CiA Draft Standard Proposal 414

CANopen

Device Profiles for Weaving Machines

Part 2: Feeders

This is a draft standard proposal and not suitable to be implemented

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HISTORY

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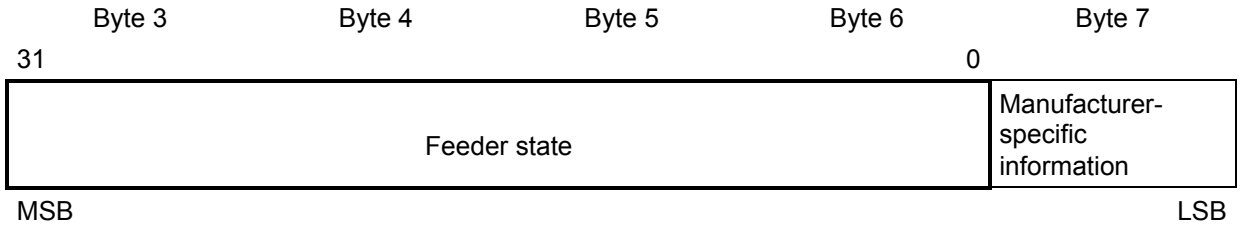
1 Scope

Part 2 of CANopen device profiles for weaving machines specifies the CANopen interface for feeders. This device profile for feeders covers ‘pre-measuring feeders’ as well as ‘weft feeders’. The normative references, definitions, acronyms, and abbreviations given in part 1 apply to this part, too.

2 Predefinitions

2.1 Emergency object

An Emergency message with error code FF10h shall be transmitted when a feeder stop event occurs or when a feeder stop disappears. In this case, the manufacturing-specific error field of this Emergency message shall be structured as follows:



Feeder state definitions:
0 = no feeder error has occurred
1 = feeder error has occurred

bit 0 = state of feeder no. 1
bit 1 = state of feeder no. 2

to

bit 31 = state of feeder no. 32

This Emergency message does not necessarily lead to a weaving machine stop. The decision is upon responsibility of the loom controller. Emergency messages with the error code FF10h, transmitted by a feeder control box, imply that a number of feeders may be effected by errors. If feeders are not able to provide detailed failure conditions immediately after the error occurs, the Emergency message will not contain detailed failure conditions. These detailed failure conditions are available by reading to the feeder error condition object (6007h).

2.2 1st RPDO mapping

This RPDO receives the pick insertion object (600Ch) from the loom controller. The default transmission type shall be 255. The pick insertion object provides the next five insertion parameters. After the occurrence of an ASS event only three pick insertion parameters may be ensured to be correct, the remaining two may still be erroneous due to the recalculation time of the loom controller. In the second PDO after an ASS event all pick insertion parameters are correct again. The default values of the mapped objects are described in the Default state attributes. *Note:* After very first power-on these default values shall be valid; if no parameters are stored after power-on or NMT reset the default values shall be valid, too.

Exactly one RPDO_1 is transmitted during a logical shed, i.e. between two consecutive angle trigger signals. On one PDO loss the feeder shall indicate that in the feeder error-condition object (6007h). If more than two consecutive RPDO_1 are lost, the feeder shall send an Emergency message and stops operation.

Index	Sub-Index	Comment	Default Value
1600h	0h	number of mapped objects	5h
	1h	pick 1	600C 01 08h
	2h	pick 2	600C 02 08h
	3h	pick 3	600C 03 08h
	4h	pick 4	600C 04 08h
	5h	pick 5	600C 05 08h

2.3 2nd RPDO mapping

This RPDO receives the loom status (object 600Ah) and the global weft filling parameters (object 6004h) from the loom controller. The default transmission type shall be 255. This PDO is transmitted whenever the mapped objects are changed. The default values of the mapped objects are described in the Default state attributes. *Note:* After very first power-on these default values shall be valid; if no parameters are stored after power-on or NMT reset the default values shall be valid, too.

