Kollmorgen Automation Suite
Release Notes

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Valid for KAS Software Revision 3.04

Valid for AKD firmware version: 01-19-00-002

Valid for AKD2G firmware version: 02-04-00-000

Part Number: 959720

For safe and proper use, follow these instructions. Keep for future use.

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- Zlib software library
- curl software library
- Mongoose software (distributed under the MIT License - see terms)
- JsonCpp software (distributed under the MIT License – see terms)
- U-Boot, a universal boot loader is used by the AKD PDMM and PCMM (distributed under the terms of the GNU General Public License). The U-Boot source files, copyright notice, and readme are available on the distribution disk that is included with the AKD PDMM and PCMM.

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Disclaimer

1 Table of Contents

2 Introduction

Welcome to KAS v3.04! This release contains new features and many improvements. This document is intended to help existing users understand the differences between this and KAS v3.03. If you are new to KAS, we recommend that you start off with other documents, such as the Installation Guide.

This document has five sections:

- Installation – this section covers system requirements as well as provides firmware, software, and hardware information.
- What's New in KAS v3.04 – an overview of new features.
- What's Changed in KAS v3.04 – this section discusses how this release may affect some of your older projects. It let's you know what to do when upgrading, especially if there is anything you need to be careful about.
- What's Fixed in KAS v3.04 – a list of issues addressed in this release.
- Known Issues – this section contains issues we are aware of, and methods for avoiding or working around them.

TIP

We recommend that you visit the Kollmorgen Developer Network ("KDN"). KDN is an online resource which includes a knowledge base, provides access to downloads, and has a user community where you can get answers from peers and Kollmorgen employees, and make feature suggestions for KAS. Additionally, beta versions of the help are posted and are searchable. Stop by https://www.kollmorgen.com/developer-network/, take a look around, and don't forget to register.

NOTE

This PDF contains links to the KAS help system, and as such works best when read from within the KAS IDE installation directory. Please be advised that the links to content will not work if the PDF is located somewhere other than `(install directory)\Kollmorgen\Kollmorgen Automation Suite 3.04.x.x\Help\`.

3 Installation

3.1 System Requirements

Element	Description
Operating System	Microsoft® Windows® 7 SP1 (32 or 64-bit), Microsoft® Windows® 10 (32 or 64-bit). For optimal performance, please be sure your operating system is fully updated with the latest patches.
Processor type	Intel® Pentium® M or equivalent processor at 1.5 GHz or greater.
Memory	1 GB RAM (for 32-bit) or 2 GB RAM (for 64-bit) or greater (which is recommended for complex applications).
Storage	16 GB (for 32-bit) or 20 GB (for 64-bit) of free space on hard disk.
Display	WXGA+ (1440 x 900) or higher-resolution monitor with 24-bit color. See Note #1 below.
Connectivity	1 Ethernet port, at either 100Mbits/s or 1Gbits/s. See Note #2 below.
Web Browser	A modern web browser is required to access the web server and online help. We recommend Microsoft Edge , Google Chrome , Mozilla FireFox , or Internet Explorer (IE9 or later, see Note #3) .

NOTE

1. Better results are achieved with OpenGL and 3D cards.
2. A 100Mb network is required in order to allow the IDE to Runtime communication to work in all conditions. The AKDWorkBench AutoTuner and Scope both require 100Mb of bandwidth to function properly.
3. IE9 should be considered a minimum. Later versions of the browser are more compliant with web standards and afford better performance and compatibility.

✦ *TIP*

See the topic Connect Remotely for information about the ports used by the KAS IDE which may need to be opened to support connecting from an external network.

3.2 Firmware & Software Requirements

KAS is comprised of several software components integrated together to provide a complete motion system. We recommend the following component software versions for best performance and compatibility.

3.2.1 Computer Software

Software Images	Recommended Version
KAS IDE	3.04.0

3.2.2 Firmware Requirements

Controller Firmware to use with KAS version 3.04

Description	Type	Name
800 MHz PCMM	KAS Runtime	KAS Runtime Firmware for AKD-PCMM (KAS-PCMM-M-MCEC)
800 MHz AKD PDMM	KAS Runtime	KAS Runtime Firmware for AKD-PDMM (KAS-PDMM-M-MCEC)
1.2 GHz PCMM	KAS Runtime	KAS Runtime Firmware for AKD-PCMM (KAS-PCMM-M-M1EC)
1.2 GHz Dual-Core PCMM	KAS Runtime	KAS Runtime Firmware for AKD-PCMM (KAS-PCMM-M-M2EC)
1.2 GHz AKD PDMM	KAS Runtime	KAS Runtime Firmware for AKD-PDMM (KAS-PDMM-M-M1EC)

Supported drives include: AKD-M (AKD PDMM Drive), AKD2G, AKD-P (Motion Tasking Drive or Position Indexer), and AKD-C/-N. The recommended firmware version is dependent upon your drive's model and revision. Controller firmware is available on KDN.

