

**CiA<sup>®</sup> 420**



***Profiles for extruder downstream devices***

Part 4: Saw

**Version: 3.1.0**  
**07 May 2015**

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## HISTORY

Date	Changes
2002-10-22	<i>Publication of version 1.0</i> as draft standard proposal
2004-02-27	<i>Publication of version 2.0</i> as draft standard proposal
2007-01-31	<i>Publication of version 3.0</i> as draft standard
2014-09-01	<i>Publication of version 3.1.0</i> as draft standard proposal
2015-05-07	<i>Publication of version 3.1.0</i> as public specification

NOTE: This document has been converted into “docx format”.  
The conversion caused minor layout differences to the predecessor document in “doc format”. The technical content word-by-word is the very same.

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## 1 Scope

The CANopen application profile for extruder downstream devices includes 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 the saw downstream device.

## 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 principles

### 4.1 General

The saw 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 shows the process data mapped into TPDOs and RPDOs.

**Table 1 – TPDO and RPDO mapping**

PDO number	Index/sub-index	Name/description
TPDO 1	6030 00 <sub>h</sub>	Status word
	6000 00 <sub>h</sub>	Counter value
	(See Note)	Manufacturer-specific process data

PDO number	Index/sub-index	Name/description
TPDO 2	6001 00 <sub>h</sub>	Actual saw counter
	6007 00 <sub>h</sub>	Product speed
RPDO 1	6020 00 <sub>h</sub>	Control word
	6005 00 <sub>h</sub>	Saw sync speed set value
	6002 00 <sub>h</sub>	Product length value
NOTE The TPDO 1 is able to map one and only one manufacturer-specific process data		

## 5.2 First TPDO

This TPDO shall be transmitted to the master-extruder. It contains by default the *status word* and the *counter value*.

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/. The sub-index 04<sub>h</sub> is reserved for compatibility reasons and shall not be implemented.

**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
Sub-index	01 <sub>h</sub>
Description	COB-ID
Entry category	Mandatory
Access	const
PDO mapping	No
Value range	4000 0180 <sub>h</sub> + node-ID or C000 0180 <sub>h</sub> + node-ID
Default value	4000 0180 <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 4 specifies the object description of the PDO mapping parameter and Table 5 specifies the associated entry description. The values are defined in /CiA301/. The unused bytes in the data field shall only be used for a manufacturer-specific second status word.

**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	rw (constant in NMT operational state)
PDO mapping	No
Value range	00 <sub>h</sub> , 02 <sub>h</sub> to 03 <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	6030 00 10 <sub>h</sub>
Default value	6030 00 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	6000 00 20 <sub>h</sub>
Default value	6000 00 20 <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	Manufacturer-specific

### 5.3 Second TPDO

This TPDO shall be transmitted to the master-extruder. It contains by default the *actual saw counter*, and the *product speed*.

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/. The sub-index 04<sub>h</sub> is reserved for compatibility reasons and shall not be implemented.

**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
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>



Attribute	Value
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	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	6001 00 20 <sub>h</sub>
Default value	6001 00 20 <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	6007 00 20 <sub>h</sub>
Default value	6007 00 20 <sub>h</sub>

#### 5.4 First RPDO

This RPDO shall be received from the master-extruder. It contains by default the *control word*, the *saw sync speed set value* and the *product length set value*.

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/. The sub-index 04<sub>h</sub> is reserved for compatibility reasons and shall not be implemented.

**Table 10 — 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 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 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	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>

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/. The unused bytes in the data field shall only be used for a manufacturer-specific second control word.

**Table 12 — 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 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	03 <sub>h</sub>
Default value	03 <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	6020 00 10 <sub>h</sub>
Default value	6020 00 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	6005 00 10 <sub>h</sub>
Default value	6005 00 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	6002 00 20 <sub>h</sub>
Default value	6002 00 20 <sub>h</sub>

## 6 Application object specification

### 6.1 Object 6000<sub>h</sub>: Counter value

This object shall provide the actual counts from measuring wheel or motor encoder. The dimensionless value shall be counted from 0000 0000<sub>h</sub> up to its overrun at FFFF FFFF<sub>h</sub>.

Table 14 specifies the object description and Table 15 specifies the entry description.