Index	Sub-Index	Comment	Default Value
1601h	0h	number of mapped objects	2h
	1h	loom status	600A 00 08h
	2h	global weft filling parameter	6004 00 20h

2.4 3rd RPDO mapping

This RPDO is optional and receives depending on the hardware features up to 8 x 8 digital outputs (object 600Dh) from the loom controller. The default transmission type shall be 255. The PDO is transmitted whenever one output value is changed. The default values of the mapped objects are described in the Default state parameters. *Note: Note:* After very first power-on these default values shall be valid; if no parameters are stored after power-on or NMT reset the default values shall be valid, too.

Index	Sub-Index	Comment	Default Value
1602h	0h	number of mapped objects	1h to 8h
	1h	output group 1	600D 01 08h
	2h	output group 2	600D 02 08h
	3h	output group 3	600D 03 08h
	4h	output group 4	600D 04 08h
	5h	output group 5	600D 05 08h
	6h	output group 6	600D 06 08h
	7h	output group 7	600D 07 08h
	8h	output group 8	600D 08 08h

2.5 4th RPDO mapping

This RPDO is mandatory if the loom controller selected at least one trigger function (angle or brush-release or pick insertion trigger). The default transmission type is 255. The PDO is transmitted whenever the angle-trigger occurs or the brush-release signal changes or the pick insertion release signal changes. The default values of the mapped objects are described in the Default state parameters. *Note:* After very first power-on these default values shall be valid; if no parameters are stored after power-on or NMT reset the default values shall be valid, too.

Index	Sub-Index	Comment	Default Value
1603h	0h	number of mapped objects	1h
	1h	trigger signal	600B 00 08h

2.6 1st TPDO mapping

This TPDO transmits the feeder unwinding time object (6010h). At each winding inserted the pre-measuring feeder transmits this TPDO. The default transmission type shall be 255. The event-timer and the inhibit-timer shall be set by default to 0. *Note:* After very first power-on these default values shall be valid; if no parameters are stored after power-on or NMT reset the default values shall be valid, too.

Index	Sub-Index	Comment	Default Value
1A00h	0h	number of mapped objects	1h
	1h	feeder unwinding time	6010 00 20h

3 Object dictionary

3.1 Overview on object dictionary entries

INDEX	Name
6000h	brush_release
6001h	feeder_functions
6002h	weft_insertion_type_parameter
6003h	single_weft_filling_parameter
6004h	global_weft_filling_parameter
6005h	trigger_signal_source
6006h	angle_trigger_timeout
6007h	feeder_error_condition
6008h	fcb_error_condition
6009h	feeder_status
600Ah	loom_status
600Bh	trigger_signal
600Ch	pick_insertion
600Dh	digital_outputs
600Eh	feeder_command
600Fh	feeder_test
6010h	feeder_unwinding_time
6011h	system_feeder_number_assignment
6012h	feeder_color_assignment

3.2 Detailed specification of object entries

3.2.1 Object 6000h: brush release

This object provides the opening delay time and the closing delay time. Both values are given in 0.1 ms/bit.

In pre-operational status, the brush release function shall be configured inside the weaving machine control for correct use in operational status. The brush release function itself, i.e. opening of the CTR/flexbrake during weft insertion to reduce the maximum yarn tension on the weft, can be provided either through the parallel function trigger signals. The brush release configuration parameters include feeder-specific delay times for the brush release function. A weaving machine that wants to use brush release shall read object 6000h from every feeder before the first start in order to be able to use brush release. The delay times specify the lead times needed by the feeder to open/close the brush after reception of the trigger signal, i.e. time by which the weaving machine shall send the trigger signal in advance so that the feeder will open/close the brush correctly. This function is only available if the respective feeder supports the brush release functionality (see object 6001h).

OBJECT DESCRIPTION

INDEX	**6000h**
Name	brush_release
Object Code	Array
Data Type	Unsigned16
Category	Conditional

ENTRY DESCRIPTION

Sub-Index	0h
Description	number_of_entries
Entry Category	Mandatory
Access	ro
PDO Mapping	No
Value Range	2h
Default Value	2h

Sub-Index	1h
Description	opening_delay_time
Entry Category	Mandatory
Access	ro
PDO Mapping	No
Value Range	Unsigned16
Default Value	0h

Sub-Index	2h
Description	closing_delay_time
Entry Category	Mandatory
Access	ro
PDO Mapping	No
Value Range	Unsigned16
Default Value	0h

3.2.2 Object 6001h: feeder functions

This object provides the feeder functionality. After power-on the functions and sensors that are not supported by the feeders, are set to "not available". E.g. BR = 00 = "Brush-release not available". If they are supported they have to be set to "on" or "off". E.g. AT = 10 = "Angle-trigger monitoring off".

