

<b>EUROMAP 27-6</b>	<b>Pipe and Profile Extrusion Lines</b> <b>Generic CANopen Interface</b> Part 6: Calibration-table
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see also [www.can-cia.org/index.php?id=specifications](http://www.can-cia.org/index.php?id=specifications).

## History

Date	Changes
2007-04-12	<i>Publication of version 1.0</i>
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# 1 Scope

The CANopen application profile for extruder downstream devices include several parts:

- Part 1 specifies general definitions
- Part 2 specifies the device profile for the puller downstream device
- Part 3 specifies the device profile for the corrugator downstream device
- Part 4 specifies the device profile for the saw downstream device
- Part 5 specifies the device profile for the co-extruder device
- Part 6 specifies the device profile for the calibration-table downstream device

NOTE All parts of this specification have been developed jointly with the European Committee of Machinery Manufacturers for the Plastics and Rubber Industries (Euromap) and is documented there as Euromap 27.

This part specifies the CANopen interface for calibration-tables.

## 2 References

/CiA420-1/ CiA 420, CANopen profile for extruder downstream devices - Part 1: General definitions

The references given in /CiA420-1/ apply to this specification as well.

## 3 Abbreviations and definitions

### 3.1 Abbreviations

The abbreviations given in /CiA420-1/ apply to this specification as well.

### 3.2 Definitions

The definitions given in /CiA420-1/ apply to this specification as well.

## 4 Operating principle

### 4.1 General

The calibration-table downstream device interface shall support all mandatory functions of /CiA301/ and /CiA420-1/ as well as all mandatory functions defined in this specification.

## 5 PDO specification

### 5.1 Overview

Table 1 illustrates the process data mapped into TPDOs and RPDOs.

**Table 1 – TPDO and RPDO mapping**

PDO number	Index/sub-index	Name/description
TPDO 1	6030 01 <sub>h</sub>	Status word 1
	6030 02 <sub>h</sub>	Status word 2
	6030 03 <sub>h</sub>	Status word 3
	6030 04 <sub>h</sub>	Status word 4
TPDO 2	6007 01 <sub>h</sub>	Actual flow rate 1
	6007 02 <sub>h</sub>	Actual flow rate 2
	600F 00 <sub>h</sub>	Actual water pressure
	600A 00 <sub>h</sub>	Actual force

PDO number	Index/sub-index	Name/description
TPDO 3	600D 01 <sub>h</sub>	Actual vacuum 1
	600D 02 <sub>h</sub>	Actual vacuum 2
RPDO 1	6020 01 <sub>h</sub>	Control word 1
	6020 02 <sub>h</sub>	Control word 2
	6020 03 <sub>h</sub>	Control word 3
	6020 04 <sub>h</sub>	Control word 4

## 5.2 First TPDO

This TPDO shall be transmitted to the extruder controller.

Table 2 specifies the object description of the PDO communication parameter and Table 3 specifies the associated entry description. The values are defined in /CiA301/.

**Table 2 — Object description**

Attribute	Value
Index	1800 <sub>h</sub>
Name	TPDO 1 communication parameter
Object code	RECORD
Data type	PDO communication parameter record
Category	Mandatory

**Table 3 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Description	Highest sub-index supported
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	02 <sub>h</sub> to 06 <sub>h</sub>
Default value	Manufacturer-specific

Attribute	Value
Sub-index	01 <sub>h</sub>
Description	COB-ID
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	See /CiA301/
Default value	4000 0180 <sub>h</sub> + node-ID
Sub-index	02 <sub>h</sub>
Description	Transmission type
Entry category	Mandatory
Access	rw
PDO mapping	Optional
Value range	See /CiA301/
Default value	01 <sub>h</sub>
Sub-index	03 <sub>h</sub>
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See /CiA301/
Default value	0000 <sub>h</sub>
Sub-index	05 <sub>h</sub>
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See /CiA301/
Default value	0000 <sub>h</sub>
Sub-index	06 <sub>h</sub>
Description	Sync start value
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See /CiA301/
Default value	0000 <sub>h</sub>

Table 4 specifies the object description of the PDO mapping parameter and Table 5 specifies the associated entry description. The values are defined in /CiA301/.

