AKD Firmware Release Notes



These release notes for the AKD drive firmware (the software that executes inside the AKD drive) describe the changes between the previous firmware releases and this release.

Kollmorgen provides different firmware files for each model type. Use the file that matches the model number of your drive. For example, with a Base Analog drive with a model number like AKD-Bxxxxx-NAAN-0000, use the firmware file AKD-B-NAAN-V01-05-00-000.i00.

WorkBench is compatible with all previous AKD firmware versions. WorkBench forward compatibility, however, cannot be ensured. When a behavior in the firmware changes, an older WorkBench version may not function correctly with the new firmware. Kollmorgen recommends that you update WorkBench when you install new firmware.

Note: AKD-P/-B/-T/-M NAxx variants are supported up to firmware version **1.14.00.002**.

Release Summaries

Version: 01-24-00-001, October 14, 2024
+ General Issues
+ Feedback Issues
+ Tuning Issues

Version: 01-23-01-000, April 03, 2024
+ General Issues
+ Field Bus Specific Issues
+ Feedback Issues

Version: 01-23-00-000, October 12, 2023
+ General Issues

Version: 01-22-01-000, July 07, 2023
+ Field Bus Specific Issues
+ General Issues
+ Feedback Issues

Version: 01-22-00-000, October 13, 2022
+ General Issues
+ Feedback Issues

Version: 01-21-03-000, July 26, 2022
+ Field Bus Specific Issues

Version: 01-21-02-000, May 23, 2022
+ Feedback Issues
+ General Issues
+ Motion Tasking Issues

Version: 01-21-01-000, November 17, 2021
+ Feedback Issues
+ General Issues
+ Field Bus Specific Issues

Version: 01-21-00-000, October 15, 2021
+ General Issues
+ Service Motion Issues
+ BASIC Issues
+ Field Bus Specific Issues

Version: 01-20-04-000, July 09, 2021
+ Field Bus Specific Issues
+ Motion Tasking Issues
+ Feedback Issues
+ General Issues

Version: 01-24-00-001 Release Date: October 14, 2024

General Issues

New Features

- **Allow enabling using Network Cyclic Feedback without Wake and Shake (77151,S-25055)**
  New Feature Details:
  When using Network Cyclic Feedback to commutate, enabling an axis required executing Wake and Shake.

  Solution:
  The firmware has been changed, so that WS.FORCEOFF now also affects Network Cyclic Feedback.

Fixed Bugs

- **Bode Inject Point does not reset excitation (D-09771)**
  Issue:
  If BODE.INJECTPOINT was 0 before a tuning measurement, the value would be restored after abortion. When it was restored to 0, the current excitation was left at whatever excitation it was before, so the motor could spin for ever, if drive was not disabled.

  Solution:
  The motor is stopped immediately, the excitation is zeroed.

Feedback Issues

New Features

- **Additional value for MOTOR.RSOURCE forcing motor temperature to be read digitally from the encoder. (77147,S-25058)**
  New Feature Details:
  When MOTOR.RSOURCE was set to 1, the drive would only attempt to read the motor temperature digitally from the encoder if firmware determined that the encoder supports transmitting temperature values. For some EnDat encoders, that do support temperature measurement, the firmware incorrectly assumed it was not supported.

  Solution:
  MOTOR.RSOURCE can now be set to 2 to force the motor temperature to be read from the encoder, even if firmware assumes the encoder does not support it.

- **Support for SFD-M encoders (S-25246)**
  New Feature Details:
  Firmware now supports SFD-M encoders, selectable as a new type 47 in FB1.SELECT. Even though the encoder supports up to 16 bits of multiturn information, the implementation is currently limited to only use 12.

Fixed Bugs

- **FB1.EXTENDEDMULTİTURN could not be enabled using a BiSS-C encoder (78827,S-25214)**
  Issue:
  Enabling FB1.EXTENDEDMULTİTURN requires using an encoder with exactly 12 bit of multiturn. For BiSS-C encoders, firmware did not calculate the number of multiturn bits, so FB1.EXTENDEDMULTITURN could never be enabled.

  Solution:
  Firmware will now calculate the number of multiturn bits from the encoder resolution in FB1.ENCRES.

Tuning Issues

New Features

- **New cogging compensation mechanism (S-25192)**
  New Feature Details:
  A new mechanism for cogging compensation has been implemented. Three sine waves can be defined by their frequency (COGCOMPH.Nx), amplitude (COGCOMPH.Ax) and phase offset (COGCOMPH.Px). Executing COGCOMPH.CALCTABLE will calculate a cogging compensation table from the three configured sine waves. Values from that table will be applied to the current command, if COGCOMPH.EN is 1. If MOTOR.AUTOSET is enabled and cogging compensation data is stored in the motor memory, these parameters will be configured automatically.

+ Service Motion Issues

Version: 01-20-03-000, February 15, 2021
+ Field Bus Specific Issues
+ Feedback Issues

Version: 01-20-02-000, December 22, 2020
+ Feedback Issues
+ BASIC Issues
+ Field Bus Specific Issues

Version: 01-20-01-000, November 26, 2020
+ IO Issues
+ Field Bus Specific Issues

Version: 01-20-00-001, October 27, 2020
+ Feedback Issues

Version: 01-19-06-000, September 18, 2020
+ IO Issues
+ Field Bus Specific Issues
+ Feedback Issues
+ Homing Issues
+ General Issues

Version: 01-19-05-000, July 29, 2020
+ Feedback Issues
+ Field Bus Specific Issues
+ General Issues

Version: 01-19-04-000, July 03, 2020
+ Field Bus Specific Issues
+ IO Issues
+ Feedback Issues

Version: 01-19-03-000, April 29, 2020
+ Feedback Issues
+ Field Bus Specific Issues

Version: 01-19-02-000, March 13, 2020
+ Feedback Issues
+ General Issues
+ Field Bus Specific Issues

Version: 01-19-01-000, January 14, 2020
+ General Issues

Version: 01-19-00-002, December 05, 2019
+ General Issues

Version: 01-19-00-001, November 13, 2019
+ Feedback Issues

Version: 01-19-00-000, November 08, 2019
+ Feedback Issues

Version: 01-18-08-000, October 30, 2019
+ General Issues
+ Field Bus Specific Issues
+ Feedback Issues

Version: 01-23-01-000 Release Date: April 03, 2024

General Issues

Fixed Bugs

- **Delay of Relay Control (D-09605)**
  Solution:
  A delay for relay control was introduced. This solved the problem with encoder emulation. Due to initialization of the encoder emulation there are some encoder pulses on the output. The relay output has to be delayed until the initialisation is finished.

Field Bus Specific Issues

New Features

- **Add MOTOR.LDLL, MOTOR.LISAT, MOTOR.PHSADVK1, MOTOR.PHSADVK2 and MOTOR.IDMAX to CANopen object dictionary (S-24760)**
  New Feature Details:
  The parameters MOTOR.LDLL, MOTOR.LISAT, MOTOR.PHSADVK1, MOTOR.PHSADVK2 and MOTOR.IDMAX were not available via direct SDO access in CANopen

  Solution:
  These objects have been implemented:

CANopen-name	index/subindex	Parameter connected
MOTOR.LDLLM	537Ch sub 0h	MOTOR.LDLL
MOTOR.LISATM	537Dh sub 0h	MOTOR.LISAT
MOTOR.IDMAXM	537Eh sub 0h	MOTOR.IDMAX
MOTOR.PHSADVK1M	537Fh sub 0h	MOTOR.PHSADVK1
MOTOR.PHSADVK2M	5380h sub 0h	MOTOR.PHSADVK2

Feedback Issues

Fixed Bugs

- **Incorrect multiturn position after SFD had been configured. (S-24839)**
  Issue:
  Multiturn bits for all feedbacks were set to 0 when SFD had been configured once before.

  Solution:
  Firmware has been changed so that multiturn bits are no longer set to 0 for all feedbacks after SFD had been selected.

- **Incorrect initial position of rotary Hiperface encoder with resolution that's not a power of two (S-24977)**
  Issue:
  When using a rotary Hiperface encoder that with a resolution that is not a power of two, the firmware did not properly calculate the encoder position from the absolute and incremental positions.

  Solution:
  The firmware now correctly calculates the initial position of a rotary Hiperface encoder with a resolution that's not a power of two.

Version: 01-23-00-000 Release Date: October 12, 2023

General Issues

Fixed Bugs

- **Velocity dropping to 0 when homing with enabled position command filter. (11239,D-09527)**
  Issue:
  If the position command filter was enabled (PL.FILTERTIME > 0), the velocity command was instantly dropping to zero, when a homing procedure found the home position. This led to issues in homing modes, where the motor is moving when the home position is found, e.g. homing to a limit switch.

  Solution:
  The position command filter will now be suspended as soon as the home position is found, for as long as the homing is in progress.

- **DRV.DIR for cogging compensation not working properly (D-09565)**
  Issue:
  Cogging table is working properly only for the same counting direction DRV.DIR as during the table generation

  Solution:
  New parameter COGCOMP.DIRMODE=1 activates a new mode for generating/using the cogging table. With this setting cogging table is independent of the counting direction.

New Features

- **Add CANopen objects for FBx.DIR (11210,S-23971)**
  New Feature Details:
  The user missed an object for accessing FB1.DIR

  Solution:
  The following objects have been implemented:

CANopen-name	Parameter connected	Object (index/subindex))
Polarity	DRV.DIR	0x607E sub 0
1st sensor inversion	FB1.DIR	0x60F1 sub 1

Version: 1-18-07-000, September 10, 2019
+ General Issues
+ IO Issues
+ Field Bus Specific Issues
+ Feedback Issues

Version: 1-18-06-002, July 31, 2019
+ General Issues

Version: 1-18-06-001, July 29, 2019
+ General Issues
+ Motion Tasking Issues
+ Tuning Issues
+ IO Issues
+ Field Bus Specific Issues

Version: 1-18-05-000, July 08, 2019
+ Field Bus Specific Issues
+ General Issues
+ IO Issues

Version: 1-18-04-000, June 04, 2019
+ General Issues
+ Field Bus Specific Issues
+ Feedback Issues

Version: 1-18-03-000, April 29, 2019
+ Service Motion Issues
+ Feedback Issues
+ Field Bus Specific Issues

Version: 1-18-02-000, March 28, 2019
+ General Issues
+ Field Bus Specific Issues
+ Feedback Issues
+ Tuning Issues

Version: 1-18-01-000, February 12, 2019
+ Field Bus Specific Issues
+ General Issues
+ Feedback Issues
+ IO Issues
+ Tuning Issues

Version: 1-18-00-005, January 10, 2019
+ General Issues

Version: 1-18-00-004, October 31, 2018
+ General Issues

Version: 1-18-00-003, October 23, 2018
+ Field Bus Specific Issues

Version: 1-18-00-002, October 19, 2018
+ Field Bus Specific Issues

Version: 1-18-00-001, October 15, 2018
+ General Issues

Version: 01-18-00-000, October 12, 2018
+ IO Issues
+ Feedback Issues

2nd sensor inversion	FB2.DIR (not AKD-N)	0x60F1 sub 2
3rd sensor inversion	FB3.DIR (only AKD-P)	0x60F1 sub 3

Beside that following objects have been implemented:

CANopen-name	Parameter connected	Object (index/subindex))
FB1.HALLVELLIMITM	FB1.HALLVELLIMIT	0x5496 sub 0
COGCOMP_DIRMODEM	COGCOMP_DIRMODE	0x64C1 sub 0

- **Added 8 virtual outputs with fieldbus support (S-24148)**
  New Feature Details:
  The number of digital outputs is not sufficient.

  Solution:
  Virtual, i.e. not hardware-dependent, digital outputs can be used to get drive information or to communicate via fieldbusses.

Version: 01-22-01-000 Release Date: July 07, 2023

Field Bus Specific Issues

New Features

- **New virtual inputs (similar to digital HW inputs) added for fieldbus access (S-24147)**
  Solution:
  A new functionality was introduced: 8 virtual inputs can be controlled via various fieldbuses (CANopen, EtherCAT, Modbus etc.). The virtual inputs have the same function set as the hardware digital inputs, however can be easily accessed via fieldbus. The user is also able to map the signal into cyclic data and therefore achieves a very fast reaction time of the input function to execute.

  The following keywords have been added:

  - VDINx.MODE: Select the virtual input mode.
  - VDINx.PARAM: Optional configuration parameter.
  - VDINx.INV: Polarity of of the selected virtual input.
  - VDINx.STATE: Returns the selected virtual input state.
  - VDIN.STATES: Returns all virtual inputs states.

  The keywords can be accessed via acyclic channel like SDO for CANopen/EtherCAT.
  In addition, the VDIN.STATES can be mapped and read via cyclic data (TXPDO for CANopen/EtherCAT) and be written cyclically to activate functions (RXPDO for CANopen/EtherCAT).

Fixed Bugs

- **IL.CMDACC not scaled properly for FBUS.INTERPOLATEMODE 1 (11195,D-09307)**
  Issue:
  The calculated IL.CMDACC in a jog move controlled via EtherCAT was too low and dependent on the fieldbus cycle time.

  Solution:
  The IL.CMDACC shows now the correct median value and is not dependent on the fieldbus cycle time any more.

General Issues

Fixed Bugs

- **Secondary feedback power supply not turned off when overcurrent fault happens on AKD-P-FDCN drives (D-09443)**
  Issue:
  When an overcurrent fault is detected on the secondary feedback power supply of an AKD-P-FDCN drive, the supply should be turned off, but wasn't.

  Solution:
  The secondary feedback power supply is now correctly turned off, when an overcurrent fault is detected on an AKD-P-FDCN drive.

Feedback Issues

Fixed Bugs

- **Intermittent SFD failure (F413) at initialization of SFD 3 encoder (S-24380)**
  Issue:
  On certain machine configuration, the initialization of the SFD 3 encoder fails intermittently and creates a F413 drive fault.

  Solution:
  The drive initialization sequence for SFD 3 has been updated to make it more robust.

  Temporary Workaround:
  Clear the drive error F413, which will trigger the re-initialization of the SFD 3 encoder. Also please check proper connection of the feedback cable to the drive.

Version: 01-22-00-000 Release Date: October 13, 2022

General Issues

Fixed Bugs

- **Motor temperature not read if no feedback selected on feedback 1 (11189,D-09284)**

+ General Issues
+ Field Bus Specific Issues

Version: 01-17-06-000, July 30, 2018
+ General Issues
+ Field Bus Specific Issues
+ Feedback Issues
+ Homing Issues
+ IO Issues
+ Brake Issues

Version: 01-17-05-000, April 23, 2018
+ Tuning Issues
+ General Issues
+ IO Issues
+ Field Bus Specific Issues
+ Feedback Issues

Version: 01-17-04-000, March 16, 2018
+ Field Bus Specific Issues
+ Homing Issues
+ Feedback Issues

Version: 01-17-03-000, February 28, 2018
+ General Issues
+ Field Bus Specific Issues

Version: 01-17-02-001, January 23, 2018
+ Motion Tasking Issues
+ General Issues
+ Field Bus Specific Issues

Version: 01-17-01-000, December 15, 2017
+ Field Bus Specific Issues
+ Brake Issues
+ General Issues
+ IO Issues

Version: 01-17-00-000, October 13, 2017
+ Field Bus Specific Issues
+ General Issues

Version: 01-16-08-000, September 25, 2017
+ Field Bus Specific Issues

Version: 01-16-07-000, August 31, 2017
+ General Issues
+ Field Bus Specific Issues

Version: 01-16-06-000, August 21, 2017
+ Field Bus Specific Issues

Version: 01-16-05-000, August 09, 2017
+ General Issues
+ Tuning Issues
+ Feedback Issues
+ Field Bus Specific Issues

Version: 01-16-04-000, June 09, 2017
+ General Issues

Issue:
When no feedback was selected on feedback 1, the firmware did not try to determine the motor temperature from a resistance connected to the drive's feedback connector. MOTOR.TEMP was fixed at 0 Ohm.

Solution:
The firmware now tries to determine the motor temperature from the resistance connected to the drive's feedback connector, even when no feedback is selected on feedback 1. In the unlikely case, that MOTOR.RTYPE is not set to 127 (No sensor) but no resistance is connected, this may cause a fault, that was not triggered with previous firmware versions. MOTOR.RTYPE needs to be set to 127 in that case.

Feedback Issues

Fixed Bugs

- **Absolute position lost when re-initializing feedback 3. (11203,D-09355)**
  Issue:
  When using an absolute EnDat 2.2 encoder as feedback 3, re-initializing the encoder by clearing a fault on feedback 3 or by writing to DRV.EMUEMODE caused the drive to not correctly determine the encoder's absolute position.

  Solution:
  The drive now correctly reads the absolute position from an EnDat 2.2 encoder used as feedback 3 when the feedback is re-initialized.

Version: 01-21-03-000 Release Date: July 26, 2022

Field Bus Specific Issues

Fixed Bugs

- **DS402: Old fieldbus velocity command active when re-enabling after a controlled stop (D-09250)**
  Issue:
  When the drive executed a controlled stop, the fieldbus velocity command that was set when the controlled stop was started, was used by the drive when re-enabling after the controlled stop was finished, even if a different velocity command had been set in the meantime.

  Solution:
  The firmware now uses the correct fieldbus velocity command when re-enabling after a controlled stop.

Version: 01-21-02-000 Release Date: May 23, 2022

Feedback Issues

Fixed Bugs

- **FB1.ENCRES not calculated for high resolution linear EnDat 2.2 encoders (11148,D-09103)**
  Issue:
  The firmware was not calculating FB1.ENCRES for certain high resolution linear EnDat 2.2 encoders (e.g. Heidenhain LIP 21).

  Solution:
  The firmware has been changed to also calculate FB1.ENCRES for these high resolution linear EnDat 2.2 encoders.

- **Feedback 3 could be selected as IL.FBSOURCE even when drive did not support feedback 3 (D-09190)**
  Issue:
  Some drive variants don't support feedback 3, but IL.FBSOURCE could still be set to feedback 3.

  Solution:
  IL.FBSOURCE can no longer be set to feedback 3, if feedback 3 is not supported by the drive.

- **Intermittent analog signal amplitude faults when initializing feedbacks (11159,S-23327)**
  Issue:
  When initializing encoders with analog signals, the firmware would sometimes create an analog signal amplitude fault, even though the encoder worked fine after clearing the fault.

  Solution:
  The initialization sequence for encoders with analog signals has been made more robust against intermittent analog signal amplitude faults.

General Issues

Fixed Bugs

- **IL.MIFOLD stuck at low values with small MOTOR.CTF0 (11150,D-09114)**
  Issue:
  With MOTOR.CTF0 set to a small value, IL.MIFOLD could get stuck at low values, not increasing again, even if the actual current supplied to the motor was below the motor's continuous current rating.

  Solution:
  IL.MIFOLD now correctly increases with small MOTOR.CTF0 values when the actual current to the motor is below the motor's continuous current rating.

- **Incorrect formatting of scope header when configured with gaps in between channels (11155,D-09154)**
  Issue:
  When there was an unused channel in the channel definitions for the scope, the scope could not reload the recording because channel names were written without comma in the feed back to the commands REC.RECEIVEHDR and REC.RETRIEVE

  Solution:
  The comma separation between channel names works now correctly. One comma between every defined channel name, no extra commas for gaps.

+ Feedback Issues

Version: 01-16-03-000, May 15, 2017
+ General Issues
+ Feedback Issues

Version: 01-16-02-000, May 05, 2017
+ General Issues
+ Motion Tasking Issues
+ Field Bus Specific Issues
+ IO Issues
+ Feedback Issues

Version: 01-16-01-000, March 24, 2017
+ General Issues
+ Feedback Issues

Version: 01-16-00-001, March 20, 2017
+ Homing Issues
+ Field Bus Specific Issues

Version: 01-16-00-000, February 21, 2017
+ Field Bus Specific Issues

Version: 01-15-06-000, February 09, 2017
+ General Issues

Version: 01-15-05-000, February 01, 2017
+ Field Bus Specific Issues
+ General Issues
+ Feedback Issues

Version: 01-15-04-000, December 06, 2016
+ General Issues
+ Field Bus Specific Issues
+ Service Motion Issues

Version: 01-15-03-000, November 24, 2016
+ Field Bus Specific Issues
+ BASIC Issues
+ General Issues

Version: 01-15-02-000, October 17, 2016
+ Feedback Issues
+ General Issues

Version: 01-15-01-000, October 06, 2016
+ General Issues
+ Tuning Issues
+ Field Bus Specific Issues
+ IO Issues
+ Feedback Issues
+ Service Motion Issues
+ BASIC Issues

Version: 01-15-00-000, July 29, 2016
+ Field Bus Specific Issues
+ Motion Tasking Issues

Version: 01-14-06-001, June 17, 2016
+ Field Bus Specific Issues

Motion Tasking Issues

Fixed Bugs

- **Incorrect trajectory when blending motion tasks that move in different directions (11145,D-09094)**
  Issue:
  When two motion tasks are configured to blend into each other, the trajectory does not decelerate to reach zero velocity at the first task's target position. That lead to an issue when the two tasks were moving into opposite directions: The trajectory would only decelerate after reaching the first task's target position, which lead to a significant overshoot.

  Solution:
  When the motion tasks to be blended are going in different directions, it is not feasible to move at the first task's velocity until reaching its target position. Thus, in this case, the firmware has been changed to decelerate so that the trajectory reaches zero velocity at the first motion task's target position and then start the second motion task.

Version: 01-21-01-000 Release Date: November 17, 2021

Feedback Issues

Fixed Bugs

- **Commutation not working after reboot when using Tamagawa feedback (D-09058)**
  Issue:
  After rebooting a drive using a Tamagawa feedback MOTOR.PHASE was not correctly restored to a previously stored value. Reading MOTOR.PHASE showed the correct value but internally the drive was operating with an incorrect phase.

  Solution:
  The drive now correctly restores MOTOR.PHASE when using a Tamagawa feedback.

General Issues

Feature Changes

- **Supply MKD-C with DC through mains supply connection (D-09040)**
  Issue:
  VBUS.DCOPERATION could be set to 1 to configure an MKD-C to be supplied with DC. It was assumed that the DC supply was connected to the DC link connector. When connecting the DC supply to the mains supply connector instead, the inrush relay did not close and the bus was not charged.

  Solution:
  VBUS.DCOPERATION 1 now behaves consistently with how it works on AKD-C, i.e. a connection of the supply to the mains supply connector is assumed. Additionally, VBUS.DCOPERATION can now be set to 2 on MKD-C to configure it for a DC supply connected to the DC link connector.

Field Bus Specific Issues

Fixed Bugs

- **Object 6072h did not work in fixed PDO 0x1725 on AKD-P (11134,D-09074)**
  Issue:
  The customer used the fixed mapping 0x1725 with EtherCAT, but the torque limits were always set to 0 after getting into OP-state, the written torque set-point was not applied.

  Solution:
  By accident the object 0x3470 sub 3 was taken out of the fixed mapping 0x1725, so the setpoint for torque limitation was shifted to that position in the PDO. Object 0x3470 is reintroduced now and the object 0x6072 works as in former versions.

- **DS402: Object 60F4h overflow error with big following error (11135,D-09075)**
  Issue:
  In a test case with setting torque limit to 0 and applying position commands via EtherCAT the visible following error via object 60F4h rose over two motor revolutions and then switched over from a positive value to a negative value.

  Solution:
  The scaling and so the overflow issue for the following error via pdo-access to 60F4h is fixed and identical to the position scaling for object 6064h.

Version: 01-21-00-000 Release Date: October 15, 2021

General Issues

Fixed Bugs

- **FB1.P, FB2.P and FB3.P scaled incorrectly in recorder data (11095,D-08957)**
  Issue:
  When recording FB1.P. FB2.P or FB3.P, their values were scaled using UNIT.PROTARY/LINEAR instead of FB1.PUNIT, FB2.PUNIT and FB3.PUNIT.

  Solution:
  FB1.P. FB2.P and FB3.P values are now scaled correctly in recorder data.

- **[EtherCAT] - RevisionNo has been used twice with different content in AKD-C ESI-file (11113,D-08992)**
  Issue:
  If a customer wants to use ECAT.LEGACYREV = 0, two devices with the RevisioNo 0x001E0000 were shown. Can be an issue with EtherCAT-masters.

  Solution:
  Firmware and ESI-file are corrected. RevisionNo is now 0x001F0000.

+ Feedback Issues
+ General Issues

Version: 01-14-05-000, May 06, 2016
+ Field Bus Specific Issues
+ General Issues
+ Feedback Issues

Version: 01-14-04-000, April 21, 2016
+ Field Bus Specific Issues
+ General Issues

Version: 01-14-03-000, April 11, 2016
+ Field Bus Specific Issues
+ General Issues
+ BASIC Issues
+ Motion Tasking Issues

Version: 01-14-02-000, February 24, 2016
+ Homing Issues
+ Brake Issues
+ General Issues

Version: 01-14-01-000, February 04, 2016

Version: 01-14-00-003, February 03, 2016
+ IO Issues
+ Field Bus Specific Issues
+ General Issues
+ BASIC Issues

Version: 01-14-00-002, December 08, 2015
+ General Issues
+ Field Bus Specific Issues

Version: 01-14-00-001, November 30, 2015
+ Feedback Issues
+ Field Bus Specific Issues
+ Brake Issues
+ General Issues

Version: 01-14-00-000, November 17, 2015
+ Field Bus Specific Issues
+ General Issues

Version: 01-13-12-000, November 11, 2015
+ General Issues
+ Brake Issues
+ Field Bus Specific Issues
+ Feedback Issues

Version: 01-13-11-000, September 29, 2015
+ General Issues
+ Field Bus Specific Issues

Version: 01-13-10-001, August 07, 2015
+ Feedback Issues
+ General Issues
+ Field Bus Specific Issues

- **Minimum and maximum values in DRV.HELP output for VL.LIMITP and VL.LIMITN inconsistent with actual limits (11109,D-08988)**

  Issue:
  When using an open loop induction motor (MOTOR.TYPE 2) the commutation frequency is limited to 599Hz and this limit is checked in addition to the keywords' general limit of 15000RPM when setting VL.LIMITP or VL.LIMITN. If a motor with less than 6 poles is used, the 599Hz limit translates to a rotational velocity that is larger than 15000RPM. The minimum and maximum values that were displayed in the DRV.HELP output for VL.LIMITN and VL.LIMITP showed this larger limit, even though no values larger than 15000RPM could be set.

  Solution:
  The minimum and maximum values displayed in the DRV.HELP output for VL.LIMITN and VL.LIMITP now show the correct limits.

- **Axis not stopping on limit switch when using IL.FRICTION (11100,D-08985)**

  Issue:
  When an axis in position mode hit a limit switch, the current configured in IL.FRICTION was continually applied during the ramp down procedure. If VL.KI was 0 a situation could occur where the proportional part of the velocity loop was not able to counteract the current from IL.FRICTION and the axis would not stop.

  Solution:
  After hitting a limit switch, the drive now uses the internal velocity command of the ramp down procedure to determine whether to apply IL.FRICTION.

- **MKD-C-CA: During charging of the DC-Bus, the power supply sporadically shows F583 (Rectifier desaturated). (44122)**

  Issue:
  When charging the DC-Bus, it could happen that the MKD-C triggers the F583 fault and interrupts the charging procedure.

  Solution:
  The user can either power cycle the unit to try the bus charge again or update to the new firmware, which fixes the issue.

New Features

- **DIN9/10/11.STATE made recordable and usable as a recorder trigger source (11126,S-22808)**

  Solution:
  The keywords DIN9.STATE, DIN10.STATE and DIN11.STATE can now be recorded and can be used as the recorder's trigger source.

Service Motion Issues

Fixed Bugs

- **Jog motion in position mode not decelerating with JOG.DEC (D-08986)**

  Issue:
  When stopping a jog motion, the deceleration rate JOG.DEC was not correctly applied. The deceleration was only limited by DRV.DEC.

  Solution:
  Stopping a jog motion in position mode now correctly decelerates with JOG.DEC.

BASIC Issues

Fixed Bugs

- **FB1.SELECT 12 not restored from NV memory on BASIC drives (11128,D-09012)**

  Issue:
  A BASIC drive did not correctly restore the setting of FB1.SELECT from NV memory after rebooting, when FB1.SELECT was set to 12 (Halls Only).

  Solution:
  BASIC drives now correctly restore FB1.SELECT values from NV when FB1.SELECT is set to 12 (Halls Only).

Field Bus Specific Issues

Fixed Bugs

- **Drive crash on malformed packets on Modbus connection (11005,S-22729)**

  Issue:
  When receiving a malformed Modbus frame, e.g. a frame with a length field indicating that the frame was longer than the maximum allowed size of a Modbus frame, the drive could crash.

  Solution:
  The Modbus implementation has been made more robust against malformed packets.

Version: 01-20-04-000 Release Date: July 09, 2021

Field Bus Specific Issues

Fixed Bugs

- **Set DS402 Status word Target Reached Bit 10 on Quick Stop (10907,D-08845)**

  Issue:
  On a Quickstop command the bit Target reached was not set at the end of movement, needed by a controller.

  Solution:
  Target reached bit is set when quickstop is commanded, quickstop option code is on 5 or 6, the velocity is below CS.THRESH and FBUS.PARAM05 bit 15 is set to 1.

- **Velocity feedback stuck at 480000 RPM (D-08858)**

Version: 01-13-09-001, June 19, 2015
+ Feedback Issues
Version: 01-13-09-000, June 18, 2015
+ General Issues
+ Field Bus Specific Issues
+ Feedback Issues
Version: 01-13-08-000, May 07, 2015
+ Motion Tasking Issues
+ General Issues
+ Field Bus Specific Issues
+ Feedback Issues
Version: 01-13-07-000, May 06, 2015
+ Field Bus Specific Issues
Version: 01-13-06-000, April 23, 2015
+ Field Bus Specific Issues
+ Homing Issues
+ General Issues
Version: 01-13-05-000, March 25, 2015
+ Field Bus Specific Issues
+ Brake Issues
+ General Issues
Version: 01-13-04-000, February 24, 2015
+ Field Bus Specific Issues
+ General Issues
Version: 01-13-03-000, February 05, 2015
+ General Issues
+ Field Bus Specific Issues
Version: 01-13-02-000, January 07, 2015
+ General Issues
+ BASIC Issues
+ Field Bus Specific Issues
Version: 01-13-00-001, November 24, 2014
+ Field Bus Specific Issues
+ BASIC Issues
+ General Issues
Version: 01-13-01-000, November 24, 2014
+ General Issues
+ Field Bus Specific Issues
Version: 01-12-05-000, October 13, 2014
+ General Issues
+ Field Bus Specific Issues
Version: 01-12-03-000, September 05, 2014
+ Field Bus Specific Issues
+ General Issues
Version: 01-12-04-000, September 05, 2014
+ General Issues

Issue:
In the rare case that the velocity feedback reached 480000 RPM, which could happen e.g. due to a misconfigured feedback or an encoder malfunction, the filtered velocity in VL.FB was stuck at that value, even when the unfiltered velocity was zero.

Solution:
The filters in the velocity feedback path now behave correctly in the case that they get a velocity input of 480000 RPM .

- **Mailbox timeout for EtherCAT-mailbox is too small for some objects. (10995,S-22492)**
  Issue:
  Feedback change via SDO can take longer than the mailbox timeout value set in the ESI-file.

  Solution:
  The timeout in the ESI-file is increased to 4 seconds for all AKD1 drive types.

- **Modbus registers for CMPx.ARM and CMPx.STATE not useable for compare setpoints beyond the first (10973,S-22421)**
  Issue:
  Accessing CMPx.ARM or CMPx.STATE through their Modbus registers was always accessing the first compare setpoint, with no way to access other setpoints.

  Solution:
  A bitmask can now be written to the Modbus registers for CMPx.ARM, with each bit controlling one setpoint. Reading that registers or the CMPx.STATE registers will return the current arm status / the setpoint state of all setpoints in the same manner.

- **EoE Init Request caused a F3bar, when MAC-address was not set by EtherCAT-master (11063,D-08918)**
  Issue:
  On a specific EtherCAT-master the EOE-configuration was initialized without setting a MAC-address. This led to a crash situation.

  Solution:
  No more crash happens, when MAC-address is not set.

- **DS402: Fieldbus velocity command still active after re-enable (11051,D-08909)**
  Issue:
  In the DS402 Profile Velocity mode the old velocity setpoint was re-activated in seldom cases in the state transition from Ready To Switch On to Switched On.

  Solution:
  The old velocity setpoint is now reset always when leaving the state Operation Enabled.

New Features

- **Synchronization of DRV.NAME and PN.DEVICENAME (S-22352)**
  Solution:
  A new keyword PN.SYNCNAMES has been added to the drive. When it is set to 0 the keywords DRV.NAME and PN.DEVICENAME are independent of each other. When it is set to 1 (default value) instead, DRV.NAME and PN.DEVICENAME are kept synchronized, i.e. writing to one will also change the other. This includes PN.DEVICENAME being written through Profinet DCP by a Profinet master.

- **Setting DRV.NAME and PN.DEVICENAME to an empty string (S-22532)**
  Solution:
  DRV.NAME and PN.DEVICENAME can now be set to an empty string by writing "Empty" to them.

- **CANopen position range limits (S-22617)**
  Solution:
  The object 607Bh for position range limits with subindex 1 (Minimum position range limit) and subindex 2 (Maximum position range limit) is now implemented.

Motion Tasking Issues

New Features

- **New keyword MT.ACTIVENUM to read currently active motion task (10988,S-22493)**
  Solution:
  A new keyword MT.ACTIVENUM has been added to the firmware. Reading it returns the number of the currently active motion task. If no motion task is active it will return the number of the last active motion task.

Feedback Issues

Fixed Bugs

- **Invalid F301 when booting a drive with FB1.SELECT -1 and single-cable feedback (11021,D-08895)**
  Issue:
  When booting a drive, an invalid F301 (Motor overheated) could be triggered when FB1.SELECT was set to -1 (Auto Identify) and no resistance was connected through the feedback connector (i.e. the resistor for measuring the motor temperature is connected to the feedback device and read digitally by the drive).

  Solution:
  The firmware has been changed to avoid triggering an invalid F301 in the aforementioned situation.

General Issues

Fixed Bugs

- **AKD-Cs and 48A drives supplied with DC voltage can't close inrush relay. (D-08896)**
  Issue:
  In firmware version 1.18.00.000 a change was introduced to immediately open the inrush relay when the AC supply is lost, to prevent high currents when the supply is connected again. This led to an issue, where devices, that are supplied with DC voltage, would never close the relay.

  Solution:

Version: 01-12-02-000, August 25, 2014
+ General Issues
Version: 01-12-01-000, August 01, 2014
+ Field Bus Specific Issues
+ General Issues
Version: 01-12-00-000, June 24, 2014
+ Field Bus Specific Issues
+ IO Issues
+ General Issues
Version: 01-11-04-000, March 26, 2014
+ Feedback Issues
+ Field Bus Specific Issues
+ General Issues
Version: 01-11-03-000, February 28, 2014
+ Feedback Issues
+ General Issues
+ Field Bus Specific Issues
Version: 01-11-02-000, February 14, 2014
+ General Issues
+ Motion Tasking Issues
+ Field Bus Specific Issues
Version: 01-11-01-000, February 07, 2014
+ Homing Issues
+ Field Bus Specific Issues
+ General Issues
+ BASIC Issues
Version: 01-11-00-006, February 03, 2014
+ General Issues
+ Field Bus Specific Issues
Version: 01-11-00-002, December 16, 2013
+ General Issues
+ Feedback Issues
Version: 01-10-07-000, November 22, 2013
+ Feedback Issues
+ General Issues
Version: 01-10-05-000, November 05, 2013
+ General Issues
+ Field Bus Specific Issues
Version: 01-10-04-000, October 23, 2013
+ BASIC Issues
+ General Issues
+ Field Bus Specific Issues
Version: 01-10-03-000, October 14, 2013
+ General Issues
+ Feedback Issues
+ Field Bus Specific Issues

A keyword VBUS.DCOPERATION, that was already available on MKD-C, has now been made available on AKD-C and 48A drives. Setting it to 1 will disable the interaction between AC input loss detection and inrush relay.

- **Position command overflow when using PL.FILTERTIME (10989,D-08872)**
  Issue:
  With PL.FILTERTIME set to zero, both position command and position feedback overflow when their 64-bit range is exceeded. When PL.FILTERTIME was set to a non-zero value, the overflow happened at smaller position values for the position command. Since the position feedback was not overflowing at the same time, this led to a large position error, causing either an immediate "Following error magnitude fault" or a runaway of the axis.

  Solution:
  The implementation of PL.FILTERTIME has been changed to not cause additional position command overflows.

New Features

- **Firmware for NC variant drives (S-22587)**
  Solution:
  The release now includes firmware files for NC variant drives.

- **New parameter DRV.FEATURECODE (S-22673)**
  Solution:
  A new parameter DRV.FEATURECODE has been added to the firmware. When set to a specific code, the drive will exhibit a corresponding customer specific behavior. Codes will not be made public and are only known by the respective customer.

Service Motion Issues

Fixed Bugs

- **Missing initialization of JOG.ACC and JOG.DEC could lead to runaway of motor (11100,D-08967)**
  Issue:
  JOG.ACC and JOG.DEC were not properly initialized if no value was stored for them in NV memory which could lead to them having a random value outside of their allowed range. Starting a jog motion in this situation, without setting JOG.ACC and JOG.DEC first, could cause the motor to run away.

  Solution:
  JOG.ACC and JOG.DEC are now correctly initialized to their default values if no value is found in NV memory.

Version: 01-20-03-000 Release Date: February 15, 2021

Field Bus Specific Issues

New Features

- **[DS402]: Implement standard object 6076h sub 0 to calculate and display actual torque / force (S-22206)**
  Solution:
  DS402 standard object 6076h is implemented as read-only object. It is calculated with DRV.ICONT and MOTOR.KT.

- **[DS402]: Add support for PL.FILTERTIME also for AKD-N and MKD-N (S-22264)**
  Solution:
  PL.FILTERTIME is now accessible via object 53FCh sub 0 on AKD-N and MKD-N

Fixed Bugs

- **Large Tx-PDO mapping with touchprobe objects leads to spikes in position error (D-08821)**
  Issue:
  When using a large Tx-PDO mapping that includes multiple of the touchprobe positions, the calculation of the position error could temporarily shift backwards, creating spikes in the position error.

  Solution:
  The feedback position used for calculating the position error is now latched before the Tx-PDOs are handled to prevent the issue.

Feedback Issues

Fixed Bugs

- **Fault on disconnected Hiperface DSL motor temperature sensor (D-08800)**
  Issue:
  In case of a digital temperature sensor connected through Hiperface DSL feedback link, no fault was generated in the event of a sensor disconnect/open-circuit.

  Solution:
  If motor temperature source is set to digital (MOTOR.RSOURCE = 1), temperature type isn't "none" (MOTOR.RTYPE != 255) and the Hiperface DSL encoder reports an open-circuit a fault 315 ("Temperature sensor connection fault.") is generated.

Version: 01-20-02-000 Release Date: December 22, 2020

Feedback Issues

Fixed Bugs

- **Fix reading number of multiturn bits from extended type label of rotary Hiperface encoders (D-08758)**
  Issue:
  Determining the number of multiturn bits from the extended type label of a rotary Hiperface encoder with type 0xFF was not done correctly.

  Solution:

Version: 01-10-02-000, October 07, 2013
+ General Issues
+ Field Bus Specific Issues

Version: 01-10-01-000, September 27, 2013
+ Feedback Issues
+ General Issues
+ Field Bus Specific Issues

Version: 01-10-00-001, September 04, 2013
+ Field Bus Specific Issues

Version: 01-10-00-000, August 26, 2013
+ General Issues
+ Field Bus Specific Issues

Version: 01-09-08-000, August 12, 2013
+ Field Bus Specific Issues
+ General Issues

Version: 01-09-07-000, July 19, 2013
+ General Issues
+ Homing Issues

Version: 01-09-06-000, June 28, 2013
+ Field Bus Specific Issues
+ General Issues
+ BASIC Issues

Version: 01-09-05-001, June 07, 2013
+ Field Bus Specific Issues
+ General Issues

Version: 01-09-03-000, May 23, 2013
+ Field Bus Specific Issues

Version: 01-09-02-000, May 15, 2013
+ General Issues
+ Field Bus Specific Issues
+ BASIC Issues

Version: 01-09-01-000, April 20, 2013
+ Field Bus Specific Issues
+ BASIC Issues
+ Feedback Issues

Version: 01-09-00-000, April 12, 2013
+ General Issues
+ Field Bus Specific Issues

Version: 01-08-08-000, March 22, 2013
+ BASIC Issues
+ Field Bus Specific Issues
+ General Issues

Version: 01-08-07-000, March 15, 2013
+ BASIC Issues
+ Field Bus Specific Issues
+ General Issues

Version: 01-08-06-000, February 28, 2013

The firmware now correctly calculates the number of multiturn bits from the information in the extended type label.

- **The Hiperface DSL position still changes in case of connection loss (D-08782)**
  Issue:
  In the event of a Hiperface DSL connection loss a 467 feedback fault is generated. The motor stops using dynamic braking but the reported position still changes. In this case a physical brake might not apply depending on the velocity and selected brake settings.

  Solution:
  The feedback interface will stop if a 467 feedback fault is generated by a Hiperface DSL message timeout. The reported position will no longer change in case of a connection loss.

BASIC Issues

Fixed Bugs

- **Remove unusable HOME.IPEAKACTIVE and HOME.MOVEREQUIRED commands on BASIC drives (D-08757)**
  Issue:
  Keywords HOME.IPEAKACTIVE and HOME.MOVEREQUIRED were available on BASIC drives but had no functionality.

  Solution:
  HOME.IPEAKACTIVE and HOME.MOVEREQUIRED have been removed on BASIC drives.

Field Bus Specific Issues

Feature Changes

- **Add SDO-support for PL.FILTERTIME (S-22116)**
  Issue:
  PL.FILTERTIME was not accessible via CANopen-object

  Solution:
  Object 53FCh sub 0 was implemented to support PL.FILTERTIME

Version: 01-20-01-000 Release Date: November 26, 2020

IO Issues

New Features

- **New digital output mode: Set output when specific warning is active (10757,S-21950)**
  Solution:
  A new digital output mode 27 has been implemented. With DOUTx.MODE set to 27, DOUTx.PARAM can be set to select a single warning number. The digital output will be active when that warning is currently present.

Field Bus Specific Issues

New Features

- **Add subindices 11 and 12 for object 1C32h (S-21993)**
  Solution:
  Subindex 11 and 12 of objects 1C32/1C33 for missed events and too small cycle times are now supported.

Version: 01-20-00-001 Release Date: October 27, 2020

Feedback Issues

Fixed Bugs

- **EnDat 2.2 diagnostic data not working on feedback 3 (D-08709)**
  Issue:
  Keyword FB3.ENDATDIAGSUPPORTED always returned 0, even if the connected encoder supported reading diagnostic data. Values written to FB3.ENDATDIAGSELECTED were not passed to the encoder, so that no diagnostic data was sent by the encoder.

  Solution:
  EnDat 2.2 diagnostic data is now working on feedback 3.

Version: 01-19-06-000 Release Date: September 18, 2020

IO Issues

Fixed Bugs

- **Non-user modes on digital outputs on X9 connector stop working after writing DRV.EMUEMODE (10682,D-08648)**
  Issue:
  When DOUTx.MODE was set to a mode other than 0 (User) on one of the digital outputs on the X9 connector (DOUT 9, 10 and 11) and DRV.EMUEMODE was set to 10 (General purpose IO), the internal configuration of the digital outputs was reset, while the user facing keywords (DOUTx.MODE and DOUTx.PARAM) still showed their original value. Because DRV.EMUEMODE is restored from non-volatile memory later than DOUTx.MODE and DOUTx.PARAM, the digital outputs on the X9 connector stopped working after a reboot of the drive.

  Solution:
  Setting DRV.EMUEMODE to 10 no longer resets the internal configuration of digital outputs 9, 10 and 11.

- **Selecting mode 23 (Compare Output) on digital output 9, 10 or 11 not resetting DOUTx.PARAM (10682,D-08648)**
  Issue:
  On digital outputs 1 and 2, setting DOUTx.MODE to 23 (Compare Output) sets DOUTx.PARAM to -1. The user then has to select

+ BASIC Issues
+ General Issues

Version: 01-08-05-000, February 15, 2013
+ BASIC Issues

Version: 01-08-04-000, February 13, 2013
+ General Issues
+ Field Bus Specific Issues

Version: 01-08-03-001, January 25, 2013
+ General Issues
+ BASIC Issues
+ Field Bus Specific Issues

Version: 01-08-02-000, December 27, 2012
+ BASIC Issues
+ General Issues

Version: 01-08-01-000, December 19, 2012
+ General Issues
+ BASIC Issues
+ Field Bus Specific Issues

Version: 01-07-04-000, November 15, 2012
+ General Issues
+ Field Bus Specific Issues

Version: 01-07-03-000, October 17, 2012
+ General Issues
+ Field Bus Specific Issues
+ BASIC Issues

Version: 01-07-02-000, September 21, 2012
+ General Issues
+ Feedback Issues
+ Field Bus Specific Issues

Version: 01-07-01-000, September 08, 2012
+ General Issues

Version: 01-07-00-002, September 07, 2012
+ General Issues
+ Field Bus Specific Issues

Version: 01-07-00-001, August 17, 2012
+ General Issues
+ BASIC Issues

Version: 01-07-00-000, July 27, 2012
+ General Issues
+ BASIC Issues

Version: 01-06-07-000, June 22, 2012
+ Feedback Issues
+ General Issues
+ Field Bus Specific Issues
+ BASIC Issues

Version: 01-06-06-000, June 08, 2012

the compare engine to be used with that output by writing 0 or 1 to DOUTx.PARAM. Only then the digital output configuration is activated. On digital outputs 9, 10 and 11, DOUTx.PARAM was set to 0 instead. A user that wanted to use compare engine 0 with one of those outputs would have no need to write DOUTx.PARAM, which lead to the configuration not being activated.

Solution:
Setting DOUTx.MODE to 23 on digital outputs 9, 10 or 11 now correctly sets DOUTx.PARAM to -1.

- **DOUTx.STATE not showing actual output state of outputs on X9 connector (D-08656)**
  Issue:
  When DOUTx.MODE was set to a mode other than 0 (User) on one of the digital outputs on the X9 connector (DOUT 9, 10 and 11) DOUTx.STATE always showed 0, independent of the actual state of the digital output.

  Solution:
  DOUTx.STATE now displays the actual output state when using a mode other than 0 on an X9 output.

- **DOUTx.MODE and DOUTx.PARAM changing configuration of a digital output on the X9 connector when DRV.EMUEMODE not 10 (GPIO) (D-08656)**
  Issue:
  When changing DOUTx.MODE or DOUTx.PARAM of one of the outputs on the X9 connector (digital outputs 9, 10 and 11), the firmware would reconfigure the output even when DRV.EMUEMODE was selecting a mode other than 10 (General Purpose I/O). The mode selected by DRV.EMUEMODE would not work afterwards.

  Solution:
  Changing DOUTx.MODE or DOUTx.PARAM of one of the X9 outputs now only changes the output configuration when DRV.EMUEMODE is set to 10.

Field Bus Specific Issues

New Features

- **CANopen access to PWM0.DUTYCYCLE and PWM0.PERIOD (S-21464)**
  Solution:
  The parameters PWM0.DUTYCYLE and PWM0.PERIOD can now be read and written via SDO and written via PDO using object 34D8h subindex 1 and 2.

- **CANopen support of parameter MOTOR.SERIALNUM (S-21780)**
  Solution:
  MOTOR.SERIALNUM can now be read using object 36A3h via SDO.

Feedback Issues

Fixed Bugs

- **Endat 2.2 - Fix F403 on auto identify (D-08654)**
  Issue:
  When no feedback is connected to the drive and auto identify is used, a F403 is shown.

  Solution:
  The F403 is not shown any more if no feedback could be identified with auto identify.

- **Fixed SICK HDSL fault after power on (D-08657)**
  Issue:
  On AKM2G motors with Hiperface DSL it can happen that a fault is thrown after bootup or after initialization of the feedback. In this case the following message was shown via FB1.FAULTS "1112: Hiperface DSL Fault, Incremental position invalid".

  Solution:
  The initialization of the feedback is changed to prevent this fault during bootup of the drive.

Homing Issues

Fixed Bugs

- **Warning n137 (Homing and feedback mismatch) not considering PL.FBSOURCE (10706,D-08676)**
  Issue:
  The drive generates warning n137 when the selected homing mode is incompatible with the identified feedback type (e.g. homing to the index pulse on purely digital feedback). For this check, the firmware always looked at the type of feedback 1, even when a different feedback was selected by PL.FBSOURCE.

  Solution:
  The firmware has been changed to also correctly check for home mode incompatibilities, when using a feedback other than feedback 1 to close the position loop.

General Issues

New Features

- **New Jog feature (S-21495)**
  Solution:
  A new Jog feature has been implemented. New keywords JOG.V, JOG.ACC and JOG.DEC can be used to set a target velocity, acceleration and deceleration. While in service position or velocity mode, the new commands JOG.MOVEP and JOG.MOVEN can be used to move the axis in positive or negative direction at the specified velocity, acceleration and deceleration.

Version: 01-19-05-000 Release Date: July 29, 2020

Feedback Issues

Fixed Bugs

- **Error F467 with Endat 2.2 on tertiary feedback after bootup (10634,D-08610)**

+ BASIC Issues
+ Feedback Issues
+ General Issues

Version: 01-06-05-000, May 25, 2012
+ General Issues
+ BASIC Issues
+ Feedback Issues

Version: 01-06-04-000, May 11, 2012
+ IO Issues
+ General Issues
+ Feedback Issues

Version: 01-06-03-000, April 27, 2012
+ Field Bus Specific Issues
+ General Issues

Version: 01-06-02-000, April 13, 2012
+ Field Bus Specific Issues
+ IO Issues
+ General Issues

Version: 01-06-01-000, March 30, 2012
+ Field Bus Specific Issues
+ General Issues

Version: 01-06-00-002, March 29, 2012
+ General Issues

Version: 01-06-00-001, March 26, 2012
+ General Issues
+ Field Bus Specific Issues

Version: 01-05-13-000, March 02, 2012
+ General Issues
+ Field Bus Specific Issues

Version: 01-05-12-000, February 17, 2012
+ Field Bus Specific Issues
+ Motion Tasking Issues
+ General Issues
+ IO Issues
+ Feedback Issues

Version: 01-05-10-000, January 27, 2012
+ Feedback Issues
+ General Issues
+ Field Bus Specific Issues

Version: 01-05-08-000, January 20, 2012
+ General Issues

Version: 01-05-07-000, January 06, 2012
+ General Issues
+ IO Issues

Version: 01-05-06-000, December 23, 2011
+ Field Bus Specific Issues
+ General Issues

Issue:
An Endat 2.2 was connected to the tertiary feedback. After a reboot of the drive a fault F467 was thrown.

Solution:
The fault F467 should only show on Feedback 1 and not on feedback 3. This has been fixed, now the fault F470 is shown when feedback 3 has a fault. Also the keyword FB3.FAULTS has been added to show a detailed error message when an error happens for the tertiary feedback. And the root cause for the fault on the tertiary feedback after reboot has also been fixed.

- **Endat 2.1 feedback identified as Endat 2.2 (10635,D-08609)**
  Issue:
  When an Endat 2.2 feedback is connected to the drive and auto identify is used, everything works as expected. As soon as an Endat 2.1 feedback is connected to this drive and auto identify is used, the feedback is identified as an Endat 2.2 feedback.

  Solution:
  The auto identify process has been changed. Now an Endat 2.1 feedback is identified correctly.

- **Fixed problem for Endat 2.2 with certain cable length (D-08600)**
  Issue:
  An Endat 2.2 encoder throws a fault with certain cable length, e.g. with a length between 16 - 19 meter.

  Solution:
  The issue for Endat 2.2 encoders with cable length between 16 - 19 meters has been fixed.

Field Bus Specific Issues

Fixed Bugs

- **EtherCAT IP mode with 8 ms cycle time, square interpolation and a high velocity has velocity spikes in the motion (10641,D-08618)**
  Issue:
  When using IP-mode with 8 ms and square interpolation, the velocity command is correct for lower velocity values. For higher velocity values, e.g. above 1900, the velocity command has spikes.

  Solution:
  The problem is fixed in the firmware. For high velocity values the square interpolation now works correct and has no more spikes.

General Issues

New Features

- **Warning if MKD-C / MKD-N fan is not spinning (S-21718)**
  Solution:
  A new warning n258 is added. This warning is triggered when the fan on a MKD-C or MKD-N device should cool down the device, but the fan is not spinning at all.

Version: 01-19-04-000 Release Date: July 03, 2020

Field Bus Specific Issues

Fixed Bugs

- **Profinet: PN.VELCSCALING/PN.ACCSCALING not stored to NV (10549,D-08533)**
  Issue:
  The two scaling parameters PN.VELCSCALING and PN.ACCSCALING are not properly stored to NV. After reboot the parameters always returned the default value.

  Solution:
  The new firmware does now restore the NV parameters PN.VELCSCALING/PN.ACCSCALING properly.

New Features

- **CANopen support of parameter MOTOR.NAME (S-21512)**
  Solution:
  MOTOR.NAME can now be accessed using object 3899h via SDO.

- **CANopen support for reading drive's model (S-21591)**
  Solution:
  The drive's model can now be read as a string by reading object 2033h via SDO.

Feature Changes

- **SDO access to FB1.EXTENDEDMULTITURN (S-21659)**
  Issue:
  FB1.EXTENDEDMULTITURN was not accessible via SDO

  Solution:
  Object 535Eh sub 0 is now available for accessing FB1.EXTENDEDMULTITURN.

IO Issues

New Features

- **PWM signal on digital output (10541,S-21462)**
  Solution:
  A user configurable PWM signal can now be generated on the drive's digital outputs. A new digital output mode 26 can be selected to enable the PWM signal on a digital output. The signal's period and duty cycle can be configured with new keywords PWM0.PERIOD and PWM0.DUTYCYCLE.

Version: 01-05-05-000, December 09, 2011
+ General Issues
+ Field Bus Specific Issues

Version: 01-05-04-000, November 25, 2011
+ General Issues
+ Feedback Issues
+ Field Bus Specific Issues
+ IO Issues

Version: 01-05-03-003, November 07, 2011
+ General Issues
+ Field Bus Specific Issues

Version: 01-05-02-000, October 28, 2011
+ General Issues

Version: 01-05-01-000, October 14, 2011
+ General Issues
+ Feedback Issues
+ Field Bus Specific Issues

Version: 01-04-19-000, September 30, 2011
+ General Issues
+ Field Bus Specific Issues
+ Homing Issues

Version: 01-04-18-000, September 16, 2011
+ General Issues

Version: 01-04-17-000, September 12, 2011
+ General Issues
+ IO Issues
+ Field Bus Specific Issues

Version: 01-04-15-002, August 29, 2011
+ Feedback Issues
+ General Issues
+ Field Bus Specific Issues

Version: 01-04-14-000, August 23, 2011
+ Field Bus Specific Issues
+ General Issues

Version: 01-04-13-000, August 15, 2011
+ General Issues
+ Field Bus Specific Issues

Version: 01-04-12-000, August 01, 2011
+ Field Bus Specific Issues
+ General Issues

Version: 01-04-11-000, July 18, 2011
+ Field Bus Specific Issues
+ General Issues

Version: 01-04-10-000, July 01, 2011
+ General Issues

Version: 01-04-09-000, June 21, 2011

On Synqnet drives, PWM0.MODE can be used to have period and duty cycle controlled via cyclic fieldbus data. In that case, the PWM signal will be turned off when the fieldbus connection is lost.

Feedback Issues

New Features

- **23-bit Tamagawa feedback support (S-21471)**
  Solution:
  Tamagawa feedback initialization has been updated to set the number of bits based on the encoder ID data read from the feedback device. Both 17-bit and 23-bit Tamagawa encoders are recognized. There are no additional user settings needed to set up Tamagawa feedbacks.

Version: 01-19-03-000 Release Date: April 29, 2020

Feedback Issues

Fixed Bugs

- **Improved Endat 2.2 diagnostic keyword handling (D-08501)**
  Issue:
  The keywords FBx.ENDATDIAGEN and FBx.ENDATDIAGEN are not stored correctly in NV when no Endat 2.2 feedback is selected.

  Solution:
  Both keywords FBx.ENDATDIAGEN and FBx.ENDATDIAGSELECTED are now stored correctly in NV independent of the selected feedback.

Field Bus Specific Issues

Fixed Bugs

- **IL.BUSFF freezes after drive is disabled (D-08513)**
  Issue:
  When setting a current offset over fieldbus this current offset is not reset correctly when the drive is disabled. And IL.BUSFF still reads out the old current offset value.

  Solution:
  The internal current offset from the drive is now set back to 0 as soon as the drive is disabled.

- **CANopen (EtherCAT/CAN): Wrong abort code on object 5481h sub 0 on drives with other feedback than SFD (10548,D-08520)**
  Issue:
  On wrong feedbacks for the object, which checks FB1.SFDCRCERRORCOUNT, the abort code was 0x06090030 (parameter value exceeded).

  Solution:
  On wrong feedback types (eg. EnDat) the object gives now an abort code 0x06040043 (incompatible parameter).

Feature Changes

- **EtherCAT input delay configurable via new object 34D1h sub 0 (S-21305)**
  Issue:
  A customer wanted to close the velocity loop over the fieldbus. He found that the reaction time of the drive, i.e. visible actual position changes, with his 250 microsecond cycle rate was more than 500 microseconds.

  Solution:
  Measures have been taken to reduce the reaction time. It is linked to the object 34D1 sub 0. The default value for the old behaviour is a 1. An InitCmd has been added to the ESI-file to enable the new behavior. It can be switched off by handling this InitCmd.

Version: 01-19-02-000 Release Date: March 13, 2020

Feedback Issues

Feature Changes

- **Parameter FB1.SFDCRCERRORCOUNT should be recordable and usable as trigger (S-21030)**
  Solution:
  Parameter FB1.SFDCRCERRORCOUNT is now recordable and usable as trigger.

Fixed Bugs

- **Improved hall sequence monitoring with high acceleration (D-08482)**
  Issue:
  When a high acceleration is used with a motor with high motor poles count a wrong hall sequence state detection can happen, which results in a F583 fault.

  Solution:
  The algorithm to detect a wrong hall sequence has been changed to prevent a wrong fault during high acceleration phases.

- **Reading of additional data in Endat2.2 can cause a F403 fault (D-08501)**
  Issue:
  On an Endat 2.2 encoder, which does not support the reducing of the recovery time it can happen that a F403 fault is thrown. The issue is that the drive may read out additional data from the encoder.

  Solution:
  On Endat 2.2 encoders, which do not support reducing of the recovery time, the additional data is now not requested by the drive.

+ General Issues
+ Service Motion Issues

Version: 01-04-08-000, June 08, 2011
+ General Issues
+ Field Bus Specific Issues

Version: 01-04-07-000, May 23, 2011
+ General Issues

Version: 01-04-05-000, May 11, 2011
+ General Issues
+ Field Bus Specific Issues

Version: 01-04-03-000, May 09, 2011
+ General Issues
+ IO Issues
+ Motion Tasking Issues
+ Field Bus Specific Issues

Version: 01-04-02-000, April 21, 2011
+ General Issues
+ Homing Issues
+ Field Bus Specific Issues

Version: 01-04-01-000, April 11, 2011
+ IO Issues
+ General Issues

Version: 01-03-20-001, April 04, 2011
+ General Issues
+ Field Bus Specific Issues

Version: 01-03-19-000, March 28, 2011
+ Field Bus Specific Issues
+ Motion Tasking Issues
+ General Issues

Version: 01-04-00-000, March 18, 2011
+ General Issues
+ Field Bus Specific Issues

Version: 01-03-18-000, March 16, 2011
+ General Issues

Version: 01-03-16-000, February 16, 2011
+ General Issues
+ Motion Tasking Issues

Version: 01-03-14-000, February 01, 2011
+ General Issues
+ Field Bus Specific Issues

Version: 01-03-13-000, January 26, 2011
+ General Issues
+ Capture Issues

Version: 01-03-12-000, January 18, 2011
+ General Issues
+ Field Bus Specific Issues

Version: 01-03-10-000, January 04, 2011
+ General Issues

This prevents the F403 fault on these encoder devices.

General Issues

Fixed Bugs

- **Fixed bug where compare engine position is wrong when changing feedback (D-08492)**
  Issue:
  When the feedback is changed and the upper 32 bit in the compare engine position are not equal to 0, these upper 32 bit are not reset correctly when the feedback is changed.