**Table 14 — Object description**

Attribute	Value
INDEX	6000 <sub>h</sub>
Name	Counter value
Object code	VAR
Data type	UNSIGNED32
Category	Mandatory

**Table 15 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Access	ro
PDO mapping	Default
Value range	UNSIGNED32
Default value	No

## 6.2 Object 6001<sub>h</sub>: Actual saw counter

This object shall provide the actual counter value. The value shall be given in 0,1 mm. Negative values shall indicate wrong directions.

This object shall only be evaluated in smooth pipe mode. In corrugated pipe mode this object shall be ignored.

Table 16 specifies the object description and Table 17 specifies the entry description.

**Table 16 — Object description**

Attribute	Value
INDEX	6001 <sub>h</sub>
Name	Actual saw counter
Object code	VAR
Data type	INTEGER32
Category	Mandatory

**Table 17 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Access	ro
PDO mapping	Default
Value range	INTEGER32
Default value	No

## 6.3 Object 6002<sub>h</sub>: Product length set value

This object shall store the product length to cut requested by the master-extruder. The value shall be given in 0,1 mm.

This object shall only be evaluated in smooth pipe mode. In corrugated pipe mode this object shall be ignored.

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

**Table 18 — Object description**

Attribute	Value
INDEX	6002 <sub>h</sub>
Name	Product length set value
Object code	VAR
Data type	UNSIGNED32
Category	Mandatory

**Table 19 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Access	rw
PDO mapping	Default
Value range	UNSIGNED32
Default value	0000 0000 <sub>h</sub>

#### 6.4 Object 6003<sub>h</sub>: Scaling factor

This object shall indicate the default factor between counted pulses and length. The value shall be given in pulse/m.

NOTE Pulse/mm per bit does not allow the necessary scaling resolution that is required for calibration.

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

**Table 20 — Object description**

Attribute	Value
INDEX	6003 <sub>h</sub>
Name	Scaling factor
Object code	VAR
Data type	UNSIGNED32
Category	Mandatory

**Table 21 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Access	rw
PDO mapping	Optional
Value range	UNSIGNED32
Default value	Manufacturer-specific

#### 6.5 Object 6004<sub>h</sub>: Saw minimum product length

This object shall provide the minimum product length due to the limitations of the saw device. The value shall be given in 0,1 mm.

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

**Table 22 — Object description**

Attribute	Value
INDEX	6004 <sub>h</sub>
Name	Saw minimum product length
Object code	VAR
Data type	UNSIGNED32
Category	Mandatory

**Table 23 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Access	ro
PDO mapping	Optional
Value range	UNSIGNED32
Default value	No

### 6.6 Object 6005<sub>h</sub>: Saw sync speed set value

This object shall store the set value of puller (line) speed cyclically transmitted from the master-extruder. This value may be used to synchronize saw motion and puller. The value shall be given in 0,01%.

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

**Table 24 — Object description**

Attribute	Value
INDEX	6005 <sub>h</sub>
Name	Saw sync speed set value
Object code	VAR
Data type	UNSIGNED16
Category	Mandatory

**Table 25 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Access	rw
PDO mapping	Optional
Value range	0 <sub>d</sub> to 10000 <sub>d</sub>
Default value	0 <sub>d</sub>

### 6.7 Object 6006<sub>h</sub>: Saw sync speed set maximum

This object shall indicate the maximum set value of the line (e.g. puller and saw) speed. The value shall be given in 1 mm/min.

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

**Table 26 — Object description**

Attribute	Value
INDEX	6006 <sub>h</sub>
Name	Saw sync speed set maximum
Object code	VAR
Data type	UNSIGNED32
Category	Mandatory

**Table 27 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Access	rw
PDO mapping	Optional
Value range	UNSIGNED32
Default value	0 <sub>d</sub>

### 6.8 Object 6007<sub>h</sub>: Product speed

This object shall provide the actual value calculated from measuring wheel or motor encoder pulses and time. The accuracy of this value shall be better than 0,3%. The value shall be given in mm/min. Negative values shall reversed directions.

