

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-Bxxxx-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.

Please update to WorkBench version 1.5.0.0000 or later when using this firmware.

Release Summaries

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Version: 01-06-04-004 Release Date: May 30, 2012

BASIC Issues

Fixed Bugs

- **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 used 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.

Version: 01-06-04-003 Release Date: May 25, 2012

General Issues

Fixed Bugs

- **Motion Task Table disappeared after reboot of AKD (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. (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.

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 occurred.

Solution:

Trajectory Generator now behaves per specification when the drive is disabled, OT switch or MOVE.ABORT occurs.

BASIC Issues

Feature Changes

- **Compiler and VM now support MOTOR.TBRAKETO. (3873,S-09348)**

Issue:

Solution:

Fixed Bugs

- **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).

- **MOVE.ABORT would not stop Camming, Electronic Gearing or Virtual Master. (3889,S-09414)**

Issue:

Motion does not stop when expected.

Solution:

All motion is now stopped when MOVE.ABORT is issued.

BASIC Issues

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.

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: 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 accessible through pure PROFINET/PROFIdrive interface.

Solution:

DRV.DIR is accessible via PNU 2117, FB1.OFFSET is accessible via PNU 2145. Further PNUs are now supported (see PROFINET manual).

Feature Changes

- **Additional parameters are now available through the fieldbus service channel (PROFINET, 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 occurred, 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 inefficient 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 supports 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 (3737)**

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 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 could 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).