  Solution:
  The upper 32 bit from the compare engine are now correctly set to the actual feedback position when the feedback is changed.

New Features

- **New velocity signal VL.FBDISPLAY added. (S-21021)**
  Solution:
  For the existing velocity signals like VL.FB or VL.FBFILTERED, the signal behavior (filtering) cannot be changed without impacting the drive behavior. Therefore a new signal VL.FBDISPLAY and a keyword to configure the filtered frequency (VL.FBDISPLAYCUTOFF) have been added to the firmware. The signal VL.FBDISPLAY is also available via Profinet (signalnumber 111).

- **New keyword MT.TPOSMINTIME added (S-21079)**
  New Feature Details:
  The new keyword MT.TPOSTIME allows the user to set a time, that has to pass after starting a motion task, before the bits in the motion status word can be set, that indicate that the target position has been reached.

Field Bus Specific Issues

Fixed Bugs

- **EtherCAT: Update of input data is delayed by one fieldbus cycle. (D-08495)**
  Issue:
  The EtherCAT input data (drive -> EtherCAT master) showed a one fieldbus cycle delay before refreshing the data. This affected all TxPDO entries that have been mapped into the PDO's, e.g. the actual position.

  Solution:
  The update of the EtherCAT input data has been corrected, so that the input buffer is now refreshed within one fieldbus cycle.

- **Customer needs an information about current limitation in PDO (10503,S-21080)**
  Issue:
  A customer needed a dedicated information about current limitation in the process data of CoE-drive.

  Solution:
  A new bit 4 (value 0x10) is included in the manufacturer status object 1002h sub 0 and object 2002h sub 1 going to 1, if the current limitation is active.

Version: 01-19-01-000 Release Date: January 14, 2020

General Issues

New Features

- **New SFD error counter (S-20935)**
  New Feature Details:
  There is a need to detect and read out SFD communication errors.

  Solution:
  A new command has been implemented: FB1.SFDCRCERRORCOUNT. It is accessible via CANopen over CAN/EtherCAT by the object 0x5481 sub 0 and via the Modbus-parameter 3122.

Version: 01-19-00-002 Release Date: December 05, 2019

General Issues

Fixed Bugs

- **REGEN.TEST not working on AKD-C and MKD-C (D-08430)**
  Issue:
  On AKD-C and MKD-C devices, REGEN.TEST would always fail, indicating an incorrectly wired regen resistor.

  Solution:
  REGEN.TEST will now properly work on AKD-C and MKD-C devices.

Version: 01-19-00-001 Release Date: November 13, 2019

Feedback Issues

Fixed Bugs

- **Added a lower velocity threshold for hall sequence monitoring (D-08417)**
  Solution:
  For the hall sequence monitoring, a lower velocity limit has been added. When the velocity is below 100 rpm, the algorithm will check for wrong hall state sequencing. This prevents a wrong fault when the feedback is connected correctly but the noise is too high.

Version: 01-03-09-000, December 28, 2010
+ General Issues
+ Field Bus Specific Issues

Version: 01-03-08-000, December 07, 2010
+ General Issues
+ Field Bus Specific Issues

Version: 01-03-07-000, November 23, 2010
+ IO Issues
+ General Issues

Version: 01-03-06-000, November 09, 2010
+ General Issues
+ Field Bus Specific Issues

Version: 01-03-05-000, October 26, 2010
+ General Issues

Version: 01-03-04-000, October 19, 2010
+ General Issues
+ Field Bus Specific Issues

Version: 01-03-02-000, October 11, 2010
+ General Issues
+ Field Bus Specific Issues

Version: 01-03-01-000, September 17, 2010
+ General Issues
+ Field Bus Specific Issues

Version: 01-03-00-004, August 02, 2010
+ General Issues

Version: 01-19-00-000 Release Date: November 08, 2019

Feedback Issues

Feature Changes

- **EnDat 2.2: More tolerance to communication errors. (S-20859)**
  Solution:
  For the cyclic EnDat communication, the drive now tolerates a CRC failure in the received feedback pacet and uses an interpolated position instead to calculate the missing updated position from the encoder. This makes the communication more robust to EMC disturbances.

Version: 01-18-08-000 Release Date: October 30, 2019

General Issues

Fixed Bugs

- **Setting PL.ERRWTHRESH to 0 does not clear position error warning (10397,D-08391)**
  Issue:
  Setting PL.ERRWTHRESH disables the position error warning n439 but does not clear a warning that was already active.

  Solution:
  An active position error warning is now cleared when setting PL.ERRWTHRESH to 0.

Field Bus Specific Issues

Fixed Bugs

- **CANopen-objects for CAPx.FBSOURCE missing on AKD-N/MKD-N (10408,D-08387)**
  Issue:
  CANopen-objects for CAPx.FBSOURCE missing on AKD-N/MKD-N

  Solution:
  The new sub indices 0x0B for CAP0.FBSOURCE and 0x0C for CAP1.FBSOURCE of the index 0x3460 are implemented for AKD-N and MKD-N-drives

Feedback Issues

New Features

- **Added monitoring for halls sequence (S-20404)**
  Solution:
  When a feedback with halls sensor is used, the halls state sequence will be monitored during the first movement of the axis. This is done automatically in the background as soon as the axis is enabled. When the observer for detects that the halls state transitions don't match the direction of the feedback, the FAULT F583 will be thrown. Via FAULT583.ACTION the fault can be disabled, or a warning can be thrown instead of a fault.

Version: 1-18-07-000 Release Date: September 10, 2019

General Issues

Fixed Bugs

- **Recorder values of FB1.HALLSTATEV and FB1.HALLSTATEW incorrect (D-08349)**
  Issue:
  When recording FB1.HALLSTATEV or FB1.HALLSTATEW, the values returned in the recording did not match the actual hall sensor states.

  Solution:
  FB1.HALLSTATEV and FB1.HALLSTATEW are now correctly recorded.

New Features

- **New keywords to check regen resistor connection (S-20634)**
  Solution:
  The regen resistor can be tested with the new keyword REGEN.TEST. To configure the regen test procedure the keywords REGEN.TESTTO and REGEN.TESTVTHRESH are used. REGEN.TESTTO is used to set the timeout to wait for the regen to discharge. And the REGEN.TESTVTHRESH keyword is used to set the percentage the vbus is discharged to. E.g. a REGEN.TESTO value of 1000 and REGEN.TESTVTHRESH value of 60 means that the regen test procedure tries to discharge the regen for maximum time of one second, until the vbus value is discharged to a value of 60 % from the vbus value before the REGEN.TEST keyword was executed.

IO Issues

Fixed Bugs

- **Motor moving on enabling the axis with analog command source and AIN.VALUE 0 (10368,D-08345)**

Issue:
Operating the drive in analog torque or analog velocity mode and disabling the drive while the current or velocity command from the analog input was not 0, would freeze the command value. If the analog input was set to 0 while the drive was disabled, the command would not follow, which could lead to an unexpected spike in current or velocity command when re-enabling the drive.

Solution:
The firmware now also updates the current or velocity command from the analog input when the drive is disabled. This will not lead to an actual current to the motor because the drive is disabled but will prevent erroneous movement when enabling.

- **MT.FEEDRATE writeable when controlled via digital input mode 4. (S-20659)**
  Issue:
  When AIN.MODE is set to 4, MT.FEEDRATE is set to value depending on the analog input voltage. The keyword MT.FEEDRATE was still set to read/write, which suggested that a value could be set via the keyword.

  Solution:
  MT.FEEDRATE will now be read-only as long as it is controlled by AIN.MODE 4.

Field Bus Specific Issues

Fixed Bugs

- **DS402: Captured position data for feedback 2 via Touchprobe is not properly scaled (D-08371)**
  Issue:
  When using the Touchprobe to capture data from feedback 2, the captured data received via EtherCAT is always scaled with the position loop feedback scaling factor.

  Solution:
  The captured data from feedback 1, feedback 2 and feedback 3 is now scaled correctly with the right gearing and feed constants (60E8, 60E9, 60ED and 60EE) when FBUS.PARAM05 bit 4 is set to 1.

- **Inaccuracies in velocity feedback read via Profidrive signal NIST_A. (D-08369)**
  Issue:
  Due to internal rounding errors the Profidrive signal NIST_A could differ from the actual velocity by up to one count.

  Solution:
  The conversion from drive internal units to Profidrive velocity units has been improved to minimize rounding errors.

Feedback Issues

Fixed Bugs

- **Prevent runaway when PL.FBSOURCE is not set to feedback 1 and DRV.DIR is set to 1 (S-20663)**
  Issue:
  When PL.FBSOURCE is not set to feedback 1 and DRV.DIR is set to 1, the motor can run away after a reboot, even though the motor ran correctly before.

  Solution:
  DRV.DIR changes now the internal feedback direction of all feedbacks. This prevents the runaway after reboot.

New Features

- **New Keyword: FB1.DIR allows to change direction of primary feedback input (S-20663)**
  Solution:
  The user can configure FB1 to reverse the counting direction of FB1 by setting FB1.DIR = 1. By default, the counting direction will not be reversed.

Version: 1-18-06-002 Release Date: July 31, 2019

General Issues

New Features

- **New MKD-C keyword VBUS.DCOPERATION (S-20344)**
  Solution:
  If two MKD-Cs are connected via their DC bus, with only one of them connected to an AC supply, only that MKD-C has to precharge internal and connected capacities of both MKD-Cs. For the other MKD-C the new keyword VBUS.DCOPERATION can be set to 1 to suppress precharging but still allow enabling connected drives.

Version: 1-18-06-001 Release Date: July 29, 2019

General Issues

New Features

- **New keyword STRINGS.ACTIVEPOWER (S-20524)**
  Solution:
  A new keyword STRINGS.ACTIVEPOWER can be used to read how much power an AKD-C or MKD-C is supplying to its strings.

- **New Digital Output Mode 25 - W&S done (10362,S-20557)**
  Solution:
  New digital output mode 25 has been added. This mode sets the output to 1, if the WS.STATE is 0, which means the wake and shake is done, in all other cases the output is set to 0.

Motion Tasking Issues

Fixed Bugs

- **Motion profile tables not correctly saved and restored (10341,D-08314)**
  Issue:
  On recently produced AKD-P-NBxx and AKD-N devices as well as on all MKD-N devices the firmware did not correctly save customer created motion profile tables. As a consequence, those tables were lost when the device was rebooted.

  Solution:
  The firmware has been changed to correctly save and restore customer created motion profile tables on all devices.

- **Spike in motion task velocity when interrupting tasks (10360,D-08323)**
  Issue:
  When interrupting a motion task during its constant velocity phase by another task with the same velocity but a smaller deceleration the trajectory velocity showed a short spike before decelerating. Depending on the magnitude of the difference in deceleration, this could cause large unexpected motion of the motor.

  Solution:
  The firmware has been changed to correctly transition between motion tasks with the same velocity and different deceleration.

Tuning Issues

New Features

- **Configurable cogging compensation teach move (10332,S-20528)**
  Solution:
  A new keyword COGCOMP.TEACHMOVE has been added to the firmware. When set to the default value of 0 the cogging compensation teach move will start gathering data as soon as the motor has accelerated to the velocity specified by COGCOMP.V. When set to 1 the motor will always do a full rotation before data is gathered, to make sure the velocity has properly settled to the specified value.

IO Issues

Fixed Bugs

- **Brake opened via digital input not always closing after DRV.RSTVAR (10366,D-08341)**
  Issue:
  When the brake is released with digital input set to mode 20 and a DRV.RSTVAR is done, the brake is not always closed properly after DRV.RSTVAR.

  Solution:
  The brake is now always closed properly when DRV.RSTVAR is done.

Field Bus Specific Issues

Feature Changes

- **DS402 state machine transitions 2 and 7 configurable (S-20527)**
  Solution:
  Bit 16 of the parameter FBUS.PARAM05 is used to create a new behaviour for the DS402 state transitions 2 and 7. With the bit set the hardware enable input decides, if the transitions between SWITCH ON DISABLED and READY TO SWITCH ON are taken.

Version: 1-18-05-000 Release Date: July 08, 2019

Field Bus Specific Issues

New Features

- **PROFINET IO: Increased PROFINET IO device name to 240 characters (S-20334)**
  Solution:
  PROFINET IO device name now supports up to 240 characters. With the new keyword PN.DEVICENAME, the actual PROFINET IO device name can be read via telnet/workbench. The initial devicename will be no-name. If DRV.NAME is unequal to no-name and PN.DEVICENAME equals no-name, PN.DEVICENAME will be set to the value of DRV.NAME until a new device name is set via PROFINET IO.

Fixed Bugs

- **PDO value of STRINGx.DRIVESSTOSTATE incorrect (D-08298)**
  Issue:
  When reading the value of a STRINGx.DRIVESSTOSTATE keyword via PDO, the data returned was inconsistent with the telnet or SDO value.

  Solution:
  PDOs for STRINGx.DRIVESSTOSTATE keywords now return the correct data.

- **Intermittent missing response to CoE request with EoE running (D-08291)**
  Issue:
  With both EoE frames and CoE requests sent to the drive, it could sometimes end up in a situation, where it did not respond to a CoE request.

  Solution:
  The faulty interference between CoE and EoE has been removed from the firmware.

Feature Changes

- **DS402 - Bit 10 of status word should get set also, if a motion is halted via Bit 8 of the control word (10327,S-20471)**
  Issue:
  Bit 10 of the DS402 status word is only set on the target reached condition in several modes. Customer needs it also to be set, when the halt bit 8 of the DS402 control word is set to 1.

Solution:
Via bit 15 of the parameter FBUS.PARAM05 the behaviour change can be set. Bit 10 of the status word goes also to 1, if the halt bit of the control word is set to 1. Bit 10 is set after the velocity is lower than CS.VTHRESH.

General Issues

Fixed Bugs

- **REC.TRIGVALUE scaled incorrectly when trigger parameter was VBUS.RECTVALUE (D-08299)**
  Issue:
  When VBUS.RECTVALUE was selected as a recorder trigger parameter, the value of REC.TRIGVALUE was scaled incorrectly. The recording would actually trigger, when VBUS.RECTVALUE reached 1000 times the configured value.

  Solution:
  REC.TRIGVALUE is now correctly scaled when VBUS.RECTVALUE is selected as a trigger parameter.

IO Issues

New Features

- **New keywords for configuring limit switch reaction (S-20462)**
  Solution:
  New keywords FAULT107.ACTION and FAULT108.ACTION have been added to the firmware that can be used to configure how the drive reacts when a limit switch is triggered. When set to 4 (default value) the drive will show a warning and start a controlled stop but will remain enabled. When set to 0, the drive will show a fault instead of a warning and will disable at the end of the controlled stop process.

Version: 1-18-04-000 Release Date: June 04, 2019

General Issues

New Features

- **New keyword REGEN.DISCHARGEBUS (S-20233)**
  Solution:
  The new keyword REGEN.DISCHARGEBUS can be used to discharge the bus of an MKD-C-CA using a connected regen resistor.

- **Range of MOTOR.VOLTMAX extended (S-20391)**
  Solution:
  To better facilitate low voltage applications, the minimum value of MOTOR.VOLTMAX has been lowered from 110V to 0V.

Field Bus Specific Issues

New Features

- **PROFINET IO: New signals IL.LIMIT added (S-20333)**
  Solution:
  The IL.LIMITN and IL.LIMITP keywords are mapped to signal 110. This signal represents an absolute value for both.

Feature Changes

- **EtherCAT cyclic setpoint change (S-20402)**
  Issue:
  EtherCAT: With EtherCAT masters with large frame jitter may create velocity jumps in interpolated position modes (IP, CSP).

  Solution:
  Issue solved by taking position setpoints earlier in 250 microseconds task.

Feedback Issues

Fixed Bugs

- **FBx.ENDATDIAGSELECT can cause a F403 Fault (D-08293)**
  Issue:
  When using FBx.ENDATDIAGSELECT to select the diagnostic data, it may cause a F403 (Endat communication) Fault due to an issue when the encoder has to be reset to activate the new configuration.

  Solution:
  Fixed the condition, when restarting the encoder to setup the diagnostic data, that can cause a F403 Fault.

  Temporary Workaround:
  If the Fault F403 happens when using FBx.ENDATDIAGSELECT, the fault can be cleared and the diagnostic data will be transferred anyhow.

Version: 1-18-03-000 Release Date: April 29, 2019

Service Motion Issues

Fixed Bugs

- **Discontinuity in velocity mode service motion stop ramp (D-08202)**
  Issue:
  When stopping a service motion in velocity mode, the drive was decelerating using DRV.DEC instead of SM.DEC for a short period of time at the beginning of deceleration. It was then reverting back to the velocity it would have decelerated to when decelerating using SM.DEC, before further decelerating correctly with SM.DEC.

  Solution:

The drive now continuously decelerates with SM.DEC (if configured) when stopping a service motion in velocity mode.

Feedback Issues

Fixed Bugs

- **Sin/Cos encoder with halls: Arbitrary commutation angle calculated on certain encoders (D-08262)**
  Issue:
  With some sin/cos + halls feedback devices, the drive could start with an arbitrary commutation angle, making initial movement unreliable. After moving past a specific hall state change, the drive would operate as normal. This could be detected by noting that the feedback position after start-up was greater than 1/6 of an electrical cycle, when it should be close to 0.

  Solution:
  The initialization sequence for the hall sensor has been corrected so that position deviation during the startup sequence are corrected.

Field Bus Specific Issues

New Features

- **Support of EtherCAT emergency requests (S-20114)**
  Solution:
  The firmware now supports EtherCAT emergency requests. When enabled by setting ECAT.ENEMCYREQ to 1, the drive will send a CoE message containing a CANopen emergency object for every new error entry in object 1003h.

- **Motor standstill indication in CANopen object 1002h (S-20239)**
  Solution:
  Bit 12 of CANopen object 1002h will now indicate whether the motor is in standstill. It uses the same conditions for determining if the motor is in standstill as the drive's controlled stop function, i.e. CS.VTHRESH and CS.TO can be used for configuration.

- **CANopen support of parameter MT.LOAD (S-20240)**
  Solution:
  MT.LOAD can now be accessed using object 3432h via SDO.

- **CANopen access to active motion task number (S-20241)**
  Solution:
  The number of the active motion task can now be read using object 2081h via SDO or PDO.

- **Select motion task to be executed in Profile Position mode. (S-20188)**
  Solution:
  The new object 2080h allows selecting a motion task to be executed in Profile Position mode via SDO or PDO. With bit 5 of the DS402 controlword set, a rising edge on bit 4 will start the motion task, that is stored in the drive's motion task table at the index specified by object 2080h. In this case, the motion task will be executed as it is stored and bit 6 of the controlword will not have an effect.

Fixed Bugs

- **Ethernet over EtherCAT (EoE): Intermittent packet corruption while SDO transfer active. (D-08235)**
  Issue:
  When EoE is configured by the EtherCAT master, there might be the situation when the master initiates an SDO transfer (upload, download) while the AKD drive is going to send an EoE packet. In this situation, the EoE packet is send with the wrong mailbox header (CoE instead of EoE) and will be not forwarded to the network properly. In addition, some EtherCAT master might also detect a failure during the SDO transfer because of the wrong mailbox header.

  Solution:
  The correct mailbox protocol type is now added to the EoE packets.

  Temporary Workaround:
  For all former firmware versions, the EtherCAT master could ignore the corrupted EoE packets in the middle of the SDO transfer. The SDO request by the master will still be properly answered by the drive and a valid SDO transfer can be executed.

Version: 1-18-02-000 Release Date: March 28, 2019

General Issues

New Features

- **Added keyword for reading the state of the input phases. (S-20007)**
  Solution:
  A new keyword VBUS.PHASESTATE has been added to the firmware for AKD-C and MKD-C. It can be used to read the state of the phase loss detection, without relying on phase loss faults or warnings to be configured.

Fixed Bugs

- **V/f open loop induction motor control not working on AKD-N (10198,D-08168)**
  Issue:
  When controlling an induction motor in an open loop (MOTOR.TYPE 2) on an AKD-N, the motor would not move.

  Solution:
  V/f open loop induction motor control on AKD-N now works the same as it does on AKD-P.

- **MOTOR.VOLTMIN not applied immediately (10198,D-08168)**
  Issue:
  Changing the value of MOTOR.VOLTMIN would not directly have an effect on V/f open loop induction motor control. Instead, either MOTOR.VRATED, MOTOR.VOLTRATED or MOTOR.TYPE had to be written for internal control parameters to be recalculated.

  Solution:

V/f open loop induction motor control is now immediately updated when changing MOTOR.VOLTMIN.

- **Prohibit using Wake and Shake or MOTOR.PHASE with Halls Only feedback (D-08167)**
  Issue:
  Executing Wake and Shake or manually setting MOTOR.PHASE to a non-zero value could lead to faulty commutation when using a "Halls Only" feedback.

  Solution:
  When using a "Halls Only" feedback, Wake and Shake can no longer be executed and MOTOR.PHASE is read-only and is forced to zero.

- **Fieldbus position command not updated while motion is suspended (10233,D-08183)**
  Issue:
  On a drive with a brake configured, suspending motion via digital input mode 26 was blocking the update of the fieldbus position command.

  Solution:
  The fieldbus position command is now properly updated while motion is suspended via digital input mode 26.

Field Bus Specific Issues

Fixed Bugs

- **DS402 - Broken controlled stop function (D-08151)**
  Issue:
  On drives with EtherCAT or CANopen a controlled stop did not work properly. This happens when FBUS.PARAM05 bit 1 is set to 0, the drive is enabled via Workbench or Telnet and the controlled stop is activated via Digital Input. In this case the power stage is disabled and no controlled stop is executed.

  Solution:
  Improved the internal DS402 state machine. The controlled stop now works as expected and the power stage stays enabled.

- **DS402 - FBUS.PARAM05 bit 1 has no impact on status word (D-08176)**
  Issue:
  The state change of 'Operation Enabled' is not prevented when FBUS.PARAM05 bit 1 is set and Hardware Enable is switched off.

  Solution:
  The state change of 'Operation Enabled' is now prevented when FBUS.PARAM05 bit 1 is set and Hardware Enable is switched off, the DS402 state is still 'Operation Enabled'.

Feedback Issues

New Features

- **Added keyword for measured amplitude of sine/cosine or resolver encoder (S-20070)**
  Solution:
  A new keyword FB1.SIGNALAMPLITUDE has been added to the firmware. It can be used to show and record the measured signal amplitude of a connected cine/cosine or resolver encoder.

Fixed Bugs

- **Support of LIKA encoder SMA2 with Biss-C interface. (S-20048)**
  Issue:
  Although the FB1.BISSBITS was set to the correct to value for the number of position bits that are transferred by the SMA 2 (24 Bits), the drive reported a feedback fault 467, which says the feedback is not identified.

  Solution:
  The initialization sequence for the BISS-C encoder was changed so that the LIKA encoder can now be detected and used properly.

Tuning Issues

Fixed Bugs

- **Warning n180 on startup when cogging compensation is enabled and absolute feedback connected. (S-20049)**
  Issue:
  When an absolute encoder (singleturn) is selected for the cogging compensation table, the warning n180 "Cogging compensation not active. Axis needs to be homed first." is triggered. This warning can be cleared when a homing is successfully executed. This does not happen on absolute multiturn encoders.

  Solution:
  The warning n180 now also suppressed on singleturn encoders, on which a homing procedure is not needed for the cogging compensation function.

- **Limited Cogging Compensation on rotary motors does not work after reboot (D-08210)**
  Issue:
  After rebooting the drive, the limited cogging compensation did not work on rotary motors.

  Solution:
  Fixed the initialization of cogging compensation. After a reboot, the limited cogging compensation is now applied correctly on rotary motors.

Version: 1-18-01-000 Release Date: February 12, 2019

Field Bus Specific Issues

New Features

- **Added keywords for EoE drives ip address, mac address, subnet and gateway (S-19841)**

Solution:
New keywords IP.EOEADDRESS, IP.EOEMACADDRESS, IP.EOESUBNET and IP.EOEGATEWAY have been added to the firmware.
They can be used to get the actual configuration values of the EoE interface.

- **Read AKD-N's and MKD-N's EoE IP address on AKD-C and MKD-C (S-19826)**
  New Feature Details:
  New keywords STRING1/STRING2/STRING3.DRIVESEOEIPADDRESS have been added to the AKD-C and MKD-C firmware. Those display the configured IP address of the Ethernet over EtherCAT interface for the AKD-Ns and MKD-Ns connected on one string.

  The AKD-C / MKD-C as well as the connected AKD-Ns / MKD-Ns have to be updated to the latest firmware to get correct address information from those keywords.

General Issues

New Features

- **Created configurable motor I2T fault. (S-19872)**
  New Feature Details:
  A new keyword IL.MI2TFTHRESH has been added to the firmware. It can be used to specify a fault threshold for the motor I2T value. When the actual motor I2T load (IL.MI2T) is higher than that threshold, a new fault F309 will be triggered and the drive will be disabled. The fault can be disabled by setting the threshold to 0.

Fixed Bugs

- **DINx.MODE 26 did not work correctly, when a disable command was send in the CS rampdown process (10084,D-08099)**
  Issue:
  When the Controlled Stop was initiated by digital input and a drive disable command came in the deceleration phase, the drive stayed enabled instead of diabling after standstill.

  Solution:
  The root cause in the initialization of the controlled stop is fixed and the behavior corrected.

- **Correctly unpower strings as a fault reaction on MKD-C. (S-19827)**
  Issue:
  As a reaction to the majority of faults, an MKD-C is supposed to disable the high voltage supply to its strings. Instead, the MKD-C's reaction to all faults was to disable all drives connected on its strings.

  Solution:
  The MKD-C now correctly cuts the high voltage supply from the strings when this is the desired fault reaction.

Feedback Issues

New Features

- **EnDat 2.2 linear encoder additional diagnostic (S-19825)**
  New Feature Details:
  New keywords FBx.ENDATDIAGEN, FBx.ENDATDIAG, FBx.ENDATDIAGSELECTED and FBx.ENDATDIAGSUPPORTED have been added to the firmware for feedback1 and feedback3.

  FBx.ENDATDIAGEN will enable receiving of diagnostic data from Endat 2.2. The FBx.ENDATDIAGSUPPORTED keyword shows which diagnostic messages are supported by the encoder and FBx.ENDATDIAGSELECTED selects the used diagnostic messages. The diagnostic messages are stored into a 16-entry width array, which is accessible with the indexed keyword FBx.ENDATDIAG.

Fixed Bugs

- **Improved handling of feedback offsets (S-19932)**
  Issue:
  FB1.OFFSET always accessed the offset of the feedback that was selected by PL.FBSOURCE. This lead to issues when offsets were to be configured for multiple feedbacks, or if an offset of a feedback other than feedback 1 had to be saved to non-volatile memory.

  Solution:
  A new keyword PL.FBOFFSET has been added to the firmware. It works the same way FB1.OFFSET did in prior versions. It uses the same fieldbus objects, to make sure no backward compatibility issues arise.

  Additionally, keywords FB1.OFFSET, FB2.OFFSET and FB3.OFFSET have been created. Using the same format as PL.FBOFFSET they access the offsets of feedback 1, 2 and 3.
  They are referencing the same internal data as PL.FBOFFSET does, i.e. with PL.FBSOURCE set to 1 (Feedback 2), changing PL.FBOFFSET will also change FB2.OFFSET and vice versa. Changing PL.FBSOURCE will update the value of PL.FBOFFSET to reflect the offset of the new PL.FBSOURCE feedback.

IO Issues

Fixed Bugs

- **AOUT.VALUE never reaching commanded value for low AOUT.CUTOFF frequencies (10062,D-08137)**
  Issue:
  With AOUT.CUTOFF set to a low frequency, the filtered AOUT.VALUE would settle at a value that was not identical to the value commanded by the drive or the user.

  Solution:
  AOUT.VALUE now settles at the correct value for all filter settings.

Tuning Issues

New Features

- **Limited cogging compensation on rotary motors (S-19930)**
  New Feature Details:
  The keywords COGCOMP.RANGELOW and COGCOMP.RANGEHIGH now have the same affect on linear and rotary motors, they limit the range for the cogging compensation.

Version: 1-18-00-005 Release Date: January 10, 2019

General Issues

Fixed Bugs

- **Update behavior when MT.FEEDRATE is set to 0. (D-08033)**
  Issue:
  When MT.FEEDRATE set to 0, it does not prevent motion.

  Solution:
  The drive now prevents motion correctly when MT.FEEDRATE is set to 0.

Version: 1-18-00-004 Release Date: October 31, 2018

General Issues

Fixed Bugs

- **Update DRV.FAULTHIST format. (D-07993)**
  Issue:
  On reading the DRV.FAULTHIST, the format a new line was not properly printed in the output of the command.

  Solution:
  DRV.FAULTHIST output is now properly formatted.

Version: 1-18-00-003 Release Date: October 23, 2018

Field Bus Specific Issues

Fixed Bugs

- **Motion into limit switch not prohibited in Fieldbus Position mode (D-07985)**
  Issue: (Identified in Version 01-17-06-000)
  When a limit switch is triggered the drive stops any motion in direction of the switch by doing a controlled stop. After the motor was stopped, a drive in Fieldbus Position mode would once again accept setpoints, even if they were commanding motion in direction of the limit switch.

  Solution:
  The drive now properly blocks motion in direction of an active limit switch in the described situation.

Version: 1-18-00-002 Release Date: October 19, 2018

Field Bus Specific Issues

Fixed Bugs

- **SynqNet: Brake not reacting on brake command from fieldbus. (10019,D-07978)**
  Issue:
  When the drive enable command, that is sent to the drive via SynqNet, was cleared, the brake would remain in the state it was in before, not following the brake command any longer. This could cause vertical loads to drop, if the brake was not closed before the drive was disabled.

  Solution:
  The firmware now also evaluates the brake command from the fieldbus, when no enable command is sent.

Version: 1-18-00-001 Release Date: October 15, 2018

General Issues

Fixed Bugs

- **Warning n570 is not cleared correctly (S-19572)**
  Issue:
  When changing the FAULT570.ACTION from 4 to 0, while the warning n570 is active, the warning n570 stays until the FAULT570.ACTION is changed again.

  Solution:
  Fixed the reset behavior for the fault F570 and warning n570.

Version: 01-18-00-000 Release Date: October 12, 2018

IO Issues

Fixed Bugs

- **Value of IL.LIMITP and IL.LIMITN changing when using Digital Input mode 21 (Current Limitation) (9900,D-07705)**
  Issue:
  When adding or removing an additional current limit using a digital input set to mode 21, the value of IL.LIMITP and IL.LIMITN would

sometimes change.

Solution:
The value of IL.LIMITP and IL.LIMITN is now unaffected by digital input mode 21.

Feedback Issues

Fixed Bugs

- **Values of FB1.SELECT not correctly restricted on AKD-N without X5 connector. (S-19535)**
  Issue:
  AKD-N variants DB, DG and DT don't have an X5 connector. Thus, only two wire feedback devices HiperfaceDSL and SFD3 can be connected to those drives. The available settings for FB1.SELECT did not reflect that.

  Solution:
  AKD-N variants DB, DG and DT now have a correctly restricted range of values for FB1.SELECT.

New Features

- **Auto identification of purely digital EnDat 2.2 encoders (S-19599)**
  New Feature Details:
  The drive can now automatically identify EnDat 2.2 encoders without analog signals when FB1.SELECT is set to -1.

General Issues

Fixed Bugs

- **Modulo does not work correctly in analog position mode (4870,D-07732)**
  Issue:
  When the drive has been moved with an analog input source in velocity mode and the user switches to position mode with modulo enabled, the drive is able to rotate more than one modulo range.

  Solution:
  Fixed modulo calculation when analog input is selected as DRV.CMDSOURCE in position mode.

- **Open inrush relay when AC input is lost on devices with input phase loss detection. (S-19572)**
  Issue:
  When all AC input phases were lost, the drive would wait for the bus voltage to drop significantly before opening the inrush relay. When power was supplied to the AC input again, before the inrush relay was opened, excessively high currents could occur.

  Solution:
  The drive will now open the inrush relay as soon as it detects losing all AC input phases. If this happens while the drive is enabled (or a connected AKD-N was enabled on AKD-C), fault 587 will be triggered.

New Features

- **New keyword FAULT587.ACTION (S-19572)**
  New Feature Details:
  A new keyword "FAULT587.ACTION" has been added to the firmware. Setting its value to 1 (default is 0), no fault 587 is issued when the inrush relay is opened on losing all AC input phases on an enabled drive (or an AKD-C that has an enabled AKD-N connected).

Field Bus Specific Issues

Fixed Bugs

- **Support of DS402 statusword bit 11 (Internal Limit Active) missing (10006,S-19561)**
  Issue:
  Bit 11 (Internal Limit Active) of the DS402 statusword was never set.

  Solution:
  By setting bit 14 of FBUS.PARAM05 (not set by default) support for bit 11 of the DS402 statusword can be activated. In that case, bit 11 of the statusword will be set whenever there's a warning active, that prevents the drive from moving the motor.

Version: 01-17-06-000 Release Date: July 30, 2018

General Issues

New Features

- **Allow triggering a recording on VBUS.VALUE (S-19151)**
  Solution:
  It is now possible to set the value of REC.TRIGPARAM to "VBUS.VALUE".

- **Add MOTOR.RSOURCE keyword to select a source for the motor thermal resistance value (S-19116)**
  Solution:
  A new keyword MOTOR.RSOURCE has been added to the firmware. Setting it to 0 (default is 1) forces reading the motor thermal resistance from the thermal control pins of the feedback connector instead of reading it digitally from the feedback device, which would be the default behavior for HiperfaceDSL and SFD3 feedbacks. It will be configured by the drive when using MOTOR.AUTOSET.

Fixed Bugs

- **Fan speed stays high indefinitely after being forced by highly loaded internal regen resistor. (D-07667)**
  Issue:
  To keep the internal regen resistor from overheating, the drive's fan is running at full speed when the resistor is heavily loaded. The

fan speed was not properly going low when the load on the resistor dropped again.

Solution:
The fan speed is now correctly adjusted when the load on the internal regen resistor drops.

- **VBUS.HALFVOLTAGE could be changed while the drive was enabled. (D-07667)**
  Issue:
  The value of VBUS.HALFVOLTAGE could be changed while the drive was enabled (or a connected drive was enabled on AKD-C) which should not be possible.

  Solution:
  The value of VBUS.HALFVOLTAGE can now only be changed when the drive is disabled (or all connected drives are disabled on AKD-C).

- **Display not showing "Sd" when loading from or saving to an SD card was triggered by the B1 button (9661,D-07671)**
  Issue:
  When the B1 button was used to load from or save to an SD card, the drive's display did not show "Sd". Instead, it froze on whatever was displayed before the load or save operation was started until the operation was finished.

  Solution:
  The drive's display now properly shows "Sd" on an SD load or save operation triggered by the B1 button.

- **Velocity can exceed IL.VLIMIT when IL.OFFSET is non-zero. (9879,D-07678)**
  Issue:
  With IL.OFFSET set to a non-zero value, the velocity can exceed the limit set by IL.VLIMIT.

  Solution:
  The velocity is now limited by IL.VLIMIT even when IL.OFFSET is non-zero.

- **The IL.CMDACC value has peaks when the drive is in service - velocity mode (5614,D-07690)**
  Issue:
  When the drive is in service - velocity mode, and the IL.KACCFF value is unequal to zero, the feedforward loop can generate peaks. These peaks can be seen in the IL.CMDACC value, and they can cause very large amp peaks for the drive.

  Solution:
  The firmware is now interpolating the acceleration for the feedforward loop, so the output of this loop is now smoother and will not generate high peaks when the drive is in service - velocity mode.

- **The setting DRV.EMUECHECKSPEED 1 can cause an F486 at boot up (6027,D-07702)**
  Issue:
  When DRV.EMUECHECKSPEED = 1 and DRV.EMUEMODE = 2 is stored in the drive, the drive reports an F486 fault after booting of the device is completed. It was also possible to cause this failure when DRV.EMUEMODE was changed from 0 to 2 during run time.

  Solution:
  The firmware is now checking correctly the velocity of the drive, when the EMUE.MODE is changed during run time and when the booting of the device is completed.

Field Bus Specific Issues

Fixed Bugs

- **PROFINET IO: ZSW1 bits 4 and 5 not behaving as specified (9793,D-07630)**
  Issue:
  ZSW1 bit 4 ("Coast stop not activated") and bit 5 ("Quick stop not activated") are specified to be following STW1 bit 1 ("No coast stop") and bit 2 ("No quick stop"). Instead, they were going low for only one fieldbus cycle after receiving a coast stop or quick stop command.

  Solution:
  ZSW1 bit 4 and 5 now always follow STW1 bit 1 and 2.

- **Writing PDO 6072h (Max torque) can unexpectedly change the value of DRV.NVCHECK. (D-07679)**
  Issue:
  For some values, reading object 6072h and writing the same value via PDO would change the value of DRV.NVCHECK although no change in non-volatile parameters is visible to the user.

  Solution:
  Writing the same value as read to object 6072h via PDO will no longer change the value of DRV.NVCHECK.

Feedback Issues

New Features

- **FAG Biss-C Encoder support (S-19251)**
  Solution:
  With setting FB1.TYPE to 34, the FAG encoder with BISS-C interface is now also supported. Correctly setting FB1.BISSBITS and FB1.ENCRES are necessary to run the encoder.

Fixed Bugs

- **VL.FBFILTER never dropping to zero. (D-07670)**
  Issue:
  Once the value of VL.FBFILTER went above a certain level (approx. 0.172 [deg/s]) it never went below that level again.

  Solution:
  The value of VL.FBFILTER will now eventually drop down to zero if the motor is stopped.

- **Issues restoring absolute position from linear Hiperface encoder (D-07672)**

Issue:
Using a linear Hiperface encoder, the drive will automatically determine the correct value of FB1.ENCRES, depending on the setting of MOTOR.PITCH and the resolution of the connected encoder. If that value did not end up being a power of two, restoring the absolute position when initializing the feedback did not work correctly.

Solution:
Restoring the absolute position when initializing a linear Hiperface encoder now also works with values of FB1.ENCRES that are not a power of two.

Homing Issues

Fixed Bugs

- **In Home Mode 8, 9 and 10 current is staying at HOME.IPEAK after home is found. (9683,D-07685)**
  Issue:
  In Home Mode 8, 9 and 10 the current limit is set to the HOME.IPEAK value. After reaching the home position, the current limitation should be reverted. But instead it stays limited by HOME.IPEAK value until the homing procedure is completely finished.

  Solution:
  The change of the current limit is now properly reverted after the home position is found.

IO Issues

Fixed Bugs

- **Suspend motion does not work properly with multiple inputs set to mode 26. (9450,D-07686)**
  Issue:
  When multiple inputs (e.g. DIN 1 and DIN 2) are configured for Mode 26, the following two error cases can happen: In the first case, when DIN 1 is toggling suspend motion mode, the motor is decelerated with DRV.DEC instead of CS.DEC. In the second case, when DIN 2 is toggling suspend motion mode, the drive is stuck in suspend motion, until DIN 1 is also toggled.

  Solution:
  When multiple inputs are set to mode 26 and multiple inputs are holding the drive in suspend motion, the drive only exits suspend motion mode when all inputs are reverting the suspend motion status. The drive is no longer staying in suspend motion state when e.g. DIN 2 is toggling suspend motion.

Brake Issues

Fixed Bugs

- **Possible drop of a vertical load when releasing the brake (9862,D-07663)**
  Issue:
  After a command to release the brake, the drive will temporarily disable the position loop until the time set by MOTOR.TBRAKERLS has expired. If the brake is physically released faster than that, the drive might not be able to hold the axis in position.

  Solution:
  The firmware will now keep the position loop enabled during the brake release process, keeping a constant position command equal to the position feedback when starting the release.

Version: 01-17-05-000 Release Date: April 23, 2018

Tuning Issues

Feature Changes

- **Extend range of PL.GEARIN to 8192 (9742,S-18921)**
  Solution:
  The maximum value allowed for PL.GEARIN has been changed from 1024 to 8192.

General Issues

Fixed Bugs

- **Fix MOTOR.TEMPC calculation for PT1000+PTC thermistor (D-07555)**
  Issue:
  The motor temperature calculation for the PT1000+PTC thermistor combination is incorrect.

  Solution:
  The motor temperature calculation for the PT1000+PTC thermistor combination has been corrected.

- **Drive unable to accept telnet connections after unfinished connection attempt (S-18991)**
  Issue:
  After an incomplete telnet connection attempt was made, the drive could be stuck in a state, where it would no longer accept any incoming telnet connection requests.

  Solution:
  The drive now correctly recovers from an incomplete telnet connection attempt.

- **DRV.NVCHECK changing unexpectedly on AKD-C (D-07597)**
  Issue:
  In certain situations (e.g. changing the state of the STO input), the value of DRV.NVCHECK was changing, even though no non-volatile parameter was changed.

  Solution:
  The AKD-C firmware now only changes the value of DRV.NVCHECK when a non-volatile parameter is changed.

New Features

- **New keyword PL.MOTIONLIMITEN: Limit acceleration, deceleration and velocity in position mode. (9757,S-18976)**
  Solution:
  A new keyword PL.MOTIONLIMITEN has been added to the firmware. Setting its value to one will enable the limitation of the velocity command to VL.LIMITN/LIMITP as well as the limitation of acceleration and deceleration to DRV.ACC and DRV.DEC even when DRV.OPMODE is set to two (Position Mode).

IO Issues

Fixed Bugs

- **DIN.Mode 8 Zero Latch doesn't save parameters to NV-memory (9698,D-07561)**
  Issue:
  DINx.MODE 8 saves the actual position to DRV.EMUEZOFFSET, but doesn't save parameters to NV-memory afterwards.

  Solution:
  The NV-memory save works now. If the signal is high at bootup this is not seen as a positive edge.

Field Bus Specific Issues

New Features

- **Fieldbus velocity command filter added (FBUS.VLCMDFILTERTIME). (S-18929)**
  Solution:
  If the drive is used in velocity mode and a fieldbus master is controlling the velocity command, the typical fieldbus cycle time is much slower than the cycle of the velocity loop of the drive. Without smoothing the fieldbus velocity command, the final calculated velocity trajectory can include steps on acceleration and deceleration phase, which introduce current peaks in the current regulator. To prevent this step creation, a simple velocity command filter is introduced. The filter can be activated by setting FBUS.VLCMDFILTERTIME. Ideally it is set to the fieldbus cycle time. Setting the filter to 0, disable the filter, which is the default behaviour.

Feedback Issues

Fixed Bugs

- **SFD Gen 3 startup problem on certain systems.. (9792,S-18976)**
  Issue:
  On certain AKD drive + motor + feedback SFD3 combinations, the customer reported intermittent initialization error. In this error condition, the drive the reports the faults F401 (Failed to set feedback type).

  Solution:
  The error condition is now properly handled by the drive and the initialization issues has been resolved.

New Features

- **Support reading extended type label from Hiperface encoders of type 0xFF. (S-19021)**
  Solution:
  When detecting a Hiperface encoder of type 0xFF, the firmware will now read out the encoder's extended type label and use the information read to correctly set the value of FB1.ENCRES.

Version: 01-17-04-000 Release Date: March 16, 2018

Field Bus Specific Issues

New Features

- **PROFINET IO: Support of faster cycle time (Minimum is now 8 ms instead of 16 ms). (S-18761)**
  Solution:
  FW has been changed to support also the minimum cycle time of 8 ms instead of 16 ms.

Fixed Bugs

- **AKD-C/N: Intermittent EtherCAT connection reset (S-18888)**
  Issue:
  Occasionally, the AKD-C reset its EtherCAT connection which lead to temporary loss of EtherCAT communication to the AKD-C and all connected AKD-Ns.

  Solution:
  The AKD-C should no longer randomly reset its EtherCAT connection.

Homing Issues

Fixed Bugs

- **Homing mode 17 not working correctly with FB1.ORIGIN set to non-zero value (9685,D-07547)**
  Issue:
  With FB1.ORIGIN set to a non-zero value, homing mode 17 would calculate an incorrect value for FB1.OFFSET. The position reported by PL.FB would correctly be set to HOME.P after homing, but changed after rebooting the drive.

  Solution:
  The firmware now correctly calculates a value for FB1.OFFSET during homing with mode 17 when FB1.ORIGIN is set to a non-zero value.

Feedback Issues

Fixed Bugs

- **Extended Multiturn stops saving position after fault 423 (9685,D-07547)**
  Issue:
  When the firmware fails to load the extended multiturn position on booting, a fault 423 is created. Clearing the fault was not getting the extended multiturn feature in an operational state again. Instead, the feature had to be disabled and reenabled for the drive to save positions again. This was not visible to the user, since the fault was no longer displayed after a DRV.CLRFAULTS had been issued.

  Solution:
  Clearing Fault 423 will now reinitialize the extended multiturn feature.

Version: 01-17-03-000 Release Date: February 28, 2018

General Issues

Fixed Bugs

- **Conversion of user units incorrect with large values of UNIT.PIN and UNIT.POUT (5441,D-07516)**
  Issue:
  With UNIT.PIN or UNIT.POUT set to a value larger than or equal to 2^31, the conversion of user units to drive internal units was incorrect.

  Solution:
  The unit conversion has been corrected for the case that UNIT.PIN or UNIT.POUT are set to a value larger than or equal to 2^31.

- **VL.VFTHRESH not updated after changing MOTOR.FIELDWEAKENING (9430)**
  Issue:
  When enabling MOTOR.FIELDWEAKENING the drive has to recalculate the value of VL.VFTHRESH, now also considering the motor back EMF overspeed threshold. When disabling MOTOR.FIELDWEAKENING the motor back EMF overspeed threshold should no longer influence VL.VFTHRESH. This was not the case.

  Solution:
  Changing MOTOR.FIELDWEAKENING now correctly updates VL.VFTHRESH.

Feature Changes

- **Changes to regen control and calculation. (9435,S-18836)**
  Issue:
  The external regen resistor cannot be fully used to absorb the returned energy of the drive. A rough calculation of the regen power within the drive, limits the maximal allowed energy directed to the regen resistor.

  Solution:
  The regen power calculation has been changed to estimate the real regen power more accurate. In addition, for the AKD-HV48 the allowed external regen resistor power has been extended from 8 to 12 kW.

Field Bus Specific Issues

Fixed Bugs

- **Ethernet/IP: Set 'In Motion' bit during movement in torque mode. (6052)**
  Issue:
  When the drive was set to DRV.OPMODE 0, bit 0 in Ethernet/IP Status Word 1 was never set.

  Solution:
  With DRV.OPMODE set to 0, the drive will set bit 0 in Ethernet/IP Status Word 1 as long as it has not detected zero velocity. Detection of zero velocity can be influenced using the parameters CS.TO and CS.VTHRESH.

- **Ethernet/IP: Error when adding 32-bit versions of 64-bit parameters to EIP.CMDMAP or EIP.RSPMAP (5141,D-07536)**
  Issue:
  When trying to add a 32-bit instance of a 64-bit parameter (e.g. instance 147: FB1.OFFSET (32 bit version)) to the dynamically mappable part of the Ethernet/IP command or response assembly via EIP.CMDMAP or EIP.RSPMAP, an error was returned, stating that the address to be mapped is invalid.

  Solution:
  The 32-bit instances of 64-bit parameters can now be added to the dynamically mappable part of the Ethernet/IP command or response assembly.

- **Ethernet/IP: Issues writing negative values to 32-bit instances of 64-bit parameters (4835,D-07536)**
  Issue:
  Negative values written to 32bit instances of 64bit parameters (e.g. instance 147: FB1.OFFSET (32 bit version)) were not properly extended to 64 bit, leading to large positive values being set instead. This was happening when writing via explicit messaging, Command Type 0x1F and dynamically mapped instance.

  Solution:
  Writing a negative value to 32-bit instances of 64-bit parameters now sets the correct value.

New Features

- **CANopen-objects for DRV.WARNING1-3 and DRV.FAULT1-10 were missing on AKD-C. (9601,S-18760)**
  Solution:
  Add support of DRV.WARNING1-3 and DRV.FAULT1-10 on AKD-C (objects 2000h and 2001h).

- **Ethernet/IP: Added missing 32-bit instances of 64-bit parameters (D-07536)**
  Solution:
  Several 64-bit parameters did not have 32-bit instances, causing issues for Ethernet/IP masters unable to handle 64-bit instances. Those missing instances have been added. To be consistent with 32-bit instances always being on the index after their 64-bit counterpart, additional 64-bit instances have also been created. The new instances are located on indices 1071 to 1116.

Feature Changes

- **DS402: Change meaning of bit 29 of manufacturer status 1002h for AKD-N to AKD-C Power Ready (9650,S-18833)**
  Issue:
  On the AKD-N bit 29 of the manufacturer status was always on 1 with the meaning HW-enable is true.

  Solution:
  Now the bit 29 of the manufacturer status (object 1002) on the AKD-N has the meaning AKD-C Power Ready.

Version: 01-17-02-001 Release Date: January 23, 2018

Motion Tasking Issues

Fixed Bugs

- **Trajectory incorrect when starting a motion task with profile table while a motion task is already active. (9477,D-07482)**
  Issue:
  When starting a motion task, that is configured to use a profile table (not one to one profile), while a motion task is already executing, the firmware sometimes calculates an incorrect trajectory.

  Solution:
  The firmware now properly calculates the trajectory in the situation described.

General Issues

Fixed Bugs

- **Recording VL.BUSFF changes its value (9622,D-07501)**
  Issue:
  Assigning VL.BUSFF to a recorder channel and arming or starting the recorder lead to the drive continuously overwriting the value of VL.BUSFF with 0.

  Solution:
  VL.BUSFF can now be recorded without affecting its value.

- **Changing some parameters does not update DRV.NVCHECK values (9623,D-07500)**
  Issue:
  The parameters PL.KI, PL.KP, VL.KI, VL.KO and VL.KP do not have their values included in the checksum DRV.NVCHECK.

  Solution:
  DRV.NVCHECK no also includes the parameters mentioned above.

- **Recording and triggering on unavailable parameters (9475,D-07503)**
  Issue:
  Some parameters, that are not available on certain drives (e.g. IL VL and PL parameters on AKD-C), can nonetheless be set as recorder channel or trigger source. Those parameters also show up in REC.TRIGPRMLIST and REC.RECPRMLIST.

  Solution:
  Only actually available parameters can be set as recorder channel or trigger source. REC.TRIGPRMLIST and REC.RECPRMLIST have been adjusted accordingly.

- **Velocity feedback was shown as 0 via PROFINET IO, when velocity feedback is negative. (9629,D-07502)**
  Issue:
  Velocity feedback was shown as 0 via PROFINET IO, when velocity feedback is negative.

  Solution:
  Every possible actual velocity value is shown correctly via PROFINET IO.

Field Bus Specific Issues

Fixed Bugs

- **Drive with brake leaving DS402 state 'Operation enabled' when suspending motion (D-07497)**
  Issue:
  When using a digital input set to mode 26 to suspend motion on a drive connected to a motor with a brake, the drive briefly tries to engage the brake. This results in the DS402 state machine switching its state from 'Operation enabled' to 'Switched on'.

  Solution:
  The drive now stays in the 'Operation enabled' state while motion is suspended.

New Features

- **Multiple parameter PNU access is now available for "Profidrive" function-blocks (S-18359)**
  Solution:
  Multi parameter access is being used by the Siemens technology blocks and is now available in read and write direction.

Feature Changes

- **[EtherCAT]: Brake command via 0x60FE does not work (S-18701)**
  Solution:
  The object 0x3450 sub 0 (MOTOR.BRAKERLS) is now also mappable to a PDO.

Version: 01-17-01-000 Release Date: December 15, 2017

Field Bus Specific Issues

Feature Changes

- **CANopen-support of PL.GEARIN and PL.GEAROUT as SDO needed (S-18498)**
  Solution:
  PL.GEARIN and PL.GEAROUT can now be accessed via objects 542Ch sub 0 and 542Dh sub 0 via SDO.

- **[Profinet]: Implement multiple parameter PNU write read for "Profidrive" block (S-18359)**
  Solution:
  The technology function block from Siemens TiA uses a standard frame index for addressing ProfiDrive-drives. The AKD supports now also the index 0xB02E as well as the index 47. Some improvements were added to the handling of multi-parameter access.

Brake Issues

Fixed Bugs

- **Drive disabling before brake is applied during suspend motion (9559,D-07450)**
  Issue:
  With the drive suspending motion via digital input mode 26, disabling the drive would disable the power stage before the motor brake was applied, even if DRV.DISMODE was configured to wait for the brake to be applied.

  Solution:
  The firmware has been changed to also correctly sequence applying the brake and disabling the power stage during suspend motion.

General Issues

Fixed Bugs

- **Wake and Shake required, when using absolute encoder connected on feedback 3 (D-07462)**
  Issue:
  When the current loop is closed using an absolute encoder connected on feedback 3, the drive will automatically arm a wake and shake procedure, even though it is not necessary for operation.

  Solution:
  The firmware now considers which feedback is used to close the current loop, when determining if a wake and shake procedure is needed.

- **Issues setting IL.OFFSET on AKD-x024 and AKD-x048 (9594,D-07468)**
  Issue:
  When the overall current limit of the drive (the minimum of motor and current loop limits) exceeded 32.767[A], the parameter IL.OFFSET could no longer be written.

  Solution:
  IL.OFFSET can now be written even with a current limit above 32.767[A].

New Features

- **Read individual AKD-N's STO type on AKD-C (S-17496)**
  Solution:
  New keywords STRING1/STRING2.DRIVESSTOTYPE have been added to the AKD-C firmware. Those display the individual STO type (local or remote) of all drives on the string.

- **Read individual AKD-N's fault status on AKD-C (S-17857)**
  Solution:
  New keywords STRING1/STRING2.DRIVESISFAULTED have been added to the AKD-C firmware. Those display the individual fault state of all drives on the string.

IO Issues

New Features

- **New analog input mode to control MT.FEEDRATE (9590,S-18667)**
  Solution:
  A new analog input mode has been added to the firmware. With AIN.MODE set to 4 the analog input will control the value inside MT.FEEDRATE, scaling from 0% feedrate at 0 Volts to 100% feedrate at 10 Volts.

Version: 01-17-00-000 Release Date: October 13, 2017

Field Bus Specific Issues

New Features

- **EtherCAT: Allow cycle times up to 10 ms. (S-18485)**
  Solution:
  For some application, it is need to run slower fieldbus cycle times. For these types of application, the cycle time can now be change up to 10 ms for AKD's with EtherCAT interface.

- **CANopen-support of MOTOR.TEMPC as SDO and PDO needed (S-18486)**
  Solution:
  The measured motor temperature MOTOR.TEMPC can now be accessed via object 3458h sub 0 by means of SDO and PDO.

General Issues

New Features

- **New motor temperature sensor support: PT1000, PTC & PT1000, PTC & PTC (S-18323)**
  Solution:
  The support of motor temperature sensors have been extended. In parameter MOTOR.RTYPE now also the following new types are configurable:
  - 6: PTC + PT 1000
  - 7: PTC + PTC
  - 8: PT 1000

Version: 01-16-08-000 Release Date: September 25, 2017

Field Bus Specific Issues

Feature Changes

- **DS402: Halt bit of controlword (bit 8) does not stop motion in profile velocity mode (9451,D-07405)**
  Issue:
  The halt bit 8 of the DS402-controlword had no effect in profile velocity mode.

  Solution:
  The halt bit 8 works now in profile velocity mode and cyclic synchronous velocity mode.

New Features

- **EtherCAT: Maximum data size of all RxPdo's increased from 21 to 32 bytes. (S-18358)**
  Solution:
  The four available RxPdo's (each with a maximum size of 8 byte) can now be completely used for PDO signal mapping. The limitation for all RxPdo's to map a maximum number of 21 bytes has now been changed to 32 bytes. This is now similiar to the TxPdo's maximum number of data that can be mapped. It is supported with revision number greater or equal to 0x180000. The keyword ECAT.LEGACYREV needs to be set to 0, if the EtherCAT EEprom information needs to match.

- **EtherCAT: IL.VLIMIT accessible as PDO. (S-18397)**
  Solution:
  The parameter IL.VLIMIT, which limits the speed in torque mode is now also accessible via RxPDO (object 207Fh00h).

Version: 01-16-07-000 Release Date: August 31, 2017

General Issues

Fixed Bugs

- **Position error is growing in Analog Torque and Analog Velocity modes (9449,D-07398)**
  Issue:
  When moving a motor in Analog Torque or Analog Position mode the position error PL.ERR was erroneously updated and was continuously growing. Switching to Analog Position mode without disabling first would then lead to a fault indicating that the following error was to large.

  Solution:
  The position error is now kept at 0 in Analog Torque and Analog position modes. This behavior is consistent with other Torque and Velocity modes.

- **Velocity and Acceleration spikes when entering Suspend Motion (Digital Input Mode 26) (D-07382)**
  Issue:
  When entering the suspend motion mode with a moving motor, spikes could be observed in velocity and acceleration commands. These spikes directly resulted in current command spikes, especially with an acceleration feed-forward configured.

  Solution:
  The firmware has been adjusted to smoothly ramp down from the current velocity in suspend motion mode.

Field Bus Specific Issues

Fixed Bugs

- **EtherCAT EoE: Issue with connecting through different subnet. (D-07383)**
  Issue:
  When Worbench is used on a host, which IP address is configured in a different subnet than the drives subnet, workbench is not able to connect via EoE.

  Solution:
  The firmware has been changed so that a connection to a different subnet via EoE is possible.

New Features

- **EtherCAT DS402 Support of CST, CSV modes (S-18341)**
  New Feature Details:
  A customer's control system demands DS402-support of Cyclic Synchronous Velocity/Torque modes

  Solution:
  CSV and CST mode are supported now. A new object 207fh can be used to limit velocity in torque modes (CST and PT).

Version: 01-16-06-000 Release Date: August 21, 2017

Field Bus Specific Issues

Feature Changes

- **DS402: All modes of operation (object 6060h) should be available via SDO and PDO-access. (6006,D-07167)**
  Issue:
  Some manufacturer-specific values for object 6060h were settable only via SDO (e.g. analogue torque).

  Solution:
  All modes of operation are now available via SDO and PDO-access.

Version: 01-16-05-000 Release Date: August 09, 2017

General Issues

Fixed Bugs

- **VL.KI not enabling when VL.KIMODE = 1 and drive enters suspend motion (9323,D-07273)**
  Issue:
  A logic error was discovered between the Position Integrator and Velocity Integrator when VL.KIMODE = 1, as well as an issue around the zero-velocity crossing while in-motion.

  Solution:
  Logic has been corrected so both integrators hand off control and zero out correctly.

- **REGEN.WATTEXT did not allow values above 6000W (9394,D-07367)**
  Issue:
  The AKD-P04807 allows external regen resistors with a power rating of more than 6000W but REGEN.WATTEXT had a maximum value of 6000W.

  Solution:
  The maximum value for REGEN.WATTEXT has been increased to 8000W on AKD-P04807.

Feature Changes

- **Add support for FB2 commands for Fieldbus and Telnet (4991,S-18169)**
  Issue:
  All three possible feedback sources should be available with their specific DS402-scaling factors.

  Solution:
  All three feedback sources are suppported via the objects 60E4h, 60E6, 60E8, 60E9h, 60EBh, 60EDh and 60EEh. The scaling is also available via TELNET with DS402-commands, which are storable in NV-RAM.

Tuning Issues

New Features

- **Added gearing factor for position loop output (PL.GEARIN and PL.GEAROUT). (S-17846)**
  New Feature Details:
  If the position loop is closed via an external encoder (PL.FBSOURCE), the velocity loop is closed via the motor feedback (VL.FBSOURCE) and a significant physical gear ratio between external encoder and motor shaft is applied, a high performance tuning of the axis is not possible due to parameter limitations.

  Solution:
  The position loop outpout has now a gear factor described by PL.GEARIN and PL.GEAROUT, which allows the user to scale the velocity command values. This gear factor should match the gear ration between external position loop encoder and the velocity feedback encoder. This allows the user to improve the tuning performance for this type of application.

Feedback Issues

Fixed Bugs

- **Wrong scaling on position from EnDat linear encoder with more than 32 bit resolution used on Feedback 3 (9376,D-07364)**
  Issue:
  When using a linear EnDat encoder on Feedback 3, that has more than 32 bits of resolution, the position values would not be scaled correctly.

  Solution:
  Linear EnDat encoders with more than 32 bits of resolution are now properly initialized when connected on Feedback 3. The drive properly scales the position values received from the encoder.

Field Bus Specific Issues

Fixed Bugs

- **F480 or F481 (velocity too high) fault, when commanding velocity via EtherCAT. (9420,D-07381)**
  Issue:
  Customer commanded velocity via Pdo via EtherCAT and got Velocity too high fault (F480/481) with small velocity setpoints.