**Table 4 — Object description**

Attribute	Value
Index	1A00 <sub>h</sub>
Name	TPDO 1 mapping parameter
Object code	RECORD
Data type	PDO mapping parameter record
Category	Mandatory

**Table 5 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Description	Highest sub-index supported
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	04 <sub>h</sub>
Default value	04 <sub>h</sub>
Sub-index	01 <sub>h</sub>
Description	1 <sup>st</sup> application object
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	See /CiA301/
Default value	6030 01 10 <sub>h</sub>
Sub-index	02 <sub>h</sub>
Description	2 <sup>nd</sup> application object
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	See /CiA301/
Default value	6030 02 10 <sub>h</sub>
Sub-index	03 <sub>h</sub>
Description	3 <sup>rd</sup> application object
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	See /CiA301/
Default value	6030 03 10 <sub>h</sub>

Attribute	Value
Sub-index	04 <sub>h</sub>
Description	4 <sup>th</sup> application object
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	See /CiA301/
Default value	6030 04 10 <sub>h</sub>

### 5.3 Second TPDO

This TPDO shall be transmitted to the extruder controller.

Table 6 specifies the object description of the PDO communication parameter and Table 7 specifies the associated entry description. The values are defined in /CiA301/.

**Table 6 — Object description**

Attribute	Value
Index	1801 <sub>h</sub>
Name	TPDO 2 communication parameter
Object code	RECORD
Data type	PDO communication parameter record
Category	Mandatory

**Table 7 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Description	Highest sub-index supported
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	02 <sub>h</sub> to 06 <sub>h</sub>
Default value	Manufacturer-specific
Sub-index	01 <sub>h</sub>
Description	COB-ID
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	4000 0280 <sub>h</sub> + node-ID
Default value	4000 0280 <sub>h</sub> + node-ID



Attribute	Value
Sub-index	02 <sub>h</sub>
Description	Transmission type
Entry category	Mandatory
Access	rw
PDO mapping	Optional
Value range	See /CiA301/
Default value	01 <sub>h</sub>
Sub-index	03 <sub>h</sub>
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See /CiA301/
Default value	0000 <sub>h</sub>
Sub-index	05 <sub>h</sub>
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See /CiA301/
Default value	0000 <sub>h</sub>
Sub-index	06 <sub>h</sub>
Description	Sync start value
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See /CiA301/
Default value	0000 <sub>h</sub>

Table 8 specifies the object description of the PDO mapping parameter and Table 9 specifies the associated entry description. The values are defined in /CiA301/.

**Table 8 — Object description**

Attribute	Value
Index	1A01 <sub>h</sub>
Name	TPDO 2 mapping parameter
Object code	RECORD
Data type	PDO mapping parameter record
Category	Mandatory

Table 9 — Entry description

Attribute	Value
Sub-index	00 <sub>h</sub>
Description	Highest sub-index supported
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	04 <sub>h</sub>
Default value	04 <sub>h</sub>
Sub-index	01 <sub>h</sub>
Description	1 <sup>st</sup> application object
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	See /CiA301/
Default value	6007 01 10 <sub>h</sub>
Sub-index	02 <sub>h</sub>
Description	2 <sup>nd</sup> application object
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	See /CiA301/
Default value	6007 02 10 <sub>h</sub>
Sub-index	03 <sub>h</sub>
Description	3 <sup>rd</sup> application object
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	See /CiA301/
Default value	600F 01 10 <sub>h</sub>
Sub-index	04 <sub>h</sub>
Description	4 <sup>th</sup> application object
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	See /CiA301/
Default value	600A 00 10 <sub>h</sub>

## 5.4 Third TPDO

This TPDO shall be transmitted to the extruder controller only if one of the measured values is available (see object 6010<sub>h</sub>). In that case all mapped objects are mandatory.

Table 10 specifies the object description of the PDO communication parameter and Table 11 specifies the associated entry description. The values are defined in /CiA301/.

**Table 10 — Object description**

Attribute	Value
Index	1802 <sub>h</sub>
Name	TPDO 3 communication parameter
Object code	RECORD
Data type	PDO communication parameter record
Category	Mandatory

**Table 11 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Description	Highest sub-index supported
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	02 <sub>h</sub> to 05 <sub>h</sub>
Default value	Manufacturer-specific
Sub-index	01 <sub>h</sub>
Description	COB-ID
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	4000 0380 <sub>h</sub> + node-ID
Default value	4000 0380 <sub>h</sub> + node-ID
Sub-index	02 <sub>h</sub>
Description	Transmission type
Entry category	Mandatory
Access	rw
PDO mapping	Optional
Value range	See /CiA301/
Default value	01 <sub>h</sub>

Attribute	Value
Sub-index	03 <sub>h</sub>
Description	Inhibit time
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See /CiA301/
Default value	0000 <sub>h</sub>
Sub-index	05 <sub>h</sub>
Description	Event timer
Entry category	Optional
Access	rw
PDO mapping	No
Value range	See /CiA301/
Default value	0000 <sub>h</sub>

Table 12 specifies the object description of the PDO mapping parameter and Table 13 specifies the associated entry description. The values are defined in /CiA301/.