By writing to this object, the feeder functions are set. Only those functions and sensors that are marked as supported can be changed.

31 30	29 28	27 26	25 24	23 22	21 20	19 18	17 16	15 14	13 12	11 10	9 8	7 6	5 4	3 2	1 0
BR	WD	AT	r	r	r	r	r	YB	IKD	YQ	RD	TKS	r	r	r

MSB LSB

Name	Bit value	Function
BR	10	Brush release off
	11	Brush release on
	00	Brush release not available
WD	10	Winding direction is S
	11	Winding direction is Z
AT	10	Angle trigger monitoring off
	11	Angle trigger monitoring on
	00	Angle trigger monitoring not available
YB	10	Yarn break sensor not active
	11	Yarn break sensor active
	00	Yarn break sensor not available
IKD	10	Input knot detection sensor not active
	11	Input knot detection sensor active
	00	Input knot detection sensor not available
YQ	10	Yarn quality sensor not active
	11	Yarn quality sensor active
	00	Yarn quality sensor not available
RD	10	Rotation direction sensor not active
	11	Rotation direction sensor active
	00	Rotation direction sensor not available
TKS	10	TKS sensor not active
	11	TKS sensor active
	00	TKS sensor not available
R	00	reserved

OBJECT DESCRIPTION

INDEX	**6001h**
Name	feeder_functions
Object Code	Array
Data Type	Unsigned32
Category	Mandatory

ENTRY DESCRIPTION

Sub-Index	0h
Description	number_of_entries
Entry Category	Mandatory
Access	ro
PDO Mapping	No
Value Range	1h to FEh
Default Value	No

Sub-Index	1h
Description	feeder_1
Entry Category	Mandatory
Access	rw
PDO Mapping	No
Value Range	See definitions above
Default Value	No

Sub-Index	2h
Description	feeder_2
Entry Category	Optional
Access	rw
PDO Mapping	No
Value Range	See definitions above
Default Value	No

to

Sub-Index	FEh
Description	feeder_254
Entry Category	Optional
Access	rw
PDO Mapping	No
Value Range	See definitions above
Default Value	No

3.2.3 Object 6002h: weft insertion type parameter

This object shall be configured before processing PDOs. When this object is not configured and a PDO is received or a PDO transmission request occurs, an Emergency message shall be transmitted containing the error code FF10h and the corresponding value in the feeder error condition object (6007h) shall be set. The following values shall be used:

0h = do not process PDOs
1h = projectile
2h = rapier
3h = air jet
4h = water jet
5h to FF = reserved

OBJECT DESCRIPTION

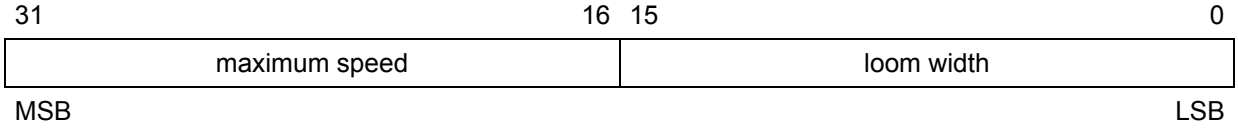
INDEX	**6002h**
Name	weft_insertion_type_parameter
Object Code	Variable
Data Type	Unsigned8
Category	Mandatory

ENTRY DESCRIPTION

Sub-Index	0h
Access	wo
PDO Mapping	No
Value Range	See definition above
Default Value	0h

3.2.4 Object 6003h: single weft filling parameter

This object contains information about the filling section of the weaving machine for a single feeder. This information is obsolete if global weft filling parameter (object 6004h) is unequal 0. This object provides information about weft filling rate and weft yarn specification (e.g. weft yarn quality, yarn type, etc.). The maximum speed is given in 1/min/bit and the loom width is given in cm/bit.