  Solution:
  The race condition which led to inconsistent setpoint data is fixed.

New Features

- **Additional fixed PDOs needed for masters which don't support more than one flexible PDO in each direction (9382,S-18224)**
  New Feature Details:
  New fixed PDO needed for EtherCAT-master, which cannot handle more than one flexible PDO.

Solution:
There are now additional two fixed PDOs 0x1725 and 0x1B26 for EtherCAT-users.

- **PROFINET IO: New telegram added 354 added. (S-18429)**
  Solution:
  A new telegram 354 was added that includes in the setpoint values the PROFINET IO signal STW1, NSOLL_A (VL.CMD), DRV_ACC and DRV_DEC. The actual values are ZSW1 (status word), NIST_A (VL.FB). This allows the user to configure the acceleration and deceleration values for velocity mode very easily.

- **PROFINET IO: New keywords added PN.ACCSCALING and PN.VELSCALING (S-18429)**
  Solution:
  New kewords have been added that allow the user to scale the PROFINET IO signals for velocity and acceleration. The keywords are called PN.ACCSCALING and PN.VELSCALING.

Version: 01-16-04-000 Release Date: June 09, 2017

General Issues

Fixed Bugs

- **Motor phase loss not detected on medium voltage devices. (D-07218)**
  Issue:
  The motor phase loss detection only detects the condition on high voltage devices.

  Solution:
  FW has been corrected to detect the motor phase loss on medium and high voltage devices.

- **Limit Switches not working correctly with MOTOR.TYPE 2. (9318,D-07263)**
  Issue:
  Using an open loop induction motor (MOTOR.TYPE 2) the drive did not properly determine if the motor was moving further into or out of a limit switch. This would lead to erroneously allowing or disallowing movement.

  Solution:
  FW has been corrected to properly determine the movement direction with MOTOR.TYPE 2.

Feedback Issues

Fixed Bugs

- **Wake and Shake using wrong position feedback (9313,D-07172)**
  Issue:
  When using a secondary feedback device to close the position loop, a Wake and Shake procedure would use this feedback's position to determine the motor phase instead of using the motor feedback. This caused an incorrect motor phase to be determined, especially with a gear factor between the motor and the secondary feedback.

  Solution:
  The firmware now always uses a position taken from the feedback selected by IL.FBSOURCE during a Wake and Shake procedure.

New Features

- **New keyword FB1.ENCSIGN added. (S-18137)**
  Solution:
  FB1.ENCSIGN is used to set the sign interpretation of the raw encoder signals. A correct setting of this keyword value for absolute encoders is needed. If an absolute encoder reports an “unsigned” position value, which is different to the default interpretation of “signed” position values (FB1.ENCSIGN 1), a position jump might be detected at “half” of the encoder measuring range. Setting the keyword to FB1.ENCSIGN 0, fixes this problem.

Version: 01-16-03-000 Release Date: May 15, 2017

General Issues

Fixed Bugs

- **PL.KI active momentarily when PL.KITHRESH = 0 and IL.CMDACC != 0 (6030,D-07168)**
  Issue:
  When PL.KITHRESH was set to zero, the position loop integrator should only be active when MT.VCMD = 0. A bug has been found that while MT.VCMD may be zero the acceleration is still present causing the integrator to activate early.

  Solution:
  When PL.KITHRESH is set to zero, an additional check is made to ensure both MT.VCMD and acceleration command is zero. All other cases work as previously implemented.

Feedback Issues

Fixed Bugs

- **Sin/Cos encoder position within one period inconsistent after power cycle. (6062)**
  Issue:
  If a sin/cos encoder is used, the position after boot up can be shifted one half of the sin/cos period. This can be an issue if the application uses a low resolution sin/cos encoder.

  Solution:
  There was a logic error in the signal analysis of the FPGA, which is fixed in the new updated FPGA firmware.

Version: 01-16-02-000 Release Date: May 05, 2017

General Issues

Fixed Bugs

- **With detecting a corrupted firmware image, the drive may open the brake in download FW mode. (5999)**
  Issue:
  If the user unplugs the cable while executing a FW download or downloads a corrupted FW image, the drive stays in download FW mode. If the user power cycles the drive, the drive still stays in download FW mode and waits for a new image, but may also open the brake (if connected). This behaviour can be seen on AKD-P drives.

  Solution:
  The backup FW, which is executed in this corner use case and which is programmed in production has been corrected to not open the brake if the image is corrupted.

- **Faults added to AKD-N fault history when powering down (5046,S-17945)**
  Issue:
  After power cycling an AKD-N drive, the fault history contained new entries that were not present before powering down.

  Solution:
  The firmware has been modified to detect a power down sequence and to no longer log certain faults in that case.

New Features

- **Read AKD-N's MAC and IP address on AKD-C (S-17503)**
  Solution:
  New keywords STRING1/STRING2.DRIVESIPADDRESS and STRING1/STRING2.DRIVESMACADDRESS have been added to the AKD-C firmware. Those display the IP/MAC address for the connected AKD-Ns, either as a list for all AKD-Ns, or for a single AKD-N when used with an index. Both, the AKD-C and the AKD-Ns have to be updated to the latest firmware to get correct address information from those keywords.

- **Support of motor phase loss detection. (5914,S-17872)**
  Solution:
  The motor phase loss detection have been added to the firmware. The fault F314 can be triggered if a motor line is not properly connected. To identify a motor phase loss, the drive needs to be enabled and the move needs to be commanded. The keyword FAULT314.ACTION allows the user to configure a fault, warning or ignore the motor phase loss condition.

- **Support the Digital Input "Command Buffer" mode with AKD BASIC (6007)**
  New Feature Details:
  The Command Buffer feature is not available on the BASIC drive.

  Solution:
  Command Buffer now supported. Same functionality as on the non-BASIC AKD drives.

Motion Tasking Issues

Fixed Bugs

- **Maximum of motion task velocity was not set correctly by VL.LIMITP/N (4663,D-07155)**
  Issue:
  The maximum velocity for motion tasks was set internally to 12000 rpm whereas the maximum allowed value for VL.LIMITP/N was 15000 rpm. When setting VL.LIMIT to a higher value than 12000 the old value for motion tasks was still valid afterwards without giving any error message beside the warning 153 when the motion tasks were started.

  Solution:
  The same maximum value of 15000 rpm is used now for velocity loop and trajectory generator.

Field Bus Specific Issues

Fixed Bugs

- **DS402: Latch status and latch control not synchronized properly (5967,D-07147)**
  Issue:
  It could happen that the latch statusword showed a new trigger, but the latch position was updated one cycle later.

  Solution:
  Latch statusword and latched position are synchronized now as the trigger signal is evaluated only once at startup of the fieldbus process data task.

New Features

- **CANopen-support for parameters WS.FORCEOFF and FAULT314.ACTION (S-18052)**
  Solution:
  The object numbers are 0x541F for WS.FORCEOFF and 0x5420 for FAULT314.ACTION

IO Issues

New Features

- **Make DIN1 to DIN7 available as trigger source (S-17874)**
  Solution:
  The user might want to trigger on a certain digital input. This is very useful for diagnostic purposes. Therefore, the trigger source in the recorder can also be set to digital input 1 to 7 (DIN1.STATE to DIN7.STATE).

Feedback Issues

Fixed Bugs

- **Hiperface Feedback stuck in fault state on initialization (6071,D-07193)**

Issue:
When initializing a Hiperface feedback device, the drive could get stuck in a state, where it showed a feedback fault that could only be cleared by power cycling the drive.

Solution:
The drive's initialization sequence has been adapted to prevent getting stuck in a fault state.

New Features

- **Make it possible to switch off automatic Wake & Shake on special sin/cos-encoders (5386,S-17785)**
  Solution:
  On sin/cos-encoders, which are absolute in one turn, once the motor phase is known no more Wake & Shake operations are needed. The new parameter WS.FORCEOFF (with value 1) makes it possible to switch off the automatic start of the Wake & Shake procedure.

Version: 01-16-01-000 Release Date: March 24, 2017

General Issues

New Features

- **Read individual AKD-N's STO status on AKD-C (S-17667)**
  Solution:
  New keywords STRING1/STRING2.DRIVESSTOSTATE have been added to the AKD-C firmware. Those display the individual STO state of all drives on the string.

- **Read AKD-N's model information on AKD-C (S-17499)**
  Solution:
  New keywords STRING1/STRING2.DRIVESMODEL have been added to the AKD-C firmware. Those display the model information for the connected AKD-Ns, either as a list for all AKD-Ns, or for a single AKD-N when used with an index.

- **Filter for velocity over speed fault F302 added (VL.THRESHCUTOFF). (S-17771)**
  New Feature Details:
  The overspeed fault signal is based on the actual raw velocity of the position encoder. This leads to a very fast reaction time. However, with using a low resolution position encoder, the overspeed level needs to be set very high by the user to run the application in normal operation mode. The root cause is the high quantization noise of the low resolution encoder signals.

  Solution:
  The overspeed velocity that is used for calculating the overspeed fault F302 can now be filtered by the user. The keyword is called VL.THRESHCUTOFF. If the keyword is set to 0, no filtering is executed for the overspeed signal. If the VL.THRESHCUTOFF is set to greater than zero, a low pass filter is applied with the configured cut-off frequency. Now the overspeed signal is smoother and the overspeed level can be reduced.

Feedback Issues

Fixed Bugs

- **FB1.USERDWORD was not restricted to feedbacks with memory (5980,D-07137)**
  Issue:
  The user words should only be available for feedbacks with memory, e.g. EnDat. Something was shown also for SFD.

  Solution:
  User words of the feedback 1 are only available for feedbacks with memory.

- **Extended Multiturn stops saving position after a fault (5990,D-07139)**
  Issue:
  After the drive had a fault, the extended multiturn feature stopped saving the position to non-volatile memory, even if the feedback position changed and saving would be required.

  Solution:
  The extended multiturn feature has been modified to be able to recover from a fault situation.

Version: 01-16-00-001 Release Date: March 20, 2017

Homing Issues

Fixed Bugs

- **Homing BiSS feedback via PROFINET IO or digital input crashes drive (D-07121)**
  Issue:
  When using a BiSS feedback device, starting a homing procedure either via PROFINET IO or with digital input mode 4, crashes the drive.

  Solution:
  The firmware has been modified to allow starting a homing procedure via PROFINET IO or digital input when a BiSS feedback is used.

Field Bus Specific Issues

Fixed Bugs

- **PROFINET IO: GSDML file change to prevent possible crash. (5965)**
  Issue:
  With certain PROFINET IO masters and current GSDML file, the I/O connection between AKD and master will fail immediately when the master tries to setup the connection parameters. The root cause for this behavior is a wrong addressing of two API's instead of one.

  Solution:

The GSDML file has been updated. The user can install latest GSDML file and the connection can be properly established.

New Features

- **New keyword ECAT.LEGACYREV (S-17769)**
  Solution:
  A new keyword ECAT.LEGACYREV has been added to the firmware. When set to the default value of one, the drive will always report the revision number two inside its EtherCAT eprom. When set to zero the drive will show a regularly increasing revision number instead. New features that might cause compatibility issues will not be added to the EtherCAT device description of devices with revision number two.

Version: 01-16-00-000 Release Date: February 21, 2017

Field Bus Specific Issues

Fixed Bugs

- **Profile Position Mode sometimes using a wrong velocity (5922,D-07004)**
  Issue:
  When setting the motion task velocity via object 6081h (Profile velocity) and starting a move by setting bit 4 of the control word in Profile Position Mode multiple times, the actual velocity could be lower than the commanded velocity by a factor of four.

  Solution:
  The firmware has been changed to use the correct velocity in Profile Position Mode.

New Features

- **EtherCAT: Fault for missing cyclic setpoints from master (S-17023)**
  Solution:
  A new fault 706 has been added to the firmware. It is triggered if the drive does not receive process data for a whole watchdog process data timeout period (EtherCAT Register 0x440). The fault can be disabled or turned into a warning using the new keyword FAULT706.ACTION. On triggering the fault or warning the drive will also change its state from "OP" to "SAFE-OP" and return an AL status error code “Syncmanager watchdog”.

Version: 01-15-06-000 Release Date: February 09, 2017

General Issues

New Features

- **EtherCAT: Ethernet over EtherCAT (EoE) support (S-17544)**
  Solution:
  The AKD drives family now also supports the communication protocol Ethernet over EtherCAT (EoE). EoE is a another communication channel, which can be used by the fieldbus master to tunnel standard Ethernet packages. This allows the user to connect Workbench via an existing EtherCAT connection without the need to connect to each service port of each AKD separately. In summary, the AKD drives family allows the user to use the mailbox protocols:

  - FoE (File over EtherCAT): Used to update FW and to send parameter files.
  - CoE (CANopen over EtherCAT): Used to handle SDO communication and give access to object dictionary.
  - EoE (Ethernet over EtherCAT): Use to connect with workbench.

  Please note that also EtherCAT master needs to support these protocols to take advantage of these features.

  Furthermore, the mailbox communication is improved by providing a 3rd FMMU, which allows the EtherCAT master to handle mailbox changes event based versus the need to poll the mailbox state. This is recommended especially if EoE is used.

- **EtherCAT: Initial position check support. (5907,S-17614)**
  Solution:
  The initial position check feature is now also supported on EtherCAT NB drives with latest hardware revision. For all drives, which support the feature, the keywords FB1.INITPSAVED, FB1.INITPWINDOW and FB1.INITSTATUS are visible in workbench.
  By writing the FB1.INITPWINDOW to a non-zero value, the supervision of the power down position is enabled. FB1.INITPSTATUS returns if FB1.P position changed outside the defined window (FB1.INITPWINDOW) while power down time. With setting FB1.INITPWINDOW to zero, the supervision is disabled. The objects for the parameters are:

  FB1.INITPSAVE 0x5375 sub 0
  FB1.INITPWINDOW 0x5377 sub 0
  FB1.INITPSTATUS 0x5379 sub 0

Version: 01-15-05-000 Release Date: February 01, 2017

Field Bus Specific Issues

New Features

- **EtherCAT: Support of SDO objects for SM manager output (1C32h) and SM manager input (1C33h). (S-17453)**
  Solution:
  The following EtherCAT communication parameter are supported via SDO access:

  - Sync mode (1C32hsub01h)
  - Cycle time (1C32hsub02h)
  - Output shift time (1C32hsub03h)
  - Min cycle time (1C32hsub05h)
  - Output delay time (1C32hsub09h)
  - Input shift time (1C33hsub03h)
  - Input Calc + Copy time (1C33hsub06h)

These parameters describe the actual communication configuration of the drive. For more details, please read the manual.

Fixed Bugs

- **Timeout on FoE download (5909,D-07079)**
  Issue:
  When downloading a file to an AKD via FoE the drive sometimes did not properly respond to the EtherCAT master's requests, leading to a failed download.

  Solution:
  The firmware has been changed to correctly respond to FoE requests where it previously did not.

General Issues

Fixed Bugs

- **Parameter download failing without motor connected (5909,D-07079)**
  Issue:
  Without a motor connected the parameter download could fail for certain parameters that depended on motor and/or feedback being connected.

  Solution:
  The firmware has been modified to allow downloading those parameters even without a motor connected.

Feedback Issues

Fixed Bugs

- **FB1.EXTENDEDMULTITURN command not available on AKD-N drives (5912,D-07084)**
  Issue:
  Enabling the extended multiturn feature via the FB1.EXTENDEDMULTITURN command was not possible on AKD-N drives.

  Solution:
  FB1.EXTENDEDMULTITURN can now also be used on AKD-N to control the extended multiturn feature.

Version: 01-15-04-000 Release Date: December 06, 2016

General Issues

Fixed Bugs

- **PROFINET IO Statusword Bit 10 ("In Position Bit") does not always work properly (-> PROFINET IO Statusword bit 10 equal to DRV.MOTIONSTAT bit 11) (5843,D-07040)**
  Issue:
  If a new motion task is started, the DRV.MOTIONSTAT Bit 11 (Target position reached) is normally cleared until the actual position is within the target position reached window (MT.TPOSWND). In very rare cases, this was not the case and the bit remained in the same state as it was when the motion task had been started. Due to the fact that this bit is mirrored in PROFINET IO ZSW1 Bit 10, this issue can also be seen in PROFINET IO applications and might lead to wrong behaviour.

  Solution:
  The root cause for this problem was identified and the DRV.MOTIONSTAT Bit 11 is now always cleared when a new motion task is started and the actual position is not immediately in the target position reached window (MT.TPOSWND).

Field Bus Specific Issues

Fixed Bugs

- **DS402: The bit Operation Enabled (Bit 2) in the statusword should be set only when the drive is able to handle setpoints. (5822,S-17382)**
  Issue:
  DS402: The bit Operation Enabled (Bit 2) in the statusword should be set only when the drive is able to handle setpoints. In an application with IP-mode the switch from Ready To Switch On to Enable interpolation was taken in one step. The AKD stated the Operation Enabled bit, when the power stage was enabled, but was not able to handle setpoints.

  Solution:
  Bit 2 of the statusword is now set to 1, when the drive is able to handle setpoints.

- **EtherCAT plugfest follow up: Drive is reacting on outputs from master in SAFEOP -> Wrong behaviour (outputs need to be ignored) (D-07030)**
  Issue:
  The setpoints arriving via EtherCAT-PDOs should not be evaluated in the communication state SAFEOP.

  Solution:
  The setpoints arriving via EtherCAT-PDOs are not evaluated in the communication state SAFEOP. Actual values via Tx-PDOs are available.

Service Motion Issues

Fixed Bugs

- **Stopping a Service Motion in Opmode 2 (Position) did not use the configured deceleration. (D-07046)**
  Issue:
  When a service motion was stopped with the drive being operated in position mode, the command velocity would be set to zero immediately, instead of decelerating with the rate specified in SM.DEC or DRV.DEC.

  Solution:
  The firmware has been changed to properly decelerate on stopping a service motion.

Version: 01-15-03-000 Release Date: November 24, 2016

Field Bus Specific Issues

Fixed Bugs

- **DS402: With certain preconditions, the drive stays enabled although control word commands a disable of the power stage. (S-17181)**

  Issue:
  The drive enables the power stage again instead of disabling it if the control word commands the state transition from "operation enabled" to "switched on" via the "disable operation" command. The preconditions for this issue are:

  1. Motor has a brake
  2. DRV.DISMODE is set to 2 (controlled stop)
  3. FBUS.PARAM05 Bit 8 set
  4. FBUS.PARAM05 Bit 3 set

  Solution:
  The new FW version fixes the problem and the power stage stays disabled after the drive reaches the "switched on" state with FBUS.PARAM05 Bit 8 set.

  Temporary Workaround:
  The user may not use the "disable operation" command instead just disable the power stage via the "shutdown command" (directly state transition from "operation enabled" to "ready to switch on") or the user can also clear either Bit 3 or Bit 8 of FBUSPARAM05.

- **The DS402-scaling for the CMPx.WIDTH objects does not work correctly (5768,D-07005)**

  Issue:
  The SDO-access to the objects 0x34AB and 0x34BB for the CMPx.WIDTH parameters did not show the right position scaling.

  Solution:
  The underlying scaling functionality did only work for Telnet. Now it works also for the SDO-access and DS402 specific position scaling (FBUS.PARAM05 bit 4 = 1).

- **Wrong response from drive when writing to objects 2031h or 2032h via CoE (5816,D-07029)**

  Issue:
  When writing to object 2031h (DRV.NAME) or 2032h (DRV.CUSTOMIDENTIFIER) via CoE and with a length greater than 4 characters the drive sometimes responds with an incorrect frame type.

  Solution:
  The new firmware correctly answers write requests to 2031h and 2032h.

New Features

- **DS402 keywords for control- and statusword added (DS402.CONTROLWORD, DS402.STATUSWORD). (S-17358)**

  Solution:
  The DS402 state machine control- and statusword can now be directly read via two keywords (DS402.CONTROLWORD or DS402.STATUSWORD) as well as used for software scope as channel or trigger signal.

BASIC Issues

Fixed Bugs

- **Service motion (bit 9) in DRV.MOTIONSTAT not set correctly. (5801,D-07015)**

  Issue:
  After starting the service motion, the DRV.MOTIONSTAT bit does not properly set the service motion bit. This was introduced in version 1.15.00.000.

  Solution:
  The new FW sets the service motion bit 9 properly.

General Issues

Fixed Bugs

- **AKD-C: Intermittent power stage fault (F531) if "precharge process" is executed. (5840,S-17352)**

  Issue:
  With certain hardware configuration, the AKD-C might trigger a power stage fault if the string(s) voltage is charging. Root cause is a detected short circuit during this "precharge process" of the string(s).

  Solution:
  The "precharge process" of the string(s) has been modified to be more robust to different hardware setups.

- **Numerical overrun in capacitor protection algorithm (D-07039)**

  Issue:
  Depending on the current ripple and the hardware setup, the capacitor bus overload fault might not be triggered although it should.

  Solution:
  The algorithm has been corrected so that the capacitor bus overload is now triggered as specified.

Version: 01-15-02-000 Release Date: October 17, 2016

Feedback Issues

Fixed Bugs

- **Improved handling of errors received from Hiperface feedback device (5756,D-06989)**

Issue:
Certain errors reported by Hiperface feedback devices were not properly handled by the drive, allowing operation while those errors were present.

Solution:
The firmware has been modified to detect errors from Hiperface feedback devices that previously remained undetected.

General Issues

Fixed Bugs

- **Improved handling of pre-charging the internal power bus (S-17181)**
  Issue:
  The fault F537 happened on the start of an AKD-C/AKD-N system.

  Solution:
  The charging mechanism of the power bus capacitors was changed to be a more "soft-start", so that no erroneous current short-circuit is detected.

Version: 01-15-01-000 Release Date: October 06, 2016

General Issues

Fixed Bugs

- **Fault history not storing new faults in case a corrupted entry is present. (5680,D-06938)**
  Issue:
  When a corrupted entry was stored in the fault history, sometimes no further faults were stored.

  Solution:
  The fault history now stores new faults even if an old entry is corrupted.

- **Recorder does not support not defined channel configuration in the middle. (5514)**
  Issue:
  The FW returns a wrong header, if the user setups a recorder setting with a "not configured" channel in the middle of the six available channels.

  Solution:
  The header information has been corrected to match the recorder data also with this configuration.

Feature Changes

- **AKD-N: Drive foldback needs to start from peak current (S-17136)**
  Solution:
  After booting the AKD-N, the drive foldback algorithm now starts from peak current and is directly in recovery mode. This is needed for the case the user commands peak current directly after reboot. Then the commanded current will be reduced and the drive hardware will be protected.

Tuning Issues

New Features

- **Added new Cogging Compensation feature to the firmware (5516,E-02180)**
  Solution:
  A cogging compensation feature has been added to the firmware. The AKD can now be set up to add an automatically determined or user defined feedforward current, counteracting cogging effects of the motor thus reducing velocity ripple and increasing synchronism. A new group of keywords COGCOMP.x has been added to set up and control the feature.

Field Bus Specific Issues

Fixed Bugs

- **Modbus dynamic mapping of 64 to 32 bit registers not properly displayed after power cycle. (5658,D-06926)**
  Issue:
  When restoring a dynamic Modbus mapping containing 64 to 32 bit registers from non-volatile memory, the mapping was not properly displayed when using MODBUS.ADDR to read the mapped register.

  Solution:
  A fix has been applied to saving Modbus dynamic mapping data. You will have to save your parameters again with the new firmware for this fix to work.

- **CANopen over EtherCAT: Dummy-Rx-PDO mapping with gap's should work (S-15286)**
  Issue:
  In a free Rx-PDO-mapping in CANopen over EtherCAT it should be possible to leave gaps, especially one-byte gaps, if e.g. the mode of operation is used in the PDO.

  Solution:
  Now one, two or 4 byte gaps are possible in a Rx-PDO-mappings. These are configured by using index 0 in the pdo mapping, which is not alloed in CANopen over CAN.

- **EtherNet/IP: AKD is not detected in Fanuc-robot system scan (5650,D-06932)**
  Issue:
  AKD with EtherNet/IP fieldbus was not detected, when a Fanuc robot scanned all EtherNet/IP nodes.

  Solution:
  The FANUC system is testing the ListServices in a case-sensitive way and such is more strict than other systems. The Standard defines that the name Communications delivered as response must have a capital letter C at the beginning. This is now the case.

- **EtherCAT Conformance: Fix Mailbox Error Service Not Supported (D-06940)**

Issue:
When a CoE mailbox message with a not defined service reached the AKD, the error respnse was wrong. Instead of 4 (mailbox service not supported) the error response was 8 (invalid size).

Solution:
The error response is now 4 (mailbox service not supported) on invalid mailbox services.

- **PROFINET IO: PNU access to VL.LIMITN was returning zero instead of valid negative values. (5714)**
  Issue:
  Accessing PNUs, which had a data width of DWORD and a signed attribute, could return a invalid PNU value of 0.

  Solution:
  The firmware has been updated to report a negative value properly for PNU VL.LIMITN.

IO Issues

Fixed Bugs

- **DOUT.STATES and DOUTx.STATE keywords not working with DOUTx.MODE 23 (Compare Output) (5110,D-06880)**
  Issue:
  With a digital output configured to display a Compare Engine's output, the value inside DOUT.STATES and DOUTx.STATE was not reflecting the actual state of the physical digital output.

  Solution:
  A firmware change has been made to read back and display the state of the physical digital output when DOUTx.MODE is set to 23.

Feature Changes

- **Timing of digital input mode 22 (Switch Cmd Source/OpMode) made more consistent. (5643,D-06919)**
  Solution:
  A firmware change was made to counteract the large variance in the time to switch the opmode and/or command source via digital input mode 22.

Feedback Issues

Fixed Bugs

- **VL.FB not calculated correctly with VL.FBSOURCE set to one or two (5651,D-06923)**
  Issue:
  With VL.FBSOURCE set to one or two, VL.FB was not showing the correct velocity thus preventing proper operation with that setting.

  Solution:
  The firmware has been adjusted to address this issue.

- **FPGA: Reduced accuracy of sinus/cosinus feedback signals (5713)**
  Issue:
  A reduced accuracy of position information provided by a resolver feedback have been detected.

  Solution:
  The FPGA has been changed to resolve the issue.

Service Motion Issues

Fixed Bugs

- **Service motion not decelerating properly on stopping when changing velocity limits during move. (5696,D-06946)**
  Issue:
  When decreasing the drives velocity limit while a service motion is active and then stopping the service motion, the trajectory velocity ramps down from the value it was moving at prior to changing the limit. The motor only starts decelerating once the trajectory velocity crosses the limited velocity, thus delaying the deceleration.

  Solution:
  The firmware has been changed to always decelerate a service motion from the limited velocity.

BASIC Issues

Fixed Bugs

- **Extended multiturn not working on BASIC drives (5706,D-06951)**
  Issue:
  When booting a BASIC drive with FB1.EXTENDEDMULTITURN enabled, it displays a fault and does not restore the extended position.

  Solution:
  A firmware fix has been made to properly save and restore extended multiturn information on BASIC drives.

Version: 01-15-00-000 Release Date: July 29, 2016

Field Bus Specific Issues

New Features

- **AKD-N: Support of drive types "DG" and "DT". (S-16606)**
  Solution:
  The new AKD-N drive types "DG" (single cable with tertiary fieldbus) and "DT" (single cable with local-STO) can now be upgraded

with the general AKD-N-FW file AKD-N-xxEC-..... .i00

- **Two new keywords: FBUS.SYNCACQUIREWND and FBUS.SYNCLOCKWND (S-16845)**
  Solution:
  The synchronization between fieldbus master and AKD slave is realized by a PLL algorithm, which normally works for most applications. However, with a master and fieldbus with a higher jitter (e.g. CANopen), there is a need to increase the tolerances. Therefore, two new keywords have been added, which allow the user to setup an acquire window (FBUS.SYNCACQUIREWND) and lock window (FBUS.SYNCLOCKWND).

Fixed Bugs

- **PROFINET IO: Correction for PNU access to PL.FILTERTIME and IL.KP (D-06891)**
  Issue:
  The access to PL.FILTERIME via PNU 3020 does not work. The full value range of IL.KP via PNU 2227 with a resolution of 0.001 [V/A] does not fit into the PNU data size (1 Word). The user cannot write a value higher than 65.535 [V/A] via PNU 2227.

  Solution:
  PL.FILTERTIME can now be accessed properly via PNU 3020. The resolution for IL.KP in PNU 2227 has been changed to 1 [V/A], which allows the user to write/read the full data range of IL.KP. Furthermore, the rounding for accessing PNU's, which parameters have the float attribute, has been corrected.

- **DS402: Status word does not change after shutdown command (5602,D-06892)**
  Issue:
  The DS402 did not change to the correct state after the shutdown command was sent to the drive. This issue only occurs if Bit 8 of FBUS.PARM05 is set, the motor that is used has a brake and the DRV.DISMODE is set to 2.

  Solution:
  The firmware of the drive have been updated so that the status word is now properly following the control word.

- **EthernetIP: Issues with Command Keywords and Non Keyword EIP Objects Related to the EIP.OBJECTLIST Command (D-06901)**
  Issue:
  When issuing the command EIP.OBJECTLIST the command keywords (such as DRV.EN, EIP Object number 128) should not be visible since they are neither read nor write keywords. In addition the non-keyword EIP objects EIPOperationMode through EIPControlWord2 (object indexes 8192 through 8197) have invalid parameter information, which prevents them from being added to the EIP Command and Response maps (using EIP.CMDMAP and EIP.RSPMAP). And the EIP.OBjECTLIST command does not return the current values for these objects.

  Solution:
  The command keywords have been removed from the list generated by the EIP.OBJECTLIST command. And the non-keyword EIP objects (objects 8192 through 8197) now have, and display the correct parameter information, allowing them to be added to the appropriate EIP command and response maps. In addition the EIP.OBJECTLIST command returns the current values for these EIP objects.

- **DS402: PDO-access to object 361A sub 0 (VBUS.VALUE) did not work (S-16995)**
  Issue:
  PDO-access to object 361A sub 0 (VBUS.VALUE) did not work

  Solution:
  VBUS.VALUE can now be read via PDO-access to object 361A sub 0. The SDO-access delivers in VOLT-units, PDO-access in Millivolt-units.

- **CANopen over EtherCAT: PDO-access to the entries behind the dummy object 0x2 did not work correctly. (5580,D-06883)**
  Issue:
  In a free PDO-mapping in CANopen over EtherCAT the mapping entries behind the dummy object (index 2) could not be used / values were shifted. No problem occurred in CANopen over CAN.

  Solution:
  The mapping of the object index 2 is now handled correclty.

Motion Tasking Issues

Fixed Bugs

- **MT.ACC and MT.DEC default to zero without motion task configured, which is outside the parameter's ranges (5606,D-06876)**
  Issue:
  When having no motion task configured, or after loading an empty motion task, MT.ACC and MT.DEC were set to zero. This led to problems when trying to write values that were previously read, since zero is not a valid value for MT.ACC and MT.DEC.

  Solution:
  The ranges of MT.ACC and MT.DEC have been changed to allow zero to be written. When issuing an MT.SET command with either of them set to zero, an error message and a warning will be displayed, indicating that those are not valid values.

Version: 01-14-06-001 Release Date: June 17, 2016

Field Bus Specific Issues

Fixed Bugs

- **Writing multiple Modbus registers shows erroneous behavior (5532,D-06865)**
  Issue:
  When writing multiple Modbus registers, parameter values might change, even though an invalid value was written to them.

  Solution:
  The firmware has been changed to properly handle writing to multiple Modbus registers.

- **DS402 Touchprobe SDO-access returns always 0 (5495,D-06863)**

Issue:
Only PDO-access to the DS402 touch probe registers was supported.

Solution:
The touch probe objects 0x60B8 to 0x60BD are now supported also for the SDO-access.

New Features

- **PROFINET IO: New file header for AKD-NBPN FW images (S-16089)**
  Solution:
  The size of the PROFINET IO FW image has been increased so that it cannot be handled by the production programmed default file system on NA/NB hardware. However, the NB hardware is able to handle bigger FW images. Therefore, when download the new image on NB hardware, a new file system will be automatically installed one time via Workbench (WB version >= 1.14). The former NA hardware cannot support the new file header.

Feedback Issues

Fixed Bugs

- **Errors in Hiperface feedback initialization (5383,D-06868)**
  Issue:
  The initialization process for Hiperface encoders could set an incorrect initial position, especially when the motor is moved during initialization.

  Solution:
  The firmware has been changed to make sure the correct position is set during initialization of Hiperface encoders.

New Features

- **EnDat 2.2: Battery backup encoder support. (S-16871)**
  Solution:
  The FW now supports the multiturn rotary battery backup encoders with EnDat 2.2 interface. If the encoder loses battery power and operating power at the same time, the fault 451 "Feedback battery" will be triggered after startup. The axis needs to be readjusted because the multiturn position values of the absolute encoder might have been corrupted. The fault can also be ignored by setting FAULT451.ACTION to 1 (Please note that a corruption of the absolute position value due to battery and system power loss cannot be detected by this setting).

General Issues

Fixed Bugs

- **User value of IL.KP overwritten by motor autoset (D-06870)**
  Issue:
  With MOTOR.AUTOSET set to one, a value that was entered by the user for IL.KP was overwritten during the autoset procedure.

  Solution:
  A new keyword IL.KPSOURCE has been added to the firmware. When set to one the drive will never try to set IL.KP during the autoset procedure. With the default value of zero the behavior remains unchanged.

New Features

- **New keyword: GEAR.SYNCWND (4155,D-06871)**
  Solution:
  A new keyword GEAR.SYNCWND has been added to the firmware. Setting it to a value larger than zero on an Electronic Gearing slave, the slave will be considered synchronized as long as its speed is within the specified window around the velocity commanded by the master.

Version: 01-14-05-000 Release Date: May 06, 2016

Field Bus Specific Issues

Fixed Bugs

- **Fieldbus position mode: Commanding position changes within one bus cycle and an absolute value change of more than one revolution creates position jump into wrong direction. (5448,D-06855)**
  Issue:
  If the fieldbus master commands a position change within one bus cycle, which creates a position error higher than one revolution, the drive moves into the wrong direction.

  Solution:
  A numerical overflow situation is created, if the master commands such a high position error within one bus cycle. This problem was introduced with adding the command PL.PDELAY. The firmware has been changed so that if the position delay is disabled, which is the default setting, a higher position error can be commanded without create motion into wrong direction.

General Issues

Feature Changes

- **Current feedback signals are bandlimited. (5086,S-16625)**
  Issue:
  Current signals like IL.FB are very noisy and from diagnostic point of view for the user very difficult to use. Therefore, a proper filtering of these signals are needed.

  Solution:
  The firmware has changed so that the current signals are now band limited and can be used much easier for diagnostic purposes.

Feedback Issues

Fixed Bugs

- **No fault triggered if communication with halls only feedback is lost. (5273)**
  Issue:
  If the feedback type "Halls only" is selected and the feedback cable is disconnected while position values are exchanged, the drive has not detected a communication fault.

  Solution:
  The new FW/FPGA triggers the fault "404: Illegal Hall state" if the feedback cable is disconnected.

Version: 01-14-04-000 Release Date: April 21, 2016

Field Bus Specific Issues

Fixed Bugs

- **Modbus: Wrong register address displayed in Modbus error list (5394,D-06653)**
  Issue:
  The register address that was displayed in the Modbus error list was sometimes not containing the register address of the Modbus access that caused the error.

  Solution:
  The Modbus error list should now always display the correct register address.

General Issues

Fixed Bugs

- **Jog Digital Input bit toggle after a drive Startup, forces axis to perform jog move. (5431,D-06653)**
  Issue:
  If the Jog start digital input bit is toggled after the drive has been rebooted or power cycled, the jog motion will start when the drive is enabled, even though the jog start bit is in the "no jog motion" state.

  Solution:
  The firmware has been modified so that the jog motion will not occur when the jog start digital input bit is toggled after a reboot or power cycle.

New Features

- **New keyword IL.VLIMIT to limit the velocity in torque mode. (S-16655)**
  Solution:
  A new keyword IL.VLIMIT has been added to the firmware. Setting it to a non-zero value will limit the velocity - in torque mode only - to the range of -IL.VLIMIT to IL.VLIMIT.

Version: 01-14-03-000 Release Date: April 11, 2016

Field Bus Specific Issues

New Features

- **EtherCAT/CANopen: Stepper command (DRV.EMUESTEPCMD) via PDO 3499hsub00h supported. (S-12412)**
  Solution:
  The emulated encoder output values the stepper command can now be controlled via PDO 3499hsub00h. The PDO setpoint value need to be updated in relation to the configured fieldbus cycle rate.

- **EtherCAT/CANopen: Support Profile Torque Mode with all mandatory objects (2383,S-16420)**
  Solution:
  A new object 0x6087 sub 0 for Torque slope is now implemented. As this is the last missing mandatory object for the Profile Torque mode it's now stated in object 6502 sub 0.

- **Add new homing modes 17 and 18 to DS402-object 6098h (S-16604)**
  Solution:
  New values for homing modes:

Value 6098h	HOME.MODE	HOME.DIR
-5	17	no change
-6	18	1
-7	18	0

- **CANopen-support for motion task parameters MT.TNUM and MT.TNEXT (5415,S-16605)**
  Solution:
  New objects for MT.TNEXT (0x35BD sub 0) and MT.TNUM (0x35B8 sub 0) are implemented

Fixed Bugs

- **PROFINET IO: Command source is not stored properly after power cycle. (5416,D-06824)**
  Issue:
  If the command source is was stored to the drive and not "set" by the PROFINET IO master after connection establishment, the command sources was always set back to CService.

Solution:
The fw has been changed so that it does not overwrite the stored command source.

- **Modbus: Some Modbus commands not behaving properly (5394,D-06830)**
  Issue:
  Some Modbus commands showed erroneous behavior, for example not doing range checks when writing or not setting the correct default values.

  Solution:
  The firmware has been changed so that the Modbus commands behave properly.

- **Modbus: F3Bar Occurs when DRV.WARNINGX command is accessed via Modbus objects (5426,D-06829)**
  Issue:
  When DRV.WARNINGx commands are accessed via the Modbus objects (1582, 1583 and 1584) the objects always return 0 even when warnings are present. And an F3Bar occurs when any telnet command is excecuted after these modbus commands are executed.

  Solution:
  The firmware has been changed so that the DRV.WARNINGx modbus objects return the warning numbers properly, and an F3Bar will not occur after these modbus commands are executed.

- **EtherCAT status word bit10 not working in homing mode (4978,D-06826)**
  Issue:
  The DS402 status word has a definition for bit 10 as Target Reached information. This was coupled to bit 11 in DRV.MOTIONSTAT, which does not work in the homing procedure.

  Solution:
  The DS402 status word bit 10 works now also in homing mode. A bit 21 has been added to DRV.MOTIONSTAT to show this also in the homing procedure. A parameter HOME.TPOSWND (object 0x5406) has been added for the window definition for this bit with default value 0, which switches the new behaviour off.

General Issues

New Features

- **Stepper command DRV.EMUESTEPCMD scalable via DRV.EMUESTEPCMDPIN and DRV.EMUESTEPCMDPOUT. (S-16627)**
  Solution:
  Two new parameters (DRV.EMUESTEPCMDPIN and DRV.EMUESTEPCMDPOUT) have been introduced, which can be used to scale the DRV.EMUESTEPCMD. For EtherCAT/CANopen the PDO 3499h00h (DRV.EMUESTEPCMD) is written cyclically, which is now scalable via SDO 5404h00h (DRV.EMUESTEPCMDPIN) and SDO 5405h00h (DRV.EMUESTEPCMDPOUT).

Fixed Bugs

- **Acceleration and deceleration ramps of electronic gearing were not smooth for certain settings (4155,D-06743)**
  Issue:
  When trying to sync to a master velocity or when stopping the electronic gearing the acceleration or deceleration ramps sometimes showed shaking.

  Solution:
  Several improvements have been made to the trajectory generation for electronic gearing to smooth out acceleration and deceleration.

BASIC Issues

Fixed Bugs

- **Position command was sometimes set so feedback position at end of absolute move on BASIC drive (5422,D-06822)**
  Issue:
  When disabling the drive during a service motion and then commanding an absolute move on a BASIC drive, the command position was set to the position feedback value at the end of the move. This could lead to the command position not being equal to the target position of the absolute move.

  Solution:
  The firmware has been changed to make sure BASIC drives move to the correct position when doing an absolute move.

- **Drive crashed (F3bar) when too many commands with long response times were called over a short time from a BASIC program (5382,D-06811)**
  Issue:
  When quickly calling many commands with long response times from a BASIC program, for example from an interrupt, the drive crashed (F3bar) and had to be power cycled to return to normal operation.

  Solution:
  The virtual machine of the AKD BASIC has been modified to properly handle many commands with long response times.

Motion Tasking Issues

Fixed Bugs

- **After a motion task the command position did sometimes not equal the motion task's target position. (5440,D-06839)**
  Issue:
  When executing a motion task with a deceleration high enough to decelerate from the maximum velocity in less than 250 µs, the command position at the end of the motion task would not be the target position of the motion task.

  Solution:
  The firmware has been changed to properly stop with a high deceleration.

Version: 01-14-02-000 Release Date: February 24, 2016

Homing Issues

New Features

- **New homing mode: Absolute homing with user offset (5239,S-16425)**
  New Feature Details:
  A new homing mode has been added. In this mode the drive will first execute an absolute homing and then calculate and store a value for FB1.OFFSET, so that the current position becomes the position specified by the user through HOME.P. The value of FB1.OFFSET is automatically saved in non-volatile memory, so that the drive does not have to be re-homed after power cycle when using an absolute feedback device.

- **New keyword: HOME.MOVEREQUIRED (5239,S-16537)**
  New Feature Details:
  A new read-only keyword HOME.MOVEREQUIRED has been added to the firmware, which is used to store, if a homing procedure with mode 17 has been executed once, so that no additional homing is required after a power cycle when using an absolute feedback.

- **New keyword HOME.IPEAKACTIVE (5316,S-16447)**
  New Feature Details:
  A new keyword HOME.IPEAKACTIVE has been added to the firmware. When setting it to one, the drive will use HOME.IPEAK to limit the current during homing instead of the limits from the current loop.

- **New homing mode 18: Find home input then find next feedback zero. (S-16448)**
  New Feature Details:
  A new homing mode 18 is added, which looks in the first step for the homing reference and then moves to the next feedback zero position. This homing mode is useful for feedback devices with more than two poles, and it is desired that the next homing position is at the next pole pair position.

Brake Issues

Fixed Bugs

- **There was a low probability that the power stage was disabled again, if brake was under fieldbus control and drive was enabling the power stage. (5331,D-06742)**
  Issue:
  There was a low probability that the power stage was disabled again, if brake was under fieldbus control and drive was enabling the power stage. This was seen with an EtherCAT-master.

  Solution:
  The race-condition was mainly solved in the brake state machine. Additional also in the DS402 power stage state machine.

General Issues

Fixed Bugs

- **When Using an AKD drive with an option card to expand the number of Inputs/Outputs, the Programmable Limit Switches (PLS's) were not working properly (5282,D-06767)**
  Issue:
  When Using an AKD drive with an option card to expand the number of Inputs/Outputs (I/O),the Programmable Limit Switches (PLS's) would not toggle the Output bits at the correct location.

  Solution:
  The firmware has been modified so that when using an AKD drive with expanded IO, the PLS's will toggle the Output bits at the correct location.

- **Value of CMPx.MODEN not properly loaded at power-up. (5321,D-06731)**
  Issue:
  After booting the drive, the compare engines' modulo was always disabled, even if it was saved as enabled.

  Solution:
  The firmware has been modified to properly load the saved value of CMPx.MODEN.

Version: 01-14-01-000 Release Date: February 04, 2016

Version: 01-14-00-003 Release Date: February 03, 2016

IO Issues

Fixed Bugs

- **Digital Output Mode 21 did not work properly (5330)**
  Issue:
  Digital Output Mode 21 was expected to set output low for 500 ms whenever a fault is encountered. This worked almost all of the time, but in some rare cases the output did not go low until the second fault was encountered. In addition, the documentation incorrectly stated that the output should stay low until the fault is cleared instead of just for 500 ms.

  Solution:
  The firmware has been modified to get rid of a race condition involving firmware bits that indicated that Mode 21 could set the output to low.

Field Bus Specific Issues

Fixed Bugs

- **In fieldbus mode, IL.CMDACC is not always calculated properly. (D-06735)**
  Issue:
  Depending on the used cycle time and the setting of FBUS.SYNCDIST, IL.CMDACC was not always calculated properly.

Solution:
The FW is modified so that calculation of IL.CMDACC is independent on the setting of FBUS.SYNCDIST and the point in time when the new set points are received. If the acceleration feed forward was activated (IL.KACCFF 1), closed loop behaviour may have changed because the feedforward value is now activated.

- **EtherCAT: There was no fault created on communication state change from OP to another state, when the power stage was enabled (DS402 state Operation Enabled). (5332,D-06736)**

  Issue:
  In an EtherCAT-application the trajectory generator crashed and switched the communication state to SAFEOP. The drive stayed in the DS402 state Operation Enabled and the power stage stayed enabled. The expectation was to get a fault and disable the power stage.

  Solution:
  A F125 fault is now created in this situation, if FBUS.PARAM04 is 1.

New Features

- **Parameters are automatically saved to the drive after a parameter file is loaded over FoE if FBUS.PARAM05 Bit 13 is set. (S-16435)**

  Solution:
  After successfully loading a parameter file over FoE, the parameters are automatically saved to the drive's non-volatile memory if FBUS.PARM05 Bit 13 was set in the loaded parameter file.

General Issues

Fixed Bugs

- **IL.MI2T does not display correctly in Workbench scope (5333)**

  Issue:
  IL.MI2T was formatted wrong when displayed in the firmware for scope signal.

  Solution:
  The firmware has been modified to format IL.MI2T correctly for scope display.

- **Auto-IP address collisions fixed (5287)**

  Issue:
  Using multiple drives in auto-ip mode there is the possibility that a drive is unable to obtain an IP address if the two have similar MAC addresses.

  Solution:
  The Auto IP collision detection and resolution algorithm is now working properly on the AKD-C/N system.

New Features

- **New keyword to reboot the AKD-N in firmware download mode to recover from corrupt operational firmware on the AKD-N. (S-16246)**

  New Feature Details:
  A new keyword STRINGS.FORCEDOWNLOAD has been added to the firmware. Setting it to 1 will power cycle all AKD-N's and boot them up in "firmware download" mode. This will allow the user to recover the drive when the operational firmware has been corrupted. Setting it to 0 will power cycle all AKD-N's and boot them to operational mode, for normal operation.

- **New keyword PL.KITHRESH (S-16301)**

  New Feature Details:
  A new keyword PL.KITHRESH has been added which defines a velocity that disables the position loop integrator.

  When MT.VCMD exceeds the value of PL.KITHRESH, the position loop integrator turns off. By default this threshold is set to the maximum drive velocity so the position loop integrator is always on.

- **AKD-C/N: Static IP address configuration now also supported on AKD-C/N (S-16352)**

  New Feature Details:
  The AKD-C/N system is now also supporting the static IP address setting for the service channel. In addition to DHCP and Auto IP, with setting the IP.MODE to 1, the static ip address is used by the device defined by the commands IP.ADDRESS, IP.SUBENET and IP.GATEWAY.

- **New keyword STRINGS.IPMODERESET for AKD-C added, which resets the IP mode of all AKD-N's to default values. (S-16352)**

  New Feature Details:
  If the AKD-N's connected to the AKD-C are set to an invalid static IP address, the command STRINGS.IPMODERESET on the AKD-C can be used to reset the IP mode of all AKD-Ns. After execution of this command, the AKD-N retrieve a new IP address either through DHCP or Auto IP.

- **New keyword VL.KIMODE (S-16301)**

  New Feature Details:
  A new keyword VL.KIMODE has been added which sets whether the velocity loop integrator is automatically disabled based on the state of the position loop integrator.

  When VL.KIMODE = 0, the velocity loop integrator is always enabled. When VL.KIMODE = 1, whenever the position loop integrator is on, the velocity integrator will be immediately disabled. When the position loop integrator turns off the velocity loop integrator will be re-enabled. Use with PL.KITHRESH to dynamically switch integrators during a move.

Feature Changes

- **Change motor I2T algorithm when using IL.MIMODE 1 to better protect the motor (D-06749)**

  Issue:
  The motor I2T algorithm when using IL.MIMODE 1 was using motor current as an indication of motor thermal load; it is better to model motor thermal load as proportional to current squared.

  Solution:

Change motor I2T algorithm (IL.MIMODE 1) to use motor phase current squared to calculate thermal load.

Known Issues

- **Fix PL.ERRMODE 1 operation (S-16299)**
  Issue:
  PL.ERRMODE 1 has been fixed so that it uses the desired profile velocity rather than the velocity loop input command. A scaling factor PL.ERRFACTOR and fault time PL.ERRTIME have been added to the fault detection logic.

BASIC Issues

Feature Changes

- **Lowering AKD Basic velocity limits to 15000 RPM (S-16301)**
  Issue:
  AKD Basic velocity limits were previously 480,000 RPM. This causes some conflicts with some features.

  Solution:
  The limit has been lowered to 15,000 to match the standard AKD product and ensure compatibility with all features.

Version: 01-14-00-002 Release Date: December 08, 2015

General Issues

New Features

- **New keyword to turn off phase loss warnings on AKD-C (S-16234)**
  New Feature Details:
  A new keyword STRINGS.PHASELOSSDETECTION has been added to the firmware. Setting it to 0 disables the warnings for the phase loss on AKD-C while the faults are not influenced.

Fixed Bugs

- **After the drive disabled, fault 703 (emergency timeout) is sporadically generated if DRV.DISMODE is set to 0. (5326,D-06734)**
  Issue:
  Disabling the drive with DRV.DISMODE 0 means the power stage is disabled directly. The disabling process in this case can be very fast and might uncover a firmware issue, which starts emergency timer, but does not stop it after the drive is finally disabled. In very rare cases, the 703 emergency timeout fault is generated.

  Solution:
  The firmware will now always clear the emergency timer in the disabled state.

Field Bus Specific Issues

Feature Changes

- **New Topology for AKD-C\AKD-N (S-15923)**
  Issue:
  The timing calculation of TwinCAT is not working correctly on the former AKD-C EtherCAT-implementation.

  Solution:
  The AKD-C has now a two core implementation for the two AKD-N strings. This solves the timing calculation issue for EtherCAT-masters. ESI-file updated.

Version: 01-14-00-001 Release Date: November 30, 2015

Feedback Issues

Fixed Bugs

- **BISS-C device doesn't reinitialize properly after fault and fault clearing. (5237,S-16189)**
  Issue:
  Feedback fault clearing doesn't work for BISSC device with encoder resolution 2^32

  Solution:
  Firmware has been modified so that the BISS-C device initialization routine will set the feedback encoder resolution values properly both at startup and re-initialization.

Field Bus Specific Issues

Fixed Bugs

- **EtherCAT/CANopen: In profile position mode and quickstop mode 5 or 6, a running motion task is not properly aborted if quickstop is active. (S-16291)**
  Issue:
  If the quickstop option code 5 or 6 (Slow down and stay enabled) are selected, a motion task might still continue after the drive was ramped down to zero velocity.

  Solution:
  Any pending motion task is now aborted if the quick stop mode is triggered.

Brake Issues

Fixed Bugs

- **Brake Open Circuit fault displayed unnecessarily (4826)**
  Issue:
  For some motors the trigger for a "Brake Open Circuit" fault was to sensitive on AKD-N, leading to faults being displayed unnecessarily.

  Solution:
  The firmware has been modified to add an additional delay to the brake release delay, preventing unnecessary faults.

General Issues

Fixed Bugs

- **AKD-C/N: Power board temperature measurement not working properly at low temperatures. (4680)**
  Issue:
  An environment temperature lower than 0 degree Celsius could lead to an invalid measured AKD-N/C power board temperature, which could cause a temperature fault.

  Solution:
  The temperature measurement has been corrected for the power board of AKD-C/N.

New Features

- **New mode for analog input to generate a configurable fault (S-15825)**
  New Feature Details:
  A new mode has been added to the Analog Input that will enable the AKD to generate a warning and fault if the input value exceeds user configured thresholds. New keywords AIN.OVFTHRESH, AIN.OVWTHRESH, AIN.UVFTHRESH, and AIN.UVWTHRESH were added to control the warning and fault thresholds.

Version: 01-14-00-000 Release Date: November 17, 2015

Field Bus Specific Issues

Fixed Bugs

- **EtherCAT drive not enabling with FBUS.PARAM05 bit 8 set (5298,D-06708)**
  Issue:
  Having bit 8 of the FBUS.PARAM05 set on an AKD using EtherCAT, the drive could not be switched to the "operation enabled" state, when a wake and shake was armed.

  Solution:
  The firmware was changed to allow enabling the drive when wake and shake is armed and bit 8 of FBUS.PARAM05 is set. When requesting a change to "operation enabled" the drive will enable, perform wake and shake and then change it's state to "operation enabled".

- **Download of a parameter file through FoE not working properly (5302,D-06714)**
  Issue:
  Under rare circumstances, a parameter file could not be loaded properly through FoE.

  Solution:
  The firmware has been updated to properly handle parameter files received through FoE.

General Issues

Fixed Bugs

- **PL.ERRMODE 1 does not work (D-06718)**
  Issue:
  PL.ERRMODE 1 had a calculation error which causes it to operate like PL.ERRMODE 0.

  Solution:
  The algorithm has been corrected to behave as the documentation states.

- **Error restoring parameter file, cannot Load AIN.VSCALE and AOUT.VSCALE (5302,D-06709)**
  Issue:
  The parameter file cannot be loaded when certain minimum values of AIN.VSCALE and AOUT.VSCALE are stored in the parameter file. For example with UNIT.VROTARY set to 3-Custom/s, UNIT.PIN set to 192, UNIT.POUT set to 10, the minimum value for AIN.VSCALE and AOUT.VSCALE is set to 0.019. However if the command "AIN.VSCALE 0.019" is issued an error will occur.

  Solution:
  The firmware has been fixed so that all values within the min/max range for AIN.VSCALE and AOUT.VSCALE can be reloaded to the drive with a terminal command or a command from the parameter file

Version: 01-13-12-000 Release Date: November 11, 2015

General Issues

New Features

- **Extended multiturn function added. (4389,D-06598)**
  New Feature Details:
  For applications moving the axis endless in one direction (round axis), it useful to recover the absolute position after power cycling also if the measuring range of a multiturn encoder is exceeded. Especially if you have modulo range configured, which does not match the encoder resolution, this could lead to a position jump after power cycle of the drive.

  Solution:
  With setting FB1.EXTENDEDMULTITURN set to 1, the drive can recover the exact multiturn position also after exceeding the measurement range of the encoder. However, this feature is restricted to encoders with 12 bit multiturn position bits and it's not

allowed to move the axis without having the drive powered on for more than 1/4 of the measuring range of the encoder.

- **Make CAN/EtherCAT Additional Feed Constant Keywords Accessible via Telnet (Workbench) (S-16197)**
  Solution:
  The two CAN/EtherCAT Additional Feed Constant parameters "3rd additional feed constant - feed" (object 0x60E9 sub3) and "3rd additional feed constant - driving shaft revolutions" (object 0x60EE sub3) are now accessible via telnet (Workbench). They can be accessed with the keywords DS402.3ADDPOSFCFEED, and DS402.3ADDPOSFCSHAFTREV respectively.

Fixed Bugs

- **Reversing Service Motion Ramp Changes if SM.VX is Changed After The Service Motion Has Started (5178,D-06651)**
  Issue:
  The Reversing Service Motion ramps (acceleration/deceleration) will change from SM.ACC/DEC to DRV.ACC/DEC if the Service Motion Velocity (SM.VX) is changed after the Service Motion has been started

  Solution:
  The firmware was has been updated so that all Reversing Service Motions use the Service Motion Ramps (SM.ACC/DEC)

Brake Issues

New Features

- **Allow higher brake current on AKD-N's >= 6 Ampere continuous drive current (S-16144)**
  New Feature Details:
  When using large motors with brakes, that need 1.5 Amps, the AKD-N's with 6 and 12 Ampere continuos current, should support the higher brake current.

  Solution:
  The high brake current of 1.5 Ampere are now supported on AKD-N 6A and AKD-N 12A. Other AKD's support a maximum brake current of 1 Ampere.

Field Bus Specific Issues

New Features

- **CANopen/EtherCAT: Quickstop function including quick stop options in object 605Ah supported (5276,D-06694)**
  Solution:
  As user it might be necessary to ramp down the drive in different ways like ramp down and disable or ramp down and stay enabled. Therefore, object quick stop option code (605Ah) is now supported with the following values:

  1: Slow down on slow down ramp and transit into Switch On Disabled.
  2: Slow down on quick stop ramp and transit into Switch On Disabled (default).
  5: Slow down on slow down ramp and stay in Quick Stop Active.
  6: Slow down on quick stop ramp and stay in Quick Stop Active.

  For AKD, the quick stop ramp is similar to CS.DEC. The slow down ramp is similar to DRV.DEC. The quick stop ramp and slow down ramp has been finished if the drive velocity VL.FB is within the velocity window defined by CS.VTHRESH and CS.TO.

Fixed Bugs

- **Timing problem on EtherCAT position feedback (5244,D-06668)**
  Issue:
  Using the AKD with EtherCAT sample time of 500uS the following error computed as FE = EtherCATCommandedPosition - EtherCATFeedbackPosition changes if the EtherCAT master is restarted while the following error computed by the drive (PL.ERR) doesn't change

  Solution:
  The firmware has been modified so that when the EtherCAT sample time of 500 uS is used, the Fieldbus following error will be consistent between EtherCAT master restarts.

Feedback Issues

Fixed Bugs

- **Operation in position mode with halls-only feedback was possible even though it should not be allowed (5271,D-06697)**
  Issue:
  Being in position mode and changing the feedback to halls-only, an error was displayed but the feedback was changed anyways.

  Solution:
  The firmware has been updated to display a fault if position mode is activated and Halls-Only feedback is selected. The fault can only be cleared once the feedback and/or the operation mode was changed.

- **FB1.ENCRES not properly set to read-only when usin a HiperfaceDSL feedback (5299,D-06712)**
  Issue:
  Using a HiperfaceDSL feedback, saving the drive parameters to file would save FB1.ENCRES, even though the parameter should be read only and thus not be saved to the parameter file. This would lead to an error when reloading parameters from the file.

  Solution:
  The firmware has been changed to set FB1.ENCRES to read-only when using a HiperfaceDSL feedback.

Version: 01-13-11-000 Release Date: September 29, 2015

General Issues

Fixed Bugs

- **AKD-C: Phase loss warning never shown. (5127)**
  Issue:
  On AKD-C, when a phase was lost and the string current was below a threshold of 8 Arms a warning should have been displayed, which was not the case.

  Solution:
  The warning is now properly displayed.

- **AKD-C: Phase loss warning was only shown sporadically in the EtherCAT/CANopen manufacturer status word. (4710)**
  Issue:
  Switching off high-voltage power set the warning bit in the manufacturer status word of EtherCAT but immediately cleared it even if the warning was still present.

  Solution:
  The warning bit in the EtherCAT manufacturer status word now correctly reflects the warning state of the drive.

- **DRV.DIR is not working for induction motor (5259,D-06676)**
  Issue:
  The induction motor closed loop control type applies wrong signed Id and slip frequency when DRV.DIR = 1; For induction open loop, it doesn't change the sign of velocity command as it should.

  Solution:
  When DRV.DIR = 1, apply the corrected sign of slip frequency and flux current for induction motor closed loop; and correct sign for velocity command for induction motor closed loop.

New Features

- **AKD-C: Added a new keyword STRINGS.PHASELOSSFTHRESH. (S-15311)**
  New Feature Details:
  A new keyword STRINGS.PHASELOSSFTHRESH was added to the AKD-C firmware. When a phase loss is detected, a fault is only triggered if the string current is above the specified threshold. Otherwise a warning is displayed.

Field Bus Specific Issues

Fixed Bugs

- **EtherCAT: Cannot move off a Limit Switch (5105)**
  Issue: (Identified in Version 01-12-02-000)
  When using a fieldbus with sample rate less than 4kHz, if a position limit switch is triggered, the controller intermitently may not be able to move the axis away from the limit.

  Solution:
  The trajectory generator now maintains the fieldbus command, this fixes the bug and also allows position error limit faults to occur if the fieldbus master continues far past the hardware position limit switch.

- **EtherCAT: Sporadically fault 630 "FPGA cyclic read fault" when using EtherCAT and no distributed clock. (5197)**
  Issue: (Identified in Version 01-13-00-004)
  If EtherCAT is used with no distributed clock selected, the AKD could sporadically trigger the 630 fault.