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

**Table 28 — Object description**

Attribute	Value
INDEX	6007 <sub>h</sub>
Name	Product speed
Object code	VAR
Data type	INTEGER32
Category	Mandatory

**Table 29 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Access	ro
PDO mapping	Default
Value range	INTEGER32
Default value	No

### 6.9 Object 6008<sub>h</sub>: Saw speed real maximum

This object shall provide maximum speed value of the saw based on the real maximum saw speed at 100% set value. The value shall be given in mm/min.

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



**Table 30 — Object description**

Attribute	Value
INDEX	6008 <sub>h</sub>
Name	Saw speed real maximum
Object code	VAR
Data type	UNSIGNED32
Category	Mandatory

**Table 31 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Access	ro
PDO mapping	Optional
Value range	UNSIGNED32
Default value	No

### 6.10 Object 6009<sub>h</sub>: Height adjustments

This object shall indicate an array for height adjustment values configured by the master-extruder (e.g. the distance from the centerline 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 32 specifies the object description and Table 33 specifies the entry description.

**Table 32 — Object description**

Attribute	Value
INDEX	6009 <sub>h</sub>
Name	Height adjustments
Object code	ARRAY
Data type	INTEGER16
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	01 <sub>h</sub> to 0A <sub>h</sub>
Default value	Manufacturer-specific

Attribute	Value
Sub-index	01 <sub>h</sub>
Description	Height adjustment 1
Entry category	Mandatory
Access	rw
PDO mapping	Optional
Value range	INTEGER16
Default value	0000 <sub>h</sub>
Sub-index	02 <sub>h</sub>
Description	Height adjustment 2
Entry category	Optional
Access	rw
PDO mapping	Optional
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	Optional
Value range	INTEGER16
Default value	0000 <sub>h</sub>

### 6.11 Object 600A<sub>h</sub>: Saw cut depth

This object shall store the set value received from the master-extruder. The value shall be given in mm measured from the ground position.

Table 34 specifies the object description and Table 35 specifies the entry description.

**Table 34 — Object description**

Attribute	Value
INDEX	600A <sub>h</sub>
Name	Saw cut depth
Object code	VAR
Data type	UNSIGNED16
Category	Optional

**Table 35 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Access	rw
PDO mapping	Optional
Value range	UNSIGNED16
Default value	0000 <sub>h</sub>

### 6.12 Object 600B<sub>h</sub>: Early warning length

This object shall indicate the early warning length, which is the exact length prior to the cut. Therefore this object indicates the configured length set value for the *early warning* signal if the *early warning* function is implemented at the *configuration word* (see clause 6.13). As soon as *product length set value* (clause 6.3) minus *actual saw counter* object (see clause 6.2) is equal or less to the value configured into the *early warning length*, the saw shall generate a signal on pin 22 as defined in /Euromap29/. The value shall be given in 0,1 mm. The value of 0<sub>d</sub> shall indicate that no warning is generated.

NOTE E.g. if the exact cut length is 50.000mm and the signal is required 1.000mm prior to cut, the value configured to this object is 1.000mm

Table 36 specifies the object description and Table 37 specifies the entry description.

**Table 36 — Object description**

Attribute	Value
INDEX	600B <sub>h</sub>
Name	Early warning length
Object code	VAR
Data type	UNSIGNED32
Category	Optional

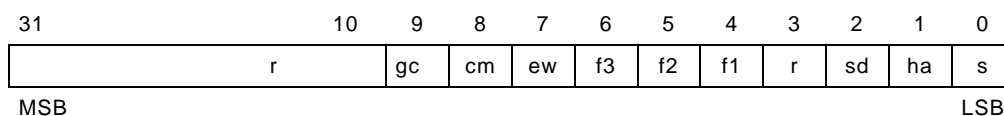
**Table 37 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Access	rw
PDO mapping	Optional
Value range	UNSIGNED32
Default value	0 <sub>d</sub>

### 6.13 Object 6010<sub>h</sub>: Configuration word

This object shall provide the configured functionality.

Figure 1 specifies the object structure and Table 38 defines the values.