OBJECT DESCRIPTION

INDEX	**6003h**
Name	single_weft_filling_parameter
Object Code	Array
Data Type	Unsigned32
Category	Optional

ENTRY DESCRIPTION

Sub-Index	0h
Description	number_of_entries
Entry Category	Mandatory
Access	ro
PDO Mapping	No
Value Range	1h to FEh
Default Value	No

Sub-Index	1h
Description	feeder_1
Entry Category	Mandatory
Access	wo
PDO Mapping	Optional
Value Range	See definitions above
Default Value	No

Sub-Index	2h
Description	feeder_2
Entry Category	Optional
Access	wo
PDO Mapping	Optional
Value Range	See definitions above
Default Value	No

to

Sub-Index	254h
Description	feeder_254
Entry Category	Optional
Access	wo
PDO Mapping	Optional
Value Range	See definitions above
Default Value	No

3.2.5 Object 6004h: global weft filling parameter

This object contains information about the filling section of the weaving machine for all feeders simultaneously.

OBJECT DESCRIPTION

INDEX	**6004h**
Name	global_weft_filling_parameter
Object Code	Variable
Data Type	Unsigned32
Category	Mandatory

ENTRY DESCRIPTION

Sub-Index	0h
Access	wo
PDO Mapping	Default
Value Range	See definitions in object 6003h
Default Value	No

3.2.6 Object 6005h: trigger signal source

This object defines in sub-index 1, which trigger sources are supported, and in sub-index 2 which trigger sources are selected. By default in sub-index 2, "angle trigger" occurs implicitly on receiving the "pick insertion object" and the "brush-release signal" is set via CANopen network, and “pick release trigger” is not selected.

The following definition shall apply for sub-index 1:

15 12	11 8	7 4	3
reserved	supported pick release trigger sources	supported angle-trigger sources	supp release

MSB

Bit definitions:

0 = source is not available

1= source is available

Bit no.	Signal/trigger	Source
00	Brush-release signal	CANopen network possible (via object 600Bh)
01		Parallel brush-release signal line possible
02		reserved
03		reserved
04	Angle-trigger	CANopen network possible (via object 600Bh)
05		Parallel angle-trigger line possible
06		reserved
07		reserved
08	Pick release trigger	CANopen network possible (via object 600Bh)
09		Parallel pick release trigger line possible
10		reserved
11		reserved
12	reserved	reserved
13	reserved	reserved
14	reserved	reserved
15	reserved	reserved

If angle-trigger sources" results to 0 then the explicit triggering via CANopen network or via parallel line is not possible. In this case, there is an "implicit angle trigger" whenever "pick insertion object" (600Ch) is received.
If brush-release signal sources results to 0 then the brush-release function is off and the brushes are set or released or unaffected as defined in object feeder functions (6001h), section "BR".

The following definition shall apply for sub-index 2:

15 12	11 8	7 4	3
reserved	selected pick release trigger sources	selected angle-trigger sources	selecte sig

MSB

Bit definitions:

0 = source not selected

1= source selected

Bit no.	Signal/trigger	Source
00	Brush-release signal	CANopen network
01		Parallel brush-release signal line
02		reserved
03		reserved
04	Angle-trigger	CANopen network
05		Parallel angle-trigger line
06		reserved
07		reserved
08	Pick release trigger	CANopen network
09		Parallel pick release trigger line possible
10		reserved
11		reserved
12	reserved	reserved
13	reserved	reserved
14	reserved	reserved
15	reserved	reserved

Reserved bits shall be 0.

OBJECT DESCRIPTION

INDEX	**6005h**
Name	trigger_signal_source
Object Code	Array
Data Type	Unsigned16
Category	Mandatory

ENTRY DESCRIPTION

Sub-Index	0h
Description	number_of_entries
Entry Category	Mandatory
Access	ro
PDO Mapping	No
Value Range	2h
Default Value	2

Sub-Index	1h
Description	trigger_sources_supported
Entry Category	Mandatory
Access	ro
PDO Mapping	No
Value Range	See definitions above
Default Value	0h

Sub-Index	2h
Description	trigger_sources_selected
Entry Category	Mandatory
Access	rw
PDO Mapping	No
Value Range	See definitions above
Default Value	1h