Drive Firmware to use with version 3.04

Description	Type	Name
AKD Firmware for KAS	Operational	AKD-Firmware-for-KAS-V01-19-00-002
	Resident	R_00-00-63-000.i00
AKD2G Firmware for KAS		AKD2G-Firmware-for-KAS-V02-04-00-000
Firmware for drive built into AKD PDMM	800 MHz AKD PDMM	AKD PDMM Servo Drive Firmware AKD-M-MCEC-01-19-00-002.i00
	1.2 GHz AKD PDMM	AKD PDMM Servo Drive Firmware AKD-M-M1EC-01-19-00-002.i00
AKD Drive Firmware	AKD-N	AKD-N-xxEC-01-19-00-002.i00
	AKD-P	AKD-P-NBxC-01-19-00-002.i00
AKD2G Drive Firmware	AKD2G-SPE	AKD2G-S-(E)-A-02-04-00-000.i00

AKD and AKD2G firmware is available on KDN.

✎ TIP

Please be aware that you may get a F106 error after upgrading your AKD firmware. This indicates that non-volatile parameters are not compatible between the two firmware versions. Resetting the drive to the default memory values using Parameter Load will fix this error.

✎ TIP

`FBUS.PARAM05` bit 5 should be set to 0, which is the default value. This will prevent an error E33 and

EtherCAT not starting. If it is not set to the default, the rotary switch of the drive is used to set the EtherCAT Station Alias. This can conflict with the address that KAS is writing.

3.2.2.1 Mandatory Resident Firmware for AKD

The recommended resident firmware is v63 (R_00-00-63-000). The recommended resident firmware for AKD-C and AKD-N is v63 (R_00-00-63-000). To reliably support the EtherCAT Firmware Download, the resident firmware must be at least version 35. Please contact Kollmorgen for any AKD Drive with resident firmware lower than v35.

3.2.3 Kollmorgen Visualization Builder

Software Images	Recommended Version	Download
Kollmorgen Visualization Builder (KVB)	2.40	

The new installation package contains both the IDE and runtime for TxC panels. The KVB ZIP file contains two different installers:

Install Type	File	Notes
New installation	setup.exe	This is the complete package which will install all prerequisite components.
Runtime	RuntimeSetup.exe	This package contains runtime software for TxC panels.

Supported by KVB 2.40

Hardware / Software	Versions
Operating Systems	Windows® 7, Windows 8, Windows 10
Controllers	PCMM, AKD PDMM
HMI	All Kollmorgen AKI panels

NOTE

The KAS IDE creates projects using KVB 2.0. When you open a version 2.0 project by double-clicking on it, KVB will upgrade the project to version 2.40.

Project Conversion
Project must be converted in order to be opened in this version of designer, this operation cannot be undone. Do you want to convert the project now?
Yes   No
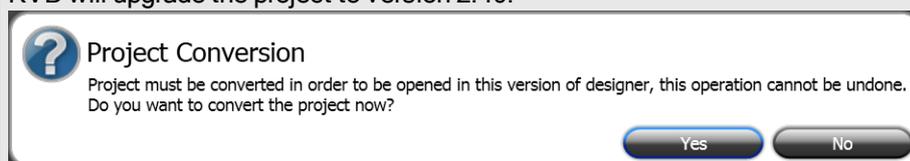
① IMPORTANT

KVB 1.2 projects are not compatible with KVB 2.x. An attempt to open a v1.2 project with v2.x will result in an alert message. If accessing v1.2 projects is important, we recommend keeping both versions installed on your system. New panels will automatically use KVB 2.0.

➤ TIP

If you have a KVB 1.2 project that needs to be updated in KVB 2.x, please contact Kollmorgen.