**Table 12 — Object description**

Attribute	Value
Index	1A02 <sub>h</sub>
Name	TPDO 3 mapping parameter
Object code	RECORD
Data type	PDO mapping parameter record
Category	Mandatory

**Table 13 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Description	Highest sub-index supported
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	02 <sub>h</sub>
Default value	02 <sub>h</sub>
Sub-index	01 <sub>h</sub>
Description	1 <sup>st</sup> application object
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	See /CiA301/
Default value	600D 01 10 <sub>h</sub>

Attribute	Value
Sub-index	02 <sub>h</sub>
Description	2 <sup>nd</sup> application object
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	See /CiA301/
Default value	600D 02 10 <sub>h</sub>

## 5.5 First RPDO

This RPDO shall be received from the extruder controller.

Table 14 specifies the object description of the PDO communication parameter and Table 15 specifies the associated entry description. The values are defined in /CiA301/.

**Table 14 — Object description**

Attribute	Value
Index	1400 <sub>h</sub>
Name	RPDO 1 communication parameter
Object code	RECORD
Data type	PDO communication parameter record
Category	Mandatory

**Table 15 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Description	Highest sub-index supported
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	02 <sub>h</sub>
Default value	02 <sub>h</sub>
Sub-index	01 <sub>h</sub>
Description	COB-ID
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	4000 0200 <sub>h</sub> + node-ID
Default value	4000 0200 <sub>h</sub> + node-ID

Attribute	Value
Sub-index	02 <sub>h</sub>
Description	Transmission type
Entry category	Optional
Access	rw
PDO mapping	Optional
Value range	See /CiA301/
Default value	01 <sub>h</sub>

Table 16 specifies the object description of the PDO mapping parameter and Table 17 specifies the associated entry description. The values are defined in /CiA301/.

**Table 16 — Object description**

Attribute	Value
Index	1600 <sub>h</sub>
Name	RPDO 1 mapping parameter
Object code	RECORD
Data type	PDO mapping parameter record
Category	Mandatory

**Table 17 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Description	Highest sub-index supported
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	No
Default value	04 <sub>h</sub>
Sub-index	01 <sub>h</sub>
Description	1 <sup>st</sup> application object
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	See /CiA301/
Default value	6020 01 10 <sub>h</sub>

Attribute	Value
Sub-index	02 <sub>h</sub>
Description	2 <sup>nd</sup> application object
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	See /CiA301/
Default value	6020 02 10 <sub>h</sub>
Sub-index	03 <sub>h</sub>
Description	3 <sup>rd</sup> application object
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	See /CiA301/
Default value	6020 03 10 <sub>h</sub>
Sub-index	04 <sub>h</sub>
Description	4 <sup>th</sup> application object
Entry category	Optional
Access	const
PDO mapping	No
Value range	See /CiA301/
Default value	6020 04 10 <sub>h</sub>

## 6 Application object specification

### 6.1 Object 6007<sub>h</sub>: Actual flow rates

This object shall provide an array with actual flow rates. The value shall be given in 0,1 l/min.

Table 18 specifies the object description and Table 19 specifies the entry description.

**Table 18 – Object description**

Attribute	Value
Index	6007 <sub>h</sub>
Name	Actual flow rates
Object code	ARRAY
Data type	UNSIGNED16
Category	Mandatory

**Table 19 – Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Description	Highest sub-index supported
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	02 <sub>h</sub> to 0A <sub>h</sub>
Default value	No
Sub-index	01 <sub>h</sub>
Description	Actual flow rate 1
Entry category	Mandatory
Access	ro
PDO mapping	Default
Value range	UNSIGNED16
Default value	No
Sub-index	02 <sub>h</sub>
Description	Actual flow rate 2
Entry category	Mandatory
Access	ro
PDO mapping	Default
Value range	UNSIGNED16
Default value	No
Sub-index	03 <sub>h</sub>
Description	Actual flow rate 3
Entry category	Optional
Access	ro
PDO mapping	Optional
Value range	UNSIGNED16
Default value	No
to	
Sub-index	0A <sub>h</sub>
Description	Actual flow rate 10
Entry category	Optional
Access	ro
PDO mapping	Optional
Value range	UNSIGNED16
Default value	No



## 6.2 Object 6008<sub>h</sub>: Flow rate set value

This object shall indicate the flow rate set value send by the master-extruder. The values in sub-index 02<sub>h</sub> to sub-index 0B<sub>h</sub> shall be given in 0,1 l/min. Positive values shall indicate the regular flow, negative values shall not be used.

Table 20 specifies the object description and Table 21 specifies the entry description.