3.2.7 Object 6006h: angle trigger timeout

When the angle trigger is provided via CANopen, a timeout shall be defined in order to allow the feeder to monitor the correct synchronization between loom controller and feeder. The timeout value shall be configured in pre-operational status. The timeout value given in ms defines the maximum time allowed between two consecutive occurrences of the angle trigger signals when loom status (600Ah) has a value of 1 ("normal running"). When there is a value of 0h, the feeder is not allowed to process PDOs. When this object is not configured and a PDO is received or a PDO transmission request occurs, an Emergency message shall be transmitted containing the error code FF10h and the corresponding value in the feeder error condition object (6007h) respectively feeder-control box error condition object (6008h) shall be set.

OBJECT DESCRIPTION

INDEX	**6006h**
Name	angle_trigger_timeout
Object Code	Variable
Data Type	Unsigned16
Category	Conditional

ENTRY DESCRIPTION

Sub-Index	0h
Access	rw
PDO Mapping	No
Value Range	Unsigned16
Default Value	0h

3.2.8 Object 6007h: feeder error condition

This object provides detailed information on feeder errors, which have been indicated by an Emergency message with the error code FF10h. If more than one error occurs at a feeder, the first error is considered as main error. The following value definitions shall apply:

00h = no error
01h = no settings available in EEPROM
02h = on/off switch in off-state
03h = weaving machine parameters missing
04h = yarn is broken
05h = pre-winder is running empty
06h = temperature to high
07h = motor voltage not okay
08h = no communication with EEPROM
09h = rotation not possible
0Ah = filling up failed
0Bh = color information missing
0Ch = angle trigger signal missing
0Dh = TKS event
0Eh = knot detected
0Fh = general error
10h to FF = reserved

OBJECT DESCRIPTION

INDEX	**6007h**
Name	feeder_error_condition
Object Code	Array
Data Type	Unsigned8
Category	Optional

ENTRY DESCRIPTION

Sub-Index	0h
Description	number_of_entries
Entry Category	Mandatory
Access	ro
PDO Mapping	No
Value Range	1h to FEh
Default Value	No

Sub-Index	1h
Description	feeder_1
Entry Category	Mandatory
Access	ro
PDO Mapping	No
Value Range	See definitions above
Default Value	No

Sub-Index	2h
Description	feeder_2
Entry Category	Optional
Access	ro
PDO Mapping	No
Value Range	See definitions above
Default Value	No

to

Sub-Index	FEh
Description	feeder_254
Entry Category	Optional
Access	ro
PDO Mapping	No
Value Range	See definitions above
Default Value	No

3.2.9 Object 6008h: Feeder control box error condition

This object provides detailed information on feeder control box errors, which have been indicated by an Emergency message. The following value definitions shall apply:

00h = no error
01h = no settings available in EEPROM
02h = *reserved*
03h = weaving machine parameters missing
04h = *reserved*
05h = *reserved*
06h = temperature to high
07h = motor voltage not okay
08h = no communication with EEPROM
09h = *reserved*
0Ah = *reserved*
0Bh = color information missing
0Ch = angle trigger signal missing
0Dh = *reserved*
0Eh = *reserved*
0Fh = general Error
10h to FF = *reserved*

OBJECT DESCRIPTION

INDEX	**6008h**
Name	fcb_error_condition
Object Code	Variable
Data Type	Unsigned8
Category	Optional

ENTRY DESCRIPTION

Sub-Index	0h
Access	ro
PDO Mapping	No
Value Range	See definitions above
Default Value	0h

3.2.10 Object 6009h: feeder status

This object provides detailed information about the internal status of the feeder sub-system. The following value definition shall apply:

0h = operational mode
1h = positioning mode
2h = filling up to maximum sensor
3h = PCAT test mode
4h = non-operational mode
5h = not present
6h = initializing mode
7h = error mode
8h to FEh = reserved

OBJECT DESCRIPTION

INDEX	**6009h**
Name	feeder_status
Object Code	Array
Data Type	Unsigned8
Category	Mandatory

