRole from the FRT link object

Configured FRT link objects should be scanned beginning from the First number of FRT link object in the MOB. Then check whether the ServiceRole in the FRT link object is the receiver or not. If the ServiceRole is receiver, go to step 3, otherwise continue to search. If all configured FRT link objects are checked and there is still no ServiceRole configured as receiver, stop analyzing.

Step 3: Comparing RemoteObjectID

If the RemoteObjectID of the FRT link object in step 2 equals to the SourceObjectID in step 1, skip to step 4, otherwise return to step 2.

Step 4: Comparing RemoteMACAddress

If the RemoteMACAddress of the FRT link object matches with the SourceMACAddress, go to step 5, otherwise return to step 2.

Step 5: Getting ValidBitOffset and ValidBitNumber of the FRT link object

The PDO data shall be extracted from the FRT application PDU through the ValidBitOffset and the ValidBitNumber in the FRT link object.

Step 6: Getting LocalObjectID of the FRT link object

LocalObjectID of the FRT link object is obtained in step 6. Then Type 14 CiA 402 mapping object is located through the LocalObjectID.

Step 7: Encoding Type 14 CiA 402 mapping object

The first number of the CiA 402 mapping parameter object shall be located through the First number of CiA402 mapping parameter object and the Number of configured mapping parameter object in the Type 14 CiA 402 mapping object.

Step 8: Getting data value of Type 14 CiA 402 mapping parameter object

The data value of the Type 14 CiA 402 mapping parameter object is filled with the PDO data in step 5.

7.4 PDOs mapping on acyclic PDU transmission

7.4.1 General

CiA 402 PDOs as defined in IEC 61700-7-201 can also be transmitted using acyclic PDU services, which is either the FRTWrite service or the FRTRead service (see IEC 61158-6-14) for peer-to-peer access.

For use of these two services, the FRT link object(s) and the CiA 402 mapping parameter objects shall be configured (see 7.2.3) and downloaded to each related device properly.

7.4.2 FRTRead service

7.4.2.1 Request

The FRTRead request parameters are coded as shown in Table 189.

Table 189 – Encoding of FRTRead request parameters

No.	Parameter name	Data type	Octet offset	Octet length	Description
1	DestinationObjectID	Unsigned16	0	2	Object ID of the destination device
2	SubIndex	Unsigned16	2	2	SubIndex of the accessed object

7.4.2.2 Positive response

The FRTRead positive response parameters are coded as shown in Table 190.

Table 190 – Encoding of FRTRead positive response parameters

No.	Parameter name	Data type	Octet offset	Octet length	Description
1	Reserved	OctetString	0	2	Reserved
2	Data	OctetString	2	N	Returned data

7.4.2.3 Negative response

The FRTRead negative response parameters are coded as shown in Table 191.

Table 191 – Encoding of FRTRead negative response parameters

No.	Parameter name	Data type	Octet offset	Octet length	Description
1	Reserved	OctetString	0	2	Reserved
2	ErrorType	ErrorType	2	N	See ErrorType

7.4.3 FRTWrite service

7.4.3.1 Request

The FRTWrite request parameters are coded as shown in Table 192.

Table 192 – Encoding of FRTWrite request parameters

No.	Parameter name	Data type	Octet offset	Octet length	Description
1	DestinationObjectID	Unsigned16	0	2	Object ID of the destination device
2	SubIndex	Unsigned16	2	2	SubIndex of the written object
3	Reserved	OctetString	4	2	Reserved
4	data	OctetSstring	6	N	Data written

7.4.3.2 Positive response

The FRTWrite positive response parameters are coded as shown in Table 193.

Table 193 – Encoding of FRTWrite positive response parameters

No.	Parameter name	Data type	Octet offset	Octet length	Description
1	DestinationObjectID	Unsigned16	0	2	Object ID of the destination device

7.4.3.3 Negative response

The FRTWrite negative response parameters are coded as shown in Table 194.

Table 194 – Encoding of FRTWrite negative response parameters

No.	Parameter name	Data type	Octet offset	Octet length	Description
1	ErrorType	ErrorType	0	N	See ErrorType

7.4.4 FRTRead service process

7.4.4.1 Sending FRTRead request

The FRTRead request frame shall be packeted with the ObjectID and the SubIndex of the object, whose attributes shall be read.

7.4.4.2 Receiving FRTRead response

Step 1: According to the ServiceID, the type of the FRTRead service shall be distinguished. Then turn to step 2.

Step 2: The DestinationObjectID and the SubIndex from the frame shall be compared with the ObjectID and the SubIndex in the MOB. If the equal objectID and SubIndex were found, turn

to step 3, otherwise the FRTRead negative response frame shall be packeted with the ErrorType.

Step 3: According to the ObjectID and the SubIndex, the attribute data to be read shall be fetched from the right position. Then turn to step 4.

Step 4: The FRTRead positive response frame shall be packeted with the fetched data.

7.4.5 FRTWrite service process

7.4.5.1 Sending FRTWrite request

The FRTWrite request frame shall be packeted with the ObjectID and the SubIndex of the object, whose attributes shall be written.

7.4.5.2 Sending FRTWrite response

Step 1: According to the ServiceID, the type of the FRTWrite service shall be distinguished. Then turn to step 2.

Step 2: The DestinationObjectID and the SubIndex from the frame shall be compared with the ObjectID and the SubIndex in the MOB. If the equal ObjectID and SubIndex were found, turn to step 3, otherwise the FRTWrite negative response frame shall be packeted with the ErrorType.

Step 3: According to the ObjectID and the SubIndex, the attribute data from the frame shall be written in to the right position. Then turn to step 4.

Step 4: The FRTWrite positive response frame shall be packeted with the equal ObjectID as the DestinationObjectID.

7.5 Alarm mechanism

7.5.1 Overview

The alarm mechanism is used to transmit error messages from one device to other device(s). The user defines the conditions which trigger the error. The alarm process is invoked to notify the error messages when the conditions are met. The alarm object shall be transmitted using the EventReport service performed by the alarm producer. As long as no new errors occur on a device no further alarm object shall be transmitted. The alarm object may be received by one or more alarm consumers. The consumers of the event notification may acknowledge the event by using the AcknowledgeEventReport service.

7.5.2 EventReport service

This service is used to transmit event notification. It is using multicast or broadcast mode. In this standard, the alarm messages shall be transmitted by calling this service.

The EventReport service parameters are coded as shown in Table 195.

Table 195 – Encoding of EventReport parameters

No.	Parameter name	Data type	Octet offset	Octet length	Description
1	SourceObjectID	Unsigned16	0	2	Application ID of the source device
2	EventNumber	Unsigned16	2	2	Number of the event
3	EventData	OctetString	4	N	Specific event data

The telegram of the EventReport service for the alarm message transmission is shown in Table 196. The SourceObjectID shall be filled with the EventObjectID of the device. The EventData shall be filled with the error code.

Table 196 – Format of EventReport service for alarm

Type	ECSME Tag	APDU header	SourceObjectID	Event Number	EventData	Padding	FCS
2B	12B	8B	2B	2B	N B	22-N	4B

7.5.3 EventReportAcknowledge service

The service allows the user to acknowledge the event notification. It is a confirmed service. After the event notification is received, the user invokes this service to acknowledge the event.

The EventReportAcknowledge service parameters are coded as shown in Table 197.

Table 197 – Encoding of EventReportAcknowledge parameters

No.	Parameter name	Data type	Octet offset	Octet length	Description
1	DestinationObjectID	Unsigned16	0	2	Object ID of the destination device
2	EventNumber	Unsigned16	2	2	Event number

The telegram of EventReportAcknowledge service for alarm message transmission is shown in Table 198. The DestinationObjectID shall be filled with the EventObjectID of the error device.

Table 198 – Format of EventReportAcknowledge service for alarm

Type	ECSME Tag	APDU header	Destination ObjectID	Event Number	Padding	FCS
2B	12B	8B	2B	2B	22B	4B

7.5.4 Event object

The Event object shall provide the error code which occurred in the drive device. Every device has an Event object. The Event object structure is defined in 7.2.4.5. Different devices have different Event objects. The Event objects are assigned according to the local physical addresses. Their relationship is shown in Table 199.

Table 199 – Event object assignment

Device number	Local physical address	Event object
1	xx-xx-xx-xx-xx-01 _h	1400
2	xx-xx-xx-xx-xx-02 _h	1401
.....		
254	xx-xx-xx-xx-xx-fe _h	1653

7.5.5 Alarm process

When the drive device detects a internal failure, it may transmit an alarm message to notify the error. The following steps describe the alarm process.

Step 1: If the device detects a failure internally, the device shall scan the Event object header, and find out the local Event object. The device fills the Event object with the error code. The examples are shown in Table 200 and Table 201.

Table 200 – Example of Event object header

Event Header Object	SubIndex0	SubIndex1	SubIndex2
12	1400	1	253

Table 201 – Example of Event object

Event object	SubIndex0
1400	2110 _h

Step 2: An EventReport service telegram is packeted with the Event object and the error code. The format of the telegram is shown in Table 196.

Step 3: The EventReport service telegram shall be transferred at acyclic communication time, which is defined in IEC 61158-5-14.

Step 4: After the local device sending the EventReport service telegram, the device shall stay in the fault state until the device gets rid of the fault or the power is restarted.

Step 5: Other devices receive the EventReport service telegram and deal with the error. The receiver shall send an EventReportAcknowledge service telegram to acknowledge the fault device that the EventReport has been received. The telegram format is shown in Table 198.

7.5.6 Error code

Error codes are defined in EN 50325-4 and IEC 61800-7-201.

8 Mapping to EtherCAT

8.1 Overview

This clause specifies the mapping of the CiA 402 drive profile onto EtherCAT. In particular, the process data object (PDO) communication and mapping parameters are defined.

8.2 Mapping of communication objects

COBs for real-time data transmission shall be mapped to process data object messages (PDOs) using the process data services. COBs for configuration data transmission shall be mapped to service data object message(s) (SDOs) using the mailbox services. COBs for emergency information transmission shall be mapped to emergency messages (EMCY). COB for synchronization may be mapped to distributed clock services or to Sync Manager Events.

8.3 Communication parameter objects

8.3.1 General

The drive device shall implement the mandatory communication parameter objects as defined in IEC 61158-5-12. The drive device may implement the optional communication parameter objects as defined in IEC 61158-5-12.

The category and entry category attributes of an object indicate if the object shall be implemented (mandatory) or may be implemented (optional).

The object code and data type attributes are defined in detail in IEC 61158-5-12. The data types used in this profile are listed in Table 202.

Table 202 – List of used data types

Data type	Reference
Visible string	IEC 61158-5-12
Unsigned8	IEC 61158-5-12
Unsigned16	IEC 61158-5-12
Unsigned32	IEC 61158-5-12
Integer8	IEC 61158-5-12
Integer16	IEC 61158-5-12
Integer32	IEC 61158-5-12

In the entry description, the access attribute is defined, indicating if an application object is read only (ro), read/write (rw) or write only (wo). Read only indicates that this shall not be written via the bus; read/write allows to read and to write this object; and write only means that this application object shall be not read via the bus.

The default value attribute defines the value of an object with access attribute of the value 'rw' after power-on or application reset.

8.3.2 Object 1000_h: Device type

This object is defined in IEC 61800-7-201 and IEC 61158-6-12. Drive devices shall support the generic PDO mapping (bit 22 in the additional information field is 0) as defined in 5.6.2. The definitions given in Table 203 apply.

Table 203 – Additional information field for generic PDO mapping

Device	Additional information															
	Mode bits								Type							
	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Frequency converter	*	*	*	*	*	*	*	*	0	0	0	0	0	0	0	1
Servo drive	*	*	*	*	*	*	*	*	0	0	0	0	0	0	1	0
Stepper motor	*	*	*	*	*	*	*	*	0	0	0	0	0	1	0	0
Multiple device module	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

8.4 Sets of pre-defined PDOs

Only the PDO set for generic drive devices is supported (see 5.6.2).

8.5 PDO mapping attributes

The objects defined in the CiA 402 drive profile (see IEC 61800-7-201) shall use the PDO mapping attributes as defined for CANopen (see Table 163).

9 Mapping to ETHERNET Powerlink

9.1 Overview

This clause specifies the mapping of the CiA 402 drive profile onto ETHERNET Powerlink network. In particular, the process data object (PDO) communication and mapping parameters are defined. In addition, this part of the IEC 61800-7 series defines the PDO mapping attribute for all objects defined in the CiA 402 drive profile (see IEC 61800-7-201).

9.2 Mapping of communication objects

COBs for real-time data transmission shall be mapped to process data object messages (PDOs). COBs for configuration data transmission shall be mapped to service data object message(s) (SDOs). COBs for network management commands shall be mapped to NMT messages. System time distribution and synchronization is handled implicitly by the ETHERNET Powerlink protocol without the need for explicit messages.

9.3 Communication parameter objects

9.3.1 General

The drive device shall implement the mandatory communication parameter objects as defined in IEC 61158-6-13. The drive device may implement the optional communication parameter objects as defined in IEC 61158-6-13.

The category and entry category attributes of an object indicate if the object shall be implemented (mandatory) or may be implemented (optional).

The object code and data type attributes are defined in detail in IEC 61158-5-13. The data types used in this profile are listed in Table 204.

Table 204 – List of used data types

Data type	Reference
Unsigned8	EN 50325-4
Unsigned16	EN 50325-4
Unsigned32	EN 50325-4
Integer8	EN 50325-4
Integer16	EN 50325-4
Integer32	EN 50325-4
PDO_CommParamRecord_TYPE	IEC 61158-5-13
PDO_MappParamArray_TYPE	IEC 61158-5-13

The default value attribute defines the value of an object with an access attribute of the value 'rw' after power-on or application reset.

9.3.2 Object 1000_h: Device type

See 5.3.2.

9.3.3 Object 67FF_h: Single device type

See 5.3.4.

9.4 Emergency information

If the PDS detects a failure internally, it shall enter the respective error code in the error history as defined in IEC 61158-6-13. The error codes are defined in EN 50325-4 or in IEC 61800-7-201.

9.5 Sets of pre-defined PDOs

9.5.1 General

The RPDO and TPDO are pre-defined for single axis devices. PDOs for multi-device modules need to be mapped manually.

There are several sets of pre-defined PDOs. The PDO set for generic drive device is independent from the drive type. The PDO sets for specific drive devices are different for frequency converter, servo controller, and stepper motor.

The PDO_CommParamRecord_TYPE and the PDO_MappParamArray_TYPE record definitions, and the value definitions of the PDO communication and mapping parameters are defined in IEC 61158-6-13.

9.5.2 PDO set for generic drive device

9.5.2.1 Overview and introduction

The PDO set for a generic drive device pre-defines seven objects in the RPDO (see Table 205) and seven objects in the TPDO (see Table 206).

Table 205 – Overview on objects in RPDO

Object	Support	Description
1	Mandatory	Controls PDS FSA
2	Optional	Mode of operation
3	Optional	Target position (pp)
4	Optional	Target velocity (pv)
5	Optional	Target torque (tq)
6	Optional	Nominal speed (vl)
7	Optional	Digital outputs

Table 206 – Overview on objects in TPDO

Object	Support	Description
1	Mandatory	Specifies PDS FSA status
2	Optional	Current mode of operation
3	Optional	Current position (pp)
4	Optional	Current velocity (pv)
5	Optional	Current torque (tq)
6	Optional	Current speed (vl)
7	Optional	Digital inputs

9.5.2.2 RPDO

Table 207 specifies the object description and Table 208 specifies the entry description of the PDO communication parameters.

Table 207 – Object description of communication parameters

Attribute	Value
Index	1400 _h
Name	PDO_RxCommParam_00h_REC
Object code	Record
Data type	PDO_CommParamRecord_TYPE
Category	Mandatory

Table 208 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Number of Entries
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	02 _h
Sub-index	01 _h
Description	NodeID_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h
Sub-index	02 _h
Description	MappingVersion_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h

Table 209 specifies the object description and Table 210 specifies the entry description of the PDO mapping parameters.

Table 209 – Object description of mapping parameters

Attribute	Value
Index	1600 _h
Name	PDO_RxMapParam_00h_AU64
Object code	Record
Data type	PDO_MappParamArray_TYPE
Category	Mandatory

Table 210 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Number of mapped objects
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	07 _h
Sub-index	01 _h
Description	ObjectMapping_U64[1]
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6040 _h – 00 _h – 00 _h – 0000 _h – 0010 _h
Sub-index	02 _h
Description	ObjectMapping_U64[2]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6060 _h – 00 _h – 00 _h – 0010 _h – 0008 _h
Sub-index	03 _h
Description	ObjectMapping_U64[3]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	607A _h – 00 _h – 00 _h – 0018 _h – 0020 _h
Sub-index	04 _h
Description	ObjectMapping_U64[4]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	60FF _h – 00 _h – 00 _h – 0038 _h – 0020 _h
Sub-index	05 _h
Description	ObjectMapping_U64[5]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6071 _h – 00 _h – 00 _h – 0058 _h – 0010 _h

Sub-index	06 _h
Description	ObjectMapping_U64[6]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6042 _h – 00 _h – 00 _h – 0068 _h – 0010 _h
Sub-index	07 _h
Description	ObjectMapping_U64[7]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	60FE _h – 00 _h – 00 _h – 0078 _h – 0020 _h

9.5.2.3 TPDO

Table 211 specifies the object description and Table 212 specifies the entry description of the PDO communication parameters.

Table 211 – Object description of communication parameters

Attribute	Value
Index	1800 _h
Name	PDO_TxCommParam_00h_REC
Object code	Record
Data type	PDO_CommParamRecord_TYPE
Category	Mandatory

Table 212 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Number of Entries
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	02 _h
Sub-index	01 _h
Description	NodeID_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h
Sub-index	02 _h
Description	MappingVersion_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h

Table 213 specifies the object description and Table 214 specifies the entry description of the PDO mapping parameters.

Table 213 – Object description of mapping parameters

Attribute	Value
Index	1A00 _h
Name	PDO_TxMapParam_00h_AU64
Object code	Record
Data type	PDO_MappParamArray_TYPE
Category	Mandatory

Table 214 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Number of mapped objects
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	07 _h
Sub-index	01 _h
Description	ObjectMapping_U64[1]
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6041 _h – 00 _h – 00 _h – 0000 _h – 0010 _h
Sub-index	02 _h
Description	ObjectMapping_U64[2]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6061 _h – 00 _h – 00 _h – 0010 _h – 0008 _h
Sub-index	03 _h
Description	ObjectMapping_U64[3]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6064 _h – 00 _h – 00 _h – 0018 _h – 0020 _h
Sub-index	04 _h
Description	ObjectMapping_U64[4]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	606C _h – 00 _h – 00 _h – 0038 _h – 0020 _h
Sub-index	05 _h
Description	ObjectMapping_U64[5]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6077 _h – 00 _h – 00 _h – 0058 _h – 0010 _h

Sub-index	06 _h
Description	ObjectMapping_U64[6]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6044 _h – 00 _h – 00 _h – 0068 _h – 0010 _h
Sub-index	07 _h
Description	ObjectMapping_U64[7]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	60FD _h – 00 _h – 00 _h – 0078 _h – 0020 _h

9.5.3 PDO set for frequency converter

9.5.3.1 Overview and introduction

The PDO set for frequency converter pre-defines two objects in the RPDO (see Table 215) and two objects in the TPDO (see Table 216).

Table 215 – Overview on objects in RPDO

Object	Support	Description
1	Mandatory	Controls PDS FSA
2	Optional	Nominal speed (vI)
3	Optional	Target torque (tq)

Table 216 – Overview on objects in TPDO

Object	Support	Description
1	Mandatory	Specifies PDS FSA status
2	Optional	Current speed (vI)
3	Optional	Current torque (tq)

9.5.3.2 RPDO

Table 217 specifies the object description and Table 218 specifies the entry description of the PDO communication parameters.

Table 217 – Object description of communication parameters

Attribute	Value
Index	1400 _h
Name	PDO_RxCommParam_00h_REC
Object code	Record
Data type	PDO_CommParamRecord_TYPE
Category	Mandatory

Table 218 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Number of Entries
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	02 _h
Sub-index	01 _h
Description	NodeID_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h
Sub-index	02 _h
Description	MappingVersion_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h

Table 219 specifies the object description and Table 220 specifies the entry description of the PDO mapping parameters.

Table 219 – Object description of mapping parameters

Attribute	Value
Index	1600 _h
Name	PDO_RxMapParam_00h_AU64
Object code	Record
Data type	PDO_MappParamArray_TYPE
Category	Mandatory

Table 220 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Number of mapped objects
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	02 _h
Sub-index	01 _h
Description	ObjectMapping_U64[1]
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6040 _h – 00 _h – 00 _h – 0000 _h – 0010 _h
Sub-index	02 _h
Description	ObjectMapping_U64[2]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6042 _h – 00 _h – 00 _h – 0010 _h – 0010 _h
Sub-index	03 _h
Description	ObjectMapping_U64[3]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6071 _h – 00 _h – 00 _h – 0028 _h – 0010 _h

9.5.3.3 TPDO

Table 221 specifies the object description and Table 222 specifies the entry description of the PDO communication parameters.

Table 221 – Object description of communication parameters

Attribute	Value
Index	1800 _h
Name	PDO_TxCommParam_00h_REC
Object code	Record
Data type	PDO_CommParamRecord_TYPE
Category	Mandatory

Table 222 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Number of Entries
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	02 _h
Sub-index	01 _h
Description	NodeID_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h
Sub-index	02 _h
Description	MappingVersion_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h

Table 223 specifies the object description and Table 224 specifies the entry description of the PDO mapping parameters.

Table 223 – Object description of mapping parameters

Attribute	Value
Index	1A00 _h
Name	PDO_TxMapParam_00h_AU64
Object code	Record
Data type	PDO_MappParamArray_TYPE
Category	Mandatory

Table 224 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Number of mapped objects
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	02 _h
Sub-index	01 _h
Description	ObjectMapping_U64[1]
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6041 _h – 00 _h – 00 _h – 0000 _h – 0010 _h
Sub-index	02 _h
Description	ObjectMapping_U64[2]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6044 _h – 00 _h – 00 _h – 0010 _h – 0010 _h
Sub-index	03 _h
Description	ObjectMapping_U64[3]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6077 _h – 00 _h – 00 _h – 0020 _h – 0010 _h

9.5.4 PDO set for servo drive

9.5.4.1 Overview and introduction

The PDO set for servo drive pre-defines three objects in the RPDO (see Table 225) and three objects in the TPDO (see Table 226).

Table 225 – Overview on objects in RPDO

Object	Support	Description
1	Mandatory	Controls PDS FSA
2	Optional	Target position (pp)
3	Optional	Target velocity (pv)

Table 226 – Overview on objects in TPDO

Object	Support	Description
1	Mandatory	Specifies PDS FSA status
2	Optional	Current position (pp)
3	Optional	Current velocity (pv)

9.5.4.2 RPDO

Table 227 specifies the object description and Table 228 specifies the entry description of the PDO communication parameters.

Table 227 – Object description of communication parameters

Attribute	Value
Index	1400 _h
Name	PDO_RxCommParam_00h_REC
Object code	Record
Data type	PDO_CommParamRecord_TYPE
Category	Mandatory

Table 228 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Number of Entries
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	02 _h
Sub-index	01 _h
Description	NodeID_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h
Sub-index	02 _h
Description	MappingVersion_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h

Table 229 specifies the object description and Table 230 specifies the entry description of the PDO mapping parameters.

Table 229 – Object description of mapping parameters

Attribute	Value
Index	1600 _h
Name	PDO_RxMapParam_00h_AU64
Object code	Record
Data type	PDO_MappParamArray_TYPE
Category	Mandatory

Table 230 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Number of mapped objects
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	03 _h
Sub-index	01 _h
Description	ObjectMapping_U64[1]
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6040 _h – 00 _h – 00 _h – 0000 _h – 0010 _h
Sub-index	02 _h
Description	ObjectMapping_U64[3 2]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	607A _h – 00 _h – 00 _h – 0010 _h – 0020 _h
Sub-index	03 _h
Description	ObjectMapping_U64[4 3]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	60FF _h – 00 _h – 00 _h – 0030 _h – 0020 _h

9.5.4.3 TPDO

Table 231 specifies the object description and Table 232 specifies the entry description of the PDO communication parameters.

Table 231 – Object description of communication parameters

Attribute	Value
Index	1800 _h
Name	PDO_TxCommParam_00h_REC
Object code	Record
Data type	PDO_CommParamRecord_TYPE
Category	Mandatory

Table 232 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Number of Entries
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	02 _h
Sub-index	01 _h
Description	NodeID_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h
Sub-index	02 _h
Description	MappingVersion_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h

Table 233 specifies the object description and Table 234 specifies the entry description of the PDO mapping parameters.

Table 233 – Object description of mapping parameters

Attribute	Value
Index	1A00 _h
Name	PDO_TxMapParam_00h_AU64
Object code	Record
Data type	PDO_MappParamArray_TYPE
Category	Mandatory

Table 234 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Number of mapped objects
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	03 _h
Sub-index	01 _h
Description	ObjectMapping_U64[1]
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6041 _h – 00 _h – 00 _h – 0000 _h – 0010 _h
Sub-index	02 _h
Description	ObjectMapping_U64[3 2]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6064 _h – 00 _h – 00 _h – 0010 _h – 0020 _h
Sub-index	03 _h
Description	ObjectMapping_U64[4 3]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	606C _h – 00 _h – 00 _h – 0030 _h – 0020 _h

9.5.5 PDO set for stepper motor

9.5.5.1 Overview and introduction

The PDO set for ~~generic drive device~~ **stepper motor** pre-defines three objects in the RPDO (see Table 235) and three objects in the TPDO (see Table 236).

Table 235 – Overview on objects in RPDO

Object	Support	Description
1	Mandatory	Controls PDS FSA
2	Optional	Target position (pp)
3	Optional	Target velocity (pv)

Table 236 – Overview on objects in TPDO

Object	Support	Description
1	Mandatory	Specifies PDS FSA status
2	Optional	Current position (pp)
3	Optional	Current velocity (pv)

9.5.5.2 RPDO

Table 237 specifies the object description and Table 238 specifies the entry description of the PDO communication parameters.

Table 237 – Object description of communication parameters

Attribute	Value
Index	1400 _h
Name	PDO_RxCommParam_00h_REC
Object code	Record
Data type	PDO_CommParamRecord_TYPE
Category	Mandatory

Table 238 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Number of Entries
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	02 _h
Sub-index	01 _h
Description	NodeID_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h
Sub-index	02 _h
Description	MappingVersion_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h

Table 239 specifies the object description and Table 240 specifies the entry description of the PDO mapping parameters.

Table 239 – Object description of mapping parameters

Attribute	Value
Index	1600 _h
Name	PDO_RxMapParam_00h_AU64
Object code	Record
Data type	PDO_MappParamArray_TYPE
Category	Mandatory

Table 240 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Number of mapped objects
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	03 _h
Sub-index	01 _h
Description	ObjectMapping_U64[1]
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6040 _h – 00 _h – 00 _h – 0000 _h – 0010 _h
Sub-index	02 _h
Description	ObjectMapping_U64[2]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	607A _h – 00 _h – 00 _h – 0010 _h – 0020 _h
Sub-index	03 _h
Description	ObjectMapping_U64[3]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	60FF _h – 00 _h – 00 _h – 0030 _h – 0020 _h

9.5.5.3 TPDO

Table 241 specifies the object description and Table 242 specifies the entry description of the PDO communication parameters.

Table 241 – Object description of communication parameters

Attribute	Value
Index	1800 _h
Name	PDO_TxCommParam_00h_REC
Object code	Record
Data type	PDO_CommParamRecord_TYPE
Category	Mandatory

Table 242 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Number of Entries
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	02 _h
Sub-index	01 _h
Description	NodeID_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h
Sub-index	02 _h
Description	MappingVersion_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h

Table 243 specifies the object description and Table 244 specifies the entry description of the PDO mapping parameters.

Table 243 – Object description of mapping parameters

Attribute	Value
Index	1A00 _h
Name	PDO_TxMapParam_00h_AU64
Object code	Record
Data type	PDO_MappParamArray_TYPE
Category	Mandatory

Table 244 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Number of mapped objects
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	03 _h
Sub-index	01 _h
Description	ObjectMapping_U64[1]
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6041 _h – 00 _h – 00 _h – 0000 _h – 0010 _h
Sub-index	02 _h
Description	ObjectMapping_U64[2]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6064 _h – 00 _h – 00 _h – 0010 _h – 0020 _h
Sub-index	03 _h
Description	ObjectMapping_U64[3]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	606C _h – 00 _h – 00 _h – 0030 _h – 0020 _h

9.6 PDO mapping attributes

Same as in 5.7.