**Table 20 – Object description**

Attribute	Value
Index	6008 <sub>h</sub>
Name	Flow rate set value
Object code	RECORD
Data type	Set process data
Category	Optional

**Table 21 – Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Description	Highest sub-index supported
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	02 <sub>h</sub> to 0A <sub>h</sub>
Default value	Manufacturer-specific
Sub-index	01 <sub>h</sub>
Description	Controller on/off
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See /CiA420-1/
Default value	Manufacturer-specific
Sub-index	02 <sub>h</sub>
Description	Set process data 1
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	INTEGER16
Default value	Manufacturer-specific

Attribute	Value
Sub-index	03 <sub>h</sub>
Description	Set process data 2
Entry category	Optional
Access	rw
PDO mapping	No
Value range	INTEGER16
Default value	Manufacturer-specific
to	
Sub-index	0B <sub>h</sub>
Description	Set process data 10
Entry category	Optional
Access	rw
PDO mapping	No
Value range	INTEGER16
Default value	Manufacturer-specific

### 6.3 Object 6009<sub>h</sub>: Height adjustment

This object shall indicate an array for height adjustment values configured by the extruder (e.g. the distance from the center-line to the bottom of the product). The values shall be given in 0,1 mm. Positive values shall be given if the distance is above the centerline, and negative values shall be given if the distance is below the centerline.

Table 22 specifies the object description and Table 23 specifies the entry description.

**Table 22 – Object description**

Attribute	Value
Index	6009 <sub>h</sub>
Name	Height adjustment
Object code	ARRAY
Data type	INTEGER16
Category	Optional

**Table 23– Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Description	Highest sub-index supported
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	01 <sub>h</sub> to 0A <sub>h</sub>
Default value	Manufacturer-specific

Sub-index	01 <sub>h</sub>
Description	Height adjustment 1
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	INTEGER16
Default value	0000 <sub>h</sub>
to	
Sub-index	02 <sub>h</sub>
Description	Height adjustment 2
Entry category	Optional
Access	rw
PDO mapping	No
Value range	INTEGER16
Default value	0000 <sub>h</sub>
to	
Sub-index	0A <sub>h</sub>
Description	Height adjustment 10
Entry category	Optional
Access	rw
PDO mapping	No
Value range	INTEGER16
Default value	0000 <sub>h</sub>

#### 6.4 Object 600A<sub>h</sub>: Actual force

This object shall provide the actual force, given by extraction of product (e.g. pipe or profile). This force is measured between puller and calibration unit. The value shall be given in 0,01 kN. Positive values shall indicate a force from puller to calibration-table, negative values shall indicate the other direction.

Table 24 specifies the object description and Table 25 specifies the entry description.

**Table 24 – Object description**

Attribute	Value
Index	600A <sub>h</sub>
Name	Actual force
Object code	VAR
Data type	INTEGER16
Category	Mandatory

**Table 25 – Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Access	ro
PDO mapping	Default
Value range	INTEGER16
Default value	No

## 6.5 Object 600B<sub>h</sub>: Actual temperature

This object shall provide an array with actual temperatures. The value shall be given in 0,1 °C per bit. Negative values shall indicate negative temperatures.

Table 26 specifies the object description and Table 27 specifies the entry description.

**Table 26 – Object description**

Attribute	Value
Index	600B <sub>h</sub>
Name	Actual temperature
Object code	ARRAY
Data type	INTEGER16
Category	Optional

**Table 27 – Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Description	Highest sub-index supported
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	01 <sub>h</sub> to 0A <sub>h</sub>
Default value	Manufacturer-specific
Sub-index	01 <sub>h</sub>
Description	Actual temperature 1
Entry category	Mandatory
Access	ro
PDO mapping	Optional
Value range	INTEGER16
Default value	No
Sub-index	02 <sub>h</sub>
Description	Actual temperature 2
Entry category	Optional
Access	ro
PDO mapping	Optional
Value range	INTEGER16
Default value	No
to	

Attribute	Value
Sub-index	0A <sub>h</sub>
Description	Actual temperature 10
Entry category	Optional
Access	ro
PDO mapping	Optional
Value range	INTEGER16
Default value	No

### 6.6 Object 600C<sub>h</sub>: Temperature set value

This object shall indicate the temperature set value send by the master-extruder. The values in sub-index 02<sub>h</sub> to sub-index 0B<sub>h</sub> shall be given in 0,1 °C. Negative values means negative temperature.

Table 28 specifies the object description and Table 29 specifies the entry description.