  Solution:
  The internal synchronization was not working properly if no distributed clock was used. This has been fixed.

- **CANopen DS402 Status word doesn´t change if controlled stop is applied externally (5176,D-06650)**
  Issue:
  The DS402 Status word should change when a controlled stop is applied externally. When using Interpolated Position (IP) Mode, bit 12 (IP Mode Active) is set to 1 as long as the drive is following the set-points. When the controlled stop is externally generated, this bit should be set to 0, but it was staying set to 1.

  Solution:
  The firmware has been changed so that the DS402 Status Word's bit 12 (IP Mode Active) is set to 0 when a controlled stop is generated externally.

Version: 01-13-10-001 Release Date: August 07, 2015

Feedback Issues

Fixed Bugs

- **Hiperface DSL multiturn position incorrect after disconnect and reconnect Hiperface DSL feedback device. (5071,D-06607)**
  Issue:
  If the Hiperface DSL feedback device is unplugged from the AKD, then reconnected, the feedback faults might need to be cleared more than one time and the multiturn position of the feedback might be incorrect.

  Solution:
  The firmware has been modified so that the feedback is fully re-initialized after the feedback cable is lost. The multiturn position is now properly latched after reconnect the feedback device to the AKD.

General Issues

Fixed Bugs

- **IL.KPLOOKUPVALUES are overwritten with default values. (5109,D-06609)**
  Issue: (Identified in Version 01-12-00-000)
  Data stored for IL.KPLOOKUPVALUES in NV memory is overwritten with default values after a power cycle, and under other conditions that update the lookup table.

  Solution:

Overwriting stored table values is prevented. Expected conditions such as DRV.RSTVAR are still allowed.

- **Acceleration limits were ignored in certain situations in analog position command. (5083,D-06597)**
  Issue: (Identified in Version 01-12-00-000)
  Setting an offset in analog position command mode while the drive was enabled sometimes caused acceleration that exceeded the specified acceleration limit.

  Solution:
  The firmware has been changed, so that the acceleration is poperly limited.

- **AIN.CUTOFF not restored properly when upgarding to 01.13.08.000 firmware (5120)**
  Issue: (Identified in Version 01-13-08-000)
  When upgrading to 01.13.08.000 firmware, the value of AIN.CUTOFF is restored to an invalid frequency.

  Solution:
  The scaling for this parameter was changed, and improperly restored for old firmwares. A patch has been implemented to handle the conversion.

- **FB1.HALLSTATE related command has the wrong sequence. (D-06536)**
  Issue: (Identified in Version 01-12-00-000)
  FB1.HALLSTATE documentation is wrong about W being the highest bit; FB1.HALLSTATEU and FB1.HALLSTATEW wrongly returns hardware W and U inputs.

  Solution:
  Code changed for FB1.HALLSTATEU AND HALLSTATEW to return values for the correct channal. Documentation updated and corrected for FB1.HALLSTATE.

Field Bus Specific Issues

Fixed Bugs

- **PROFINET IO: Real time jogging causes the drive to stop the movement. (5102)**
  Issue:
  If the application toggles the real time jogging within every bus cycle, the jogging might be just stop and the drive does not react on any real time jogging command anymore.

  Solution:
  The new FW does fixes the problem. However, also triggering the "non real" time jog command will unstuck the real time jog command.

- **PROFINET IO: Reading of PNU 2592 for IL.MI2T was limited to 65 % (5100,D-06591)**
  Issue: (Identified in Version 01-11-04-915)
  PROFINET IO: Reading of PNU 2592 for IL.MI2T was limited to 65 %

  Solution:
  IL.MI2T is now completely handled as 32-bit value. The limitation issue is fixed.

Version: 01-13-09-001 Release Date: June 19, 2015

Feedback Issues

Fixed Bugs

- **Hiperface DSL multiturn position is not correct after switch feedback type from resolver to hiperface DSL. (5071,D-06607)**
  Issue:
  The Hiperface DSL (HFDSL) multi-turn position is not correct if resolver feedback type is selected (FB1.SELECT = 40) before selecting HFDSL feedback (FB1.SELECT = 46).

  Solution:
  The firmware has been modified so that the HDSL multi-turn positon is correct after first selecting resolver feedback, then HFDSL feedback.

Version: 01-13-09-000 Release Date: June 18, 2015

General Issues

Fixed Bugs

- **Saved Current Limits are overwritten with default values after the drive is restarted. (5107,D-06604)**
  Issue: (Identified in Version 01-13-03-000)
  If the current limits, IL.LIMITP and IL.LIMITN are saved to the drive (using DRV.NVSAVE, or the workbench "Save to Device" command), they are then overwritten with the default values, when the drive is restarted with a DRV.REBOOT command, or a Power Cycle.

  Solution:
  The firmware has been changed so that the current limit values IL.LIMITP and IL.LIMITN that have been saved to the drive, are the active values after the drive is restarted. They are no longer overwritten with the default values when the drive is restarted.

- **Over speed fault 302 with "Halls only" feedback. (D-06612)**
  Issue:
  The halls only feedback has a very "low" resolution, which can create a lot of quantization noise in the velocity signal. Therefore, the user has to set a "very high unnatural" over speed threshold to get the application running without encounter the over speed fault. This has an negative impact on the machine design.

  Solution:
  For "Halls only" the velocity signal is now filtered for the over speed calculation. The over speed threshold can now be set to an appropriate level.

Field Bus Specific Issues

New Features

- **Added a new command type Velocity Setpoint and keywords EIP.ACC and EIP.DEC to EthernetIP. (S-15711)**
  New Feature Details:
  Added a new command type Velocity Setpoint (0x8) which allows the user adjust velocity every cyclic cycle. Additionally, the user can set the acceleration and deceleration used by the next position or velocity command from Workbench (see keywords EIP.ACC and EIP.DEC).

- **Added 32-bit access to 64-bit wide keywords for EthernetIP. (S-15756)**
  New Feature Details:
  Added 32-bit access to 64-bit wide keywords for EthernetIP.

Feedback Issues

Fixed Bugs

- **Inductive EnDat on AKM52H-ANCNLB00 does not work in EnDat 2.1 mode (5085)**
  Issue: (Identified in Version 01-13-03-004)
  Selecting EnDat 2.1 mode, FB1.SELECT 30, with an AKM with and inductive feedback (AKMxxx-xxxxLBxx) generated a fault. In previous versions no fault was reported.

  Solution:
  The firmware has been changed so that no fault is reported when using inductive EnDat devices and FB1.SELECT is 30.

Version: 01-13-08-000 Release Date: May 07, 2015

Motion Tasking Issues

Fixed Bugs

- **DRV.STOP does not work consistently under certain motion task configurations. (5075,D-06565)**
  Issue:
  Under certain motion task configurations, when switching between the current task and the following task, DRV.STOP may be ignored so that the drive does not stop but continues the motion task.

  Solution:
  The motion task logic has been fixed so that drive stops correctly when DRV.STOP is received.

General Issues

Fixed Bugs

- **Wake and Shake Mode 2 does not execute commutation validation. (5082)**
  Issue:
  If WS.MODE 2 is set in conjunction with WS.CHECKMODE 1 (Active Commutation Check), the check will not occur after Wake and Shake completes.

  Solution:
  Active commutation check support has been added to Wake and Shake mode 2.

- **Warning n309 (Motor I2t load. reduce load) not shown in DRV.WARNINGx. (5101)**
  Issue:
  The warning 309 did not show up in the DRV.WARNINGx commands, but is reported in DRV.WARNINGS.

  Solution:
  The new FW shows also the 309 code in the DRV.WARNINGx commands and not only in DRV.WARNINGS. DRV.WARNINGx can also be accessed via the fieldbus channel.

New Features

- **Added Halls Only Feedback support (S-15659)**
  New Feature Details:
  Standard AKD and NSD drives now support Hall Only feedback, just set FB1.SELECT = 12 and connect a hall device to connector to the primary feedback to operate.

- **Added Software Reboot command, DRV.REBOOT (S-15677)**
  New Feature Details:
  The software reboot command, DRV.REBOOT command has been added. Note that the reboot command will reload the parameters that have been saved to the drive. To issue the command type "DRV.REBOOT 0xaabbccdd".

Field Bus Specific Issues

Fixed Bugs

- **Firmware crash on bootup in configuration with many PROFINET IO-drives (5060,D-06555)**
  Issue:
  Some customers reported firmware crashes of drives in the bootup-phase of the PROFINET IO-network.

  Solution:
  Thread-handling in the drive's PROFINET IO-implementation is fixed.

- **Unpowered drive shows faults 308 (Voltage exceeds motors rating) and 503 (Bus capacitor overloaded). (5084,D-06576)**
  Issue:
  If the drive is unpowered, the drives shows faults 308 and 503. The user can just switch on the main power and both of these faults can be cleared.

Solution:
There is no functional problem. The FW was triggering these two faults if the vbus.value changed into the negative direction. This is now fixed.

New Features

- **New keyword PN.POSSCALE for PROFINET IO devices added. (S-15672)**
  New Feature Details:
  The new keyword PN.POSSCALE can be used to scale all PNUs, which have an index greater 2000, which are position scaled parameters and which have the attribute float (e.g. PL.FB and HOME.P). In some applications, the default scaling value of 1000 for these kinds of PNUs created a too coarse resolution for position parameters. Therefore, the user can now change the scaling and can configure the right resolution either by PNU access to PN.POSSCALE or directly in workbench. In addition, the new parameter is storable.

  The scaling parameter PN.POSSCALE is used as follows:

  PNU value = Parameter value (like PL.FB or HOME.P) / PN.POSSCALE

- **Add EIP.OBJECTLIST keyword. (S-15729)**
  New Feature Details:
  The EIP.OBJECTLIST keyword provides information about objects that are available for dynamic mapping. With no arguments, the keyword output contains the full array of objects. With one numerical index argument, the output provides information about the object at the index. This keyword supports the Workbench dynamic mapping GUI.

Feedback Issues

Fixed Bugs

- **Intermittent Hiperface DSL feedback faults on AKD-N. (S-15731)**
  Issue:
  In some applications, the AKD-N with Hiperface DSL feedback (single cable) created intermittent DSL feedback faults (F467) like "Incremental Position invalid" in FB1.FAULTS.

  Solution:
  There was a problem identified in the communication path between Feedback and Drive, which created this issue. An update to newest FPGA and FW fixes the problem.

Version: 01-13-07-000 Release Date: May 06, 2015

Field Bus Specific Issues

Fixed Bugs

- **AKD-Synqnet (SQ) brake does not engage for faults 502, 503, and others. (5064,D-06553)**
  Issue:
  When using an AKD-SyqNet drive, the motor brake would not engage when faults would occur; faults such as under voltage (fault 502) and bus capacitor overload (fault 503).

  Solution:
  The AKD-SynqNet firmware has been modified so that the motor brake will be engaged/applied when faults occur.

Version: 01-13-06-000 Release Date: April 23, 2015

Field Bus Specific Issues

Fixed Bugs

- **CANopen: If a master commands the DS402 state change from Switched On to Operational Enabled, then changes the command to Shut Down, the power stage may stay enabled. (5031,D-06529)**
  Issue:
  When the master sends a command word of 15, the drive begins enabling the power stage in order to transition to the Operational Enabled state. This transition is not completed until the motor brake has fully released. If the master changes the command word during the time the drive is waiting for the brake to open, the power stage may stay enabled. In this case, the DS402 state might be Switched On Enabled, yet the drive is servoing.

  Solution:
  The power stage will now be disabled if the master changes the command word while a transition to Operational Enabled is in progress.

- **EtherCAT: PDO-Config setting needed by EtherCAT masters like DeltaTau or Omron (5049,S-15607)**
  Issue:
  Some EtherCAT-masters need a special flag in the ESI-file and the EEProm emulation to state that a free-mapping of PDOs is available

  Solution:
  The Flag PDOconfig is now supported in the ESI-file and EEProm emulation of the AKD-P

- **Ethernet IP: Reconnect issue on AKD when unplugging cable while running cyclically. (5034,D-06520)**
  Issue:
  A PLC cannot reconnect to an AKD when you unplug the X11 Ethernet cable for 30 seconds on an AKD that is running Ethernet IP cyclically.

  Solution:
  The PLC can now reconnect and setup a cyclic connection.

New Features

- **CANopen: Add support for object 0x60FC sub 0 (Position demand internal value) (5048,S-15629)**

New Feature Details:
A NC-manufacturer wanted to see the internal position command value via CANopen

Solution:
The DS402-object 0x60FC sub 0 is supported now. The scaling is consistent to the internal position value 0x6063 sub 0. This is a read-only object.

Homing Issues

Fixed Bugs

- **Velocity command value glitch happens on leaving hardware limit switch in homing mode 1 /2 (4941,D-06528)**
  Issue:
  In using homing mode 1 or 2 a glitch of 250 microseconds in the velocity command (VL.CMD) occurred always when the hardware limit switch was left. Only, if VL.KVFF unequal 0.

  Solution:
  The glitch does not occurr any longer in the homing procedure.

General Issues

Fixed Bugs

- **Modbus dynamic mapping had bounds checking fixed (5002)**
  Issue:
  Error checking on the address index and Service table index does not alert user when an invalid configuation is submitted to the drive. In these instances the table is not configured, but the user is unaware.

  Solution:
  Error checking improved when setting up Modbus dynamic mapping, user is informed when values written to the table are not accepted by the drive.

New Features

- **New acceleration SM.ACC and deceleration SM.DEC ramp parameter for service motion added. (5019,S-15307)**
  New Feature Details:
  In some applications it might be useful to configure an different acceleration/deceleration ramp in service motion than the drive limits configured via DRV.DEC and DRV.ACC. This can be useful e.g. for jogging purposes.

  Solution:
  Therefore, two new parameters SM.ACC and SM.DEC have been added, which will be active in service motion mode. If these parameters are configured unequal to zero and below the drive acceleration/deceleration limits DRV.ACC and DRV.DEC, the service motion running is using SM.ACC/SM.DEC. If they are set to zero, the drive is using the ramps configured in DRV.ACC/DRV.DEC.

Version: 01-13-05-000 Release Date: March 25, 2015

Field Bus Specific Issues

Fixed Bugs

- **PROFINET IO: Intermittent 702 fault if Workbench and PROFINET IO master via cyclic and acylic communication is connected to AKD. (4925,D-06495)**
  Issue:
  The AKD could trigger the 702 fault, if all three communication channels (Workbench, PROFINET IO Cyclic and Acyclic) have been used at the same time.

  Solution:
  The intermittent 702 fault have been fixed also if all three communication channels are used.

- **Changing the position polarity with IDN 55 could lead to wrong sign. (4954,D-06486)**
  Issue:
  The inverse position polarity via IDN 55 could lead to wrong sign of either position feedback or following error if these values are read in the cyclic map and also via service channel (SVC).

  Solution:
  The wrongly calculated inversion of position IDN(s), which are called via cyclic and service channel is fixed.

- **Using Ethernet IP dynamic parameter types float, position, acceleration, or velocity had incorrect data lengths. (4967,D-06461)**
  Issue:
  Ethernet IP dynamic parameter types float, position, acceleration, or velocity were set to four byte data lengths.

  Solution:
  Changed Ethernet IP dynamic parameters lengths to match the values defined in the Ethernet IP documenation, specifically Appendix B: Parameter Listing.

- **EtherCAT/CANopen: Touchprobe data inconsistency. (5000,D-06509)**
  Issue:
  Using the touchprobe functionality defined drive profile function (DS402) via PDO, might show the effect that the touchprobe status register is updated and says a position is latched, also the latched position register is not yet updated in the same fieldbus cycle. The workaround might be to check the latched position register always on fieldbus cycle later.

  Solution:
  The problem is fixed so that the status and position register are properly updated in one fieldbus cycle. Also the order of the PDO mapping is not important.

- **Sercos III: Status word is not updated proplery if the drive is disabled due to STO or HW enable. (5044,D-06508)**
  Issue:
  If the drive is enabled via the Sercos controller and the hardware enable input is low, the power stage will be disabled, but the status

word via Sercos still does not change the current state.

Solution:
The status word and the state machine via Sercos is now updating properly also if an external disable has occurred.

Brake Issues

Fixed Bugs

- **Changing brake behavior on vertical axis when drive is disabled. (4970,D-06493)**
  Issue:
  On a vertical axis the user could create a safety critical situation, if he opens the brake manually and try to close it again with setting MOTOR.BRAKERLS from 1 to 0. In this case the brake might not apply directly because the actual velocity is not in the Zero Velocity Window, which is defined by CS.TO and CS.VTRHESH. The setting of parameter MOTOR.BRAKEIMM does not change the behavior.

  Solution:
  The behavior has changed if user sets MOTOR.BRAKEIMM to 1 and the drive is disabled. With the new firmware, the brake will always close if the parameter MOTOR.BRAKERLS changes from 1 to 0 regardless of the actual velocity VL.FB.

General Issues

Fixed Bugs

- **Update signal resolution for IL.VCMD and IL.DVCMD. (5025,R-02409)**
  Issue:
  Customer identified a performance issue in the AKD current loop when working with 10% of normal operating bus with relatively speaking low inductance motors.

  Solution:
  A FPGA change is implemented to improve the resolution of Vd/Vq register; the counts to real world unit scaling for IL.VCMD and IL.DVCMD are changed in in correspond to that.

- **Motor Inductance Saturation (MOTOR.LISAT) max limit is too low (4884,D-06500)**
  Issue:
  The absolute maximum value of MOTOR.LISAT for big motors is much too small with actual 900 Ampere

  Solution:
  The maximum value for MOTOR.LISAT is now 10000 Ampere

Version: 01-13-04-000 Release Date: February 24, 2015

Field Bus Specific Issues

New Features

- **New signals (following error, drive motion status and drive software limits) added for PROFINET IO (S-15378)**
  New Feature Details:
  Some of the internal data of the drive can only accessed via PNU access. For those who even might be needed in a cyclic manner, it makes sense to make them map able in I/O data.

  Solution:
  Three new signals are now available to be mapped into the I/O data of a PROFINET IO telegram. The signal XIST_ERROR (following error) has the signal number 104 and is connected to PL.ERR. The signal DRV_MOTION_STAT has the signal number 105 and is identical to the definition of DRV.MOTIONSTAT. The signal DRV_INPUTS (signal number 106) refers to the software limits (Bit 0 and 1), the hardware limits (Bit 2 and 3).

- **Sercos III: Absolute homing support while drive is in Halt state (S-15271)**
  New Feature Details:
  For some application with absolute feedback encoder, it is needed to run the absolute homing while of the drive while it is enabled and in halt state.

  Solution:
  The profile function absolute homing with drive enabled is now supported over Sercos III.

Fixed Bugs

- **CANopen: The touch probe function using CoE object 60B8h does not work properly. (4990,D-06487)**
  Issue:
  For the user it was not possible to configure the digital input and primary index via the touch probe control. The capture engines have been armed, but not configured properly.

  Solution:
  The touchprobe control does as expected and configures the capture engine properly.

General Issues

Fixed Bugs

- **Motor starts jogging by itself if jog input is toggled during bootup (4975,D-06469)**
  Issue:
  If the jog input (DINx.MODE = 6) is toggled during bootup, then the motor can start jogging even though the jog input is off after bootup is complete.

  Solution:
  The firmware has been modified so that the motor can not start jogging if the jog input is toggled during bootup, and the jog input is off after the bootup is complete.

Version: 01-13-03-000 Release Date: February 05, 2015

General Issues

Fixed Bugs

- **Open-loop Volts/Hz speed control generates warning 582 although ECCN 3A225 speed limitation not reached. (4969,D-06465)**

  Issue:
  If the user changes to motor type 2 (V/f open loop) and limits the speed by using VL.LIMITN or VL.LIMITP, the warning 582 is generated if these limits are reached although the ECCN 3A225 limitation might not restrict the maximum allowed speed.

  Solution:
  The warning is now only generated if the limits are set beyond the allowed ECCN 3A225 limitation or velocity command exceeds the 600 Hz commuation.

Field Bus Specific Issues

New Features

- **EtherCAT: PDO not updated on AKD-C (4909,S-15208)**

  New Feature Details:
  FBUS.SAMPLEPERIOD was not updated to the EtherCAT-masters cycle time. It had to be set via Telnet. If it was not fitting the EtherCAT cycle time, the PDO content didn't change.

  Solution:
  There has been no direct access to FBUS.SAMPLEPERIOD on the AKD-C. This is now available via ESC-registers 0x9A0/0x9A2 and object 0x1C32 sub 2.

- **DS402: Support for current limit in each direction needed (4937,S-15315)**

  New Feature Details:
  User wants to have the possibility (also in real-time) to limit the current set-point separately in both direction.

  Solution:
  Two DS402 objects 60E0h sub 0 (positive) and 60E1h sub 0 (negative) for current limits are available now.

Fixed Bugs

- **CAN: The PDO-mapping of the third entry of Tx-PDO3 failed always (4908,D-06389)**

  Issue:
  CAN: The PDO-mapping of the third entry of Tx-PDO3 failed always

  Solution:
  PDO-mapping works now for all 8 possible entries of each Rx- and Tx-PDO.

- **PROFINET IO: PLS.UNITS cannot be written via PNU 2337 to a value greater than 127 (4963,D-06462)**

  Issue:
  Writing the PNU 2337 with a values greater than 127 was not working.

  Solution:
  The root cause was a wrong signed conversion for parameters from type "unsigned" and a length smaller than 4 byte. This issue is now fixed.

- **PDO access to object 6072h lead to invalid IL.LIMITs (4895,D-06422)**

  Issue:
  PDO access to object 6072h lead to invalid IL.LIMITs, higher value than DRV.IPEAK

  Solution:
  The object 6072 limits now IL.LIMITP/N correctly.

Version: 01-13-02-000 Release Date: January 07, 2015

General Issues

New Features

- **New Digital Output Mode 24 - STO status (4882)**

  New Feature Details:
  Digital Output Mode 24 can now be used to trigger a digital out state depending on the status of the STO(s) (Keyword STO.STATE). When an STO input goes to 0V (Safe Torque Off), the digital output will go high, While all the STO(s) have 24V applied, the digital output will stay low. The digital output will be the inverse of the keyword STO.STATE.

BASIC Issues

Fixed Bugs

- **AIN.OFFSET and AIN2.OFFSET reference same parameter value. (4587)**

  Issue:
  When I set AIN.OFFSET, AIN2.OFFSET is also set the same value. Opposite is true .. when I set AIN2.OFFSET, AIN.OFFSET also changes to the same value.

  Solution:
  Firmware fix implemented to bind the AINx.OFFSET parameter to the associated AIN channel.

Field Bus Specific Issues

Fixed Bugs

- **Overflow possible in 16 bit set-point 0x6071, reverting direction of current (4953,D-06456)**

Issue:
The current-setpoint may get an overflow with the profile set-point 0x6071 (scaled as rated current, 1000 per mille = continuous drive current) with high values (> 3 * rated current)

Solution:
Overflow issue is solved. Set-point is now clamped, no reverting happening.

- **Interpolator error in DS402-mode Interpolated Position via CAN (5108)**
  Issue:
  Interpolator error in DS402-mode Interpolated Position via CAN. FBUS.SYNCDIST-setting helped, but storage of this parameter was not possible starting with firmware 1.8.3.0.

  Solution:
  The value of FBUS.SYNCDIST is correctly restored again.

Version: 01-13-00-001 Release Date: November 24, 2014

Field Bus Specific Issues

Fixed Bugs

- **AKD + PROFINET IO: Cyclic communication lost while acyclic running (PNU access) and workbench connected. (4900)**
  Issue:
  A 702 fault can occur when the cyclic communication between the PROFINET IO master and AKD is running, the PNU's are accessed and also workbench is connected.

  Solution:
  Cyclic and acyclic PROFINET IO communication has now an higher priority than the Workbench connection, which was for the PROFINET IO connection loss.

- **PROFINET IO: Torque mode is not fully supported. (4872,S-15112)**
  Issue:
  A user does not have a way to set IL.CMDU over PROFINET IO.

  Solution:
  A user can now map IL.CMDU (PNU 102) using flexible mapping (telegram 0 or 400).

- **Product code on EtherCAT drives should be sychronized between EEProm and object 0x1018 sub 2 (S-12179)**
  Issue:
  The product code for devices given in the EtherCAT-ESI-file, the devices EEProm-content and the CANopen-object 0x1018 sub 2 shall be the same.

  Solution:
  The three sources of product code are synchronized on EtherCAT-devices(AKD-P, AKD-N and AKD-C).

Feature Changes

- **EtherNet/IP devices are not visible to Allen Bradley PLCs in manual IP address configuration (4896)**
  Issue:
  Allen Bradley PLCs default to an address in the subnet 192.168.1.0. AKD drives default to an address in the subnet 192.168.0.0. AKDs have a default net mask of 255.255.255.0, which prevents them from responding to traffic coming from the 192.168.1.0 range. For this reason, the PLCs cannot communicate with the AKDs until the netmask or IP address is set manually.

  Solution:
  The default value of IP.SUBNET has been modified on EtherNet/IP models of AKD to 255.255.254.0. This allows Allen Bradley PLCs to discover the drives when both are in their default address ranges.

- **CANopen: Add manufacturer specific modes to object 0x6060: Analog modes and electronic gearing (S-15171)**
  Issue:
  CANopen-support is needed for some manufacturer specific modes, that are not in DS 402

  Solution:
  Three new values are implemented:

  -1 for analog current mode
  -2 for analog velocity mode
  -3 for electronic gearing mode

- **PROFINET IO: Create Telegram 353 which is the same as Telegram 352 plus HOME.MODE. (S-15187)**
  Issue:
  Some PROFINET IO PLC's do not support PNU's, so parameters can only be changed by real time telegrams. HOME.MODE needs to be added to a telegram so that the user can modify it.

  Solution:
  Telegram 353 has been created, which is the same as Telegram 352 but with HOME.MODE added. This will allow the user to set HOME.MODE with a telegram.

New Features

- **CANopen: Fault history and runtime should be available via some CANopen-objects (4902,S-15145)**
  New Feature Details:
  Some customers want to have a solution for reading the fault history via CANopen

  Solution:
  New objects are implemented:

  Object 0x2011 sub 0 for DRV.RUNTIME, given in seconds as a 32 bit value
  Object 0x2012 sub 0 to 20 for the fault numbers last 20 fault events, latest entry at sub-index 1

Object 0x2013 sub 0 to 20 for the fault time stamps last 20 fault events, latest entry at sub-index 1

BASIC Issues

Fixed Bugs

- **Motion.Abort prematurely terminates velocity rampdown. (4866,D-06339)**
  Issue:
  Move.Abort premature terminates velocity rampdown resulting in an "elbow" in the rampdown profile.

  Solution:
  Move.Abort trajectory generation has been modified to produce a rampdown profile similar to that of a Controlled Stop.

General Issues

Fixed Bugs

- **When the drive starts a firmware download it sometimes incorrectly displays F3bar (4424)**
  Issue:
  Sometimes when downloading firmware to an AKD drive sometimes displays and F and 3 bars on the display. The download actually proceeds and completes correctly.

  Solution:
  The firmware in the drive has been changed to show the correct digits on the display.

- **Bug 4899 - Homing Mode 14 is not working correctly in negative direction (4899,D-06374)**
  Issue:
  For homing mode 14 in the negative direction, the motor will start decelerating when the home input turns on, and then reverse direction and move back to the position where the input turned on. The motor should not reverse direction. Also warning 161 "Homing Procedure Failed" is generated when faults occur and homing is not active. This warning should only be generated if a fault occurs when homing is active.

  Solution:
  The firmware has been modified so that when homing with mode 14 in the negative direction, the motor will decelerate when the home input turns on and stop. It will not reverse direction to move back to where the input turned on. Also warning 161 "Homing Procedure Failed" will only be generated when a fault occurs while homing is active. This has been fixed for all homing modes.

- **Sporadically fault 630 "FPGA cyclic read fault." after power up. (D-06390)**
  Issue:
  Sometimes the drive reports 630 Fault after power up, which needs to be cleared once to enable and run the AKD.

  Solution:
  The fault occured due a initalisation problem, which is now fixed.

Version: 01-13-01-000 Release Date: November 24, 2014

General Issues

Fixed Bugs

- **Drive may not enable correctly for induction motors after FB1.SELECT has been changed (4934)**
  Issue:
  When using MOTOR.TYPE 2 and switching between resolver (FB1.SELECT 40) and no feedback (FB1.SELECT 1) when enabling the drive would alternate between drive active and dynamic break.

  Solution:
  The firmware has been changed to correctly report faults when switching to no feedback selected (FB1.SELECT 1) when using induction motors (MOTOR.TYPE 2).

- **Rare issue where a motion task will not initiate properly (4935)**
  Issue:
  When starting a blended move (two motion tasks where the first blends into the second) the drive may fail to transition from the first to the second move.

  Solution:
  An error has been fixed to prevent this rare error.

- **Removing PL.FILTERTIME (position loop filter) from BASIC drive (S-15250)**
  Issue:
  When modulo is used on the AKD BASIC drive, PL.FILTERTIME is not compatible.

  Solution:
  To prevent unexpected motion, this filter has been removed from AKD BASIC

New Features

- **New trajectory filters PL.PDELAY and VL.FFDELAY (S-15200)**
  New Feature Details:
  By delaying the feedforward signal and position command signals, optimal trajectory and following error can be achieved.

  Solution:
  PL.PDELAY and VL.FFDELAY have been added. They can be tuned by setting them equal to the number of microseconds to delay the signal. Note: These filters are not available on AKD BASIC

Field Bus Specific Issues

Fixed Bugs

- **PROFINET IO: Reading negative values in SWLS.LIMIT0, SWLS.LIMIT1 and VL.FB via PNU is not working properly (4942)**

  Issue:
  Negatives values for parameters, which have the attributes "64 Bit Value", "Float" and "Signed" cannot be properly read via the PNU access.

  Solution:
  The conversion of the parameters with the attributes "64 Bit Value", "Float" and "Signed" have been corrected to work also for negative values via PNU access.

New Features

- **EtherCAT Conformance Test issues (S-15225)**

  New Feature Details:
  Mapping objects for Tx- and Rx-PDOs could be written in Safe Operational mode. This is not allowed.

  Solution:
  The mapping is now not allowed in Safe Operational and Operational mode for CANopen over EtherCAT.

- **Sercos III: Add support for absolute homing (S-15260)**

  New Feature Details:
  The Set Absolute Position procedure (IDN 447) is needed to provide a reliable position reference at power-up when an absolute encoder is present.

  Solution:
  The procedure involving IDN 447 and related IDNs in the Absolute Homing section of the AKD Sercos III Communication Manual is implemented.

Version: 01-12-05-000 Release Date: October 13, 2014

General Issues

New Features

- **New parameter DRV.CUSTOMIDENTIFIER and CANopen-support for it and DRV.NAME implemented (4624,S-12710)**

  New Feature Details:
  Customers want to access DRV.NAME and new implemented parameter DRV.CUSTOMIDENTIFIER via CANopen

  Solution:
  New objects 2031h sub 0 for DRV.NAME (10 characters) and 2032 sub 0 for DRV.CUSTOMIDENTIFIER (32 characaters) are introduced.

- **New parameter DRV.FAULTDISPLAYMODE To Enable Display of All Faults on AKD LED Display including CANopen-support. (S-12182)**

  New Feature Details:
  Customers want to see all drive Faults displayed on the AKD LED display.

  Solution:
  New keyword DRV.FAULTDISPLAYMODE had been added. When set to 0 (default) only the highest priority fault is displayed (exiting behavior). When it is set to 1, all faults will be displayed (new behavior). Also a new can object 53C7h has been added for DRV.FAULTDISPLAYMODE.

Feature Changes

- **Induction Motors subject to ECCN 3A225 speed limitation (S-15054)**

  Issue:
  ECCN 3A225 requires Induction Motors running in V/F mode be less than 600Hz commutation speed.

  Solution:
  If the velocity command neets or exceeds 600Hz commutation, warning 582 will be thrown referencing this regulation. 600Hz commutation speed is equal to 36000 RPM / Motor Pole Pairs.

  Example:
  An induction motor with 20 poles, would be limited to a speed less than 36000 / (20/2) = 3600 RPM.

Field Bus Specific Issues

Fixed Bugs

- **CanOpen touch probe functions does not capture distinct positions for rising and falling touch probe inputs. (4527)**

  Issue:
  When Touch probe object 60b8 is configured for rising and falling edge inputs, a duplicate position is captured for both edge transitions.

  Solution:
  Additional capture engines have been added that allow for seperate position capture for dual edge touch probe configuration.

New Features

- **Customer doesn't want to handle Emergency Error Codes for faults and wants to have time stamps of occurred faults via CANopen (S-12185)**

  New Feature Details:
  Customer doesn't want to handle Emergency Error Codes for faults and wants to have time stamps of occurred faults via CANopen

  Solution:

New objects 2010h sub 0 to 20 introduced to deliver strings with the AKD fault number and the time of occurrence.

- **Add IDN S-0-0053 Position Feedback 2 (external feedback) to Sercos III cyclic data (S-15075)**
  New Feature Details:
  Customer would like to see data from external feedback device.

  Solution:
  Added IDN S-0-0053 to cyclic data (CP4). Also made accessible during CP2.

Version: 01-12-03-000 Release Date: September 05, 2014

Field Bus Specific Issues

New Features

- **Make DRV.NAME accessible RW via CANopen SDO access (S-12181)**
  New Feature Details:
  There is currently no support for reading or writing the drive name via CAN or EtherCAT.

  Solution:
  A new visible string object 0x2031 sub 0 is introduced to access DRV.NAME.

Fixed Bugs

- **EIP.CMDMAP and EIP.RSPMAP do not work with DRV.RSTVAR (4833,D-06297)**
  Issue:
  EIP.CMDMAP and EIP.RSPMAP do not work with DRV.RSTVAR

  Solution:
  Modified firmware to properly initialize EIP.CMDMAP and EIP.RSPMAP so that they are set to the correct value when DRV.RSTVAR command is issued.

General Issues

New Features

- **Allow HV48 Phase Loss fault 570 to be settable as disabling fault, warning, or ignored (S-15003)**
  New Feature Details:
  Currently the only option for HV48 Phase loss fault is disabling the amplifier. Allow user to select between a disabling fault, warning, or ignore when phase is lost.

  Solution:
  Create keyword FAULT570.ACTION. A value of 0 disables amp, 1 ignores fault and 4 generates a warning.

- **New Home mode 16 added (Extension of home mode 4 "Find home input"). (S-14990)**
  New Feature Details:
  Some applications need to find the home input with a fast velocity to decrease the time for the homing procedure. On the other side the detection of the homing switch with this "fast velocity" could result in an inaccurate home position when the home input sensor e.g. has different "switching times".

  Solution:
  Home mode 16 can be used to solve this issue. For the first detection of the home input, the axis will move with the velocity "HOME.V". When the input is detected, the axis moves back with a slower velocity defined by HOME.V and HOME.FEEDRATE and sets the home reference. For DS402, home mode 16 is also available via home method -3 and -4 (see reference for object 6098h).

Version: 01-12-04-000 Release Date: September 05, 2014

General Issues

New Features

- **FPGA support for second STO on high voltage drives (4848)**
  New Feature Details:
  Newer AKD HV48 drives have the ability for two STO inputs

  Solution:
  A new FPGA release has been made to allow the user to use both STO inputs

Version: 01-12-02-000 Release Date: August 25, 2014

General Issues

Fixed Bugs

- **CMPx.MODE Default Value should equal 1 (Continuous) (4830)**
  Issue:
  By default all Compare setpoints are set up to trigger in a single-shot mode. The specification calls for the mode to default to a Continuous mode.

  Solution:
  The default mode for all Compare Setpoints was changed to be Continuous mode.

- **Coming out of limit switch can cause unexpected motion (4834)**
  Issue:
  The following bug occurs when either PL.KI is non-zero, OR VL.KI is set to zero. When a motor enters a limit switch, with VL.KI equal to zero and the position loop disabled, the motor can drift from where it entered the limit switch.
  Upon leaving the switch, there will be a momentary jump to the position command which was set when the motor entered the limit

switch.

Solution:
After entering a limit switch, the position integrator is zeroed as well as setting the position command equal to the value of position feedback. These two changes eliminate the posibility of the motor jumping as it moves off of the limit switch.

New Features

- **AKD48 - Phase loss fault detection (4777)**
  New Feature Details:
  There is currently no support for phase loss detection on the AKD48 drives.

  Solution:
  Added new fault 570 when loss of 3 phase voltage is detected.

- **AKD HV48 STO2 - Support for a second Safe Torque Off (STO2) input has been added (4675,S-12164)**
  New Feature Details:
  There is currently no support for a second safe torque off on AKD drives.

  Solution:
  Added support for the second safe torque off input (STO2). It's state is reflected in STO.STATE.

Version: 01-12-01-000 Release Date: August 01, 2014

Field Bus Specific Issues

Fixed Bugs

- **SynqNet param REGEN.TYPE = External, rejected by FW. (4820,D-00000)**
  Issue:
  When a user tried to set the Regen resistor to External using SynqNet, a validation error was reported.

  Solution:
  The validation code in the AKD firmware was changed to work for SynqNet.

General Issues

Fixed Bugs

- **Some BiSS feedback faults are not reported correctly. (3700)**
  Issue:
  Certain fault conditions with BiSS feedback devices are not reported correclty by the drive. Faults due to a BiSS Watchdog would report a BiSS Sensor Error, and vice versa. Also certain communication errors were not reported.

  Solution:
  F405 BiSS Watchdog and F407 BiSS Sensor Fault are now reported properly. Also F467 Feedback Fault will now be reported in the case of certain other communication errors with BiSS devices.

Version: 01-12-00-000 Release Date: June 24, 2014

Field Bus Specific Issues

New Features

- **PROFINET IO: Create fieldbus communication lost fault (F702) if the PROFINET IO master changes from run to stop. (S-12574)**
  New Feature Details:
  In case of a failure inside the PROFINET IO PLC, the AKD creates no fault if the PLC state changes from run to stop.

  Solution:
  With setting Bit 0 in FBUS.PARAM02 to 1, the AKD creates the communication fault F702 if the PROFINET IO master changes its state from run to stop.

- **CANopen: No emergency message sent when a drive warning occurs. (4533,D-05143)**
  New Feature Details:
  Some CANopen PLCs cannot handle "non severe" emergency messages, which occur for every warning in the AKD.

  Solution:
  The user can now set Bit 11 in FBUS.PARAM05, to suppress the emergency generation on the CAN-Bus for all warnings in the AKD.

- **Bug 4651 - Add FB3-support to Canopen/EtherCAT (4651,S-12552)**
  New Feature Details:
  Customers would like to use an object to access FB3.P via CANopen objects.

  Solution:
  The object 0x60E4 sub 3 is added for the third additional feedback sensor position. It can be scaled via the feed contant 0x60E9 sub 3 and 0x60EE sub 3. It is available via SDO and PDO.

Fixed Bugs

- **Add home mode -11 support to object 6098 in DS402 [wanted in 1-12] (4626,S-12062)**
  Issue:
  A customer wants to use HOME.MODE 11 for index pulse search, which was not available via DS402.

  Solution:
  Two new objects 0x50C5 (HOME.DIR) and 0x50CB (HOME.MODE) were added for direct setting. The modes 33 and 34 of object

0x6098 were changed to use mode 11, when the identified feedback has to use it.

- **CAN-problem with acceptance of first event-triggered Rx-PDO after switching to Operational the second and further times (4412)**

  Issue:
  If a CAN-AKD was switched to the communication state Operational from other communication states for the second, third and more times the first Rx-PDO- content was not taken directly, if the content was not different from the former Rx-PDO-content.

  Solution:
  The AKD-CAN-drive now takes always the first event-driven Rx-PDO when the communication state Operational is entered.

- **PROFINET IO: F3 bar after multiples power cycle on 1.11.4.7 (D-05155)**

  Issue:
  After some hours test on a PROFINET IO-drive with continuously switching off and on the drive and reconnecting to it and driving motion tasks, an F3bar occurred.

  Solution:
  The place of F3bar creation was found. This will create a fault F701 now.

- **Modbus error list handling conforms to documented behavior (D-05118)**

  Issue:
  If a user has an error condition that fills the error list (125 entries max), additional errors don't reliably appear at the bottom of the list.

  Solution:
  Modbus error list handling has been fixed so that it conforms to documented behavor. New errors will be placed at the bottom of a full error list.

Feature Changes

- **EIP I/O threads need to be faster because the customer is getting 702 faults (communication lost). (D-05112)**

  Issue:
  The drive gets an occasional 702 fault when I/O traffic is heavy.

  Solution:
  Throw away I/O packets when the drive gets busy or behind due to heavy traffic.

- **PROFINET IO: Connection problem with Siemens PLC fixed (D-05051)**

  Issue:
  Randomly, the IO data in the Siemens PLC is not updated properly. The IO connection needs to be re-established by power cycle the drive or pulling the cable or using a function block like SFC12.

  Solution:
  There is certain timing behavior the Siemens PLC is checking and which was causing this issue. Other plc from other vendors do not expect this behavior. We are in touch with Siemens if this check is correct. In the meanwhile, the AKD FW has been changed to match the expectation to be compatible in the field.

IO Issues

New Features

- **Added new keywords DOUT9-11.MODE and DOUT9-11.PARAM to allow Compare to use RS485 outputs. (S-12295)**

  New Feature Details:
  High speed (RS485) outputs are needed for fast compare output.

  Solution:
  Added new keywords DOUT9-11.MODE and DOUT9-11.PARAM to allow Compare to use RS485 outputs. The only supported modes are 0 (User) and 23 (Compare).

- **DRV.EMUECHECKSPEED = 1 now checks for over-speed for stepper output modes (DRV.EMUEMODE = 15, 16, or 17) (S-12327)**

  New Feature Details:
  Overspeed faults would not occur for emulated encoder output (EEO) modes 15-17.

  Solution:
  A check was added so that attempts to drive the EEO output at speeds beyond the capability of the drive would produce a fault.

General Issues

Fixed Bugs

- **Fault during homing leaves homing status bits set in DRV.MOTIONSTAT (2554)**

  Issue:
  If a fault occurs during a homing operation, the status of the homing at the time of the fault persists even after the fault is cleared. This can make it appear as though the drive successfully homed when it did not.

  Solution:
  If a fault is generated during homing, all homing status bits are now cleared, and a homing error status bit is set to alert the user.

- **PL.FILTERTIME can cause a jump when the amplifier is enabled (4757)**

  Issue:
  In some edge cases, an uncontrolled motion will occur when enabling the amplifier with PL.FILTERTIME set to a non-zero value.

  Solution:
  A bug in the filter initialization was responsible for this in some operating conditions, this has been resolved and initializes correctly now.

- **Dual Motor Use on X9 and X10 Does Not Work With EnDat 2.2 Feedback on X9 (4774,D-05161)**

  Issue:
  When switching feedback from X10 (primary) to x9 (fb3/tertiary EnDat 2.2 encoder) it is not possible to commutate/control the motor

with the x9 feedback. Commutation/control with x9 is achieved by setting PL.FBSOURCE, VL.FBSOURCE and IL.FBSOURCE from FB1 to FB3. In addition non-zero phase angles (FB3.MOTORPHASE) could not be used.

Solution:
Bugs in the firmware's commutation initializaton code were preventing this commutation/control from working properly. The firmware has been modified to correct this. And even when the motor's phase offset (FB3.MOTORPHASE) is non-zero the commutation/control will work properly.

- **Unexpected motion if IL.FBSOURCE is set to a non-zero value, then back to zero (D-05142)**
  Issue:
  A commutation setup error has been identified when IL.FBSOURCE is set to a non-zero value to commutate on FB2 or FB3. If the IL.FBSOURCE is subsequently set back to zero to commutate on FB1 again a value is initailized to an incorrect value causing incorrect commutation.

  Solution:
  Correct commutation initalization occurs to allow seamless switching between commutation sources..

- **Wake and Shake works with FB2 and FB3 (S-12782)**
  Issue:
  If a user had set PL.FBSOURCE to either FB2 or FB3, OR if a user had set IL.FBSOURCE to either FB2 or FB3, Wake and Shake would fail preventing the user from obtaining a correct commutation angle.

  Solution:
  Wake and Shake has been updated to allow PL.FBSOURCE to be set to FB2 or FB3, as well as IL.FBSOURCE set to FB2 or FB3. This will improve dual-loop applications ease of use.

Version: 01-11-04-000 Release Date: March 26, 2014

Feedback Issues

Fixed Bugs

- **FB3.P and FB1.P (PL.FB) must maintain position when changing PL.FBSOURCE. (S-12324)**
  Issue:
  When an EnDat 2.2 single turn encoder is used as the source for FB3 on the X9 connector, and the encoder was moved past one revolution, the multi-turn position was not maintained when PL.FBSOURCE was changed from FB1 (PL.FBSOURCE = 0) to FB3 (PL.FBSOURCE = 2)

  Solution:
  Firmware has been modified so that the FB3 multi-turn position information will be preserved when PL.FBSOURCE is changed from FB1 to FB3

- **SFD feedback errors can not always be cleared. (4717)**
  Issue:
  Certain SFD faults which occured after the device had succesfully initialized could not be cleared using the button in Workbench or the DRV.CLRFAULTS command.

  Solution:
  The Clear Faults action will now always cause the drive to reset the feedback device if there is an SFD fault, clearing any transient feedback faults.

- **FB3 and step-n-direction input do not work at the same time. (D-04998)**
  Issue:
  Step-n-direction on X7 does not increment its value if an EnDat 2.2 encoder is connected to X9 and DRV.EMUMODE is set to 11 at the same time.

  Solution:
  EnDat 2.2 as FB3 and step-n-direction can be used at the same time now.

- **Drive runs away when enabling after power up. Specific to when DRV.DIR = 1 and PL.FBSOURCE = 1 is saved to NV Ram. (D-05038)**
  Issue:
  Problem with PL.FBSOURCE = feedback 2 and DriveDir 1 initializing improperly from poweron (assigns DrvDir 1 to feedback1 instead of feedback2).

  Solution:
  When a new FBSOURCE is selected, apply DRV.DIR from previous FBSOURCE.

- **Tamagawa battery error does not display battery warning on initialization (D-05077)**
  Issue:
  We were displaying a generic Fault 401 "Failed to set feedback type" message when Tamagawa battery was disconnected. This made it difficult for the user to realize there was a low battery root cause.

  Solution:
  We now display a Fault 451 "Feedback battery" when we initialize with out battery connected.

Field Bus Specific Issues

Fixed Bugs

- **SynqNet: Brake is not being applied after loss of fieldbus communication. (4726,D-05037)**
  Issue:
  If the SynqNet connection is broken while the brake is released, the brake remains released.

  Solution:
  Code was added to the SQError state to apply the brake. The brake is applied immediately if communication is lost.

New Features

- **PROFINET IO: Added real time jogging direction bit in STW1. (S-01871)**

New Feature Details:
As user i want to jog also in negative direction. The MDI_VELOCITY signal is used for the real time jogging, but has only positive values.

Solution:
Bit 13 in STW1 can be used to change the velocity from clockwise (0) to counterclockwise (1) with the appropriate velocity MDI_VELOCITY.

- **Make MT.FEEDRATE accessible via PROFINET IO. (S-12280)**
  New Feature Details:
  The parameter MT.FEEDRATE (0-100% scaled to 0 to 65535) should be available in the process data of PROFINET IO.

  Solution:
  The new signal 101 for MT.FEEDRATE is now implemented. It can be mapped to the process data of PROFINET IO.

General Issues

Fixed Bugs

- **Recording IL.CMDACC can cause drive crash (D-05036)**
  Issue:
  If resource intensive features are used (such as Motion Tasking with user Profile Tables) and IL.CMDACC was being recorded, a drive crash could occur.

  Solution:
  User unit scaling has been optimized to prevent a drive crash from occuring.

New Features

- **Add FPGA cyclic read hard fault. (S-12273)**
  New Feature Details:
  Failure of the microcontroller to read properly from the FPGA is a critical failure condition that the drive should report.

  Solution:
  Fault 630, "FPGA cyclic read fault", has been added to indicate a critical communication failure between the microcontroller and FPGA.

- **Feedback 3 can be used as a commutation source (S-12177)**
  New Feature Details:
  Feedback 3 can now be used as a commutation source if IL.FBSOURCE, PL.FBSOURCE and VL.FBSOURCE are all set to 2 (Feedback 3).Note: If dual loop is being used, then PL.FBSOURCE or VL.FBSOURCE may not need to be 2.

- **CMPx.ADVANCE: Compare now supports phase advance from 0.001 to 30ms. (S-12338)**
  New Feature Details:
  Slow output devices (relays, etc.) have delays that might be significant. The CMPx.ADVANCE value (ms), if non-zero will cause the compare engine to compensate for these delays by triggering early.

Version: 01-11-03-000 Release Date: February 28, 2014

Feedback Issues

New Features

- **A user would like to be able to enter a feedback resolution per rev for FB3. Scaling much be configurable to any value of FB3 resolution. A new parameter FB3.ENCRES is recommended for this purpose. ()**
  New Feature Details: (Identified in Version 01-11-01-000)
  A user cannot properly translate linear encoder scale into motor revolutions.

  Solution:
  Add a FB3.ENCRES parameter to allow scaling fron encoder scale to motor revolutions.

- **Encoders mounted to end of shaft will count backwards, causing following errors when the FB3 is used as a position loop feedback source. Provide a means of changing the sign of direction for FB3. ()**
  New Feature Details: (Identified in Version 01-11-01-000)
  Shaft mounted encoders can count backwards

  Solution:
  Add a FB3.DIR parameter to the command set. A value of '0' or '1' should count in the forward or reverse direction respectively.

Fixed Bugs

- **LC415 Linear EnDat 2.2 Reports Fault that can not be cleared (4697)**
  Issue: (Identified in Version 01-05-00-000)
  If you tried to use a LC415 EnDat 2.2 feedback device from Heidenhaim as the feedback 1 or feeback 3 you would always get a fault that can not be cleared. This device powers up an imediatly reports a fault which the firmware could not clear

  Solution:
  The firmware now initalises the EnDat feedback devices to correctly clear fault on power up as recomended by Heidenhaim.

- **You Have To Issue Clear Faults Multiple Times To Clear Faults on EnDat on Feedback 3 (4284)**
  Issue: (Identified in Version 01-05-00-000)
  If you are using an EnDat feedback on feedback 3 (FB3) and you get a fault you have to issue a fault several times before the fault is cleared.

  Solution:
  The firmware now only needs to issue the clerar fault instruction once to clear the fault.

- **Drive could crash if EnDat feedback is configured for feedback 3 but it is not connected. (4295)**

Issue: (Identified in Version 01-05-00-000)
The drive could crash if EnDat feedback is configured for feedback 3, DRV.ENUEMODE 11, but the feedback is not connected to the drive.

Solution:
The firmware does not crash in this case and will report a new fault "470: Feedback fault on feedback 3".

General Issues

New Features

- **A user would like to be able to use a general-purpose, hardware-based configurable compare engine. (E-01793)**
  New Feature Details:
  Two compare engines are available to the user, each of which supports eigth setpoints (PLS). It supports single-shot and continuous modes. Pulse-widths can be time or position-based. It also supports modulo.

- **Three new Emulated Encoder modes provide synchronizing outputs for CAN or EtherCAT drives. (S-01871)**
  New Feature Details:
  The user would like to have an external signal that could be used for master/slave or synchronized coordination of several drives.

  Solution:
  Three new EEO modes are supported (15-17) that provide A quad B, Step/Direction, or CW/CCW pulse output signals from the EEO (X9) output connector. These output pulse streams follow CAN PDO values sent to the drive over the motion bus (CAN or EtherCAT).

Field Bus Specific Issues

New Features

- **Parameter File download via File over EtherCAT (S-12230)**
  New Feature Details:
  As user i want to have the option to download a parameter file over EtherCAT.

  Solution:
  The drive supports the parameter file download via FoE. The download is supported in EtherCAT communication states INIT, PRE-OP or SAFE-OP. Try to download the parameter file in communication state OP will lead to an FoE error response.

Version: 01-11-02-000 Release Date: February 14, 2014

General Issues

Fixed Bugs

- **Tamagawa feedback faults could not be cleared with DRV.CLRFAULTS. ()**
  Issue: (Identified in Version 01-10-04-000)
  For some Tamagawa faults an encoder reset is required. This was not executing during DRV.CLRFAULTS.

  Solution:
  Tamagawa feedback faults can be cleared with DRV.CLRFAULTS.

Motion Tasking Issues

New Features

- **Motion Tasking Feedrate Keyword Added (S-12220)**
  New Feature Details:
  A new keyword MT.FEEDRATE has been added which allows the user to scale the motion tasking velocity from 0.001% to 100% of the original velocity on the fly while the motion task is running.

Field Bus Specific Issues

Fixed Bugs

- **Fieldbus Velocity mode accumulates position error (4701)**
  Issue: (Identified in Version 01-10-02-000)
  When the AKD is operated in FieldBus command source and Velocity mode, the position error grows depending on how far the axis moves. If the axis is then switched to Position mode, the large position error will generate a following error fault.

  Solution:
  The AKD will no longer increment position error while in Velocity mode. When the axis is switched to Position mode, there is no position error so no fault is generated.

Version: 01-11-01-000 Release Date: February 07, 2014

Homing Issues

New Features

- **New Homing Mode 15 - Find next feedback zero position (S-12063)**
  New Feature Details:
  A new homing mode has been added (Mode 15) which will move to the next feedback zero position.
  This homing mode is useful for feedback devices with more than two poles, and it is desired that the next homing position is at the next pole pair position.

Field Bus Specific Issues

New Features

- **PROFINET IO: Add new manufacture specific telegram 352, which includes the HOME.DIST parameter. (S-12061)**
  New Feature Details:
  The user cannot write the homing distance over the real time data.

  Solution:
  Telegram 352 is added, which has in addition to telegram 9 also the signal for writing the homing distance (HOME.DIST).

- **CAN: Support of COB-ID time stamp object (S-12061)**
  New Feature Details:
  As a user I want to be able to set the local time of the drive via COB-ID, the CAN standard has defined object 1012h for it.

  Solution:
  Implemented CAN object 1012h as describt in the CAN standard to give the user the option to set a COB-ID for the time stamp.

- **EtherCAT Switched on state does not conform to DS402 according to ETG. (D-04835)**
  New Feature Details:
  According to the ETG the transition from “ready to switch on” to the “switched on” should be refused when the high-level power is inactive.

  Solution:
  The new FBUS.PARAM05 Bit10 allows to switch to a ETG conform transition change, when Bit8 (ETG conformant mode) is set to 1. Both bits must be set to 1 to activate this behavior.

- **Add CANopen objects for EEO position value and other related values (S-12036)**
  New Feature Details:
  CANopen-objects for stepper control via EEO are needed

  Solution:
  New objects: 0x3499 for DRV.EMUESTEPCMD (also mappable), 0x538B for DRV.EMUESTEPMODE, 0x538C for DRV.EMUESTEPSTATUS and 0x538D for DRV.EMUESTEPVMAX

Feature Changes

- **Improve the timing of Motion Task start when a move is triggered in CANopen Profile Position mode. (4629)**
  Issue:
  When a Motion Task is initiated via CAN, it will sometimes take a longer time to start motion.

  Solution:
  The timing of motion task initiation over CAN has been improved to reliably start within several milliseconds. Note: If Workbench is open, this can impact start times.

Fixed Bugs

- **Motion Task Velocity <MT.V> will be divided by 4 when task is started via CANopen-interface, when bit 5 of control word is not set and DS402-scaling is used (4630)**
  Issue:
  Motion Task Velocity will be divided by 4 when task is started via CANopen-interface, when bit 5 of control word is not set and DS402-scaling is used

  Solution:
  The correct velocity will be driven, when the CHANGE_SET_IMMEDIATELY-bit is not set and there is a stand still of the motor.

General Issues

Fixed Bugs

- **Large Position values causes rounding errors when using position units other than 32bit per rev (4642)**
  Issue:
  An incorrect calculation was being used which did not maintain full resolution. Calculation has been fixed on position values.

  Solution:
  Any position unit may be used without loss of precision.

- **DIN.MODE 22 resetting DRV.OPMODE to 0 at power up (D-04913)**
  Issue:
  When DINx.Mode is set to 22 and the signal is high at start up, then the original value can't get restored after signal goes low.

  Solution:
  Values for command source and op mode get now restored correctly.

- **Fix Modbus Error list so that the last 64 entries can properly store and retrive errors (D-04917)**
  Issue:
  User could not utilize the last half of the error list containing objects 4480-4601.

  Solution:
  Support for the full error list has been implemented

BASIC Issues

Fixed Bugs

- **The watch panel in the IDE is not displaying properly the BASIC NV variable values (always 0) (4679)**
  Issue:
  When viewing values in the watch window, BASIC variables which are declared Non Volatile will incorrectly display a value of 0.

  Solution:
  Firmware was incorreclty reporting the NV values for the watch window. This has been fixed.

Version: 01-11-00-006 Release Date: February 03, 2014

General Issues

Fixed Bugs

- **Linear motor overspeed limit is incorrect. (D-04947)**
  Issue:
  MOTOR.VMAX is scaled incorrectly. Typically, the overspeed threshold calculation is considerably lower than MOTOR.VMAX.

  Solution:
  The MOTOR.VMAX scaling has been fixed.

- **MOTOR.PITCH does not appear as a linear motor supported parameter. (D-04948)**
  Issue:
  MOTOR.PITCH does not appear in the MOTOR.SUPPORTEDPARAMS list for MOTOR.TYPE = 1, and therefore does not appear in the Workbench Motor configuration screen for the Linear Surface PM motor type.

  Solution:
  MOTOR.PITCH has been added to the MOTOR.SUPPORTEDPARAMS list for the linear motor.

Field Bus Specific Issues

Fixed Bugs

- **Flexible mapped Tx-PDOs are not working for EtherCAT (4684)**
  Issue: (Identified in Version 01-10-04-000)
  The free-mapped PDOs delivered 0-data instead of e.g. status word and actual position values.

  Solution:
  The free-mapped Tx-PDOs work correctly.

Version: 01-11-00-002 Release Date: December 16, 2013

General Issues

Feature Changes

- **Modify suspend motion behavior to include CS deceleration and CS IO polarity. (S-11919)**
  Issue:
  The digital input mode Suspend Motion should changed from high-active to low-active so that it can used to detect broken wire and stop the motor. And use CS.DEC as the decelaration of the suspend motion.

  Solution:
  Suspend Motion is now low-active. When suspend motion is active, it will stop motion at the rate set by CS.DEC, keep the axis enabled, and inhibit further motion.

New Features

- **Add new fault support for missing packet faults for NSD and CPS. (S-10778)**
  New Feature Details:
  It is desirable to report a fault if communication is interrupted between a CPS and an NSD.

  Solution:
  Support for the status bits has been added to the firmware so that if packets are not received within the timout period (currently 80ms) faults are generated and reported. These new faults are numbered 628 and 629).

Feedback Issues

Fixed Bugs

- **Feedback Faults F130, F131, F132 cannot be cleared. (4345)**
  Issue:
  If a feedback 2 fault was detected on the X9 connector and an FB2 overcurrent fault was generated, the 5V supply voltage would never be restored unless the user powercycled the AKD or FB2.SOURCE was re-configured.

  Solution:
  The drive now restores the 5V supply when FB2.SOURCE is configured for X9 and DRV.CLRFAULTS is issued.

Version: 01-10-07-000 Release Date: November 22, 2013

Feedback Issues

Fixed Bugs

- **FB1.FAULTs does not state a fault although Fault 467 tells the user to take a look FB1.FAULTS (4595)**
  Issue:
  Auto-Identify sometimes reports a transient fault which is later cleared

  Solution:
  While auto-identifying, prevent faults from being generated at all.

General Issues

Feature Changes

- **Added read only parameters IL.PWMFREQ and IL.DEADBAND. (2739)**

Issue:
When manually tuning the current loop it is useful to know the PWM frequency of the drive.

Solution:
Two new read only parameters, IL.PWMFREQ and IL.DEADBAND, have been added to the firmware.

- **Motor Memory Version 0.3 support added (S-11739)**
  Issue:
  The user would like the programmed parameters of Motor ID version 0.3 to be used by the firmware.

  Solution:
  All feedback devices (with the exception of Tamagawa) now support Motor ID version 0.3 parameters.

Fixed Bugs

- **KAS - Drive will not enter operational/cyclic mode when feedback cable is unplugged (4507,D-04665)**
  Issue:
  The drive would not enter operational/cyclic mode, and the KAS controller would report an F33 fault, when no feedback was present and the KAS application was started. This was because the transition to operational mode depended on fault clearing to complete within 10 seconds. With no feedback the fault clearing method will complete in more than 10 seconds.

  Solution:
  The transition to operational/cyclic mode no longer waits for the clear faults method to complete.

