Overview of the changes and new functionality of Motion Controller V3.0 firmware revision N (compared to M).

Changes and fixes

No.	Affected Component	Change Description
1	Reference Encoder as actual speed source	When using an additional incremental encoder (DigIn 1 – DigIn 3) – the actual speed sign is influenced by the sign of the gain of the reference encoder (0x2316.04).
2	Linear motors	Support of sin/cos interface of Faulhaber linear motors
3	Limit Switches	Motor is stopped when both switches are activated (broken cable).
4	Positioning via Pulse / Direction	Counting direction corrected.
5	Temperature Error	If the temperature shutdown threshold is exceeded, a temperature error is indicated in the device status word.

New Functions

No.	Affected Component	Description
1	IoT Ready	IoT ready: Recording and preprocessing of any recordable signal. Key-values like absolute min/max, min, max, mean or even rms of any recordable signal like a motor current can be configured to be computed after either a specific time or after a configured number or motors turns. Thus data bandwidth can be significantly reduced when observing the **State of Health** of a drive or driven application.
2	Status Word	An error bit is assigned to bit 8 of the status word (0x6041.00). Errors to be flagged can be selected via a mask (0x2321.07) based on the Faulhaber error register (0x2320.00).
3	OEM strings	There are strings available to label the final product: 0x2610.01: OEM Product Name (string) 0x2610.02: OEM Product Id (string) 0x2610.03: OEM Serial Nr (uint32)
4	Digital Inputs	Added a mask (0x2310.0F) to select the used digital inputs. The ones selected are evaluated by the controller as digital inputs. The default setting of the mask selects all digital inputs. This is a helpful feature when using a multi-function I/Os pin making sure only to read the digital input when not used otherwise.
5	New product IMC	The actual current of the integrated Motion Controller IMC is calculated based on a motor model, providing an even better current feedback than the previously used current measurement.