**Table 28 – Object description**

Attribute	Value
Index	600C <sub>h</sub>
Name	Temperature set value
Object code	RECORD
Data type	Set process data
Category	Optional

**Table 29 – Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Description	Highest sub-index supported
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	02 <sub>h</sub> to 0A <sub>h</sub>
Default value	Manufacturer-specific
Sub-index	01 <sub>h</sub>
Description	Controller on/off
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See /CiA420-1/
Default value	Manufacturer-specific

Sub-index	02 <sub>h</sub>
Description	Set temperature 1
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	INTEGER16
Default value	Manufacturer-specific
to	
Sub-index	03 <sub>h</sub>
Description	Set temperature 2
Entry category	Optional
Access	rw
PDO mapping	No
Value range	INTEGER16
Default value	Manufacturer-specific
to	
Sub-index	0B <sub>h</sub>
Description	Set temperature 10
Entry category	Optional
Access	rw
PDO mapping	No
Value range	INTEGER16
Default value	Manufacturer-specific

**6.7 Object 600D<sub>h</sub>: Actual vacuum value**

This object shall provide an array with actual vacuum values from vacuum tank. The value shall be given in 1 mbar. Positive values shall indicate negative pressures; negative values shall indicate positive pressures.

Table 30 specifies the object description and Table 31 specifies the entry description.

**Table 30 – Object description**

Attribute	Value
Index	600D <sub>h</sub>
Name	Actual vacuum value
Object code	ARRAY
Data type	INTEGER16
Category	Optional

**Table 31 – Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Description	Highest sub-index supported
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	02 <sub>h</sub> to 0A <sub>h</sub>
Default value	Manufacturer-specific
Sub-index	01 <sub>h</sub>
Description	Actual vacuum 1
Entry category	Mandatory
Access	ro
PDO mapping	Default
Value range	INTEGER16
Default value	No
Sub-index	02 <sub>h</sub>
Description	Actual vacuum 2
Entry category	Mandatory
Access	ro
PDO mapping	Default
Value range	INTEGER16
Default value	No
Sub-index	03 <sub>h</sub>
Description	Actual vacuum 3
Entry category	Optional
Access	ro
PDO mapping	Optional
Value range	INTEGER16
Default value	No
to	
Sub-index	0A <sub>h</sub>
Description	Actual vacuum 10
Entry category	Optional
Access	ro
PDO mapping	Optional
Value range	INTEGER16
Default value	No

## 6.8 Object 600E<sub>h</sub>: Vacuum set value

This object shall indicate the vacuum set value send by the master-extruder. The values in sub-index 02<sub>h</sub> to sub-index 0B<sub>h</sub> shall be given in 1 mbar. Positive values shall indicate negative pressures; negative values shall indicate positive pressures.

Table 32 specifies the object description and Table 33 specifies the entry description.

**Table 32 – Object description**

Attribute	Value
Index	600E <sub>h</sub>
Name	Vacuum set value
Object code	RECORD
Data type	Set process data
Category	Optional

**Table 33 – Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Description	Highest sub-index supported
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	02 <sub>h</sub> to 0A <sub>h</sub>
Default value	Manufacturer-specific
Sub-index	01 <sub>h</sub>
Description	Controller on/off
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	See /CiA420-1/
Default value	Manufacturer-specific
Sub-index	02 <sub>h</sub>
Description	Set process data 1
Entry category	Mandatory
Access	rw
PDO mapping	No
Value range	INTEGER16
Default value	Manufacturer-specific



Attribute	Value
Sub-index	03 <sub>h</sub>
Description	Set process data 2
Entry category	Optional
Access	rw
PDO mapping	No
Value range	INTEGER16
Default value	Manufacturer-specific
to	
Sub-index	0A <sub>h</sub>
Description	Set process data 10
Entry category	Optional
Access	rw
PDO mapping	No
Value range	INTEGER16
Default value	Manufacturer-specific

### 6.9 Object 600F<sub>h</sub>: Actual water pressures

This object shall provide an array with actual water pressure values. The value shall be given in 0,1 bar. Table 34 specifies the object description and Table 35 specifies the entry description.

**Table 34 – Object description**

Attribute	Value
Index	600F <sub>h</sub>
Name	Actual water pressures
Object code	ARRAY
Data type	UNSIGNED16
Category	Mandatory

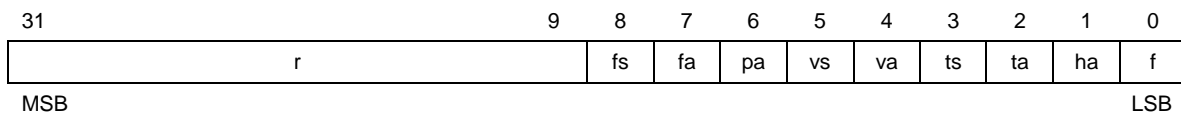
**Table 35 – Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Description	Highest sub-index supported
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	01 <sub>h</sub> to 0A <sub>h</sub>
Default value	Manufacturer-specific