New Features

- **Compute current loop gain scheduling values (IL.KPLOOKUPVALUE) for motor memory version 0.3. (S-11749)**
  New Feature Details:
  The current loop gain scheduling values should be calculated automatically when the necessary motor parameters are available.

  Solution:
  IL.KPLOOKUPVALUE values are calculated using MOTOR.LISAT, which is available in motor memory version 0.3, when MOTOR.AUTOSET = 1.

- **Require several MOTOR parameters to be set for IPM motor type (MOTOR.TYPE = 6). Prevent drive enable when they are not set. (S-11857)**
  New Feature Details:
  Several safety and critical performance related parameters need to be required for the IPM motor type.

  Solution:
  A unique set of required parameters (contained in DRV.SETUPREQLIST) is maintained for each motor type. The drive may only be enabled when the full set of required parameters is set.

Version: 01-10-05-000 Release Date: November 05, 2013

General Issues

Fixed Bugs

- **Unexpected motion can occur in Electronic Gearing. (3180)**
  Issue:
  Electronic Gearing is only valid when the OpMode is Position Mode. However, the AKD will allow a user to set the command source and opmode individually. The result of this process can result in intermediate illegal OpMode states. A bug was found that when transitioning between different OpModes and the Command Source is Electronic Gearing, unexpected motion can occur in the invalid OpMode states.

  Solution:
  Some invalid electronic gearing opmodes were not clearing out command values correctly. Now Torque and Velocity mode ensure a zero command.

- **Feedforwards incorrect after OpMode change-on-the-fly (S-11798)**
  Issue:
  If the AKD is in position mode with an active trajectory (position command is changing), and the OpMode is changed to velocity mode, Feedforwards will be left in the that state until the drive is returned to position mode.

  Solution:
  Logic has been corrected to update feedforward values correctly during change-on-the-fly operations.

- **Restrict IP.MODE to DHCP on AKD-N & AKD-C (4246)**
  Issue:
  On AKD-N & AKD-C, when IP.MODE allow rotary switch or a static IP address, it can misconfigure the drive and be unable to connect to it.

  Solution:
  IP.MODE only allow a setting of DHCP on AKD-N & AKD-C.

- **Fix SFD Gen 3 Fault Clearing Check for Rev9 CC and Correct FPGA and Add Two Faults (D-04777)**
  Issue:
  When an SFD Gen 3 CRC Fault Occurs the fault cannot be cleared by the clear faults command. Also the firmware needs to check that the control card is rev 9 or higher, and it needs to check the fpga supports SFD3 Feedback. And support for reporting and clearing two new faults needs to be added, undefined fault (for future use) and communications fault.

  Solution:
  Firmware has been modified so that the SFD Gen 3 faults can be cleared with the clear faults command. Checks have been added to check for rev 9 or later control card, and that the FPGA is version 0501 or later. Support for the faults undefined fault (for future use) and communications fault have been added.

Field Bus Specific Issues

Fixed Bugs

- **Sercos 3: Following error is not inverted if bit 0 and bit 2 are set in IDN 55 (Position polarity parameters) (4597)**
  Issue:
  If IDN 55 (position polarity parameters) is configured to invert the polarity of position command values (Bit 0) and position feedback values (Bit 2), the following error in IDN 189 is not inverted.

  Solution:
  The following error (IDN 189) is now also inverted if bit 0 and bit 2 of IDN 55 are set.

- **Sercos 3: PL.MODPEN was not recovered from NVRAM properly (4596)**
  Issue:
  IDN 76 position data scaling bit 7 is connected to PL.MODPEN. The default setting for IDN 76 was clearing this bit and therefore always has overwritten the setting of PL.MODPEN from NVRAM.

  Solution:
  After startup IDN76 bit 7 now displays the stored status of PL.MODPEN properly without overwriting it.

- **Drives enables from HW Enable input even if EtherCAT controlword is 0 (4580,D-04747)**
  Issue:
  The user tried to enable the drive when the hardware enable was low. Then he wanted to disable the drive (sw-disable), but this did not work in the DS402 state machine.

  Solution:
  The software-enable is now taken away regardless of the hardware-enable-signal.

Feature Changes

- **Allow Workbench control of brake with SynqNet disconnected. (S-11750)**
  Issue:
  The user would like to be able to manually release the brake to ship the motor. SynqNet control of the brake disables the MOTOR.BRAKERLS command which would be used by the customer to release the brake using Workbench.

  Solution:
  The control of the brake by SynqNet (disabling Workbench) only becomes active when SynqNet is cyclic.

Version: 01-10-04-000 Release Date: October 23, 2013

BASIC Issues

Fixed Bugs

- **Trajectory Spike when Modulo is used with BASIC (S-11746)**
  Issue: (Identified in Version 01-10-02-000)
  When using modulo on an AKD Basic drive, the user may see position error and current spikes at the point modulo rolls over.

  Solution:
  A bug was introduced when optimizing performance. The bug has been fixed while maintaining performance optimizations

General Issues

Fixed Bugs

- **MOTOR.KE now populated from feedback devices with motor memory (D-04654)**
  Issue:
  Most feedback devices with motor memory contain a parameter for the motors back-emf constant, but this value is not populated to the keyword MOTOR.KE.

  Solution:
  Firmware has been updated to read motor memory and update MOTOR.KE on successfull feedback initiatlization.

New Features

- **Added a new keyword MOTOR.TEMPC to report the motor temperature in degree C. (S-10556)**
  New Feature Details:
  Currently the motor temperature is only reported in Ohms, but the user want to see the motor temperature reported in degree C, so user do not have to know the complex formula to do the conversion.

  Solution:
  Add a new parameter MOTOR.TEMPC to report the motor temperature in degrees C. If MOTOR.RTYPE is 2-4 then report motor temperature which conversion from Ohms to degrees C, but If MOTOR.RTYPE is not 2-4, then MOTOR.TEMPc returns the max negative number because there is no conversion formula.

- **Added a new keyword VL.VFTHRESH to report the overall overspeed fault threshold. (S-11635)**
  New Feature Details:
  There are multiple overspeed thresholds, the minimum of which is used for fault detection. Reporting the overall overspeed threshold would be useful.

  Solution:
  A new parameter VL.VFTHRESH contains the minimum of VL.THRESH, 1.2 * MOTOR.VMAX, and for interior permanent magnet motors a calculation relating the maximum bus voltage VBUS.OVFTHRESH to speed through the back emf constant MOTOR.KE.

Field Bus Specific Issues

Fixed Bugs

- **EtherCAT Flexible PDO Selection, sub-index is not set properly (4482,D-04569)**

Issue:
When there was a gap (e.g. 0x1600, 0x1601, 0x1603) in the used sub-PDOs for the free-mapped PDOs of EtherCAT, the drive didn't work correctly.

Solution:
The drive works also correctly, if sub-PDOs are omitted.

- **Certain general emergency codes are not visible via CAN. ()**
  Issue:
  Every drive fault and warning should be visible with CAN

  Solution:
  Every fault or warning without a specific CAN emergency code will now cause a general emergency code.

- **EtherNet/IP: Transition smoothly from Jog to Position moves when in position mode. (S-11737)**
  Issue:
  When doing a Jog move in position mode, and the commanding a position move to final position, the axis will halt momentarily (stopping the jog) before accelerating back to speed for a move to position.

  Solution:
  When in position mode, Jog and Position moves will now blend without a stop in between the moves.

Version: 01-10-03-000 Release Date: October 14, 2013

General Issues

Feature Changes

- **Added support for Brake using SynqNet. (S-11750)**
  Issue:
  The mode of operation expected by SynqNet users did not function. The brake bit set by SynqNet was not being used by the drive firmware.

  Solution:
  Allowed the SynqNet drive firmware to control the FORCE_APPLY and FORCE_RELEASE brake commands in a way similar to that used by CAN. Set the commands based on the status of the brake release bit in the SynqNet cyclic data.

Feedback Issues

Fixed Bugs

- **Tamagawa encoder feedback value different each time it initializes (4582,D-04761)**
  Issue:
  Multi-turn value is changed when customer did the following: (1) Power on AKD. (2) Select Tamagawa feedback type. Note the multi-turn value. Repeat. The values of the multi-turn data differ.

  Solution:
  Multi-turn data was not getting properly initialized by firmware. With this release, the multi-turn data is properly returned and the same after power-cycling the drive.

Field Bus Specific Issues

Fixed Bugs

- **Wrong scaling of object 0x6063 sub 0 (3134,D-04742)**
  Issue:
  A customer used the interpolated position mode with PDO-mapping of object 0x6063. At startup he read this object via SDO and got a different value.

  Solution:
  Old behaviour is kept, but can be changed with setting bit 9 of FBUS.PARAM05 (0x200). Then the SDO value is consistent with PDO value.

Version: 01-10-02-000 Release Date: October 07, 2013

General Issues

Feature Changes

- **Apply VBUS.HALFVOLT changes immediately instead of after power cycle. (S-11669)**
  Issue:
  The effect of changing VBUS.HALFVOLT is only seen after a power cycle.

  Solution:
  The values that depend on VBUS.HALFVOLT (Bus over/undervoltage, regen and in-rush relay thresholds) are updated imediately when VBUS.HALFVOLT is set.

- **Support new motor ID version 0.3 keywords that specify thermal interface. (S-11244)**
  Issue:
  In Kollmorgen motor ID version 0.3, added a couple of variables to more completely and more generally support motor thermal sensors. AKD firmware should update accroding to the new motor ID.

  Solution:
  Use new couple of varibles instead of old variable when motor ID version is 0.3. MOTOR.RTYPE provides more detail about the type of thermal resistor used inside of the motor to measures motor temperature.

Fixed Bugs

- **Acceleration Feedforward is not accurate when PL.FILTERTIME is non-zero (D-04563)**
  Issue:
  When the Position Loop filter (PL.FILTERTIME) was turned on and set to a non-zero value, the Acceleration Feedforward was not shaped correctly by the new trajectory.

  Solution:
  Acceleration Feedforward has been corrected to reflect the new trajectory caused by modifying PL.FILTERTIME.

New Features

- **Added a Digital Input mode "SuspendMotion" which if triggered causes motion to be suspended and further motion to be disallowed. (S-11534)**
  New Feature Details:
  The user may want the drive to remain enabled when motion is stopped

  Solution:
  The user can use this new mode to stop and prevent motion while letting the drive remain enabled.

- **Added a command DRV.MOTIONDISSOURCES to return the sources that are causing motion to be disallowed. (S-11712)**
  New Feature Details:
  The user needs to know why motion is not allowed.

  Solution:
  The user can use the new keyword to discover why motion is disallowed.

- **Add new MOTOR commands for IPM motor support. (S-11698)**
  New Feature Details:
  New keywords are needed to configure and run the interior permanent magnet motor.

  Solution:
  The following keywords have been added or customized for IPM: MOTOR.LDLL, LISAT, IDMAX.

Field Bus Specific Issues

Fixed Bugs

- **AKD Display does not work properly when CAN communication is lost (4186)**
  Issue:
  When the CAN-drive got the warning n702 (error passive), the warning was not shown on the display.

  Solution:
  The warning n702 can now also be seen on the AKD display

- **Fix PLL-problem (seen in EtherCAT-use without Distributed Clocks) (D-04717)**
  Issue:
  A customer used the EtherCAT-AKD without Distributed Clocks and didn't get the PLL to the locked state.

  Solution:
  The phase error between a field bus synchronizing signal and the 16 kHz routine is now controlled by a PI-controller. (Fixes issue introduced in FW 1.8.3.0)

Version: 01-10-01-000 Release Date: September 27, 2013

Feedback Issues

New Features

- **Add a keyword FB1.LASTIDENTIFIED to shorten auto-id time (S-11243)**
  New Feature Details:
  If FB1.SELECT=-1, AKD will take a long time to detect the feedback type for certain feedback types.

  Solution:
  To shorten auto-id time, the identified type is stored to non-volatile memory when drive parameters are saved. The next time the auto-id sequence is performed, AKD will test first for the previously identified type. In most cases this will greatly reduce all subsequent feedback initializations.

  A keyword FB1.LASTIDENTIFIED was added, which is set to FB1.IDENTIFIED when it is set successfully. This is saved to NV memory. The auto detection sequence will attempt to detect this feedback type first.

- **Add SFD Gen 3 to the types of feedback devices supported by the "Auto" selection. (S-11242)**
  New Feature Details:
  If FB1.SELECT=-1, The AKD would not detect SFD-Gen3 (Type 45)

  Solution:
  During Auto-ID, the initialization routine for SFD Gen3 is called. If this succeeds the device is initialized and FB1.IDENTIFIED is set accordingly.

- **Add Hiperface DSL to the types of feedback devices supported by the "Auto" selection. (S-11245)**
  New Feature Details:
  If FB1.SELECT=-1, The AKD would not detect Hiperface DSL (Type 46)

  Solution:
  During Auto-ID, the initialization routine for Hiperface DSL is called. If this succeeds the device is initialized and FB1.IDENTIFIED is set accordingly.

Fixed Bugs

- **Hiperface initialization fails. (4402)**

Issue:
The following sequence fails: select Hiperface feedback (33) for FB1. Disconnect feedback, clear faults, re-connect, clear faults. The error 401, "Failed to set feedback type", persists.

Solution:
Fault clearing on the Hiperface device was improved to remove this failure corner-case.

General Issues

Fixed Bugs

- **Wake and Shake Mode 0 sets WS.T to 1 if aborted (4517)**
  Issue:
  A bug has been identified in WS.MODE 0, where if wake and shake is aborted, WS.T and WS.TDELAY1 is set to 1. This often causes a subsequent wake and shake procedure to fail and find the wrong commutation angle.

  Solution:
  Wake and Shake mode 0 no longer overrides WS.T and WS.TDELAY1 in the event that Wake and Shake is aborted.

- **Foldback fault levels appear to behave inconsistently. (D-04599)**
  Issue:
  Depending on the specified user foldback fault level, motor and drive foldback faults occur when the foldback level is less than the fault level, or less than or equal to the fault level.

  Solution:
  Foldback faults are always thrown when the foldback level is less than or equal to the fault level.

- **Motion Task "Blend Into Acc" sometimes causes velocity command to go to zero in between motion tasks. (D-04655)**
  Issue:
  If multiple motion tasks are configured with Blend into Acceleration it is possible to configure motion tasks which cannot reach the desired velocity with the desired acceleration. In this situation a triangular velocity profile is used, where there is no constant velocity portion of motion. If a triangular profile is required for motion and blend into accleration is selected, the resulting velocity command will go to zero in between the two motion tasks.

  Solution:
  The trajectory generator has been improved to successfully blend into a triangular trajectory when the initial velocity is non-zero.

Feature Changes

- **Enable PWM neutral point modulation by default. (S-11636)**
  Issue:
  With neutral point modulation, AKD can provide line-to-line voltage with no distortion at ~15% higher magnitude. This will reduce current harmonics distrotion at operations above base speeds.

  Solution:
  PWM neutral point modulation is enabled by default at initialization.

Field Bus Specific Issues

Fixed Bugs

- **AKD-SYNQNET Discovery failure with controller sample rate 16 kHz. (D-04551)**
  Issue:
  AKD-SQ controller cannot connect without faults to the AKD SynqNet drive when the controller sample rate is set to 16khz or higher. The amp fault cannot be cleared by the SynqNet controller due to the Not_Ready_For_Remote_Control bit being asserted as true

  Solution:
  The AKD initialization firmware code has been modified so that the SynqNet controllers can successfully connect to the AKD/SynqNet drive without faults for sample rates of 16khz and higher.

Version: 01-10-00-001 Release Date: September 04, 2013

Field Bus Specific Issues

Fixed Bugs

- **AKD-SQ firmware status Not-Ready-For-Remote-Control ignores STO input (3369,D-04434)**
  Issue:
  The AKD-SQ firmware must assert Not-Ready-For-Remote-Control status bit in SynqNet cyclic drive status when Safe Torque Off signal disables the drive.

  Solution:
  A bug was identified and fixed for the bits returned to SynqNet controller.

- **AKD-SYNQNET Absolute Position Negative Values Initialization Problem. (4128,D-04435)**
  Issue:
  AKD-SQ Absolute Position Negative Values are not initialized properly. Negative position values are converted to positive values as reported by the SynqNet controller after a SynqNet controller reset, due to the fact that the sign extension was not handled properly. The position value is reported properly by the AKD drive.

  Solution:
  A bug in the AKD firmware was identified and fixed, so that the sign extension is handled properly, and negative absolute positions are correct.

Version: 01-10-00-000 Release Date: August 26, 2013

General Issues

Fixed Bugs

- **HOME.MODE 2 and HOME.MODE 9 do not home correctly if DRV.DIR = 1 (D-04552)**
  Issue:
  If DRV.DIR = 1 and HOME.MODE 2 or 9 are set, the final home position is incorrect.

  Solution:
  A defect was found in the target position algorithm for HOME.MODE 2 and 9 if DRV.DIR = 1, this calculation has been fixed.

- **Corruption of DRV.DISSOURCES in recorder was fixed. (S-11439)**
  Issue:
  The recorder should always display the correct value of DRV.DISSOURCES.

  Solution:
  The corruption of DRV.DISSOURCES recorded value has been eliminated.

- **Quick Stop input held active breaks homing and controlled stop. (D-04568)**
  Issue:
  Leaving a Quick stop digital input in high breaks homing and controlled stop. After start the home mode 4, the motor does not stop when home reference input is triggered. And after start a motion, the motor also does not stop when controlled stop input is triggered.

  Solution:
  A defect was found in digital input.

- **Homing mode 14 cause a glitch in velocity command when reference input is found (4447,D-04530)**
  Issue:
  High peak in the current command while homing procedure is running

  Solution:
  A bug was identified and fixed in the homing algorithm.

Feature Changes

- **Add a new fault F465 "Excessive shock detected by feedback device" (S-11536)**
  Issue:
  If excessive shock is detected by a Hiperface DSL device, this should be reported as a high level fault by DRV.FAULTS

  Solution:
  A new fault has been added for this device error.

Field Bus Specific Issues

Fixed Bugs

- **Drive crash due to unrecognized Modbus command was fixed. (D-04528)**
  Issue:
  Sending an unrecognized Modbus command should not cause the drive to crash.

  Solution:
  The drive responds with an error message when it receives an unrecognized Modbus command.

New Features

- **PROFINET IO: Add new Bit 14 in ZSW1 for motion task active information. (S-11495)**
  New Feature Details:
  To be sure the internal motion task has really finished, the user needs to have the DRV.MOTIONSTAT Bit 0 (motion task active) information also available over PROFINET IO.

  Solution:
  In position mode, bit 14 in ZSW1 (manufacture specific bit) reflects the motion task active state (like DRV.MOTIONSTAT Bit 0).

Version: 01-09-08-000 Release Date: August 12, 2013

Field Bus Specific Issues

New Features

- **Add real time jogging via control word bit 12 and telegram 9 for AKD with PROFINET IO interface. (S-08968)**
  New Feature Details:
  As customer I'd like to change the jogging velocity without stopping the drive.

  Solution:
  Via control word bit 12 the jog velocity during the jogging move can be changed.

- **Add SDO access for CAPx.FBSOURCE (S-11410)**
  New Feature Details:
  The commands for the feedback source of the capture engines should be available via DS402.

  Solution:
  Two new objects 0x3460 sub B and C for CAP0.FBSOURCE and CAP1.FBSOURCE are available.

- **New PROFINET IO PNU to increase the the resolution of acceleration/deceleration. (S-11492)**
  New Feature Details:
  In PROFINET IO the resolution of acceleration parameters is too low (763rpm/s). Higher resolution is required.

Solution:
PNU 1008 specifies the resolution of acceleration and deceleration values in rpm/s per count.

- **New telnet commands for PROFINET IO PN.STW1 and PN.ZSW1 added. (S-11494)**
  New Feature Details:
  It would be helpful to view control word STW1 and status word ZSW1 very easily to analyze the PROFINET IO system and debug a controller program.

  Solution:
  With PN.STW1 and PN.ZSW1, the user can record and trigger on the PROFIdrive status- and control word.

General Issues

New Features

- **Saved position feedback is compared to position measured at startup. (S-11280)**
  New Feature Details:
  It is desirable to know if the position has changed since the previous power down of the drive, so one can avoid re-homing.

  Solution:
  FB1.INITPSTATUS indicates whether the measured position is within a window defined by FB1.INITPWINDOW around the saved position.

Fixed Bugs

- **HOME.MODE 5 does not work with DRV.DIR = 1 (4453)**
  Issue:
  If HOME.MODE 5 is used with DRV.DIR 1, the final home position is incorrect.

  Solution:
  A bug was identified and fixed in the homing target position algorithm.

- **Reduce Emulated Encoder Output jitter at constant speed for comcoder input (4455)**
  Issue:
  For comcoder input when the input quadrature position quanta is not much smaller than the desired EEO output quanta there is high edge to edge jitter.

  Solution:
  A filter has been added to the comcoder input to reduce this jitter

- **Wrong initial commutation angle for Hall based devices (4454)**
  Issue:
  When using feedback devices with Halls, If the initial Hall state is 001 (u,v,w) some encoders will cause the initial commutation to be off be 60 degrees. This angle will be immediately corrected on the next hall state change.

  Solution:
  Halls now work properly in this initial state for all devices.

- **DRV.ENDEFAULT 1 doesn´t work properly when DRV.DISMODE is 2 or 3 (4466)**
  Issue: (Identified in Version 01-09-00-000)
  When DRV.ENDEFAULT is set to 1, and DRV.DISMODE is set to 2 or 3, when the drive is powered up, the amplifier will not be enabled

  Solution:
  DRV.ENDEFAULT works as expected for all configurations of DRV.DISMODE

- **Absolute position of Hiperface DSL feedback is not reinitialised after a feedback fault (4446)**
  Issue:
  If communication is lost with a Hiperface DSL feedback device, for example the cable was disconnected, the absolute position was not restored when the cable was connected back and the faults cleared.

  Solution:
  The absolute feedback position is now restored when the DRV.CLRFAULTS is executed.

- **Reversing Service Motion move to VL.CMD 0 between moves (4478)**
  Issue:
  When any reversing service motion is configured, in between each move the trajectory will decelerate to VL.CMD = 0 for one sample. This bug is especially visible for reversing moves which move in between two velocities of the same sign (ie 60RPM -> 120RPM -> 60RPM).

  Solution:
  Trajectory Generator has been updated to blend between moves instead of approach VL.CMD 0 in between moves.

- **When use PLS in continuous mode and time trigger unit, sometimes the number of pulse from DOUT is more than expected or the width of the pulse is bigger than expected. (4456)**
  Issue:
  Use PLS in continuous mode and time trigger unit, if the trigger point is near to the modulo range, the width of the pulse will bigger, if not near then there will be one more trigger at the modulo range.

  Solution:
  PLS algorithm update, then PLS will not active when cross the modulo range but not a really trigger postion.

Feature Changes

- **Feedback 2 position is returned through FB2.P as a 64-bit value. (S-11509)**
  Issue:
  Unlike other feedback sources, secondary feedback could only be read as a 32-bit single turn value.

  Solution:

FB2.P returns a 64-bit value for position.

Version: 01-09-07-000 Release Date: July 19, 2013

General Issues

Fixed Bugs

- **DRV.DBILIMIT gets reset to default after power cycle. (D-04470)**
  Issue:
  DRV.DBILIMIT gets reset to default after power cycle.

  Solution:
  DRV.DBILIMIT will now be restored as expected from non-volatile memory.

Homing Issues

Fixed Bugs

- **Homing bits are not cleared after a Feedback fault (4431)**
  Issue:
  Two bits of DRV.MOTIONSTAT (home:Position Found and home:Routine Finished) relate to whether the drive has been homed. If there is a feedback fault during an operation, the actual position is unknown, so the drive has to be homed again. But the Home bits remain set.

  Solution:
  Homing bits (DRV.MOTIONSTAT: bits 1 and 2) are cleared after a feedback fault.

Version: 01-09-06-000 Release Date: June 28, 2013

Field Bus Specific Issues

Fixed Bugs

- **PROFINET IO was not able to enable power stage after a communication fault 702 occured. (D-04090)**
  Issue:
  The user was not able to activate power stage after the communication error 702 occured.

  Solution:
  State machine has been modified to work as expected.

General Issues

Fixed Bugs

- **Induction Motor phase inconsistent, causing incorrect motion (S-11363)**
  Issue: (Identified in Version 01-09-03-000)
  A bug was introduced in a recent beta, which caused the motor phase to not report correctly to the motor controller, this could result in motion in the incorrect direction

  Solution:
  Motor phase reporting corrected.

BASIC Issues

Fixed Bugs

- **Writing large value to FB1.USERDWORD0 or FB1.USERDWORD1 causes F818 fault on AKD Basic (4422)**
  Issue:
  If a user tries to write a number which approaches 2^32 to FB1.USERDWORD0 or FB1.USERDWORD1 from within an AKD Basic program, Fault 818 occurs.

  Solution:
  A numerical casting issue was found which cast the 32bit number as a signed integer, the result caused the interpreted number to be negative, which is less than the minimum allowed of zero. The issue has been fixed.

Version: 01-09-05-001 Release Date: June 07, 2013

Field Bus Specific Issues

New Features

- **ASCII SDO Command Grouping support implemented (S-11268)**
  New Feature Details:
  To help speed up fieldbus communication over Can/EtherCAT, ASCII SDO commands can now be grouped together. Commands are separated by CR/LF pairs and resonses are separated by the prompt -->. In both cases, the end of a sequences of grouped messages is delineated with either then end of data in the packet or a 0 value byte after the CR/LF or the response prompt.

  Solution:
  Up to 8 ASCII SDO commands can now be sent with CRLF (\r\n) as the delimeter between commands. An optional \0 null character can be used to ensure termination of the command.

Fixed Bugs

- **PROFINET IO was not able to start home move after the previous motion task has been interrupted by power stage disable. (D-04068)**

Issue:
The user was not able to start home move after the previous motion task has been interrupted by power stage disable.

Solution:
bug fixed. State machine modified.

General Issues

Fixed Bugs

- **Maximum current may be limited incorrectly with certain motor/drive combinations (4423)**
  Issue: (Identified in Version 01-08-01-000)
  If the motor foldback limit is a multiple of the drive folback limit, the actual maximum current that can be commanded is incorreclty limited to a smaller value, even when foldback is not active.

  Solution:
  The algorithm has been repaired so that max current may be commanded when foldback levels allow.

Version: 01-09-03-000 Release Date: May 23, 2013

Field Bus Specific Issues

New Features

- **Sercos slave address S-0-1040 and S3.ADDRESS command added (S-11255)**
  New Feature Details:
  The user was not able to store the Sercos slave address. It was always set to 53 after a power cycle.

  Solution:
  The Sercos slave address can now be stored via writing to S-0-1040. A write procedure to this IDN will also trigger a DRV.NVSAVE and the user should be aware that all NV parameter inclusive the Sercos slave address are stored. Additional the S3.ADDRESS command is available over Workbench. It can be used to read and write the slave address. To store the value over Workbench, a DRV.NVSAVE command needs to be called explicit.

- **Add 0x20A7 for Capture Engine 1 (S-11205)**
  New Feature Details:
  DS402: A new object 0x20A7 similar to the known object 0x20A6 for the capture engine 1 should be added.

  Solution:
  The new object 0x20A7 is implemented with SDO and PDO access. It works like the object 0x20A6, but for capture engine 1 (instead of 0).

Fixed Bugs

- **Fixed bug in PROFINET IO for PN2230 (IL.LIMITP) and PN2231 (IL.LIMITN). (D-04277)**
  Issue:
  Setting negative current limits over PROFINET IO results in a high positive current value.

  Solution:
  Fixed bug which caused to miss interpret the value.

Version: 01-09-02-000 Release Date: May 15, 2013

General Issues

Fixed Bugs

- **Drive disconnects, then refuses connection (4176,D-04299)**
  Issue:
  A drive will intermittently disconnect from a telnet session and you can no longer connect to it without power cycling.

  Solution:
  The new firmware no longer has this issue. An IP stack bug was identified and fixed.

Field Bus Specific Issues

Fixed Bugs

- **Objects 1026 sub 1 and 2 are not working (4331,D-04245)**
  Issue:
  The possible mapping of object 1026 (OS-prompt) lead to a drive crash

  Solution:
  The object 1026 sub 1 and 2 are working now

BASIC Issues

New Features

- **Enhanced BASIC When Statement. (4361)**
  New Feature Details:
  It is desirable to in the When statement, to use EXTENCODER.POSITION as a condition and EGEAR.ON and CAM.ACTIVATE as action. It is also desired to capture EXTENCODER.POSITION when the When condition is satisfied.

  Solution:
  Enhanced BASIC When statement: 1. Added a condition based on EXTENCODER.POSITION. 2. Added two new actions: EGEAR.ON and CAM.ACTIVATE. 3. Latch an additional parameter (EXTENCODER.POSITION) and return it in

WHEN.EXTENCODERPOSITION.

Version: 01-09-01-000 Release Date: April 20, 2013

Field Bus Specific Issues

Fixed Bugs

- **DS402-object 0x606d doesn't work correctly (4333,D-04245)**
  Issue:
  The DS402-object 0x606d sub 0 (velocity window) worked only as PDO. SDO access was not working correctly.

  Solution:
  SDO and PDO-access of 0x606d sub 0 are working now consistently.

BASIC Issues

Fixed Bugs

- **Random() function not supported in BASIC. (3507,D-04340)**
  Issue:
  User could not generate a random number in a BASIC program.

  Solution:
  Random function added to compiler and firmware.

- **FB1.MECHPOS does not work correctly in a BASIC program. (4371,D-04344)**
  Issue:
  When used in a BASIC program, FB1.MECHPOS would wrap around 2^31-1 and display negative values.

  Solution:
  FB1.MECHPOS is now treated as a long (i.e. 64-bit integer) in a BASIC program.

- **BASIC compiler crashes with two variables mapped to the same Modbus register. (4302,D-04343)**
  Issue:
  The compiler (and Workbench) would hang if two BASIC user variables were mapped to the same Modbus register.

  Solution:
  The compiler is now generating an error if two variables are mapped to the same register.

Feedback Issues

Fixed Bugs

- **Motors With Absolute Multi-turn Feedback Are Not Automatically Homed (4305,D-04172)**
  Issue:
  When a motor with an absolute multi-turn feedback device is initialized, it's home status should be "found" and "done" with no motion, and the multi-turn position should be preserved as the current feedback position. Currently the home status is not "found" and not "done".

  Solution:
  The firmware has been modified so that motors with Absolute Multi-turn feedback devices will have a home status of "found" and "done" when they are initialized, with no motion. And the multi-turn position is preserved as the current feedback position.

Version: 01-09-00-000 Release Date: April 12, 2013

General Issues

New Features

- **Support for Hiperface DSL feedback devices (E-01606)**
  New Feature Details:
  The AKD now supports Hiperface DSL feedback devices.

  Solution:
  Once you have connected a motor with a Hiperface DSL feedback device to the AKD, set FB1.SELECT to 46. Optionally set MOTOR.AUTOSET=1 to automatically load motor parameters from Kollmorgen motors. MOTOR.TEMP will report the motor temperature using the thermistor attached to the Hiperface DSL device in the motor.

- **Automatically setup motor temperature parameters from Motor ID data stored in the feedback device (E-01606)**
  New Feature Details:
  It is desirable to load motor temperature parameters automatically from the motor.

  Solution:
  For supported Kollmorgen motors, MOTOR.RTYPE and MOTOR.TEMPFAULT will now be configured automatically when MOTOR.AUTOSET=1.

Field Bus Specific Issues

Fixed Bugs

- **DS402-objects 0x6083 and 0x6084 shall change DRV.ACC and DRV.DEC in Profile Velocity Mode (4223,S-10634)**
  Issue:
  The objects 0x6083 and 0x6084 influence only the motion task components MT.ACC and MT.DEC for the Profile Position Mode

  Solution:
  The objects 0x6083 and 0x6084 change now DRV.ACC and DRV.DEC in Profile Velocity Mode, in other modes MT.ACC and MT.DEC are changed.

Version: 01-08-08-000 Release Date: March 22, 2013

BASIC Issues

Fixed Bugs

- **MOVE.RELATIVEDIST was over-written when using electronic camming. (4276)**
  Issue:
  The value the user assigned to MOVE.RELATIVEDIST was over-written when electronic camming was used.

  Solution:
  Electronic camming no longer over-writes MOVE.RELATIVEDIST.

- **Cam Profiling with external encoder (CAM.MASTER = 2) does not work properly. (4332)**
  Issue:
  EXTENCODER.POSITION was not processed correctly using EXTENCODER.POSMODULO. Also, a program/user error where the cam master position can easily be outside the cam table resulted in silent failure.

  Solution:
  EXTENCODER.POSITION is processed correctly using EXTENCODER.POSMODULO. A new fault (916) will be triggered if the master position is outside the cam table.

New Features

- **BASIC Workbench and Firmware incompatibility detection. (S-10705)**
  New Feature Details:
  Upgrading the firmware or Workbench could result in an incompatible system.

  Solution:
  Workbench and the firmware now ensure that the program compiled and download by Workbench will not fail due to incompability.

Field Bus Specific Issues

Fixed Bugs

- **EtherCAT Configured Station Alias is lost after power up (4226,D-04057)**
  Issue:
  The Configured Station Alias, which can be set via rotary switches or FBUS.PARAM03, sometimes incorrectly read 0 when the drive first powered up. This value can also be read via the register 0x12. The EtherCAT EEProm had still the right value in it.

  Solution:
  The station alias will now report the correct value immediatley after power up.

General Issues

Fixed Bugs

- **MOTOR.TBRAKERLS and MOTOR.TBRAKEAPP are switched when read from motor memory (4083)**
  Issue:
  Some feedback devices support reading Kollmorgen motor data from motor memory. When initializing the values for the brake release and apply times, the values are reversed in the drive from the correct data stored in the device.

  Solution:
  These values are now loaded properly from motor memory.

Version: 01-08-07-000 Release Date: March 15, 2013

BASIC Issues

Fixed Bugs

- **MOVE.RELATIVEDIST was over-written when using electronic camming. (4276)**
  Issue:
  The value the user assigned to MOVE.RELATIVEDIST was over-written electronic camming was used.

  Solution:
  Electronic camming no longer over-writes MOVE.RELATIVEDIST.

New Features

- **BASIC Workbench and Firmware incompatibility detection. (S-10705)**
  New Feature Details:
  Upgrading the firmware or Workbench could result in an incompatible system.

  Solution:
  Workbench and the firmware now ensure that the program compiled and download by Workbench will not fail due to incompability.

Field Bus Specific Issues

Fixed Bugs

- **EtherCAT Configured Station Alias is lost after power up (4226,D-04057)**
  Issue:
  The Configured Station Alias, which can be set via rotary switches or FBUS.PARAM03, sometimes incorrectly read 0 when the drive first powered up. This value can also be read via the register 0x12. The EtherCAT EEProm had still the right value in it.

  Solution:

Works now correctly.

General Issues

Fixed Bugs

- **MOTOR.TBRAKERLS and MOTOR.TBRAKEAPP are switched when read from motor memory (4083)**
  Issue:
  Some feedback devices support reading Kollmorgen motor data from motor memory. When initializing the values for the brake release and apply times, the values are reversed in the drive from the correct data stored in the device.

  Solution:
  These values are now loaded properly from motor memory.

Version: 01-08-06-000 Release Date: February 28, 2013

BASIC Issues

Fixed Bugs

- **F251 Randomly Reported On BASIC with IO option Card (4233)**
  Issue:
  Some BASIC drives with an IO option card would generate a F251 fault randomly.

  Solution:
  F521 Faults are no longer randomly generated.

General Issues

Fixed Bugs

- **Digital Input mode 22 (Switch Operation Mode) does not work properly if the input is high when the drive powers up. (4133)**
  Issue:
  The behavior of this input mode is that on a positive edge it switches to the requested "high" mode, and on a negative edge it returns to the previous "low" mode. If the drive boots with the input high, it will properly switch into the high mode. But when the input is subsequently set low, the drive will switch into Torque mode, rather than the previous "low" mode (which would be the mode stored in Non-volatile memory).

  Solution:
  This issue has been fixed, so that when the input is high at boot time, switching the input low will result in returning to the initial value stored in non-volatile memory.

Version: 01-08-05-000 Release Date: February 15, 2013

BASIC Issues

Fixed Bugs

- **IL.KACCFF added to BASIC. (S-10698)**
  Issue:
  Cannot access IL.KACCFF from a BASIC program.

  Solution:
  Added IL.KACCFF to BASIC.

Version: 01-08-04-000 Release Date: February 13, 2013

General Issues

Fixed Bugs

- **Power regeneration does not perform optimally, causing drive faults when the regen resistor power should be sufficient. (4000)**
  Issue:
  With a sufficient regeneration resistor installed and configured, the drive faults with a Bus Power Overload fault although sufficient power dissipation was available.

  Solution:
  Errors were detected and fixed in the algorithm which controls power shunting to the resistor. These have been fixed and regeneration, including bus sharing, has been validated to work as expected.

- **Certain faults do not open the fault relay. ()**
  Issue:
  A small number of faults were identified which do not open the fault relay.

  Solution:
  The fault relay is now opened for all faults.

- **If multiple faults are detected simultaneously, AKD should follow the highest priority fault reaction (4076)**
  Issue:
  It is possible in rare circumstances that AKD will follow a lower priority fault reaction if several faults are detected at the same time.

  Solution:
  AKD will now always take the highest priority fault reaction. From highest to lowest priority, the reactions are: Disable power stage immediately; Dynamic brake (sensorless stop); Controlled stop (utilize position feedback to bring the axis to a stop, then disable).

  Note: A physical brake, if installed, will always be applied in a fault situation according to drive configuration values, such as

CS.VTHRESH, CS.TO and MOTOR.BRAKEIMM.

- **When disabling, do not turn on the Dynamic Brake (sensorless stop) if a fault has occurred requiring an immediate Power Stage Disable. ()**

  Issue:
  Certain fault reactions are defined to immediately disable the power stage. But if the disable mode setting DRV.DISMODE is set to 1 or 3 (use dynamic brake), the drive will improperly turn on dynamic braking.

  Solution:
  AKD will not turn on dynamic braking if a fault has been detected requiring a Disable Power Stage reaction.

- **A small number of faults with the Controlled Stop fault reaction would override the DRV.DISMODE setting for Dynamic Braking. ()**

  Issue:
  When a fault results in a Controlled Stop reaction, AKD will stop the axis and then "disable"... this disable can be of two types, either Power Stage Disable or Dynamic Brake. Normally DRV.DISMODE is used to configure the drive to disable using either a Power Stage Disable or a Dynamic Brake. However, a small number of faults resulted in a Dynamic Brake once the Controlled Stop was completed, regardless of the value of DRV.DISMODE.

  Solution:
  All fault reactions which execute a Controlled Stop will now complete with either a Power Stage Disable or a Dynamic Brake, according to the setting of DRV.DISMODE.

Field Bus Specific Issues

Fixed Bugs

- **CanOpen control word can't disable SW EN (4248,D-04026)**

  Issue:
  After creating a STO-fault by taking away STO, HW-enable and mains power the drive's power stage was again enabled, when the three were back and the fault was cleared by control word.

  Solution:
  Power stage will now stay in switch on disabled state

- **EtherCAT free mappable PDO not working with 6060 and 6061 objects (4294,D-04133)**

  Issue:
  The mode change did not work, when the PDO was called more often than every 2 milliseconds

  Solution:
  Now also a PDO rate of 4 kHz works for mode of operation changes

- **EtherCAT PDO 0x1701 has invalid default configuration (4190,D-04060)**

  Issue:
  DS402: The mentioned objects in the fixed-mapping PDOs show not the really used objects in the firmware.

  Solution:
  The fixed-PDO mappings are corrected to the really used values. For legacy purposes the old xml-file is maintained.

- **EtherCAT free mappable PDO not working with 6060 and 6061 objects (4294,D-04133)**

  Issue:
  There is no other object than 0x6061 sub 0x0 (mode of operation display) to map as one-byte object

  Solution:
  Four new one-byte objects for the Tx-direction are implemented: Object 0x2002 sub 0x1 to 0x4 as the LSB to MSB of the manufacturer status object 0x1002 sub 0x0. The xml-file contains also one more dummy-object 0x2 sub 0 as one-byte object for the Rx-direction.

Version: 01-08-03-001 Release Date: January 25, 2013

General Issues

New Features

- **Diagnostic keywords and registers for developing Modbus applications (4137)**

  New Feature Details:
  When developing a Modbus scanner application using block read and write, it can be difficult to determine the source of Modbus error responses.

  Solution:
  To support modbus scanners in general, a set of new keywords were added:

  MODBUS.ERRORMODE, MODBUS.CLRERRORS, MODBUS.ERRORS Up to 125 errors will be logged in an error list (ERRORS) so that the user is able to verify successful completion of a Modbus request.

  The error list is cleared with command CLRERRORS.

  With ERRORMODE = 1, Modbus error responses can be disabled.

- **IL.CMDACC keyword added to measure acceleration command (4192)**

  New Feature Details:
  For measurement and tuning feedforwards it was often difficult since acceleration command was not readily available.

  Solution:
  IL.CMDACC has been added so that acceleration command can be monitored. This keyword is also recordable.

Fixed Bugs

- **Wake and Shake does not require success to enable amplifier (4204)**

Issue:
Feedback devices without halls require wake and shake to operate the drive. Other feedback devices that do not normally require wake and shake do not prohibit the drive from operating.

In cases where the feedback device is not aligned by the manufacturer, but the feedback device does not normally require wake and shake - the user can manually start wake and shake to determine motor phase angle.

However, if Wake and Shake does not pass, the drive will not require Wake and Shake to complete and the drive will be allowed to operate; this condition can lead to a motor runaway.

Solution:
If a user manually arms/starts Wake and Shake, the drive will require that Wake and Shake succesfully complete before the drive is allowed to operate. In the case of a failed wake and shake that was manually started - Wake and Shake will be automatically re-armed. If the user manually disarms Wake and Shake (and the user had manually enabled Wake and Shake), the drive will enable without requiring a Wake and Shake.

- **Power to an EnDat on FB3 Momentarily Turns Off (4188)**
  Issue:
  If you have an EnDat feedback devide connected to X9 it is providing the position reported by FB2. The power to this device, pin 9 on X9, should be continously on but it turn off momenterally each time the drive is enabled.

  Solution:
  This issue has been resolved. The drive keeps the power to the EnDat device on continously.

- **Low power drives (ML3 and ML6) cannot be enabled if the voltage is below 50V ()**
  Issue:
  The Inrush Relay switch on voltage is configured in the ML drive models for 30V, but the drive will not actually switch on below 50V.

  Solution:
  The Inrush Switch-On threshold will now follow the drive configuration if set below 50V.

- **T-ICAN (BASIC drive) will fail to boot if communication with the option card fails (S-10308)**
  Issue:
  Drive will not boot if option card is faulty.

  Solution:
  Drive will now boot up properly and display a fault if the option card fails.

Feature Changes

- **Default tuning improved to be more robust (S-10652)**
  Issue:
  Default tuning could cause an unstable situation "out of the box" with mechanical systems with a large inertia mismatch.

  Solution:
  Default tuning has been revised to be significantly more robust, allowing a wider range of inertias out of the box.

BASIC Issues

Fixed Bugs

- **Trajectory Generator not working correctly with Scurving (MOVE.SCURVETIME) (4282,D-04087)**
  Issue:
  When changing moves on the fly with SCurving enabled, the velocity command would dip.

  Solution:
  This bug was fixed so that switching moves does not cause a dip in the velocity command.

- **Using Trajectory Generator with Modulo (PL.MODP2) would cause a discontinuity in VL.CMD. (4275,D-04100)**
  Issue:
  Initiating moves with Modulo (PL.MODP2) would cause a discontinuity in VL.CMD.

  Solution:
  This bug was fixed so that VL.CMD is not affected by modulo.

Field Bus Specific Issues

New Features

- **Report drive faults in a CAN object array which is not cleared by a bus reset command. (S-10648)**
  New Feature Details:
  If a bus error is cleared the existing DS301 fault list will cleared with it.

  Solution:
  Added new object 2000h subindex 1-3 for warnings and 2001h subindex 1-10 for faults which allow to read active faults and warning. The AKD fault numbers are reported (not standard CAN error codes).

Fixed Bugs

- **Modbus access of write-only keywords returned an error response (4225,D-04056)**
  Issue:
  Some Modbus scanners expect all registers to allow read/write access and will abort their application if an error response is received.

  Solution:
  Read access of all write-only keywords will not return an error response. The read value is always zero (0).

- **IL.OFFSET value not saved to NV if large (4238)**
  Issue:
  If IL.OFFSET exceeds approximately 2.5 Amps, it will not be saved to NV ram, but not successfully restored upon power up.

Solution:
An initialization order bug was found, and fixed.

Version: 01-08-02-000 Release Date: December 27, 2012

BASIC Issues

New Features

- **FB1.USERxxx can now be accessed from a BASIC program (S-10427)**
  New Feature Details:
  It would be helpful to read/write these special user locations in motor memory from BASIC programs.

  Solution:
  In this version, FB1.USERxxx keywords can be accessed from BASIC

General Issues

New Features

- **Drive serial number can now be accessed via Modbus (S-10308)**
  New Feature Details:
  It would be helpful to read the drive serial number over Modbus registers.

  Solution:
  The serial number is now available in ASCII coded bytes starting at register 6000. Register 6000 contains the length of the serial number in registers (currently 6). The following registers contain the serial number.

Version: 01-08-01-000 Release Date: December 19, 2012

General Issues

New Features

- **DRV.EMUEMODE Pass through the index from the primary encoder to the Emulated encoder output. (S-03693)**
  New Feature Details:
  It is desirable to be able to pass the primary encoder's index (zero/Z) pulse directly to the the emulated encoder output (EEO).

  Solution:
  Three new modes have been added to DRV.EMUEMODE in order to enable the primary encoder index pass through to the emulated encoder output (EEO). When these modes are selected the primary encoder index (zero/Z) pulse will be passed directly to the EEO's index output pins on the X9 connector. These three modes are as follows: Mode 12: Output – A/B with index pass through Mode 13: Output – Step/Dir with index pass through Mode 14: Output – CW/CCW with index pass through.

- **Keyword FBUS.STATE returns the current state of the fieldbus. ()**
  New Feature Details:
  User needs to be able to retrieve the current state of the fieldbus.

  Solution:
  FBUS.STATE returns the current state of the fieldbus. This keyword is currently implemented only for CANOpen and EtherCAT.

- **Keyword TEMP.CONTROL reads the temperature of the control board temperature sensor. ()**
  New Feature Details:
  Users need to read the value of the control board temperature (in degrees Celsius) as an integer.

  Solution:
  TEMP.CONTROL can be read to get the control board temperature in degrees Celsius.

- **Keyword TEMP.POWER1,2,3 reads the temperature of the power board(s) temperature sensor(s). ()**
  New Feature Details:
  Users need to read the value of the power board(s) temperature(s) (in degrees Celsius) as an integer.

  Solution:
  TEMP.POWER1, TEMP.POWER2, TEMP.POWER3 can be read to get the power board(s) temperature in degrees Celsius.

BASIC Issues

Fixed Bugs

- **The drive would crash when a BASIC program with I/O Option Board parameters were executed on a BASIC drive w/o an I/O Option Board. (4274)**
  Issue:
  The drive would crash when a BASIC program with I/O Option Board parameters were executed on a BASIC drive w/o and I/O Option Board.

  Solution:
  Modified the firmware so that reading/writing I/O Option Board parameters would return an error on a BASIC drive w/o an I/O Option Board.

Field Bus Specific Issues

Fixed Bugs

- **The index number of the objects DRV.HANDWHEELSRC, IL.KPLOOKUPINDEX, IL.KPLOOKUPINDEX, IL.KPLOOKUPVALUE, FAULT451.ACTION has changed, these object were no longer accessible by it previous index number. (4154)**

Issue:
Customer wants to write and read IL.KPLOOKUPINDEX, Object 5265h and IL.KPLOOKUPVALUE, Object 5266h during Start up but it is not possible, because the object numbers has changed.

Solution:
Corrected the index numbers to the previous values.

- **Dynamic mapping table of Modbus did not get restored after DRV.NVSAVE. (4156)**
  Issue:
  After configuring the dynamic mapping table and executing DRV.NVSAVE the mapping table does not get restored after a power-up or DRV.NVLOAD.

  Solution:
  Fix a problem in drive initialization which prevented restoration of the mapping table.

- **CANOpen Object 608FhSub01h is not accessible if FBUS.PARAM05 Bit 4 is set. (4153)**
  Issue:
  608Fh01Subh is used to calculate the encoder increments and depending on FB1.PSCALE.

  Solution:
  The object is now also accessible when FBUS.PARAM05 Bit 4 set.

- **Writing object 608FhSub01h over CANopen/EtherCAT, did not change FB1.PSCALE. (4159)**
  Issue:
  Changing FB1.PSCALE over telnet did change object 608Fh01Subh, but writing the object over CANopen/EtherCAT did not change FB1.PSCALE.

  Solution:
  Writing object 608FhSub01h does now change FB1.PSCALE to the appropriate value.

- **EtherNet/IP - Connection timeouts can lead to a drive crash (4193)**
  Issue:
  Connection time outs (due to cabling issues, or expected packet rate too high) result in a drive crash rather than a simple fault.

  Solution:
  This issue has been resolved. The drive will now fault with a network timeout F702 and will not crash.

- **EtherNet/IP - Connection timeout faults cannot be cleared with Logix controllers (4193)**
  Issue:
  With a Logix controller, F702 Fieldbus Communication Lost cannot be cleared after it occurs without a reboot.

  Solution:
  The system has been modified so that these controllers are able to reconnect after a network timeout.

Version: 01-07-04-000 Release Date: November 15, 2012

General Issues

New Features

- **MOTOR.BRAKERLS command extended to allow forcing the brake to apply when the drive is enabled. (S-09960)**
  New Feature Details:
  For test purposes, it may be desirable to apply the brake when the drive is enabled, and command motion.

  Solution:
  The existing command MOTOR.BRAKERLS was extended with a new option 2. If MOTOR.BRAKERLS=2, the brake will be engaged regardless of the state of the drive. The drive is allowed to enable and motion may be commanded.

- **Direct control of the brake from a fieldbus (S-09960)**
  New Feature Details:
  It is sometimes necessary to override the drive control of the brake, and directly enage or disengage the brake from CANopen or EtherCAT.

  Solution:
  A new object 0x345A has been added which allows the fieldbus to directly control the brake, as long as there are no faults on the drive. See user documentation for details.

Field Bus Specific Issues

Fixed Bugs

- **SDO values and mapping cannot always be read over ECat (4135)**
  Issue:
  The objects 0x50b7 and 0x50b9 were not accessible, but delivered also no SDO abort codes via EtherCAT, whereas they worked via CAN. There were other objects marked as reserved in xml and EDS-file, which delivered abort codes in TwinCAT-SDO-list. The mapping information for the fixed PDOs was not available.

  Solution:
  All reserved objects were taken out of the firmware, EDS and XML-file updated. The fixed mappings can now be read.

- **AKD doesn't reach BOOTSTRAP mode after PREOP->INIT transition (4117)**
  Issue:
  When downloading a firmware-file with KAS the drive was sometimes unable to switch to BOOTSTRAP mode.

  Solution:
  The drive will no longer be stucked in the INIT trasition.

Feature Changes

- **Modbus: Do not return an error response setting a value fails due to drive disable (4137)**

Issue:
Some drive keywords (such as VL.CMDU) normally return errors when they are set while the drive is disabled. When using a Modbus master, however, and error response is not expected in this situation.

Solution:
If the drive is disabled and a Modbus command tries to set a value which cannot be set while disabled, no error response will be returned. The Modbus command will be ignored.

Version: 01-07-03-000 Release Date: October 17, 2012

General Issues

Fixed Bugs

- **SFD Checksum Fault F534 seen intermittently (4063)**
  Issue:
  With certain drive types (except EtherCAT), spurious F534 faults are sometimes seen with SFD feedback devices.

  Solution:
  These faults should now only occur when there is a real problem communicating with the feedback device.

- **Broken Wire Detected fault F417 reported incorrectly on certain incremental encoders (4111)**
  Issue:
  False broken wire faults could be reported by the drive when incremental encoders anomalously jitter up/down at a very high rate for extended periods of time. Renishaw incremental encoders have this non-ideal characteristic even at position hold.

  Solution:
  Incorrect faults should no longer be reported on these devices.

- **Power Stage Fault F531 is sometimes reported when STO power is first applied. (4100)**
  Issue:
  False faults can be reported by the drive when power is first applied to the STO input. This issue exists only on the following part numbers:
  AKD-x00xx7-xxxx
  AKD-x00246-xxxx

  Solution:
  Incorrect faults should no longer be reported on these drives.

- **Startup position is initialized incorrectly for BiSS mode B absolute feedback devices (4136)**
  Issue:
  The absolute position value is initialized incorrectly for BiSS-B absolute feedback devices if the total number of incremental plus multiturn bits is greater than 32 (bits above 32 are lost)

  Solution:
  The absolute position value is now initialized correctly for these devices.

Feature Changes

- **Voltage thresholds modified for 5V Logic line faults (4145)**
  Issue:
  Intermittent faults F510 "5V over voltage", and F512 "5V under voltage" are sometimes seen.

  Solution:
  The fault threshold values have been expanded. The allowed range is now 4.70-5.35 V.

Field Bus Specific Issues

Fixed Bugs

- **PROFINET IO: Disable, Enable and start and abort a home procedure through a disable command does not always work. (S-08955)**
  Issue:
  When the user disables the drive over STW1 and does not clear the Start Homing Bit before the drive state machine has changed to < S4, the next start homing command does not work.

  Solution:
  In case of the drive is disabled when a homing procedure is running, the move is now properly aborted.

New Features

- **Fieldbus Command Arbitration: Block Telnet Access to Parameters (S-10131)**
  New Feature Details:
  It is sometimes desirable to block specific service channel commands (normally available in Workbench) when using a fieldbus to ensure motion commands from the fieldbus are not interrupted.

  Solution:
  New parameters FBUS.PROTECTION and FBUS.BLOCKING added.
  FBUS.PROTECTION sets the protection level from 0 to 2. A level of 0 disables the parameter protection, a level of 1 and higher enables the protection of parameters with an equal or lower protection value.

  Currently, to all protected parameters a level of 1 is assigned. A fieldbus (CANOpen and EtherCAT) must be operational to activate the protection. The protection is enabled when FBUS.PROTECTION is greater than 0 and CANOpen or EtherCAT are operational.

  FBUS.BLOCKING is a read-only parameter and returns 1 if the protection is active, 0 otherwise.

BASIC Issues

Fixed Bugs

- **MOVE.GOREL on top of camming in the negative direction would result in motion in positive direction. (4122,S-10192)**
  Issue:
  Commanding a relative move (i.e. MOVE.GOREL) in the negative direction on top of camming would result in motion in the positive direction.

  Solution:
  Now MOVE.GOREL in the negative direction on top of camming works correctly.

Version: 01-07-02-000 Release Date: September 21, 2012

General Issues

Known Issues

- **HOME.MODE 7 used with DRV.DIR 1 homes to random positions (4099)**
  Issue:
  When the commutation direction is inverted and Home mode 7 run, an error in the trajectory generator generated the wrong final position.

  Solution:
  Calculation has been fixed when HOME.MODE 7 is used when DRV.DIR 1.

New Features

- **New command DRV.DISSOURCESMASK added (S-08412)**
  Solution:
  DRV.DISSOURCESMASK is a bitwise parameter that returns all possible causes of a drive disable. If a bit is set, the drive can be disabled for this reason. See also DRV.DISSOUCES.

Known Issues

- **Position Loop not executing when inside a software limit switch (3773)**
  Issue: (Identified in Version 01-06-01-000)
  This bug was fixed in version 01-06-01-000 but caused a larger bug: 4092. This bug has been intentionally re-introduced until a full fix for both 3773 and 4092 can be implemented

Feedback Issues

Known Issues

- **Switching PL.FBSOURCE can loose multi-turn part of PL.FB (4087)**
  Issue:
  If you are using a feedback type that does not support preserving multi-turn data then if you switch PL.FBSOURCE from FB1 to FB2 or FB2 to FB1 and then back to the original value any multi-turn data that was returned by PL.FB was forced to zero.

  Solution:
  The PL.FB position will now preserve the multi-turn data.

Field Bus Specific Issues

Known Issues

- **With AKD + EtherCAT fieldbus disable causes glitch before controlled stop (4060)**
  Issue:
  Disabling the drive via control word when running interpolated or cyclic position mode, can introduce a short velocity jump till a control stop is executed. This occurs when the master freezes the position set point value and in the same moment disables the drive.

  Solution:
  The drive now maintains the last valid velocity command from the master until the controlled stop has started.

Feature Changes

- **display effective braking resistance in watts - FW (S-09959)**
  Issue: (Identified in Version 01-06-01-000)
  The existing keyword REGEN.POWER is instantaneous and not helpful for comparing to the trigger value REGEN.TEXT. This real-time value should be filtered to get a more reliable actual value. EtherCAT-access via SDO and PDO should be possible.

  Solution:
  A new parameter REGEN.POWERFILTERED is implmented. The object 0x3417 sub 0 was added to give CAN-/EtherCAT-access.

New Features

- **Read firmware version during EC scan in operational. (S-10060)**
  Solution:
  The firmware version is now part of the EEProm - emulation in EtherCAT. It is located in the address 0x0801 and has 12 characters in the form 0x-xx-xx-xxx.

Version: 01-07-01-000 Release Date: September 08, 2012

General Issues

New Features

- **Support of FB1.USERBTYEx in Hiperface encoders ()**
  New Feature Details:
  The FB1.USERBYTEx access was not supported for hiperface.

  Solution:
  The FB1.USERBYTEx/USERWORDx/USERDWORDx parameters can now be used to store up to 8 byte in Hiperface feedback memory.

- **New Digital Output Mode 20 for Controlled Stop Active (S-09919)**
  New Feature Details:
  As a user, I need to know when controlled stop is active (stopping) on axis 1 so that I can initiate a controlled stop on a linked axis 2

  Solution:
  A digital output will be high in normal operation (drive enabled), but will be low when a controlled stop is in progress.

- **New keyword REGEN.POWERFILTERED (S-09959)**
  New Feature Details:
  As a user, I want to see a filtered value of the power being dissipated by the regen resistor.

  Solution:
  REGEN.POWERFILTERED has been added as a keyword which provides the user a filtered version of REGEN.POWER.

- **Added New Digital Output Mode 21 (S-09950)**
  Solution:
  A new digital output mode 21 has been added. This new output mode produces a low signal for 50ms after a fault that disables the power stage immediately. After the 50ms pulse the output returns to the high state until DRV.CLRFAULTS has been executed.

- **New Fault F312: Brake released when it should be applied. (S-10011)**
  New Feature Details:
  Previously, a fault condition where the motor brake is released when it should be applied generated an incorrect and misleading fault F307 (Brake applied during Enable-State). Now, fault F312 will be generated instead.

  Solution:
  A fault (F312) will be generated when the motor brake is released when it should be applied.

- **Induction motor open loop V/F control implemented as MOTOR.TYPE 2. (S-09872)**
  New Feature Details:
  As a machine builder, I want to configure an AKD to perform V/f control of an induction motor, so I can control induction motors without feedbacks.

  Solution:
  Expand MOTOR.TYPE to include 2 for induction motor V/f control. When MOTOR.TYPE 2 is selected, drive outputs PWM voltage waveform equivalent to a 3-phase AC voltage, with frequency corresponding to user's velocity feedforward command. The output voltage magnitude is proportional to frequency; At rated speed command the output voltage magnitude matches the rated voltage magnitude configured by user. In this mode, feedback position is ignored, current regulator, position regulator and velocity regulator are not running, only the feedforward velocity command takes effects.

Fixed Bugs

- **Bugs in FB1.USERBTYEx (3984)**
  Issue:
  Inconsistencies in DRV.HELP for indexed parameters like Fb1.USERBYTEx and unclear error messages.

  Solution:
  The functionality itself has not changed, only the error messages and the help string.

- **IL.KACCFF Could Be Set To Value Larger Than the Maximum (4008)**
  Issue:
  You could set IL.KACCFF to a value larger than the maximum value returned by DRV.HELP IL.KACCFF. If you do this then when you try to read the value back you will not get the value you initially entered.

  Solution:
  IL.KACCFF now returns an error it you try and set it to a value larger than the maximum.

- **AOUT.PSCALE has wrong minimum value (4009)**
  Issue:
  The minimum value setting for AOUT.PSCALE is larger than the maximum value

  Solution:
  A signed issue caused the minus sign to be misinterpreted. This has been fixed.