ENTRY DESCRIPTION

Sub-Index	0h
Description	number_of_entries
Entry Category	Mandatory
Access	ro
PDO Mapping	No
Value Range	1h to FEh
Default Value	No

Sub-Index	1h
Description	feeder_1
Entry Category	Mandatory
Access	ro
PDO Mapping	No
Value Range	See definitions above
Default Value	No

Sub-Index	2h
Description	feeder_2
Entry Category	Optional
Access	ro
PDO Mapping	No
Value Range	See definitions above
Default Value	No

to

Sub-Index	FEh
Description	feeder_254
Entry Category	Optional
Access	Ro
PDO Mapping	No
Value Range	See definitions above
Default Value	No

3.2.11 Object 600Ah: loom status

The loom controller provides its status information by PDO service. The following value definitions shall apply:

0h = stop
1h = start advice (loom speed value is sent in the very same PDO, loom-status changed to "normal running")
2h = new speed only (no change of loom status)
3h = slow motion forward
4h = slow motion backward
5h to FEh = reserved

OBJECT DESCRIPTION

INDEX	**600Ah**
Name	loom_status
Object Code	Variable
Data Type	Unsigned8
Category	Mandatory

ENTRY DESCRIPTION

Sub-Index	0h
Access	wo
PDO Mapping	Default
Value Range	See definitions above
Default Value	0h

3.2.12 Object 600Bh: trigger signal

This object defines the loom's angle triggers, pick release triggers and brush-release signals, when those are defined within objects 6001h (feeder functions) and 6005h (trigger signal source). The loom controller transmits this object by PDO service. The following value definitions shall apply:

00h = no signal
01h = angle trigger
02h = pick release trigger
03h = brush signal 'do not release'
04h = brush signal 'do release'
05h = to FEh = reserved for future triggers

The angle and pick release trigger shall occur only once per insertion pick: ___|_____|____

The brush-signal may change 0, 2 or 4 times per pick: ____-------_____-------

OBJECT DESCRIPTION

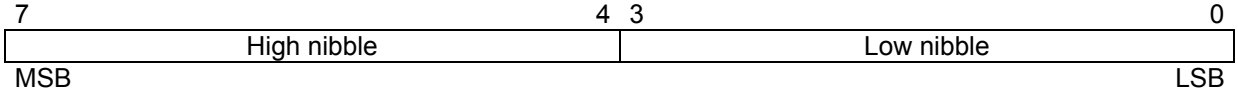
INDEX	**600Bh**
Name	trigger_signal
Object Code	Variable
Data Type	Unsigned8
Category	Mandatory

ENTRY DESCRIPTION

Sub-Index	0h
Access	wo
PDO Mapping	Default
Value Range	See definitions above
Default Value	No

3.2.13 Object 600Ch: pick insertion

This object provides color information for the next consecutive five picks for pre-measuring feeders. The feeder my use the color information to calculate acceleration and retardation ramps and therefore keep the stress on the weft as low as possible. The following value definitions shall apply:



High nibble	*Low nibble*	*Pick insertion*
0h	0h	Empty pick
0h	1h to Fh	Single pick insertion with color 1 to 15
1h	0h	Single pick insertion with color 16
1h to Fh	1h to Fh	Double pick insertion with color 1 to 15 and color 1 to 15
1h	1h	Triple pick insertion with color 1, 3 and 5
2h	2h	Triple pick insertion with color 2, 4 and 6
3h	3h	Triple pick insertion with color 3, 5 and 7
4h	4h	Triple pick insertion with color 4, 6 and 8
5h	5h	Triple pick insertion with color 5, 7 and 9
6h	6h	Triple pick insertion with color 6, 8 and 10
7h	7h	Triple pick insertion with color 7, 9 and 11
8h	8h	Triple pick insertion with color 8, 10 and 12
9h	9h	Triple pick insertion with color 9, 11 and 13
Ah	Ah	Triple pick insertion with color 10, 12 and 14
Bh	Bh	Triple pick insertion with color 11, 13 and 15
Ch	Ch	Triple pick insertion with color 12, 14, and 16
Dh	Dh	reserved
Eh	Eh	reserved
Fh	Fh	reserved

In order to have some free High/Low-nibble combinations for future use, there is the following restriction:

```
HighNibble = 0 or HighNibble ≥ LowNibble
```