Sub-index	01 <sub>h</sub>
Description	Actual pressure 1
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
to	
Sub-index	02 <sub>h</sub>
Description	Actual pressure 2
Entry category	Optional
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No
to	
Sub-index	0A <sub>h</sub>
Description	Actual pressure 10
Entry category	Optional
Access	ro
PDO mapping	No
Value range	UNSIGNED16
Default value	No

**6.10 Object 6010<sub>h</sub>: Configuration word**

This object shall provide the configured functionality. Figure 1 specifies the structure of sub-index 01<sub>h</sub> (configuration word 1) and Table 36 defines the values.



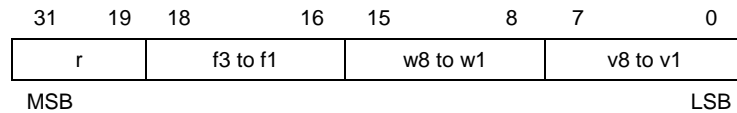
**Figure 1 — Structure of sub-index 01<sub>h</sub>**

**Table 36 — Value definition**

Signal	Value	Definition
f (Actual extraction force)	0 <sub>b</sub> 1 <sub>b</sub>	Force measuring not available Force measuring available
ha (height adjustment)	0 <sub>b</sub> 1 <sub>b</sub>	Height adjustment not available Height adjustment available
ta (actual temperatures)	0 <sub>b</sub> 1 <sub>b</sub>	Temperature measuring not available Temperature measuring available
ts (set temperatures)	0 <sub>b</sub> 1 <sub>b</sub>	Temperature setting not available Temperature setting available
va (actual vacuum values)	0 <sub>b</sub> 1 <sub>b</sub>	Vacuum measuring not available Vacuum measuring available
vs (set vacuum values)	0 <sub>b</sub> 1 <sub>b</sub>	Vacuum setting not available Vacuum setting available

Signal	Value	Definition
pa (actual pressure values)	0 <sub>b</sub> 1 <sub>b</sub>	Pressure measuring not available Pressure measuring available
fa (actual flow rates)	0 <sub>b</sub> 1 <sub>b</sub>	Flow rate measuring not available Flow rate measuring available
fs (set flow rates)	0 <sub>b</sub> 1 <sub>b</sub>	Flow rate setting not available Flow rate setting available
r	Reserved; always 0	

Figure 2 specifies the structure of sub-index 02<sub>h</sub> (configuration word 2) and Table 37 defines the values.



**Figure 2 — Structure of sub-index 02<sub>h</sub>**

**Table 37 — Value definition**

Signal	Value	Definition
v1, ..., v8 (start/stop function of vacuum pumps)	0 <sub>b</sub> 1 <sub>b</sub>	Vacuum pump not available Vacuum pump available
w1, ..., w8 (start/stop function of water pump)	0 <sub>b</sub> 1 <sub>b</sub>	Water pump not available Water pump available
f1, ..., f3 (auxiliary function)	0 <sub>b</sub> 1 <sub>b</sub>	Auxiliary function not available Auxiliary function available
r	Reserved; always 0	

Table 38 specifies the object description and Table 39 specifies the entry description.

**Table 38 – Object description**

Attribute	Value
Index	6010 <sub>h</sub>
Name	Configuration word
Object code	ARRAY
Data type	UNSIGNED32
Category	Mandatory

**Table 39 – Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Description	Highest sub-index supported
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	02 <sub>h</sub>
Default value	02 <sub>h</sub>

Sub-index	01 <sub>h</sub>
Description	Configuration word 1
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	See value definition
Default value	No
Sub-index	02 <sub>h</sub>
Description	Configuration word 2
Entry category	Mandatory
Access	ro
PDO mapping	No
Value range	See value definition
Default value	No

### 6.11 Object 6020<sub>h</sub>: Control word

This object shall indicate the commands transmitted by the extruder. Figure 3 specifies the structure of sub-index 01<sub>h</sub> (control word 1) and Table 40 defines the values.

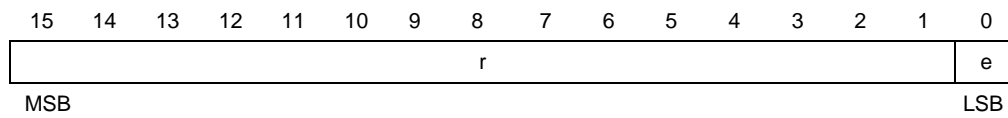


Figure 3 — Structure of sub-index 01<sub>h</sub>

Table 40 — Value definition

Signal	Value	Definition
e (extruder run)	0 <sub>b</sub> 1 <sub>b</sub>	Extruder stopped (default value) Extruder is running
r (reserved)	Reserved; always 0	

Figure 4 specifies the structure of sub-index 02<sub>h</sub> (control word 2) and Table 41 defines the values.