Bibliography

IEC 60050-351, *International Electrotechnical Vocabulary – Part 351: Control technology*¹⁵

IEC 61158 (all parts), *Digital data communications for measurement and control – Fieldbus for use in industrial control systems*

IEC 61499-1:~~2005~~, *Function blocks – Part 1: Architecture*

IEC 61784-1, *Industrial communication networks – Profiles – Part 1: Fieldbus profiles*

IEC 61784-2, *Industrial communication networks – Profiles – Part 2: Additional fieldbus profiles for real-time networks based on ISO/IEC 8802-3*

IEC 61800 (all parts), *Adjustable speed electrical power drive systems*

IEC 61800-7-1:2015, *Adjustable speed electrical power drive systems – Part 7-1: Generic interface and use of profiles for power drive systems – Interface definition*

IEC 61800-7-202:2015, *Adjustable speed electrical power drive systems – Part 7-202: Generic interface and use of profiles for power drive systems – Profile type 2 specification*

IEC 61800-7-203:2015, *Adjustable speed electrical power drive systems – Part 7-203: Generic interface and use of profiles for power drive systems – Profile type 3 specification*

IEC 61800-7-204:2015, *Adjustable speed electrical power drive systems – Part 7-204: Generic interface and use of profiles for power drive systems – Profile type 4 specification*

IEC 61800-7-302:2015, *Adjustable speed electrical power drive systems – Part 7-302: Generic interface and use of profiles for power drive systems – Mapping of profile type 2 to network technologies*

IEC 61800-7-303:2015, *Adjustable speed electrical power drive systems – Part 7-303: Generic interface and use of profiles for power drive systems – Mapping of profile type 3 to network technologies*

IEC 61800-7-304:2015, *Adjustable speed electrical power drive systems – Part 7-304: Generic interface and use of profiles for power drive systems – Mapping of profile type 4 to network technologies*

IEC ~~ITS~~ 61915-1, *Low-voltage switchgear and controlgear – Principles for the development of Device profiles for networked industrial devices – Part 1: General rules for the development of device*

IEC TR 62390:2005, *Common Automation Device – Profile Guideline*

ISO/IEC 2382-15:~~1999~~, *Information technology – Vocabulary – Part 15: Programming languages*

ISO/IEC 19501, *Information technology – Open Distributed Processing – Unified Modeling Language (UML) Version 1.4.2*

¹⁵ See also the IEC Multilingual Dictionary – Electricity, Electronics and Telecommunications.

ISO 15745-1:~~2003~~, *Industrial automation systems and integration – Open systems application integration framework – Part 1: Generic reference description*

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ADJUSTABLE SPEED ELECTRICAL POWER DRIVE SYSTEMS –**Part 7-301: Generic interface and use of profiles for power drive systems – Mapping of profile type 1 to network technologies**

FOREWORD

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International Standard IEC 61800-7-301 has been prepared by subcommittee SC 22G: Adjustable speed electric drive systems incorporating semiconductor power converters, of IEC technical committee TC 22: Power electronic systems and equipment.

This second edition cancels and replaces the first edition published in 2007. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- Additional mappings to communication systems are included (see Clause 6 and Clause 7).

The text of this standard is based on the following documents:

FDIS	Report on voting
22G/311/FDIS	22G/326/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 61800 series, under the general title *Adjustable speed electrical power drive systems*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

The IEC 61800 series is intended to provide a common set of specifications for adjustable speed electrical power drive systems.

IEC 61800-7 specifies profiles for power drive systems (PDS) and their mapping to existing communication systems by use of a generic interface model.

IEC 61800-7 describes a generic interface between control systems and power drive systems. This interface can be embedded in the control system. The control system itself can also be located in the drive (sometimes known as "smart drive" or "intelligent drive").

A variety of physical interfaces is available (analogue and digital inputs and outputs, serial and parallel interfaces, fieldbuses and networks). Profiles based on specific physical interfaces are already defined for some application areas (e.g. motion control) and some device classes (e.g. standard drives, positioner). The implementations of the associated drivers and application programming interface are proprietary and vary widely.

IEC 61800-7 defines a set of common drive control functions, parameters, and state machines or description of sequences of operation to be mapped to the drive profiles.

IEC 61800-7 provides a way to access functions and data of a drive that is independent of the used drive profile and communication interface. The objective is a common drive model with generic functions and objects suitable to be mapped on different communication interfaces. This makes it possible to provide common implementations of motion control (or velocity control or drive control applications) in controllers without any specific knowledge of the drive implementation.

There are several reasons to define a generic interface:

For a drive device manufacturer

- less effort to support system integrators;
- less effort to describe drive functions because of common terminology;
- the selection of drives does not depend on availability of specific support;

For a control device manufacturer

- no influence of bus technology;
- easy device integration;
- independent of a drive supplier;

For a system integrator

- less integration effort for devices;
- only one understandable way of modeling;
- independent of bus technology.

Much effort is needed to design a motion control application with several different drives and a specific control system. The tasks to implement the system software and to understand the functional description of the individual components may exhaust the project resources. In some cases, the drives do not share the same physical interface. Some control devices just support a single interface, which will not be supported by a specific drive. On the other hand, the functions and data structures are often specified with incompatibilities. This requires the system integrator to write special interfaces for the application software and this should not be his responsibility.

Some applications need device exchangeability or integration of new devices in an existing configuration. They are faced with different incompatible solutions. The efforts to adapt a solution to a drive profile and to manufacturer-specific extensions may be unacceptable. This will reduce the degree of freedom to select a device best suited for this application to the selection of the unit, which will be available for a specific physical interface and supported by the controller.

IEC 61800-7-1 is divided into a generic part and several annexes as shown in Figure 1. The drive profile types for CiA® 402¹, CIP Motion™², PROFIdrive³ and SERCOS®⁴ are mapped to the generic interface in the corresponding annex. The annexes have been submitted by open international network or fieldbus organizations, which are responsible for the content of the related annex and use of the related trade marks.

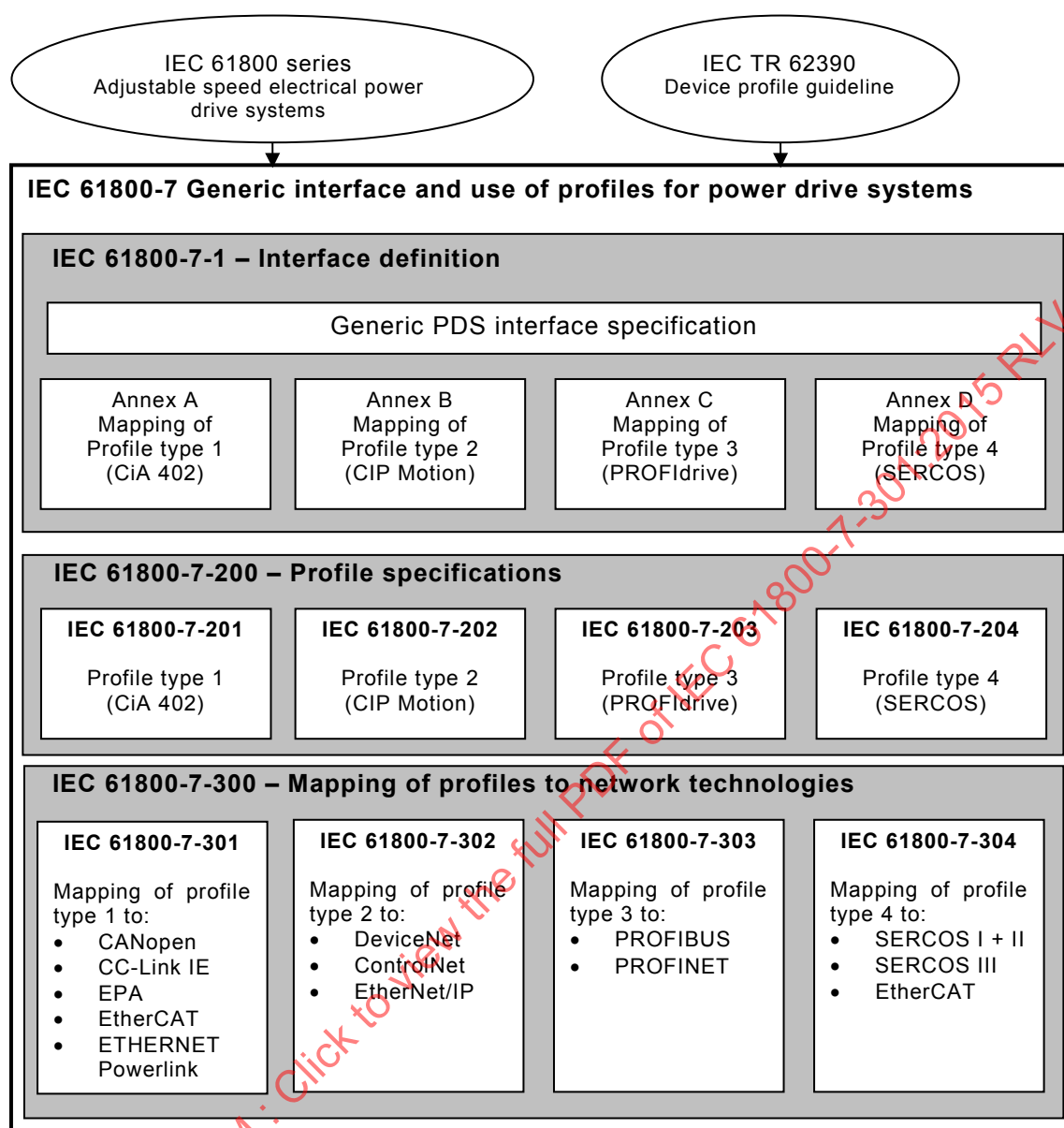
The different profile types 1, 2, 3, 4 are specified in IEC 61800-7-201, IEC 61800-7-202, IEC 61800-7-203 and IEC 61800-7-204.

This part of IEC 61800-7 specifies how the profile type 1 (CiA® 402) is mapped to the network technologies CANopen®⁵, CC-Link IE® Field Network⁶, EPA™⁷, EtherCAT®⁸ and Ethernet Powerlink™⁹.

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IEC 61800-7-302, IEC 61800-7-303 and IEC 61800-7-304 specify how the profile types 2, 3 and 4 are mapped to different network technologies (such as EtherCAT®, DeviceNet™¹⁰, ControlNet™¹¹, EtherNet/IP™¹², PROFIBUS¹³, PROFINET¹⁴ and SERCOS®).

-
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IEC

Figure 1 – Structure of IEC 61800-7

ADJUSTABLE SPEED ELECTRICAL POWER DRIVE SYSTEMS –

Part 7-301: Generic interface and use of profiles for power drive systems – Mapping of profile type 1 to network technologies

1 Scope

This part of IEC 61800 specifies the mapping of the profile type 1 (CiA 402) specified in IEC 61800-7-201 onto different network technologies.

The functions specified in this part of IEC 61800-7 are not intended to ensure functional safety. This requires additional measures according to the relevant standards, agreements and laws.

- CANopen, see Clause 5;
- CC-Link IE Field, see Clause 6;
- EPA, see Clause 7;
- EtherCAT, see Clause 8;
- ETHERNET Powerlink, see Clause 9;

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61158-4-14, *Industrial communication networks – Fieldbus specifications – Part 4-14: Data-link layer protocol specification – Type 14 elements*

IEC 61158-5-12, *Industrial communication networks – Fieldbus specifications – Part 5-12: Application layer service definition – Type 12 elements*

IEC 61158-5-13, *Industrial communication networks – Fieldbus specifications – Part 5-13: Application layer service definition – Type 13 elements*

IEC 61158-5-14, *Industrial communication networks – Fieldbus specifications – Part 5-14: Application layer service definition – Type 14 elements*

IEC 61158-5-23, *Industrial communication networks – Fieldbus specifications – Part 5-23: Application layer service definition – Type 23 elements*

IEC 61158-6-12, *Industrial communication networks – Fieldbus specifications – Part 6-12: Application layer protocol specification – Type 12 elements*

IEC 61158-6-13, *Industrial communication networks – Fieldbus specifications – Part 6-13: Application layer protocol specification – Type 13 elements*

IEC 61158-6-14, *Industrial communication networks – Fieldbus specification – Part 6-14: Application layer protocol specification – Type 14 elements*

IEC 61158-6-23, *Industrial communication networks – Fieldbus specification – Part 6-23: Application layer protocol specification – Type 23 elements*

IEC 61800-7-201, *Adjustable speed electrical power drive systems – Part 7-201: Generic interface and use of profiles for power drive systems – Profile type 1 specification*

EN 50325-4, *Industrial communications subsystem based on ISO 11898 (CAN) for controller-device interfaces – Part 4: CANopen*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1

actual value

value of a variable quantity at a given instant

Note 1 to entry: Actual value is used in this document as input data of the application control program to monitor variables of the PDS (e.g. feedback variables).

[SOURCE: IEC 61800-7-1:2015, 3.3.1.1]

3.1.2

application

software functional element specific to the solution of a problem in industrial-process measurement and control

Note 1 to entry: An application may be distributed among resources, and may communicate with other applications.

[SOURCE: IEC 61800-7-1:2015, 3.2.2]

3.1.3

attribute

property or characteristic of an entity

[SOURCE: IEC 61800-7-1:2015, 3.2.3]

3.1.4

class

description of a set of objects that share the same attributes, operations, methods, relationships, and semantics

[SOURCE: IEC 61800-7-1:2015, 3.2.5]

3.1.5

commands

set of commands from the application control program to the PDS to control the behavior of the PDS or functional elements of the PDS

Note 1 to entry: The behavior is reflected by states or operating modes.

Note 2 to entry: The different commands may be represented by one bit each.

[SOURCE: IEC 61800-7-1:2015, 3.3.1.3]

3.1.6

communication macrocycle

set of basic cycles needed for a configured communication activity in a macro network segment

3.1.7

configuration data

data for selecting functional units, assigning their location and defining their interconnections

3.1.8

control

purposeful action on or in a process to meet specified objectives

[SOURCE: IEC 61800-7-1:2015, 3.2.6]

3.1.9

control device

physical unit that contains – in a module/subassembly or device – an application program to control the PDS

[SOURCE: IEC 61800-7-1:2015, 3.2.7]

3.1.10

data type

set of values together with a set of permitted operations

[SOURCE: IEC 61800-7-1:2015, 3.2.8]

3.1.11

device

field device

<function blocks> networked independent physical entity of an industrial automation system capable of performing specified functions in a particular context and delimited by its interfaces

[SOURCE: IEC 61800-7-1:2015, 3.2.9]

3.1.12

device profile

representation of a device in terms of its parameters, parameter assemblies and behaviour according to a device model that describes the data and behaviour of the device as viewed through a network, independent from any network technology

[SOURCE: IEC 61800-7-1:2015, 3.2.11]

3.1.13

entity

particular thing, such as a person, place, process, object, concept, association, or event

3.1.14

feedback variable

variable quantity, which represents the controlled variable and is returned to the comparing element

[SOURCE: IEC 61800-7-1:2015, 3.2.12]

3.1.15**functional element**

entity of software or software combined with hardware, capable of accomplishing a specified function of a device

Note 1 to entry: A functional element has an interface, associations to other functional elements and functions.

Note 2 to entry: A functional element can be made out of function block(s), object(s) or parameter list(s).

[SOURCE: IEC 61800-7-1:2015, 3.2.13]

3.1.16**input data**

data transferred from an external source into a device, resource or functional element

[SOURCE: IEC 61800-7-1:2015, 3.2.14]

3.1.17**interface**

shared boundary between two entities defined by functional characteristics, signal characteristics, or other characteristics as appropriate

[SOURCE: IEC 61800-7-1:2015, 3.2.15]

3.1.18**mapping**

set of values having defined correspondence with the quantities or values of another set

3.1.19**message**

ordered series of octets intended to convey information

3.1.20**model**

mathematical or physical representation of a system or a process, based with sufficient precision upon known laws, identification or specified suppositions

[SOURCE: IEC 61800-7-1:2015, 3.2.17]

3.1.21**operating mode**

characterization of the way and the extent to which the human operator intervenes in the control equipment

[SOURCE: IEC 61800-7-1:2015, 3.2.18]

3.1.22**offset**

number of octets from a specially designed position

3.1.23**output data**

data originating in a device, resource or functional element and transferred from them to external systems

[SOURCE: IEC 61800-7-1:2015, 3.2.19]

3.1.24

parameter

data element that represents device information that can be read from or written to a device, for example through the network or a local HMI

Note 1 to entry: A parameter is typically characterized by a parameter name, data type and access direction.

[SOURCE: IEC 61800-7-1:2015, 3.2.20]

3.1.25

profile

representation of a PDS interface in terms of its parameters, parameter assemblies and behavior according to a communication profile and a device profile

[SOURCE: IEC 61800-7-1:2015, 3.2.21, modified — Note 1 to entry is deleted]

3.1.26

set-point

value or variable used as output data of the application control program to control the PDS

[SOURCE: IEC 61800-7-1:2015, 3.3.1.5]

3.1.27

status

set of information from the PDS to the application control program reflecting the state or mode of the PDS or a functional element of the PDS

Note 1 to entry: The different status information may be coded with one bit each.

[SOURCE: IEC 61800-7-1:2015, 3.3.1.6]

3.1.28

type

hardware or software element which specifies the common attributes shared by all instances of the type

[SOURCE: IEC 61800-7-1:2015, 3.2.23]

3.1.29

variable

software entity that may take different values, one at a time

Note 1 to entry: The values of a variable as well as of a parameter are usually restricted to a certain data type.

[SOURCE: IEC 61800-7-1:2015, 3.2.25]

3.2 Abbreviated terms

APDU	application protocol data unit
AREP	application relationship end point
ASE	application service element
c	constant
CAN	controller area network
CiA	CAN in Automation
COB	communication object
ECSME	Type 14 communication scheduling management entity

EMCY	emergency message
EPA	Ethernet for Plant Automation
FAL	fieldbus application layer
FCS	frame check sequence
FRT	fast real-time
EM	(as a prefix) Type 14 management
FSA	finite state automaton
ID	identifier
IP	internet protocol
MOB	management object base
NMT	network management
PDO	process data object
PDS	power drive system
PDU	protocol data unit
ro	read-only
RPDO	receive process data object
rw	read-write
SDO	service data object
SYNC	synchronization message
TIME	time message
TPDO	transmit process data object
wdc	watch dog counter

4 General

The following clauses specify the mapping of the CiA 402 drive profile onto different communication technologies:

- CANopen, see Clause 5
- CC-Link IE, see Clause 6
- EPA, see Clause 7
- EtherCAT, see Clause 8
- ETHERNET Powerlink, see Clause 9

5 Mapping to CANopen

5.1 Overview

This clause specifies the mapping of the CiA 402 drive profile onto CANopen network. In particular, the process data object (PDO) communication and mapping parameters are defined. In addition, this part of the IEC 61800-7 series defines the PDO mapping attribute for all objects defined in the CiA 402 drive profile (see IEC 61800-7-201).

5.2 Mapping of communication objects

COBs for real-time data transmission shall be mapped to process data object messages (PDOs). COBs for configuration data transmission shall be mapped to service data object message(s) (SDO). COBs for emergency information transmission shall be mapped to emergency messages (EMCY). COBs for network management commands shall be mapped to

NMT messages. COB for network management state information may be mapped to heartbeat message or node guarding message. COB for synchronization may be mapped to sync message (SYNC). COB for system time distribution may be mapped to time message (TIME).

5.3 Communication parameter objects

5.3.1 General

The drive device shall implement the mandatory communication parameter objects as defined in EN 50325-4. The drive device may implement the optional communication parameter objects as defined in EN 50325-4.

The category and entry category attributes of an object indicate if the object shall be implemented (mandatory) or may be implemented (optional).

The object code and data type attributes are defined in detail in EN 50325-4. The data types used in Clause 5 are listed in Table 1. The data types used in the CiA 402 profile are defined in EN 50325-4. Therefore, no mapping is defined.

Table 1 – List of used data types

Data type	Reference
Unsigned8	EN 50325-4
Unsigned16	EN 50325-4
Unsigned32	EN 50325-4
Integer8	EN 50325-4
Integer16	EN 50325-4
Integer32	EN 50325-4
PDO commpar	EN 50325-4
PDO mapping	EN 50325-4

In the entry description, the access attribute indicating if an application object is read only (ro), read/write (rw), or constant (c) is defined. Read only indicates that this shall not be written via the bus; read/write allows to read and to write this object; and constant means that this object is not changed.

The default value attribute defines the factory setting value of an object with access attribute of the value 'rw' or 'c'.

5.3.2 Object 1000_h: Device type

This object is defined in IEC 61800-7-201 and EN 50325-4. Drive devices shall support either the generic PDO mapping or the type-specific PDO mapping. For devices supporting the generic PDO mapping (bit 22 in the additional information field shall be 0), the definitions given in Table 2 shall apply. For devices supporting the type-specific PDO mapping (bit 22 in the additional information field shall be 1) the definitions given in Table 3 shall apply. In Table 2 and Table 3 the symbol “*” means manufacturer-specific.

Table 2 – Additional information field for generic PDO mapping

Device	Additional information															
	Mode bits								Type							
	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Frequency converter	*	*	*	*	*	*	*	*	0	0	0	0	0	0	0	1
Servo drive	*	*	*	*	*	*	*	*	0	0	0	0	0	0	1	0
Stepper motor	*	*	*	*	*	*	*	*	0	0	0	0	0	1	0	0
Multiple device module	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table 3 – Additional information field for type-specific PDO mapping

Device	Additional information															
	Mode bits								Type							
	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Frequency converter	*	*	*	*	*	*	*	*	0	1	0	0	0	0	0	1
Servo drive	*	*	*	*	*	*	*	*	0	1	0	0	0	0	1	0
Stepper motor	*	*	*	*	*	*	*	*	0	1	0	0	0	1	0	0
Multiple device module	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

5.3.3 Object 1029_h: Error behavior

This object specifies to which NMT state the device shall be set (see EN 50325-4), when a communication error or a device-internal error is detected. The device-internal error shall be valid when the PDS FSA is in fault reaction active state (see IEC 61800-7-201).

Table 4 specifies the value definition, Table 5 specifies the object description, and Table 6 specifies the entry description.

Table 4 – Value definition

Value	Definition
00 _h	Enter NMT pre-operational state (only if current NMT state is operational)
01 _h	No NMT state change
02 _h	Enter NMT stopped state

Table 5 – Object description

Attribute	Value
Index	1029 _h
Name	Error behavior
Object code	Array
Data type	Unsigned8
Category	Optional

Table 6 – Entry description

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	01 _h to 02 _h
Default value	Manufacturer-specific
Sub-index	01 _h
Description	Communication error
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See Table 4
Default value	00 _h
Sub-index	02 _h
Description	Internal device error
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See Table 4
Default value	01 _h

5.3.4 Object 67FF_h: Single device type

The object at index 67FF_h and multiples with an offset of 800_h shall define the type of each device within one drive unit and its functionality. The object structure shall be the same as defined in object 1000_h (for details, see EN-50325-4).

5.4 Emergency message

When the drive device detects internally a failure, it may transmit an emergency message as defined in EN 50325-4. The emergency message may use the error codes as defined in EN 50325-4 or in IEC 61800-7-201.

5.5 Communication fault events

These events are covered by IEC 61800-7-201 object 6007_h.

5.6 Sets of pre-defined PDOs

5.6.1 General

A drive device supporting more than one mode of operation may require more than one pre-defined PDO. Therefore several PDOs are pre-defined in respect to the different possible modes of operation for drive devices.

The PDO assignments defined hereafter shall be used for every axis of a multi-device module with an offset of 64. For example, the first PDO of the second axis gets the number 65. In this way, a drive device is able to support a maximum of 8 axes.

NOTE All PDOs of the second and following axes are disabled by default.

There are several sets of pre-defined PDOs. The PDO set for generic drive device is independent from the drive type. The PDO sets for specific drive devices are different for frequency converter, servo controller, and stepper motor.

All pre-defined RPDOs with transmission type of 255 shall immediately enter all mapped objects into the object dictionary.

All pre-defined TPDOs with transmission type of 255 shall be transmitted when entering the NMT operational state.

The PDO commpar and the PDO mapping record definitions, and the value definitions of the PDO communication and mapping parameters are defined in EN 50325-4.

In general all PDO communication objects defined in EN 50325-4 can be used. The following sections describe only the default values of the PDO objects.

5.6.2 PDO set for generic drive device

5.6.2.1 Overview and introduction

The PDO set for generic drive device pre-defines eight RPDOs (see Table 7) and seven TPDOs (see Table 8). The TPDOs with transmission type of 255 shall be triggered when any mapped object is changing. The RPDOs with transmission type 255 shall immediately update all mapped objects.

Table 7 – Overview on RPDO

PDO	Support	Description
1	Mandatory	Controls PDS FSA
2	Optional	Controls PDS FSA and modes of operation
3	Optional	Controls PDS FSA and target position (pp)
4	Optional	Controls PDS FSA and target velocity (pv)
5	Optional	Controls PDS FSA and target torque (tq)
6	Optional	Controls PDS FSA and nominal speed (vl)
7	Optional	Controls PDS FSA and digital outputs
8	Optional	Controls PDS FSA and mode of operation (broadcast PDO)
9 to 16	Reserved	
17 to 64	Optional	Manufacturer-specific

Table 8 – Overview on TPDO

PDO	Support	Description
1	Mandatory	Specifies PDS FSA status
2	Optional	Specifies PDS FSA status and current mode of operation
3	Optional	Specifies PDS FSA status and current position (pp)
4	Optional	Specifies PDS FSA status and current velocity (pv)
5	Optional	Specifies PDS FSA status and current torque (tq)
6	Optional	Specifies PDS FSA status and current speed (vl)
7	Optional	Specifies PDS FSA status and digital inputs
8 to 16	Reserved	
17 to 64	Optional	Manufacturer-specific

5.6.2.2 RPDO 1

Table 9 specifies the object description and Table 10 specifies the entry description of the PDO communication parameters.

Table 9 – Object description of communication parameters

Attribute	Value
Index	1400 _h
Name	Receive PDO1 parameter
Object code	Record
Data type	PDO commpar
Category	Mandatory

Table 10 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	0000 0200 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 11 specifies the object description and Table 12 specifies the entry description of the PDO mapping parameters.

Table 11 – Object description of mapping parameters

Attribute	Value
Index	1600 _h
Name	Receive PDO1 mapping
Object code	Record
Data type	PDO mapping
Category	Mandatory

Table 12 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	01 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.3 RPDO 2

Table 13 specifies the object description and Table 14 specifies the entry description of the PDO communication parameters.

Table 13 – Object description of communication parameters

Attribute	Value
Index	1401 _h
Name	Receive PDO2 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 14 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	(0000 0300 _h or 8000 0300 _h) + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 15 specifies the object description and Table 16 specifies the entry description of the PDO mapping parameters.

Table 15 – Object description of mapping parameters

Attribute	Value
Index	1601 _h
Name	Receive PDO2 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1401 _h is implemented

Table 16 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6060 0008 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.4 RPDO 3

Table 17 specifies the object description and Table 18 specifies the entry description of the PDO communication parameters.

Table 17 – Object description of communication parameters

Attribute	Value
Index	1402 _h
Name	Receive PDO3 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 18 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	(0000 0400 _h or 8000 0400 _h) + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 19 specifies the object description and Table 20 specifies the entry description of the PDO mapping parameters.

Table 19 – Object description of mapping parameters

Attribute	Value
Index	1602 _h
Name	Receive PDO3 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1402 _h is implemented

Table 20 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	607A 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.5 RPDO 4

Table 21 specifies the object description and Table 22 specifies the entry description of the PDO communication parameters.

Table 21 – Object description of communication parameters

Attribute	Value
Index	1403 _h
Name	Receive PDO4 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 22 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	(0000 0500 _h or 8000 0500 _h) + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 23 specifies the object description and Table 24 specifies the entry description of the PDO mapping parameters.

Table 23 – Object description of mapping parameters

Attribute	Value
Index	1603 _h
Name	Receive PDO4 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1403 _h is implemented

Table 24 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	60FF 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.6 RPDO 5

Table 25 specifies the object description and Table 26 specifies the entry description of the PDO communication parameters.

Table 25 – Object description of communication parameters

Attribute	Value
Index	1404 _h
Name	Receive PDO5 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 26 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	8000 0000 _h
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 27 specifies the object description and Table 28 specifies the entry description of the PDO mapping parameters.

Table 27 – Object description of mapping parameters

Attribute	Value
Index	1604 _h
Name	Receive PDO5 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1404 _h is implemented

Table 28 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6071 0010 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.7 RPDO 6

Table 29 specifies the object description and Table 30 specifies the entry description of the PDO communication parameters.

Table 29 – Object description of communication parameters

Attribute	Value
Index	1405 _h
Name	Receive PDO6 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 30 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	8000 0000 _h
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 31 specifies the object description and Table 32 specifies the entry description of the PDO mapping parameters.

Table 31 – Object description of mapping parameters

Attribute	Value
Index	1605 _h
Name	Receive PDO6 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1405 _h is implemented

Table 32 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6042 0010 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.8 RPDO 7

Table 33 specifies the object description and Table 34 specifies the entry description of the PDO communication parameters.

Table 33 – Object description of communication parameters

Attribute	Value
Index	1406 _h
Name	Receive PDO7 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 34 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	8000 0000 _h
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 35 specifies the object description and Table 36 specifies the entry description of the PDO mapping parameters.

Table 35 – Object description of mapping parameters

Attribute	Value
Index	1606 _h
Name	Receive PDO7 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1406 _h is implemented

Table 36 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	60FE 0120 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.9 RPDO 8

Table 37 specifies the object description and Table 38 specifies the entry description of the PDO communication parameters.

Table 37 – Object description of communication parameters

Attribute	Value
Index	1407 _h
Name	Receive PDO8 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 38 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	8000 0000 _h
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 39 specifies the object description and Table 40 specifies the entry description of the PDO mapping parameters.