3.3 KAS Controls

KAS Runtime is compatible with, and has been verified with the following hardware models:

Description	Model Number	Main Characteristics
PCMM, 800 MHz single core	AKC-PCM-MC-080-00N-00-000	Standard Mutli-axis Controller
PCMM, 1.2 GHz single core	AKC-PCM-M1-120-00N-00-000	High Performance Multi-Axis Controller
PCMM, 1.2 GHz dual core	AKC-PCM-M2-120-00N-00-000	High Performance Multi-Axis Controller
AKD PDMM, 800 MHz	AKD-M0xxxx-MCEC-0000	Standard Drive Resident Controller
AKD PDMM, 1.2 GHz	AKD-M0xxxx-M1EC-0000	High Performance Drive Resident Controller

3.4 Allow Simulator to Use HTTP Communication

The Simulator needs to open HTTP ports to allow communication. The first time Simulator is run, Windows will prompt you to block or unblock the KAS application. You should allow access to all of these requests to ensure correct behavior.
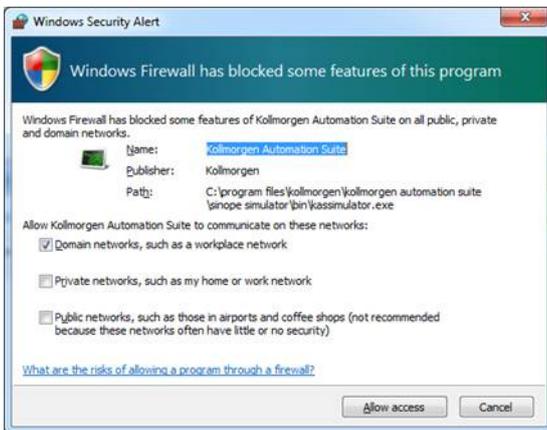
The Simulator uses port 80 for the web server. This communication channel is mandatory for Simulator to work properly. So please close any application, such as VOIP, that may use port 80 before starting Simulator.

For more information see Start Simulator.

4 What's New in KAS v3.04

KAS v3.04 introduces the following new features.

4.1 Function Blocks

- New function blocks have been added for TCP/IP communication. See TCP/IP Function Blocks for more information.
- The eipAdapter function block has been added to read adapter status bits.
- New file management function blocks have been created which run in background cycles. The existing file management function blocks have been deprecated. See File Management for more information.

4.2 Safety

The KAS IDE now supports using a BBH FSoE Master and SafePLC with an AKD2G with SMM.

- Support for BBH SCU-1-EC.
- Ability to map read-only variables to FSoE PDO objects.
- Add, Delete, Import, and Export SafePLC projects from the KAS IDE.
- Launch SafePLC directly from the KAS IDE.
- SafePLC project files are stored in KAS projects.

4.3 KAS IDE WorkBench Improvements

- When connecting, the view now provides a status during communication initialization.
- Visual in-progress indicators for navigation and view loading.
- Optimized command grouping for communication performance.
- The KAS IDE WorkBench internal behavior parameters have been adjusted for best performance across Ethernet with latencies up to 200 msec.

4.4 E-Bus I/O Support

- Support for the new Kollmorgen AKT2G E-Bus Coupler, Digital Input/Output Slices, and Analog Input/Output Slices.
- The IO tab views for the AKT2 I/O Slices support PLC variable mapping. Presently, the basic digital and analog input/output variable mapping are supported with IO tab views. The Analog I/O views do not support offset and gain parameters yet.

4.5 Other Items

- DriveParamStrRead is added to read a drive parameter string, which is useful for AKD2G fault strings.
- Multi-select PDO objects for mapping to variables. See Map PLC Variable to PDO Object.
- **PLCopen User Units Parameters:** There are new axis parameter identifiers for the User Units (UU) numerator () and denominator (FBU): `MC_AXIS_PARAM_UU_FB_RATIO_NUM` and `MC_AXIS_PARAM_UU_FB_RATIO_DEN`. Additionally, there is a new axis parameter to read the UU/FBU ratio - `MC_AXIS_PARAM_UU_FB_RATIO`. For more details, please see the table in Axis Parameters.
- Manually adding an EtherCAT device uses the latest revision by default.
- Auto-complete opening parentheses in the ST Editor.

4.6 AKD2G Support

This release of KAS supports the AKD2G drives. This release supports:

- Both single and dual-axis models
- Functional Safety Option #1, #2, and #3

Limitations:

- SMM basic and advanced support is available. Only Workbench safety parameter modules are supported with the BBH SCU-EC1.
- The KAS IDE drive status bar cannot detect if AKD2G is active or inactive in pre-op mode. This feature will be available in a future **AKD2G for KAS** firmware release.

