

Overview over the changes and new functionality of Motion Controller V3.0 firmware revision K (compared to J).

Changes and fixes

No.	Affected Component	Change Description
1	Touch-probe	<p>The touch-probe positions</p> <p>0x60BA Touch probe 1 positive edge 0x60BB Touch probe 1 negative edge 0x60BC Touch probe 2 positive edge 0x60BD Touch probe 2 negative edge</p> <p>Are now captured using the scaling of the factor group.</p> <p>Up to firmware revision J the internal values had been used.</p>
2	Profile Generator	<p>Improved calculation of the motion profile</p> <p>Will reduce the residual speed when reaching the target position significantly.</p> <ul style="list-style-type: none"> • Reduced transient time • Reduced overshoot
3	Boot behavior	<p>In case of a non-readable parameter section the drive will automatically restore the factory parameters. A red blink code at the stats LED will signal the state:</p> <ul style="list-style-type: none"> • Flashes red 1 – 3 times: device is severely damaged and will have to be returned • Flashes red 4 times: factory parameters have been restored <p>After a boot problem has been identified and the blink code has been signaled the drive will automatically switch into bootloader mode after a reset.</p> <p>After a next reset the device will one again boot into the firmware and needs to be reconfigured as any configuration is lost.</p>
4	Behavior with U_{mot} missing	<p>A missing motor supply voltage is now treated as severe error and will lead to an immediate shutdown of the power stage. It is therefore no longer possible to select the type of state change under such a condition.</p> <p>In cases where the power stage remained active without U_{mot} the power stage of the MCs was damaged in certain cases when the supply was switched on again.</p> <p>If a missing motors supply shall not be treated as an error, the lower threshold can be reduced to 0. In such a case there still is the risk of burning the controller.</p>

5	Calculation of commutation angle when using D-Hall & Encoder for sinusoidal commutation	The commutation angle was calculated wrong when the raw position counter of the motor encoder had an overflow at the 32 bit limit. .This is fixed. This is a critical update. Not updating and using D-Hall +IE in endless mode can damage the controller or the motor.
6	Support of multi turn encoders	Absolute position was lost after a rest to the EtherCAT init state.
7	PWMin with no input connected	When no external input connected the PWM input resulted in 100%. There are internal pull-down resistors configured now which lead to 0%.

New Functions

No.	Affected Component	Description
1	MotorEncoder RefEncoder	<p>Added an object 2315.08 / 2316.08 to access the encoder speed directly – independently from its use in the control loop.</p> <p>This is the encoder speed in min^{-1}.</p> <p>Additionally this speed can be filtered using entry 0x2315.09 / 0x2316.09.</p>
2	Hall-Filter	<p>In products with an switchable filter at hall-inputs the default setting:</p> <ul style="list-style-type: none"> • Activated for A-Hall • Deactivated for D-Hall <p>Can now be configured manually too:</p> <p>0x2318.05:</p> <ul style="list-style-type: none"> • Bit 0 = 1: force manual filter configuration • Bit 1 = 1: filter is enabled
3	BASIC	<p>Max program size</p> <p>Increased buffer size of the scripting environment. Up to 16100 bytes can be used. Object 0x3001.0A can be used to rea the available memory of the device.</p>
4	BASIC	<p>Bit wise XOR added</p> <p>$C = a \wedge b$ will exor the two values. a, b are signed 32 bit values.</p>
5	BASIC	<p>Encrypted variable access</p> <p>Access to the variables a ... z via 0x3005 can be encrypted via a access key.</p> <p>Access key is stored in object 0x300F.00 and is treated as a unsigned 32 bit value.</p> <p>Any read or write access to one of the variables via 0x3005 is XORed with the contents of the access key. The default access key is 0 – which does not change the contents of any variable.</p>
6	BASIC	<p>Interface Parameters</p> <p>Objects 0x3010.0110 can store up to 16 free parameters which can be use to tailor the behavior of a script without having to change the script itself. The values can be stored via a save all or save application parameters access. Default value of the parameters is 0.</p>