- **FB1.USERBYTE* does not work with MOTOR.AUTOSET=0 (4068)**
  Issue:
  FB1.USERBYTE* parameters will not be updated properly if MOTOR.AUTOSET is cleared AND no valid motor data is stored in the feedback memory.

  Solution:
  FB1.USERBYTE* does now work regardless if the motor data is valid or not, but still it checks if the feedback memory is capable of supporting this functionality (e.g. size of eeprom is too small).

Feature Changes

- **New actions for fault F306 (Brake short circuit) and F307 (Brake applied during Enable-State). (S-10011)**
  Issue:
  As a user with a brake, I do not want to damage my machine if the brake is closed when it should be released. If this error situation occurs, disable the axis immediately without doing a controlled stop. In current behavior, the drive will do a controlled stop if the brake circuit reports a fault while the brake should be released.

  Solution:
  Previously, when F306 (Brake short circuit) or F307 (Brake applied during Enable-State) occurred, the drive would execute an

emergency stop. Now, instead the drive would executing dynamic brake and disable the power stage.

Version: 01-07-00-002 Release Date: September 07, 2012

General Issues

New Features

- **New keyword WS.CHECKMODE (S-09884)**
  New Feature Details:
  As a user, I want to select between active, passive, or no commutation check, as my application may not work with one of the modes.

  Solution:
  The addition of WS.CHECKMODE allows the user to specify which method the drive will confirm a valid commutation after Wake and Shake. When WS.CHECKMODE is set to 0(No commutation check), neither passive nor active commutations checks will be executed. When WS.CHECKMODE is set to default value 1(Active commutation check), AKD will make a short torque move after an angle has been selected. If the motor fails to move in the expected direction, a fault will be generated. When WS.CHECKMODE is set to 2(Passive commutation check), AKD will monitor torque commands and acceleration values for 10 revolutions after Wake and Shake has completed. During this time, a fault will be generated if unexpected motion is detected.

Fixed Bugs

- **Drive crashes on EtherNet/IP drive when disconnect/reconnect network cable (3762)**
  Issue:
  Occasionally, the drive crashes after replugging the network cable and when an EtherNet/IP TCP connection is running.

  Solution:
  Non thread-safe function call generated this problem. The problem is fixed.

- **Can't reset IP Address while drive is in a dynamic brake state (DRV.STATUS=3) (4018)**
  Issue:
  When the drive is disabled, it should be possible to reset the IP address. But if the drive is disabled with dynamic brake engaged (due to DRV.DISMODE setting or certain faults) it is not possible to reset the IP address.

  Solution:
  A bug was identified and fixed where the IP Address could not be reset when the drive was in a dynamic braking state.

- **Wake and Shake remains active after a fault (4030)**
  Issue:
  A problem in the Wake and Shake state machine can allow Wake and Shake to remain active after a fault occurs.

  Solution:
  The state machine has been re-worked to prevent conflicting commands.

- **WS.TSTANDSTILL can set values out of the range (4043)**
  Issue:
  WS.TSTANDSTILL returns successfully when set values bigger than the maximum value, and smaller than the minimum value.

  Solution:
  Add range check for WS.TSTANDSTILL.

- **The measured time to ramp the current up to WS.IMAX takes longer than the setting value (4046)**
  Issue:
  In wake and shake mode 1, set WS.TIRAMP = 256 ms, WS.IMAX = 1, the measured time to ramp the current up to WS.IMAX could be more than 100 ms longer than the setting value.

  Solution:
  Modify WS.TIRAMP minimum value to 512ms, the measured time to ramp the current up to WS.IMAX also could be a little bigger than the setting time, but won't drift too far.

- **F493 will not be generated in some opmode/commandd source combinations (4088)**
  Issue:
  An error caused commutation validation to not run in Fieldbus/Velocity, Analog/Torque, and Analog/Velocity modes.

  Solution:
  The state machine has been updated to run commutation checking in all opmode/command source combinations.

- **DRV.DIS is ignored if performing a Controlled Stop (S-10049)**
  Issue:
  If DRV.DISMODE is 0 or 1 (disable immediately or dynamic brake immediately) and the drive is performing a controlled stop issuing a DRV.DIS or removing the fieldbus enable would be ignored and the drive would continue to complete the controlled stop.

  Solution:
  The drive now terminates the controlled stop and will immediately disable or dynamic brake.

- **The reaction to an overspeed fault should have been to dynamic brake. (4059)**
  Issue:
  The reaction to a overspeed fault was to initiate a controlled stop. If the overspeed is due to a loss of commutation or an unstable servo tuning the controlled stop will not be able to slow the axis down. If the DRV.DISTO is set to a long time the axis will not stop until this timeout has been reached.

  Solution:
  The firmware has been changed to perform a dynamic brake in response to an overspeed fault.

- **F106 fault and parameters lost when upgrading from earlier firmware versions (4041)**
  Issue:
  When upgrading from certain earlier versions, changes in parameter types can result in an F106 Nonvolatile Memory data error, and parameter settings stored in the drive are lost.

Solution:
Parmeter type changes are now handled, such that upgrading from older versions will result in proper parameter values, and no fault will be reported.

Field Bus Specific Issues

Fixed Bugs

- **DS402: Object 3470h sub 3 (AOUT.VALUEU) doesn't work as PDO, but as an SDO (3939)**
  Issue:
  The object mapping works, but the value written to the PDO doesn't get into effect. The SDO-access works as expected.

  Solution:
  Object 3470 sub 3 works as expected by SDO or PDO access.

Version: 01-07-00-001 Release Date: August 17, 2012

General Issues

Fixed Bugs

- **F301 "Motor overheated" appears after power cycle (3966)**
  Issue:
  After a power cycle, there is a chance that Fault 301 - Motor Overheated is generated eroneously

  Solution:
  The fault is now inhibited until the sensors are fully initialized.

- **Restore DRV.OPMODE and DRV.CMDSOURCE to initial condition when W&S fails because of a disable of the power stage (S-09829)**
  Issue:
  User disabled accidentally the Wake & Shake process by disabling the power stage. Afterwards the DRV.OPMODE and DRV.CMDSOURCE stayed in the mode used in the Wake & Shake process.

  Solution:
  The previous values are restored now. Additionally the Wake & Shake is re-armed.

- **Wake and Shake changes opmode and command source if arm, then disarm is issued before the drive is enabled. (4031)**
  Issue:
  If Wake and Shake is armed, then disarmed without running Wake and Shake, the opmode/command source values are restored to unintialized states. This results in setting the drive to Torque Mode and Service Mode.

  Solution:
  Issuing a Wake and Shake disarm command no longer restores previous opmode and command source.

- **AOUT.PSCALE has wrong minimum value reported by DRV.HELP (4009)**
  Issue:
  The minimum value setting for AOUT.PSCALE is larger than the maximum value

  Solution:
  A signed issue caused the minus sign to be misinterpreted. This has been fixed.

- **Glitch in enable when dynamic brake signal changes (4014)**
  Issue:
  A very infrequent "glitch" was found where the drive will apply the dynamic brake and then briefly re-enable for several milliseconds before again applying the dynamic brake and disabling successfully. This condition can only be seen when the drive is disabling and it is configured to use the dynamic brake (DRV.DISMODE=1 or 3).

  Solution:
  A bug has been identified and fixed so this re-enabling glitch cannot occur.

- **Reading FB1.USERBYTE, USERWORD, or USERDWORD may cause a drive crash (3969)**
  Issue:
  Using FB1.USERBYTEx commands with no feedback with memory leads to a drive crash.

  Solution:
  The behaviour is now fixed.

- **WS.MODE 1 results in incorrect motor phase when DRV.DIR = 1 (4003)**
  Issue:
  Wake and Shake Mode 1 does not work properly when the drive direction (DRV.DIR) is set to 1. The value of the commutation angle is wrong (MOTOR.PHASE) after commutation alignment was succesful terminated.

  Solution:
  Eliminated a sign problem that caused the the wrong motor phase.

BASIC Issues

Fixed Bugs

- **Drive crash when using a camming program. (4027,S-09935)**
  Issue:
  When the compiler generates an odd number of data bytes, it could be placed on an odd boundary that would cause a misaligned access exception.

  Solution:
  The firmware was modified to avoid the misaligned access exception.

Version: 01-07-00-000 Release Date: July 27, 2012

General Issues

Fixed Bugs

- **DRV.FAULTHIST reports incorrect time stamps due to bad runtime values. (3619,S-09413)**
  Issue:
  The runtime value got stuck at 48days, which led to incorrect fault history values once the runtime hit this limit.

  Solution:
  Removed the limiting bug in the code.

BASIC Issues

Fixed Bugs

- **After MOVE.ABORT the decel rate used is CS.DEC instead of MOVE.DEC. (3958)**
  Issue:
  After MOVE.ABORT the decel rate used is CS.DEC instead of MOVE.DEC.

  Solution:
  Now MOVE.DEC is restored as the decel rate after a MOVE.ABORT.

- **Drive crash with BASIC telnet console output (3940,S-09703)**
  Issue:
  A drive crash can occur when a BASIC program is printing and receiving messages simultaneously.

  Solution:
  The BASIC program can now send and receive messages from Workbench or another client simultaneously. Receiving strings from the BASIC program still occurs on port 54321. Now when sending string to the BASIC program the Telnet client must use port 54322.

- **Virtual Encoder/Master moving flag (CAMVM.MOVING) not working correctly. (3974,S-09770)**
  Issue:
  Starting a move like CAMVM.GOREL and checking the CAMVM.MOVING flag immeidately afterwards could result in incorrect value.

  Solution:
  CAMVM.MOVING is now reporting the correct value.

- **EXTENCODER.FREQ, CAMVM.FREQ did not report correct values for large internal values (> 2^32) of these parameters. (3972)**
  Issue:
  ExtEncoder Frequency/Velocity conversion routine does not work correctly for large values.

  Solution:
  EXTENCODER.FREQ and CAMVM.FREQ is now reporting the correct values.

- **Analog Position Mode does not work. (3918,S-09667)**
  Issue:
  In Analog Position mode the drive does not respond to analog commands.

  Solution:
  Analog position mode is now working correctly.

- **Incorrect unit conversions for FB1.P, FB2.P, and FB3.P. (3937,S-09657)**
  Issue:
  Reading the values of FB1.P, FB2.P, and FB3.P returns incorrect values.

  Solution:
  Reading FB1.P, FB2.P, and FB3.P now returns correct values.

- **SD.SAVE saves active parameters instead of NV parameters. (3976,S-09800)**
  Issue:
  SD.SAVE saves active parameters instead of NV parameters which may result in incorrect drive state saved in the SD card.

  Solution:
  Now SD.SAVE performs a DRV.NVLOAD prior to saving away the parameters. Users should be aware that current changes to their parameters will be overwritten when performing SD.SAVE.

New Features

- **The parameters EXTENCODER.POSITION, EXTENCODER.FREQ, CAM.MASTERPOS, CAMVM.POSITION, CAMVM.FREQ are now recordable and triggerable. (S-09724)**
  New Feature Details:
  When debugging camming applications it is useful to see plots of these parameters on the scope.

  Solution:
  User can view plots of above parameters as part of developing, testing, and debugging camming programs.

Version: 01-06-07-000 Release Date: June 22, 2012

Feedback Issues

Fixed Bugs

- **FB1.ENCRES Changed to be Read-Only When Using Tamagawa Abs Feedbacks (S-09616)**

Issue:
If you upload a parameter file from a drive using a Tamagawa feedback and download it back to the same drive you get the following error message "Error: [0054] Unknown Encoder Type."

Solution:
FB1.ENCRES has been changed to be read-only when the Tamagawa feedback is selected. With this parameter read-only it will not be included in an uploaded parameter file or output by DRV.NVLIST. With this paramter not in the parameter file downloading it back to a drive will not generate any error messages.

General Issues

Fixed Bugs

- **Scope traces for IL.VCMD were inverted (S-09650)**
  Issue:
  If you scoped plotted IL.VCMD and IL.CMD then you would see the IL.VCMD is not the correct sign.

  Solution:
  IL.VCMD now reports the voltage with the correct sign.

- **W&S was sometimes automatically disarmed after drive enable. (3932)**
  Issue:
  When W&S is armed and the drives gets enabled to start the WSS procedure the drive has self disarmed W&S. In this case it was also possible that even disarmed the motor moves, when the motor.phase has been altered to angle that would lead to a commutation fault.

  Solution:
  Drive will no longer self disable W&S.

- **VL.FBFILTER overflows in some situations (3954)**
  Issue:
  When VL.FB reaches a speed of > 3500 RPM or the acceleration is very high, an overflow can occur in the calculation of VL.FBFILTER.

  Solution:
  Calculation has been modified so that an overflow cannot occur.

- **Unexpected velocity command seen when controlled stop initiates (3981)**
  Issue: (Identified in Version 01-06-00-001)
  When a controlled stop is commanded, it is expected that the velocity command will immediatly be set to actual velocity, and then decelerate at the rate of CS.DEC. But if the actual velocity is above 3500 rpm, the velocity command at controlled stop initiation will be set to a wrong value (possibly lower than expected or in the wrong direction). The velocity command then decelerates from this wrong initial command value, resulting in unexpected deceleration rates or acceleration in the wrong direction.

  Solution:
  A bug has been fixed in VL.FBFILTERED (the 10Hz filtered actual velocity value) which is used to set the initial velocity command for a controlled stop. The behavior is now that a controlled stop from above 3400 rpm will decelerate properly at CS.DEC from the starting actual velocity to a stop.

- **W&S mode 0: Occasional "Fault 475 Excessive movement" failures (3956)**
  Issue:
  During W&S mode 0, sometimes a fault 475 was triggered although the axis moved in the allowed position range.

  Solution:
  The start position for the W&S monitoring was not always properly initialized.

Field Bus Specific Issues

Fixed Bugs

- **PROFINET IO: Signal ITIST_GLATT (torque value) not updated (3955)**
  Issue:
  The torque value in telegram 350 was not updated.

  Solution:
  Torque value is now available as "actual value" in telegram 350.

New Features

- **PROFINET IO: New manufacture specific telegram 351 created. (3957)**
  New Feature Details:
  Telegram 350 has for velocity mode only the actual current and actual velocity. In some application there is also need for the actual position.

  Solution:
  For the velocity mode, a new manufacture specific telegram 351 is created, which returns the actual current, velocity and position.

BASIC Issues

Fixed Bugs

- **MOVE.ABORT not clearing out the position error. (3882,S-09714)**
  Issue:
  When executing a MOVE.ABORT, the motor would not stopped the expected position.

  Solution:
  Now a MOVE.ABORT will decelerate and the CS.DEC rate and the position error will be cleared.

- **CAMVM.POSITION reported incorrect position values. (3914,S-09639)**

Issue:
When reading CAMVM.POSITION, the values reported would be in internal units.

Solution:
Now CAMVM.POSITION reports the value in user units.

- **EXTENCODER.POSMODULO cannot be written while drive is enabled. (3911)**
  Issue:
  EXTENCODER.POSMODULO cannot be written while drive is enabled.

  Solution:
  Now EXTENCODER.POSMODULO can be written when drive is enabled..

- **CAMVM.GOREL did not work. (3912,S-09596)**
  Issue:
  CAMVM.GOREL did not work.

  Solution:
  Now CAMVM.GOREL works properly.

- **CAMVM.GOVEL did not execute when the drive was disabled. (3913,S-09597)**
  Issue:
  CAMVM.GOVEL would stop or not start if the drive is disabled.

  Solution:
  Now CAMVM.GOVEL starts and continues when the drive is disabled.

- **Program running upon start up (i.e. VM.AUTOSTART = 1) may not start a move or enable drive. (3909,S-09593)**
  Issue:
  Program running upon start up (i.e. VM.AUTOSTART = 1) may not start a move or enable drive.

  Solution:
  Now the program starts running after the drive has been completely initialized.

Version: 01-06-06-000 Release Date: June 08, 2012

BASIC Issues

Fixed Bugs

- **Incorrect default value for EGEAR.RATIO. (3902,S-09509)**
  Issue:
  EGEAR.RATIO had incorrect default value of 0.

  Solution:
  EGEAR.RATIO default value changed to 1.

- **Incorrect handling of Over-Travel, MOVE.ABORT, and drive disable in the Trajectory Generator (including Electronic Gearing and Camming). (3891,S-09437)**
  Issue:
  Trajectory Generator did not operate properly when OT switch, MOVE.ABORT, or drive disabled occured.

  Solution:
  Trajectory Generator now behaves per specification when the drive is disabled, OT switch or MOVE.ABORT occurs.

- **MOVE.ABORT would cause MOVE.DEC to be over-written by the value of CS.DEC. (3904,S-09541)**
  Issue:
  MOVE.ABORT would cause MOVE.DEC to be over-written by the value of CS.DEC.

  Solution:
  MOVE.ABORT now uses the CS.DEC value without modifying MOVE.DEC.

New Features

- **Stop and restart a BASIC program with the rotary switches and B1. (S-09553)**
  New Feature Details:
  Need to be able to stop and restart a program without a PC connected.

  Solution:
  Set the rotary switch to 0x12 to stop or 0x13 to restart and long press B1 to stop/restart the BASIC program.

Feedback Issues

Fixed Bugs

- **Battery Fault was generated for Tamagawa feedback devices if the Battery Power was lost when AKD is still powered (S-09322)**
  Issue:
  When using a Tamagawa feedback and the battery was disconnected while the drive was powered on, a F465 fault was generated. As long as the AKD drive is still powered a fault should not be generated because the drive can still operate normally.

  Solution:
  Fault F465 “Tamagawa encoder fault (battery error)” has been deleted. Fault F451 “Feedback battery fault.” has been maintaind and is generated if the feedback loses the battery power while the drive is powered off. A new warning n451 “Feedback battery" has been added to indicate that the Tamagawa feedback does not currently have any battery power. The n451 warning is not shown if FAULT451.ACTION is 1.

- **MOTOR.PHASE with Tamagawa feedbacks was being set incorrectly (S-09322)**

Issue:
When using a Tamagawa feedback, wake and shake would fail becuase MOTOR.PHASE was used incorrectly. MOTOR.PHASE is correct for all other feedbacks.

Solution:
Reading and writing MOTOR.PHASE is now correctly used for Tamagawa feedbacks.

General Issues

Fixed Bugs

- **Wake and Shake fails often with Fault 492 (3899)**
  Issue: (Identified in Version 01-05-08-000)
  When Wake and Shake completes, a short validation routine runs to ensure the commutation angle is correct. User may observe that high friction / high inertia systems Fault 492 occurs often.

  Solution:
  It was discovered that WS.IMAX was overriding the current peak limits for the entirety of Wake and Shake, including the validation. This was found to be incorrect, and should only affect the execution portion of Wake and Shake, not the validation. This prevented the validation check from using the full current motor continuous rating.

Version: 01-06-05-000 Release Date: May 25, 2012

General Issues

Feature Changes

- **DIN[X].PARAM and DOUT[X].PARAM ranges are now enforced (S-08920)**
  Issue:
  Digital Input/Output parameter keywords allowed any numerical value. This could lead to internal overflows for certain cases.

  Solution:
  Now the appropriate ranges are implemented for each digital input/output mode. Now each time the digital input or output mode is changed, the associated parameter is set to zero to avoid conflicts. This also means that the IO Mode must be set **before** the parameter is set.

Fixed Bugs

- **Motion Task Table disappeared after reboot of AKD in Beta 01-06-03-000 (3865,S-09353)**
  Issue: (Identified in Version 01-06-03-000)
  Motion Tasks are not restored after a power cycle or the execution of DRV.NVLOAD.

  Solution:
  Motion task tables are now properly restored from non-volatile memory.

- **Acceleration rates not restored after a drive reboot in Beta 01-06-03-000 (3894)**
  Issue: (Identified in Version 01-06-03-000)
  Acceleration parameters were not saved properly to non-volatile memory. This bug was introduced in 01-06-03-000.

  Solution:
  Acceleration parameters such as DRV.ACC are now restored after a power cycle or load from non-volatile memory.

New Features

- **Timeout duration included in DRV.HELP response (S-09310)**
  New Feature Details:
  Some drive keywords take a long time to complete execution.

  Solution:
  The specific max timeout values are now included in the DRV.HELP string.

BASIC Issues

Feature Changes

- **BASIC Compiler and VM now support MOTOR.TBRAKETO. (3873,S-09348)**
  Issue:
  Compiler error when MOTOR.TBRAKETO is in the params section.

  Solution:
  MOTOR.TBRAKETO is now available to BASIC programs.

Fixed Bugs

- **Occasionally drive crashes when connecting/disconnecting from Workbench Console. (3808,S-09315)**
  Issue:
  Drive can crash when connecting or disconnecting from the Workbench Console.

  Solution:
  This issue has been resolved.

- **MOVE.MOVING = 1 when disabled and move command is issued. (3877,S-09355)**
  Issue:
  MOVE.MOVING = 1 when disabled and move command is issued.

  Solution:

MOVE.MOVING will now be 0 when disabled. It will only be 1 when both enabled and moving.

- **107: "Warning: Positive Limit Switch Triggered", when software limit switches weren't configured. (3860,S-09349)**
  Issue:
  107: "Warning: Positive Limit Switch Triggered", when software limit switches weren't configured.

  Solution:
  This problem has been resolved.

- **A negative value of PL.Mod2 should not be allowed (3821,S-09316)**
  Issue:
  A negative value of PL.MODP2 in the BASIC firmware causes the Modulo positioning to malfunction.

  Solution:
  The minimum value of PL.MODP2 in the BASIC firmware is now 0 (zero).

- **Do not allow BASIC motion (including EGearing, Camming, and CamVM) in non-BASIC mode. (3841,S-09364)**
  Issue:
  Can initiate BASIC Trajectory Generator, EGearing, Camming, and CamVM motion in non-BASIC mode.

  Solution:
  Set DRV.CMDSOURCE to Program (5) to use BASIC Trajectory Generator (including EGearing, Camming, and CamVM).

Feedback Issues

Fixed Bugs

- **Tamagawa Feedback: Battery fault Issues (S-09272)**
  Issue:
  If you disconnect the battery to the Tamagawa feedback device you correctly get a feedback battery fault. If you then clear the battery fault without connecting the battery the battery fault is cleared, it should continue to be reported.

  Solution:
  The clear faults will now not clear the feedback battery fault if the barrery is not connected. The fault number for the Feedback battery fault has change to 451 to be consistent with the FAULT451.ACTION that you use to ignore this fault. Changing the FAULT451.ACTION would not imediatly ignore or enable the feedback battery fault, now the firmware imediatly applies the setting change.

Version: 01-06-04-000 Release Date: May 11, 2012

IO Issues

Fixed Bugs

- **AIN2.VALUE not returning correct values when recorded (3836)**
  Issue:
  AIN2.VALUE shows up correctly on the Analog Input screen, and when accessed by AIN2.VALUE, but when recorded, AIN2.VALUE returns wrong value

  Solution:
  AIN2.VALUE was pointing at the value of AIN.VALUE, it has been corrected

- **DIN21-32, DOUT21-30 when recorded always return 0 (3823)**
  Issue:
  When recording DIN21-32.VALUE or DOUT20-30.VALUE the recorder always returns 0, even though the values can be accessed via the terminal, or the Digital IO screen.

  Solution:
  An interface bug was found causing these values not to record correctly, it has been corrected. DIN21-32.VALUE and DOUT21-30.VALUE can now be recorded.

General Issues

New Features

- **IL.VCMD, IL.VUFB, IL.VVFB are now recordable in the Scope (S-09072)**
  New Feature Details:
  It is difficult to diagnose all problems. To aid in difficult problems three voltages have been added to the available traces for the Scope.

  Solution:
  IL.VCMD is the torque producing voltage output by the current loop.
  IL.VUFB is the voltage on the U winding of the motor
  IL.VVFB is the voltage on the V winding of the motor

- **Support for reading and writing parameter data and BASIC programs to an SD card. (S-09107)**
  New Feature Details:
  The new drive variant with an I/O Option Card supports an SD Card for storing parameter data and BASIC project files.

  Solution:
  New commands SD.SAVE and SD.LOAD have been added to AKD. On drives equipped with an option card, these commands will copy parameter and project data to and from an SD Card.

Feedback Issues

Fixed Bugs

- **Motor parameters are not properly stored with FB1.MOTIDSAVE and Hiperface feedback (S-09236)**
  Issue:
  The parameters MOTOR.CTFO, MOTOR.PHASE, MOTOR.TBRAKERLS, MOTOR.BRAKE, ,MOTOR.TBRAKEAPP, MOTOR.VOLTMAX, MOTOR.VMAX are always set to zero for an Hiperface encoder when executing FB1.MOTIDSAVE

  Solution:
  These set of parameters can now be stored properly in the feedback memory.

Version: 01-06-03-000 Release Date: April 27, 2012

Field Bus Specific Issues

New Features

- **PROFINET IO: More manufacture specific PNUs are now supported. (3816)**
  New Feature Details: (Identified in Version 01-06-02-000)
  DRV.DIR and FB1.OFFSET were not accessable through pure PROFINET IO/PROFIdrive interface.

  Solution:
  DRV.DIR is accessibale via PNU 2117, FB1.OFFSET is accessible via PNU 2145. Further PNUs are now supported (see PROFINET IO manual).

Feature Changes

- **Additional parameters are now availble through the fieldbus service channel (PROFINET IO, SyqnNET, Modbus, EtherNet/IP) ()**
  Issue:
  Some drive parameters were not available through the fieldbus service channel.

  Solution:
  Many additional parameters are now available through the fieldbus service channels.

Fixed Bugs

- **Unwanted movement in motor, when switching the AKD off via control word in CAN-application in interpolated position mode (3843)**
  Issue: (Identified in Version 01-06-02-000)
  Customer used interpolated position mode in CAN (same in EtherCAT). A jump occured, when switching off the drive and again when switching to enable.

  Solution:
  The bug had been, that position values were taken in other states than Operation Enable + setpoint enable bit of interpolated position mode. This is solved.

- **Scaling of DS402-object 60F4 sub 0 wrong (3815)**
  Issue: (Identified in Version 01-06-00-002)
  The value of the PDO-content of object 60F4 sub 0 was 4096 times too high. Only with FBUS.PARAM05 bit 4 = 0 (telnet scaling, OK with DS402-scaling).

  Solution:
  The content is now consistent.

General Issues

Feature Changes

- **Improved timing and bugfixes for W&S mode 0 (S-09018)**
  Issue:
  Faster and more reliable wake and shake mode 0.

  Solution:
  Improved mode 0 timing. Calculated more accurate angles from W&S. Detected and fixed a coding error that caused the last coarse angle to be used instead of the calculated average. Added new command WS.DELAY4 to set the time between the initial shake, which should move the rotor from the cogging point, and the start of actual W&S. When WS.DELAY is 0, there is no delay.

Fixed Bugs

- **AIN.PSCALE has invalid Range (3742)**
  Issue:
  The range of AIN.PSCALE was incorrect. A second bug prevented the user from setting AIN.PSCALE to a negative value

  Solution:
  Range has been updated to only allow valid values, and range checking has been fixed. Note: this bug only applied to Analog Position Mode.

- **Fault history log cannot recover if it is corrupted. (3819)**
  Issue:
  The drive saves a fault log to non-volatile memory. If an entry is corrupted (such as power loss during the write of a log entry) the system could fail to provide correct log data until DRV.CLRFAULTHIST is executed.

  Solution:
  The code for reading and writing fault history entries is now robust, so that the system can gracefully recover from corrupted entries. The particular bad entry will simply be reported in the fault log as a bad log entry.

- **Digital Input Mode 23 broken when input is high on boot (3751)**
  Issue:
  If a digital input is configured to be mode 23, and the digital input is high on boot, the digital input will not be configured correctly.

Solution:
The mode is configured on a state change, because the digital input started high (no state change) the input was not being configured. This bug has been solved, so that the input is correctly configured on boot.

Version: 01-06-02-000 Release Date: April 13, 2012

Field Bus Specific Issues

New Features

- **Wake and Shake support via SynqNet Autonomous Action (S-09111)**
  New Feature Details:
  This issues only affected firmware release 01-06-01-000, earlier versions worked as expected.

  Solution:
  SynqNet now supports the Autonomous Drive Action mode, as well as the parameter command WS.ARM. The MPI software will now work as follows: 1. ensure drive is disabled 2. set WS.ARM (warning will be triggered) 3. set mode to Autonomous Action 4. enable drive to start WS. When WS is completed, the drive will set autonomous action complete bit to 1. The MPI software then disables the drive, which responds by clearing the autonomous action complete bit. The MPI software then changes the operating mode back to torque.

IO Issues

Fixed Bugs

- **In 01-06-01-000 DOUT9.STATEU, DOUT10.STATEU and DOUT11.STATEU Would Not Drive Any Outputs (S-03221)**
  Issue:
  This issues only affected firmware release 01-06-01-000, earlier versions worked as expected.

  Solution:
  The firmware has been changed to fix this issue so that

General Issues

New Features

- **Added command grouping telnet (E-01446)**
  New Feature Details:
  The telnet protocol was inifficient because the client could only send one command to the drive at a time and would have to wait for the response before sending the next command.

  Solution:
  The client can now send multiple commands separated by CR LF in one message. The drive will respond with the responses grouped into one message with each response terminated with the cursor "-->". A drive that suppoorts this new protocol will respond to a read of DRV.FEATURES with a line "003: Message grouping".

Fixed Bugs

- **Analog Velocity Mode cannot operate when UNIT.VSCALE = 0 (3766)**
  Issue:
  When an AKD is configured as a Linear Motor in Velocity Mode, and the units have been set to Counts (UNIT.VSCALE = 0), the range of UNIT.VSCALE was being calculated improperly.

  Solution:
  Calculation has been fixed in this mode.

Feature Changes

- **FPGA Updated to version 0301 (3813)**
  Issue:
  The FPGA has been updated to version 0301

  Solution:
  Additionally, a new 15.5kHz filter has been added to the internal feedforward term of the FPGA interpolator to smooth out noise. This will improve low resolution feedback device performance.

Version: 01-06-01-000 Release Date: March 30, 2012

Field Bus Specific Issues

Fixed Bugs

- **STO sometimes triggers warning not error - 1.06 and trunk (S-08781)**
  Issue:
  A software disable was executed, when the STO was seen by the DS402 state machine. This was faster detected then the STO-fault.

  Solution:
  STO-fault will come in every case.

General Issues

Fixed Bugs

- **Position Loop not executing when inside a software limit switch (3773)**
  Issue:
  If the motor is driven into a software limit switch, a controlled stop is executed and held until motion is commanded away from the

limit switch. A bug was found that caused the position loop to stop executing, which allowed the position error to slowly grow over time.

Solution:
The bug has been fixed, and the drive will correctly hold the axis at the command position the controlled stop ended at.

New Features

- **Added support for the I/O option Board (S-08903)**
  Solution:
  The firmware will now support the new I/O option board.

Version: 01-06-00-002 Release Date: March 29, 2012

General Issues

Fixed Bugs

- **Poor system performance when connected via EtherCAT ()**
  Issue: (Identified in Version 01-05-01-000)
  Under certain circumstances, recent beta versions (1.5.1+) can suffer poor performance when under a heavy load and connected to an EtherCAT master.

  Solution:
  System performance has been dramatically improved with an EtherCAT connection.

Version: 01-06-00-001 Release Date: March 26, 2012

General Issues

Feature Changes

- **Controlled Stop starts from VL.CMD instead of VL.FB (3721)**
  Issue:
  When a Controlled Stop was issued, the trajectory towards zero velocity would originate from the current velocity command. This can cause problems when the trajectory is at a much higher speed than the current actual motor speed.

  Solution:
  Controlled Stop now begins trajectory calculation based on current velocity feedback, not velocity command to ensure a safe trajectory to zero velocity.

- **Change name of FBx.P related parameter commands. (S-88220)**
  Issue:
  Some of the Fbx.P related parameter might cause confusion to the user, so they have to be changed to make them more clear.

  Solution:
  Commands FBx.OFFSET, FBx.UNIT, FBx.DIR are renamed FBx.POFFSET, FBx.PUNIT, FBx.PDIR

Fixed Bugs

- **Controlled stop overflow bug (3711)**
  Issue:
  After running against a mechanical limit and a disabled following error detection, the commanded setpoint velocity will increase inside the drive over a numerical limit. If this happens and a control stop is executed (e.g. through a fault situation), the drive could execute a control stop from a very high velocity in the opposite direction and then try to slow down.

  Solution:
  The numerical overflow is fixed.

- **Unexpected following error fault when in a limit switch (3709)**
  Issue:
  When the drive enters a limit switch, it will execute a controlled stop (deceleration to zero velocity) then come under command of the current operation mode. When the controlled stop completes, a following error may occur.

  Solution:
  Properly calculate position error during the controlled stop (previously it was not being updated during a controlled stop).

- **dynamic brake flickers off and on when enabling in DISMODE 1 or 3 (3727)**
  Issue:
  If the drive is configured to use the dynamic brake when disabled, the dynamic brake might go and and off when enabling the drive, so that DRV.ACTIVE changes between 1 and 3 repeatedly.

  Solution:
  The source of the problem has been identified and fixed.

- **Biss Mode C allows feedback to be set when faults exist (3658)**
  Issue:
  In certain intermittent instances, it is possible to set FB1.SELECT = 34, and the feedback will be identified even when there is nothing connected to the X10 connector.

  Solution:
  The initialization process was happening quicker than the faults coudl be detected, allowing the feedback to pass initialization. A short delay was added to the initialization of Biss Mode C devices to detect faults and fail the init process reliably.

- **When downloading firmware the seven segment display did not show the correct characters. (D-03107)**
  Issue:
  If you download firmware from WorkBench the seven segment display would show Fr during whole of the download process. The seven segment display should be showing a the sequence dd, d5, d7.

Solution:
The firmware will now show the correct sequence of characters.

Field Bus Specific Issues

Fixed Bugs

- **SDO value read or written with object 6081 are wrong by factor 4 (3790)**
  Issue: (Identified in Version 01-05-13-000)
  The SDO value of object 0x6081 sub 0 is wrong, when DS402 - scaling is used (FBUS.PARAM05 bit 4 = 1)

  Solution:
  Now PDO and SDO deliver the same correct value for object 0x6081 sub 0

- **AKD DRIVE STATUS - through SDO (3737)**
  Issue:
  The drive is enabled via Telnet. The DS402-statusword does not show the transition as it in earlier KAS-versions.

  Solution:
  The DS402-statusword goes again to the state SWITCHED ON (0x33), when the drive is enabled via Workbench (if FBUS.PARAM05 bit 2 set to 0).

Version: 01-05-13-000 Release Date: March 02, 2012

General Issues

Fixed Bugs

- **MT.CONTINUE only continues the current task, and not following tasks (3616)**
  Issue:
  When a series of sequential motion tasks is configured, and during one of the motion tasks a DRV.STOP commands is issued, motion stops as expected. If motion is resumed using MT.CONTINUE only the motion task that was interrupted finishes, and not any following motion tasks.

  Solution:
  The logic bug has been identified which caused following tasks to not occur.

- **DOUT1.MODE/DOUT2.MODE 13 range does not allow user to set values (3656)**
  Issue:
  The range for DOUT1.PARAM and DOUT2.PARAM when DOUT1/2.MODE is set to 13 has a range of Minimum 0 to Maximum 0. This range does not allow the user to enter a valid value for the digital output parameter.

  Solution:
  The range was not being correctly set for Digital Output mode 12 or 13, the range is now set appropriately based on the user units for velocity the user has selected.

- **F439 unexpected FollowingError (3707)**
  Issue:
  Under certain circumstances an unexpected following error can occur (fault F439).

  Solution:
  The issue is fixed.

New Features

- **Added new homing mode for rotary motors and new homing command. (S-08737)**
  New Feature Details:
  A homing mode is needed which will turn the motor into one direction until the reference switch is found. When the reference switch is active when the drive starts homing it is not allowed to move the motor into the opposit direction to deactivate the switch, like it is for homing mode 4. Also distance the motor is allowed to turn should be restritable, so that the motor won't spin endless into one direction and reaching the maximum distance should lead to an error.

  Solution:
  Homing mode 14 has been added. This homing mode will always let the motor spin into the direction set with HOME.DIR. Even when the reference switch is active while starting the homing procedure. To restrict the maximum distance a new command has been added HOME.MAXDIST with this command the user can set the distance relative to the starting postion the motor is allowed to move until an the drive will have an error.

Field Bus Specific Issues

Fixed Bugs

- **Clear the fieldbus torque command when switching operational mode (S-08717)**
  Issue:
  When operating EtherNet/IP in torque mode, switching to velocity mode, then back to torque mode, the motor will immediately move according to the previous torque command.

  Solution:
  When entering torque mode, the fieldbus torque command is cleared. The master must send a new torque command after switching the operational mode to initiate motion.

Version: 01-05-12-000 Release Date: February 17, 2012

Field Bus Specific Issues

Fixed Bugs

- **ZSW1 bits shall be set before drive is enabled (S-08607)**
  Issue:
  The ZSW1 bits were set only if the drive was enabled (ProfiDrive state S4).

  Solution:
  The ZSW1 bits are now directly set depending on the opmode.

- **ZSW1 traversing task ACK bit (S-08606)**
  Issue:
  If a motion task was triggered without a homed axis (position mode), the ZSW1 ack bit was set in any case.

  Solution:
  The traversing task acknowledge bit in ZSW1 is not set in case of an error like homing was not done.

- **Cannot Disable/Enable with WB after EtherCAT was running (3660)**
  Issue:
  After disconnecting a running EtherCAT communication, it was not possible to reenable the drive via Workbench.

  Solution:
  If the EtherCAT cyclic communication (writing the control word) is done, the drive will again accept commands over the service channel (WB).

- **Disable over DS402 allows uncontrolled velocity until controlled stop takes effect. (D-03004)**
  Issue:
  A disable over fieldbus will allow a vertical load to drop quickly until the controlled stop eventually starts.

  Solution:
  The code resolves this problem in 2 ways: First, after a disable DS402 will provide interpolated velocity or position requesting 0; Second, AKD now triggers a controlled stop much more quickly after receiving the disable command.

- **PDO transmision stops after some NodeGuard requests (3616)**
  Issue:
  Remote frames like node guarding frames could lead to undefined behaviour in the CANopen communication.

  Solution:
  Remote frames are now properly handled by the AKD with CANopen interface.

New Features

- **Analog Output 0 can be written via Synqnet. (S-08479)**
  New Feature Details:
  The user can now write the value for Analog Output 0. This value will be written cyclic in to register of Analog Input 0.

  Solution:
  Analog Input 0 will now cyclic be set with the value from Analog Output 0 via Synqnet.

Motion Tasking Issues

New Features

- **Fault 139 Action command implemented (S-08637)**
  New Feature Details:
  If a motion task was unable to successfully complete without the trajectory overshooting due to a command change on-the-fly, Fault 139 would be generated, even if this was acceptable behavior.

  Solution:
  FAULT139.ACTION has been implemented to allow the user to ignore this fault. When the fault is ignored, Motion tasking will not throw a fault even in cases where on-the-fly moves cause trajectory overshoots.

  Note: The target position will be correct even in the case of an overshoot when Fault 139 is ignored.

General Issues

Fixed Bugs

- **MOTOR.TBRAKETO=0 should cause the brake to apply immediately (S-08628)**
  Issue:
  The drive was ignoring the timer when TBRAKETO=0, so would not apply brake in until velocity fell below CS.VTHRESH

  Solution:
  The brake will now apply immediately in the case of a disable when MOTOR.TBRAKETO=0

- **Gearing slave moves during time that brake is releasing (no motion is expected during this time) (3649)**
  Issue:
  When a gearing slave is disabled through the Hardware Enable input, and then re-enabled, the motor may move at a constant velocity during the time the brake is releasing.

  Solution:
  When the drive is disabled, gearing motion is now aborted and the velocity feedforward is zeroed.

New Features

- **With a vertical axis (and certain other situations), it should be possible to immediately apply the brake in the event of the drive disabling for any reason. (S-08628)**
  New Feature Details:
  With a vertical axis, the brake must be applied immediately in the event of a fault which causes the power stage to disable. Any other disabling event should also ensure that the brake is applied immediately.

  Solution:

With the new keyword MOTOR.BRAKEIMM (Brake Immediately) set to 1, the brake will be applied immediately in the event of the drive disabling for any reason.

- **Drive discovery protocol extended to return extra data (S-08585)**
  New Feature Details:
  Currently the Ethernet protocol WorkBench uses to discover drives in the Ethernet network only provides drive name, a free/busy status, the MAC address and IP address of the drive.

  Solution:
  The discory protocol now includes extra information including the model number, serial number and hardware revision of the drive in addition to the executing firmware and FPGA version numbers. Older versions of WorkBench will still work with new firmware, WorkBench will just not show the extra information. Newer versions of WorkBench will work with any version of firmware, if the drive supports this extended protocol the extra information is available.

Feature Changes

- **MOTOR.TBRAKETO should apply the brake if controlled stop is unable to stop motion (S-08628)**
  Issue:
  When a controlled stop was in progress, the brake timer MOTOR.TBRAKETO was previously not started until motion had stopped.

  Solution:
  The brake timer MOTOR.TBRAKETO will now be started at the beginning of a controlled stop, rather than waiting until motion has stopped. If this timer expires before the controlled stop has completed, the brake will apply and then the drive will be disabled.

IO Issues

Fixed Bugs

- **Range on AIN.PSCALE is invalid (3653)**
  Issue: (Identified in Version 01-05-07-000)
  AIN.PSCALE had its range increased in firmware version 01-05-07-000, however it was not marked as a signed value which caused an overflow.

  Solution:
  The paramter has been marked as a signed value and now works as expected

Feedback Issues

New Features

- **New commands for FB2 and FB3! (S-08672)**
  New Feature Details:
  The user wants to read the value of the feedback seperatly and set the unit of the value. Also the diretion and the offset of feedback 3 should be changeable.

  Solution:
  Feedback 1 - 3 should be readable seperatly and independend, addition keywords are needed FB1.P, FB2.P, FB3.P in 64Bit count (32Bit Multiturn, 32Bit Singleturn) or user specific. To set the unit for each feedback use the new commands FB1.UNIT, FB2.UNIT, FB3.UNIT. Following unit are avaible 0 for 64Bit counts and 3 for user specific. The User specific unit can be set with FBx.PIN and FBx.POUT. Additional new command are FB3.DIR which will change the counting direction of feedback 3 and FB3.OFFSET which wil set set the offset of feedback 3 (does not affect the position loop offset when feedback 3 used as position loop feedback)

Version: 01-05-10-000 Release Date: January 27, 2012

Feedback Issues

New Features

- **Added new commands FB1.P, DRV.HANDWHEELSRC and a new warning n604: EMUEMODE incompatible with HANDWHEELSRC. (S-08499)**
  New Feature Details:
  The customer wants use the feeback 3 as handwheel and will compare the value of feeback 1 with feedback 3 for safety applications.

  Solution:
  Add command to read raw value of feedback 1 and allow the user to select the handwheel source.

- **Added new parameter to configure sine/cosine auto calibration. (S-08572)**
  New Feature Details:
  Customers cannot configure auto calibration for sine/cosine encoders

  Solution:
  FB1.CALTHRESH is used to set the velocity threshold for auto calibration. The unit depends on the UNIT.* settings. The auto calibration is activated by setting FB1.TRACKINGCAL to 1.

General Issues

Fixed Bugs

- **HOME.AUTOMOVE conditional modifications (3572,S-08545)**
  Issue:
  If automatic homing procedure is activated it should work until the drive is homed successfully.

  Solution:
  Following modification incorporated: 1. If an auto-home failed due to STO or Fault or HW disable, it is possible to re-start auto-home after clearing. 2. If an auto-home done, then another auto-home will not be allowed until a power cycle.

- **Electronic Gearing Accel/Decel defaults are too low (3635)**

Issue: (Identified in Version 01-05-01-000)
Electronic Gearing Accel/Decel clamping was fixed in 01-05-01-000. Afterwards it was found that the default values for GEAR.ACCMAX and GEAR.DECMAX often caused oscillations in the movement profile.

Solution:
These limits were meant to be safety limits, and not trajectory shaping parameters such as DRV.ACC and DRV.DEC. The solution to this was to raise GEAR.ACCMAX and GEAR.DECMAX to their maximum values, and users can attenuate these values based on machine/application requirements.

Field Bus Specific Issues

Feature Changes

- **Improvements to EtherNet/IP messages ()**
  Issue:
  Several issues were identified with IO command and response messages that could be improved.

  Solution:
  1. It is now possible to send 0 values for acceleration and deceleration in Jog and Move commands. In this case the existing values will be used.
  2. The direction bit now reports the command direction of motion, not the actual velocity direction. The bit is now stable when moving in one direction at low speed.

Version: 01-05-08-000 Release Date: January 20, 2012

General Issues

Fixed Bugs

- **Bug in Wake and Shake Validation Routine (S-08531)**
  Issue:
  A bug was found in the Wake and Shake validation routine when DRV.DIR was set to 1.

  Solution:
  Wake and Shake now takes into account the DRV.DIR setting.

- **BiSS Mode C Failed to initalise feedback device (S-08520)**
  Issue:
  Since firmware version 01-05-05-000 selecting BiSS mode C (FB1.SELECT = 34) would fail to identify the feedback device.

  Solution:
  The firmware has been corrected so that selecting BiSS mode C (FB1.SELECT = 34) will now correctly identify and initalise BiSS mode C feedbacks.

New Features

- **Ascii parameter from type integer can be written in hexadecimal format. (S-08531)**
  New Feature Details:
  The user might want to write ascii parameters from type integer directly in hexadecimal format (comparable to the user manual) instead of the convert it to decimal (Bitcombination are easier to modify).

  Solution:
  Hexadecimal format is supported e.g. MT.CNTL 0x2003.

- **Added Support for Tamagawa feedbacks (S-08482)**
  New Feature Details:
  Tamagawa feedback devices are now supported as a primary feedback device. Tamagawa feedback is not supported on all drive models.

  Solution:
  Setting FB1.SELECT to 42 manually selects Tamagawa feedback as the primary feedback.

  A new NV parameter F451.ACTION has been added to to select if the feedback battery fault (F451) should be ignored.
  0 = Disable amplifier.
  1 = Ignores the fault.

  The following new faults can be reported when using Tamagawa feedback devices.
  F453 Tamagawa communication fault (timeout)
  F454 Tamagawa communication fault (transfer incomplete)
  F456 Tamagawa communication fault (CRC)
  F457 Tamagawa communication fault (start timeout)
  F458 Tamagawa communication fault (UART Overrun)
  F459 Tamagawa communication fault (UART Framing)
  F460 Tamagawa encoder fault (over speed)
  F461 Tamagawa encoder fault (counting Error)
  F462 Tamagawa encoder fault (counting overflow)
  F463 Feedback overheat fault
  F464 Tamagawa encoder fault (multi-turn error)
  F465 Tamagawa encoder fault (battery error)
  F467 Feedback Battery Fault

- **Add a programmable delay on the HW Enable input so the drive can apply the brake before the disable. (R-01936)**
  New Feature Details:
  With a vertical load (bias in one direction), some movement could occur when the drive was disabled with a hardware input because the power stage was disabled immediately, before the brake could apply.

  Solution:
  A user parameter DRV.HWENDELAY has been added which will delay the disabling of the power stage. During this delay time, the drive will apply the brake immediatly and simultaneously attempt to follow normal disable procedures (according to DRV.DISMODE

and CS.* settings).

Version: 01-05-07-000 Release Date: January 06, 2012

General Issues

Fixed Bugs

- **Brake may not be applied under certain fault conditions ()**
  Issue:
  With a fault disable, the brake logic previously would never apply the brake until velocity fell below CS.VTHRESH. However, on a vertical axis, it is not guaranteed that motor velocity will fall below CS.VTHRESH when an axis disables, since it may accelerate downward. This may result in the axis falling to the floor in the case of a fault.

  Solution:
  MOTOR.TBRAKETO was previously added to solve a similar problem for a hardware disable - the brake will apply after TBRAKETO milliseconds, regardless of velocity. This logic has been extended to ALL disable conditions. In all cases, the brake will now apply no more than TBRAKETO milliseconds after the disable. On a vertical axis, this parameter should be set to a small value according to system mechanics.

- **Motion task relative to previous target position does not work properly after homing (3563,S-08418)**
  Issue:
  Motion task relative to previous target position does not work properly after homing only for the first activation. The final position will not be as expected when HOME.DIST is used.

  Solution:
  Position scale will be refreshed when HOME.P hold any value. The motion task after homing in this situation will now end at the desired position.

- **IL.KP Gain Scheduling rounding down when not necessary (S-08496)**
  Issue:
  An integer math error was uncovered, in some instances when a value was entered for the gain scheduling term, it would be rounded down further than necessary.

  Solution:
  Integer math rounding fixed.

IO Issues

Fixed Bugs

- **Analog Output scaling units are incorrect (3513)**
  Issue: (Identified in Version 01-05-00-000)
  The units for analog output scaling were inadvertently inverted.

  Solution:
  The unit label has been corrected.

Version: 01-05-06-000 Release Date: December 23, 2011

Field Bus Specific Issues

Fixed Bugs

- **Acceleration Feedforward causes audible noise when used over Fieldbus (2485)**
  Issue: (Identified in Version 01-00-00-000)
  When using acceleration feed forward (IL.KACCFF) and a field bus where the sample rate is less than 4khz, audible noise is heard during acceleration and deceleration.

  Solution:
  The algorithm which derives the acceleration has been modified to take into account the field bus sample rate. This ensures the correct acceleration is calculated regardless of sample rate and that the acceleration feedforward is applied for the correct duration.

General Issues

Fixed Bugs

- **When a fault occurs, the drive should continue servoing until the brake has been engaged ()**
  Issue: (Identified in Version 01-03-04-000)
  For overhanging loads, it is very important for the drive to continue servoing until the brake has fully engaged, for any disable situation. Since version 01-03-04-000, some fault conditions would cause the drive to disable at the same time that the brake begins engaging. This created a short period of time during which the load would not be under control.

  Solution:
  The problem has been identified and fixed. The drive will now wait for the brake to fully engage before disabling.

- **Motion task and DIN.MODE 14 do not work properly after homing starts but fails (3563,S-08418)**
  Issue:
  Motion task and DIN.MODE 14 do not work properly after homing starts but fails.

  Solution:
  DOUT monitor based on DRV.MOTIONSTAT is modified. The four bits of DRV.MOTIONSTAT to be checked, before enabling DOUT. > BIT 1 - Home position found /reference point set - High > BIT2 - Home routine finished - High > BIT3 - Homing active - low > BIT4 - Homing error condition has occurred - low

- **Error loading parameter file - FB1.ENCRES ()**
  Issue:
  If the drive is currently set to a feedback type which does not allow setting of FB1.ENCRES, and a parameter file is loaded which contains FB1.ENCRES, an error will be reported.

Solution:
FB1.SELECT is now listed in the parameter file before FB1.ENCRES. This ensures that the value will always be accepted properly.

New Features

- **Report Motor autoset parameters in drive parameter files (3433)**
  New Feature Details:
  For diagnosing system problems, it would be very helpful for motor auto-set parameters (which are read-only for certain motor types) to be reported in parameter files.

  Solution:
  A new section has been added to the bottom of the parameter file, which is created by the Workbench Save Parameters to File button. This section is for information purposes only, and will not be loaded into the drive when the parameter file is loaded.

Version: 01-05-05-000 Release Date: December 09, 2011

General Issues

New Features

- **SM.MODE 2 constant torque/velocity with SM.I2/SM.V2. (S-08247)**
  New Feature Details:

  Solution:
  With SM.MODE 2, the SM.I2/SM.V2 and SM.T2 parameters are used for the service motion. This is the only difference to SM.MODE 0.

- **Allow ignoring of Fault 702 Bus Communication Lost (S-08276)**
  New Feature Details:
  It some situations, it may be desirable to ignore certain faults.

  Solution:
  A new keyword FAULT702.ACTION has been added. With the default value of 0, normal fault handling occurs. Set the value to 1 (Ignore) to ignore this fault. The fault will not be reported and drive will remain enabled.

Fixed Bugs

- **FB1 faults can be cleared without initialized feedback (3550)**
  Issue: (Identified in Version 01-05-03-002)
  A bug since 01-05-03-002 could allow a user to clear faults without correctly configuring feedback, and subsequently allowing the amplifier to enable.

  Solution:
  The fault mechanism has been repaired and functions as expected.

Field Bus Specific Issues

New Features

- **Jog 1 and Jog 2 for PROFINET IO added. (S-08247)**
  New Feature Details:

  Solution:
  The user can now configure the jog velocity 1 with PNU 1004, jog velocity 2 with PNU 1005 and the acceleration and deceleration for the jog move with PNU 1006 and PNU 1007. The jog move is started with Bit 8 and 9 in STW1.

Fixed Bugs

- **DS402: Drive enabled after stopping application (3254)**
  Issue:
  When a specific KAS application stopped running, the drive enabled after a short time and stayed enable afterwards.

  Solution:
  The application didn't look for the DS402 status word before switching states. There should be looked always after feedback from the status word, when the control word changes states! Firmware behaviour changed because of safety relevance.

Version: 01-05-04-000 Release Date: November 25, 2011

General Issues

Fixed Bugs

- **Failure to Read Motor Parameters from Hiperface Feedback Memory (3229)**
  Issue:
  When the drive is power cycled sometimes the motor parameters were not read from the feedback device. This would result in a 534 Fault "Failed to Read Motor Parameters From Feedback Device"

  Solution:
  Firmware modifications have made the reading of motor parameters from Hiperface Feedback more reliable.

- **Analog Position Mode creates limit cycles (3455)**
  Issue:
  Under certain circumstances where DRV.ACC was set to a low value (1000 RPM/s or less), the motor would overshoot the target position, then undershoot the target position in a sinusoidal manner.

Solution:
A bug was identified in the acceleration clamping mechanism. Correct clamping of acceleration and not deceleration has been fixed.

- **FAN Bit is overwritten earlier set through FPGA (3415)**
  Issue:
  The fan speed cotntrol bit in the FPGA does not always get set or cleared when ising the test mode.

  Solution:
  The firmware has been modified to consistently write to the fan control bit in the FPGA.

- **Secondary Feedback faults occur on boot (3419)**
  Issue:
  A condition was identified where the FPGA would latch faults before setting up the secondary feedback and was using the wrong fault mask, so it would allow faults when they should not be allowed.

  Solution:
  The logic has been corrected and FB2 faults are only returned when they should be.

Feedback Issues

Fixed Bugs

- **SFD Fault (402/421) occurs on DRV.RSTVAR command (S-08093)**
  Issue:
  A condition was identified where the FPGA would latch a fault before configuring feedback devices. This led to false faults being returned for correctly identified smart feedback devices.

  Solution:
  Start up logic has been modified to clear feedback faults before feedbacks have been configured.

Field Bus Specific Issues

New Features

- **Fault 702: Fieldbus communication lost added. (S-08032)**
  New Feature Details:
  If the PROFINET IO connection times out, the drive generates no fault.

  Solution:
  Fault 702: Fieldbus communication lost added.

IO Issues

Feature Changes

- **DIOx.INV range limited to 0 only. (S-08253)**
  Solution:
  DIOx.INV range is limited to 0 until mode one and two are implemented. The actual mode one will be mode two as it behaves diffrent from the inverting function from the other in/outputs as it is a hardware impletation in the fpga. The new mode one will behave the same way the other inverting functions do.

Version: 01-05-03-003 Release Date: November 07, 2011

General Issues

New Features

- **W&S validation step added to Wake and Shake algorithm (3412)**
  New Feature Details:
  There are known failure modes for the current implementations of Wake and Shake. These failure modes can allow Wake and Shake to finish with an incorrect motor phase angle. Enabling a motor with an invalid motor phase can result in a runaway.

  Solution:
  An extra step has been added to both Wake and Shake mode 0 and 1 which validates that Wake and Shake returned a valid motor phase.

Feature Changes

- **SFD Resolver signal level faults changed from generic "402 Analog signal fault" to "421 SFD resolver signal fault" (S-08041)**
  Issue:
  Generic signal level faults with sin/cos and quadrature encoders could generate a 402 Analog signal fault. SFD feedback devices could also trigger this fault, however internally this means something different. This can lead to difficult debugging.

  Solution:
  When a SFD feedback device has a resolver signal fault, a new fault 421 SFD resolver signal fault is thrown instead of the old 402 Analog signal fault.

Field Bus Specific Issues

Fixed Bugs

- **Using PROFINET IO in position mode, the traversing task acknowledge bit in the status word (ZSW1) was not cleared properly. (S-08012)**
  Issue:
  If the user implements a handshake algorithm and loads a new motion task AFTER the current motion task has finished, the traversing task acknowledge bit is not cleared after the actviate traversing task bit in the control word (STW1) is cleared.

Solution:
The acknowledge bit is cleared also when the motion task has finished.

- **Using PROFINET IO and run homing, the homing was not aborted properly. (S-08080)**
  Issue:
  When a homing is started and the "Do Not Reject Traversing Task" bit in control word (bit 4 in STW1) is cleared, the home procedure cannot be aborted by clearing the homing bit (STW1).

  Solution:
  The homing bit 11 can be used for stopping the home procedure although the "Do Not Reject Traversing Task" is cleared.

Version: 01-05-02-000 Release Date: October 28, 2011

General Issues

Fixed Bugs

- **PL.ERRMODE 1 is broken (3383)**
  Issue:
  When PL.ERRMODE is set to 1, unless the Position Error Tolerance (PL.ERRFTHRESH) is extremely low, a position following error fault cannot be generated.

  Solution:
  When PL.ERRMODE is 0 and 1, the displayed Error is always the same (PL.ERR). When PL.ERRMODE is 1, the value that triggers a position following error fault is not PL.ERR but an internal calculation of position error based on the trajectory. PL.ERRMODE 1 also requires that the calculated error must be greater than the fault threshold for 100ms.

  Error Calculation with PL.ERRMODE = 1
  [ERROR] = | PL.ERR - velocityDelta * (1 - VL.KVFF) / PL.KP |
  where velocityDelta = standard control loop trajectory - velocity feed forward output.

  Note: When PL.ERRMODE = 1, and VL.KVFF = 1, the error is calculated the same as PL.ERRMODE 0. However, the 100ms requirement is still true.

- **When the drive is first configured for IP.MODE=1 (Static IP setting), a DHCP server can subsequently reset the address. (3411)**
  Issue:
  When the drive is configured for static IP addressing, a DHCP server can change the address.

  Solution:
  IP addressing now shuts down the DHCP client when configured for Static IP mode

Version: 01-05-01-000 Release Date: October 14, 2011

General Issues

Feature Changes

- **FB1.ENCRES may be set with an uninitialized feedback device ()**
  Issue:
  FB1.ENCRES is dependent on the feedback type, as it is not used for some types. Sometimes it may be desirable to set ENCRES before selecting the feedback type.

  Solution:
  FB1.ENCRES may now be set if no feedback type has been identified (FB1.IDENTIFIED = 0). In addition, DRV.HELP will report properly whether FB1.ENCRES is read-only or read/write.

New Features

- **Added Warning for OPMODE incompatible with CMDSOURCE (S-07857)**
  New Feature Details:
  It is possible to configure the drive with DRV.CMDSOURCE set to electronic gearing and DRV.OPMODE set to torque or velocity modes. In this state the drive will not perform any motion, a zero command is pased to control loops, because gearing will only work in position mode. This may be confusing if your drive was in this statre by mistake.

  Solution:
  A new warning, 603: OPMODE incompatible with CMDSOURCE, has been added and is generated when the drive is enabled and the gearing command source is selected at the same time as torque or velocity op-mode.

Known Issues

- **Current Loop Gain Scheduling modified -- tables stored in older versions of FW will be lost when upgrading. (1)**
  Issue:
  The tables for storing current gain scheduling have been modified, and are not compatible with older versions of firmware. If you use this feature, save parameters to a file and then restore them to the drive after upgrading to this version.

Feedback Issues

New Features

- **New Keyword: FB2.DIR allows user to change direction of secondary feedback input. (S-07794)**
  New Feature Details:
  FB2 has always always incremented positive for positive inputs on either X9 or X7

  Solution:
  The user can now configure FB2 to move positive by leaving FB2.DIR = 0 (default), and configure FB2 to count negative by setting

FB2.DIR = 1.

Fixed Bugs

- **Re-arm the commutation phase-find procedure in case that the previous procedure failed. (S-07486)**
  Issue:
  The user connects a motor + feedback combination to the AKD, which required a commutation phase-find procedure after the software enable (such as Wake & Shake). This phase-find procedure was not re-armed automatically in case that the previous process failed. The user expects that the W&S function will be re-started after the next software enable in case that the previous W&S function failed.

  Solution:
  The DRV.CLRFAULTS command identifies a pending W&S error and re-arms the phase-find process again.

