

JX2-SV1
Version Update
from V. 1.43 to V. 1.48



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1 Introduction

Version Updates - Survey			
Version	Function	upgraded	corrected
JX2-SV1 V1.24	New technological function "Flying Shear"	✓	
	Registers for the positioning offset for technological functions in master-slave mode: Registers 1x139 and 1x595	✓	
	Register for speed limitation in the technological function "Follower Control": Register 1x503	✓	
	Releasing the slave from master-slave operation by means of the positioning command in the technological function "Follower Control"	✓	
	Overflow problem in the technological function "Follower Control", variant: Table		✓
	Overflow problem in the technological function "Follower Control", if an absolute encoder is used by the master.		✓
	A tracking error has occurred during the reference run		✓
JX2-SV1 V1.25	Technological function "Flying Shear"; immediate cutting.	✓	
JX2-SV1 V1.33	Technological function "Winding"	✓	
	The position of the spindle on the circumference is displayed		
	Offset of the traversing axis		
	"Jump at the Edge" function		
	Malfunctioning concerning the "Void Increments" function		✓
	The winding gradient during the winding process equals zero		✓
	Technological function "Follower Control", "Table Mode", "Handling of Overflows"		✓
	If a resolver error occurs, enable is switched off		✓
JX2-SV1 V1.40	Technological function "Winding"		
	The mathematical rounding in the turns counter can be switched off	✓	
	Digital winding functions properly again		✓

	<p>Technological function "Position control to the position of another module"</p> <p>The encoder can be switched during position control</p> <p>Position controller: The speed pre-control is scalable</p> <p>Digital offset in position feedback mode 0</p>	<p>✓</p> <p>✓</p>	<p>✓</p>
<p>JX2-SV1 V1.43</p>	<p>Technological function "Follower Control"</p> <p>Tracking error at power-up, if the master counter has had an overflow before.</p> <p>Overflow of the table could at times fail at processing the upper table.</p> <p>Relative positioning</p> <p>Issuing command 19 twice could lead to wrong positioning.</p> <p>Technological function "Position control to the position of another module"</p> <p>As of V. 1.40, there has been no overflow processing in relative positioning and endless mode.</p>		<p>✓</p> <p>✓</p> <p>✓</p>
<p>JX2-SV1 V1.48</p>	<p>Technological function "Winding"</p> <p>"Varying Winding Factors" function</p> <p>Displaying the winding direction</p>	<p>✓</p>	
	<p>At entering the "void increments", the axis will "jump".</p>		<p>✓</p>
	<p>Referencing by means of a bridge between K0 and K1</p>		<p>✓</p>
	<p>Driving by a very large digital offset</p>		<p>✓</p>

2 Expansions

2.1 New Functions within the "Winding" Category

2.1.1 "Varying Winding Factors" Function

By means of the "Varying Winding Factors" function, the traversing axis moves by an altered winding factor (travel of the traversing axis during one spindle revolution) at the end or the beginning of a layer. This way, the coil ends of certain winding materials can be handled more easily.

For each individual edge, a distance depending on the changed winding factor can be specified; this will influence the motion towards, and away, from this edge. The winding factors for these areas can also be defined individually.

There are eight new parameters for this function:
Registers 1x532 through 1x539

Register 1x532 Changed Winding Factor when Driving Towards the Positive Edge	
Function	Description
Read:	Present parameter value
Write:	New parameter value
Value range:	0 .. 8388607
Value after reset:	0

Register 1x536 Driving Distance Towards the Positive Edge at the Changed Winding Factor	
Function	Description
Read:	Present parameter value
Write:	New parameter value
Value range:	0 .. 8388607 increments (of the traversing axis)
Value after reset:	0

When the distance between the traverse axis and the positive edge (register 1x193) amounts to the number of increments set in register 1x536, the winding factor will be set to the value of register 1x532, until the traverse axis has reached the edge. This way, the transmission ratio between spindle and traverse axis is changed to the new value. The traverse axis will drive by the speed changed accordingly.

The value of register 1x536 specifies a distance; thus, it must always be positive.