Table 39 – Object description of mapping parameters

Attribute	Value
Index	1607 _h
Name	Receive PDO8 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1407 _h is implemented

Table 40 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6060 0008 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.10 TPDO 1

Table 41 specifies the object description and Table 42 specifies the entry description of the PDO communication parameters.

Table 41 – Object description of communication parameters

Attribute	Value
Index	1800 _h
Name	Transmit PDO1 parameter
Object code	Record
Data type	PDO commpar
Category	Mandatory

Table 42 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	4000 0180 _h + node ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 43 specifies the object description and Table 44 specifies the entry description of the PDO mapping parameters.

Table 43 – Object description of mapping parameters

Attribute	Value
Index	1A00 _h
Name	Transmit PDO1 mapping
Object code	Record
Data type	PDO mapping
Category	Mandatory

Table 44 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	01 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.11 TPDO 2

Table 45 specifies the object description and Table 46 specifies the entry description of the PDO communication parameters.

Table 45 – Object description of communication parameters

Attribute	Value
Index	1801 _h
Name	Transmit PDO2 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 46 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	(4000 0280 _h or C000 0280 _h) + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 47 specifies the object description and Table 48 specifies the entry description of the PDO mapping parameters.

Table 47 – Object description of mapping parameters

Attribute	Value
Index	1A01 _h
Name	Transmit PDO2 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1801 _h is implemented

Table 48 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6061 0008 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.12 TPDO 3

Table 49 specifies the object description and Table 50 specifies the entry description of the PDO communication parameters.

Table 49 – Object description of communication parameters

Attribute	Value
Index	1802 _h
Name	Transmit PDO3 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 50 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	(4000 0380 _h or C000 0380 _h) + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	1 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 51 specifies the object description and Table 52 specifies the entry description of the PDO mapping parameters.

Table 51 – Object description of mapping parameters

Attribute	Value
Index	1A02 _h
Name	Transmit PDO3 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1802 _h is implemented

Table 52 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6064 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.13 TPDO 4

Table 53 specifies the object description and Table 54 specifies the entry description of the PDO communication parameters.

Table 53 – Object description of communication parameters

Attribute	Value
Index	1803 _h
Name	Transmit PDO4 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 54 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	(4000 0480 _h or C000 0480 _h) + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	1 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 55 specifies the object description and Table 56 specifies the entry description of the PDO mapping parameters.

Table 55 – Object description of mapping parameters

Attribute	Value
Index	1A03 _h
Name	Transmit PDO4 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1803 _h is implemented

Table 56 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	606C 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.14 TPDO 5

Table 57 specifies the object description and Table 58 specifies the entry description of the PDO communication parameters.

Table 57 – Object description of communication parameters

Attribute	Value
Index	1804 _h
Name	Transmit PDO5 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 58 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	C000 0000 _h
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	1 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 59 specifies the object description and Table 60 specifies the entry description of the PDO mapping parameters.

Table 59 – Object description of mapping parameters

Attribute	Value
Index	1A04 _h
Name	Transmit PDO5 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1804 _h is implemented

Table 60 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6077 0010 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.15 TPDO 6

Table 61 specifies the object description and Table 62 specifies the entry description of the PDO communication parameters.

Table 61 – Object description of communication parameters

Attribute	Value
Index	1805 _h
Name	Transmit PDO6 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 62 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	C000 0000 _h
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	1 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 63 specifies the object description and Table 64 specifies the entry description of the PDO mapping parameters.

Table 63 – Object description of mapping parameters

Attribute	Value
Index	1A05 _h
Name	Transmit PDO6 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1805 _h is implemented

Table 64 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6044 0010 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.2.16 TPDO 7

Table 65 specifies the object description and Table 66 specifies the entry description of the PDO communication parameters.

Table 65 – Object description of communication parameters

Attribute	Value
Index	1806 _h
Name	Transmit PDO7 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 66 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	C000 0000 _h
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 67 specifies the object description and Table 68 specifies the entry description of the PDO mapping parameters.

Table 67 – Object description of mapping parameters

Attribute	Value
Index	1A06 _h
Name	Transmit PDO7 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1806 _h is implemented

Table 68 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	60FD 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.3 PDO set for frequency converter

5.6.3.1 Overview and introduction

The PDO set for frequency converter pre-defines three RPDOs (see Table 69) and three TPDOs (see Table 70). The TPDOs with transmission type of 255 shall only be triggered when the mapped statusword is changing, other mapped objects shall not cause a PDO transmission. The RPDOs with transmission type 255 shall immediately update all mapped objects.

Table 69 – Overview on RPDO

PDO	Support	Description
1	Mandatory	Controls PDS FSA and vl target velocity
2	Optional	Manufacturer-specific
3	Optional	Manufacturer-specific
4 to 16	Reserved	
17 to 64	Optional	Manufacturer-specific

Table 70 – Overview on TPDO

PDO	Support	Description
1	Mandatory	Specifies PDS FSA status and vl velocity actual value
2	Optional	Manufacturer-specific
3	Optional	Manufacturer-specific
4 to 16	Reserved	
17 to 64	Optional	Manufacturer-specific

5.6.3.2 RPDO 1

Table 71 specifies the object description and Table 72 specifies the entry description of the PDO communication parameters.

Table 71 – Object description of communication parameters

Attribute	Value
Index	1400 _h
Name	Receive PDO1 parameter
Object code	Record
Data type	PDO commpar
Category	Mandatory

Table 72 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	0000 0200 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 73 specifies the object description and Table 74 specifies the entry description of the PDO mapping parameters.

Table 73 – Object description of mapping parameters

Attribute	Value
Index	1600 _h
Name	Receive PDO1 mapping
Object code	Record
Data type	PDO mapping
Category	Mandatory

Table 74 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6042 0010 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.3.3 RPDO 2

Table 75 specifies the object description and Table 76 specifies the entry description of the PDO communication parameters.

Table 75 – Object description of communication parameters

Attribute	Value
Index	1401 _h
Name	Receive PDO2 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 76 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0000 0300 _h + node ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 77 specifies the object description and Table 78 specifies the entry description of the PDO mapping parameters.

Table 77 – Object description of mapping parameters

Attribute	Value
Index	1601 _h
Name	Receive PDO2 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1401 _h is implemented

Table 78 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.3.4 RPDO 3

Table 79 specifies the object description and Table 80 specifies the entry description of the PDO communication parameters.

Table 79 – Object description of communication parameters

Attribute	Value
Index	1402 _h
Name	Receive PDO3 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 80 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0000 0400 _h + node ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 81 specifies the object description and Table 82 specifies the entry description of the PDO mapping parameters.

Table 81 – Object description of mapping parameters

Attribute	Value
Index	1602 _h
Name	Receive PDO3 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1402 _h is implemented

Table 82 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.3.5 TPDO 1

Table 83 specifies the object description and Table 84 specifies the entry description of the PDO communication parameters.

Table 83 – Object description of communication parameters

Attribute	Value
Index	1800 _h
Name	Transmit PDO1 parameter
Object code	Record
Data type	PDO commpar
Category	Mandatory

Table 84 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if PDO linking is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	4000 0180 _h + node ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 85 specifies the object description and Table 86 specifies the entry description of the PDO mapping parameters.

Table 85 – Object description of mapping parameters

Attribute	Value
Index	1A00 _h
Name	Transmit PDO1 mapping
Object code	Record
Data type	PDO mapping
Category	Mandatory

Table 86 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6044 0010 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.3.6 TPDO 2

Table 87 specifies the object description and Table 88 specifies the entry description of the PDO communication parameters.

Table 87 – Object description of communication parameters

Attribute	Value
Index	1801 _h
Name	Transmit PDO2 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 88 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	4000 0280 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 89 specifies the object description and Table 90 specifies the entry description of the PDO mapping parameters.

Table 89 – Object description of mapping parameters

Attribute	Value
Index	1A01 _h
Name	Transmit PDO2 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1801 _h is implemented

Table 90 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.3.7 TPDO 3

Table 91 specifies the object description and Table 92 specifies the entry description of the PDO communication parameters.

Table 91 – Object description of communication parameters

Attribute	Value
Index	1802 _h
Name	Transmit PDO3 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 92 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	4000 0380 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 93 specifies the object description and Table 94 specifies the entry description of the PDO mapping parameters.

Table 93 – Object description of mapping parameters

Attribute	Value
Index	1A02 _h
Name	Transmit PDO3 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1802 _h is implemented

Table 94 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	No
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.4 PDO set for servo drive

5.6.4.1 Overview and introduction

The PDO set for servo drive pre-defines four RPDOs (see Table 95) and four TPDOs (see Table 96). The TPDOs with transmission type of 255 shall only be triggered when the mapped statusword is changing, other mapped objects shall not cause a PDO transmission. The RPDOs with transmission type 255 shall immediately update all mapped objects.

Table 95 – Overview on RPDO

PDO	Support	Description
1	Mandatory	Controls PDS FSA
2	Optional	Controls PDS FSA, target position (pp)
3	Optional	Controls PDS FSA and target velocity (pv)
4	Optional	Manufacturer-specific
5 to 16	Reserved	
17 to 64	Optional	Manufacturer-specific

Table 96 – Overview on TPDO

PDO	Support	Description
1	Mandatory	Specifies PDS FSA status
2	Optional	Specifies PDS FSA status and current position (pp)
3	Optional	Specifies PDS FSA status and current velocity (pv)
4	Optional	Manufacturer-specific
5 to 16	Reserved	
17 to 64	Optional	Manufacturer-specific

5.6.4.2 RPDO 1

Table 97 specifies the object description and Table 98 specifies the entry description of the PDO communication parameters.

Table 97 – Object description of communication parameters

Attribute	Value
Index	1400 _h
Name	Receive PDO1 parameter
Object code	Record
Data type	PDO commpar
Category	Mandatory

Table 98 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	0000 0200 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 99 specifies the object description and Table 100 specifies the entry description of the PDO mapping parameters.

Table 99 – Object description of mapping parameters

Attribute	Value
Index	1600 _h
Name	Receive PDO1 mapping
Object code	Record
Data type	PDO mapping
Category	Mandatory

Table 100 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	01 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.4.3 RPDO 2

Table 101 specifies the object description and Table 102 specifies the entry description of the PDO communication parameters.

Table 101 – Object description of communication parameters

Attribute	Value
Index	1401 _h
Name	Receive PDO2 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 102 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0000 0300 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 103 specifies the object description and Table 104 specifies the entry description of the PDO mapping parameters.

Table 103 – Object description of mapping parameters

Attribute	Value
Index	1601 _h
Name	Receive PDO2 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1401 _h is implemented

Table 104 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	607A 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.4.4 RPDO 3

Table 105 specifies the object description and Table 106 specifies the entry description of the PDO communication parameters.

Table 105 – Object description of communication parameters

Attribute	Value
Index	1402 _h
Name	Receive PDO3 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 106 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0000 0400 _h + node ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 107 specifies the object description and Table 108 specifies the entry description of the PDO mapping parameters.

Table 107 – Object description of mapping parameters

Attribute	Value
Index	1602 _h
Name	Receive PDO3 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1402 _h is implemented

Table 108 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	60FF 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.4.5 RPDO 4

Table 109 specifies the object description and Table 110 specifies the entry description of the PDO communication parameters.

Table 109 – Object description of communication parameters

Attribute	Value
Index	1403 _h
Name	Receive PDO4 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 110 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0000 0500 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 111 specifies the object description and Table 112 specifies the entry description of the PDO mapping parameters.

Table 111 – Object description of mapping parameters

Attribute	Value
Index	1603 _h
Name	Receive PDO4 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1403 _h is implemented

Table 112 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.4.6 TPDO 1

Table 113 specifies the object description and Table 114 specifies the entry description of the PDO communication parameters.

Table 113 – Object description of communication parameters

Attribute	Value
Index	1800 _h
Name	Transmit PDO1 parameter
Object code	Record
Data type	PDO commpar
Category	Mandatory

Table 114 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	4000 0180 _h + node ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 115 specifies the object description and Table 116 specifies the entry description of the PDO mapping parameters.

Table 115 – Object description of mapping parameters

Attribute	Value
Index	1A00 _h
Name	Transmit PDO1 mapping
Object code	Record
Data type	PDO mapping
Category	Mandatory

Table 116 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	01 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.4.7 TPDO 2

Table 117 specifies the object description and Table 118 specifies the entry description of the PDO communication parameters.

Table 117 – Object description of communication parameters

Attribute	Value
Index	1801 _h
Name	Transmit PDO2 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 118 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	4000 0280 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	100 _d

Table 119 specifies the object description and Table 120 specifies the entry description of the PDO mapping parameters.

Table 119 – Object description of mapping parameters

Attribute	Value
Index	1A01 _h
Name	Transmit PDO2 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1801 _h is implemented

Table 120 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6064 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.4.8 TPDO 3

Table 121 specifies the object description and Table 122 specifies the entry description of the PDO communication parameters.

Table 121 – Object description of communication parameters

Attribute	Value
Index	1802 _h
Name	Transmit PDO3 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 122 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	4000 0380 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	100 _d

Table 123 specifies the object description and Table 124 specifies the entry description of the PDO mapping parameters.

Table 123 – Object description of mapping parameters

Attribute	Value
Index	1A02 _h
Name	Transmit PDO3 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1802 _h is implemented

Table 124 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	606C 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.4.9 TPDO 4

Table 125 specifies the object description and Table 126 specifies the entry description of the PDO communication parameters.

Table 125 – Object description of communication parameters

Attribute	Value
Index	1803 _h
Name	Transmit PDO4 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 126 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	4000 0480 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 127 specifies the object description and Table 128 specifies the entry description of the PDO mapping parameters.

Table 127 – Object description of mapping parameters

Attribute	Value
Index	1A03 _h
Name	Transmit PDO4 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1803 _h is implemented

Table 128 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	No
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.5 PDO set for stepper motor

5.6.5.1 Overview and introduction

The PDO set for stepper motor pre-defines four RPDOs (see Table 129) and four TPDOs (see Table 130). The TPDOs with transmission type of 255 shall only be triggered when the

mapped statusword is changing, other mapped objects shall not cause a PDO transmission. The RPDOs with transmission type 255 shall update immediately all mapped objects.

Table 129 – Overview on RPDO

PDO	Support	Description
1	Mandatory	Controls PDS FSA
2	Optional	Controls PDS FSA, target position (pp)
3	Optional	Controls PDS FSA and target velocity (pv)
4	Optional	Manufacturer-specific
5 to 16	Reserved	
17 to 64	Optional	Manufacturer-specific

Table 130 – Overview on TPDO

PDO	Support	Description
1	Mandatory	Specifies PDS FSA status
2	Optional	Specifies PDS FSA status and current position (pp)
3	Optional	Specifies PDS FSA status and current velocity (pv)
4	Optional	Manufacturer-specific
5 to 16	Reserved	
17 to 64	Optional	Manufacturer-specific

5.6.5.2 RPDO 1

Table 131 specifies the object description and Table 132 specifies the entry description of the PDO communication parameters.

Table 131 – Object description of communication parameters

Attribute	Value
Index	1400 _h
Name	Receive PDO1 parameter
Object code	Record
Data type	PDO commpar
Category	Mandatory

Table 132 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	0000 0200 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 133 specifies the object description and Table 134 specifies the entry description of the PDO mapping parameters.

Table 133 – Object description of mapping parameters

Attribute	Value
Index	1600 _h
Name	Receive PDO1 mapping
Object code	Record
Data type	PDO mapping
Category	Mandatory

Table 134 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	01 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.5.3 RPDO 2

Table 135 specifies the object description and Table 136 specifies the entry description of the PDO communication parameters.

Table 135 – Object description of communication parameters

Attribute	Value
Index	1401 _h
Name	Receive PDO2 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 136 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0000 0300 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 137 specifies the object description and Table 138 specifies the entry description of the PDO mapping parameters.

Table 137 – Object description of mapping parameters

Attribute	Value
Index	1601 _h
Name	Receive PDO2 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1401 _h is implemented

Table 138 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	607A 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.5.4 RPDO 3

Table 139 specifies the object description and Table 140 specifies the entry description of the PDO communication parameters.

Table 139 – Object description of communication parameters

Attribute	Value
Index	1402 _h
Name	Receive PDO3 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 140 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0000 0400 _h + node ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 141 specifies the object description and Table 142 specifies the entry description of the PDO mapping parameters.

Table 141 – Object description of mapping parameters

Attribute	Value
Index	1602 _h
Name	Receive PDO3 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1402 _h is implemented

Table 142 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	60FF 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.5.5 RPDO 4

Table 143 specifies the object description and Table 144 specifies the entry description of the PDO communication parameters.

Table 143 – Object description of communication parameters

Attribute	Value
Index	1403 _h
Name	Receive PDO4 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 144 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	0000 0500 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	B

Table 145 specifies the object description and Table 146 specifies the entry description of the PDO mapping parameters.

Table 145 – Object description of mapping parameters

Attribute	Value
Index	1603 _h
Name	Receive PDO4 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1403 _h is implemented

Table 146 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	No
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.5.6 TPDO 1

Table 147 specifies the object description and Table 148 specifies the entry description of the PDO communication parameters.

Table 147 – Object description of communication parameters

Attribute	Value
Index	1800 _h
Name	Transmit PDO1 parameter
Object code	Record
Data type	PDO commpar
Category	Mandatory

Table 148 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	c or rw (if COB-ID is changeable)
PDO mapping	No
Value range	See EN 50325-4
Default value	4000 0180 _h + node ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 149 specifies the object description and Table 150 specifies the entry description of the PDO mapping parameters.

Table 149 – Object description of mapping parameters

Attribute	Value
Index	1A00 _h
Name	Transmit PDO1 mapping
Object code	Record
Data type	PDO mapping
Category	Mandatory

Table 150 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	01 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.5.7 TPDO 2

Table 151 specifies the object description and Table 152 specifies the entry description of the PDO communication parameters.

Table 151 – Object description of communication parameters

Attribute	Value
Index	1801 _h
Name	Transmit PDO2 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 152 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	4000 0280 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	255 _d
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	100 _d

Table 153 specifies the object description and Table 154 specifies the entry description of the PDO mapping parameters.

Table 153 – Object description of mapping parameters

Attribute	Value
Index	1A01 _h
Name	Transmit PDO2 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1801 _h is implemented

Table 154 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6064 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.5.8 TPDO 3

Table 155 specifies the object description and Table 156 specifies the entry description of the PDO communication parameters.

Table 155 – Object description of communication parameters

Attribute	Value
Index	1802 _h
Name	Transmit PDO3 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 156 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	4000 0380 _h + node ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	100 _d

Table 157 specifies the object description and Table 158 specifies the entry description of the PDO mapping parameters.

Table 157 – Object description of mapping parameters

Attribute	Value
Index	1A02 _h
Name	Transmit PDO3 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1802 _h is implemented

Table 158 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	02 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	606C 0020 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.6.5.9 TPDO 4

Table 159 specifies the object description and Table 160 specifies the entry description of the PDO communication parameters.

Table 159 – Object description of communication parameters

Attribute	Value
Index	1803 _h
Name	Transmit PDO4 parameter
Object code	Record
Data type	PDO commpar
Category	Optional

Table 160 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	COB-ID used by PDO
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	4000 0480 _h + node-ID
Sub-index	02 _h
Description	Transmission type
Entry category	Mandatory
Access	c or rw (if PDO type change is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	03 _h
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	05 _h
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

Table 161 specifies the object description and Table 162 specifies the entry description of the PDO mapping parameters.

Table 161 – Object description of mapping parameters

Attribute	Value
Index	1A03 _h
Name	Transmit PDO4 mapping
Object code	Record
Data type	PDO mapping
Category	Conditional, if 1803 _h is implemented

Table 162 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
Sub-index	02 _h
Description	2nd application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	c or rw (if variable mapping is supported)
PDO mapping	No
Value range	See EN 50325-4
Default value	Manufacturer-specific

5.7 PDO mapping attributes

The objects defined in the CiA 402 drive profile (see IEC 61800-7-201) shall use the PDO mapping attributes as given in Table 163.

Table 163 – PDO mapping attributes of CiA 402 objects

Index/sub-index	Object name	PDO mapping
6007 00 _h	Abort connection option code	No
603F 00 _h	Error code	TPDO
6040 00 _h	Controlword	RPDO
6041 00 _h	Statusword	TPDO
6042 00 _h	vl target velocity	RPDO
6043 00 _h	vl velocity demand	TPDO
6044 00 _h	vl velocity actual value	TPDO
6046 00 _h	vl velocity min max amount – highest sub-index supported	No
6046 01 _h	vl velocity min max amount – vl velocity min amount	RPDO
6046 02 _h	vl velocity min max amount – vl velocity max amount	RPDO
6048 00 _h	vl velocity acceleration – highest sub-index supported	No
6048 01 _h	vl velocity acceleration – delta speed	RPDO
6048 02 _h	vl velocity acceleration – delta time	RPDO
6049 00 _h	vl velocity deceleration – highest sub-index supported	No
6049 01 _h	vl velocity deceleration – delta speed	RPDO
6049 02 _h	vl velocity deceleration – delta time	RPDO
604A 00 _h	vl velocity quick stop – highest sub-index supported	No
604A 01 _h	vl velocity quick stop – delta speed	RPDO
604A 02 _h	vl velocity quick stop – delta time	RPDO
604B 00 _h	vl set-point factor – highest sub-index supported	No
604B 01 _h	vl set-point factor – vl set-point factor numerator	RPDO
604B 02 _h	vl set-point factor – vl set-point factor denominator	RPDO
604C 00 _h	vl dimension factor – highest sub-index supported	No
604C 01 _h	vl dimension factor – vl dimension factor numerator	RPDO
604C 02 _h	vl dimension factor – vl dimension factor denominator	RPDO
605A 00 _h	Quick stop option code	No
605B 00 _h	Shutdown option code	No
605C 00 _h	Disable operation option code	No
605D 00 _h	Halt option code	No
605E 00 _h	Fault reaction option code	No
6060 00 _h	Modes of operation	RPDO
6061 00 _h	Modes of operation display	TPDO
6062 00 _h	Position demand value	TPDO
6063 00 _h	Position actual internal value	TPDO
6064 00 _h	Position actual value	TPDO
6065 00 _h	Following error window	RPDO
6066 00 _h	Following error time out	RPDO
6067 00 _h	Position window	RPDO
6068 00 _h	Position window time	RPDO
6069 00 _h	Velocity sensor actual value	TPDO
606A 00 _h	Sensor selection code	RPDO
606B 00 _h	Velocity demand value	TPDO
606C 00 _h	Velocity actual value	TPDO
606D 00 _h	Velocity window	RPDO
606E 00 _h	Velocity window time	RPDO
606F 00 _h	Velocity threshold	RPDO
6070 00 _h	Velocity threshold time	RPDO
6071 00 _h	Target torque	RPDO
6072 00 _h	Max torque	RPDO
6073 00 _h	Max current	RPDO
6074 00 _h	Torque demand	TPDO
6075 00 _h	Motor rated current	No
6076 00 _h	Motor rated torque	No
6077 00 _h	Torque actual value	TPDO
6078 00 _h	Current actual value	TPDO
6079 00 _h	DC link circuit voltage	RPDO
607A 00 _h	Target position	RPDO

Index/sub-index	Object name	PDO mapping
607B 00 _h	Position range limit – highest sub-index supported	No
607B 01 _h	Position range limit – min position range limit	RPDO
607B 02 _h	Position range limit – max position range limit	RPDO
607C 00 _h	Home offset	RPDO
607D 00 _h	Software position limit – highest sub-index supported	No
607D 01 _h	Software position limit – min position limit	RPDO
607D 02 _h	Software position limit – max position limit	RPDO
607E 00 _h	Polarity	RPDO
607F 00 _h	Max profile velocity	RPDO
6080 00 _h	Max motor speed	RPDO
6081 00 _h	Profile velocity	RPDO
6082 00 _h	End velocity	RPDO
6083 00 _h	Profile acceleration	RPDO
6084 00 _h	Profile deceleration	RPDO
6085 00 _h	Quick stop deceleration	RPDO
6086 00 _h	Motion profile type	RPDO
6087 00 _h	Torque slope	RPDO
6088 00 _h	Torque profile type	RPDO
608F 00 _h	Position encoder resolution – highest sub-index supported	No
608F 01 _h	Position encoder resolution – encoder increments	RPDO
608F 02 _h	Position encoder resolution – motor revolutions	RPDO
6090 00 _h	Velocity encoder resolution – highest sub-index supported	No
6090 01 _h	Velocity encoder resolution – encoder increments per second	RPDO
6090 02 _h	Velocity encoder resolution – motor revolutions per second	RPDO
6091 00 _h	Gear ratio – highest sub-index supported	No
6091 01 _h	Gear ratio – motor revolutions	RPDO
6091 02 _h	Gear ratio – shaft revolutions	RPDO
6092 00 _h	Feed constant – highest sub-index supported	No
6092 01 _h	Feed constant – feed	RPDO
6092 02 _h	Feed constant – shaft revolutions	RPDO
6098 00 _h	Homing method	RPDO
6099 00 _h	Homing speeds – highest sub-index supported	No
6099 01 _h	Homing speeds – speed during search for switch	RPDO
6099 02 _h	Homing speeds – speed during search for zero	RPDO
609A 00 _h	Homing acceleration	RPDO
60A3 00 _h	Profile jerk use	No
60A4 00 _h	Profile jerk – highest sub-index supported	No
60A4 01 _h to 06 _h	Profile jerk – profile jerk 1 to profile jerk 6	No
60B0 00 _h	Position offset	RPDO
60B1 00 _h	Velocity offset	RPDO
60B2 00 _h	Torque offset	RPDO
60B8 00 _h	Touch probe mode	RPDO
60B9 00 _h	Touch probe status	TPDO
60BA 00 _h	Touch probe 1 positive edge	TPDO
60BB 00 _h	Touch probe 1 negative edge	TPDO
60BC 00 _h	Touch probe 2 positive edge	TPDO
60BD 00 _h	Touch probe 2 negative edge	TPDO
60C0 00 _h	Interpolation sub mode select	RPDO
60C1 00 _h	Interpolation data record – highest sub-index supported	No
60C1 01 _h to FE _h	Interpolation data record – 2 nd set-point to 254 th set-point	RPDO
60C2 00 _h	Interpolation time period – highest sub-index supported	No
60C2 01 _h	Interpolation time period – interpolation time period value	RPDO
60C2 02 _h	Interpolation time period – interpolation time index	RPDO
60C4 00 _h	Interpolation data configuration – highest sub-index supported	No
60C4 01 _h	Interpolation data configuration – maximum buffer size	No
60C4 02 _h	Interpolation data configuration – actual buffer size	RPDO
60C4 03 _h	Interpolation data configuration – buffer organisation	RPDO
60C4 04 _h	Interpolation data configuration – buffer position	RPDO
60C4 05 _h	Interpolation data configuration – size of data record	RPDO

Index/sub-index	Object name	PDO mapping
60C4 06 _h	Interpolation data configuration – buffer clear	RPDO
60C5 00 _h	Max acceleration	RPDO
60C6 00 _h	Max deceleration	RPDO
60D0 00 _h	Touch probe source	No
60D1 00 _h	Touch probe time stamp 1 positive value	TPDO
60D2 00 _h	Touch probe time stamp 1 negative value	TPDO
60D3 00 _h	Touch probe time stamp 2 positive value	TPDO
60D4 00 _h	Touch probe time stamp 2 negative value	TPDO
60D5 00 _h	Touch probe 1 positive edge counter	TPDO
60D6 00 _h	Touch probe 1 negative edge counter	TPDO
60D7 00 _h	Touch probe 2 positive edge counter	TPDO
60D8 00 _h	Touch probe 2 negative edge counter	TPDO
60E0 00 _h	Positive torque limit value	RPDO
60E1 00 _h	Negative torque limit value	RPDO
60E3 00 _h	Supported homing methods	No
60E4 00 _h	Additional position actual value, highest sub-index supported	No
60E4 01 _h to FE _h	1st to 254th additional position actual value	TPDO
60E5 00 _h	Additional velocity actual value, highest sub-index supported	No
60E5 01 _h to FE _h	1st to 254th additional velocity actual value	TPDO
60E6 00 _h	Additional position encoder resolution – encoder increments, highest sub-index supported	No
60E6 01 _h to FE _h	1st to 254th additional position encoder resolution – encoder increments	RPDO
60E7 00 _h	Additional velocity encoder resolution – encoder increments per second, highest sub-index supported	No
60E7 01 _h to FE _h	1st to 254th additional velocity encoder resolution – encoder increments per second	RPDO
60E8 00 _h	Additional gear ratio – motor shaft revolutions, highest sub-index supported	No
60E8 01 _h to FE _h	1st to 254th additional gear ratio – motor shaft revolutions	RPDO
60E9 00 _h	Additional feed constant – feed, highest sub-index supported	No
60E9 01 _h to FE _h	1st to 254th additional feed constant – feed	RPDO
60EA 00 _h	Commutation angle	RPDO
60EB 00 _h	Additional position encoder resolution – motor revolutions, highest sub-index supported	No
60EB 01 _h to FE _h	1st to 254th additional position encoder resolution – motor revolutions	RPDO
60EC 00 _h	Additional velocity encoder resolution – motor revolutions per second, highest sub-index supported	No
60EC 01 _h to FE _h	1st to 254th additional velocity encoder resolution – motor revolutions per second	RPDO
60ED 00 _h	Additional gear ratio – driving shaft revolutions, highest sub-index supported	No
60ED 01 _h to FE _h	1st to 254th additional gear ratio – driving shaft revolutions	RPDO
60EE 00 _h	Additional feed constant – driving shaft revolutions, highest sub-index supported	No
60EE 01 _h to FE _h	1st to 254th additional feed constant – driving shaft revolutions	RPDO
60F2 00 _h	Positioning option code	RPDO
60F3 00 _h	Max slippage (frequency)	RPDO
60F4 00 _h	Following error actual value	TPDO
60F8 00 _h	Max slippage (velocity)	RPDO
60FA 00 _h	Control effort	TPDO
60FC 00 _h	Position demand internal value	TPDO
60FD 00 _h	Digital inputs	TPDO
60FE 00 _h	Digital output – highest sub-index supported	No
60FE 01 _h	Digital output – physical outputs	RPDO
60FE 02 _h	Digital output – bit mask	RPDO
60FF 00 _h	Target velocity	RPDO
6402 00 _h	Motor type	No
6403 00 _h	Motor catalogue number	No
6404 00 _h	Motor manufacturer	No
6405 00 _h	http motor catalogue address	No
6406 00 _h	Motor calibration date	No

Index/sub-index	Object name	PDO mapping
6407 00 _h	Motor service period	No
6502 00 _h	Supported drive modes	TPDO
6503 00 _h	Drive catalogue number	No
6505 00 _h	http drive catalogue address	No
67FE 00 _h	Version number	No
67FF 00 _h	Single device type	No

6 Mapping to CC-Link IE Field Network

6.1 Overview

This clause specifies the mapping of the CiA 402 drive profile onto CC-Link IE Field Network. In particular, the process data object (PDO) communication and mapping parameter are defined.