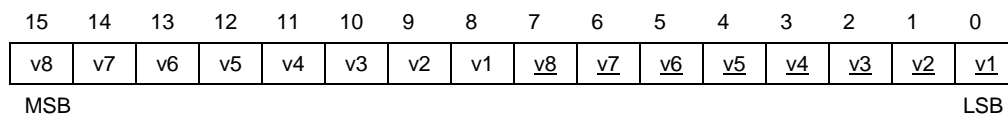
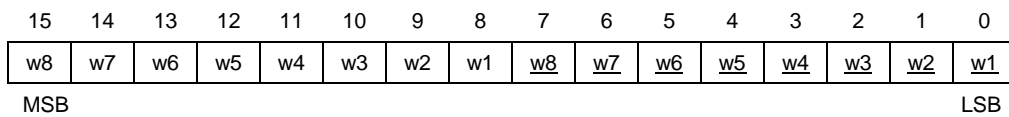


Figure 4 — Structure of sub-index 02<sub>h</sub>

Table 41 — Value definition

Signal	Value	Definition
v1 to v8 (vacuum pump 1 to vacuum pump 8)	0 <sub>b</sub> 1 <sub>b</sub>	No command (default value) Stop function (start prevention)
v1 to v8 (vacuum pump 1 to vacuum pump 8)	0 <sub>b</sub> 1 <sub>b</sub>	No command (default value) Start function

Figure 5 specifies the structure of sub-index 03<sub>h</sub> (control word 3) and Table 42 defines the values.

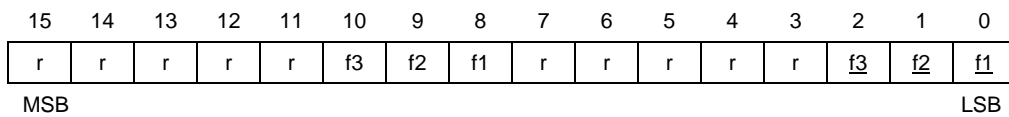


**Figure 5 — Structure of sub-index 03<sub>h</sub>**

**Table 42 — Value definition**

Signal	Value	Definition
<u>w1</u> to <u>w8</u> (water pump 1 to water pump 8)	0 <sub>b</sub> 1 <sub>b</sub>	No command (default value) Stop function (start prevention)
w1 to w8 (water pump 1 to water pump 8)	0 <sub>b</sub> 1 <sub>b</sub>	No command (default value) Start function

Figure 6 specifies the structure of sub-index 04<sub>h</sub> (control word 4) and Table 43 defines the values.



**Figure 6 — Structure of sub-index 04<sub>h</sub>**

**Table 43 — Value definition**

Signal	Value	Definition
<u>f1</u> to <u>f3</u> (function 1 to function 3)	0 <sub>b</sub> 1 <sub>b</sub>	No command (default value) Stop function (start prevention)
f1 to f3 (function 1 to function 3)	0 <sub>b</sub> 1 <sub>b</sub>	No command (default value) Start function
r (reserved)	Reserved; always 0	

Table 44 specifies the object description and Table 45 specifies the entry description.

**Table 44 – Object description**

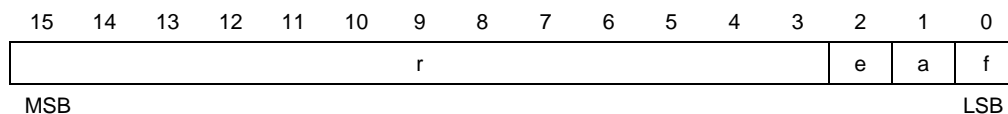
Attribute	Value
Index	6020 <sub>h</sub>
Name	Control word
Object code	ARRAY
Data type	UNSIGNED16
Category	Mandatory

**Table 45 – Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Description	Highest sub-index supported
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	04 <sub>h</sub>
Default value	04 <sub>h</sub>
Sub-index	01 <sub>h</sub>
Description	Control word 1
Entry category	Mandatory
Access	rw
PDO mapping	Default
Value range	See value definition
Default value	0000 <sub>h</sub>
to	
Sub-index	04 <sub>h</sub>
Description	Control word 4
Entry category	Mandatory
Access	rw
PDO mapping	Default
Value range	See value definition
Default value	0000 <sub>h</sub>

**6.12 Object 6030<sub>h</sub>: Status word**

This object shall provide the status transmitted to the master-extruder. Figure 7 specifies the structure of sub-index 01<sub>h</sub> (status word 1) and Table 46 defines the values.