Register 1x533 Changed Winding Factor when Driving Towards the Negative Edge	
Function	Description
Read:	Present parameter value
Write:	New parameter value
Value range:	0 .. 8388607
Value after reset:	0

Register 1x537 Driving Distance towards the Negative Edge at the Changed Winding Factor	
Function	Description
Read:	Present parameter value
Write:	New parameter value
Value range:	0 .. 8388607 increments (of the traversing axis)
Value after reset:	0

When the distance between the traverse axis and the negative edge (register 1x194) amounts to the number of increments set in register 1x537, the winding factor will be set to the value of register 1x533, until the traverse axis has reached the edge. This way, the transmission ratio between spindle and traverse axis is changed to the new value. The traverse axis will drive by the accordingly changed speed.
 The value of register 1x537 defines a distance; thus, it must always be positive.

Register 1x534 Changed Winding Factor when Driving Off the Positive Edge	
Function	Description
Read:	Present parameter value
Write:	New parameter value
Value range:	0 .. 8388607
Value after reset:	0

Register 1x538 Driving Distance Away from the Positive Edge at the Changed Winding Factor	
Function	Description
Read:	Present parameter value
Write:	New parameter value
Value range:	0 .. 8388607 increments (of the traversing axis)
Value after reset:	0

While the traverse axis is moving away from the positive edge (register 1x193) by the number of increments set in register 1x538, the winding factor is set to the value specified in register 1x534. This way, the transmission ratio between spindle and traverse axis is changed to the new value. The traverse axis will drive by the accordingly changed speed. As soon as the travel of the traversing axis away from the positive edge is greater than the distance set in register 1x538, the originally set winding factor will be activated again. The value of register 1x538 defines a distance; thus, it must always be positive.

Register 1x535 Changed Winding Factor when Driving Off the Negative Edge	
Function	Description
Read:	Present parameter value
Write:	New parameter value
Value range:	0 .. 8388607
Value after reset:	0

Register 1x539 Driving Distance Away from the Negative Edge at the Changed Winding Factor	
Function	Description
Read:	Present parameter value
Write:	New parameter value
Value range:	0 .. 8388607 increments (of the traversing axis)
Value after reset:	0

While the traverse axis is moving away from the positive edge (register 1x194) by the number of increments set in register 1x539, the winding factor is set to the value specified in register 1x535. This way, the transmission ratio between spindle and traverse axis is changed to the new value. The traverse axis will drive by the accordingly changed speed. As soon as the travel of the traversing axis away from the negative edge is greater than the distance set in register 1x539, the originally set winding factor will be activated again. The value of register 1x539 specifies a distance; thus, it must always be positive.

Command 86: Activating the "Varying Winding Factors" function (register 1x101 = 86)

Command 87: Deactivating the "Varying Winding Factors" function (register 1x101 = 87)

Each of these commands is valid, until the other one is issued. If the winding function is not active, command 86 will not be of any effect either.

Remarks!

- Commands 86 and 87 may only be issued, while the traversing axis is not in the travel range defined by one of the distances (register 1x536 through 1x537).
- The ranges for the changed winding factors, which have been defined by the distances (register 1x536 through 1x537), must not overlap. This means that the

range set in registers 1x193 through 1x538 must be greater than the range set in registers 1x194 and 1x537. The same applies to the range set in registers 1x194 through 1x539; it must be greater than the range set in registers 1x193 and 1x536.

- All values in registers 1x532 through 1x539 must be either zero or positive values.
- If one distance (register 1x536 – register 1x539) of zero has been set, the respective "Varying Winding Factors" function is not active. If all four distances have been set to zero, the "Varying Winding Factors" function should be deactivated (command 87).
- During the winding process, all resulting speeds of the traversing axis are limited via register 1x103. For this reason, please make sure that the value of this register is great enough for all set speeds resulting from the speed of the spindle axis and the winding factors.
- In register 1x156, the respectively actual value of the winding factor is displayed.

Interaction with the "Void Increments" parameter (register 1x188)

The "Varying Winding Factors" function interacting with the delay function can also be made use of by means of void increments at the edge of the coil.

Interaction with the offset during the winding process (register 1x139)

The same way, the "Varying Winding Factors" function interacting with the offset can also be made use of during winding.

If all functions are being made use of, the following path might result, for example, when driving towards the positive edge:

The traversing axis is driving by winding factor (x) having been set via register 1x156. When there is still a distance from the edge of the number of increments specified in register 1x536, the winding factor is changed to the value specified in register 1x532. At the edge, the traversing axis will stand still during the time the spindle elements defined in register 1x188 are being covered. Then, the traversing axis will drive away from the edge by twice the offset value (register 1x139) at the greatest possible speed; then it continues by the winding factor defined in register 1x534. When the traversing axis has driven away from the positive edge by the number of increments defined in register 1x538, winding factor (x) is set again.