6.2 Device model

On CC-Link IE Field Network, each device has the object dictionary (OD) as an internal database. The OD structure is specified in Table 164. All objects shall be accessible by the 24-bit CANopen address (16-bit index + 8-bit sub-index).

Table 164 – Object dictionary structure

Index	Object	Reference
0000 _h to 0FFF _h	Data type	IEC 61158-5-23
1000 _h to 1FFF _h	Communication parameter	IEC 61158-5-23
2000 _h to 5FFF _h	Manufacturer-specific	–
6000 _h to 9FFF _h	Profile-specific	IEC 61800-7-201

NOTE CC-Link IE Field devices can also implement multi axes.

6.3 Mapping of communication objects

6.3.1 General

COBs for real-time data transmission shall be mapped to process data object messages (PDOs) using the cyclic data transmission services. COBs for configuration data transmission shall be mapped to service data object message(s) (SDOs) using the acyclic data transmission services. COBs for synchronization may be mapped to synchronization services.

6.3.2 The detailed mapping of communication objects

The PDO shall be implemented as Write service in Cyclic Data ASE (see IEC 61158-5-23). RPDO shall be placed to cycData field in cyclicDataRWw-PDU. TPDO shall be placed to cycData field in cyclicDataRWw-PDU. CyclicDataRWw-PDU and cyclicDataWRR-PDU shall have the same structure as F-CyclicData-PDU (see IEC 61158-6-23).

SDO shall be implemented as AC Data service in Acyclic Data ASE (see IEC 61158-5-23). The structure of data for AC Data is described as below:

- Read Object
- Write Object

Read Object is provided to download SDO based on index, sub-index, and data. Write Object is provided to upload SDO based on index, sub-index, and data. In detail, index, sub-index,

and data are placed in the field of objectIndex, objectSubIndex, and data field respectively in FieldMotionSpecificTransient (see 6.3.3.1).

6.3.3 FAL syntax description

6.3.3.1 FALPDU type F abstract syntax

In general, the definitions of FALPDU type F abstract syntax are defined in IEC 61158-6-23. In this clause the extended definitions of FALPDU type F regarding the mapping of CiA 402 are described.

```

FieldMotionSpecificTransient ::= SEQUENCE {
    command                TraCommand,
    subCommand              TraSubCommand,
    fMSTraData              CHOICE {
        setCycleTime        [721] TraSysSetCycleTime,
        readObject           [723] TraSysReadObject,
        writeObject          [724] TraSysWriteObject,
        ...
    }
}

TraSysSetCycleTime ::= CHOICE {
    setCycleTimeRequest     [0]
        SEQUENCE {
            ctCycle          Unsigned8,
            syCycle          Unsigned8,
            reserved         OCTET STRING (SIZE (8))
        },
    setCycleTimeResponse    [1]
        SEQUENCE {
            ctCycle          Unsigned8,
            syCycle          Unsigned8,
            result           Unsigned8,
            wdcSupport       Unsigned8,
            reserved1       OCTET STRING (SIZE (2)),
            wdcDIIndex      Unsigned16,
            wdcDISubIndex   Unsigned8,
            reserved2       OCTET STRING (SIZE (1)),
            wdcUIIndex      Unsigned16,
            wdcUISubIndex   Unsigned8,
            reserved3       OCTET STRING (SIZE (1)),
            wdcDIOffset     Unsigned16,
            wdcUIOffset     Unsigned16
        }
}

```

```

TraSysReadObject ::= CHOICE {
    readObjectRequest      [0] SEQUENCE {
        objectIndex        Unsigned16,
        objectSubIndex      Unsigned8,
        reserved1           OCTET STRING (SIZE (1)),
        reserved2           OCTET STRING (SIZE (6))
    },
    readObjectResponse      [1] SEQUENCE {
        objectIndex        Unsigned16,
        objectSubIndex      Unsigned8,
        objectDataType      Unsigned8,
        objectDataSize      Unsigned16,
        sdoAbortCode        Unsigned32,
        data                OCTET STRING (SIZE (0 to 1454))
    }
}

TraSysWriteObject ::= CHOICE {
    readObjectRequest      [0] SEQUENCE {
        objectIndex        Unsigned16,
        objectSubIndex      Unsigned8,
        objectDataType      Unsigned8,
        objectDataSize      Unsigned16,
        data                OCTET STRING (SIZE (4 to 1458))
    },
    readObjectResponse      [1] SEQUENCE {
        objectIndex        Unsigned16,
        objectSubIndex      Unsigned8,
        reserved1           OCTET STRING (SIZE (1)),
        reserved2           OCTET STRING (SIZE (2)),
        sdoAbortCode        Unsigned32
    }
}

```

6.3.3.2 Data type assignments for type F

See IEC 61158-6-23.

6.3.4 FAL transfer syntax

6.3.4.1 FALPDU type F elements encoding

In general, the definitions of FALPDU type F elements encoding are defined in IEC 61158-6-23. In this clause the extended definitions of FALPDU type F regarding the mapping of CiA 402 are described.

6.3.4.2 FieldMotionSpecificTransient

This field is contained in the transient data field in Transient1-PDU (see IEC 61158-5-23). The structure of the FieldMotionSpecificTransient is shown in Table 165.

Table 165 – FieldMotionSpecificTransient

Field	Description
command	This field specifies the type of field-motion-specific command. The value for each dataType and dataSubType are in accordance with Table 166.
subCommand	This field specifies the sub-command type. The values for each command are in accordance with Table 167.
fmSTraData	This field specifies the field-motion-specific data. The structure of this field differs according to the command and subCommand. For the command, refer to Table 166. For the subCommand, refer to Table 167. The structure of the Read Object Request is shown in Table 173. The structure of the Read Object Response is shown in Table 174. The structure of the Write Object Request is shown in Table 175. The structure of the Write Object Response is shown in Table 176.

Table 166 – command (dataType: 08_h, dataSubType: 0002_h)

Value	Description
00 _h	Not applicable
01 _h	SetCycleTime
02 _h	Read Object
03 _h	Write Object
04 _h to FF _h	Reserved for future use

Table 167 – subCommand type for each command type

Value of command	Value	Description
01 _h	00 _h	Request
02 _h	00 _h	Request
	80 _h	Response
03 _h	00 _h	Request
	80 _h	Response

The structure of setCycleTimeRequest is shown in Table 168.

Table 168 – Structure of setCycleTimeRequest

Field	Description
ctCycle	This field specifies the communication cycle time. The value is in accordance with Table 169.
syCycle	This field specifies the synchronization cycle time. The value is in accordance with Table 170.
reserved	Reserved for future use. The value of each octet is 00 _h .

The ctCycle is shown in Table 169.

Table 169 – ctCycle

Value	Description
00 _h to 01 _h	Reserved for future use
02 _h	27 µs
03 _h	55 µs
04 _h	111 µs
05 _h	222 µs
06 _h	444 µs
07 _h	888 µs
08 _h	1 777 µs
09 _h	3 555 µs
0A _h to 11 _h	Reserved for future use
12 _h	31,2 µs
13 _h	62,5 µs
14 _h	125 µs
15 _h	250 µs
16 _h	500 µs
17 _h	1 000 µs
18 _h	2 000 µs
19 _h	4 000 µs
1A _h to FF _h	Reserved for future use

The syCycle is shown in Table 170.

Table 170 – syCycle

Value	Description
00 _h	Asynchronous
01 _h	Reserved for future use
02 _h	27 µs
03 _h	55 µs
04 _h	111 µs
05 _h	222 µs
06 _h	444 µs
07 _h	888 µs
08 _h	1 777 µs
09 _h	3 555 µs
0A _h to 11 _h	Reserved for future use
12 _h	31,2 µs
13 _h	62,5 µs
14 _h	125 µs
15 _h	250 µs
16 _h	500 µs
17 _h	1 000 µs
18 _h	2 000 µs
19 _h	4 000 µs
1A _h to FF _h	Reserved for future use

The structure of the setCycleTimeResponse is shown in Table 171.

Table 171 – Structure of setCycleTimeResponse

Field	Description
ctCycle	This field specifies the communication cycle time. The value is in accordance with Table 169.
syCycle	This field specifies the synchronization cycle time. The value is in accordance Table 170.
result	This field specifies the result of setCycleTimeRequest. The value is in accordance with Table 172.
wdcSupport	This field specifies the watch dog counter (wdc) function support. 00 _h indicates disabled, 01 _h indicates enabled.
reserved1	Reserved for future use. The value of each octet is 00 _h .
wdcDIIndex	This field specifies the index of wdc used in communication from the controller to the drive.
wdcDISubIndex	This field specifies the sub-index of wdc used in communication from the controller to the drive.
reserved2	Reserved for future use. The value of each octet is 00 _h .
wdcUIIndex	This field specifies the index of wdc used in communication from the drive to the controller.
wdcUISubIndex	This field specifies the sub-index of wdc used in communication from the drive to the controller.
reserved3	Reserved for future use. The value of each octet is 00 _h .
wdcDIOffset	This field specifies the shared memory offset of wdc used in communication from the controller to the drive.
wdcUIOffset	This field specifies the shared memory offset of wdc used in communication from the drive to the controller.

Table 172 – Result

Value	Description
00 _h	Accept ctCycle and syCycle
01 _h	Accept ctCycle and reject syCycle
02 _h to 0F _h	Reserved for future use.
10 _h	Reject ctCycle and accept syCycle
11 _h	Reject ctCycle and syCycle
12 _h to FF _h	Reserved for future use.

Table 173 – Structure of readObjectRequest

Field	Description
objectIndex	This field specifies the index in the object dictionary.
objectSubIndex	This field specifies the sub-index in the object entry description.
reserved1	Reserved for future use. The value of each octet is 00 _h .
reserved2	Reserved for future use. The value of each octet is 00 _h .

Table 174 – Structure of readObjectResponse

Field	Description
objectIndex	This field specifies the index in the object dictionary.
objectSubIndex	This field specifies the sub-index in the object entry description.
objectDataType	This field specifies the data type of target object.
objectDataSize	This field specifies the number of octets if data type is visible string.
sdoAbortCode	This field specifies the SDO abort code.
data	This field specifies the object value.

Table 175 – Structure of writeObjectRequest

Field	Description
objectIndex	This field specifies the index in the object dictionary.
objectSubIndex	This field specifies the sub-index in the object entry description.
objectDataType	This field specifies the data type of target object.
objectDataSize	This field specifies the number of octets if data type is visible string.
data	This field specifies the object value.

Table 176 – Structure of writeObjectResponse

Field	Description
objectIndex	This field specifies the index in the object dictionary.
objectSubIndex	This field specifies the sub-index in the object entry description.
reserved1	Reserved for future use. The value of each octet is 00 _h .
reserved2	Reserved for future use. The value of each octet is 00 _h .
sdoAbortCode	This field specifies the SDO abort code.

6.4 Communication parameter objects

6.4.1 General

The drive device shall implement the mandatory communication parameter as defined in IEC 61158-5-23. The drive device may implement the optional communication parameter as defined in IEC 61158-5-23.

The category and entry category attributes of an object indicate if the object shall be implemented (mandatory) or may be implemented (optional).

The data type attributes are defined in detail in IEC 61158-5-23. The data types used in this profile are listed in Table 177.

Table 177 – List of used data types

Data type	Reference
UNSIGNED8	IEC 61158-5-23
UNSIGNED16	IEC 61158-5-23
UNSIGNED32	IEC 61158-5-23
INTEGER8	IEC 61158-5-23
INTEGER16	IEC 61158-5-23
INTEGER32	IEC 61158-5-23
Visible string	IEC 61158-5-23

In the entry description, the access attribute is defined, indicating if an application object is read only (ro), read/write (rw) or write only (wo). Read only indicates that this shall not be written via the bus; read/write allows to read and to write this object; and write only means that this application object shall be not read via the bus.

The default value attribute defines the value of an object with access attribute of the value 'rw' after power-on or application reset.

6.4.2 Object 1000_h: Device type

See 5.3.2.

6.5 Sets of pre-defined PDOs

6.5.1 General

Only the PDO set for generic drive devices is supported. The communication parameter objects (object 1400_h to 1407_h and object 1800_h to 1807_h) are not used.

6.5.2 PDO set for generic drive device

6.5.2.1 Overview and introduction

The PDO set for a generic drive device pre-defines one object in the RPDO (see Table 178) and one object in the TPDO (see Table 179).

Table 178 – Overview on object in RPDO

Object	Support	Description
1	Mandatory	Controls PDS FSA

Table 179 – Overview on object in TPDO

Object	Support	Description
1	Mandatory	Specifies PDS FSA status

6.5.2.2 RPDO

Table 180 specifies the object description and Table 181 specifies the entry description of the PDO mapping parameters.

Table 180 – Object description of mapping parameters

Attribute	Value
Index	1600 _h
Name	Receive PDO mapping
Object code	Record
Data type	PDO mapping
Category	Mandatory

Table 181 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	See IEC 61158-6-23
PDO mapping	No
Value range	See IEC 61158-6-23
Default value	00 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	See IEC 61158-6-23
PDO mapping	No
Value range	See IEC 61158-6-23
Default value	6040 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	See IEC 61158-6-23
PDO mapping	No
Value range	See IEC 61158-6-23
Default value	6060 0008 _h
Sub-index	03 _h
Description	3rd application object
Entry category	Optional
Access	See IEC 61158-6-23
PDO mapping	No
Value range	See IEC 61158-6-23
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	See IEC 61158-6-23
PDO mapping	No
Value range	See IEC 61158-6-23
Default value	Manufacturer-specific

6.5.2.3 TPDO

Table 182 specifies the object description and Table 183 specifies the entry description of the PDO mapping parameters.

Table 182 – Object description of mapping parameters

Attribute	Value
Index	1A00 _h
Name	Transmit PDO mapping
Object code	Record
Data type	PDO mapping
Category	Mandatory

Table 183 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Highest sub-index supported
Entry category	Mandatory
Access	See IEC 61158-6-23
PDO mapping	No
Value range	See IEC 61158-6-23
Default value	00 _h
Sub-index	01 _h
Description	1st application object
Entry category	Mandatory
Access	See IEC 61158-6-23
PDO mapping	No
Value range	See IEC 61158-6-23
Default value	6041 0010 _h
Sub-index	02 _h
Description	2nd application object
Entry category	Mandatory
Access	See IEC 61158-6-23
PDO mapping	No
Value range	See IEC 61158-6-23
Default value	Manufacturer-specific
to	
Sub-index	40 _h
Description	64th application object
Entry category	Optional
Access	See IEC 61158-6-23
PDO mapping	No
Value range	See IEC 61158-6-23
Default value	Manufacturer-specific

6.6 PDO mapping attributes

Same as in 5.7.

7 Mapping to EPA

7.1 Overview

This clause specifies the mapping of the CiA 402 drive profile onto EPA. The data types used in this profile are listed in Table 184.

Table 184 – List of used data types

Data type	Reference
Boolean	IEC 61158-5-14
Unsigned8	IEC 61158-5-14
Unsigned16	IEC 61158-5-14
Unsigned32	IEC 61158-5-14
Unsigned64	IEC 61158-5-14
Int8	IEC 61158-5-14
Int16	IEC 61158-5-14
Int32	IEC 61158-5-14
Int64	IEC 61158-5-14
Real	IEC 61158-5-14
VisualString	IEC 61158-5-14
OctetString	IEC 61158-5-14
PrecisionTimeDifference	IEC 61158-5-14
ErrorType	IEC 61158-5-14

7.2 Device module

7.2.1 Overview

The EPA drive system consists of a controller and a number of drive devices, also the motors are included. The system can support 1 to 254 drive devices and its structure is shown in Figure 2.

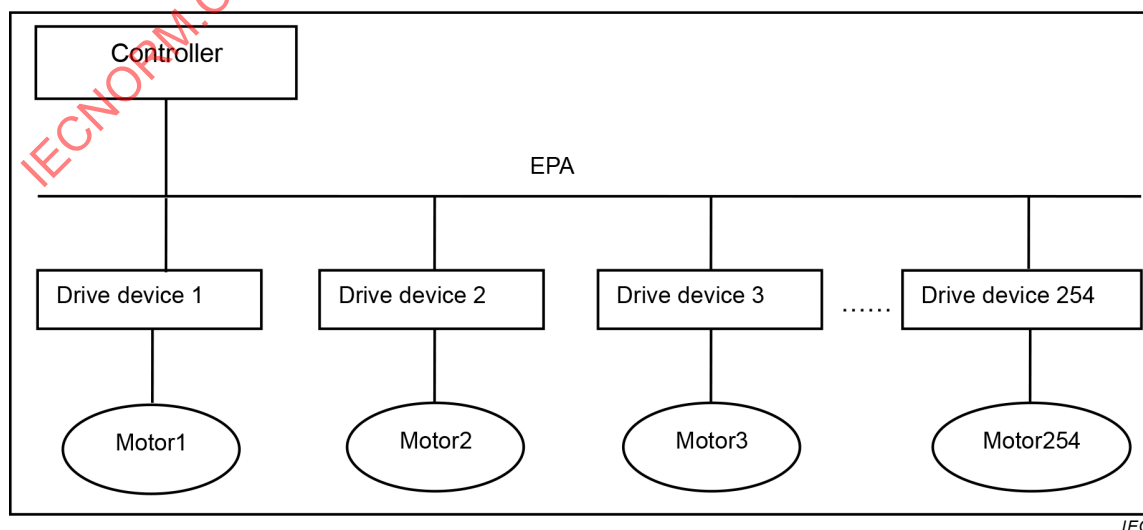


Figure 2 – Structure of EPA drive system

IP address is used as logical address to mark different drive devices, but it has not the same meaning as IP address in IEEE 802.3.

The PDO set for a generic drive device pre-defines seven RPDOs (see Table 185) and seven TPDOs (see Table 186).

Table 185 – Overview on RPDO

PDO	Support	Description
1	Mandatory	Controls PDS FSA
2	Optional	Mode of operation
3	Optional	Target position
4	Optional	Target velocity
5	Optional	Target torque
6	Optional	Nominal speed
7	Optional	Digital outputs
8 to 16	Reserved	
17 to 64	Optional	Manufacturer-specific

Table 186 – Overview on TPDO

PDO	Support	Description
1	Mandatory	Specifies PDS FSA status
2	Optional	Current mode of operation
4	Optional	Current velocity
5	Optional	Current torque
6	Optional	Current speed
7	Optional	Digital inputs
8 to 16	Reserved	
17 to 64	Optional	Manufacturer-specific

7.2.2 Additional definition for mapping to CiA 402

EPA communication system has defined its own management object base (MOB) to organize all the management objects (see IEC 61158-5-14) used in FAL management entity. The MOB is a two-dimension table, as shown in Table 187. Each object has a unique identifier ObjectID.

For mapping profile type 1 to EPA, objects such as CiA 402 mapping object header, CiA 402 mapping object and CiA 402 mapping parameter object, Event object Header, Event object and FRT link object are additionally defined, as shown in the gray-highlighted part of Table 187.

Table 187 – Management object base

Object	ObjectID	Illustration
MOB header	1	Device management object base header object
Device descriptor	2	Device descriptor object
Time synchronization	3	Time synchronization object
Max response time	4	Confirmed service Max response time
Communication schedule management	5	Communication schedule management object
Device application information	6	Device application information object
FB application information header	7	Function block application information header
Link object header	8	Link object header
Domain application object header	9	Domain application object header
FRT link object header	10	FRT link object header
CiA 402 mapping object header	11	CiA 402 mapping object header
Event object header	12	Event object header
	13 to 999	Reserved
CiA 402 mapping object 1	1000	CiA 402 mapping object 1
CiA 402 mapping object 2	1001	CiA 402 mapping object 2
	Increased number in turn	
Event object 1	1300	Event object 1
Event object 2	1301	Event object 2
	1302 to 1599	Reserved
CiA 402 mapping parameter object 1	1600	CiA 402 mapping parameter object 1
CiA 402 mapping parameter object 2	1601	CiA 402 mapping parameter object 2
	Increased number in turn	
FB application information 1	2000	Function block application information 1
FB application information 2	2001	Function block application information 2
	Increased number in turn	
Domain application object 1	4000	Domain application object 1
Domain application object 2	4001	Domain application object 2
	Increased number in turn	
Link object 1	5000	Link object 1
Link object 2	5001	Link object 2
	Increased number in turn	
FRT link object 1	7000	FRT link object 1
FRT link object 2	7001	FRT link object 2
	Increased number in turn	

7.2.3 CiA 402 mapping module

Using the additional defined CiA 402 mapping object header, CiA 402 mapping object, CiA 402 mapping parameter object, and FRT link object (see IEC 61158-5-14), CiA 402 can be mapped onto EPA. The relationship between the objects is shown in Figure 3.

After configuration, the communication relationships between different drive devices are determined. Using CiA 402 mapping object header, where the key attribute is Object, the location and offset of the mapping objects in the memory can be determined. Then using CiA mapping object and FRT link object, where the key attribute are ObjectID and LocalObjectID, the location and offset of the mapping parameter objects and the ServiceRole and ServiceOperation can be further determined. After that, using CiA 402 mapping parameter object, where the key attribute is ObjectID, the mapping parameter can be determined.

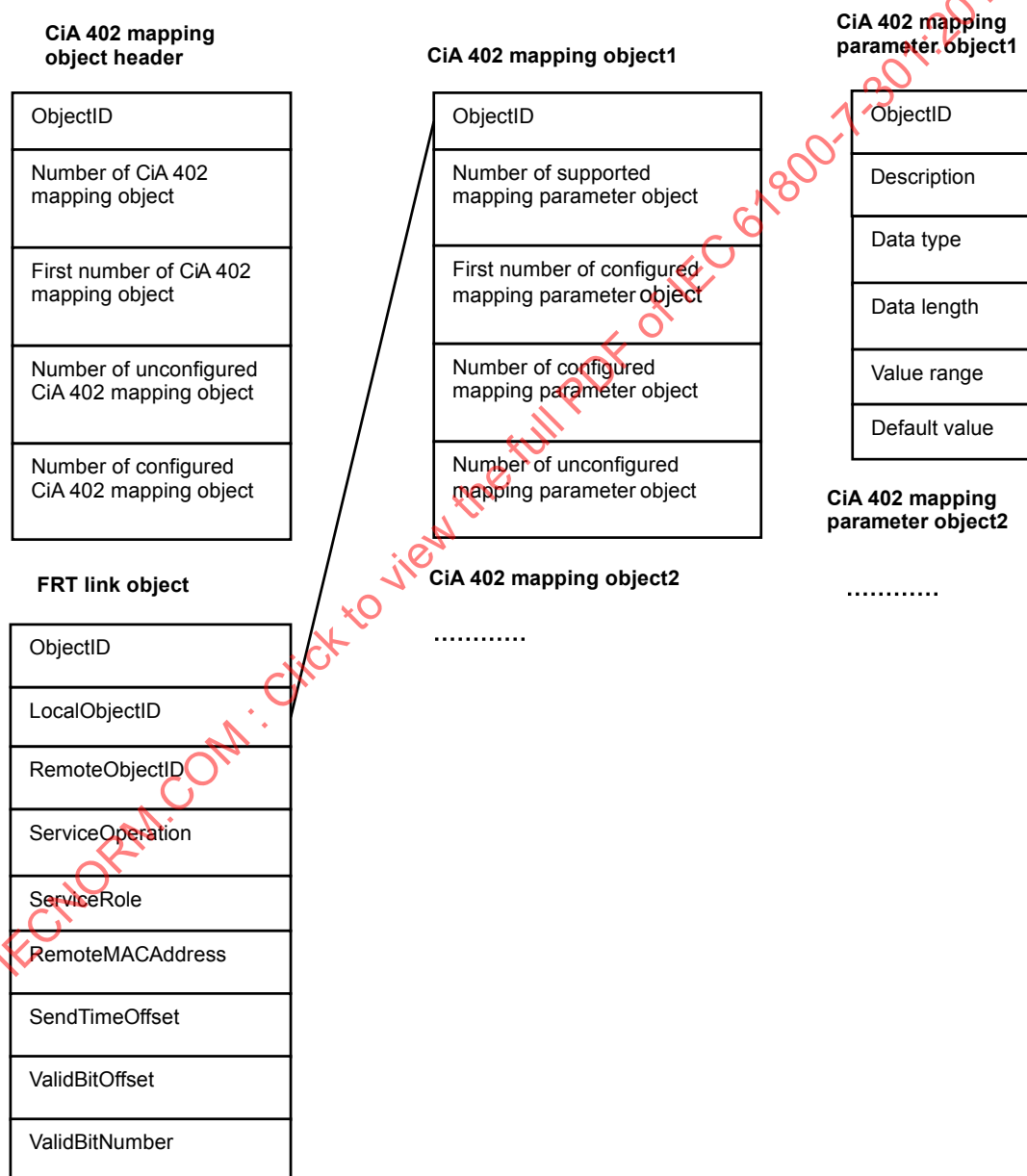


Figure 3 – CiA 402 mapping structure

7.2.4 FAL management object for CiA 402 mapping

7.2.4.1 CiA 402 mapping object header class

7.2.4.1.1 Formal model

ASE:	FAL MANAGEMENT ASE
CLASS:	CiA 402 MAPPING OBJECT HEADER
CLASS ID:	Not used
PARENT CLASS:	TOP
ATTRIBUTES:	
1.	(m) Key attribute: ObjectID
2.	(m) Attribute: Number of CiA 402 mapping object
3.	(m) Attribute: First number of CiA 402 mapping object
4.	(m) Attribute: Number of configured CiA 402 mapping object
5.	(m) Attribute: Number of unconfigured CiA 402 mapping object
SERVICES:	
1.	(o) OpService: FTRRead

7.2.4.1.2 Attributes

ObjectID

This attribute identifies the CiA 402 mapping object header in MOB. Its value is 11.

Number of CiA 402 mapping object

This attribute indicates the number of CiA 402 mapping objects in MOB.

First number of CiA 402 mapping object

This attribute indicates the first number of the CiA 402 mapping object in MOB.

Number of configured CiA 402 mapping object

This attribute indicates the number of CiA 402 mapping objects configured by users.

Number of unconfigured CiA 402 mapping object

This attribute indicates the number of unconfigured CiA 402 mapping objects.

7.2.4.1.3 Services

FTRRead

The optional service allows the user to read the attributes of CiA 402 mapping object header class.

7.2.4.2 CiA 402 mapping object class

7.2.4.2.1 Formal model

ASE:	FAL MANAGEMENT ASE
CLASS:	CiA 402 MAPPING OBJECT
CLASS ID:	Not used
PARENT CLASS:	TOP
ATTRIBUTES:	
1.	(m) Key attribute: ObjectID
2.	(m) Attribute: Number of supported mapping parameter object
3.	(m) Attribute: First number of configured mapping parameter object
4.	(m) Attribute: Number of configured mapping parameter object
5.	(m) Attribute: Number of unconfigured mapping parameter object
SERVICES:	
1.	(o) OpService: FTRRead

7.2.4.2.2 Attributes

ObjectID

This attribute identifies the CiA 402 mapping object in MOB.

Number of supported mapping parameter object

This attribute indicates the number of supported mapping parameter objects.

First number of configured mapping parameter object

This attribute indicates the first number of the mapping parameter object configured by users.

Number of configured mapping parameter object

This attribute indicates the number of mapping parameter objects configured by users.

Number of unconfigured mapping parameter object

This attribute indicates the number of unconfigured mapping parameter objects.

7.2.4.2.3 Services

FRTRead

The optional service allows the user to read the attributes of CiA 402 mapping object class.