Field Bus Specific Issues

New Features

- **Add a Torque attribute to the EtherNet/IP Position Controller Object (attribute 0x19) (R-01589)**
  New Feature Details:
  It is desirable to access actual torque through Polled I/O by using the Get Attribute field. But Torque is not a supported attribute.

  Solution:
  Torque may now be read with attribute 0x19 of the Position Controller Object.

- **DS402: Standard objects for touch probe functionality (60b8 etc.) shall be implemented (1676,S-07661)**
  New Feature Details:
  Besides the latch implementation (nearly compatibel with Servostar) the DS402 touch probe functionality is needed.

  Solution:
  The DS402 standard objects are implemented

Fixed Bugs

- **DS402: Creation of a SFD fault creates besides the correct fault emergency codes a generic warning emergency code (3417)**
  Issue:
  The Emergency Error Code for F438 was built wrongly, the warning n414 lead to the generic warning.

  Solution:
  F438 leads now to the error code 0x86B0, n414 to the error code 0x7390.

Version: 01-04-19-000 Release Date: September 30, 2011

General Issues

Fixed Bugs

- **Electronic Gearing States not cleared after Command Source change. (3185)**
  Issue: (Identified in Version 01-04-00-000)
  When Electronic Gearing was enabled, and the Command Source was subsequently changed out of Electronic Gearing mode, the Electronic Gearing Active state and Electronic Gearing Slave Synchronized state were not cleared. This prevented other types of motion in other command source modes.

  Solution:
  The Electronic Gearing states are now cleared when changing out of electronic gearing mode

- **EnDat Feedback Does Not Read Sine/Cosine Information During Initialization (2994)**
  Issue:
  EnDat Feedback devices were not reading the sine/cosine information during initialization, so the initialization accuracy was on the order of arc minutes, not arc seconds.

  Solution:
  A new FPGA has been impelemented, and firmware has been modified so that the sine/cosine information is now read during EnDat feedback device initialization. So now initialization accuracy is on the order of arc seconds.

- **Homing direction has the wrong default value. (2872)**
  Issue:
  HOME.DIR should default to the positive direction (1)

  Solution:
  The default value of HOME.DIR is now positive.

- **DRV.ACC and DRV.DEC does not update trajectory with large numbers (3349)**
  Issue:
  A bug was found in the trajectory generator where large values of DRV.ACC and DRV.DEC would be rejected from the trajectory generator without alerting the user.

  Solution:
  The trajectory generator now will return an error to the user, and accepts a larger range of values

- **With Digital Input mode 22, cannot set DINx.PARAM to command source Gearing or Analog (3356)**
  Issue:
  Since 01-04-16-000, Digital Input mode 22 has a bug, where you cannot set the command-source portion of DINx.PARAM to 2 or 3.

  Solution:
  All valid values of DINx.PARAM are now accepted when the input mode is 22.

- **Recorder trigger does not work when capturing on CAP0.PLFB and CAP1.PLFB (3353)**

Issue:
When the recorder was set to CAP0.PLFB or CAP1.PLFB the capture will work and capture new positions, but will not trigger the recorder.

Solution:
A bug was found in the triggering code that was preventing this from working reliably.

- **Downloading Parameter Files To Configure a Drive For Electronic Grearing Generates An Error Message (3350)**
  Issue:
  If you have a parameter file which sets up the drive for electronic gearing you can not download it without generating an error setting DRV.CMDSOURCE. This is becuse setting DRV.CMDSOURCE to gearing when DRV.OPMODE is in its default torque mode generated an error message.

  Solution:
  The firmware has been modified to remove the error generated when setting DRV.CMDSOURCE before DRV.OPMODE.

- **F307 Brake Applied During Enable-State (3047)**
  Issue:
  When using a motor with brake, you may sometimes see F307 if you command a drive enable while the drive is in the process of braking, or command a disable while the drive is enabling.

  Solution:
  This condition should no longer cause a fault.

- **Recorder does not trigger on DRV.ACTIVE rising edge (0 to 1) (3358)**
  Issue:
  Trying to trigger the Recorder by setting the trigger parameter to DRV.ACTIVE never triggers the scope

  Solution:
  The internal scaling of the trigger parameter was incorrect, this created a condition that could never be true. The internal scaling has been corrected, and triggering on DRV.ACTIVE works as expected.

- **FB2 Faults not always occuring (S-07804)**
  Issue:
  When FB2 faults were added to work when FB2.MODE was configured, FB2 faults were inadvertently broken for DRV.EMUEMODE configurations

  Solution:
  This has been fixed so either keywords DRV.EMUEMODE and FB2.MODE can generate FB2 faults when they are configured as inputs on X9. An additional bug was fixed for FB2.MODE configurations that prevented a 5V overcurrent fault.

- **Incorrect Motor.Ke unit label (3338)**
  Issue:
  When a Rotary motor is configured, the units for MOTOR.KE are Vpeak / k-rpm. The correct units for rotary motors is Vrms / k-rpm

  Solution:
  This has been fixed. Note: for Linear Motors, the units are still Vpeak / m/s.

- **It takes more than 50msec for the drive to begin decelearation after a quickstop trigger. (3015,S-07819)**
  Issue:
  The DualMoveTest_Type10_QuickStop_xxx tests check for the time it takes from when the DIN configured for QuickStop is triggered and when the deceleration begins. Its observed to take as long as 67.5msec in some instances. This is seen on both the Release candidate(M_01-04-00-002) and the trunk(M_01-03-20-000)

  Solution:
  Quickstop inputs were sampled in a background task. As a fix, inputs in quick stop mode are now sampled in the 1kHz task.

- **Velocity blend move with same velocity donot work (3360,S-07798)**
  Issue:
  Identical or very close velocities cause problem when configured as blend in to velocity. Next motion task donot take over.

  Solution:
  The condition for triggering next notion task is modified, which now can handle both positive and negative velocity conditions.

New Features

- **Adding new command DRV.DIFVAR to see parameters changed (S-07569)**
  New Feature Details:
  Add DRV.DIFVAR (servostar name) to see parameters changed

  Solution:
  DRV.DIFVAR command is added.

- **Clear multiplier when DINx.MODE changes from mode 23 to another mode (3296)**
  New Feature Details:
  If you change the DINx.MODE from mode 23 to another mode the analogue input will remain inverted or zeroed.

  Solution:
  The firmware has been changed to restore the analogue input to the state without inversion or zero when changing away from DINx.MODE 23.

Field Bus Specific Issues

Fixed Bugs

- **Correction of the latch-functionality via DS402-objects 20a4/20a5 (S-07661)**
  Issue:
  The use of capture engine 1 via the DS402-objects 20a4/20a5 + 20a2/20a3 was depending on the parameter CAP0.MODE.

  Solution:

The capture engine 1 functionality is now dependant on CAP1.MODE.

New Features

- **The DS402-objects allow only a torque resolution of 0.1% of the rated torque. (R-01785)**
  New Feature Details:
  The DS402-objects 6071/6077 allow only a torque resolution of 0.1% of the rated torque.

  Solution:
  The new objects 2071 / 2077 are 32-bit values and are given in mAmps.

Feature Changes

- **CANOpen: DRV.NVCHECK re-assigned to SDO3895 ()**
  Issue:
  DRV.NVCHECK was assigned to SDO2019. This was inconsistent with the general SDO groups.

  Solution:
  DRV.NVCHECK is now assigned to SDO3895. SDO2019 got deleted!

Homing Issues

Fixed Bugs

- **HOME.MODE=4 did not work in case that homing velocity is very low. (2872,S-07604)**
  Issue:
  The user selects a small homing velocity <= 2[rpm]. In HOME.MODE=4 when hitting the reference switch the motor turns the direction instead of stopping the motion and indicating that the home position has been found.

  Solution:
  A wrong program sequence has been corrected. The homing mode 4 works from now on also with a very small homing speed.

Version: 01-04-18-000 Release Date: September 16, 2011

General Issues

Fixed Bugs

- **A fault should be issued if the emergency timer times out while executing a controlled stop (3169)**
  Issue:
  DRV.DISTO (emergency timeout) should be applied to controlled stop. The drive will disable after the timer expires, but does not reliably issue F703.

  Solution:
  F703 is now issued if the disable time expires while executing a controlled stop.

- **Drive should enable when Controlled Stop input is set. (3048)**
  Issue:
  If controlled stop input is cleared (to active a stop) and then set (to enable), the drive does not enable but a software enable command must be sent to enable.

  Solution:
  Setting the controlled stop input will now enable the drive, as long as all other disable inputs are cleared.

- **Can't change digital input mode 13 when controlled stop input is cleared (3170)**
  Issue:
  If controlled stop input is cleared (to active a stop), the digital input mode cannot be changed. This is to ensure that changing the input mode does not cause the drive to unexpectedly enable.

  Solution:
  When leaving digital input mode 13 (controlled stop), if the input is cleared, the mode will be changed as requested, and the software enable will be cleared to keep the drive disabled.

- **Fault not issues for undervoltage when enabled (S-07691)**
  Issue:
  When VBUS.UVMODE=1 and bus power is below the threshold, the drive should fault when it is enabled. A bug was introduced in 01-04-10-000 which prevents the drive from faulting in this condition.

  Solution:
  The drive now faults in this condition.

- **Motor Overtemperature fault not seen when sensor was disconnected. (S-07690)**
  Issue:
  A bug was introduced in 01-04-10-000 that rejected certain raw values (including the value for a disconnected sensor) returned by the sensor ADC.

  Solution:
  The drive now faults in this condition.

Feature Changes

- **Changing REC.TRIGPARAM Sometimes generates an "Error: Argument bigger than maximum." (3320)**
  Issue:
  Some time if you change the trigger parameter using REC.TRIGPARAM it will generate an error.

  Solution:
  The firmware has changed to not generate this error.

New Features

- **New Emulated Encoder modes for Step/Direction and CW/CCW, pulse width of emulated encoder signals is configurable, fault 486 is raised, if the drives velocity exceeds the emulators capability. ()**

  New Feature Details:
  Step/Direction and CW/CCW modes, adjustable pulse width of emulated output, raise fault, if the velocity exceeds the pulse width. This fault is disabled (masked) by default.

  Solution:
  Added DRV.EMUEPULSEWIDTH to configure the pulse width. Added DRV.EMUECHECKSPEED to enable / disable fault 486 (velocity exceeds emulator's capability (pulse width too high). Added new modes to DRV.EMUEMODE: - 6 Step/Direction, Z-pulse / rev. - 7 Step/Direction, Z-pulse absolute - 8 CW/CCW, Z-pulse / rev. - 9 CW/CCW, Z-pulse absolute Added new fault 486 - Velocity exceeds maximum speed of emulated encoder.

Version: 01-04-17-000 Release Date: September 12, 2011

General Issues

New Features

- **Tertiary feedback (FB3) support has been added for EnDat 2.2 (S-07498)**

  New Feature Details:
  Users need to connect a digital feedback device to the X9 connector for use as a dual feedback device. Currently this connector only supports A Quad B encoder signals, or step and direction, or step up/step-down signals

  Solution:
  Tertiary feedback (FB3) support has been added for EnDat 2.2 feedback devices. Two new keywords have been created, FB3.P and FB3.MODE. A new fault, Fault 420 – "FB3EnDat communication fault" has been added. In addition keywords DRV.EMUEMODE, and PL.FBSOURCE have been modified.

  The FB3 EnDat 2.2 Feedback device is connected to the X9 connector on the drive. To configure X9 for FB3 input, the X9 mode is set to 11 (DRV.EMUEMODE = 11). The FB3 feedback type (currently EnDat 2.2 only) is selected with FB3.MODE (0 = EnDat 2.2). The position value is reported by FB3.P as raw encoder counts.

  FB3 can be selected as the position loop feedback by setting PL.FBSOURCE to 2. Then the keyword PL.FB reports the FB3 position. With this configuration the FB3 position can used to provide dual loop control via the drive. Or the FB3 value can be retrieved via the PL.CMD position by a control computer connected by a fieldbus to the drive. This position can be used by the control computer for diagnostic purposes, or it can be used to control the axis's position loop with the control computer. .

  When FB3 feedback has been selected (DRV.EMUEMODE = 11), if the feedback device is not connected, or is not operating properly, fault 420 (FB3 EnDat communication fault) will be generated. A clear fault command can clear this fault once the device is connected and operating properly.

Fixed Bugs

- **Electronic Gearing Deceleration clamp not working (S-07518)**

  Issue:
  Acceleration is properly clamped, however when the command position reaches the gearing master, rather than overshoot and slowly decelerate, the trajectory decelerates uncontrolled to ensure no overshoot. This causes discontinuities in the velocity command, and therefore audible noise and eratic motion.

  Solution:
  The Deceleration clamp has been fixed.

- **Secondary Feedback Faults un-clearable (S-07610)**

  Issue:
  In FW 01-04-15-000, FB2 faults were fixed so that they would alert users to wiring issues on FB2 connectors X7 and X9. A bug was discovered where when FB2 was being used on X9 where all possible faults were enabled. Making the X9 unusable for most secondary feedback applications, like Step & Direction, or Up/Down.

  Solution:
  FB2 faults have been modified so only faults relevant to the secondary feedback mode selected are active.

  Further, new keywords: FAULT130.ACTION, FAULT131.ACTION, FAULT132.ACTION and FAULT134.ACTION have been added which allow the user to further allow/ignore FB2 faults. See documentation for keyword usage.

- **Drive Sometimes Was Not Listed in the WorkBench Connect Window (3286)**

  Issue:
  Sometimes after a power cycle or a firmware download the drive would not appear atall or appear as "unknown" in the list of drives in the WorkBench connact dialoge.

  Solution:
  The firmware of the drive has been fixed to correct an intermitent problem with responing to the drive discovery protocol.

IO Issues

New Features

- **Use signals of the X9 connector as general purpose IOs. (S-07416)**

  New Feature Details:
  Fieldbus masters need to be able to use the signals of the X9 connector as general purpose IOs.

  Solution:
  New keywords have been added in order to allow adjusting the signals of the X9 connector as general purpose IOs in case that DRV.EMUEMODE has been set to 10. The keywords are called: DIOx.DIR, DIOx.INV, DOUTx.STATE, DOUTx.STATEU and DINx.STATE with x=9, 10 & 11)

- **New DRV.EMUEMODE 10 allows X9 connector to be used as General Purpose IO or SynqNet fieldbus controlled IO (2003)**

New Feature Details:
Some customers would like to use the bidirectional IOs of X9 for their own use. SynqNet applications expect these IOs to be directly under the control of the SynqNet master via the SynqNet FPGA.

Solution:
DRV.EMUEMODE 10 allows the 3 bidirectional IOs on the X9 connector to be controlled as general purpose digital IO. The new commands DIN9.DIR, DIN10.DIR and DIN11.DIR can be used to set the direction of these pins individually, where DINx.DIR 0 indicates input (and is the default) and DINx.DIR 1 indicates and output. When one of these pins is an input, the value can be read at DINx.STATE. When it is configured as an output, it can be set at DOUTx.STATEU. In the special case of the SynqNet fieldbus, when the fieldbus is in cyclic mode and is set to an output, the output value will be set directly from the SynqNet master with no user involved.

Field Bus Specific Issues

New Features

- **AKD now supports SynqNet Fieldbus (in torque mode only) (1795)**
  New Feature Details:
  SynqNet fieldbus users want to use AKD drives

  Solution:
  The SynqNet fieldbus is implemented on AKD in torque mode only. Note that once a drive is under the full control of the SynqNet master, that is in cyclic mode, some Workbench and Telnet commands have restricted parameter lists or are read-only to avoid interference with the master. For details, please see the AKD SynqNet Manual.

Fixed Bugs

- **PDO with torque actual value report wrong data on MV3 (3212)**
  Issue:
  The DS402 object 6077 showed a wrong value when negative values should be shown. Object 6072 via SDO was scaled wrong according to DS402.

  Solution:
  The object 6077 and 6072 show now correct scaled values in 1/1000 of rated torque.

- **Cannot save or clearfaults on EtherNet/IP using Explicit Messages (S-07616)**
  Issue:
  When sending a DRV.CLRFAULTS or DRV.NVSAVE command with an explicit message to the Parameter Object, the connection times out.

  Solution:
  These commands now work properly. The response will be given right away and the commands will execute in the background. Note that no error checking is possible, so the response will show a success whether or not the command succeeds.

Version: 01-04-15-002 Release Date: August 29, 2011

Feedback Issues

Feature Changes

- **Feedback 5V Supply is active even on feedback errors (3153)**
  Issue:
  When a feedback devices was incorrectly configured or any feedback fault was detected, the 5V power was disconnected. This made diagnosing feedback problems difficult, and aligning Sin/Cos feedback devices required an external power supply.

  Solution:
  Feedback connectors have been configured to always output 5V when the feedback type is selected.
  Note: 5V will NOT be active if a feedback fault occurs while "Auto Identify", a feedback type MUST be selected for 5V to be active.

- **Faults not returned for FB2 (3101,S-07392)**
  Issue:
  Feedback faults for FB2 were not always returned when FB2 is configured using FB2.SOURCE.

  Solution:
  This problem has been fixed, and now FB2 faults are returned when configured on connectors X9 and X7.

General Issues

Feature Changes

- **Access parameters in Modbus with Workbench scaling units (S-07422)**
  Issue:
  Modbus has its own scaling algorithms. For some simple HMI's, it is desirable to use Workbench units instead of these Modbus-specific units.

  Solution:
  The paramter MODBUS.SCALING allows users to disable Modbus scaling and enable WB (Telnet) scaling.

Field Bus Specific Issues

Feature Changes

- **Add a fieldbus disable flag, separate from the user software disable flag (S-07388)**
  Issue:
  It is desirable to have separate disable bits in DRV.DISSOURCES for disabling/enabling the drive from Workbench and from EtherNet/IP

  Solution:
  Bit 0x40 of DISSOURCES is now a Fieldbus Disable bit. When EtherNet/IP enters cyclic communication, the Software Disable (bit

0x01 of DISSOURCES) will be cleared and Fieldbus Disable will follow the fieldbus command. When exiting cyclic communication, the Software Disable will be set if the Fieldbus Disable was set, and then the Fieldbus Disable will be cleared. This allows for user control of enable/disable when the fieldbus is disconnected. This also allows the user to disable the drive from Workbench while in cyclic communication.

Version: 01-04-14-000 Release Date: August 23, 2011

Field Bus Specific Issues

New Features

- **New CANopen/EtherCAT object 0x3544 IL.KVFF added (S-07373)**
  New Feature Details:
  IL.KVFF no accessible over CANopen.

  Solution:
  Feedforward gain for torque mode now also accessible via CANopen access.

- **EtherNet/IP Cyclic Message Enhancements (S-07283)**
  New Feature Details:
  User programs often need to monitor actual position and velocity in each cycle

  Solution:
  The cyclic message now returns actual position and velocity in each response.

- **EtherNet/IP Motion task control (S-07283)**
  New Feature Details:
  User programs may wish to setup and control motion task sequences through EtherNet/IP

  Solution:
  The cyclic message now provide the ability to trigger motion task sequences and report the active motion task.

General Issues

Feature Changes

- **Add Modbus Dynamic Mapping to DRV.NVLIST, so that the mapping is stored in the parameter file. (S-07193)**
  Issue: (Identified in Version 01-04-05-000)
  Modbus Dynamic Mapping could only be configured through Modbus itself. Workbench was not able to store the mapping in the parameter file.

  Solution:
  DRV.NVLIST (used by Workbench to save the configuration) includes the Modbus mapping. The following new commands were added: - MODBUS.DYNMAP to enable (0) or disable (1) - MODBUS.CLRDYNMAP to reset (default) the dynamic mapping table. - MODBUS.ADDR# indexed parameter to read / write dynamic mapping entries. First index (register address) is 8192.

Version: 01-04-13-000 Release Date: August 15, 2011

General Issues

New Features

- **New Keyword IP.MODE (R-07325)**
  New Feature Details:
  Understanding what mode the drive would use to select an IP address was complicated.

  Solution:
  The addition of IP.MODE allows the user to specify which method the drive will acquire an IP Address. IP.MODE 0 is the default and current operation, where the Rotary Switches are tried first, then DHCP and lastly AutoIP. When IP.MODE is set to 1, the IP.ADDRESS, IP.SUBNET and IP.GATEWAY settings are used. When IP.Mode is set to 2, the operation is the same as Mode 0, except the Rotary switches are bypassed and the akd immediately goes to DHCP, followed by AutoIP.

Feature Changes

- **IP.RESET is inhibited when drive is enabled (S-07326)**
  Issue:
  A safety concern has been identified, if the drive is in operation and the user accidentally initiates a IP.RESET and loses communication.

  Solution:
  IP.RESET is now inhibited when the drive is enabled, and will return an error message.

- **IP.ADDRESS, IP.SUBNET, and IP.GATEAY now displayed in IPv4 format (S-07385)**
  Issue: (Identified in Version 01-04-05-000)
  When the IP Keywords were implemented in 01-04-05-000, when NVRam was saved to a parameter file, IP Addresses would be listed as a single 32-bit unsigned integer. This is hard to read and hard for a user to edit.

  Solution:
  IP.ADDRESS, IP.SUBNET, and IP.GATEWAY are now listed in parameter files as a standard IPv4 address (ie. 192.168.0.1).
  Note: Any parameter file saved betwen betas 01-04-05-000 and 01-04-13-000 will not restore IP.ADDRESS, IP.SUBNET or IP.GATEWAY correctly due to this change.

Field Bus Specific Issues

Feature Changes

- **Minimum value for PLL offset variable changed from 10[ns] to 2[ns] (S-07370)**

Issue:
TG Drives requests that the minimum value for the CAN object 0x3496 subindex 4 is lowerd to 2.

Solution:
The minimum value for the CAN object 0x3496 subindex 4 has been changed according to the customer request.

- **Send motion commands over EtherNet/IP in a single communication cycle (S-05942)**
  Issue:
  Motion commands take too long to execute, because position, velocity and acceleration values are sent to the drive in successive packets.

  Solution:
  Motion commands are now sent in a single message.

Version: 01-04-12-000 Release Date: August 01, 2011

Field Bus Specific Issues

New Features

- **EIP.CONNECTED parameter added (S-07016)**
  New Feature Details:
  It is desirable to detected whether the EthernetIP connection is active from Workbench.

  Solution:
  The parameter EIP.CONNECTED returns a 1 if connected to an EthernetIP master, and a 0 if disconnected.

- **Parameter AOUT.CUTOFF needs DS402-support (2977,S-06468)**
  New Feature Details:
  DS402-support for LPF of analogue output is needed

  Solution:
  The new object is 3470 sub 6 (UNSIGNED32)

General Issues

New Features

- **New general indexed parameter USER.INT1 to USER.INT24. (S-07288)**
  New Feature Details:
  A customer (user) needs a set of parameters to store application specific values in the AKD drive

  Solution:
  Parameter USER.INT1 to USER.INT24 were added.

- **New parameter value checksum needs to be visible on EtherCAT. (S-07267)**
  New Feature Details:
  Customers must be able to read the parameter checksum via EtherCAT / CANOpen

  Solution:
  SDO2019 Subindex 0 was added and is linked to DRV.NVCHECK.

- **Trigger scope on exact values and on bitmasks (R-01729)**
  New Feature Details:
  The scope is triggered on the slope of a parameter passing a value. It would be helpful at times to trigger on an exact value, or when a value matches a bitmask.

  Solution:
  Two new trigger types have been added.

  1) Parameter Exact Value – this is like normal triggering off a parameter, but instead of setting a slope to positive or negative and waiting for the value to be greater or less, this triggers if and only if the value exactly matches the trigger value.
  2) Parameter Bitmask – this adds a mask parameter, and does a bitwise AND with the data before comparing to the trigger value. IF((trigger_data & mask) == trigger_value) THEN trigger()

  REC.TRIGTYPE
  4 = Parameter Exact
  5 = Parameter Bitmask

  REC.TRIGMASK - mask value to use with TRIGTYPE=5
  REC.TRIGVALUE - this existing parameter is used for both new trigger types.

- **New parameter, DRV.NVCHECK, added to check if NV parameters have changed. (R-01705)**
  New Feature Details:
  In some applications it is desired that a master in the systems wishes to confirm the AKD drive contains an expected set of drive parameters. You could read the drive parameters indevidually from the drive but this could be a long process. DRV.NVCHECK is a checksum on all the NV parameters that can be read in a single transaction to confirm that the drive paramters match the expected.

  Solution:
  DRV.NVCHECK will return the same number if all the drive parameters match, if any of the drive parameters are changed or are different then DRV.NVCHECK will return a different value. This parameter is accessible via EtherCAT / CANOpen using SDO2019 Subindex 0. This parameter is accessible via Modbus using address .

Fixed Bugs

- **VBUS.VALUE reported as high number when actual voltage is negative (3132)**
  Issue:
  When the VBUS goes negative due to voltage, or improper calibration settings, the VBUS.VALUE reported may report a negative number resulting in multiple faults: Fault 501 Bus Over Voltage Fault 503 Bus Capacitor Over Load Fault 308 Voltage Exceeds Motor Rating

Solution:
This has been fixed to display the correct negative number.

Feature Changes

- **Initialize absolute linear position properly for EnDat Feedback (1776,S-07189)**
  Issue:
  When using Linear EnDat Feedback devices, the initialization is not correct. The encoder resolution parameter FB1.ENCRES is not set properly. In addition the absolute linear position is not set properly.

  Solution:
  The firmware has been changed so that the parameter FB1.ENCRES is set properly, and the linear absolute position is initialized properly for all EnDat feedback devices

Version: 01-04-11-000 Release Date: July 18, 2011

Field Bus Specific Issues

Fixed Bugs

- **Fieldbus synchronization improvement/correction (3125,S-07180)**
  Issue:
  The synchronization of the Slave when work with an Eckelmann CAN master did not work properly for certain FBUS.SYNCDIST settings.

  Solution:
  The fieldbus synchronization routine has been improved and simplified so that the AKD works properly with the Eckelmann CAN controller. New CANopen-objects 3496 sub 1 to 4 for FBUS.SYNCDIST, FBUS.SYNCACT, FBUS.SYNCWND and FBUS.COMPTIME (last not available via Telnet). Default FBUS.COMPTIME changed to 150 ns and FBUS.SYNCDIST-default changed from 100000 to 320000 for CAN.

- **First PDO value of DS402 object 60FF gives a wrong velocity setpoint (3167,S-07233)**
  Issue:
  The resulting setpoint value in the profile velocity mode is 4.4 times higher than the demanded value.

  Solution:
  PDO and SDO setpoint values are synchronized now

New Features

- **Switch fieldbus type (DRV.TYPE) without a Workbench connection (S-07092)**
  New Feature Details:
  For CC drive models the user wants to be able to switch from fieldbus type EtherCAT to CAN and vice versa without connecting with Workbench to the Drive. The DRV.TYPE parameter need to be accessed in a second way.

  Solution:
  For AKD CC drive models the user can set the rotary switches to the value of 89 and press the B1 button for about 3 seconds. The Drive will indicate the DRV.TYPE switch on the 7 segment display. The AKD needs to power cycled after the procedure (see documentation).

General Issues

New Features

- **New user specific ASCII commands (USER.VAR1...USER.VAR24) added. (3118,S-07113)**
  New Feature Details:
  The user wants to have 24 general purpose keywords which are stored in the NV-memory for own purposes.

  Solution:
  24 new ASCII commands USER1...USER24 have been implemented. These commands will be stored in the NV-memory. The object numbers for SDO-/Mailbox-access are 2030 sub 1 to 0xc for USER.VAR1-12 and 2090 sub 1 to 0xc for USER.VAR13-24.

Feature Changes

- **The Units for DRV.EMUEMTURN have been corrected to be revolutions (3135,S-07137)**
  Issue:
  When using emulated encode output (EEO) mode 2 the Z pulse is located at an absolute position. DRV.EMUEMTURN specifies in which turn the Z pulse will be but the units are reported incorrectly as counts when they should be revolutions.

  Solution:
  The drive firmware has been changed to now report the units as [rev].

Version: 01-04-10-000 Release Date: July 01, 2011

General Issues

Fixed Bugs

- **MOTOR.VMAX minimum lowered to 1RPM / 1mm/s (3039)**
  Issue:
  The minimum for MOTOR.VMAX was 100RPM. Some Motors have a VMAX lower than 100RPM.

  Solution:
  The range of MOTOR.VMAX has been increased so the minimum value is now 1 RPM, or 1mm/s for Linear Motors

- **Biss Analog Feedback Will F3Bar After a Power Cycle (3055)**

Issue:
When Biss Analog Feedback is selected (FB1.SELECT = 32) and the drive is power cycled with no feedback device connected, when the clear faults command is issued, the drive will generate an F3Bar fault.

Solution:
The firmware has been modifed so that the conditions described above do not generate an F3Bar fault.

New Features

- **Report the hardware revision number in DRV.INFO and via fieldbus (3118)**
  New Feature Details:
  It is desirable to read the hardware revision number.

  Solution:
  The hardware revision number is now accessible in Workbench with the DRV.INFO command, or in EtherCAT/CANopen in SDO 1009.

Version: 01-04-09-000 Release Date: June 21, 2011

General Issues

Fixed Bugs

- **Autoset Value of VL.THRESH (2660,S-06606)**
  Issue:
  When a feedback device with motor feedback memory (SFD, EnDat, BISS or HIPERFACE) is connected and autosetting is TRUE (MOTOR.AUTOSET = 1) the value of VL.THRESH is automatically set to the value read from the feedback (MOTOR.VMAX). Three changes were needed to improve this feature 1). VL.THRESH should be set to 120% of MOTOR.VMAX (it was getting set to 100%) 2). When units other than RPM are used, the value is not set properly 3). The value for VL.THRESH should only be set to 120% of MOTOR.VMAX when the current value (at initialization time) is set to the default value.

  Solution:
  These three issues have been corrected 1). VL.THRESH will be set to 120% of MOTOR.VMAX (it was getting set to 100%) 2). When units other than RPM are used, the value of VL.THRESH is set properly 3). The value for VL.THRESH will only be set to 120% of MOTOR.VMAX when the current value of VL.THRESH (at initialization time) is set to the default value. This will allow the user to set a value for VL.THRESH that is different than the value saved in motor memory, and the drive will preserve this value. To recover the value saved in motor memory, the user can issue a DRV.RSTVAR, or set the value of VL.THRESH back to the default value, and toggle MOTOR.AUTOSET from 1 to 0 and back to 1.

New Features

- **Get Motion task Target Velocity value from Analog Input or User parameter (S-07070)**
  New Feature Details:
  The user wants to determin the target velocity of a motion task via the voltage measured on an analog input signal.

  Solution:
  The motion task control word has a bit (bit 16) that determines if the Motion task Traget Velocity is set by the MT.V parameter (Stored in motion task table) from the user (bit value 0), or if it is scaled by the analog input (bit value 1).

Feature Changes

- **Add velocity acc and dec limits in analogue position mode. (S-07044)**
  Issue:
  In analogue position mode a sudden change will accelerate the motor with maximum torque to the highest possible speed.

  Solution:
  Acceleration is limited to DRV.ACC and the velocity ot VL.LIMITP AND VL.LIMITN.

Service Motion Issues

Fixed Bugs

- **Changing service motion parameter on the fly did not work properly. (3138,S-00000)**
  Issue:
  The user starts a reversing service motion in DRV.OPMODE = 1 or 2. The motor continuous moving with 1/4 times the expected service motion speed when changing a service motion parameter (e.g. SM.T1/2 or SM.V1/2) on the fly.

  Solution:
  The code has been fixed and the motor moves with the expected speed when changing service motion parameters on the fly for reversing mode.

Version: 01-04-08-000 Release Date: June 08, 2011

General Issues

Fixed Bugs

- **Rev 8 and 9 Control boards occasionally get 2V5 undervoltage errors. (3103)**
  Issue:
  After power up some boards have fault 507: 2V5 under voltage. The Rev 8 and 9 control boards have no 2.5 v supply. There should never be a fault for this voltage on these boards.

  Solution:
  This fault was triggered erroneously when the condition was tested prior to complete system initialization. The test is now done at the proper time.

- **External Regen Resistor needs to be read/write not read only (3076)**

Issue:
External Regen resister valaue to be made Read/Write

Solution:
REGEN.REXT is changed as Read/Write parameter with 330 ohm as default value. Min value is 0 and MAx value is 330 Ohm

- **Modbus writes of large values to MT.ACC_32 and MT.DEC_32 is not correct (3111)**
  Issue:
  When writing large values (>= 0x80000000, >= 2147483648) to MT.ACC_32 (2056) or MT.DEC_32 (2058) via Modbus, the write fails and when reading the value backthe returned value reading is negative.

  Solution:
  Fixed the sign extension handling for 64bit parameters mapped to 32bit.

Field Bus Specific Issues

New Features

- **AKD-Test with interpolated-position mode via CAN (3077)**
  New Feature Details:
  The information about the state of the hardware limit switches and home switch were not inside of the object 60FD. This CNC needs this information in this object.

  Solution:
  Now the state of the negative HWLS is in bit 0, of the positive HWLS is in bit 1 and the state of the home switch is in bit 2.

- **Problems with state switch from SWITCHED ON to OPERATION ENABLE (3084)**
  New Feature Details:
  User needed the state SWITCHED ON with free rotating motor shaft, as it is demanded in the DS402 - spec of the ETG.

  Solution:
  This behaviour can now be forced by setting bit 8 of FBUS.PARAM05 to 1.

Version: 01-04-07-000 Release Date: May 23, 2011

General Issues

Fixed Bugs

- **Switch from velocity to position mode with limited torque (3030)**
  Issue:
  Some Applications needs to limit the current (torque) in velocity mode and then switch to position loop to hold the position. This can result in instable velocity loop, which sets a higher set point for the current loop than allowed (due to the limited current (torque)). This affects only applications, which use the KI in the velocity loop and the limitation of the current (torque).

  Solution:
  If the users limit the current (torque) with IL.LIMITN and IL.LIMITP, also the upper limit for integral error in the velocity loop is affected. The set point for the current loop from the velocity will now be given in this limited range and a faster response of the velocity loop is given.

- **Switch from velocity to position mode with limited torque (3038)**
  Issue:
  The AKD executes a Motion Task or Service Motion and enters the fault state or warning state. Executing the Controlled Stop (CS) caused a Watchdog F3bar. Tests showed that high Modbus traffic plus performing motion caused the Watchdog F3bar.

  Solution:
  A high data rate (request rate) of Modbus plus executing a motion led to a watchdog timeout, because other background tasks did not get enough CPU time. A data rate monitor was added to Modbus. If the delay between the last response message and a new request is too small for 10 consecutive messages the Modbus thread is suspended for 5ms to free CPU time for other background tasks. The new warning 601 is raised to inform the user that the data rate is too high and that the respones time has increased.

- **Jump in the position command value during command source switch fixed (3077)**
  Issue:
  The can master triggered the following sequence in DRV.OPMODE=2 (Position): 1) Start a homing in mode 5 and stop the process after a while. 2) Switch command source to fieldbus and move the motor a bit. 3) Switch back to command source Service. After these three steps a jump in PL.CMD has been observed.

  Solution:
  The actual position need to be forwarded to the motion classes when switching the command source from one value to another in order to avoid the jump in PL.CMD.

- **F125 fault doesn't open fault relay (3095)**
  Issue:
  Behavior was changed prior to version 01-04-00-000 so that an F125 fault no longer opened the fault relay. The relay should be opened.

  Solution:
  The relay will now open if an F125 fault occurs.

- **FW setting of DRV.DISMODE should not be tied to DINx.mode 13 (2887)**
  Issue:
  When a user sets a digital input for a controlled stop (dinx.mode - 13) they expect a controlled stop where the drive ramps down the velocity to zero using the power of the drive. DRV.DISMODE actually controls the desired behavior the controlled stop. The default value is 0. This value corresponds to an immediate power stage disable, NOT A CONTROLLED STOP. If a user sets a digital input to mode 13, and they are not aware of the DRV.DISMODE setting, they will not get the behavior that they want. dinx.mode-13 should behave like DRV.DISMODE 3, but not be dependant on that setting.

  Solution:
  The controlled stop input (DINx.MODE = 13) behaves the same way for all DRV.DISMODE values.

Version: 01-04-05-000 Release Date: May 11, 2011

General Issues

Fixed Bugs

- **Information of External Regen Resistor (3076,S-06788)**
  Issue:
  Two parameter values for regen resistor (external) is wrong. (help sends back wrong values) 1. REGEN.REXT 2.REGEN.WATTEXT

  Solution:
  1. REGEN.REXT is changed as read-only parameter with 330 ohm as default value. This Resistance value is fixed. 2. REGEN.WATTEXT data is corrected as MAX value to 6000 Watt.

- **CAPx.MODE is not saved to NV memory (3021,S-06805)**
  Issue:
  The capture parameter are not stored to non volatile memory. If the user needs a special capture setting, e.g. for homing, the setting will be lost after power cycle.

  Solution:
  CAPx.MODE, CAPx.EDGE, CAPx.EN, CAPx.EVENT, CAPx.FILTER, CAPx.PREFILTER, CAPx.PRESELECT, CAPx.PREEDGE are now stored to non volatile memory. Furthermore, HOME.AUTOMOVE is working with homing mode 3, 6, 10, 11. The home modes are dependent on one capture engine.

Field Bus Specific Issues

New Features

- **Allow Rotary Switch to Set EtherCAT Station Alias (2414,S-06598)**
  New Feature Details:
  The address set by the rotary switches should be usable for the EtherCAT configured station alias - usage.

  Solution:
  When there is built a Hot-Connect-Group in TwinCAT or other EtherCAT-masters the address of the drive can be either fixed by the parameter FBUS.PARAM03, if the rotary switches are on 0 or via the rotary switches, if they are not on 0. FBUS.PARAM03 can be used independently of the rotary switches, when FBUS.PARAM05- bit 5 (0x20) is set.

Version: 01-04-03-000 Release Date: May 09, 2011

General Issues

Fixed Bugs

- **Motor Phase Needs to be Set to 0 with Memory Version 0.01 (2985,S-06488)**
  Issue:
  Motor phase is not defined for feedback device memory version 0.01. As a result if motor phase (MOTOR.PHASE) has been previously set for a different motor, the non-zero value will remain for memory version 0.01 feedback devices.

  Solution:
  Motor phase will be set to 0 if the feedback memory is version 0.01.

- **Reconnection of LAN cable results in IP address 1 (DHCP) (3051,S-06615)**
  Issue:
  If the IP address is assigned through DHCP, after a reconnection of the cable, the IP address will be set to 0.0.0.1 instead assigned IP address by DHCP server.

  Solution:
  The assigned DHCP server address also after reconnection used.

- **Modbus: Receiption of fragmented request messages or multiple request messages. (S-06401)**
  Issue:
  The former handling expected a complete Modbus request in the TCP/IP receiption queue. The Modbus via TCP/IP specification prermits multiple requests. Depending on the delay between requests, it is possible that more than one request is in the TCP/IP receiption queue. If so, only the first request was processed!

  Solution:
  Added a preprocessor to handle all request stored in the receiption queue, including fragmented messages.

- **Drive does not re-enable after clearing CS input if DRV.DISMODE = 2 or 3 (3048)**
  Issue:
  When the CS input was activated (DIN mode 13) a controlled stop would set the software disable if DRV.DISMODE is 2 or 3. This would require DRV.EN to re-enable thed drive when the CS input was no longer active.

  Solution:
  A check was made for controlled stop input being active in DISMODE 2 and 3 and the SW disable was not set in this case.

New Features

- **Add Support for Hiperface SEK90 Feedback Device (R-01616)**
  New Feature Details:
  Support is required for SEK 90 Hiperface Feedback Device. This is a Single Turn Hollow Rotary Feedback Device

  Solution:
  Support for the SEK 90 Hiperface Feedback device has been added. The firmware has also been modified so that any future Hiperface feedback device with the label type 0xFF can be automatically configured. Feedback Devices SEK90 and SEK160 have this label type, and all new Hiperface encoders should also have this label type so that the firmware does not have to be modified in order to support these new devices.

- **New warning n140 added when changing VBUS.HALFVOLT (1096,S-06599)**

New Feature Details:
Changing VBUS.HALFVOLT takes only affect in case that the parameters are stored on the NV memory and the Drive is power-cycled. This needs to be indicated to the user.

Solution:
A new arning (n140) indicates that a DRV.NVSAVE and a power-cycle of the Drive needs to be triggered in case that the user changes the numerical value of VBUS.HALFVOLT.

- **New Homing Mode 13 - “Use current feedback position” (S-06623)**
  New Feature Details:
  With homing mode 0 the current position of the feedback is set to HOME.P. But some application needs the possibility to set the current feedback position directly to home position without explicit configuring HOME.P or FB1.OFFSET.

  Solution:
  Homing mode 13 sets the current feedback position as home position without starting a movement.

- **Modbus.Mt commands are positive edge triggered ()**
  New Feature Details:
  Modbus.Mt executes several commands, like MT.SET or MT.MOVE. If a master writes to Modbus.Mt repeatedly commands might be executed with each write request leading to an undesired behavior.

  Solution:
  To avoid multiple executions when a Modbus master is writing to Modbus.Mt repeatedly, the commands are only executed when the corresponding bit changes from 0 to 1 (positive edge triggered).

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  Solution:
  To avoid multiple executions when a Modbus master is writing to Modbus.Mt repeatedly, the commands are only executed when the corresponding bit changes from 0 to 1 (positive edge triggered).

IO Issues

Fixed Bugs

- **Digital Output mode 4-In Position does not function properly (2921,S-06557)**
  Issue:
  Output mode 4- "In Position" does not change state based on a window around a target position, as it should. Rather it functions as "Position Error > x".

  Solution:
  DOUT Mode-17 is added as "MtInPosition", and will enable the DOUT using a window around target position of the Motion task which donot have any further following Motion tasks. DOUT Mode-4 is renamed as "PositionErrorMonitor".

Motion Tasking Issues

New Features

- **New DRV.MOTIONSTAT bit 15 added (2921,S-06557)**
  New Feature Details:
  A new output mode needs to be ccreated in order to set the digital output to high as soon as the actual position PL.FB is within a certain area around the target position of a motion task.

  Solution:
  A new DRV.MOTIONSTAT bit has been implemented in order to allow creating the new digital output mode.

Field Bus Specific Issues

New Features

- **Support for some AKD-parameters is needed (3052,S-06622)**
  New Feature Details:
  Support needed for the following parameters: VBUS.UVMODE, VBUS.UVFTHRESH, VBUS.UVWTHRESH, DOUT1.PARAM, DOUT2.PARAM, DIN1.PARAM~DIN7.PARAM, HOME.AUTOMOVE, HOME.DIST

  Solution:
  - New SDOs (EDS-file revision 24):

parameter	object (index/subindex))
DIN1.PARAM	SDO 3474 sub 1/8 (low/high)
...	...
DIN7.PARAM	SDO 3474 sub 7/0xE (low/high)
DOUT1.PARAM	SDO 3475 sub 1/3 (low/high)
DOUT2.PARAM	SDO 3475 sub 2/4 (low/high)
HOME.DIST	SDO 3484 sub 0
VBUS.UVWTHRESH	SDO 3495 sub 0
VBUS.UVMODE	SDO 3617 sub 0
VBUS.UVFTHRESH	SDO 361D sub 0
HOME.AUTOMOVE	SDO 36D7 sub 0

Version: 01-04-02-000 Release Date: April 21, 2011

General Issues

Feature Changes

- **Modbus: MODBUS.HOME AND MODBUS.DRV commands are edge triggered. ()**

Issue:
A level triggered command executes the command with each write request. This is inefficient and may lead to error responses.

Solution:
Added edge detection and to avoid repeated execution of commands.

- **Unit strings retruned by a TelNet command need to be modified. (S-06482)**
  Issue:
  For some parameters the TelNet command response of the units were not coherent in terms of using brackets and spaces. Example: A velocity parameter could be displayed with the unit [PIN/POUT/s] although the related acceleration parameter is using brackets as follows: [(PIN/POUT)/s^2].

  Solution:
  The unit strings of the TelNet commands have been modified in order to be coherent.

- **Crash dump diagnostic information can now be cleared by the user. ()**
  Issue:
  When diagnosing drive problems, it is sometimes helpful to clear out old diagnostic information.

  Solution:
  The command DRV.CLRCRASHDUMP may now be entered in the terminal window in Workbench to clear old diagnostic information.

New Features

- **DRV.DISSOURCES should be recordable in the Workbench scope ()**
  New Feature Details:
  It would be helpful to record DRV.DISSOURCES

  Solution:
  This value can now be recorded.

Fixed Bugs

- **Strange behaviour of axis, when motion task movement is blocked (3020)**
  Issue:
  The current command would reverse several times if a motion was commanded (position mode) and the axis was blocked

  Solution:
  The acceleration limiting method was rolling over. The calculation causing the rollover was revised to correct the problem

- **Unit strings for analog output scaling parameters corrected. (3046)**
  Issue:
  The unit strings for the commands AOUT.ISCALE, AOUT.VSCALE and AOUT.PSCALE have been wrong.

  Solution:
  The unit strings for the commands AOUT.ISCALE, AOUT.VSCALE and AOUT.PSCALE have been corrected.

Homing Issues

Fixed Bugs

- **Jerk during homing in HOME.MODE 0 (2992,S-06473)**
  Issue:
  A jerk in the motor-shaft could happen when triggering a homing via HOME.MOVE in HOME.MODE=0 while the Drive is enabled. The jerk appeared since the parameter DRV.MOTIONSTAT was accessed from different priority levels.

  Solution:
  The modification of DRV.MOTIONSTAT from different priority levels is now protected.

- **IL.OFFSET does not work in Torque Mode (2996)**
  Issue:
  A bug was identified that prevented IL.OFFSET from applying a torque command while the drive was in Torque Mode (IL.OFFSET worked fine in Velocity and Position mode)

  Solution:
  Bug has been removed, and now IL.OFFSET works in Torque Mode

Field Bus Specific Issues

Fixed Bugs

- **DS402 (Cyclic synchronous position mode): Motor jumped back to old position, when switching on (2970)**
  Issue:
  The motor jumped to its old set point position, when drive was disabled, moved in the disabled state and afterwards got to the DS402-state "Switched on" again.

  Solution:
  Behaviour corrected. Set points are only taken, when DS402-state "Operation enabled" is reached.

- **NMT reset communication command (2670)**
  Issue:
  After the AKD node receives a NMT reset communication command, the SDO transmission stops.

  Solution:
  The SDO communication is now working after NMT reset command.

Version: 01-04-01-000 Release Date: April 11, 2011

IO Issues

Fixed Bugs

- **Jog move out of the software or hardware limits and triggered via digital input mode 6 has been corrected. (3010)**

  Issue:
  A user moves into a positive/negative software/hardware limit switch in DRV.OPMODE velocity or position. The attempt moving out of this limit switch by triggering a jog move via digital input mode 6 did not work reliable. Sometimes a user has to trigger the jog move for several times before the motor moves.

  Solution:
  The code has been corrected in a way that only one trigger event is needed for moving out of the limit switches.

General Issues

Fixed Bugs

- **Brake delay for apply and release does not seem to work? (1241)**

  Issue:
  Brake handling in earlier versions of the drive firmware had several problems involving the apply or release sequence. The release delay should prevent motion until after the mechanical delay in releasing the brake that is normally seen when power is applied to the brake. Similarly, disabling the power stage may also be delayed until the motor has stopped and the brake has been applied.

  Solution:
  This sequencing has been corrected in this version of the firmware to match the behavior escribed in the AKD documentation (MOTOR.TBRAKEAPP, MOTOR.TBRAKERLS, DRV.DISMODE).

- **Need ability to disarm wake and shake after arming (2237)**

  Issue:
  There were various problems with Wake and Shake for both mode 0 and mode 1. Faults could not be cleared (2336, 2488), time scale was incorrect, disarming was not an option (2237).

  Solution:
  These problems were corrected in this release.

- **Cannot generate fault 138: Instability during autotune - on the trunk firmware. (2999)**

  Issue:
  N/A

  Solution:
  The Fault mask is properly configured and the GetBodeFaults procedure is modified.

- **Strange behavior of axis occurs when motion task movement is blocked. (3020)**

  Issue:
  This problem was caused by a rollover in CControl::ExcecuteAccDecLimit() in position mode. The Position PI output is limited to 32 bits while CControl::ExcecuteAccDecLimit() is limited to 28 bits. This problem was introduced when the acceleration resolution was increased (between 1.3.2 and 1.3.3) and is not seen in 1.3.0.012.

  Solution:
  The correction is to allow CControl::ExcecuteAccDecLimit() to handle 32 bits when in position mode (i. e. not limiting).

- **Modbus.Home was not readable. ()**

  Issue:
  Modbus.Home is a command and did not return a zero when read.

  Solution:
  Add ArgGetVal and ArgGetValIntern to the command handler function of Modbus.Home

- **Modbus: Reading velocity parameters returned an invalid value,most of the time a -1. (2995)**

  Issue:
  Reading velocity values, like VL.FBFILTER or VL.CMD, returned a -1.

  Solution:
  Velocity parameters are 64bit values mapped to 32bit values in Modbus. The mapping uses flags, which were not reset correctly. Those flags caused the return of the wrong value.

New Features

- **Adding Low-Pass filter on Analog Output. (2977)**

  New Feature Details:
  Noise signals at analog output to be filtered.

  Solution:
  A user configurable Low-pass filter is added in the firmware. Default filter will be off. New user command AOUT.CUTOFF is interduced for user configuration of filter frequency. The range is 0 - 100000 Hz, and 0 will disable the filter.

Version: 01-03-20-001 Release Date: April 04, 2011

General Issues

New Features

- **Auto Homing for Multi-turn Feedback (2439)**

  New Feature Details:
  When a multi-turn feedback device is initialized it should be automatically homed with no motion, and with the multi-turn absolute position preserved.

  Solution:

The firmware has been modified so that Multi-turn feedback devices will be automatically homed with no motion. The multi-turn position is preserved and the home done flag is set to true. This will allow software limits to also be active. The keyword MT.HOMEREQUIRE has also been removed as part of this change, since it is no longer required since mult-turn feedback devices will automatically be homed.

- **Voltage thresholds for HV and MV Drives needs to be lowered on demand. (1096)**
  New Feature Details:
  voltag thresholds for an MV or HV Drive needs to be lowered on demand in case that the Drive will be supplied with a lower DC-bus voltage.

  Solution:
  A new command called VBUS.HALFVOLT has been implemented in order to lower voltage thresholds for the overvoltage fault generation and for the inrush-relay and regen-resistor activation thresholds.

Fixed Bugs

- **Overspeed takes too long to detect (3005)**
  Issue:
  A velocity over speed takes too long to detect (problem introduced in the 01-03-19-000.

  Solution:
  The drive will now respond to a velocity overspeed in 13ms or less.

Feature Changes

- **On CC drives the default was Has been changed to 2 (3007)**
  Issue:
  On CC drives DRV.TYPE should default to EtherCAT not Analog.

  Solution:
  The default for DRV.TYPE has been changed.

Field Bus Specific Issues

Fixed Bugs

- **DS402: Profile velocity (object 6081) gives a four times too high velocity set point. (2993)**
  Issue:
  The target speed for the profile position mode didn't work as in former firmwares (< 1.3.17.0).

  Solution:
  A new conversion had been introduced. The PDO-function and SDO-function for the object 6081 fits now to the new scheme.

Version: 01-03-19-000 Release Date: March 28, 2011

Field Bus Specific Issues

Fixed Bugs

- **Multiple EtherCAT errors (2905)**
  Issue:
  - Halt bit in profile position mode only works one time - Writing 0 to object 6098 sub 0 (Home mode) doesn't work correctly, gives a timeout

  Solution:
  - Halt bit (bit 8 control word) works now correctly- Value 0 for object 6098 generates now an abort message as well as the other not supported values

- **Object 6072 sub 0 influenced only the positive torque limit (2969)**
  Issue:
  Object 6072 sub 0 (max torque) should set both current limits, but the negative isn't changed.

  Solution:
  Bug fixed. Now also IL.LIMITN is changed.

Motion Tasking Issues

New Features

- **Parameter PL.MODPDIR extended (2957)**
  New Feature Details:
  A user enables modulo-axis and starts an absolute motion task within the modulo range. The user requests that the motor moved the shortest distance to the expected target position.

  Solution:
  The parameter PL.MODPDIR has been extended. PL.MODPDIR=3 let the motor move to the expected target position via using the shortest distance.

General Issues

Fixed Bugs

- **Motor brake behviour corrected (2958)**
  Issue:
  The MOTOR.BRAKE parameter was not correctly initialized in case that a feedback device with motor-id memory version 0.2 has been connected to the AKD and in case that MOTOR.AUTOSET has been set to 1.

  Solution:

The initialization process of the MOTOR.BRAKE parameter for MOTOR.AUTOSET=1 has been corrected.

- **Motion task deceleration rate otherthan expected (2918)**
  Issue:
  This is a condition of change-on-fly exception, when new MT is activated, and creeping to target position with adjusted deceleration ramp.

  Solution:
  1. When the motion task encounter exception during activation process, and another Motion task is already active (On fly) a new behaviour is implemented, that the currently active Motion task will decelerate to zero velocity, and dduring the process, if it exceeds next motion task target position, fault (F139) will be raised, otherwise the balance distance will be covered with the activation of new motion task. 2. Bit 13 of DRV.MOTIONSTAT is configured to indicate motion task exception during activtion(static or dynamic activation). The bit will get reset up on sucessfull activation of another motion, or by using DRV.CLRFAULTS command.

New Features

- **New motor protection (I2t) added (2900)**
  New Feature Details:
  The actual motor load should be calculated and displayed in %.

  Solution:
  A new I2t motor load algorithm has been implemented in order to show the motor load in %. Furthermore the applied current will be limited according to the load of the motor. The new mode can be activated via a new parameter called IL.MIMODE. The commands IL.MIMODE, IL.MI2TWTHRESH and IL.MI2T are supported by CAN/EtherCAT via the objects 3427 sub 1, 2 and 3.

- **Support for Hiperface SEK 160 Feedback Device (2915)**
  New Feature Details:
  Support is required for the Hiperface SEK 160 (type 255) Feedback device.

  Solution:
  Firmware has been modified to include support for the Hiperface SEK 160 Feedback device.

Version: 01-04-00-000 Release Date: March 18, 2011

General Issues

New Features

- **Support for SFD sensor fault added. (1921)**
  New Feature Details:
  When the SFD Feedback Sensor (Resolver) does not provide the correct signal to the SFD feedback board, the AKD firmware should generate a signal amplitude fault (Fault 402).

  Solution:
  The firmware has been modified so it will generate a signal amplitude fault (Fault 402) when the SFD Feedback Sensor (resolver) does not provide the correct signal to the SFD Sensor board.

- **Allow writing of motor parameters to encoder memory. (2606)**
  New Feature Details:
  When using EnDat and Hiperface encoders, the ability to write the motor parameters to the motor is required.

  Solution:
  The firmware has been modified to allow writing the motor parameters (motor ID) to the EnDat and Hiperface encoder memory. The command to write to the memory is password protected. Note that for Hiperface feedback devices, the ability to read motor parameters from the memory has also been implemented. EnDat Feedback devices already have the ability to read the motor parameters from the memory. To read the memory contents, the autoset parameter (MOTOR.AUTOSET) must be set to True.

- **Read the availability of a motor-brake from the feedback NV memory. (575)**
  New Feature Details:
  The availability of a motor brake was not read from a feedback device with memory, even if the information was available.

  Solution:
  For feedback devices with factory programmed memory (SFD, EnDat, and Biss) the firmware will read the availability of the motor brake from the feedback NV memory and initialize the corresponding MOTOR.BRAKE parameter.

- **Current loop gain scheduling feature added. (2776)**
  New Feature Details:
  When motors saturate, their effective inductance decreases, which can cause instabilities in the current loop since the current loop gain is dependent on motor inductance.

  Solution:
  Current loop gain scheduling has been implemented under the Current Loop view so that a user can specify a current loop lookup table to change the current loop gain based on a current command level.

Fixed Bugs

- **Hiperface encoder locks up sometimes with clear faults. (2890)**
  Issue:
  Sometimes Hiperface encoders would not be able to clear the "Failed to Set Feedback Fault" (Fault 401) with the clear faults command. The drive had to be power cycled in order to clear this fault.

  Solution:
  The firmware has been modified so that Hiperface feedback devices can clear the "Failed to Set Feedback Fault" (Fault 401) with the clear faults command (assuming that the feedback device is functioning properly). Power cycling is not required to clear this fault.

- **Read the availability of a motor-brake from the feedback NV memory. ()**
  Issue:
  A setting of MODBUS.PSCALE = 20 did not work as expected.

Solution:
The shift factor is now calculated correctly.

Field Bus Specific Issues

New Features

- **CANopen autobaud detection added. (2818)**
  New Feature Details:
  If the two CANopen nodes have a fix, but not the same baudrate, the communication will not work. Autobaud creates a flexible and easy to install CANopen-Bus configuration.

  Solution:
  Instead of using a fix baudrate, the autobaud detection can be configured. A master node can send an initial CANopen-Frame on the CANopen-Bus and the drive measures the bit-rate and initializes the baudrate of the CAN-Controller with the measured baudrate (125, 250, 500 or 1000 kBit/s).

- **New parameters supported via CANopen. (2901)**
  New Feature Details:
  Customer requested support for parameters MOTOR.VRATED, MOTOR.VOLTMIN, MOTOR.VRATED, PLL.SYNCDIST and PLL.SYNCWND.

  Solution:
  The parameters MOTOR.VRATED, MOTOR.VOLTRATED and MOTOR.VOLTMIN are implemented as SDO 3457 sub 1, 2 and 3. The support for the PLL commands is not provided.

Fixed Bugs

- **CANopen SDO request answered before Bbootup message has been sent. (2907)**
  Issue:
  After power on, a CANopen master polls a CANopen object via SDO request before the bootup message of the drive has been sent. The drive does not answer this request until it is fully initialized. This initialization is done when the boot up message has been sent.

  Solution:
  A SDO request is not answered until the bootup message has been sent.

- **Bit 10 of the DS402 status word did not work in profile velocity mode. (2805)**
  Issue:
  Bit 10 (target reached) of the DS402 status word did not work in profile velocity mode.

  Solution:
  The objects 606D sub 0 (Velocity Window) and 606E sub 0 (Velocity window time) determine the setting for the surveillance of the velocity demand value. If the velocity reached the window and is in for the defined time, bit 10 will be set.

- **Sometimes the commanded torque value is not taken by the drive. (2830)**
  Issue:
  The object 6071 sub 0 is sent periodically. From time to time, the old value is kept and the new not taken.

  Solution:
  The takeover of the command value via SDO 6071 always works now. The PDO access was not affected.

Version: 01-03-18-000 Release Date: March 16, 2011

General Issues

Fixed Bugs

- **Range specified for MOTOR.KE is too small (0.000 - 1000.000). (2952)**
  Issue:
  The range for the motor back emf constant (MOTOR.KE) is too small. The maximum value that can be set is 1000 Volts/Krpm. This range should be increased to 100,000 Volts/Krpm to cover DDR Motors.

  Solution:
  The range has been increased to 100,000 Volts/Krpm.

- **Blink Drive causes fault F532 (2971)**
  Issue:
  Using the "blink drive" button in Workbench can cause an F532 fault due to changing the value of DRV.SETUPREQBITS.

  Solution:
  DRV.SETUPREQBITS is no longer modified when the drive display blinks.

Version: 01-03-16-000 Release Date: February 16, 2011

General Issues

New Features

- **Modulo extension added. (1672)**
  New Feature Details:
  The modulo-axis feature should be completed.

  Solution:
  The following scopable variables are converted into modulo-format (if selected) upon a recorder retrieve command: CAP0.PLFB, CAP1.PLFB, PL.FB, PL.CMD

- **Read motor phase from Hiperface feedback memory added. (2814)**

New Feature Details:
Hiperface feedback devices are not aligned to the motor's windings. As a result the commutation offset angle must be read from the Hiperface feedback memory, and set on the drive using the MOTOR.PHASE parameter.

Solution:
The commutation offset angle will be read from the Hiperface feedback memory. The angle is read from the S-300 drive memory location which is Datafield 0, bytes 2 and 3. When autoset is true (MOTOR.AUTOSET = 1) this read value is automatically stored in the drive, in the parameter MOTOR.PHASE. Note that AKM motors will have this value programmed into their memory when shipped from the factory. For non-AKM motors, an S-300 drive must be used to program this value in the Hiperface memory. When full motor ID is implemented for Hiperface in the future, the drive will be able to store this angle in the Hiperface memory.

Fixed Bugs

- **Inputs "switch bounce" changes the motion task profile. (2065)**
  Issue:
  More DIN modes were created to enable interruptible and uninterruptible motion task features.