**Figure 1 — Object structure**

**Table 38 — Value definition**

Signal	Value	Definition
s (speed measuring)	0 <sub>b</sub> 1 <sub>b</sub>	Speed measuring not available Speed measuring available
ha (height adjustment)	0 <sub>b</sub> 1 <sub>b</sub>	Height adjustment not available Height adjustment available
sd (saw cut depth)	0 <sub>b</sub> 1 <sub>b</sub>	Saw cut depth not available Saw cut depth available
f1, f2, f3 (auxiliary function)	0 <sub>b</sub> 1 <sub>b</sub>	Auxiliary function not available Auxiliary function available
ew (early warning)	0 <sub>b</sub> 1 <sub>b</sub>	Early warning signal not available Early warning signal available
cm (corrugator pipe cutting management capability)	0 <sub>b</sub> 1 <sub>b</sub>	corrugator pipe cutting management capability not available corrugator pipe cutting management capability available (NOTE)
gc (groove count mode)	0 <sub>b</sub> 1 <sub>b</sub>	groove count mode not available groove count mode available
r (reserved)	Reserved; always 0	
NOTE The saw shall start cutting immediately if requested from the corrugator through cp bit 14 in object 6030 <sub>h</sub> in the CiA 420 Part 3: CANopen device profile for the corrugator downstream device. This can be done by reading this bit directly from the corrugator with a slave-to-slave communication mode."		

Table 39 specifies the object description and Table 40 specifies the entry description.

**Table 39 — Object description**

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

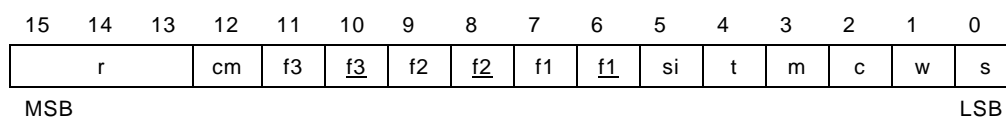
**Table 40 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Access	ro
PDO mapping	No
Value range	See Table 38
Default value	No

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

This object shall indicate the commands transmitted by the master-extruder. The master-extruder shall set the bits to 1<sub>b</sub> if the corresponding button is pressed but not shorter than 100 ms.

Figure 2 specifies the object structure and Table 41 defines the values.


**Figure 2 — Object structure**

**Table 41 — Value definition**

Signal	Value	Definition
s (saw program on/off)	0 <sub>b</sub> 1 <sub>b</sub>	Saw program is off and actual saw counter is reset and off (default value) Saw program and actual saw counter are on
w (wall-thickening active)	0 <sub>b</sub> 1 <sub>b</sub>	After a manual cut wall-thickening is off – the current product length will be repeated (default value) After a manual cut wall-thickening is on – the current product length shall be destroyed and shall be not repeated
c (change of actual length setting)	0 <sub>b</sub> ⇒1 <sub>b</sub> or 1 <sub>b</sub> ⇒0 <sub>b</sub>	The new product length shall be loaded prior to the cut of the current product and shall be taken automatically by the comparator after the next cut. Each value change shall force the saw to takeover the new length setting (default value shall be 0 <sub>b</sub> )
m (manual cut by master-extruder)	0 <sub>b</sub> 1 <sub>b</sub>	No cut command (default value) Cut immediately
t (tip pulse)	0 <sub>b</sub> 1 <sub>b</sub>	No tip command (default value) Tip out product (See Note)
si (stop immediately)	0 <sub>b</sub> 1 <sub>b</sub>	No action (default value) Stop saw immediately and move to the initial saw position
f1, f2, f3 (function stop)	0 <sub>b</sub> 1 <sub>b</sub>	No command (default value) Stop function (start prevention)
f1, f2, f3 (function start)	0 <sub>b</sub> 1 <sub>b</sub>	No command (default value) Start function
cm (count mode)	0 <sub>b</sub> 1 <sub>b</sub>	Smooth pipe; length based on millimetre (default value) Corrugated pipe; length based on groove (NOTE2)
r (reserved)	0 <sub>d</sub>	Reserved
NOTE1 Pulse length is selectable and is generated by the master-extruder NOTE2 In case the corrugated pipe is active, the objects 6001 <sub>n</sub> and 6002 <sub>n</sub> are ignored. Instead the objects 6031 <sub>n</sub> and 6032 <sub>n</sub> are used for device control.		

Table 42 specifies the object description and Table 43 specifies the entry description.