7.2.4.3 CiA 402 mapping parameter object class

7.2.4.3.1 Formal model

ASE:		FAL MANAGEMENT ASE	
CLASS:		CiA 402 MAPPING PARAMETER OBJECT	
CLASS ID:		Not used	
PARENT CLASS:		TOP	
ATTRIBUTES:			
1.	(m)	Key attribute:	ObjectID
2.	(m)	Attribute:	Description
3.	(m)	Attribute:	Data type
4.	(m)	Attribute:	Data length
5.	(m)	Attribute:	Value range
6.	(m)	Attribute:	Default value
SERVICES:			
1.	(o)	OpsService:	FRTRead
2.	(o)	OpsService:	FRTWrite

7.2.4.3.2 Attributes

ObjectID

This attribute identifies CiA 402 mapping parameter object in MOB.

Description

This attribute indicates the description of the parameter.

Data type

This attribute indicates the data type of the parameter.

Data length

This attribute indicates the data length of the parameter.

Value range

This attribute indicates the value range of the parameter.

Default value

This attribute indicates the default value of the parameter.

7.2.4.3.3 Services

FRTRead

The optional service allows the user to read the attributes of CiA 402 mapping parameter object class.

FRTWrite

The optional service allows the user to configure the attributes of CiA 402 mapping parameter object class.

7.2.4.4 FRT link object class

7.2.4.4.1 Formal model

ASE:	FAL MANAGEMENT ASE
CLASS:	FRT LINK OBJECT
CLASS ID:	Not used
PARENT CLASS:	TOP
ATTRIBUTES:	
1. (m)	Key attribute: ObjectID
2. (m)	Attribute: LocalObjectID
3. (m)	Attribute: RemoteObjectID
4. (m)	Attribute: ServiceOperation
5. (m)	Attribute: ServiceRole
6. (m)	Attribute: RemoteMACAddress
7. (m)	Attribute: SendTimeOffset
8. (m)	Attribute: ValidBitOffset
9. (m)	Attribute: ValidBitNumber
SERVICES:	
1. (o)	OpsService: FRTRead
2. (o)	OpsService: FRTWrite

7.2.4.4.2 Attributes

ObjectID

This attribute identifies the FRT link object in MOB. The ObjectID number of the FRT link object should be appointed in series.

LocalObjectID

This attribute identifies the local variant object.

RemoteObjectID

This attribute identifies the remote variant object.

ServiceOperation

This attribute specifies the application service to be used in the relevant communication relationship.

- 0: local link, no application service is used
- 1 through 17: the ServiceID of the Type 14 application services is used
- Others: invalid service

ServiceRole

This attribute defines the AREP role of the local device in the communication process.

- 0: sender, indicating that the AREP role of the local device is client or publisher
- 1: receiver, indicating that the AREP role of the local device is server or subscriber

Others: link object is invalid, and FF_h indicates that the link object is not configured or the link object has been deleted

RemoteMACAddress

This attribute identifies the MAC address of the remote device.

SendTimeOffset

This attribute defines the time offset when the relevant message should be sent from the start time of a communication macrocycle. This attribute is valid when the ServiceID is 12_h (FRTVariableDistribute) and the ServiceRole is 0.

ValidBitOffset

This attribute defines the bit offset when the relevant message should be sent or received from the start time of field of Data in FRTVariableDistribute service. This attribute is valid when ServiceID is 12_h (FRTVariableDistribute).

ValidBitNumber

This attribute defines the bit number when the relevant message should be sent or received from the start time of field of Data in FRTVariableDistribute service. This attribute is valid when ServiceID is 12_h (FRTVariableDistribute).

7.2.4.4.3 Service

FRTRead

This optional service permits users to read the attributes of the FRT link object.

FRTWrite

This optional service permits users to configure the attributes of the FRT link object.

7.2.4.5 Event object class

7.2.4.5.1 Formal model

ASE:	FAL MANAGEMENT ASE		
CLASS:	Event object		
CLASS ID:	Not used		
PARENT CLASS:	TOP		
ATTRIBUTES:			
1.	(m)	Key attribute:	ObjectID
2.	(m)	Attribute:	Error code
SERVICES:			
1.	(o)	OpsService:	EventReport service
2.	(o)	OpsService:	AcknowledgeEventReport service

7.2.4.5.2 Attributes

ObjectID

This attribute indicates the identifier of the Event object in MOB.

Error code

This attribute shall provide the error code of the last error which occurred in the drive device. The error code is defined in IEC 61800-7-201.

7.2.4.5.3 Services

EventReport

This optional service allows the server to notify one or more event.

AcknowledgeEventReport

This optional service enables a client to acknowledge several event occurrences.

7.2.4.6 Event header object class

7.2.4.6.1 Formal model

ASE:	FAL MANAGEMENT ASE
CLASS:	Event header object
CLASS ID:	Not used
PARENT CLASS:	TOP
ATTRIBUTES:	
1. (m)	Key attribute: ObjectID
2. (m)	Attribute: LocalEventObjectID
3. (m)	Attribute: Number of configured Event objects
4. (m)	Attribute: Number of unconfigured Event objects
SERVICES:	
1. (o)	OpsService: EventReport service
2. (o)	OpsService: AcknowledgeEventReport service

7.2.4.6.2 Attributes

ObjectID

This attribute indicates the identifier of the Event header object in MOB.

LocalEventObjectID

This attribute identifies the Event object that is assigned to the local drive device.

Number of configured Event objects

This attribute provides the number of configured Event objects.

Number of unconfigured Event objects

This attribute provides the number of unconfigured Event objects.

7.2.4.6.3 Services

EventReport

This optional service allows the server to notify one or more event.

AcknowledgeEventReport

This optional service enables a client to acknowledge several event occurrences.

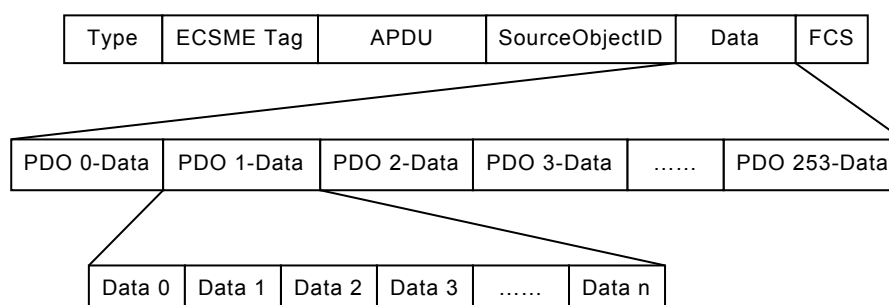
7.3 PDOs mapping on cyclic PDU transmission

7.3.1 Overview

CiA 402 PDOs as defined in IEC 61800-7-201 can be transmitted using the cyclic PDU service FRTVariableDistribute (see IEC 61158-6-14).

Figure 4 describes the mapping of CiA 402 PDOs to the PDU of the FRTVariableDistribute service.

In Figure 4, the format of the ECSME tag is defined in IEC 61158-4-14 and the format of the APDU header is defined in IEC 61158-6-14. The data area of the FRTVariableDistribute service is made up of PDO-Data sets. Different PDO-Data sets are dedicated for different devices. A PDO-Data set is composed of Data 0 to Data n. Data 0 to Data n are defined in the Type 14 CiA 402 mapping object.



IEC

Figure 4 – Format of Type 14 PDU for FRT application

7.3.2 Configuration

7.3.2.1 General

Table 188 describes the link relationship between the sending devices and receiving devices. The sending data can be packeted according to the FRT link object. The receiving data shall be analyzed according to the FRT link object.

Table 188 – Definition of Type 14 FRT link object

No	Parameter name	Read/write property	Data type	Octet offset	Octet length	Description
1	ObjectID	Read only	Unsigned16	0	2	The index of Type 14 link object in the MOB
2	LocalObjectID	Read/write	Unsigned16	2	2	The index for local mapping parameters
3	RemoteObjectID	Read/write	Unsigned16	4	2	ID of the remote element object
4	ServiceOperation	Read/write	Unsigned8	6	1	Type 14 ServiceID used by the link object
5	ServiceRole	Read/write	Unsigned8	7	1	Role of the local object in the communication process
6	RemoteMACAddress	Read/write	Unsigned32	8	4	MAC address of the remote device; if local and destination FB instance objects are in the same Type 14 device, then this property can be ignored; if the Type 14 service uses the broadcast or the multicast method, then this property should be the broadcast or the multicast group address.
7	SendTimeOffset	Read/write	PrecisionTime Difference	12	8	Time offset when sending periodic packet from the start time of a communication macrocycle. Its data type is 4 octets of the TimeDifference. The unit is nanoseconds.
8	ValidBitOffset	Read/write	Unsigned16	20	4	The bit offset when the relevant message should be sent or received from the start time of the field of Data in FRTVariableDistribute service
9	ValidBitNumber	Read/write	Unsigned16	24	4	The bit number when the relevant message should be sent or received from the start time of the field of Data in FRTVariableDistribute service

7.3.2.2 Description of configuration for sending

7.3.2.2.1 Peer-to-peer sending

LocalObjectID shall be configured as the ObjectID of Type 14 CiA 402 mapping object of the local device.

RemoteObjectID shall be configured as the ObjectID of Type 14 CiA 402 mapping object of the receiver.

ServiceOperation shall be configured as the FRTVariableDistribute service.

ServiceRole shall be configured as the sender.

RemoteMACAddress shall be configured as the MAC address of the receiver.

SendTimeOffset shall be configured as the time of sending data.

ValidBitOffset shall be configured as the offset of the PDU data.

ValidBitNumber shall be configured as the total length of the sent data.

7.3.2.2.2 Multicast sending

LocalObjectID shall be configured as the ObjectID of Type 14 CiA 402 mapping object of the local device.

RemoteObjectID shall be configured as the ObjectID of Type 14 CiA 402 mapping object of the receiver.

ServiceOperation shall be configured as the FRTVariableDistribute service.

ServiceRole shall be configured as the sender.

RemoteMACAddress shall be configured as the Multicast MAC address of the receiver.

SendTimeOffset shall be configured as the time of sending data.

ValidBitOffset shall be configured as the offset of the PDU data.

ValidBitNumber shall be configured as the total length of the sent data.

7.3.2.3 Description of configuration for receiving

LocalObjectID shall be configured as the ObjectID of Type 14 CiA 402 mapping object of the local device.

RemoteObjectID shall be configured as the ObjectID of Type 14 CiA 402 mapping object of the sender.

ServiceOperation shall be configured as the FRTVariableDistribute service.

ServiceRole shall be configured as the receiver.

RemoteMACAddress shall be configured as the MAC address of the sender.

SendTimeOffset is unused.

ValidBitOffset shall be configured as the offset of the PDU data.

ValidBitNumber shall be configured as the length of the receiving data.

7.3.3 Procedure of sending PDOs

The procedure of sending PDUs of the FRT application is as follows.

Step 1: Searching out the sender in the FRT link object

Search for the sender beginning from the First number of FRT link object in the FRT link object header by checking the ServiceRole.

Step 2: Getting Type 14 CiA 402 mapping object location

The Type 14 CiA 402 mapping object would be located through the LocalObjectID of the FRT link object found in step 1.

Step 3: Getting Type 14 CiA 402 mapping parameter object

The first number of the CiA 402 mapping parameter object shall be located through the First number of CiA402 mapping parameter object and Number of configured mapping parameter object in the Type 14 CiA 402 mapping object.

Step 4: Packeting FRT PDU data

PDU data for FRT application is filled with the data values of the Type 14 CiA 402 mapping parameter object in step 3. The SourceObjectID for the PDU of the FRT application is filled with the LocalObjectID in step 1.

7.3.4 Procedure of receiving PDOs

The procedure of receiving PDUs of the FRT application is as follows.

Step 1: Getting parameters from the FRT application PDU

SourceObjectID and SourceMACAddress shall be extracted from the FRT application PDU.

Step 2: Getting ServiceRole from the FRT link object

Configured FRT link objects should be scanned beginning from the First number of FRT link object in the MOB. Then check whether the ServiceRole in the FRT link object is the receiver or not. If the ServiceRole is receiver, go to step 3, otherwise continue to search. If all configured FRT link objects are checked and there is still no ServiceRole configured as receiver, stop analyzing.

Step 3: Comparing RemoteObjectID

If the RemoteObjectID of the FRT link object in step 2 equals to the SourceObjectID in step 1, skip to step 4, otherwise return to step 2.

Step 4: Comparing RemoteMACAddress

If the RemoteMACAddress of the FRT link object matches with the SourceMACAddress, go to step 5, otherwise return to step 2.

Step 5: Getting ValidBitOffset and ValidBitNumber of the FRT link object

The PDO data shall be extracted from the FRT application PDU through the ValidBitOffset and the ValidBitNumber in the FRT link object.

Step 6: Getting LocalObjectID of the FRT link object

LocalObjectID of the FRT link object is obtained in step 6. Then Type 14 CiA 402 mapping object is located through the LocalObjectID.

Step 7: Encoding Type 14 CiA 402 mapping object

The first number of the CiA 402 mapping parameter object shall be located through the First number of CiA402 mapping parameter object and the Number of configured mapping parameter object in the Type 14 CiA 402 mapping object.

Step 8: Getting data value of Type 14 CiA 402 mapping parameter object

The data value of the Type 14 CiA 402 mapping parameter object is filled with the PDO data in step 5.

7.4 PDOs mapping on acyclic PDU transmission

7.4.1 General

CiA 402 PDOs as defined in IEC 61700-7-201 can also be transmitted using acyclic PDU services, which is either the FRTWrite service or the FRTRead service (see IEC 61158-6-14) for peer-to-peer access.

For use of these two services, the FRT link object(s) and the CiA 402 mapping parameter objects shall be configured (see 7.2.3) and downloaded to each related device properly.

7.4.2 FRTRead service

7.4.2.1 Request

The FRTRead request parameters are coded as shown in Table 189.

Table 189 – Encoding of FRTRead request parameters

No.	Parameter name	Data type	Octet offset	Octet length	Description
1	DestinationObjectID	Unsigned16	0	2	Object ID of the destination device
2	SubIndex	Unsigned16	2	2	SubIndex of the accessed object

7.4.2.2 Positive response

The FRTRead positive response parameters are coded as shown in Table 190.

Table 190 – Encoding of FRTRead positive response parameters

No.	Parameter name	Data type	Octet offset	Octet length	Description
1	Reserved	OctetString	0	2	Reserved
2	Data	OctetString	2	N	Returned data

7.4.2.3 Negative response

The FRTRead negative response parameters are coded as shown in Table 191.

Table 191 – Encoding of FRTRead negative response parameters

No.	Parameter name	Data type	Octet offset	Octet length	Description
1	Reserved	OctetString	0	2	Reserved
2	ErrorType	ErrorType	2	N	See ErrorType

7.4.3 FRTWrite service

7.4.3.1 Request

The FRTWrite request parameters are coded as shown in Table 192.

Table 192 – Encoding of FRTWrite request parameters

No.	Parameter name	Data type	Octet offset	Octet length	Description
1	DestinationObjectID	Unsigned16	0	2	Object ID of the destination device
2	SubIndex	Unsigned16	2	2	SubIndex of the written object
3	Reserved	OctetString	4	2	Reserved
4	data	OctetSstring	6	N	Data written

7.4.3.2 Positive response

The FRTWrite positive response parameters are coded as shown in Table 193.

Table 193 – Encoding of FRTWrite positive response parameters

No.	Parameter name	Data type	Octet offset	Octet length	Description
1	DestinationObjectID	Unsigned16	0	2	Object ID of the destination device

7.4.3.3 Negative response

The FRTWrite negative response parameters are coded as shown in Table 194.

Table 194 – Encoding of FRTWrite negative response parameters

No.	Parameter name	Data type	Octet offset	Octet length	Description
1	ErrorType	ErrorType	0	N	See ErrorType

7.4.4 FRTRead service process

7.4.4.1 Sending FRTRead request

The FRTRead request frame shall be packeted with the ObjectID and the SubIndex of the object, whose attributes shall be read.

7.4.4.2 Receiving FRTRead response

Step 1: According to the ServiceID, the type of the FRTRead service shall be distinguished. Then turn to step 2.

Step 2: The DestinationObjectID and the SubIndex from the frame shall be compared with the ObjectID and the SubIndex in the MOB. If the equal objectID and SubIndex were found, turn

to step 3, otherwise the FRTRead negative response frame shall be packeted with the ErrorType.

Step 3: According to the ObjectID and the SubIndex, the attribute data to be read shall be fetched from the right position. Then turn to step 4.

Step 4: The FRTRead positive response frame shall be packeted with the fetched data.

7.4.5 FRTWrite service process

7.4.5.1 Sending FRTWrite request

The FRTWrite request frame shall be packeted with the ObjectID and the SubIndex of the object, whose attributes shall be written.

7.4.5.2 Sending FRTWrite response

Step 1: According to the ServiceID, the type of the FRTWrite service shall be distinguished. Then turn to step 2.

Step 2: The DestinationObjectID and the SubIndex from the frame shall be compared with the ObjectID and the SubIndex in the MOB. If the equal ObjectID and SubIndex were found, turn to step 3, otherwise the FRTWrite negative response frame shall be packeted with the ErrorType.

Step 3: According to the ObjectID and the SubIndex, the attribute data from the frame shall be written in to the right position. Then turn to step 4.

Step 4: The FRTWrite positive response frame shall be packeted with the equal ObjectID as the DestinationObjectID.

7.5 Alarm mechanism

7.5.1 Overview

The alarm mechanism is used to transmit error messages from one device to other device(s). The user defines the conditions which trigger the error. The alarm process is invoked to notify the error messages when the conditions are met. The alarm object shall be transmitted using the EventReport service performed by the alarm producer. As long as no new errors occur on a device no further alarm object shall be transmitted. The alarm object may be received by one or more alarm consumers. The consumers of the event notification may acknowledge the event by using the AcknowledgeEventReport service.

7.5.2 EventReport service

This service is used to transmit event notification. It is using multicast or broadcast mode. In this standard, the alarm messages shall be transmitted by calling this service.

The EventReport service parameters are coded as shown in Table 195.

Table 195 – Encoding of EventReport parameters

No.	Parameter name	Data type	Octet offset	Octet length	Description
1	SourceObjectID	Unsigned16	0	2	Application ID of the source device
2	EventNumber	Unsigned16	2	2	Number of the event
3	EventData	OctetString	4	N	Specific event data

The telegram of the EventReport service for the alarm message transmission is shown in Table 196. The SourceObjectID shall be filled with the EventObjectID of the device. The EventData shall be filled with the error code.

Table 196 – Format of EventReport service for alarm

Type	ECSME Tag	APDU header	SourceObjectID	Event Number	EventData	Padding	FCS
2B	12B	8B	2B	2B	N B	22-N	4B

7.5.3 EventReportAcknowledge service

The service allows the user to acknowledge the event notification. It is a confirmed service. After the event notification is received, the user invokes this service to acknowledge the event.

The EventReportAcknowledge service parameters are coded as shown in Table 197.

Table 197 – Encoding of EventReportAcknowledge parameters

No.	Parameter name	Data type	Octet offset	Octet length	Description
1	DestinationObjectID	Unsigned16	0	2	Object ID of the destination device
2	EventNumber	Unsigned16	2	2	Event number

The telegram of EventReportAcknowledge service for alarm message transmission is shown in Table 198. The DestinationObjectID shall be filled with the EventObjectID of the error device.

Table 198 – Format of EventReportAcknowledge service for alarm

Type	ECSME Tag	APDU header	Destination ObjectID	Event Number	Padding	FCS
2B	12B	8B	2B	2B	22B	4B

7.5.4 Event object

The Event object shall provide the error code which occurred in the drive device. Every device has an Event object. The Event object structure is defined in 7.2.4.5. Different devices have different Event objects. The Event objects are assigned according to the local physical addresses. Their relationship is shown in Table 199.

Table 199 – Event object assignment

Device number	Local physical address	Event object
1	xx-xx-xx-xx-xx-01 _h	1400
2	xx-xx-xx-xx-xx-02 _h	1401
.....		
254	xx-xx-xx-xx-xx-fe _h	1653

7.5.5 Alarm process

When the drive device detects a internal failure, it may transmit an alarm message to notify the error. The following steps describe the alarm process.

Step 1: If the device detects a failure internally, the device shall scan the Event object header, and find out the local Event object. The device fills the Event object with the error code. The examples are shown in Table 200 and Table 201.

Table 200 – Example of Event object header

Event Header Object	SubIndex0	SubIndex1	SubIndex2
12	1400	1	253

Table 201 – Example of Event object

Event object	SubIndex0
1400	2110 _h

Step 2: An EventReport service telegram is packeted with the Event object and the error code. The format of the telegram is shown in Table 196.

Step 3: The EventReport service telegram shall be transferred at acyclic communication time, which is defined in IEC 61158-5-14.

Step 4: After the local device sending the EventReport service telegram, the device shall stay in the fault state until the device gets rid of the fault or the power is restarted.

Step 5: Other devices receive the EventReport service telegram and deal with the error. The receiver shall send an EventReportAcknowledge service telegram to acknowledge the fault device that the EventReport has been received. The telegram format is shown in Table 198.

7.5.6 Error code

Error codes are defined in EN 50325-4 and IEC 61800-7-201.

8 Mapping to EtherCAT

8.1 Overview

This clause specifies the mapping of the CiA 402 drive profile onto EtherCAT. In particular, the process data object (PDO) communication and mapping parameters are defined.

8.2 Mapping of communication objects

COBs for real-time data transmission shall be mapped to process data object messages (PDOs) using the process data services. COBs for configuration data transmission shall be mapped to service data object message(s) (SDOs) using the mailbox services. COBs for emergency information transmission shall be mapped to emergency messages (EMCY). COB for synchronization may be mapped to distributed clock services or to Sync Manager Events.

8.3 Communication parameter objects

8.3.1 General

The drive device shall implement the mandatory communication parameter objects as defined in IEC 61158-5-12. The drive device may implement the optional communication parameter objects as defined in IEC 61158-5-12.

The category and entry category attributes of an object indicate if the object shall be implemented (mandatory) or may be implemented (optional).

The object code and data type attributes are defined in detail in IEC 61158-5-12. The data types used in this profile are listed in Table 202.

Table 202 – List of used data types

Data type	Reference
Visible string	IEC 61158-5-12
Unsigned8	IEC 61158-5-12
Unsigned16	IEC 61158-5-12
Unsigned32	IEC 61158-5-12
Integer8	IEC 61158-5-12
Integer16	IEC 61158-5-12
Integer32	IEC 61158-5-12

In the entry description, the access attribute is defined, indicating if an application object is read only (ro), read/write (rw) or write only (wo). Read only indicates that this shall not be written via the bus; read/write allows to read and to write this object; and write only means that this application object shall be not read via the bus.

The default value attribute defines the value of an object with access attribute of the value 'rw' after power-on or application reset.

8.3.2 Object 1000_h: Device type

This object is defined in IEC 61800-7-201 and IEC 61158-6-12. Drive devices shall support the generic PDO mapping (bit 22 in the additional information field is 0) as defined in 5.6.2. The definitions given in Table 203 apply.

Table 203 – Additional information field for generic PDO mapping

Device	Additional information															
	Mode bits								Type							
	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Frequency converter	*	*	*	*	*	*	*	*	0	0	0	0	0	0	0	1
Servo drive	*	*	*	*	*	*	*	*	0	0	0	0	0	0	1	0
Stepper motor	*	*	*	*	*	*	*	*	0	0	0	0	0	1	0	0
Multiple device module	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

8.4 Sets of pre-defined PDOs

Only the PDO set for generic drive devices is supported (see 5.6.2).

8.5 PDO mapping attributes

The objects defined in the CiA 402 drive profile (see IEC 61800-7-201) shall use the PDO mapping attributes as defined for CANopen (see Table 163).

9 Mapping to ETHERNET Powerlink

9.1 Overview

This clause specifies the mapping of the CiA 402 drive profile onto ETHERNET Powerlink network. In particular, the process data object (PDO) communication and mapping parameters are defined. In addition, this part of the IEC 61800-7 series defines the PDO mapping attribute for all objects defined in the CiA 402 drive profile (see IEC 61800-7-201).

9.2 Mapping of communication objects

COBs for real-time data transmission shall be mapped to process data object messages (PDOs). COBs for configuration data transmission shall be mapped to service data object message(s) (SDOs). COBs for network management commands shall be mapped to NMT messages. System time distribution and synchronization is handled implicitly by the ETHERNET Powerlink protocol without the need for explicit messages.

9.3 Communication parameter objects

9.3.1 General

The drive device shall implement the mandatory communication parameter objects as defined in IEC 61158-6-13. The drive device may implement the optional communication parameter objects as defined in IEC 61158-6-13.

The category and entry category attributes of an object indicate if the object shall be implemented (mandatory) or may be implemented (optional).

The object code and data type attributes are defined in detail in IEC 61158-5-13. The data types used in this profile are listed in Table 204.

Table 204 – List of used data types

Data type	Reference
Unsigned8	EN 50325-4
Unsigned16	EN 50325-4
Unsigned32	EN 50325-4
Integer8	EN 50325-4
Integer16	EN 50325-4
Integer32	EN 50325-4
PDO_CommParamRecord_TYPE	IEC 61158-5-13
PDO_MappParamArray_TYPE	IEC 61158-5-13

The default value attribute defines the value of an object with an access attribute of the value 'rw' after power-on or application reset.

9.3.2 Object 1000_h: Device type

See 5.3.2.

9.3.3 Object 67FF_h: Single device type

See 5.3.4.

9.4 Emergency information

If the PDS detects a failure internally, it shall enter the respective error code in the error history as defined in IEC 61158-6-13. The error codes are defined in EN 50325-4 or in IEC 61800-7-201.

9.5 Sets of pre-defined PDOs

9.5.1 General

The RPDO and TPDO are pre-defined for single axis devices. PDOs for multi-device modules need to be mapped manually.

There are several sets of pre-defined PDOs. The PDO set for generic drive device is independent from the drive type. The PDO sets for specific drive devices are different for frequency converter, servo controller, and stepper motor.

The PDO_CommParamRecord_TYPE and the PDO_MappParamArray_TYPE record definitions, and the value definitions of the PDO communication and mapping parameters are defined in IEC 61158-6-13.

9.5.2 PDO set for generic drive device

9.5.2.1 Overview and introduction

The PDO set for a generic drive device pre-defines seven objects in the RPDO (see Table 205) and seven objects in the TPDO (see Table 206).

Table 205 – Overview on objects in RPDO

Object	Support	Description
1	Mandatory	Controls PDS FSA
2	Optional	Mode of operation
3	Optional	Target position (pp)
4	Optional	Target velocity (pv)
5	Optional	Target torque (tq)
6	Optional	Nominal speed (vl)
7	Optional	Digital outputs

Table 206 – Overview on objects in TPDO

Object	Support	Description
1	Mandatory	Specifies PDS FSA status
2	Optional	Current mode of operation
3	Optional	Current position (pp)
4	Optional	Current velocity (pv)
5	Optional	Current torque (tq)
6	Optional	Current speed (vl)
7	Optional	Digital inputs

9.5.2.2 RPDO

Table 207 specifies the object description and Table 208 specifies the entry description of the PDO communication parameters.

Table 207 – Object description of communication parameters

Attribute	Value
Index	1400 _h
Name	PDO_RxCommParam_00h_REC
Object code	Record
Data type	PDO_CommParamRecord_TYPE
Category	Mandatory

Table 208 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Number of Entries
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	02 _h
Sub-index	01 _h
Description	NodeID_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h
Sub-index	02 _h
Description	MappingVersion_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h

Table 209 specifies the object description and Table 210 specifies the entry description of the PDO mapping parameters.

Table 209 – Object description of mapping parameters

Attribute	Value
Index	1600 _h
Name	PDO_RxMapParam_00h_AU64
Object code	Record
Data type	PDO_MappParamArray_TYPE
Category	Mandatory

Table 210 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Number of mapped objects
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	07 _h
Sub-index	01 _h
Description	ObjectMapping_U64[1]
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6040 _h – 00 _h – 00 _h – 0000 _h – 0010 _h
Sub-index	02 _h
Description	ObjectMapping_U64[2]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6060 _h – 00 _h – 00 _h – 0010 _h – 0008 _h
Sub-index	03 _h
Description	ObjectMapping_U64[3]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	607A _h – 00 _h – 00 _h – 0018 _h – 0020 _h
Sub-index	04 _h
Description	ObjectMapping_U64[4]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	60FF _h – 00 _h – 00 _h – 0038 _h – 0020 _h
Sub-index	05 _h
Description	ObjectMapping_U64[5]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6071 _h – 00 _h – 00 _h – 0058 _h – 0010 _h

Sub-index	06 _h
Description	ObjectMapping_U64[6]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6042 _h – 00 _h – 00 _h – 0068 _h – 0010 _h
Sub-index	07 _h
Description	ObjectMapping_U64[7]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	60FE _h – 00 _h – 00 _h – 0078 _h – 0020 _h

9.5.2.3 TPDO

Table 211 specifies the object description and Table 212 specifies the entry description of the PDO communication parameters.

Table 211 – Object description of communication parameters

Attribute	Value
Index	1800 _h
Name	PDO_TxCommParam_00h_REC
Object code	Record
Data type	PDO_CommParamRecord_TYPE
Category	Mandatory

Table 212 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Number of Entries
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	02 _h
Sub-index	01 _h
Description	NodeID_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h
Sub-index	02 _h
Description	MappingVersion_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h

Table 213 specifies the object description and Table 214 specifies the entry description of the PDO mapping parameters.