OBJECT DESCRIPTION

INDEX	**600Ch**
Name	pick_insertion
Object Code	Array
Data Type	Unsigned8
Category	Mandatory

ENTRY DESCRIPTION

Sub-Index	0h
Description	number_of_entries
Entry Category	Mandatory
Access	ro
PDO Mapping	No
Value Range	1h to 5h
Default Value	5

Sub-Index	1h
Description	pick_1
Entry Category	Mandatory
Access	wo
PDO Mapping	Default
Value Range	See definitions above
Default Value	0h

to

Sub-Index	5h
Description	pick_5
Entry Category	Mandatory
Access	wo
PDO Mapping	Default
Value Range	See definitions above
Default Value	0h

3.2.14 Object 600Dh: digital outputs

This object provides 8 x 8 digital output lines. The following value definitions shall apply:

0 = output switched off 1 = output switched on

OBJECT DESCRIPTION

INDEX	**600Dh**
Name	digital_outputs
Object Code	Array
Data Type	Unsigned8
Category	Mandatory

ENTRY DESCRIPTION

Sub-Index	0h
Description	number_of_entries
Entry Category	Mandatory
Access	ro
PDO Mapping	No
Value Range	1h to 8h
Default Value	No

Sub-Index	1h
Description	output_group_1
Entry Category	Mandatory
Access	rw
PDO Mapping	Default
Value Range	See definitions above
Default Value	0h

Sub-Index	2h
Description	output_group_2
Entry Category	Optional
Access	rw
PDO Mapping	Optional
Value Range	See definitions above
Default Value	0h

to

Sub-Index	8h
Description	output_group_8
Entry Category	Optional
Access	rw
PDO Mapping	Default
Value Range	See definitions above
Default Value	0h

3.2.15 Object 600Eh: feeder command

This object allows controlling directly the feeders by the loom controller.

00h = non-operation mode (feeder reacts only on feeder commands and status requests)
01h = operation mode
02h = start (feeder runs with filling up speed)
03h = stop mode
04h = reset (feeder data are cleared and parameter reset)
05h = LED on
06h = LED off
07h = open the pin (valid only for pre-measuring feeders).
08h = close the pin (valid only for pre-measuring feeders).
09h to 5F = manufacturer-specific
60h to FFh = reserved

OBJECT DESCRIPTION

INDEX	**600Eh**
Name	feeder_command
Object Code	Array
Data Type	Unsigned8
Category	Mandatory

ENTRY DESCRIPTION

Sub-Index	0h
Description	number_of_entries
Entry Category	Mandatory
Access	ro
PDO Mapping	No
Value Range	1h to FEh
Default Value	No

Sub-Index	1h
Description	feeder_1
Entry Category	Mandatory
Access	wo
PDO Mapping	No
Value Range	See definitions above
Default Value	No

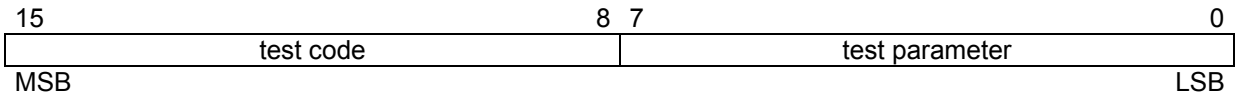
Sub-Index	2h
Description	feeder_2
Entry Category	Optional
Access	wo
PDO Mapping	No
Value Range	See definitions above
Default Value	No

to

Sub-Index	FEh
Description	feeder_254
Entry Category	Optional
Access	wo
PDO Mapping	No
Value Range	See definitions above
Default Value	No

3.2.16 Object 600Fh: feeder test

This object provides some feeder testing functionality. The corresponding test is executed only when the feeder is in operation mode. Only one test can be active each time. If a new test is received while a test is already in progress the current test is immediately stopped and the new test starts as soon as possible.



Test code: 0h = No Test: stop immediately any running test. Test parameter field can be any value and must be ignored.

1h = Motor Test: test parameter defines the motor speed in Hz with a range from 5 to 100 (Hz). A test parameter with a value of 0 means stop the motor test.