  Solution:
  Bit No 13 and 14 in control word (MT.CNTL) are used to identify the authentication of activation of new motion task externally. If control word bits 13 and 14 are not set, then normal operation occurs. Any motion task is allowed for Activation. If control word bit 13 is set and any motion task is active, then Deny Activate, Otherwise Allow Activation occurs. If control word bit 14 is set and no motion task is active, then Deny Activate, Otherwise Allow Activation occurs.

- **Motor.KT Limit too low for linear motors (2833)**
  Issue:
  The drive firmware limits the value of to 65 Nm/A for rotary motors, and 65 N/A for linear motors. This value is too low, as it is easy to exceed this limit on a linear motor.

  Solution:
  The firmware limit has been changed to 1,000,000 Nm/A for rotary motors, and 1,000,000 N/A for linear motors.

Motion Tasking Issues

New Features

- **Additional options for the registration move added. (2666)**
  New Feature Details:
  Two additional bits were added to the motion task control-word, which both have an impact on the motion-task trigger.

  Solution:
  A motion task can not be interrupted if bit 13 of the MT.CNTL parameter of a running motion task has been set to true. A motion task can not be started from velocity 0 if bit 14 of the MT.CNTL parameter of that motion-task, which is supposed to be started, has been set to true.

Version: 01-03-14-000 Release Date: February 01, 2011

General Issues

New Features

- **Modbus: Mapping of 64-bit parameters to 32-bit added. ()**
  New Feature Details:
  HMI devices or PLCs using Modbus do not always support 64bit variables / parameters.

  Solution:
  An interim solution is provided: Starting at register address 2000, the low 32-bit word of 64-bit parameters are mirrored. The mapping of these registers is described in Modbus documentation.

- **Digital output modes 5 & 6 should function with PL.FB in linear or in modulo scaling, depending on the PL.MODPEN setting. (1672)**
  New Feature Details:
  Certain functionalities of the drive should work with modulo-scaled position variables when a modulo axis is selected.

  Solution:
  The digital output modes 5 & 6 now work with modulo-scaled position variables when a modulo-axis is selected.

- **Software limit switches should function with PL.FB in linear or in modulo scaling, depending on the PL.MODPEN setting. (1672)**
  New Feature Details:
  Some certain functionalities of the drive should work with modulo-scaled position variables when a modulo axis has been selected.

  Solution:
  The software limit-switch functionality now works with modulo-scaled position variables when a modulo-axis has been selected.

Fixed Bugs

- **PLS also should follow modulo scaling if enabled. (2797)**
  Issue:
  Programable Limit Switches also need to be follow modulo scaling.

  Solution:
  The Programable Limit Switch functionality now works with modulo-scaled position variables when a modulo axis has been enabled.

Field Bus Specific Issues

New Features

- **MODBUS.FAULT1 - MODBUS.FAULT10 now return the fault numbers of the active faults. ()**

New Feature Details:
It was not possible to determine the fault status of the drive via Modbus.

Solution:
Up to 10 active faults are now stored in registers MODBUS.FAULT1 to MODBUS.FAULT10. - If MODBUS.FAULT1 is zero, then no fault is active. - If MODBUS.FAULT1 is non-zero, then the following register may contain further fault numbers. - A fault register with a value of zero marks the end of the fault list.

- **CANopen baud rate can be configured via the rotary switches and button B1. (2583)**
  New Feature Details:
  The user wants to configure the CANopen baud rate without using a PC.

  Solution:
  The new feature supports CANopen baud rate configuration through the rotary switches and button B1. The following sequence will configure a new baud rate and store the setting in non-volatile memory: 1.) Drive must be disabled. 2.) Set the rotary switches to: 91 - 125K bit 92 - 250K bit 93 - 500K bit 94 - 1000K bit (1M) 3.) Push the button B1 and hold it for at least 3 seconds. 4.) To confirm the new setting, the setting of the rotary switches will flash 5 times on the 7seg LEDs 5.) Reset the rotary switches to the original setting. If an error occured, the following error messages will flash 5 times: E1 - Drive is enabled. E2 - Non-volatile storage of the new setting failed. E3 - Invalid rotary switch selection.

Version: 01-03-13-000 Release Date: January 26, 2011

General Issues

New Features

- **Improved motion task blending ("registration move") added. (2666)**
  New Feature Details:
  Users want to interrupt a currently active motion task and start a new motion task via a digital input. When the input is triggered, the actual position value is latched and the second motion task is started, depending on the latched position.

  Solution:
  Users can use CAPx.MODE 4 to continuously capture the actual feedback position, depending on a digital input (configurable via CAPx.TRIGGER). With DINx.MODE 2 or 4, a motion task can be started via a digital input. With MT.CNTL 5 (relative to external start position), the specific motion task uses the captured position as start position of the triggered motion task.

Fixed Bugs

- **Biss Mode C Encoder initializes with incorrect position. (2849)**
  Issue:
  Biss Mode C Resolute Single Turn encoders with 32 bits of precision do not initialize the position correctly. If the starting position is greater than 180 degrees, the position was being initialized to a value of 180 degrees minus the start position.

  Solution:
  Now when the start position is greater than 180 degrees, the position is initialized properly

Capture Issues

New Features

- **CAP0.PLFB and CAP1.PLFB should be converted in modulo format when a modulo axis is selected. (1672)**
  New Feature Details:
  Certain functionalities of the drive should work with modulo scaled position variables when a modulo axis has been selected.

  Solution:
  CAP0.PLFB and CAP1.PLFB are converted in modulo format when the modulo axis is selected.

Version: 01-03-12-000 Release Date: January 18, 2011

General Issues

Fixed Bugs

- **Motion task complete does not work with S-curve enabled. (2645)**
  Issue:
  S-Curve Motion task do not set Motion Task complete status bit after reaching target position.

  Solution:
  Motion task complete now works with S-curve enabled.

- **S-curve profiles moving to wrong position. (2732)**
  Issue:
  1:1 S-curve Motion task always reach the specified target position by 360 degrees.

  Solution:
  S-curve profiles move to correct position now.

- **Problems occur when recording using an immediate trigger at a rate other than 16 kHz (2837)**
  Issue:
  When recording data using immediate trigger, the first data point would sometimes be duplicated. Also, REC.RETRIEVE would return data starting at an incorrect index.

  Solution:
  This problem has been identified and fixed.

- **Inputs "switch bounce" changes the motion task profile. (2065)**
  Issue:
  Customers using an earlier version of DIN.MODE-2 requested the interruptible Motion Task feature.

Solution:
Digital Input Mode 2 - "Start Motion task" was reverted as interruptible Motion Task and new DIN mode was added (Digital Input Mode 24 - "Start uninterrupted Motion task").

Feature Changes

- **Fault 133 "Instability during autotune" number changed to 138. Fault is now also shown in the display. (2731)**
  Issue:
  Fault was not shown on display.

  Solution:
  Fault number was changed and enabled to show on display.

New Features

- **FB1.MECHPOS should be recordable by the WorkBench scope. (1125)**
  New Feature Details:
  When setting up motor commutation, it is helpful to be able to plot the mechanical position of the motor (FB1.MECHPOS) in conjunction with the Hall switch states. The parameter FB1.MECHPOS should be made "recordable" in order to achieve this.

  Solution:
  The firmware has been modified so that FB1.MECHPOS is recordable.

Field Bus Specific Issues

Fixed Bugs

- **FBUS.PARAM01 was reset to its default value by DRV.RSTVAR and object 1011 sub 1. (2550)**
  Issue:
  With the object or the command DRV.RSTVAR, the CANopen-baudrate was reset to its default value. This leads to problems in working machines.

  Solution:
  FBUS.PARAM01 is no longer reset to default by DRV.RSTVAR and object 1011 sub 1.

New Features

- **Emergency 0x8AF0 added for unreasonable parameter combinations of homing mode and feedback type. (2792)**
  New Feature Details:
  Some combinations of motor feedback types with the selected homing mode are unreasonable. For example, a SFD feedback is used together with homing mode "Find index". In this case a emergency message 0x8AF0 "Homing and Feedback mismatch!" is generated because no index signal is generated by the SFD feedback.

  Solution:
  An emergency is issued when the selected homing mode cannot be used with the feedback device. Use another homing mode.

Version: 01-03-10-000 Release Date: January 04, 2011

General Issues

Fixed Bugs

- **Opmode switching over SDO causes runaway. (2567)**
  Issue:
  When switching opmode via command word in CANOpen, unexpected motion occurs about 10% of the time.

  Solution:
  Code has been corrected so that opmode and command source are cleanly handled from all change sources.

- **Fault reaction time is too slow. (2767)**
  Issue:
  Fault response time is not deterministic and can take over 50 ms in a worst case scenario.

  Solution:
  Response time is now deterministic and under 5 ms.

Feature Changes

- **DIN mode 22 - opmode switching with multiple digital inputs added. (2573)**
  Issue:
  DIN mode 22 was initially implemented with only one input changing. The case of multiple inputs changing was not defined. This implementation extends the original design with the following rule: if more than one input is active at a time, the lowest numbered input will determine the desired opmode.

  Solution:
  Mode 22 works as described above for multiple inputs.

Version: 01-03-09-000 Release Date: December 28, 2010

General Issues

Fixed Bugs

- **Hiperface Type SEL37 does not initialize. (2775)**

Issue:
The multi-turn Hiperface feedback device SEL37 does not initialize properly.

Solution:
Firmware has been modified so that the SEL37 multi-turn Hiperface feedback will initialize. A delay was added to the firmware to accommodate the longer than typical time to power up the encoder. According to the SEL37 data sheet, it takes 1200 ms for this encoder to power up and initialize. Note that the hiperface specification says that this time is no longer than 900 ms for a typical Hiperface encoder.

- **Hiperface feedback selection initializes properly. (1664)**
  Issue:
  If the user selects Hiperface explicitly (FB1.SELECT = 33), then the absolute position will not be initialized properly for both single turn and multi-turn hiperface encoders.

  Solution:
  Firmware has been modified so that the user can select either auto identify (FB1.SELECT = -1) or explicitly select Hiperface (FB1.SELECT = 33) and the absolute position information will be correct.

New Features

- **Warnings added for unreasonable parameter combinations of homing mode and feedback type. (2792)**
  New Feature Details:
  Some combinations of motor feedback types with the selected homing mode are unreasonable. For example, a SFD feedback is used together with homing mode "Find index". In this case a warning 137 "Homing and Feedback mismatch" is generated because no index signal is generated by the SFD feedback.

  Solution:
  A warning is issued when the selected homing mode cannot be used with the feedback device. Use another homing mode.

Field Bus Specific Issues

Fixed Bugs

- **Velocity set point via SDO 60FF was sometimes not taken. (2793)**
  Issue:
  Sometimes the velocity set point coming via SDO 60FF is not taken into account correctly. The last sent value was often taken again.

  Solution:
  This set point is now handled properly.

Feature Changes

- **Brake delay times were not observed in DS402-state-machine. (2411)**
  Issue:
  The state "Operation Enabled" was signaled too early with motors with brakes. This might have confused controls, when the set points were taken later than intended.

  Solution:
  The times connected to brake now influence the DS402 state machine. The state switches will take longer with brake motors.

- **In DS402 profile velocity mode, scaling objects 604B and 604C have been replaced with 204C. ()**
  Issue:
  Objects 604B and 604C, as implemented, are not appropriate for profile velocity mode.

  Solution:
  Manufacturer specific object 204C has been added to implement unit scaling for this mode.

Version: 01-03-08-000 Release Date: December 07, 2010

General Issues

Fixed Bugs

- **Controlled Stop function (logic state) illegal on startup. (2689)**
  Issue:
  After a power cycle the drive is not in the controlled stop state, and the drive can be enabled even though Digital input 1 is configured to generate a controlled stop (DIN1.MODE =13), and the input is in the state that should generate the controlled stop. Note the drive off time during the power cycle must be approximately 90 seconds in order to see this issue.

  Solution:
  Firmware was modified so that now the drive will be in the controlled stop state (and it cannot be activated when the controlled stop is configured), and the input bit is in the state that will generate a controlled stop.

- **Linear motor acceleration limits are too low. (1777)**
  Issue:
  When linear motors are selected, the limits for allowable command accelerations are too low. When the linear motor type is selected, the maximum allowable acceleration is 833 encoder counts/second^2. For linear motors there are 4294967296 encoder counts per electrical cycle, where one electrical cycle is typically on the order of 32 to 36 millimeters in length, which translates to a maximum acceleration of 6 e-6 mm/sec^2.

  Solution:
  Problem with units conversion for linear motors was corrected. The old conversion was actually poles/sec/sec instead of counts/sec/sec.

- **Hall Switch U, V and W State parameters must be recordable in the WorkBench scope. (1125)**
  Issue:
  The new U, V and W Hall Switch State parameters cannot be recorded and displayed by the WorkBench scope. These parameters are FB1.HALLSTATEU, FB1.HALLSTATEV, and FB1.HALLSTATEW.

Solution:
Firmware has been modified so that these parameters can now be recorded by the WorkBench scope.

- **Implementation of DRV.ENDEFAULT corrected. (2695)**
  Issue:
  The user selects DRV.ENDEFAULT=1, HOME.AUTOMOVE=1, HOME.MODE=4. With this combination of parameters the drive should enable automatically after power-up and start immediately afterwards a homing procedure. But instead, the drive immediately creates an undervoltage fault after the boot sequence when trying to start the homing procedure. The root cause was the attempt to move the motor before the inrush relay was closed.

  Solution:
  The DRV.ENDEFAULT feature pays attention to the status of the inrush relay and the drive will only be enabled when the inrush-relay is closed.

- **Inputs "switch bounce" changes the motion task profile. (2065)**
  Issue:
  The multiple raising edges on digital input were triggering the same motion task again and again, which is unexpected.

  Solution:
  Digital Input Mode 2 - "Start Motion task" was modified as an un-interrupted profile, and ignores any sub-sequent activate signals of the same motion task from same digital input. These input signals could be occurring because of bouncing switches.

- **Need to issue two DRV.CLRFAULTS commands in order to clear a safe torque off (STO) fault. (1844)**
  Issue:
  Need to issue two DRV.CLRFAULTS commands in order to clear a safe torque off (STO) fault.

  Solution:
  It is now possible to clear the STO fault after one DRV.CLRFAULTS command.

- **Modbus speed improvements added. (2624)**
  Issue:
  The response time was too slow (sometimes as high as 200ms).

  Solution:
  Response time has been dramatically improved (10ms response typical).

- **Help string not covering Min, Max and Default values for DINx.FILTER parameters. (2766)**
  Issue:
  Min, Max and Default values for DINx.FILTER help are missing.

  Solution:
  Support for Min, Max and Default values for DINx.FILTER added.

- **Restoring parameters for a linear motors may not work correctly. ()**
  Issue:
  If you used DRV.NVLIST to save parameters for a system with a linear motor and you tried to restore these parameters to a new drive some of the position, velocity and acceleration parameters were not restored correctly.

  Solution:
  DRV.NVLIST has been changed to output the MOTOR.TYPE parameter at the top of the list of parameters output by DRV.NVLIST.

- **New digital input mode 23 added. (2676)**
  Issue:
  The user wants to change the algebraic sign of the measured analog voltage upon a rising edge on the digital input in order to change the direction of motion. The user wants to zero the measured voltage upon a falling edge on the digital input.

  Solution:
  A new digital input mode (mode 23) has been added.

- **DRV.DISMODE should not be writable when the drive is enabled. (2779)**
  Issue:
  Kollmorgen recommends that you do not change the disable mode when the drive is enabled due to complex interactions.

  Solution:
  The drive must now be disabled before changing DRV.DISMODE.

New Features

- **Multi-turn Hiperface support added. (1664)**
  New Feature Details:
  Current AKD firmware treats multi-turn Hiperface encoders as single turn Hiperface encoders. The multi-turn information is ignored.

  Solution:
  Firmware has been modified so that the multi-turn information is used.

Field Bus Specific Issues

Fixed Bugs

- **The first event Tx-PDO or event Rx-PDO will not get processed. Starting with the second event PDO, the processing is executed. (2674)**
  Issue:
  The first event Tx-PDO or event Rx-PDO will not get processed. Starting with the second event PDO, the processing is executed.

  Solution:
  A minor bug in event RxPDO processing prevented the first RxPDO from being executed.

Feature Changes

- **DS402 status work now displays the status of the Safe Torque Off input. ()**
  Issue:
  The STO status should be displayed in the status word.

  Solution:
  Bit 8 of the DS402 status word now reflects the STO state.

- **HOME.IPEAK SDO35E2s0 should be scaled in mA not in Amps. (2345)**
  Issue:
  Amps is not a useful scaling for HOME.IPEAK.

  Solution:
  The value is now in mA.

Version: 01-03-07-000 Release Date: November 23, 2010

IO Issues

New Features

- **Added "switch bounce" conditioning to the digital inputs. (2065)**
  New Feature Details:
  Digital Input debounce switches create problems such as multiple activations, multiple triggers, etc. based on the mode of the Digital Input assigned.

  Solution:
  FPGA is built with configurable filters for Digital I/O channels. New user command "DINX.FILTER" is added as user command which can alter the configuration of DIN filter. DINX.FILTER simply returns the present value of the filter of channel X. DINX.FILTER followed with data will alter the value of the filter. The data allowed is 0 to 3. 0 - No filter setting (40ns) 1 - Fast filter setting (10.24µs +/- 0.64µs) 2 - Standard filter setting (163µs +/- 10.24µs) 3 - Slow filter setting (2.62ms +/- 0.16384ms)

Fixed Bugs

- **When the value of AIN.DEADBAND is non-zero, the value of AIN.VALUE is affected. (2741)**
  Issue:
  If the AIN.DEADBAND value was set to a value, then the value of AIN.VALUE would reflect AIN.DEADBAND applied to the actual value of the analog input. This is incorrect; AIN.VALUE should always return the actual value on the Analog Input.

  Solution:
  Firmware was modified so that AIN.DEADBAND does not affect the value of AIN.VALUE

General Issues

Fixed Bugs

- **Provide specific warning messages for various types of motion task errors. (2466)**
  Issue:
  Clearing of motion task warnings to be done on successful activation of motion.

  Solution:
  Clearing of motion task warnings implemented on successful activation of motion. Also, users can clear these warnings by DRV.CLRFAULTS command.

- **Controlled stop should ramp down from present actual velocity to zero, not from present velocity command. (2717)**
  Issue:
  Controlled stop would ramp down from present commanded velocity to zero. If the commanded velocity was very high, the ramp would cause the motor to accelerate rather than decelerating when in controlled stop!

  Solution:
  The present actual velocity is now used for the start of the controlled stop ramp.

- **Add parameter for states of the individual Hall switches U, V and W (1125)**
  Issue:
  During setup of non-catalog motors with Hall switches, the user needs to be able to see the states of the individual Hall switches using the WorkBench scope.

  Solution:
  Parameters were added to report the states of the three Hall switches U, V and W. These parameters are FB1.HALLSTATEU, FB1.HALLSTATEV and FB1.HALLSTATEW.

- **Differentiate the warnings for motion tasks, add new emergency error codes for CANopen and EtherCAT. (2466)**
  Issue:
  A general motion warning was shown to the customer. This warning was not informative enough.

  Solution:
  New emergency error codes corresponding to the new warnings:

Warning number	emergency error code	warning
n151	0x8686	Not enough distance to move; Motion Exception
n152	0x8687	Not enough distance to move; Following Motion Exception
n153	0x8688	Velocity Limit Violation, Exceeding Max Limit
n154	0x8689	Following Motion Failed; Check Motion Parameters

n156	0x868a	Target Position crossed due to Stop command
n157	0x86a0	Homing Index pulse not found
n158	0x86a1	Homing Reference Switch not found
n159	0x86a2	Failed to set motion task parameters
n160	0x86a3	Motion Task Activation Failed
n161	0x86a4	Homing Procedure Failed

- **Wrong behavior in DS402-quickstop-state, when new set point was given. (2716)**
  Issue:
  When the state machine of DS402 was in the state of quick stop, the drive moved, when getting a new set point in profile velocity and profile torque mode.

  Solution:
  The drive does not take set points now in states other than Operation Enable.

Feature Changes

- **No full access to MT.CNTL via SDO. ()**
  Issue:
  Bit 0 of MT.CNTL is reserved for the use via the DS402-control word.

  Solution:
  Now, if the full access is needed, bit 6 of FBUS.PARAM05 can be set to 1 to get it.

Version: 01-03-06-000 Release Date: November 09, 2010

General Issues

Fixed Bugs

- **Homing Mode 10 does not work. (1635)**
  Issue:
  The user starts a homing mode 10 in any direction and hits a mechanical stop. Instead of changing the direction and searching for the index signal, the drive states that a "homing procedure error" occurred.

  Solution:
  The homing mode 10 now works properly.

- **Wrong exception handling for 1:1 profile handling. (2677)**
  Issue:
  The total time calculation is using maximum velocity instead of target velocity.

  Solution:
  The calculation has been corrected.

- **Provide specific warning messages for various types of motion task errors. (2466)**
  Issue:
  The warning numbers assigned are clashing with some Error numbers.

  Solution:
  Warning numbers are changed to 150 series. The updated list can be found in log for release version "01-03-05-000".

- **Drive unexpectedly enables when clearing a fault while in dynamic braking and DISMODE=2. (2673)**
  Issue:
  Certain faults cause the drive to enter dynamic brake mode regardless of the value of DRV.DISMODE. This is expected, but when clearing these faults, it was possible for the drive to unexpectedly enable.

  Solution:
  The drive no longer enables in this situation when faults are cleared, but instead enters the software disabled state as expected.

Feature Changes

- **DRV.EMUERES EEO output resolution too low. (2600)**
  Issue:
  The existing resolution of 65535 lines/revolution for the emulated encoder output (DRV.EMEURES) is too low for some customer applications.

  Solution:
  The FPGA and firmware have been modified to increase the resolution from 65535 (16 bits) to 16777215 (24 bits).

- **VL.FB now includes AR Filter 3 and 4, added VL.FBUNFILTERED to return raw velocity signal. (2678)**
  Issue:
  Previously, a user was unable to filter the velocity feedback; this was counterintuitive since two filters are listed as feedback filters.

  Solution:
  The value of VL.FB has been updated to return the actual velocity, after it has passed through Feedback Filers 3 and 4. An additional drive parameter, VL.FBUNFILTERED, has been added which returns the raw feedback value.

New Features

- **New homing mode required. (2607)**

New Feature Details:
A new homing mode was requested (homing to mechanical stop + motion to a home switch).

Solution:
A new homing mode 12 has been implemented.

- **Require new parameters for linear motor support. (2697)**
  New Feature Details:
  Drive parameters LOAD.INERTIA and MOTOR.KE have been added. LOAD.INERTIA is in units kg*cm^2 for rotary motors and kg for linear motors. MOTOR.KE (Back EMF Constant) is in units of Vpeak/k-rpm for rotary motors and Vpeak / m/s for linear motors.

  Solution:
  Added LOAD.INERTIA and MOTOR.KE as drive parameters

- **Added VL.FBUNFILTERED and VL.FBFILTER to available Analog Output options. (2556)**
  New Feature Details:
  VL.FBUNFILTERED (raw velocity feedback), and VL.FBFILTER (10Hz filter applied to raw velocity feedback) have been added as AOUT.MODE 10 and 11 (respectively).

- **Analog Input Deadzone feature added. (2469)**
  New Feature Details:
  The existing operation of the AIN.DEADBAND value holds the output at zero when the input is less than the deadband; once the value has exceeded the deadband, the full input is used to calculate the output. This new AIN.DEADBANDMODE = 1 changes this operation

  When AIN.DEADBANDMODE = 1, while the input is less than the deadband the output will be held at zero, once the input exceeds the deadband, the output will be calculated: Output = (Input - Deadband) * Scaling.

Field Bus Specific Issues

Fixed Bugs

- **Add several available CANopen objects to EtherCAT xml file. (2682)**
  Issue:
  Objects 0x3440sub1 (CS.DEC), 0x3440sub2 (CS.VTHRESH), 0x3440sub3 (CS.TO) and 0x3440sub4 (CS.STATE) should be in the EtherCAT xml file.

  Solution:
  The xml file has been updated.

Version: 01-03-05-000 Release Date: October 26, 2010

General Issues

Fixed Bugs

- **Units need to be correct for Linear Motor mode. (2652)**
  Issue:
  When putting the AKD into Linear motor mode, Motor units are returned in rotary units.

  Solution:
  MOTOR.KT set to [N/Arms] and MOTOR.INERTIA set to [kg], MOTOR.PITCH default value changed to 32mm. MOTOR.VMAX units set to [mm/s].

- **Provide specific warning messages for various types of motion task errors. (2466)**
  Issue:
  There is only a single warning type for motion task problems. It can be difficult to debug the source of the problem.

  Solution:
  Several warnings were added for motion tasking. Note that the way to reset these warnings is by using DRV.CLRFAULTS command. Emergency Stop Fail 150 MT exception 151 Following MT exception 152 Target Velocity Limit 153 MT Next Fail 154 Target Position Overstep 156 Home Index Fail 157 Home Ref Switch Fail 158 MT Set Fail 159 MT Activation Fail 160 Home Procedure Fail 161

Version: 01-03-04-000 Release Date: October 19, 2010

General Issues

Feature Changes

- **The resolution of acceleration parameters is too coarse. (1271)**
  Issue:
  The resolution of acceleration parameters is 1.86 rpm/sec. This resolution is too coarse.

  Solution:
  Resolution has been increased to 0.224 rpm/sec for all acceleration parameters.

Field Bus Specific Issues

Feature Changes

- **CANopen SDO object 606C (position feedback) scaling is reverted to maintain backward compatibility. (2427)**
  Issue:
  The scaling of this object was changed in the previous beta release, breaking backward compatibility.

  Solution:
  The change is reverted to maintain backward compatibility.

Fixed Bugs

- **SDO 1010 sub 1 stores parameters on read access. (2549)**
  Issue:
  The object 1010 has one subindex, which gives the right response on read access (line 11 of trace), but it takes one second to respond. Investigation showed that the parameters are stored, when reading subindex 1. This should only happen for write access with the special value 0x65766173 (meaning "save"), which works also.

  Solution:
  SDO1010 sub 1 triggered an NVSAVE on a read request, because the code did not check for a read access. The code always assumed a write access. Separate read-write access was implemented and tested and resolved this issue.

- **SDO 1011 sub 1 does not work. (2550)**
  Issue:
  Writing of this SDO should reset all parameters. The drive returns an abort code of 0606 0000, which means SDO hardware fault.

  Solution:
  Only the infrastructure of SDO1011 was implemented. The actual functionality was missing. This functionality was added and tested to reset parameters to default values.

- **CanOpen DS301 nodegard is not responding. (2113)**
  Issue:
  The drive did not process node guarding messages (Index: 701, RTR, zero length). The incoming message was ignored.

  Solution:
  Processing of RTR messages was not built into the CANopen controller interface. To resolve this issue, the following were implemented: - Configuration of CANopen controller to accept incoming RTR messages (node guarding only). - Include RTR flag in message data, so that the port code recognizes the node guarding message.

- **CANopen Interface: NMT reset creates no bootup message. (2113)**
  Issue:
  CANopen specification requires a message after nmt reset (DS301). This message is currently not provided.

  Solution:
  Port code triggered bootup message transmission, but the request was not forwarded to the application code (CCanOpen). A new flag was added to forward the request.

Version: 01-03-02-000 Release Date: October 11, 2010

General Issues

Fixed Bugs

- **The maximum value in DRV.HELP for IL.KP is not correct. (2110)**
  Issue:
  The maximum value from DRV.HELP IL.KP should be 2,000 but it was reported incorrectly.

  Solution:
  The firmware has been modified to report the maximum value correctly.

- **On a 24A drive DRV.HELP WS.IMAX reports an incorrect maximum value. (2598)**
  Issue:
  When using a 24A drive and setting the MOTOR.IPEAK to a large value (greater than about 30A), you can not set WS.IMAX to a value larger than 6A.

  Solution:
  The firmware has been changed to report and use the correct maximum value.

- **DRV.DBLIMIT can not be set to ICONT of drive. (2595)**
  Issue:
  Using a 24A drive and with the MOTOR.IPEAK set to a value larger than 65.535A will give a incorrect maximum value for DRV.DBILIMIT. This will prevent you from entering a large value for DRV.DBILIMIT.

  Solution:
  The firmware has changed to report and use the correct maximum value.

- **Motor jumps when transitioning from analog velocity to digital position mode. (2477)**
  Issue:
  When using a digital input to change opmode and cmdsource, the motor will sometimes jump when transitioning from analog velocity to digital position mode.

  Solution:
  The motor no longer jumps when transitioning modes.

- **Fix the unexpected "Global Motion Task Warning" for motion tasks in negative direction. (2448)**
  Issue:
  A motion task in negative direction was triggered and the motion task was stopped in the middle via a DRV.STOP command. The n123 warning (Global Motion Warning) was accidently shown.

  Solution:
  A bug was present in the source code responsible for creating the n123 warning when crossing the target position of a motion task upon a DRV.STOP command. This bug is fixed.

- **Modify CS.VTHRESH min and default value, and use filtered velocity for controlled stop. (2371)**
  Issue:
  Velocity threshold and default value for controlled stop are too high, and the velocity is too noisy.

  Solution:
  CS.VTHRESH min value was changed to 0, and default value was changed to 5 rpm. Velocity filtered by 10 Hz LPF (like VL.FBFILTER) is used for controlled stop.

- **Bode would sometimes fail due to negative limits. ()**
  Issue:
  Bode would sometimes fail.

  Solution:
  Negative limits are now written correctly on power up, removing the issue.

Feature Changes

- **Reduce minimum value for DRV.DISTO so that the disable timeout can be disabled. (1819)**
  Issue:
  There is no way to disable the disable timeout.

  Solution:
  The range of DRV.DISTO minimum value is modified to allow setting it to 0, which disables the disable timeout.

- **VBUS.VALUE will be changed to float type, and recording it will show the value calculated based on the last 2 samples done at 16Khz. (1853)**
  Issue:
  User read only parameter VBUS.VALUE is an integer data type and this means the reportable value is quantized to 1 Volt, which is not enough. Second VBUS.VAULE variable is so filtered it is too sluggish to accurately catch rapidly rising bus voltages.

  Solution:
  VBUS.VALUE has been changed to float, and the deep moving average changed to averaging last 2 values sampled in 16Khz.

Field Bus Specific Issues

Fixed Bugs

- **Small changes were made to CANopen code to pass conformance tests. ()**
  Issue:
  The drive would fail the conformance test due to small configuration issues.

  Solution:
  Configuration issues fixed in EDS file and in firmware.

Feature Changes

- **SDO object 606C is now scaled in units of 0.001 rpm. (2427)**
  Issue:
  The PDO and SDO of object 606C are scaled differently.

  Solution:
  Both the PDO and SDO of object 606C are now scaled in units of 0.001 rpm

- **Changed operation of the EtherCAT master mailbox counter to allow communication with master devices which are not standard conformant. ()**
  Issue:
  Some EtherCAT masters, which are not fully conformant to the specification, cannot communicate with the drive.

  Solution:
  Non-conformant drives can now communicate with the drive.

New Features

- **Added object 0x3473 for CANopen access to the rotary switch. ()**
  New Feature Details:
  The rotary switch cannot be read via CANopen.

  Solution:
  Subindex 1 provides access to DIN.ROTARY, and subindex 2 gives access to DIN1.INV-DIN7.INV via bits 0 to 6.

- **Added object 0x35D2 for access to FB1.MECHPOS. ()**
  New Feature Details:
  An object is not provided for accessing mechanical position of feedback 1.

  Solution:
  This value is now available via object 0x35D2.

Version: 01-03-01-000 Release Date: September 17, 2010

General Issues

Fixed Bugs

- **Change the syntax for fault F106. (1540)**
  Issue:
  Users should be made aware that Fault 106 might happen after a firmware download.

  Solution:
  The phrase "(might occur when downloading firmware)" is added to the fault message.

- **Fix FB1.MEMDUMP Command for Biss feedback. (2578)**
  Issue:
  parameter FB1.MEMDUMP does not work properly for Biss analog feedback devices.

  Solution:

parameter FB1.MEMDUMP for Biss Analog Feedback devices is now functioning properly.

- **The drive will intermittently not setup properly when using EnDat feedbacks. (2451)**
  Issue:
  When the drive powers on and you are using EnDat feedback and MOTOR.AUTOSET is 1 the drive intermittently does not get the motor identification data from the feedback device and will not setup the drive correctly. The drive will report a 534 "Failed to read motor parameters from feedback device" fault. This fault can be cleared and the drive will continue to operate correctly.

  Solution:
  The firmware is fixed so that data read from the EnDat device is now consistently read correctly.

- **Drive will intermittently not setup up encoder resolution (FB1.ENCRES) properly when using EnDat 2.1 (2453)**
  Issue:
  When the drive powers on and you are using EnDat 2.1 feedback, the drive intermittently does not get the correct value for the encoder resolution (FB1.ENCRES). The drive will not report any faults, but the motor commutation will not work properly. As a result when motion is commanded, the motor will not move, and the drive may generate a 503 fault - Bus Capacitor Overload. This problem can be cleared by toggling the feedback selection between 30 (EnDat 2.1) and -1 (auto identify), or by power cycling the drive.

  Solution:
  The firmware has been fixed so that data read from the EnDat device is now consistently read correctly.

- **Drive will intermittently issue a signal amplitude fault with EnDat 2.1 or Biss analog feedbacks. (2426)**
  Issue:
  When the drive powers on or you switch feedback types using FB1.SELECT when using an EnDat 2.1 or Biss Analog feedback device the drive intermittently will get a signal amplitude fault (fault 402). The fault cannot be cleared with a clear faults command in WorkBench. It can only be cleared by power cycling the drive.

  Solution:
  A new FPGA was created that will prevent this from occurring. The new FPGA that corrects this issue is version FP0004_0100_00_02

- **The Homing complete output is "on" when the drive is first powered up. (2546)**
  Issue:
  When the drive powers on when an absolute feedback device is connected (SFD, EnDat, Biss, Hiperface or Resolver) the home "found" bit is true. As a result, the homing complete output is on as well. The intent of this was so that absolute feedback devices could execute a motion task without having to first be homed.

  Solution:
  The firmware has been modified so that absolute feedback devices are not considered "homed" when they first power up (reference bug 2439). The ability to execute a motion task without first homing is now handled by the new parameter MT.HOMEREQUIRE (reference bug 2038).

- **Infrequent watchdog error upon receipt of drive discovery message from WorkBench. (2130)**
  Issue:
  The drive would occasionally experience watchdog errors upon receipt of a drive discovery message when WorkBench was opened on a connected computer.

  Solution:
  This issue has been corrected.

- **Running multiple instances of WorkBench can cause some drives not to appear in the Connect screen. ()**
  Issue:
  If using multiple copies of WorkBench on a network, drives sometimes disappear from the Connect screen.

  Solution:
  Drives now respond properly to discovery messages when multiple instances of WorkBench are on the network.

- **F703 occurs after disabling the drive for the first time. (2435)**
  Issue:
  The drive issues an F703 fault (emergency timeout) when it receives a disable command for the first time after the boot process.

  Solution:
  A variable was not initialized and therefore the disable function did not work properly. This issue has been resolved and the fault does not occur.

- **All homing modes should move to home position + home distance. (2191)**
  Issue:
  When home distance is set to zero, motion should stop at the home position. Instead, the motion stops at a different position due to deceleration distance.

  Solution:
  The target position is now set to home position + home distance, even when the home distance is set to zero.

- **Default value for VL.OBSBW is incorrect. (2205)**
  Issue:
  The default value for VL.OBSBW is below the stated minimum value.

  Solution:
  The default value has been updated from 0.3 Hz to the correct value of 30 Hz.

- **Units for IL.FF and IL.BUSFF are incorrect. (1539)**
  Issue:
  IL.BUSFF and IL.FF units should be Arms.

  Solution:
  IL.BUSFF and IL.FF units are now shown as Arms.

- **Drive issues wrong error message for IL.DLIMITP minimum value. (1593)**
  Issue:
  When IL.DLIMITP is set to -1, the user gets a message stating "Argument bigger than maximum".

  Solution:

A signed integer compared to an unsigned integer caused this bug. This issue has been resolved.

- **Analog command does not work properly in position mode. (1600)**
  Issue:
  When setting AIN.PSCALE to a value equals or greater than 2^32, the actual scale is wrong. The scale resembles a numerical overflow or truncation. -->DRV.EN -->AIN.PSCALE 4294967296 -->AIN.PSCALE 4294967296.000 [Counts/V] -->AIN.OFFSET 1.000 [V] -->AIN.VALUE 1.016 [V] -->PL.CMD 4362692968.000 [Counts] -->AIN.OFFSET 2 -->AIN.VALUE 2.016 [V] -->PL.CMD 4362158398.000 [Counts]

  Solution:
  The position command variable was 64 bits long and casting of this variable to 32 bits lost all data of the higher 32 bits. The casting was removed and now the command works properly.

- **Current sensor short cannot be reset. (1803)**
  Issue:
  When the drive issues Fault 526: "Current sensor short", the WorkBench Disable and Clear Faults buttons do not clear this fault.

  Solution:
  When the drive was in dynamic brake mode, the clearing of the relevant fault bit in the FPGA did not occur, because the drive was considered enabled. This issue has been fixed.

- **Record reports the value of MT.VCMD incorrectly. (2117)**
  Issue:
  When using WorkBench to record MT.VCMD, the value is off by a factor of 4.

  Solution:
  Recording is now correct for MT.VCMD.

- **DCT capture result is incorrect when near zero. (2491)**
  Issue:
  Capture of the EtherCAT Distributed Clock (DCT) was not correct when the result was near zero.

  Solution:
  DCT is now accurate near zero.

- **Drive failure occurred when running feedback auto-identify on devices that do not support auto-ID. (2511)**
  Issue:
  The drive could intermittently fail during the auto-ID process.

  Solution:
  The issue has been resolved.

- **Wrong minimum and maximum values for BODE.IAMP. (2202)**
  Issue:
  The drive reported incorrect minimum and maximum values for BODE.IAMP, which could cause problems in WorkBench.

  Solution:
  These values are now reported correctly.

New Features

- **Customer Profile Tables (1689)**
  New Feature Details:
  Users would like to download various S-Curve profiles and other customer defined profiles to be executed as motion tasks by the drive.

  Solution:
  Customer profile tables can now be loaded and executed by the drive.

Field Bus Specific Issues

Fixed Bugs

- **EtherCAT Stability Improvements (2435)**
  Issue:
  When using EtherCAT communications the drive would perform erratically and the ASCII SDO would take a long time to respond to the master.

  Solution:
  Several performance improvements and stability changes were made to the firmware allowing the drive to operate reliably.

- **The drive allows an EtherCAT mailbox size of only 512 bytes. (2449)**
  Issue:
  Users should be able to configure a mailbox size of 40 to 512 bytes. The drive, however, allows a mailbox size of only 512 bytes for the SyncManagers 0 and 1 mailbox. The drive should allow a mailbox size of 40 to 512 bytes for these state transitions.

  Solution:
  The drive now accepts even-numbered mailbox sizes between 40 and 512 bytes for the SyncManagers 0 and 1.

- **Scaling of PDO20A6 is not the same as PDO6063. (2344)**
  Issue:
  The fixed mapping for TxPDOS 0x1B23 contains the actual internal position feedback and the captured position (CAP0.PLFB, AKD.xml name: Latch 1 pn). The scaling is different, but should be the same.

  Solution:
  PDO20A6 now has the same scaling as PDO6063.

- **Small changes were made to EtherCAT communication to pass the conformance test. (1335)**
  Issue:
  EtherCAT communications were not fully conformant.

Solution:
Changes were made to fix the non-conformant issues.

New Features

- **Support Modbus block read/write and single register access. (2464)**
  New Feature Details:
  Many Modbus HMIs require block read/write access.

  Solution:
  Block read/write is now supported, as well as reading individual registers (16 bits) out of 32 or 64 bit parameters.

- **Support PDO Free-Mapping for EtherCAT. (1677)**
  New Feature Details:
  Users would like to create dynamic PDO maps rather than relying on fixed mappings.

  Solution:
  Free mapping is now supported.

Version: 01-03-00-004 Release Date: August 02, 2010

General Issues

Feature Changes

- **Add drive support for the Modbus TCP protocol. (1669)**
  Issue:
  Modbus TCP is a common communication protocol used primarily for HMI interfaces and low-priority communication.

  Solution:
  The drive now fully supports access to drive parameters over Modbus TCP, in addition to the existing Telnet interface and WorkBench software. See the User Guide and parameter reference for usage instructions. This feature does not currently support block read/write. A future update will include block read/write access. This feature also does not currently support partial reads of 64-bit parameters. A future update will include the ability to read 64-bit variables as 32-bit variables to help support more devices and programs.

- **Add support for single-ended pulse command inputs on X7 high-speed opto inputs. (2135)**
  Issue:
  Support for single-ended pulse command inputs was needed for the X7 high-speed opto inputs (pins 9 and 10).

  Solution:
  Support for single-ended pulse command inputs for the X7 high speed opto inputs has been added. This support was added to the firmware using the parameters FB2.XX. The new parameters are the source (FB2.SOURCE), the mode (FB2.MODE) and the resolution (FB2.ENCRES). The emulated encoder input (X9 connector) modes can be defined using these keywords also, or with the previous keywords (DRV.EMUEMODE, DRV.EMUERES).

- **Add support for EnDat 2.2 feedback. (1776)**
  Issue:
  Support for EnDat 2.2 encoders is required. Support is required for rotary single turn and multi-turn encoders and linear encoders.

  Solution:
  Support for EnDat 2.2 encoders has been added to the firmware. Rotary single turn and multi-turn encoders are currently supported. The drive does not support linear EnDat 2.2 encoders yet.

- **Add Mode 22-Command source/opmode change. (1603)**
  Issue:
  Applications require command source and opmode changes during operation via digital inputs.

  Solution:
  DINx.MODE 22 (command source/opmode change) was added.

- **Add support for Programmable Limit Switches for turning on outputs at programmed positions. (1673)**
  Issue:
  Additional support needed for Programmable Limit Switches.

  Solution:
  Added support for Programmable Limit Switches for turning on outputs at programmed positions.

- **Add DRV.HWENMODE. (1744)**
  Issue:
  A rising edge on the hardware enable input would always clear any faults on the drive. If you are using the drive with an EtherCAT or CANopen master, you may want to control the clearing of faults independently using the network.

  Solution:
  A new parameter DRV.HWENMODE has been added. This parameter controls whether or not the rising edge of the hardware enable clears any drive faults.

  - 0 (default) = The rising edge of the hardware enable clears the drive faults.
  - 1 = The rising edge of the hardware enable does not clear the drive faults.

  The high/low state of the hardware enable is always used to control the active enable state of the drive.

- **Increase the maximum allowed position delta between two fieldbus position command values. (2136)**
  Issue:
  The motor moves in the wrong direction when the position delta between two fieldbus position command values is larger than 0.5 motor rev, which corresponds to 2^(FB1.PSCALE)Fieldbus-Counts.

  Solution:
  Instead of only considering the position delta within one revolution (the lower FB1.PSCALE bits in the fieldbus position command value), the whole 32-bit position delta is now used for calculating a position delta within the drive. Thus the maximum position delta

for the fieldbus command values is 0.5*2^(32-FB1.PSCALE)motor rev, which corresponds to 2^31 Fieldbus-Counts.

- **Added DRV.CDMDELAY to add delays in the command buffer for commands which take time to execute (such as DRV.EN). (2177)**

  Issue:
  Some command actions do not occur immediately (such as DRV.EN). When using the command buffer, this delay causes the en->move command sequence to fail.

  Solution:
  By adding DRV.CMDDELAY, you can insert a delay command into the command buffer. For DRV.EN, this delay allows the drive to enable before the motion command is given.

- **Update of the AKD XML File to version 1.09. (1335)**

  Issue:
  TwinCAT did not behave according to the EtherCAT conformance test tool during a Mailbox access (SDO exchange). The mailbox counter was not incremented by TwinCAT.

  Solution:
  The AKD XML file has been updated in order to activate the missing feature in TwinCAT (incrementing the mailbox counter for each mailbox access).

- **Add DS402-mode 8 - cyclic synchronous position mode. (1432)**

  Issue:
  The EtherCAT-conformance tool demands one of the cyclic set point modes (position, velocity, or torque). This mode works in user-scaled positions, whereas the interpolated position mode works in motor incremental units.

  Solution:
  This new mode is now implemented. Two new fixed PDO-mappings have been created for this mode: In the receive direction the mapping (0x1724) includes the object 0x607A sub 0 as target position. In the transmit direction (0x1B24), the mapping includes the object 0x6064 sub 0 as position actual value. This mode is supported starting with version 1.08 of the AKD.xml-file.

- **STO fault behavior change. (1384)**

  Issue:
  The STO fault appears upon power up, which causes a safety-chain deadlock.

  Solution:
  The STO fault will not occur unless software and hardware enable are on.

- **DS402-state machine should be influenced by the hardware-enable input. (1743)**

  Issue:
  No change of the state machine occurred if the hardware-enable signal was taken away and the drive was disabled.

  Solution:
  The default behavior is changed. If the hardware enable goes to 0, then the state of the state machine goes to "Switch On Disabled". This behavior can be switched off by setting bit 0 of FBUS.PARAM05 to 1.

- **Add DS402-support for parameters DOUTx.MODE, PL.ERRWTHRESH, IL.IFOLD, MOTOR.PHASE, REGEN.POWER, DRV.DISMODE, and MT.SET. (1796)**

  Issue:
  This feature addresses a customer request for SDO access to parameters.

  Solution:
  New objects:

parameter	object (index/subindex))
DOUT1.MODE	0x35AF sub 0
DOUT2.MODE	0x35B2 sub 0
PL.ERRWTHRESH	0x3483 sub 0
IL.IFOLD	0x3425 sub 0
MOTOR.PHASE	0x359C sub 0
REGEN.POWER	0x3416 sub 0
DRV.DISMODE	0x35FF sub 0
MT.SET	0x3431 sub 0

- **Add DS402-support for parameters VL.KVFF, MOTOR.INERTIA, MOTOR.KT, VL.ERR, WS.MODE, WS.IMAX, WS.DISTMIN, WS.DISTMAX, WS.T, WS.TDELAY1, WS.TDELAY2, WS.TDELAY3, WS.VTHRESH, WS.STATE, and IL.KACCFF. (1719)**

  Issue:
  This feature addresses a customer request for SDO access to parameters.

  Solution:
  New objects:

parameter	object (index/subindex))
VL.KVFF	0x354B sub 0
MOTOR.INERTIA	0x35AB sub 0
MOTOR.KT	0x3493 sub 0
VL.ERR	0x3407 sub 4
WS.MODE	0x3864 sub 0
WS.IMAX	0x3494 sub 1
WS.DISTMIN	0x36D1 sub 0
WS.DISTMAX	0x3494 sub 2
WS.T	0x36D0 sub 0
WS.TDELAY1	0x3863 sub 0
WS.TDELAY2	0x3865 sub 0
WS.TDELAY3	0x3494 sub 3
WS.VTHRESH	0x3494 sub 4
WS.STATE	0x3494 sub 5
WS.NUMLOOPS	0x36E2 sub 0
IL.KACCFF	0x3426 sub 0

- **Add DS402-support for parameters AIN.PSCALE, AOUT.PSCALE, MOTOR.CTF0, MOTOR.LQLL, MOTOR.POLES, MOTOR.R and WS commands. (2168)**

  Issue:
  This feature addresses a customer request for SDO access to parameters.

  Solution:
  New objects:

parameter	object (index/subindex))
AIN.PSCALE	0x3472 sub 0
AOUT.PSCALE	0x3471 sub 5
MOTOR.CTF0	0x3454 sub 0
MOTOR.LQLL	0x3455 sub 0
MOTOR.POLES	0x359D sub 0
MOTOR.R	0x3456 sub 0
PLS.P1 .. PLS.P16	0x34A0 sub 1..8
PLS.WIDTH1 .. PLS.WIDTH8	0x34A1 sub 1..8
PLS.T1 .. PLS.T8	0x34A2 sub 1..8
PLS.EN	0x34a3 sub 1
PLS.RESET	0x34a3 sub 2
PLS.MODE	0x34a3 sub 3
PLS.STATE	0x34a3 sub 4
PLS.UNITS	0x34a4 sub 0

- **Allow EtherCAT firmware download with 512 byte and 1024 byte mailbox size. (2243)**

  Issue:
  The software download via KAS was not possible because the EtherCAT state transition from Init -> Bootstrap was denied by the drive. This state was denied because, originally, a reconfigured mailbox size of 1024 bytes was required.

  Solution:
  The drive now allows a mailbox size of 512 bytes and 1024 bytes when switching from Init to Bootstrap state.

- **Correction of the electronic gearing behavior when hitting a hardware limit switch. (2362)**

  Issue:
  The electronic gearing class continued counting master pulses when hitting a hardware limit switch in a certain direction. This behavior let the following error grow. While this situation was pending, it would be problematic to release the hardware limit switch, since the position loop tries immediately to move the motor to PL.CMD. It appears as a runaway problem in the drive.

  Solution:
  The electronic gearing class no longer considers master signals, which try to move the motor in direction of an active hardware limit switch.

- **SDO access needed for WS.ARM. (2412)**

  Issue:
  SDO-Access needed for WS.ARM.

  Solution:
  SDO 0x3494 sub 6 implemented for WS.ARM.

- **Added new homing mode. (1709)**

  Issue:
  This feature was added to address customer requests that a new homing mode (Homing Mode 11) be added to the already existing homing modes. This new mode searches for the index signal without the need to identify a hardware limit switch, a home switch, or a mechanical stop prior to the index-signal detection.

  Solution:
  The new homing mode searches for the index. The motor starts rotating in the homing direction as soon as the homing is triggered. If the limit switch is active before the index, the motor turns its direction of rotation and searches for the index. As soon it finds the index, home position found status should be set. The actual position and command position is set to the home position.

- **VBUS.OVWTHRESH was changed to R/W. (1251)**

  Issue:
  The over voltage warning was not operative.

  Solution:
  VBUS.OVWTHRESH changed to be R/W with default 0 (which inhibits the warning). The user can define this parameter to allow the warning to appear.

- **Increase the fault log size. (1594)**

  Issue:
  The fault log size is too small.

  Solution:
  Fault log size was increased to 50 entries.

- **VBUS.UVFTHRESH was changed to R/W. (1790)**

  Issue:
  A customer requested an option to execute a controlled stop when main loss is discovered.

  Solution:
  VBUS.UVFTHRESH was changed to be read/write type and can now be stored on the NV. VBUS.UVFTHRESH default value is the value set on the EE (which is also the parameter minimum value) and its maximum value is VBUS.OVFTHRESH.

- **Changed active disable behavior on INMODE 13 and on DRV.DIS. (1874)**

  Issue:
  Confusion around the behavior of INMODE 13 and DRV.DIS resulted in a request to unite CS.TMAX and DRV.DISTO.

  Solution:
  CS.TMAX was removed and DRV.DISTO is activated whenever active disable is requested.

Fixed Bugs

- **Digital input mode 1 (fault reset) would clear the software enable. (1744)**
  Issue:
  When you used only the digital inputs to control the drive, if you cleared a fault with a digital input configured as mode 1, the software enable would also be cleared and you could not enable the drive without sending a command using Telnet.

  Solution:
  DIN.MODE 1 (fault reset) was changed so that it does not clear the software enable.

- **DRV.HELP returned an inconsistent response. (1871)**
  Issue: (Identified in Version 01-02-00-000)
  DRV.HELP for FB1.HALLSTATE, DRV.SETUPREQLIST, and DRV.ONTIME returned a response that did not match the original command.

  ```
  -->DRV.HELP FB1.HALLSTATE
  Help for: PFB.HALLSTATE [Info] [Recordable]
  -->
  ```

  Solution:
  DRV.HELP for FB1.HALLSTATE, DRV.SETUPREQLIST, and DRV.ONTIME now returns a consistent response.

- **Long strings would crash the drive. (1308)**
  Issue: (Identified in Version 01-01-00-000)
  If you send a long string to the drive using Telnet the drive crashed, either immediately or the next time you try to connect to the drive.

  Solution:
  The firmware now detects long strings (greater than 256 characters) and returns "Error: Command was not found.".

- **RxPDOs were not configured as event-triggered by default. (1881)**
  Issue:
  All RxPDOs should be event-triggered by default.

  Solution:
  The default configuration of the transmission type has been set to event-triggered. Additionally, a bug in the event detection algorithm was fixed.

- **Electronic gearing was aborted when a HW or SW limit switch is triggered. (1974)**
  Issue:
  The drive moves a motor in "Electronic Gearing" mode and triggers a limit switch while the motor is in motion. The electronic gearing was aborted and therefore it was not possible for the drive to move the motor out of the limit switch.

  Solution:
  The electronic gearing function now remains active even if a limit switch has been triggered. This active state allows the drive to leave the limit switch in the opposite direction.

- **False brake fault conditions reported during brake enable/disable. (1857)**
  Issue:
  When enabling or disabling a motor brake, a 306: Brake Short Circuit Fault condition occurred intermittently on a working brake.

  Solution:
  The false brake faults no longer occur.

- **DRV.ENDEFAULT was not working on CANopen drives. (1328)**
  Issue:
  DRV.ENDEFAULT was ignored on CANopen drives regardless of CMDSOURCE value.

  Solution:
  The drive now prevents CANopen from disabling the drive upon power up. DRV.ENDEFAULT is now considered even if DRV.CMDSOURCE=1.

- **User could not enter maximum value of acceleration/deceleration parameters. (2098)**
  Issue:
  The user was not able to enter the maximum value of acceleration parameters in UNIT.ACCROTARY=3.

  Solution:
  The CUnitsConversion class has been corrected in order to allow setting the maximum allowed acceleration value, which is displayed in the DRV.HELP information.

- **Delay occurred when starting a Motion Task from the digital inputs. (2211)**
  Issue:
  The user has a 2 to 12 ms delay in starting a motion task from the digital inputs. This delay occurs in digital inputs modes 2 and 4.

  Solution:
  Digital input mode 2 and mode 4 were corrected to have a maximum delay of 1 ms.

- **Analog position mode correction. (2224)**
  Issue:
  A problem existed with the interpolation mechanism of the analog position mode.

  Solution:
  A bug existed in the interpolation mechanism of the analog position mode. The flag for new position command was missing, causing the interpolation to repeat on the same command.

- **DRV.STOP behavior corrected for motion in opmode 2. (1907)**
  Issue:
  A problem occurred when a motion task was running with a very low PL.KP gain and a DRV.STOP command was triggered while the motion task was in the deceleration phase. The software scope exposed that the motion task was triggered again, although a stop-procedure had been triggered.

  Solution:
  A race-condition was the root cause of this bug. The motion task class displayed that the sto -procedure is finished although the underlying trajectory generator was still active. Consequently, the motion task was triggered again when PL.CMD was set to PL.FB

at the end of the stop procedure even though the motion task was not completed by the trajectory generator. This condition has been fixed.

- **Corrected the "target position reached" bit in DRV.MOTIONSTAT. (2239)**
  Issue:
  The user adjusts a sequence of motion tasks that are consecutively called (one motion task calls the next one). The error was that the "target position reached" flag in DRV.MOTIONSTAT was high after finishing the first motion task, although further motion tasks follow. This behavior also adversely affected digital output mode 3, which considers this particular bit in DRV.MOTIONSTAT.

  Solution:
  The line in the motion task class source code, which sets the target position reached flag too early, has been identified and has been removed.

- **Analog input low-pass filter blocked input. (1730)**
  Issue:
  If the low pass filter is set to any value below 4, then the input signal is blocked and no response occurred to a changing input signal.

  Solution:
  The minimal value allowed to be written to low-pass filter is now 1.

- **PDO scaling of DS402-object 0x606C sub 0 was wrong. (1681)**
  Issue:
  A still motor returned large values for the actual speed in PDO.

  Solution:
  The scaling was not correct for negative values. The value is now scaled in rpm/1000.

- **DRV.DISMODE=2 enables the drive automatically when HW-enable is set to 1. (2037)**
  Issue:
  The drive was creating motion when the hardware enable was set to 0. After stopping motion and setting the hardware enable to 1 again, the axis was enabled automatically. This happened only with DRV.DISMODE=2.

  Solution:
  The definition of DRV.DISMODE=2 is "Use a controlled stop to ramp down and then disable the drive". This setting is now fixed.

- **When the TwinCAT-EtherCAT-master is re-started, the axis does not move (when set to operation enabled in profile velocity mode). (2170)**
  Issue:
  When the TwinCAT-EtherCAT-master is re-started, the axis does not move (when set to operation enabled in profile velocity mode). The drive gets a communication fault and cannot be re-started.

  Solution:
  The fault situation was not handled correctly. This problem is fixed and the axis moves.

- **Correction of the motion abort when moving out of the limit switches. (2246)**
  Issue:
  You create a motion in DRV.OPMODE 2 (service motion) into a hardware limit switch and afterwards the motion stops. When you try to move out of the hardware limit switch via a service motion in the opposite direction, the motion is immediately aborted after starting that motion due to the behavior of the hardware limit switch code.

  Solution:
  The hardware limit handler now aborts only motion in direction of the limit switch and does not abort the motion when the motor leaves the limit switch.

- **The DS402-state machine does not change its state when software enable is removed via Telnet. (2102)**
  Issue:
  The external software disable does not change the state of the DS402-state machine from operation enable.

  Solution:
  The state of the DS402-state machine is now changed by an external software disable. This behavior can be switched off by setting bit 3 of FBUS.PARAM05 to 1.

- **Some objects in the fixed EtherCAT-PDOs are not scaled. (1915)**
  Issue:
  The actual position given by object 6063 and object 60C1 sub 1 and the latched values 20A0 to 20a3 are not scaled by FB1.PSCALE. Also, the object 60F4 (following error) is not scaled correctly.

  Solution:
  The objects 6063, 60C1 and 20A0 to 20A3 are now scaled via object 608F sub 1, which is connected to the parameter FB1.PSCALE, and gives the increments per motor revolution (power of 2).

- **Bit 5 of the DS402-control word does not work correctly in profile position mode. (2223)**
  Issue:
  If you try to start more than one motion task, the first works correctly, but the next ones are not stored to motion task 0.

  Solution:
  The bit 5 set to 0 works now correctly. When a first motion task is running and a second one is started with bit 5 = 0, the execution of it is delayed until the first reaches its target position.

- **Bit 13 of the DS402-status word was not supported. (1720)**
  Issue:
  Bit 13 in the DS402-status word was not supported.

  Solution:
  Bit 13 is set when the following fault (F439) occurs. This condition can happen in all positioning modes (profile position, homing, interpolated position mode, cyclic synchronous position mode)

- **Position mode capture returns raw data results instead of position values that are adjusted for scaling and homing. (2262)**
  Issue:
  CAPx.PLFB returns raw data values that are not scaled or adjusted for homing as PL.FB is.

Solution:
The value returned by CAPx.PLFB is now scaled and homed. It will match what the user expects from PL.FB.

- **Wrong maximum value check returned for the MT.TNUM parameter. (2347)**
  Issue:
  A maximum value of 8 for the MT.TNUM parameter was allowed, but the AKD returns an error when sending the motion task with MT.TNUM=8 to the drive via the MT.SET command.

  Solution:
  The maximum value check has been changed from 8 to 7 for the MT.TNUM parameter.

- **CANopen SDO objects for the velocity channel biquad filters were not responding. (1929)**
  Issue:
  CANopen SDO objects for the velocity channel biquad filters were not responding to read or write requests.

  Solution:
  The SDO objects have been fixed and now function properly.

- **HOME.SET prevents motion in electronic gearing mode. (2269)**
  Issue:
  HOME.SET should not prevent any subsequent motion if the drive is enabled.

  Solution:
  Issuing HOME.SET no longer suppresses motion in electronic gearing mode.

- **DCT capture feature was incomplete. (2133)**
  Issue:
  Capture of the EtherCAT Distributed Clock (DCT) was not implemented.

  Solution:
  Capture of the EtherCAT Distributed Clock is now supported.

- **SDO-access to object 60FD sub 0 does not work. (2327)**
  Issue:
  The read access to 60FD sub 0 delivers 0 instead of the read value of the PDO.

  Solution:
  The read access to 60FD sub 0 now delivers the correct value.

- **Safe torque off warning is missing. (1384)**
  Issue:
  Safe torque off does not issue a fault until the user tries to make the drive active. As soon as the user tries to make the drive active, the drive faults. The drive should issue a warning when the drive is inactive and the safe torque is off.

  Solution:
  Added a warning to the state in which the drive is inactive and safe torque is off.