Table 213 – Object description of mapping parameters

Attribute	Value
Index	1A00 _h
Name	PDO_TxMapParam_00h_AU64
Object code	Record
Data type	PDO_MappParamArray_TYPE
Category	Mandatory

Table 214 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Number of mapped objects
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	07 _h
Sub-index	01 _h
Description	ObjectMapping_U64[1]
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6041 _h – 00 _h – 00 _h – 0000 _h – 0010 _h
Sub-index	02 _h
Description	ObjectMapping_U64[2]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6061 _h – 00 _h – 00 _h – 0010 _h – 0008 _h
Sub-index	03 _h
Description	ObjectMapping_U64[3]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6064 _h – 00 _h – 00 _h – 0018 _h – 0020 _h
Sub-index	04 _h
Description	ObjectMapping_U64[4]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	606C _h – 00 _h – 00 _h – 0038 _h – 0020 _h
Sub-index	05 _h
Description	ObjectMapping_U64[5]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6077 _h – 00 _h – 00 _h – 0058 _h – 0010 _h

Sub-index	06 _h
Description	ObjectMapping_U64[6]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6044 _h – 00 _h – 00 _h – 0068 _h – 0010 _h
Sub-index	07 _h
Description	ObjectMapping_U64[7]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	60FD _h – 00 _h – 00 _h – 0078 _h – 0020 _h

9.5.3 PDO set for frequency converter

9.5.3.1 Overview and introduction

The PDO set for frequency converter pre-defines two objects in the RPDO (see Table 215) and two objects in the TPDO (see Table 216).

Table 215 – Overview on objects in RPDO

Object	Support	Description
1	Mandatory	Controls PDS FSA
2	Optional	Nominal speed (vI)
3	Optional	Target torque (tq)

Table 216 – Overview on objects in TPDO

Object	Support	Description
1	Mandatory	Specifies PDS FSA status
2	Optional	Current speed (vI)
3	Optional	Current torque (tq)

9.5.3.2 RPDO

Table 217 specifies the object description and Table 218 specifies the entry description of the PDO communication parameters.

Table 217 – Object description of communication parameters

Attribute	Value
Index	1400 _h
Name	PDO_RxCommParam_00h_REC
Object code	Record
Data type	PDO_CommParamRecord_TYPE
Category	Mandatory

Table 218 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Number of Entries
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	02 _h
Sub-index	01 _h
Description	NodeID_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h
Sub-index	02 _h
Description	MappingVersion_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h

Table 219 specifies the object description and Table 220 specifies the entry description of the PDO mapping parameters.

Table 219 – Object description of mapping parameters

Attribute	Value
Index	1600 _h
Name	PDO_RxMapParam_00h_AU64
Object code	Record
Data type	PDO_MappParamArray_TYPE
Category	Mandatory

Table 220 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Number of mapped objects
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	02 _h
Sub-index	01 _h
Description	ObjectMapping_U64[1]
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6040 _h – 00 _h – 00 _h – 0000 _h – 0010 _h
Sub-index	02 _h
Description	ObjectMapping_U64[2]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6042 _h – 00 _h – 00 _h – 0010 _h – 0010 _h
Sub-index	03 _h
Description	ObjectMapping_U64[3]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6071 _h – 00 _h – 00 _h – 0028 _h – 0010 _h

9.5.3.3 TPDO

Table 221 specifies the object description and Table 222 specifies the entry description of the PDO communication parameters.

Table 221 – Object description of communication parameters

Attribute	Value
Index	1800 _h
Name	PDO_TxCommParam_00h_REC
Object code	Record
Data type	PDO_CommParamRecord_TYPE
Category	Mandatory

Table 222 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Number of Entries
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	02 _h
Sub-index	01 _h
Description	NodeID_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h
Sub-index	02 _h
Description	MappingVersion_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h

Table 223 specifies the object description and Table 224 specifies the entry description of the PDO mapping parameters.

Table 223 – Object description of mapping parameters

Attribute	Value
Index	1A00 _h
Name	PDO_TxMapParam_00h_AU64
Object code	Record
Data type	PDO_MappParamArray_TYPE
Category	Mandatory

Table 224 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Number of mapped objects
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	02 _h
Sub-index	01 _h
Description	ObjectMapping_U64[1]
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6041 _h – 00 _h – 00 _h – 0000 _h – 0010 _h
Sub-index	02 _h
Description	ObjectMapping_U64[2]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6044 _h – 00 _h – 00 _h – 0010 _h – 0010 _h
Sub-index	03 _h
Description	ObjectMapping_U64[3]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6077 _h – 00 _h – 00 _h – 0020 _h – 0010 _h

9.5.4 PDO set for servo drive

9.5.4.1 Overview and introduction

The PDO set for servo drive pre-defines three objects in the RPDO (see Table 225) and three objects in the TPDO (see Table 226).

Table 225 – Overview on objects in RPDO

Object	Support	Description
1	Mandatory	Controls PDS FSA
2	Optional	Target position (pp)
3	Optional	Target velocity (pv)

Table 226 – Overview on objects in TPDO

Object	Support	Description
1	Mandatory	Specifies PDS FSA status
2	Optional	Current position (pp)
3	Optional	Current velocity (pv)

9.5.4.2 RPDO

Table 227 specifies the object description and Table 228 specifies the entry description of the PDO communication parameters.

Table 227 – Object description of communication parameters

Attribute	Value
Index	1400 _h
Name	PDO_RxCommParam_00h_REC
Object code	Record
Data type	PDO_CommParamRecord_TYPE
Category	Mandatory

Table 228 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Number of Entries
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	02 _h
Sub-index	01 _h
Description	NodeID_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h
Sub-index	02 _h
Description	MappingVersion_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h

Table 229 specifies the object description and Table 230 specifies the entry description of the PDO mapping parameters.

Table 229 – Object description of mapping parameters

Attribute	Value
Index	1600 _h
Name	PDO_RxMapParam_00h_AU64
Object code	Record
Data type	PDO_MappParamArray_TYPE
Category	Mandatory

Table 230 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Number of mapped objects
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	03 _h
Sub-index	01 _h
Description	ObjectMapping_U64[1]
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6040 _h – 00 _h – 00 _h – 0000 _h – 0010 _h
Sub-index	02 _h
Description	ObjectMapping_U64[2]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	607A _h – 00 _h – 00 _h – 0010 _h – 0020 _h
Sub-index	03 _h
Description	ObjectMapping_U64[3]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	60FF _h – 00 _h – 00 _h – 0030 _h – 0020 _h

9.5.4.3 TPDO

Table 231 specifies the object description and Table 232 specifies the entry description of the PDO communication parameters.

Table 231 – Object description of communication parameters

Attribute	Value
Index	1800 _h
Name	PDO_TxCommParam_00h_REC
Object code	Record
Data type	PDO_CommParamRecord_TYPE
Category	Mandatory

Table 232 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Number of Entries
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	02 _h
Sub-index	01 _h
Description	NodeID_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h
Sub-index	02 _h
Description	MappingVersion_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h

Table 233 specifies the object description and Table 234 specifies the entry description of the PDO mapping parameters.

Table 233 – Object description of mapping parameters

Attribute	Value
Index	1A00 _h
Name	PDO_TxMapParam_00h_AU64
Object code	Record
Data type	PDO_MappParamArray_TYPE
Category	Mandatory

Table 234 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Number of mapped objects
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	03 _h
Sub-index	01 _h
Description	ObjectMapping_U64[1]
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6041 _h – 00 _h – 00 _h – 0000 _h – 0010 _h
Sub-index	02 _h
Description	ObjectMapping_U64[2]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6064 _h – 00 _h – 00 _h – 0010 _h – 0020 _h
Sub-index	03 _h
Description	ObjectMapping_U64[3]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	606C _h – 00 _h – 00 _h – 0030 _h – 0020 _h

9.5.5 PDO set for stepper motor

9.5.5.1 Overview and introduction

The PDO set for stepper motor pre-defines three objects in the RPDO (see Table 235) and three objects in the TPDO (see Table 236).

Table 235 – Overview on objects in RPDO

Object	Support	Description
1	Mandatory	Controls PDS FSA
2	Optional	Target position (pp)
3	Optional	Target velocity (pv)

Table 236 – Overview on objects in TPDO

Object	Support	Description
1	Mandatory	Specifies PDS FSA status
2	Optional	Current position (pp)
3	Optional	Current velocity (pv)

9.5.5.2 RPDO

Table 237 specifies the object description and Table 238 specifies the entry description of the PDO communication parameters.

Table 237 – Object description of communication parameters

Attribute	Value
Index	1400 _h
Name	PDO_RxCommParam_00h_REC
Object code	Record
Data type	PDO_CommParamRecord_TYPE
Category	Mandatory

Table 238 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Number of Entries
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	02 _h
Sub-index	01 _h
Description	NodeID_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h
Sub-index	02 _h
Description	MappingVersion_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h

Table 239 specifies the object description and Table 240 specifies the entry description of the PDO mapping parameters.

Table 239 – Object description of mapping parameters

Attribute	Value
Index	1600 _h
Name	PDO_RxMapParam_00h_AU64
Object code	Record
Data type	PDO_MappParamArray_TYPE
Category	Mandatory

Table 240 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Number of mapped objects
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	03 _h
Sub-index	01 _h
Description	ObjectMapping_U64[1]
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6040 _h – 00 _h – 00 _h – 0000 _h – 0010 _h
Sub-index	02 _h
Description	ObjectMapping_U64[2]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	607A _h – 00 _h – 00 _h – 0010 _h – 0020 _h
Sub-index	03 _h
Description	ObjectMapping_U64[3]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	60FF _h – 00 _h – 00 _h – 0030 _h – 0020 _h

9.5.5.3 TPDO

Table 241 specifies the object description and Table 242 specifies the entry description of the PDO communication parameters.

Table 241 – Object description of communication parameters

Attribute	Value
Index	1800 _h
Name	PDO_TxCommParam_00h_REC
Object code	Record
Data type	PDO_CommParamRecord_TYPE
Category	Mandatory

Table 242 – Entry description of communication parameters

Attribute	Value
Sub-index	00 _h
Description	Number of Entries
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	02 _h
Sub-index	01 _h
Description	NodeID_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h
Sub-index	02 _h
Description	MappingVersion_U8
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	00 _h

Table 243 specifies the object description and Table 244 specifies the entry description of the PDO mapping parameters.

Table 243 – Object description of mapping parameters

Attribute	Value
Index	1A00 _h
Name	PDO_TxMapParam_00h_AU64
Object code	Record
Data type	PDO_MappParamArray_TYPE
Category	Mandatory

Table 244 – Entry description of mapping parameters

Attribute	Value
Sub-index	00 _h
Description	Number of mapped objects
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	03 _h
Sub-index	01 _h
Description	ObjectMapping_U64[1]
Entry category	Mandatory
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6041 _h – 00 _h – 00 _h – 0000 _h – 0010 _h
Sub-index	02 _h
Description	ObjectMapping_U64[2]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	6064 _h – 00 _h – 00 _h – 0010 _h – 0020 _h
Sub-index	03 _h
Description	ObjectMapping_U64[3]
Entry category	Optional
Access	See IEC 61158-6-13
PDO mapping	No
Value range	See IEC 61158-6-13
Default value	606C _h – 00 _h – 00 _h – 0030 _h – 0020 _h

9.6 PDO mapping attributes

Same as in 5.7.

Bibliography

IEC 60050-351, *International Electrotechnical Vocabulary – Part 351: Control technology*¹⁵

IEC 61158 (all parts), *Digital data communications for measurement and control – Fieldbus for use in industrial control systems*

IEC 61499-1, *Function blocks – Part 1: Architecture*

IEC 61784-1, *Industrial communication networks – Profiles – Part 1: Fieldbus profiles*

IEC 61784-2, *Industrial communication networks – Profiles – Part 2: Additional fieldbus profiles for real-time networks based on ISO/IEC 8802-3*

IEC 61800 (all parts), *Adjustable speed electrical power drive systems*

IEC 61800-7-1:2015, *Adjustable speed electrical power drive systems – Part 7-1: Generic interface and use of profiles for power drive systems – Interface definition*

IEC 61800-7-202:2015, *Adjustable speed electrical power drive systems – Part 7-202: Generic interface and use of profiles for power drive systems – Profile type 2 specification*

IEC 61800-7-203:2015, *Adjustable speed electrical power drive systems – Part 7-203: Generic interface and use of profiles for power drive systems – Profile type 3 specification*

IEC 61800-7-204:2015, *Adjustable speed electrical power drive systems – Part 7-204: Generic interface and use of profiles for power drive systems – Profile type 4 specification*

IEC 61800-7-302:2015, *Adjustable speed electrical power drive systems – Part 7-302: Generic interface and use of profiles for power drive systems – Mapping of profile type 2 to network technologies*

IEC 61800-7-303:2015, *Adjustable speed electrical power drive systems – Part 7-303: Generic interface and use of profiles for power drive systems – Mapping of profile type 3 to network technologies*

IEC 61800-7-304:2015, *Adjustable speed electrical power drive systems – Part 7-304: Generic interface and use of profiles for power drive systems – Mapping of profile type 4 to network technologies*

IEC 61915-1, *Low-voltage switchgear and controlgear – Device profiles for networked industrial devices – Part 1: General rules for the development of device*

IEC TR 62390:2005, *Common Automation Device – Profile Guideline*

ISO/IEC 2382-15, *Information technology – Vocabulary – Part 15 Programming languages*

ISO/IEC 19501, *Information technology – Open Distributed Processing – Unified Modeling Language (UML) Version 1.4.2*

¹⁵ See also the IEC Multilingual Dictionary – Electricity, Electronics and Telecommunications.

ISO 15745-1, *Industrial automation systems and integration – Open systems application integration framework – Part 1: Generic reference description*

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

ENTRAÎNEMENTS ÉLECTRIQUES DE PUISSANCE À VITESSE VARIABLE –

Partie 7-301: Interface générique et utilisation de profils pour les entraînements électriques de puissance – Mise en correspondance du profil de type 1 avec les technologies de réseaux

AVANT-PROPOS

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La Norme internationale IEC 61800-7-301 a été établie par le sous-comité 22G: Systèmes d'entraînement électrique à vitesse variable comprenant des convertisseurs à semi-conducteurs, du comité d'études 22 de l'IEC: Systèmes et équipements électroniques de puissance.

Cette deuxième édition annule et remplace la première édition parue en 2007. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- Inclusion de mises en correspondance supplémentaires avec les systèmes de communication (voir Article 6 et Article 7).

Le texte de cette norme est issu des documents suivants:

FDIS	Rapport de vote
22G/311/FDIS	22G/326/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette norme.

Cette publication a été rédigée selon les Directives ISO/IEC, Partie 2.

Une liste de toutes les parties de la série IEC 61800, publiées sous le titre général *Entraînements électriques de puissance à vitesse variable*, peut être consultée sur le site web de l'IEC.

Le comité a décidé que le contenu de cette publication ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "<http://webstore.iec.ch>" dans les données relatives à la publication recherchée. A cette date, la publication sera

- reconduite,
- supprimée,
- remplacée par une édition révisée, ou
- amendée.

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INTRODUCTION

La série IEC 61800 est destinée à fournir un ensemble commun de spécifications dédiées aux entraînements électriques de puissance à vitesse variable.

L'IEC 61800-7 spécifie les profils dédiés aux entraînements électriques de puissance (PDS) et leur mise en correspondance avec les systèmes de communication existants grâce à un modèle d'interface générique.

L'IEC 61800-7 décrit une interface générique entre les systèmes de commande et les entraînements électriques de puissance. Cette interface peut être intégrée au système de commande. Le système de commande proprement dit peut également être situé dans le dispositif d'entraînement (parfois appelé "dispositif d'entraînement intelligent").

Il existe un grand nombre d'interfaces physiques disponibles (entrées et sorties analogiques et numériques, interfaces séries et parallèles, bus de terrain et réseaux). Les profils établis sur des interfaces physiques spécifiques sont déjà définis pour certains domaines d'application (par exemple, commande de mouvement) et certaines classes de dispositifs (par exemple, dispositifs d'entraînement classiques, positionneur). Les implémentations correspondantes des interfaces de programmes de commande et de programmeurs d'application associées sont de nature propriétaire et varient de manière importante.

L'IEC 61800-7 définit un ensemble de fonctions, paramètres et diagrammes d'états communs pour la commande d'entraînement ou une description de séquences d'opérations à mettre en correspondance avec les profils d'entraînement.

L'IEC 61800-7 fournit une procédure d'accès aux fonctions et données d'un dispositif d'entraînement, indépendante du profil d'entraînement et de l'interface de communication employés. Il s'agit de définir un modèle commun d'entraînement comportant des fonctions génériques et des objets pouvant être mis en correspondance avec des interfaces de communication différentes. Ceci permet de prévoir des implémentations communes de commande de mouvement (ou applications de commande de vitesse ou de commande d'entraînement) dans les contrôleurs sans aucune connaissance spécifique de la mise en œuvre du dispositif d'entraînement.

Il y a plusieurs raisons de définir une interface générique:

Pour un constructeur de dispositif d'entraînement

- assistance plus aisée des intégrateurs de systèmes;
- description plus aisée des fonctions d'entraînement du fait d'une terminologie commune;
- le choix des dispositifs d'entraînement ne dépend pas de la disponibilité d'une assistance spécifique;

Pour un constructeur de dispositif de commande

- aucune influence de la technologie de bus;
- intégration aisée des dispositifs;
- indépendance par rapport à un fournisseur de dispositifs d'entraînement;

Pour un intégrateur de systèmes

- effort moindre d'intégration des dispositifs;
- méthode intelligible unique de modélisation;
- indépendance par rapport à la technologie de bus.

Concevoir une application de commande de mouvement avec plusieurs dispositifs d'entraînement différents et un système de commande spécifique nécessite un effort certain. Les tâches de mise en œuvre des logiciels systèmes et de compréhension de la description fonctionnelle des composants individuels peuvent conduire à l'épuisement des ressources

d'un projet. Dans certains cas, les dispositifs d'entraînement ne partagent pas la même interface physique. Certains dispositifs de commande ne prennent en charge qu'une interface unique qui n'est pas prise en charge par un dispositif d'entraînement spécifique. D'autre part, les fonctions et les structures de données sont souvent spécifiées avec des incompatibilités. Cela exige de l'intégrateur de systèmes d'établir des interfaces spéciales pour le logiciel d'application alors que cette opération ne relève pas vraiment de sa responsabilité.

Certaines applications nécessitent de pouvoir échanger des dispositifs, voire intégrer de nouveaux dispositifs dans une configuration existante. Elles sont alors confrontées à différentes solutions incompatibles. Les efforts nécessaires pour adapter une solution relative à un profil d'entraînement et aux extensions spécifiques au constructeur peuvent se révéler inacceptables. Ceci réduit le degré de liberté concernant le choix d'un dispositif le mieux adapté à cette application à la simple sélection du dispositif disponible pour une interface physique spécifique et pris en charge par le contrôleur.

L'IEC 61800-7-1 est divisée en une partie générique et en plusieurs annexes comme représenté à la Figure 1. Les types de profils d'entraînement pour CiA® 402¹, CIP Motion™², PROFIdrive³ et SERCOS®⁴ sont mis en correspondance avec l'interface générique dans l'annexe correspondante. Les annexes ont été soumises par des organismes internationaux indépendants spécialisés dans les réseaux ou les bus de terrain, et responsables du contenu de l'annexe qui y est associée, ainsi que de l'utilisation des marques connexes.

Les différents types de profils 1, 2, 3 et 4 sont spécifiés dans l'IEC 61800-7-201, l'IEC 61800-7-202, l'IEC 61800-7-203 et l'IEC 61800-7-204.

¹ CiA® 402 est une marque déposée de CAN in Automation, e.V. (CiA) Cette information est fournie pour la commodité des utilisateurs de la présente norme internationale et ne constitue en aucun cas un entérinement par l'IEC du détenteur de la marque ou de l'un quelconques de ses produits. La conformité à ce profil n'implique pas l'utilisation de la marque déposée CiA® 402. L'utilisation de la marque déposée CiA® 402 nécessite l'autorisation de CAN in Automation e.V. (CiA).

² CIP Motion™ est une marque de ODVA, Inc. Cette information est fournie pour la commodité des utilisateurs de la présente norme internationale et ne constitue en aucun cas un entérinement par l'IEC du détenteur de la marque ou de l'un quelconques de ses produits. La conformité à ce profil n'implique pas l'utilisation de la marque CIP Motion™. L'utilisation de la marque CIP Motion™ nécessite l'autorisation de ODVA, Inc.

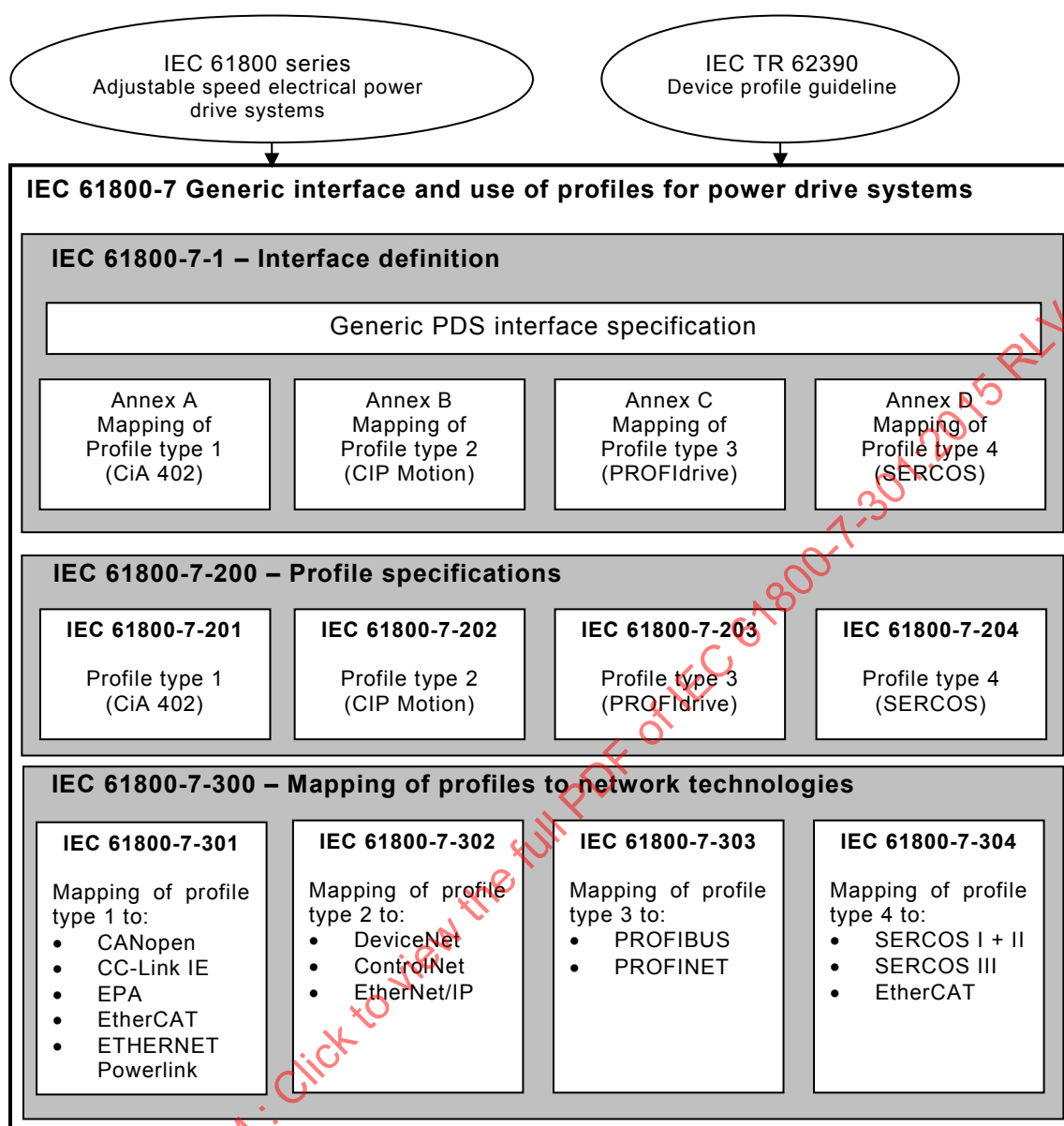
³ PROFIdrive est une marque de PROFIBUS & PROFINET International. Cette information est fournie pour la commodité des utilisateurs de la présente norme internationale et ne constitue en aucun cas un entérinement par l'IEC du détenteur de la marque ou de l'un quelconques de ses produits. La conformité à ce profil n'implique pas l'utilisation de la marque PROFIdrive. L'utilisation de la marque PROFIdrive nécessite l'autorisation de PROFIBUS & PROFINET International.

⁴ SERCOS® est une marque déposée par SERCOS International e.V. Cette information est fournie pour la commodité des utilisateurs de la présente Norme internationale et ne constitue en aucun cas un entérinement par l'IEC du détenteur de la marque ou de l'un quelconques de ses produits. La conformité à ce profil n'implique pas l'utilisation de la marque déposée SERCOS®. L'utilisation de la marque déposée SERCOS® nécessite l'autorisation de son détenteur.

La présente partie de l'IEC 61800-7 spécifie la ou les méthodes de mise en correspondance du profil de type 1 (CiA® 402) avec les technologies de réseaux telles que CANopen®⁵, CC-Link IE® Field Network⁶, EPA™⁷, EtherCAT®⁸ et Ethernet Powerlink™⁹.

Les IEC 61800-7-302, IEC 61800-7-303 et IEC 61800-7-304 spécifient la ou les méthodes de mise en correspondance des profils de types 2, 3 et 4 avec les différentes technologies de réseaux (telles que EtherCAT®, DeviceNet™¹⁰, ControlNet™¹¹, EtherNet/IP™¹², PROFIBUS¹³, PROFINET¹⁴ et SERCOS ®).

- 5 CANopen® est une marque déposée de CAN in Automation, e.V. (CiA). Cette information est fournie pour la commodité des utilisateurs de la présente norme internationale et ne constitue en aucun cas un entérinement par l'IEC du détenteur de la marque ou de l'un quelconques de ses produits. La conformité à ce profil n'implique pas l'utilisation de la marque déposée CANopen®. CANopen® est l'acronyme de "Controller Area Network open (*Gestionnaire de réseau de communication ouvert*) et fait référence à l'EN 50325-4. L'utilisation de la marque déposée CANopen® nécessite l'autorisation de CAN in Automation e.V. (CiA).
- 6 CC-Link IE® Field Network est une marque déposée de Mitsubishi Electric Corporation. Cette information est fournie pour la commodité des utilisateurs de la présente norme internationale et ne constitue en aucun cas un entérinement par l'IEC du détenteur de la marque ou de l'un quelconques de ses produits. La conformité à ce profil n'implique pas l'utilisation de la marque déposée CC-Link IE® Field Network. L'utilisation de la marque déposée CC-Link IE® Field Network nécessite l'autorisation de Mitsubishi Electric Corporation.
- 7 EPA™ est une marque de SUPCON Group Co. Ltd. Cette information est fournie pour la commodité des utilisateurs de la présente norme internationale et ne constitue en aucun cas un entérinement par l'IEC du détenteur de la marque ou de l'un quelconques de ses produits. La conformité à ce profil n'implique pas l'utilisation de la marque EPA™. L'utilisation de la marque EPA™ nécessite l'autorisation du détenteur de la marque.
- 8 EtherCAT® est une marque déposée de Beckhoff, Verl. Cette information est fournie pour la commodité des utilisateurs de la présente norme internationale et ne constitue en aucun cas un entérinement par l'IEC du détenteur de la marque ou de l'un quelconques de ses produits. La conformité à ce profil n'implique pas l'utilisation de la marque déposée EtherCAT®. L'utilisation de la marque déposée EtherCAT® nécessite l'autorisation du détenteur de la marque.
- 9 Ethernet Powerlink™ est une marque de Bernecker & Rainer Industrieelektronik Ges.m.b.H., le contrôle de son utilisation est confié à l'organisme à but non lucratif EPSG. Cette information est fournie pour la commodité des utilisateurs de la présente norme internationale et ne constitue en aucun cas un entérinement par l'IEC du détenteur de la marque ou de l'un quelconques de ses produits. La conformité à ce profil n'implique pas l'utilisation de la marque Ethernet Powerlink™. L'utilisation de la marque nécessite l'autorisation du détenteur de la marque.
- 10 DeviceNet™ est une marque de ODVA, Inc. Cette information est fournie pour la commodité des utilisateurs de la présente Norme internationale et ne constitue en aucun cas un entérinement par l'IEC du détenteur de la marque ou de l'un quelconques de ses produits. La conformité à ce profil n'implique pas l'utilisation de la marque DeviceNet™. L'utilisation de la marque DeviceNet™ nécessite l'autorisation de ODVA, Inc.
- 11 ControlNet™ est une marque de ODVA, Inc. Cette information est fournie pour la commodité des utilisateurs de la présente Norme internationale et ne constitue en aucun cas un entérinement par l'IEC du détenteur de la marque ou de l'un quelconques de ses produits. La conformité à ce profil n'implique pas l'utilisation de la marque ControlNet™. L'utilisation de la marque ControlNet™ nécessite l'autorisation de ODVA, Inc.
- 12 EtherNet/IP™ est une marque de ODVA, Inc. Cette information est fournie pour la commodité des utilisateurs de la présente norme internationale et ne constitue en aucun cas un entérinement par l'IEC du détenteur de la marque ou de l'un quelconques de ses produits. La conformité à ce profil n'implique pas l'utilisation de la marque EtherNet/IP™. L'utilisation de la marque EtherNet/IP™ nécessite l'autorisation de ODVA, Inc.
- 13 PROFIBUS est une marque de PROFIBUS & PROFINET International. Cette information est fournie pour la commodité des utilisateurs de la présente norme internationale et ne constitue en aucun cas un entérinement par l'IEC du détenteur de la marque ou de l'un quelconques de ses produits. La conformité à ce profil n'implique pas l'utilisation de la marque PROFIBUS. L'utilisation de la marque PROFIBUS nécessite l'autorisation de PROFIBUS & PROFINET International.
- 14 PROFINET est une marque de PROFIBUS & PROFINET International. Cette information est fournie pour la commodité des utilisateurs de la présente norme internationale et ne constitue en aucun cas un entérinement par l'IEC du détenteur de la marque ou de l'un quelconques de ses produits. La conformité à ce profil n'implique pas l'utilisation de la marque PROFINET. L'utilisation de la marque PROFINET nécessite l'autorisation de PROFIBUS & PROFINET International.