Example

In the table below, the functioning principle will be illustrated once more:

Positive edge (1x193) = 14000
 Negative edge (1x194) = 2000

Void increments (1x188) = 5000

"Varying Winding Factors" when driving towards the positive edge

Register 1x532 = 900
 Register 1x536 = 2000

"Varying Winding Factors" when driving away from the positive edge

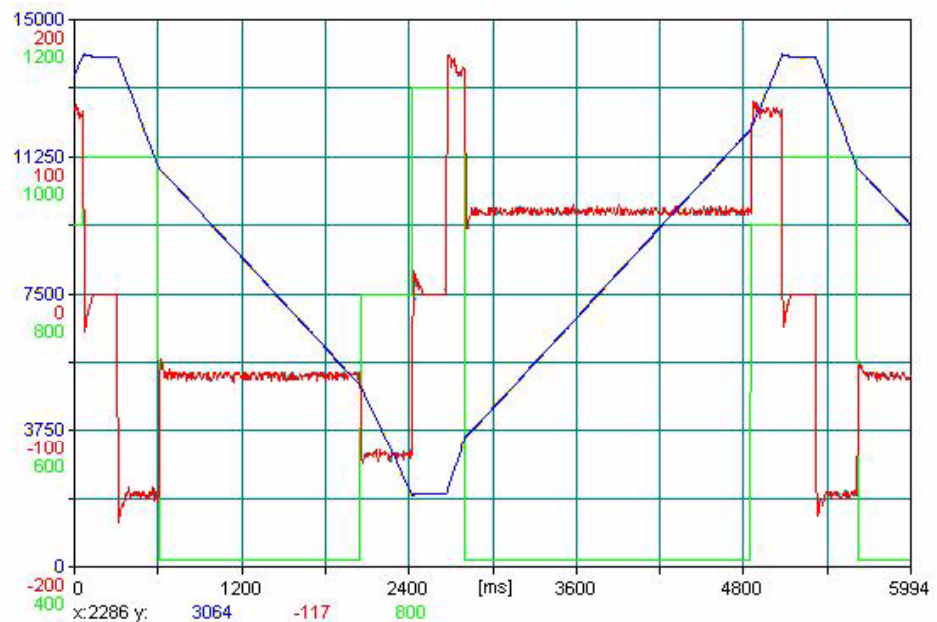
Register 1x534 = 1000
 Register 1x538 = 3000

"Varying Winding Factors" when driving towards the negative edge

Register 1x533 = 800
 Register 1x537 = 3000

"Varying Winding Factors" when driving away from the negative edge

Register 1x535 = 1100
 Register 1x539 = 1500



blue = position (register 1x109)
 red = speed (register 1x112)
 green = winding factor (register 1x156)

The above diagram illustrates, how the speed is adjusted to each change of the winding factor. When the traversing axis has reached the edge, it stands still, until the respective void increments have been covered.

2.1.2 The Direction of the Traversing Axis

There exists a new register now, out of which the present direction of the traversing axis can be read.

Register 1x531 The Direction of the Traversing Axis	
Function	Description
Read:	Present parameter value
Write:	illegal
Value range:	0 .. 2
Value after reset:	0

Meaning of the values:

- Register 1x531 = 0: The axis is not in the winding mode
- Register 1x531 = 1: The axis is driving towards the positive edge
- Register 1x531 = 2: The axis is driving towards the negative edge

3 Eliminated Software Bugs

3.1 At Entering the "Void Increments", the Axis will "Jump".

When the traversing axis is in "winding" function, it will jerk, if the void increments register 1x188 has been written into during the winding process the distance between axis and edge being greater than the new value written into register 1x188. The axis covers a distance that approximately equals the value written into register 1x188. This error has occurred since version 1.33.

3.2 Referencing by means of a Bridge between K0 and K1

If fine referencing (referencing without the index impulse (K0) of the incremental encoder sent only towards the reference switch signal) is not necessary, and if the reference switch signal has been given, the index signal can be bridged by an encoder track (K1 or K2), in order to very quickly receive an edge signal at the index input.

When in the former version referencing was to be carried out this way for the second time after power-up, the reference would not be recognized any more.

3.3 Driving by Very High Digital Offset

If in mode zero the digital offset (register 1x108) had been set to a very high value, and the axis was in a positioning run already, it would jerk at writing the set speed into register 1x103. (This behaviour would not occur, if the axis was at a standstill during writing the set speed into the register, or if the value of the digital offset was correspondingly small.)