2h = Pin Test: test parameter defines the pin test frequency in Hz within the range from 1 to 20 (Hz). A test parameter with a value of 0 means stop the pin test.

3h = Strobo function: this test allows running the feeder in presence of the stroboscope light.
Test parameter meaning:
0x00 = Strobo function OFF.
0x01 = Strobo function ON.

4h to FF = reserved

Test parameter: See the definition of test code above.

OBJECT DESCRIPTION

INDEX	**600Fh**
Name	feeder_test
Object Code	Array
Data Type	Unsigned16
Category	Optional

ENTRY DESCRIPTION

Sub-Index	0h
Description	number_of_entries
Entry Category	Mandatory
Access	ro
PDO Mapping	No
Value Range	1h to FEh
Default Value	No

Sub-Index	1h
Description	feeder_1
Entry Category	Mandatory
Access	rw
PDO Mapping	No
Value Range	See definitions above
Default Value	0h

Sub-Index	2h
Description	feeder_2
Entry Category	Optional
Access	rw
PDO Mapping	No
Value Range	See definitions above
Default Value	0h

to

Sub-Index	FEh
Description	feeder_254
Entry Category	Optional
Access	rw
PDO Mapping	No
Value Range	See definitions above
Default Value	0h

3.2.17 Object 6010h: feeder unwinding time

The feeder transmits this object to the loom controller by PDO service. This object is specific for pre-measuring feeders.

31 24	23 16	15
feeder selected	winding number	coil unwinding time

MSB

Feeder selected: The number of feeder, which is inserting the weft from 01h to FEh. Note that on jet weaving machines only one weft feeder is selected each time.

Winding number: The number of winding which has been inserted. Allowed value range: 1 to 50.

Coil unwinding time: Time of the last inserted winding in 0,1 ms.
The first pulse is the time from the trigger command to the first unwinding pulse. Allowed value range: 0 to 1000.

OBJECT DESCRIPTION

INDEX	**6010h**
Name	unwinding_time
Object Code	Variable
Data Type	Unsigned32
Category	Mandatory

ENTRY DESCRIPTION

Sub-Index	0h
Access	ro
PDO Mapping	Default
Value Range	See definitions above
Default Value	No

3.2.18 Object 6011h: system feeder number assignment

This object assigns a system feeder number to each feeder. The numbering is application-specific.

OBJECT DESCRIPTION

INDEX	**6011h**
Name	system_feeder_number_assignment
Object Code	Array
Data Type	Unsigned8
Category	Optional

ENTRY DESCRIPTION

Sub-Index	0h
Description	number_of_entries
Entry Category	Mandatory
Access	ro
PDO Mapping	No
Value Range	1h to FEh
Default Value	No

Sub-Index	1h
Description	feeder_1
Entry Category	Mandatory
Access	rw
PDO Mapping	No
Value Range	Unsigned8
Default Value	1h

Sub-Index	2h
Description	feeder_2
Entry Category	Optional
Access	rw
PDO Mapping	No
Value Range	Unsigned8
Default Value	2h

to

Sub-Index	FEh
Description	feeder_254
Entry Category	Optional
Access	rw
PDO Mapping	No
Value Range	Unsigned8
Default Value	254h

3.2.19 Object 6012h: feeder color assignment

This object assigns one color to each feeder. The values are application-specific.

OBJECT DESCRIPTION

INDEX	**6012h**
Name	feeder_color_assignment
Object Code	Array
Data Type	Unsigned8
Category	Optional

ENTRY DESCRIPTION

Sub-Index	0h
Description	number_of_entries
Entry Category	Mandatory
Access	ro
PDO Mapping	No
Value Range	1h to FEh
Default Value	No

Sub-Index	1h
Description	feeder_1
Entry Category	Mandatory
Access	rw
PDO Mapping	No
Value Range	Unsigned8
Default Value	1h

Sub-Index	2h
Description	feeder_2
Entry Category	Optional
Access	rw
PDO Mapping	No
Value Range	Unsigned8
Default Value	2h

to

Sub-Index	FEh
Description	feeder_254
Entry Category	Optional
Access	rw
PDO Mapping	No
Value Range	Unsigned8
Default Value	254h