IEC

Anglais	Français
IEC 61800 series Adjustable speed electrical power drive systems	Série IEC 61800 Entraînements électriques de puissance à vitesse variable
IEC TR 62390 Device profile guideline	IEC TR 62390 Device profile guideline (disponible en anglais seulement)
IEC 61800-7 Generic interface and use of profiles for power drive systems	IEC 61800-7 Interface générique et utilisation de profils pour les entraînements électriques de puissance
IEC 61800-7-1 Interface definition	IEC 61800-7-1 Définition de l'interface
Generic PDS interface specification	Spécification d'interface PDS générique
Annex A, Mapping of Profile type 1 (CiA 402)	Annexe A, Mise en correspondance du profil de type 1 (CiA 402)
Annex B, Mapping of Profile type 2 (CIP Motion)	Annexe B, Mise en correspondance du profil de type 2 (CIP Motion)
Annex C, Mapping of Profile type 3 (PROFIdrive)	Annexe C, Mise en correspondance du profil de type 3 (PROFIdrive)
Annex D, Mapping of Profile type 4 (SERCOS)	Annexe D, Mise en correspondance du profil de type 4 (SERCOS)
IEC 61800-7-200 – Profile specifications	IEC 61800-7-200 –Spécifications des profils
IEC 61800-7-201 Profile type 1 (CiA 402)	IEC 61800-7-201 Profil de type 1 (CiA 402)

Anglais	Français
IEC 61800-7-202 Profile type 2 (CIP Motion)	IEC 61800-7-202 Profil de type 2 (CIPMotion)
IEC 61800-7-203 Profile type 3 (PROFIdrive)	IEC 61800-7-203 Profil de type 3 (PROFIdrive)
IEC 61800-7-204 Profile type 4 (PROFIdrive)	IEC 61800-7-204 Profil de type 4 (SERCOS)
IEC 61800-7-300 – Mapping of profiles to network technologies	IEC 61800-7-300 – Mise en correspondance des profils avec les technologies de réseaux
IEC 61800-7-301 Mapping of profile type 1 to CANopen CC-Link IE EPA EtherCAT ETHERNET Powerlink	IEC 61800-7-301 Mise en correspondance du profil de type 1 avec CANopen CC Link IE EPA EtherCAT ETHERNET Powerlink
IEC 61800-7-302 Mapping of profile type 2 to DeviceNet ControlNet EtherNet/IP	IEC 61800-7-302 Mise en correspondance du profil de type 2 avec DeviceNet ControlNet EtherNet/IP
IEC 61800-7-303 Mapping of profile type 3 to PROFIBUS PROFINET	IEC 61800-7-303 Mise en correspondance du profil de type 3 avec PROFIBUS PROFINET
IEC 61800-7-304 Mapping of profile type 4 to SERCOS I + II SERCOS III EtherCAT	IEC 61800-7-304 Mise en correspondance du profil de type 4 avec SERCOS I + II SERCOS III EtherCAT

Figure 1 – Structure de l'IEC 61800-7

ENTRAÎNEMENTS ÉLECTRIQUES DE PUISSANCE À VITESSE VARIABLE –

Partie 7-301: Interface générique et utilisation de profils pour les entraînements électriques de puissance – Mise en correspondance du profil de type 1 avec les technologies de réseaux

1 Domaine d'application

La présente partie de l'IEC 61800 spécifie la mise en correspondance du type de profil 1 (CiA 402), décrit dans l'IEC 61800-7-201, avec les différentes technologies de réseau.

Les fonctions spécifiées dans la présente partie de l'IEC 61800-7 ne sont pas destinées à assurer la sécurité fonctionnelle. Ceci exige l'application de mesures supplémentaires conformes aux normes, conventions et lois pertinentes.

- CANopen, voir l'Article 5;
- CC-Link IE Field, voir l'Article 6;
- EPA, voir l'Article 7;
- EtherCAT, voir l'Article 8;
- ETHERNET Powerlink, voir l'Article 9;

2 Références normatives

Les documents suivants sont cités en référence de manière normative, en intégralité ou en partie, dans le présent document et sont indispensables pour son application. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 61158-4-14, *Réseaux de communication industriels – Spécifications des bus de terrain – Partie 4-14: Spécification du protocole de la couche liaison de données – Éléments de type 14*

IEC 61158-5-12, *Réseaux de communication industriels – Spécifications des bus de terrain – Partie 5-12: Définition des services de la couche application – Éléments de type 12*

IEC 61158-5-13, *Réseaux de communication industriels – Spécifications des bus de terrain – Partie 5-13: Définition des services de la couche application – Éléments de type 13*

IEC 61158-5-14, *Réseaux de communication industriels – Spécifications des bus de terrain – Partie 5-14: Définition des services de la couche application – Éléments de type 14*

IEC 61158-5-23, *Réseaux de communication industriels – Spécifications des bus de terrain – Partie 5-23: Définition des services de la couche application – Éléments de type 23*

IEC 61158-6-12, *Réseaux de communication industriels – Spécifications des bus de terrain – Partie 6-12: Spécification du protocole de la couche application – Éléments de type 12*

IEC 61158-6-13, *Réseaux de communication industriels – Spécifications des bus de terrain – Partie 6-13: Spécification du protocole de la couche application – Éléments de type 13*

IEC 61158-6-14, *Réseaux de communication industriels – Spécifications des bus de terrain – Partie 6-14: Spécification du protocole de la couche application – Éléments de type 14*

IEC 61158-6-23, *Réseaux de communication industriels – Spécifications des bus de terrain – Partie 6-23: Spécification du protocole de la couche application – Éléments de type 23*

IEC 61800-7-201, *Entraînements électriques de puissance à vitesse variable – Partie 7-201: Interface générique et utilisation de profils pour les entraînements électriques de puissance – Spécification de profil de type 1*

EN 50325-4, *Sous-système de communications industriel basé sur l'ISO 11898 (CAN) pour les interfaces des dispositifs de commande – Partie 4: CANopen*

3 Termes, définitions et abréviations

3.1 Termes et définitions

Pour les besoins du présent document, les termes et définitions suivants s'appliquent.

3.1.1

valeur instantanée

valeur d'une grandeur variable à un instant déterminé

Note 1 à l'article: La valeur instantanée est utilisée dans le présent document comme donnée d'entrée du programme de commande d'application pour superviser les variables du PDS (par exemple, variables de réaction).

[SOURCE: IEC 61800-7-1:2015, 3.3.1.1]

3.1.2

application

élément fonctionnel logiciel spécifique à la résolution d'un problème en termes de mesure et de commande de procédés industriels

Note 1 à l'article: Une application peut être répartie entre les ressources, et peut communiquer avec d'autres applications.

[SOURCE: IEC 61800-7-1:2015, 3.2.2]

3.1.3

attribut

propriété ou caractéristique d'une entité

[SOURCE: IEC 61800-7-1:2015, 3.2.3]

3.1.4

classe

description d'un ensemble d'objets qui partagent les mêmes attributs, opérations, méthodes, relations et sémantique

[SOURCE: IEC 61800-7-1:2015, 3.2.5]

3.1.5

commandes

consignes

ensemble de commandes entre le programme de commande d'application et le PDS permettant de contrôler le comportement du PDS ou les éléments fonctionnels de celui-ci

Note 1 à l'article: Les états ou les modes de fonctionnement reflètent le comportement.

Note 2 à l'article: Les différentes commandes peuvent être représentées par un bit chacune.

[SOURCE: IEC 61800-7-1:2015, 3.3.1.3]

3.1.6

macrocycle de communication

ensemble de cycles de base requis pour une activité de communication configurée dans un segment de macroréseau

3.1.7

données de configuration

données destinées à la sélection des unités fonctionnelles, à l'attribution de leur emplacement et à la définition de leurs interconnexions

3.1.8

commande

régulation

action délibérée sur (ou dans) un processus, en vue d'atteindre des objectifs définis

[SOURCE: IEC 61800-7-1:2015, 3.2.6]

3.1.9

dispositif de commande/régulation

unité physique contenant – dans un module/sous-ensemble ou dispositif – un programme d'application de commande du PDS

[SOURCE: IEC 61800-7-1:2015, 3.2.7]

3.1.10

type de données

ensemble de valeurs associé à un ensemble d'opérations autorisées

[SOURCE: IEC 61800-7-1:2015, 3.2.8]

3.1.11

dispositif

dispositif de terrain

<blocs de fonction> entité physique indépendante en réseau dans un système d'automatisation industriel, capable d'accomplir des fonctions spécifiées dans un contexte particulier et délimitée par ses interfaces

[SOURCE: IEC 61800-7-1:2015, 3.2.9]

3.1.12

profil de dispositif

représentation d'un dispositif en termes de ses paramètres, ensembles de paramètres et comportement selon un modèle de dispositif qui décrit les données et le comportement du dispositif tel que perçus par l'intermédiaire d'un réseau, indépendamment de toute technologie de réseau

[SOURCE: IEC 61800-7-1:2015, 3.2.11]

3.1.13

entité

élément particulier, tel qu'une personne, un lieu, un processus, un objet, un concept, une association ou un événement

3.1.14

variable de réaction

grandeur variable qui représente la variable commandée et qui est réintroduite dans le comparateur

[SOURCE: IEC 61800-7-1:2015, 3.2.12]

3.1.15

élément fonctionnel

entité de logiciel ou logiciel combiné au matériel, capable d'accomplir une fonction spécifiée d'un dispositif

Note 1 à l'article: Un élément fonctionnel comporte une interface et des associations à d'autres éléments fonctionnels et fonctions.

Note 2 à l'article: Un élément fonctionnel peut être constitué de bloc(s) de fonctions, d'objet(s) ou de liste(s) de paramètres.

[SOURCE: IEC 61800-7-1:2015, 3.2.13]

3.1.16

données d'entrée

données transférées d'une source externe dans un dispositif, une ressource ou un élément fonctionnel

[SOURCE: IEC 61800-7-1:2015, 3.2.14]

3.1.17

interface

frontière partagée entre deux entités, définie par des caractéristiques fonctionnelles, des caractéristiques de signal ou d'autres caractéristiques appropriées

[SOURCE: IEC 61800-7-1:2015, 3.2.15]

3.1.18

mise en correspondance

ensemble de valeurs ayant une correspondance définie avec les grandeurs ou valeurs d'un autre ensemble

3.1.19

message

série ordonnée d'octets destinés à transmettre de l'information

3.1.20

modèle

représentation mathématique ou physique d'un système ou d'un processus, basée, avec une précision suffisante, sur des lois connues, sur une identification ou sur des hypothèses spécifiées

[SOURCE: IEC 61800-7-1:2015, 3.2.17]

3.1.21

mode de fonctionnement

caractérisation de la manière et du degré avec lequel l'opérateur humain intervient sur l'équipement de commande

[SOURCE: IEC 61800-7-1:2015, 3.2.18]

3.1.22**décalage**

nombre d'octets à partir d'une position spécialement désignée

3.1.23**données de sortie**

données provenant d'un dispositif, d'une ressource ou d'un élément fonctionnel et transférées de ces derniers vers des systèmes externes

[SOURCE: IEC 61800-7-1:2015, 3.2.19]

3.1.24**paramètre**

élément de donnée qui représente les informations d'un dispositif qui peuvent être lues ou saisies dans un dispositif, par exemple, par le biais du réseau ou d'une IHM locale

Note 1 à l'article: Un paramètre est caractérisé généralement par son nom, le type de données et la direction d'accès.

[SOURCE: IEC 61800-7-1:2015, 3.2.20]

3.1.25**profil**

représentation d'une interface PDS en termes de ses paramètres, ensembles de paramètres et comportement selon un profil de communication et un profil de dispositif

[SOURCE: IEC 61800-7-1:2015, 3.2.21, modifiée — La Note 1 à l'article est supprimée]

3.1.26**point de consigne**

valeur ou variable utilisée comme donnée de sortie du programme de commande d'application afin de commander le PDS

[SOURCE: IEC 61800-7-1:2015, 3.3.1.5]

3.1.27**état****statut**

ensemble d'informations entre le PDS et le programme de commande d'application, qui reflète l'état ou le mode du PDS ou un élément fonctionnel de ce dernier

Note 1 à l'article: Les différentes informations d'état peuvent être codées avec un bit chacune.

[SOURCE: IEC 61800-7-1:2015, 3.3.1.6]

3.1.28**type**

élément matériel ou logiciel qui spécifie les attributs communs partagés par toutes les instances du type

[SOURCE: IEC 61800-7-1:2015, 3.2.23]

3.1.29**variable**

entité logicielle qui peut prendre différentes valeurs, mais une seule valeur à la fois

Note 1 à l'article: Les valeurs d'une variable, ainsi que d'un paramètre, se limitent habituellement à un certain type de données.

[SOURCE: IEC 61800-7-1:2015, 3.2.25]

3.2 Abréviations

APDU	application protocol data unit (unité de données du protocole d'application)
AREP	application relationship end point (point d'extrémité de relation entre applications)
ASE	application service element (élément de service d'application)
c	constant
CAN	controller area network (gestionnaire de réseau de communication)
CiA	CAN in Automation (CAN en mode automatisé)
COB	communication object (objet de communication)
ECSME	Type 14 communication scheduling management entity (entité de gestion du programme de communication de type 14)
EMCY	emergency message (message d'urgence)
EPA	Ethernet for Plant Automation (ethernet pour l'automatisation des installations)
FAL	fieldbus application layer (couche application du bus de terrain)
FCS	frame check sequence (séquence de contrôle de trame)
FRT	temps réel (fast real-time)
EM	(comme un préfixe) gestion de Type 14
FSA	finite state automaton (automatisation d'états finis)
ID	identificateur
IP	Internet protocol (protocole Internet)
MOB	management object base (base de l'objet de gestion)
NMT	network management (gestion de réseau)
PDO	process data object (objet de données de processus)
PDS	power drive system (entraînement électrique de puissance)
PDU	protocol data unit (unité de données de protocole)
ro	read-only (lecture seule)
RPDO	receive process data object (réception d'objet de données de processus)
rw	read-write (lecture-écriture)
SDO	service data object (objet de données de service)
SYNC	synchronisation message (message de synchronisation)
TIME	time message (message temporel)
TPDO	transmit process data object (transmission d'objet de données de processus)
wdc	watch dog counter (compteur de l'organe de surveillance)

4 Généralités

Les articles suivants spécifient la mise en correspondance du profil d'entraînement CiA 402 avec différentes technologies de communication:

- CANopen, voir l'Article 5
- CC-Link IE Field, voir l'Article 6
- EPA, voir l'Article 7
- EtherCAT, voir l'Article 8
- ETHERNET Powerlink, voir l'Article 9

5 Mise en correspondance avec CANopen

5.1 Vue d'ensemble

Le présent article spécifie la mise en correspondance du profil d'entraînement CiA 402 avec le réseau CANopen. Notamment, les paramètres de communication et de mise en correspondance de l'objet de données de processus (PDO) sont définis. De plus, la présente partie de la série IEC 61800-7 définit l'attribut de mise en correspondance du PDO pour tous les objets définis dans le profil d'entraînement CiA 402 (voir l'IEC 61800-7-201).

5.2 Mise en correspondance des objets de communication

Les objets de communication (COB) d'une transmission de données en temps réel doivent être mis en correspondance avec les messages des objets de données de processus (PDO). Les COB de transmission des données de configuration doivent être mis en correspondance avec le(s) message(s) de l'objet de données de service (SDO). Les COB de transmission des informations d'urgence doivent être mis en correspondance avec les messages d'urgence (EMCY). Les COB des commandes de gestion de réseau doivent être mis en correspondance avec les messages de gestion de réseau (NMT). Le COB de l'information d'état en matière de gestion de réseau peut être mis en correspondance avec le message de pulsation ou le message de surveillance de nœud. Le COB de synchronisation peut être mis en correspondance avec le message de synchronisation (SYNC). Le COB de répartition du temps système peut être mis en correspondance avec le message temporel (TIME).

5.3 Objets du paramètre de communication

5.3.1 Généralités

Le dispositif d'entraînement doit mettre en œuvre les objets obligatoires du paramètre de communication tels que définis dans l'EN 50325-4. Le dispositif d'entraînement peut mettre en œuvre les objets facultatifs du paramètre de communication tels que définis dans l'EN 50325-4.

Les attributs de catégorie et de catégorie d'entrée d'un objet indiquent si l'objet doit être mis en œuvre (obligatoire) ou peut être mis en œuvre (facultatif).

Les attributs de code de l'objet et de type de données sont définis de façon détaillée dans l'EN 50325-4. Les types de données utilisés à l'Article 5 sont énumérés dans le Tableau 1. Les types de données utilisés dans le profil CiA 402 sont définis dans l'EN 50325-4. Par conséquent, aucune mise en correspondance n'est définie.

Tableau 1 – Liste des types de données utilisés

Type de données	Référence
Unsigned8	EN 50325-4
Unsigned16	EN 50325-4
Unsigned32	EN 50325-4
Integer8	EN 50325-4
Integer16	EN 50325-4
Integer32	EN 50325-4
PDO compar	EN 50325-4
Mise en correspondance du PDO	EN 50325-4

Dans la description d'entrée, l'attribut d'accès indiquant si un objet d'application est en lecture seule (ro), en lecture-écriture (rw) ou est constant (c) est défini. La «lecture seule» indique que cet objet ne doit pas être saisi via le bus; la «lecture-écriture» permet de lire et d'écrire cet objet; et la mention «constant» signifie que cet objet n'est pas modifié.

L'attribut de la valeur par défaut définit la valeur fixée en usine d'un objet avec l'attribut d'accès de la valeur 'rw' ou 'c'.

5.3.2 Objet 1000_h: type de dispositif

Cet objet est défini dans l'IEC 61800-7-201 et l'EN 50325-4. Les dispositifs d'entraînement doivent prendre en charge soit la mise en correspondance générique du PDO soit la mise en correspondance du PDO spécifique au type. Pour les dispositifs prenant en charge la mise en correspondance générique du PDO (le bit 22 dans le champ d'informations supplémentaires doit être égal à 0), les définitions données dans le Tableau 2 doivent s'appliquer. Pour les dispositifs prenant en charge la mise en correspondance du PDO spécifique au type (le bit 22 dans le champ d'informations supplémentaires doit être égal à 1), les définitions données dans le Tableau 3 doivent s'appliquer. Dans le Tableau 2 et le Tableau 3, le symbole "*" signifie spécifique au constructeur.

Tableau 2 – Champ d'informations supplémentaires pour la mise en correspondance générique du PDO

Dispositif	Informations supplémentaires															
	Bits de mode								Type							
	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Convertisseur de fréquence	*	*	*	*	*	*	*	*	0	0	0	0	0	0	0	1
Entraînement asservi	*	*	*	*	*	*	*	*	0	0	0	0	0	0	1	0
Moteur pas-à-pas	*	*	*	*	*	*	*	*	0	0	0	0	0	1	0	0
Module multi équipements	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Tableau 3 – Champ d'informations supplémentaires pour la mise en correspondance du PDO spécifique au type

Dispositif	Informations supplémentaires															
	Bits de mode								Type							
	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Convertisseur de fréquence	*	*	*	*	*	*	*	*	0	1	0	0	0	0	0	1
Entraînement asservi	*	*	*	*	*	*	*	*	0	1	0	0	0	0	1	0
Moteur pas-à-pas	*	*	*	*	*	*	*	*	0	1	0	0	0	1	0	0
Module multi équipements	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

5.3.3 Objet 1029_h: comportement d'erreur

Cet objet spécifie l'état NMT (gestion de réseau) auquel le dispositif doit être réglé (voir l'EN 50325-4), lorsqu'une erreur de communication ou une erreur interne du dispositif est détectée. L'erreur interne du dispositif doit être valide lorsque la FSA PDS est en état actif de réaction au défaut (voir l'IEC 61800-7-201).

Le Tableau 4 spécifie la définition des valeurs, le Tableau 5 spécifie la description de l'objet et le Tableau 6 spécifie la description d'entrée.

Tableau 4 – Définition des valeurs

Valeur	Définition
00 _h	Entrer l'état préopérationnel NMT (seulement si l'état courant NMT est opérationnel)
01 _h	Pas de changement d'état NMT
02 _h	Entrer l'état d'arrêt NMT

Tableau 5 –Description de l'objet

Attribut	Valeur
Index	1029 _h
Nom	Comportement d'erreur
Code de l'objet	Matrice
Type de données	Unsigned8
Catégorie	Facultative

Tableau 6 –Description d'entrée

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c
Mise en correspondance du PDO	Aucune
Plage de valeurs	01 _h à 02 _h
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	Erreur de communication
Catégorie d'entrée	Obligatoire
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir Tableau 4
Valeur par défaut	00 _h
Sous-index	02 _h
Description	Erreur interne du dispositif
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir Tableau 4
Valeur par défaut	01 _h

5.3.4 Objet 67FF_h: type de dispositif unique

L'objet à l'index 67FF_h et les multiples avec un décalage de 800_h doivent définir le type de dispositif unique à l'intérieur d'une unité d'entraînement et sa fonctionnalité. La structure de l'objet doit être la même que celle définie dans l'objet 1000_h (voir l'EN 50325-4 pour de plus amples informations).

5.4 Message d'urgence

Lorsque le dispositif d'entraînement détecte à l'interne une défaillance, il peut transmettre un message d'urgence tel que défini dans l'EN 50325-4. Le message d'urgence peut utiliser les codes d'erreur définis dans l'EN 50325-4 ou dans l'IEC 61800-7-201.

5.5 Événements de défaut de communication

Ces événements sont traités par l'objet 6007_h défini dans l'IEC 61800-7-201.

5.6 Ensembles de PDO prédéfinis

5.6.1 Généralités

Un dispositif d'entraînement prenant en charge plusieurs modes de fonctionnement peut nécessiter plusieurs PDO prédéfinis. Par conséquent, plusieurs PDO sont prédéfinis par rapport aux différents modes de fonctionnement possibles pour les dispositifs d'entraînement.

Les attributions de PDO définies ci-après doivent être utilisées pour tous les axes d'un module multi équipements avec un décalage de 64. Par exemple, le premier PDO du deuxième axe a le nombre 65. De cette façon, un dispositif d'entraînement est en mesure de prendre en charge un maximum de 8 axes.

NOTE Tous les PDO du deuxième axe et des axes suivants sont désactivés par défaut.

Il y a plusieurs ensembles de PDO prédéfinis. L'ensemble de PDO pour le dispositif d'entraînement générique ne dépend pas du type d'entraînement. Les ensembles de PDO pour les dispositifs d'entraînement spécifiques sont différents pour le convertisseur de fréquence, le contrôleur asservi et le moteur pas à pas.

Tous les RPDO prédéfinis avec type de transmission de 255 doivent entrer immédiatement tous les objets mis en correspondance dans le dictionnaire d'objets.

Tous les TPDO prédéfinis avec type de transmission de 255 doivent être transmis pendant l'entrée à l'état opérationnel NMT.

Les définitions d'enregistrement de CommPar PDO et de mise en correspondance du PDO et les définitions des valeurs des paramètres de communication et de mise en correspondance du PDO sont définies dans l'EN 50325-4.

En général, tous les objets de communication PDO définis dans l'EN 50325-4 peuvent être utilisés. Les sections suivantes décrivent uniquement les valeurs par défaut des objets PDO.

5.6.2 Ensemble de PDO pour le dispositif d'entraînement générique

5.6.2.1 Vue d'ensemble et introduction

L'ensemble de PDO pour le dispositif d'entraînement générique prédéfinit huit RPDO (voir Tableau 7) et sept TPDO (voir Tableau 8). Les TPDO avec type de transmission de 255 doivent être déclenchés lorsqu'un objet quelconque mis en correspondance change. Les RPDO avec type de transmission de 255 doivent immédiatement actualiser tous les objets mis en correspondance.

Tableau 7 – Vue d'ensemble du RPDO

PDO	Prise en charge	Description
1	Obligatoire	Contrôle la FSA PDS
2	Facultative	Contrôle la FSA PDS et les modes de fonctionnement
3	Facultative	Contrôle la FSA PDS et la position cible (pp)
4	Facultative	Contrôle la FSA PDS et la vitesse cible (pv)
5	Facultative	Contrôle la FSA PDS et le couple cible (tq)
6	Facultative	Contrôle la FSA PDS et la vitesse nominale (vl)
7	Facultative	Contrôle la FSA PDS et les sorties numériques
8	Facultative	Contrôle la FSA PDS et le mode de fonctionnement (PDO à diffusion générale)
9 à 16	Réservée	
17 à 64	Facultative	Spécifique au constructeur

Tableau 8 – Vue d'ensemble du TPDO

PDO	Prise en charge	Description
1	Obligatoire	Spécifie l'état de la FSA PDS
2	Facultative	Spécifie l'état de la FSA PDS et le mode courant de fonctionnement
3	Facultative	Spécifie l'état de la FSA PDS et la position courante (pp)
4	Facultative	Spécifie l'état de la FSA PDS et la vitesse courante (pv)
5	Facultative	Spécifie l'état de la FSA PDS et le couple courant (tq)
6	Facultative	Spécifie l'état de la FSA PDS et le régime courant (vl)
7	Facultative	Spécifie l'état de la FSA PDS et les entrées numériques
8 à 16	Réservée	
17 à 64	Facultative	Spécifique au constructeur

5.6.2.2 RPDO 1

Le Tableau 9 spécifie la description de l'objet et le Tableau 10 spécifie la description d'entrée des paramètres de communication du PDO.

Tableau 9 – Description de l'objet des paramètres de communication

Attribut	Valeur
Index	1400 _n
Nom	Paramètre de réception de PDO1
Code de l'objet	Enregistrement
Type de données	CommPar PDO
Catégorie	Obligatoire

Tableau 10 – Description d'entrée des paramètres de communication

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	ID du COB utilisé par le PDO
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si l'ID du COB est modifiable)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	0000 0200 _h + ID du nœud
Sous-index	02 _h
Description	Type de transmission
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si le changement de type de PDO est pris en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	255 _d
Sous-index	05 _h
Description	Temporisateur d'événement
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

Le Tableau 11 spécifie la description de l'objet et le Tableau 12 spécifie la description d'entrée des paramètres de mise en correspondance du PDO.

Tableau 11 – Description de l'objet des paramètres de mise en correspondance

Attribut	Valeur
Index	1600 _h
Nom	Mise en correspondance du PDO1 de réception
Code de l'objet	Enregistrement
Type de données	Mise en correspondance du PDO
Catégorie	Obligatoire

Tableau 12 – Description d'entrée des paramètres de mise en correspondance

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	01 _h
Sous-index	01 _h
Description	1 ^{er} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6040 0010 _h
Sous-index	02 _h
Description	Deuxième objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	40 _h
Description	64 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

5.6.2.3 RPDO 2

Le Tableau 13 spécifie la description de l'objet et le Tableau 14 spécifie la description d'entrée des paramètres de communication du PDO.

Tableau 13 – Description de l'objet des paramètres de communication

Attribut	Valeur
Index	1401h
Nom	Paramètre de réception de PDO2
Code de l'objet	Enregistrement
Type de données	CommPar PDO
Catégorie	Facultative

Tableau 14 – Description d'entrée des paramètres de communication

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	ID du COB utilisé par le PDO
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si l'ID du COB est modifiable)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	(0000 0300 _h ou 8000 0300 _h) + ID du nœud
Sous-index	02 _h
Description	Type de transmission
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si un changement de type de PDO est pris en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	255 _d
Sous-index	05 _h
Description	Temporisateur d'événement
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

Le Tableau 15 spécifie la description de l'objet et le Tableau 16 spécifie la description d'entrée des paramètres de mise en correspondance du PDO.

Tableau 15 – Description de l'objet des paramètres de mise en correspondance

Attribut	Valeur
Index	1601 _h
Nom	Mise en correspondance du PDO2 de réception
Code de l'objet	Enregistrement
Type de données	Mise en correspondance du PDO
Catégorie	Conditionnelle, si 1401 _h est mise en œuvre

Tableau 16 – Description d'entrée des paramètres de mise en correspondance

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	02 _h
Sous-index	01 _h
Description	1 ^{er} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6040 0010 _h
Sous-index	02 _h
Description	2 ^{ème} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6060 0008 _h
Sous-index	03 _h
Description	3 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
à	
Sous-index	40 _h
Description	64 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

5.6.2.4 RPDO 3

Le Tableau 17 spécifie la description de l'objet et le Tableau 18 spécifie la description d'entrée des paramètres de communication du PDO.