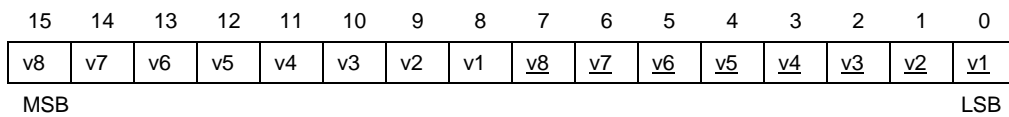


**Figure 7 — Structure of sub-index 01<sub>h</sub>**

**Table 46 — Value definition**

Signal	Value	Definition
f (fault downstream equipment)	0 <sub>b</sub> 1 <sub>b</sub>	No fault Fault
a (alarm downstream equipment)	0 <sub>b</sub> 1 <sub>b</sub>	No alarm Alarm
e (enable extruder)	0 <sub>b</sub> 1 <sub>b</sub>	Extruder shall stop and start is not allowed Extruder enabled to run
r (reserved)	Reserved; always 0	

Figure 8 specifies the structure of sub-index 02<sub>h</sub> (status word 2) and Table 47 defines the values.

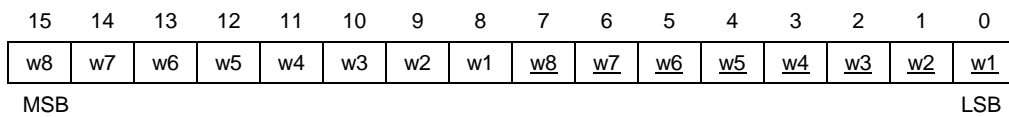


**Figure 8 — Structure of sub-index 02<sub>h</sub>**

**Table 47 — Value definition**

Signal	Value	Definition
<u>v1</u> to <u>v8</u> (vacuum pump 1 to vacuum pump 8)	0 <sub>b</sub>	Function is not running
	1 <sub>b</sub>	Function is running
v1 to v8 (vacuum pump 1 to vacuum pump 8)	0 <sub>b</sub>	Function is blocked
	1 <sub>b</sub>	Function is ready to start

Figure 9 specifies the structure of sub-index 03<sub>h</sub> (status word 3) and Table 48 defines the values.

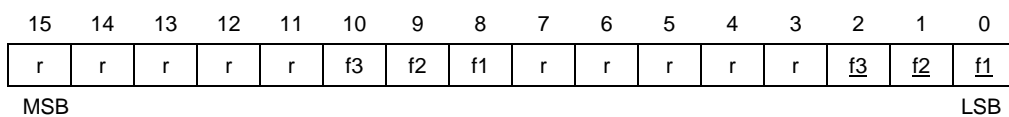


**Figure 9 — Structure of sub-index 03<sub>h</sub>**

**Table 48 — Value definition**

Signal	Value	Definition
<u>w1</u> to <u>w8</u> (water pump 1 to water pump 8)	0 <sub>b</sub>	Function is not running
	1 <sub>b</sub>	Function is running
w1 to w8 (water pump 1 to water pump 8)	0 <sub>b</sub>	Function is blocked
	1 <sub>b</sub>	Function is ready to start

Figure 10 specifies the structure of sub-index 04<sub>h</sub> (status word 4) and Table 49 defines the values.



**Figure 10 — Structure of sub-index 04<sub>h</sub>**

**Table 49 — Value definition**

Signal	Value	Definition
<u>f1</u> , ..., <u>f3</u> (function 1 to function 3)	0 <sub>b</sub>	Function is not running
	1 <sub>b</sub>	Function is running
f1, ..., f3 (function 1 to function 3)	0 <sub>b</sub>	Function is blocked
	1 <sub>b</sub>	Function is ready to start
r (reserved)	Reserved; always 0	

Table 50 specifies the object description and Table 51 specifies the entry description.

**Table 50 – Object description**

Attribute	Value
Index	6030 <sub>h</sub>
Name	Status word
Object code	ARRAY
Data type	UNSIGNED16
Category	Mandatory

**Table 51 – Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Description	Highest sub-index supported
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	04 <sub>h</sub>
Default value	04 <sub>h</sub>
Sub-index	01 <sub>h</sub>
Description	Status word 1
Entry category	Mandatory
Access	ro
PDO mapping	Default
Value range	See value definition
Default value	No
to	
Sub-index	04 <sub>h</sub>
Description	Status word 4
Entry category	Mandatory
Access	Ro
PDO mapping	Default
Value range	See value definition
Default value	No



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