**Table 42 — Object description**

Attribute	Value
INDEX	6020 <sub>n</sub>
Name	Control word
Object code	VAR
Data type	UNSIGNED16
Category	Mandatory

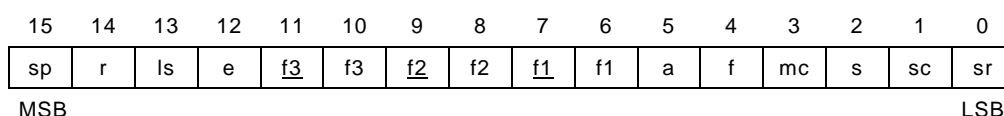
**Table 43 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Access	rw
PDO mapping	Default
Value range	See Table 41
Default value	See Table 41

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

This object shall provide the status transmitted to the master-extruder. The saw downstream device shall set the bits to 1<sub>b</sub> if the corresponding button is pressed but not shorter than 100 ms.

Figure 3 specifies the object structure and Table 44 defines the values.

**Figure 3 — Object structure****Table 44 — Value definition**

Signal	Value	Definition
sr (saw ready)	0 <sub>b</sub> 1 <sub>b</sub>	Saw is not ready to cut Saw is ready to cut or cut is in progress
sc (saw is cutting)	0 <sub>b</sub> 1 <sub>b</sub>	Saw is not cutting Saw is cutting
s (sample)	0 <sub>b</sub> 1 <sub>b</sub>	No request Request to insert sample
mc (manual cut by saw)	0 <sub>b</sub> 1 <sub>b</sub>	No immediate cut Immediate cut
f (fault downstream device)	0 <sub>b</sub> 1 <sub>b</sub>	No fault Fault (saw switched off and start is prevented)
a (alarm downstream device)	0 <sub>b</sub> 1 <sub>b</sub>	No alarm Alarm (saw not switched off, next cut still permitted)
f1, f2, f3 (function run)	0 <sub>b</sub> 1 <sub>b</sub>	Function is not running Function is running
<u>f1</u> , <u>f2</u> , <u>f3</u> (function ready to start)	0 <sub>b</sub> 1 <sub>b</sub>	Function is blocked Function is ready to start
e (enable saw program)	0 <sub>b</sub> 1 <sub>b</sub>	Saw program is stopped and restart prevented Saw program is enabled
ls (cut from limit switch)	0 <sub>b</sub> 1 <sub>b</sub>	Limit switch is not pressed Limit switch is pressed
sp (start saw program)	0 <sub>b</sub> 1 <sub>b</sub>	No saw program start requested Start saw program is requested
r (eserved)	0 <sub>b</sub>	Reserved for future use by CiA (always 0)

Table 45 specifies the object description and Table 46 specifies the entry description.

**Table 45 — Object description**

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

**Table 46 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Access	ro
PDO mapping	Default
Value range	See Table 44
Default value	No

**6.16 Object 6031<sub>h</sub>: Actual groove counter**

This object shall provide the actual groove counter value. The value shall be dimensionless.

This object shall only be evaluated in corrugated pipe mode. In smooth pipe mode this object shall be ignored.

Table 47 specifies the object description and Table 48 specifies the entry description.

**Table 47 — Object description**

Attribute	Value
INDEX	6031 <sub>h</sub>
Name	Actual groove counter
Object code	VAR
Data type	UNSIGNED32
Category	Optional

**Table 48 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Access	ro
PDO mapping	Optional
Value range	UNSIGNED32
Default value	No

**6.17 Object 6032<sub>h</sub>: Product groove set value**

This object shall store the product groove to cut requested by the master-extruder. The value shall be dimensionless. This object shall only be evaluated in corrugated pipe mode. In smooth pipe mode this object shall be ignored.

Table 49 specifies the object description and Table 50 specifies the entry description.

**Table 49 — Object description**

Attribute	Value
INDEX	6032 <sub>h</sub>
Name	Product groove set value
Object code	VAR
Data type	UNSIGNED32
Category	Optional

**Table 50 — Entry description**

Attribute	Value
Sub-index	00 <sub>h</sub>
Access	rw
PDO mapping	Optional
Value range	UNSIGNED32
Default value	0000 0000 <sub>h</sub>