Tableau 17 – Description de l'objet des paramètres de communication

Attribut	Valeur
Index	1402 _h
Nom	Paramètre de réception de PDO3
Code de l'objet	Enregistrement
Type de données	CommPar PDO
Catégorie	Facultative

Tableau 18 – Description d'entrée des paramètres de communication

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	ID du COB utilisé par le PDO
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si l'ID du COB est modifiable)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	(0000 0400 _h ou 8000 0400 _h) + ID du nœud
Sous-index	02 _h
Description	Type de transmission
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si un changement de type de PDO est pris en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	255 _d
Sous-index	05 _h
Description	Temporisateur d'événement
Catégorie d'entrée	Facultative
Accès	Rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

Le Tableau 19 spécifie la description de l'objet et le Tableau 20 spécifie la description d'entrée des paramètres de mise en correspondance du PDO.

Tableau 19 – Description de l'objet des paramètres de mise en correspondance

Attribut	Valeur
Index	1602 _h
Nom	Mise en correspondance du PDO3 de réception
Code de l'objet	Enregistrement
Type de données	Mise en correspondance du PDO
Catégorie	Conditionnelle, si 1402 _h est mise en œuvre

Tableau 20 – Description d'entrée des paramètres de mise en correspondance

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	02 _h
Sous-index	01 _h
Description	1 ^{er} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6040 0010 _h
Sous-index	02 _h
Description	2 ^{ème} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	607A 0020 _h
Sous-index	03 _h
Description	3 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
à	
Sous-index	40 _h
Description	64 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

5.6.2.5 RPDO 4

Le Tableau 21 spécifie la description de l'objet et le Tableau 22 spécifie la description d'entrée des paramètres de communication du PDO.

Tableau 21 – Description de l'objet des paramètres de communication

Attribut	Valeur
Index	1403 _h
Nom	Paramètre de réception de PDO4
Code de l'objet	Enregistrement
Type de données	CommPar PDO
Catégorie	Facultative

Tableau 22 – Description d'entrée des paramètres de communication

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	ID du COB utilisé par le PDO
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si l'ID du COB est modifiable)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	(0000 0500 _h ou 8000 0500 _h) + ID du nœud
Sous-index	02 _h
Description	Type de transmission
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si un changement de type de PDO est pris en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	255 _d
Sous-index	05 _h
Description	Temporisateur d'événement
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

Le Tableau 23 spécifie la description de l'objet et le Tableau 24 spécifie la description d'entrée des paramètres de mise en correspondance du PDO.

Tableau 23 – Description de l'objet des paramètres de mise en correspondance

Attribut	Valeur
Index	1603 _h
Nom	Mise en correspondance du PDO3 de réception
Code de l'objet	Enregistrement
Type de données	Mise en correspondance du PDO
Catégorie	Conditionnelle, si 1403 _h est mise en œuvre

Tableau 24 – Description d'entrée des paramètres de mise en correspondance

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	02 _h
Sous-index	01 _h
Description	1 ^{er} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6040 0010 _h
Sous-index	02 _h
Description	2 ^{ème} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	60FF 0020 _h
Sous-index	03 _h
Description	3 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
à	
Sous-index	40 _h
Description	64 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

5.6.2.6 RPDO 5

Le Tableau 25 spécifie la description de l'objet et le Tableau 26 spécifie la description d'entrée des paramètres de communication du PDO.

Tableau 25 – Description de l'objet des paramètres de communication

Attribut	Valeur
Index	1404 _h
Nom	Paramètre de réception de PDO5
Code de l'objet	Enregistrement
Type de données	CommPar PDO
Catégorie	Facultative

Tableau 26 – Description d'entrée des paramètres de communication

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	ID du COB utilisé par le PDO
Catégorie d'entrée	Obligatoire
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	8000 0000 _h
Sous-index	02 _h
Description	Type de transmission
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si un changement de type de PDO est pris en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	255 _d
Sous-index	05 _h
Description	Temporisateur d'événement
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

Le Tableau 27 spécifie la description de l'objet et le Tableau 28 spécifie la description d'entrée des paramètres de mise en correspondance du PDO.

Tableau 27 – Description de l'objet des paramètres de mise en correspondance

Attribut	Valeur
Index	1604 _h
Nom	Mise en correspondance du PDO5 de réception
Code de l'objet	Enregistrement
Type de données	Mise en correspondance du PDO
Catégorie	Conditionnelle, si 1404 _h est mise en œuvre

Tableau 28 – Description d'entrée des paramètres de mise en correspondance

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	02 _h
Sous-index	01 _h
Description	1 ^{er} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6040 0010 _h
Sous-index	02 _h
Description	2 ^{ème} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6071 0010 _h
Sous-index	03 _h
Description	3 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
à	
Sous-index	40 _h
Description	64 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

5.6.2.7 RPDO 6

Le Tableau 29 spécifie la description de l'objet et le Tableau 30 spécifie la description d'entrée des paramètres de communication du PDO.

Tableau 29 – Description de l'objet des paramètres de communication

Attribut	Valeur
Index	1405 _h
Nom	Paramètre de réception de PDO6
Code de l'objet	Enregistrement
Type de données	CommPar PDO
Catégorie	Facultative

Tableau 30 – Description d'entrée des paramètres de communication

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	ID du COB utilisé par le PDO
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si l'ID du COB est modifiable)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	8000 0000 _h
Sous-index	02 _h
Description	Type de transmission
Catégorie d'entrée	Obligatoire
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	255 _d
Sous-index	05 _h
Description	Temporisateur d'événement
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

Le Tableau 31 spécifie la description de l'objet et le Tableau 32 spécifie la description d'entrée des paramètres de mise en correspondance du PDO.

Tableau 31 – Description de l'objet des paramètres de mise en correspondance

Attribut	Valeur
Index	1605 _h
Nom	Mise en correspondance du PDO6 de réception
Code de l'objet	Enregistrement
Type de données	Mise en correspondance du PDO
Catégorie	Conditionnelle, si 1405 _h est mise en œuvre

Tableau 32 – Description d'entrée des paramètres de mise en correspondance

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	02 _h
Sous-index	01 _h
Description	1 ^{er} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6040 0010 _h
Sous-index	02 _h
Description	2 ^{ème} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6042 0010 _h
Sous-index	03 _h
Description	3 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
à	
Sous-index	40 _h
Description	64 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

5.6.2.8 RPDO 7

Le Tableau 33 spécifie la description de l'objet et le Tableau 34 spécifie la description d'entrée des paramètres de communication du PDO.

Tableau 33 – Description de l'objet des paramètres de communication

Attribut	Valeur
Index	1406 _h
Nom	Paramètre de réception de PDO7
Code de l'objet	Enregistrement
Type de données	CommPar PDO
Catégorie	Facultative

Tableau 34 – Description d'entrée des paramètres de communication

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	ID du COB utilisé par le PDO
Catégorie d'entrée	Obligatoire
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	8000 0000 _h
Sous-index	02 _h
Description	Type de transmission
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si un changement de type de PDO est pris en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	255 _d
Sous-index	05 _h
Description	Temporisateur d'événement
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

Le Tableau 35 spécifie la description de l'objet et le Tableau 36 spécifie la description d'entrée des paramètres de mise en correspondance du PDO.

Tableau 35 – Description de l'objet des paramètres de mise en correspondance

Attribut	Valeur
Index	1606 _h
Nom	Mise en correspondance du PDO7 de réception
Code de l'objet	Enregistrement
Type de données	Mise en correspondance du PDO
Catégorie	Conditionnelle, si 1406 _h est mise en œuvre

Tableau 36 – Description d'entrée des paramètres de mise en correspondance

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	02 _h
Sous-index	01 _h
Description	1 ^{er} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6040 0010 _h
Sous-index	02 _h
Description	2 ^{ème} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	60FE 0120 _h
Sous-index	03 _h
Description	3 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
à	
Sous-index	40 _h
Description	64 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

5.6.2.9 RPDO 8

Le Tableau 37 spécifie la description de l'objet et le Tableau 38 spécifie la description d'entrée des paramètres de communication du PDO.

Tableau 37 – Description de l'objet des paramètres de communication

Attribut	Valeur
Index	1407 _h
Nom	Paramètre de réception de PDO8
Code de l'objet	Enregistrement
Type de données	CommPar PDO
Catégorie	Facultative

Tableau 38 – Description d'entrée des paramètres de communication

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	ID du COB utilisé par le PDO
Catégorie d'entrée	Obligatoire
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	8000 0000 _h
Sous-index	02 _h
Description	Type de transmission
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si un changement de type de PDO est pris en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	255 _d
Sous-index	05 _h
Description	Temporisateur d'événement
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

Le Tableau 39 spécifie la description de l'objet et le Tableau 40 spécifie la description d'entrée des paramètres de mise en correspondance du PDO.

Tableau 39 – Description de l'objet des paramètres de mise en correspondance

Attribut	Valeur
Index	1607 _h
Nom	Mise en correspondance du PDO8 de réception
Code de l'objet	Enregistrement
Type de données	Mise en correspondance du PDO
Catégorie	Conditionnelle, si 1407 _h est mise en œuvre

Tableau 40 – Description d'entrée des paramètres de mise en correspondance

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	02 _h
Sous-index	01 _h
Description	1 ^{er} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6040 0010 _h
Sous-index	02 _h
Description	2 ^{ème} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6060 0008 _h
Sous-index	03 _h
Description	3 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
à	
Sous-index	40 _h
Description	64 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

5.6.2.10 TPDO 1

Le Tableau 41 spécifie la description de l'objet et le Tableau 42 spécifie la description d'entrée des paramètres de communication du PDO.

Tableau 41 – Description de l'objet des paramètres de communication

Attribut	Valeur
Index	1800 _h
Nom	Paramètre de transmission de PDO1
Code de l'objet	Enregistrement
Type de données	CommPar PDO
Catégorie	Obligatoire

Tableau 42 – Description d'entrée des paramètres de communication

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	ID du COB utilisé par le PDO
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si l'ID du COB est modifiable)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	4000 0180 _h + ID du nœud
Sous-index	02 _h
Description	Type de transmission
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si un changement de type de PDO est pris en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	255 _d
Sous-index	03 _h
Description	Temps de blocage
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	05 _h
Description	Temporisateur d'événement
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

Le Tableau 43 spécifie la description de l'objet et le Tableau 44 spécifie la description d'entrée des paramètres de mise en correspondance du PDO.

Tableau 43 – Description de l'objet des paramètres de mise en correspondance

Attribut	Valeur
Index	1A00 _h
Nom	Mise en correspondance du PDO1 de transmission
Code de l'objet	Enregistrement
Type de données	Mise en correspondance du PDO
Catégorie	Obligatoire

Tableau 44 – Description d'entrée des paramètres de mise en correspondance

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	01 _h
Sous-index	01 _h
Description	1 ^{er} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6041 0010 _h
Sous-index	02 _h
Description	2 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
à	
Sous-index	40 _h
Description	64 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

5.6.2.11 TPDO 2

Le Tableau 45 spécifie la description de l'objet et le Tableau 46 spécifie la description d'entrée des paramètres de communication du PDO.

Tableau 45 – Description de l'objet des paramètres de communication

Attribut	Valeur
Index	1801 _h
Nom	Paramètre de transmission de PDO2
Code de l'objet	Enregistrement
Type de données	CommPar PDO
Catégorie	Facultative

Tableau 46 – Description d'entrée des paramètres de communication

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	ID du COB utilisé par le PDO
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si l'ID de COB est modifiable)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	(4000 0280 _h ou C000 0280 _h) + ID du nœud
Sous-index	02 _h
Description	Type de transmission
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si un changement de type de PDO est pris en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	255 _d
Sous-index	03 _h
Description	Temps de blocage
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	05 _h
Description	Temporisateur d'événement
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

Le Tableau 47 spécifie la description de l'objet et le Tableau 48 spécifie la description d'entrée des paramètres de mise en correspondance du PDO.

Tableau 47 – Description de l'objet des paramètres de mise en correspondance

Attribut	Valeur
Index	1A01 _h
Nom	Mise en correspondance du PDO2 de transmission
Code de l'objet	Enregistrement
Type de données	Mise en correspondance du PDO
Catégorie	Conditionnelle, si 1801 _h est mise en œuvre

Tableau 48 – Description d'entrée des paramètres de mise en correspondance

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	02 _h
Sous-index	01 _h
Description	1 ^{er} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6041 0010 _h
Sous-index	02 _h
Description	2 ^{ème} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6061 0008 _h
Sous-index	03 _h
Description	3 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
à	
Sous-index	40 _h
Description	64 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

5.6.2.12 TPDO 3

Le Tableau 49 spécifie la description de l'objet et le Tableau 50 spécifie la description d'entrée des paramètres de communication du PDO.

Tableau 49 – Description de l'objet des paramètres de communication

Attribut	Valeur
Index	1802 _h
Nom	Paramètre de transmission de PDO3
Code de l'objet	Enregistrement
Type de données	CommPar PDO
Catégorie	Facultative

Tableau 50 – Description d'entrée des paramètres de communication

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	ID du COB utilisé par le PDO
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si l'ID du COB est modifiable)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	(4000 0380 _h ou C000 0380 _h) + ID du nœud
Sous-index	02 _h
Description	Type de transmission
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si un changement de type de PDO est pris en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	1 _d
Sous-index	03 _h
Description	Temps de blocage
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	05 _h
Description	Temporisateur d'événement
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

Le Tableau 51 spécifie la description de l'objet et le Tableau 52 spécifie la description d'entrée des paramètres de mise en correspondance du PDO.

Tableau 51 – Description de l'objet des paramètres de mise en correspondance

Attribut	Valeur
Index	1A02 _h
Nom	Mise en correspondance du PDO3 de transmission
Code de l'objet	Enregistrement
Type de données	Mise en correspondance du PDO
Catégorie	Conditionnelle, si 1802 _h est mise en œuvre

Tableau 52 – Description d'entrée des paramètres de mise en correspondance

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	02 _h
Sous-index	01 _h
Description	1 ^{er} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6041 0010 _h
Sous-index	02 _h
Description	2 ^{ème} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6064 0020 _h
Sous-index	03 _h
Description	3 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
à	
Sous-index	40 _h
Description	64 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

5.6.2.13 TPDO 4

Le Tableau 53 spécifie la description de l'objet et le Tableau 54 spécifie la description d'entrée des paramètres de communication du PDO.

Tableau 53 – Description de l'objet des paramètres de communication

Attribut	Valeur
Index	1803 _h
Nom	Paramètre de transmission de PDO4
Code de l'objet	Enregistrement
Type de données	CommPar PDO
Catégorie	Facultative

Tableau 54 – Description d'entrée des paramètres de communication

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	ID du COB utilisé par le PDO
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si l'ID du COB est modifiable)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	(4000 0480 _h ou C000 0480 _h) + ID du nœud
Sous-index	02 _h
Description	Type de transmission
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si un changement de type de PDO est pris en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	1 _d
Sous-index	03 _h
Description	Temps de blocage
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	05 _h
Description	Temporisateur d'événement
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

Le Tableau 55 spécifie la description de l'objet et le Tableau 56 spécifie la description d'entrée des paramètres de mise en correspondance du PDO.

Tableau 55 – Description de l'objet des paramètres de mise en correspondance

Attribut	Valeur
Index	1A03 _h
Nom	Mise en correspondance du PDO4 de transmission
Code de l'objet	Enregistrement
Type de données	Mise en correspondance du PDO
Catégorie	Conditionnelle, si 1803 _h est mise en œuvre

Tableau 56 – Description d'entrée des paramètres de mise en correspondance

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	02 _h
Sous-index	01 _h
Description	1 ^{er} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6041 0010 _h
Sous-index	02 _h
Description	2 ^{ème} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	606C 0020 _h
Sous-index	03 _h
Description	3 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
à	
Sous-index	40 _h
Description	64 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

5.6.2.14 TPDO 5

Le Tableau 57 spécifie la description de l'objet et le Tableau 58 spécifie la description d'entrée des paramètres de communication du PDO.

Tableau 57 – Description de l'objet des paramètres de communication

Attribut	Valeur
Index	1804 _h
Nom	Paramètre de transmission de PDO5
Code de l'objet	Enregistrement
Type de données	CommPar PDO
Catégorie	Facultative

Tableau 58 – Description d'entrée des paramètres de communication

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	ID du COB utilisé par le PDO
Catégorie d'entrée	Obligatoire
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	C000 0000 _h
Sous-index	02 _h
Description	Type de transmission
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si un changement de type de PDO est pris en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	1 _d
Sous-index	03 _h
Description	Temps de blocage
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	05 _h
Description	Temporisateur d'événement
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

Le Tableau 59 spécifie la description de l'objet et le Tableau 60 spécifie la description d'entrée des paramètres de mise en correspondance du PDO.

Tableau 59 – Description de l'objet des paramètres de mise en correspondance

Attribut	Valeur
Index	1A04 _h
Nom	Mise en correspondance du PDO5 de transmission
Code de l'objet	Enregistrement
Type de données	Mise en correspondance du PDO
Catégorie	Conditionnelle, si 1804 _h est mise en œuvre

Tableau 60 – Description d'entrée des paramètres de mise en correspondance

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	02 _h
Sous-index	01 _h
Description	1 ^{er} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6041 0010 _h
Sous-index	02 _h
Description	2 ^{ème} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6077 0010 _h
Sous-index	03 _h
Description	3 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
à	
Sous-index	40 _h
Description	64 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

5.6.2.15 TPDO 6

Le Tableau 61 spécifie la description de l'objet et le Tableau 62 spécifie la description d'entrée des paramètres de communication du PDO.

Tableau 61 – Description de l'objet des paramètres de communication

Attribut	Valeur
Index	1805 _h
Nom	Paramètre de transmission de PDO6
Code de l'objet	Enregistrement
Type de données	CommPar PDO
Catégorie	Facultative

Tableau 62 – Description d'entrée des paramètres de communication

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	ID du COB utilisé par le PDO
Catégorie d'entrée	Obligatoire
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	C000 0000 _h
Sous-index	02 _h
Description	Type de transmission
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si un changement de type de PDO est pris en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	1 _d
Sous-index	03 _h
Description	Temps de blocage
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	05 _h
Description	Temporisateur d'événement
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

Le Tableau 63 spécifie la description de l'objet et le Tableau 64 spécifie la description d'entrée des paramètres de mise en correspondance du PDO.

Tableau 63 – Description de l'objet des paramètres de mise en correspondance

Attribut	Valeur
Index	1A05 _h
Nom	Mise en correspondance du PDO6 de transmission
Code de l'objet	Enregistrement
Type de données	Mise en correspondance du PDO
Catégorie	Conditionnelle, si 1805 _h est mise en œuvre

Tableau 64 – Description d'entrée des paramètres de mise en correspondance

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	02 _h
Sous-index	01 _h
Description	1 ^{er} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6041 0010 _h
Sous-index	02 _h
Description	2 ^{ème} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6044 0010 _h
Sous-index	03 _h
Description	3 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
à	
Sous-index	40 _h
Description	64 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

5.6.2.16 TPDO 7

Le Tableau 65 spécifie la description de l'objet et le Tableau 66 spécifie la description d'entrée des paramètres de communication du PDO.

Tableau 65 – Description de l'objet des paramètres de communication

Attribut	Valeur
Index	1806 _h
Nom	Paramètre de transmission de PDO7
Code de l'objet	Enregistrement
Type de données	CommPar PDO
Catégorie	Facultative

Tableau 66 – Description d'entrée des paramètres de communication

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	ID du COB utilisé par le PDO
Catégorie d'entrée	Obligatoire
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	C000 0000 _h
Sous-index	02 _h
Description	Type de transmission
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si un changement de type de PDO est pris en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	255 _d
Sous-index	03 _h
Description	Temps de blocage
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	05 _h
Description	Temporisateur d'événement
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

Le Tableau 67 spécifie la description de l'objet et le Tableau 68 spécifie la description d'entrée des paramètres de mise en correspondance du PDO.

Tableau 67 – Description de l'objet des paramètres de mise en correspondance

Attribut	Valeur
Index	1A06 _h
Nom	Mise en correspondance du PDO7 de transmission
Code de l'objet	Enregistrement
Type de données	Mise en correspondance du PDO
Catégorie	Conditionnelle, si 1806 _h est mise en œuvre

Tableau 68 – Description d'entrée des paramètres de mise en correspondance

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	02 _h
Sous-index	01 _h
Description	1 ^{er} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6041 0010 _h
Sous-index	02 _h
Description	2 ^{ème} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	60FD 0020 _h
Sous-index	03 _h
Description	3 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
à	
Sous-index	40 _h
Description	64 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

5.6.3 Ensemble de PDO pour le convertisseur de fréquence

5.6.3.1 Vue d'ensemble et introduction

L'ensemble de PDO pour le convertisseur de fréquence prédéfinit trois RPDO (voir Tableau 69) et trois TPDO (voir Tableau 70). Les TPDO avec type de transmission de 255 ne doivent être déclenchés que lorsque le mot d'état mis en correspondance change, les autres objets mis en correspondance ne doivent pas entraîner une transmission de PDO. Les RPDO avec type de transmission de 255 doivent immédiatement actualiser tous les objets mis en correspondance.

Tableau 69 – Vue d'ensemble du RPDO

PDO	Prise en charge	Description
1	Obligatoire	Contrôle la FSA PDS et la vitesse cible vl
2	Facultative	Spécifique au constructeur
3	Facultative	Spécifique au constructeur
4 à 16	Réservée	
17 à 64	Facultative	Spécifique au constructeur

Tableau 70 – Vue d'ensemble du TPDO

PDO	Prise en charge	Description
1	Obligatoire	Spécifie l'état de la FSA PDS et la valeur instantanée de la vitesse vl
2	Facultative	Spécifique au constructeur
3	Facultative	Spécifique au constructeur
4 à 16	Réservée	
17 à 64	Facultative	Spécifique au constructeur

5.6.3.2 RPDO 1

Le Tableau 71 spécifie la description de l'objet et le Tableau 72 spécifie la description d'entrée des paramètres de communication du PDO.

Tableau 71 – Description de l'objet des paramètres de communication

Attribut	Valeur
Index	1400 _h
Nom	Paramètre de réception de PDO1
Code de l'objet	Enregistrement
Type de données	CommPar PDO
Catégorie	Obligatoire

Tableau 72 – Description d'entrée des paramètres de communication

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	ID du COB utilisé par le PDO
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si l'ID du COB est modifiable)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	0000 0200 _h + ID du nœud
Sous-index	02 _h
Description	Type de transmission
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si un changement de type de PDO est pris en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	255 _d
Sous-index	05 _h
Description	Temporisateur d'événement
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

Le Tableau 73 spécifie la description de l'objet et le Tableau 74 spécifie la description d'entrée des paramètres de mise en correspondance du PDO.

Tableau 73 – Description de l'objet des paramètres de mise en correspondance

Attribut	Valeur
Index	1600 _h
Nom	Mise en correspondance du PDO1 de réception
Code de l'objet	Enregistrement
Type de données	Mise en correspondance du PDO
Catégorie	Obligatoire

Tableau 74 – Description d'entrée des paramètres de mise en correspondance

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	02 _h
Sous-index	01 _h
Description	1 ^{er} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6040 0010 _h
Sous-index	02 _h
Description	2 ^{ème} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6042 0010 _h
Sous-index	03 _h
Description	3 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
à	
Sous-index	40 _h
Description	64 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

5.6.3.3 RPDO 2

Le Tableau 75 spécifie la description de l'objet et le Tableau 76 spécifie la description d'entrée des paramètres de communication du PDO.

Tableau 75 – Description de l'objet des paramètres de communication

Attribut	Valeur
Index	1401 _h
Nom	Paramètre de réception de PDO2
Code de l'objet	Enregistrement
Type de données	CommPar PDO
Catégorie	Facultative

Tableau 76 – Description d'entrée des paramètres de communication

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	ID du COB utilisé par le PDO
Catégorie d'entrée	Obligatoire
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	0000 0300 _h + ID du nœud
Sous-index	02 _h
Description	Type de transmission
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si un changement de type de PDO est pris en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	255 _d
Sous-index	05 _h
Description	Temporisateur d'événement
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

Le Tableau 77 spécifie la description de l'objet et le Tableau 78 spécifie la description d'entrée des paramètres de mise en correspondance du PDO.

Tableau 77 – Description de l'objet des paramètres de mise en correspondance

Attribut	Valeur
Index	1601 _h
Nom	Mise en correspondance du PDO2 de réception
Code de l'objet	Enregistrement
Type de données	Mise en correspondance du PDO
Catégorie	Conditionnelle, si 1401 _h est mise en œuvre

Tableau 78 – Description d'entrée des paramètres de mise en correspondance

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	1 ^{er} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	02 _h
Description	2 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
à	
Sous-index	40 _h
Description	64 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

5.6.3.4 RPDO 3

Le Tableau 79 spécifie la description de l'objet et le Tableau 80 spécifie la description d'entrée des paramètres de communication du PDO.

Tableau 79 – Description de l'objet des paramètres de communication

Attribut	Value
Index	1402 _h
Nom	Paramètre de réception de PDO3
Code de l'objet	Enregistrement
Type de données	CommPar PDO
Catégorie	Facultative

Tableau 80 – Description d'entrée des paramètres de communication

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	ID du COB utilisé par le PDO
Catégorie d'entrée	Obligatoire
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	0000 0400 _h + ID du nœud
Sous-index	02 _h
Description	Type de transmission
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si un changement de type de PDO est pris en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	255 _d
Sous-index	05 _h
Description	Temporisateur d'événement
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

Le Tableau 81 spécifie la description de l'objet et le Tableau 82 spécifie la description d'entrée des paramètres de mise en correspondance du PDO.

Tableau 81 – Description de l'objet des paramètres de mise en correspondance

Attribut	Valeur
Index	1602 _h
Nom	Mise en correspondance du PDO3 de réception
Code de l'objet	Enregistrement
Type de données	Mise en correspondance du PDO
Catégorie	Conditionnelle, si 1402 _h est mise en œuvre

Tableau 82 – Description d'entrée des paramètres de mise en correspondance

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	1 ^{er} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	02 _h
Description	2 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
à	
Sous-index	40 _h
Description	64 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

5.6.3.5 TPDO 1

Le Tableau 83 spécifie la description de l'objet et le Tableau 84 spécifie la description d'entrée des paramètres de communication du PDO.

Tableau 83 – Description de l'objet des paramètres de communication

Attribut	Value
Index	1800 _h
Nom	Paramètre de transmission de PDO1
Code de l'objet	Enregistrement
Type de données	CommPar PDO
Catégorie	Obligatoire

Tableau 84 – Description d'entrée des paramètres de communication

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	ID du COB utilisé par le PDO
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une liaison PDO est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	4000 0180 _h + ID du nœud
Sous-index	02 _h
Description	Type de transmission
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si un changement de type de PDO est pris en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	255 _d
Sous-index	03 _h
Description	Temps de blocage
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	05 _h
Description	Temporisateur d'événement
Catégorie d'entrée	Obligatoire
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

Le Tableau 85 spécifie la description de l'objet et le Tableau 86 spécifie la description d'entrée des paramètres de mise en correspondance du PDO.

Tableau 85 – Description de l'objet des paramètres de mise en correspondance

Attribut	Valeur
Index	1A00 _h
Nom	Mise en correspondance du PDO1 de transmission
Code de l'objet	Enregistrement
Type de données	Mise en correspondance du PDO
Catégorie	Obligatoire

Tableau 86 – Description d'entrée des paramètres de mise en correspondance

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	02 _h
Sous-index	01 _h
Description	1 ^{er} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6041 0010 _h
Sous-index	02 _h
Description	2 ^{ème} objet d'application
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	6044 0010 _h
Sous-index	03 _h
Description	3 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
à	
Sous-index	40 _h
Description	64 ^{ème} objet d'application
Catégorie d'entrée	Facultative
Accès	c ou rw (si une mise en correspondance variable est prise en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

5.6.3.6 TPDO 2

Le Tableau 87 spécifie la description de l'objet et le Tableau 88 spécifie la description d'entrée des paramètres de communication du PDO.

Tableau 87 – Description de l'objet des paramètres de communication

Attribut	Valeur
Index	1801 _h
Nom	Paramètre de transmission de PDO2
Code de l'objet	Enregistrement
Type de données	CommPar PDO
Catégorie	Facultative

Tableau 88 – Description d'entrée des paramètres de communication

Attribut	Valeur
Sous-index	00 _h
Description	Plus grand sous-index pris en charge
Catégorie d'entrée	Obligatoire
Accès	c
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	01 _h
Description	ID du COB utilisé par le PDO
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si l'ID du COB est modifiable)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	4000 0280 _h + ID du nœud
Sous-index	02 _h
Description	Type de transmission
Catégorie d'entrée	Obligatoire
Accès	c ou rw (si un changement de type de PDO est pris en charge)
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	255 _d
Sous-index	03 _h
Description	Temps de blocage
Catégorie d'entrée	Facultative
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur
Sous-index	05 _h
Description	Temporisateur d'événement
Catégorie d'entrée	Obligatoire
Accès	rw
Mise en correspondance du PDO	Aucune
Plage de valeurs	Voir l'EN 50325-4
Valeur par défaut	Spécifique au constructeur

Le Tableau 89 spécifie la description de l'objet et le Tableau 90 spécifie la description d'entrée des paramètres de mise en correspondance du PDO.