> ⓘ **IMPORTANT**
>
> If you are upgrading an application from v2.12 (or older) and switching from AKD to AKD2G drives, or from a single-core PCMM to a dual-core PCMM, you need to update the sub-programs from UDFBs. The sub-programs need to be recreated to support the new devices.

4.7 AKD Firmware Notes

- The AKD Firmware v1-16 (and higher) supports a new drive parameter, ECAT.LEGACYREV, to enable a backwards compatibility RevisionNo (0x2). By default, AKD-Series drives will ship with the latest production release firmware, with ECAT.LEGACYREV = 1, for backwards compatibility.
- The AKD Firmware version 1-16 (and higher) supports a 3rd FMMU if the ECAT.LEGACYREV = 0. The advantage of using a 3rd FMMU is 30% performance improvement with the KAS IDE embedded Workbench communication.
- EtherCAT RevisionNo: EtherCAT provides an optional field to identify a vendor specific RevisionNo for a device and a field to specify the logic to CheckRevisionNo for device compatibility. The KAS IDE and Runtime supports multiple RevisionNos for the same Vendor/ProductID. In previous KAS versions, the EtherCAT initialization would generate a device mismatch error, if the device's RevisionNo and the project's RevisionNo did not match. If the device's ESI file does not specify the CheckRevisionNo logic, then by default the KAS Runtime will allow any RevisionNo at EtherCAT initialization. Also, the IDE will allow you to map physical devices to project devices with different RevisionNos and keep the project device configurations.
- Limitation: The CheckRevisionNo options "equal or greater than" (EQ_OR_G, LW_EQ_HW_EQ_OR_G, and HW_EQ_LW_EQ_OR_G) are not supported. They will be evaluated as "equal" (EQ).

5 What's Changed in KAS v3.04

The following changes have been implemented for this release.

- **Axes Groups**: The PLCopen code generated from the IDE project tree axes group(s) will no longer automatically enable each axes group. Your PLC application code must enable an axes group before using it. For more details see MC_GrpEnable.
- **Improved Input (Tx) PDO Latency with AKD and AKD2G**: The latency for drive inputs -> controller has been reduced by 1/2 EtherCAT cycle for the AKD and AKD2G drives. If you are upgrading from a previous release, you may need to adjust controller parameters that use actual position or time-based capture for optimum performance. For more details, please see Tuning Controller Performance for EtherCAT Communication Latency.
- **Save As... project upgrade prompt:** If you open a v3.02 (or older) project containing PLCopen axes, the KAS IDE will prompt to create a backup copy of the project file before upgrading your project. KAS IDE versions 3.02 (or older) cannot translate PLCopen Axes or Axes Groups with KAS projects from KAS IDE v3.03 (or higher). Making a backup copy of a project before upgrading to v3.03 (or higher) is recommended. For more details, see KAS IDE to Project File Compatibility.
- **Deprecated File Management Functions**: The existing file management functions could block PLC cycles and have been deprecated. See *DEPRECATED* File Management Functions for a list of the new and old functions.

6   What's Fixed in KAS v3.04

Items fixed by KAS v3.04

Defect	Description
BZ-8242	Missed cycles while doing file operations.
BZ-8633	When a crash report fails due to error (ex: timeout, connection failure, …) report is lost. User cannot resend.
BZ-9832	Cannot add libraries (.KAL files) with non-ASCII file names.
BZ-9848	KAS IDE broken if Windows user name contains non-ASCII characters.
BZ-10453	ESI CheckRevisionNo Algorithms are not Implemented. Warning! This change causes an incompatibility with previous KAS IDE versions.
BZ-10456	KAS IDE WorkBench freeze, partial tree/no views, or crash occur with heavy loading.
BZ-10485	Duplicate CoE InitCmds for AKD2G Safety Models with Modules
BZ-10498	Adding more than one axis to axis group from project tree fails.
BZ-10509	MOD/MODR/MODLR with zero input or negative base.
BZ-10526	KAS IDE will crash at Motion Engine Selector after import PipeNetwork.
BZ-10538	MC_CamResumePos(…) output value incorrect with relative position camming.
BZ-10546	PLCopen axis user units cannot be set to a specific value.
BZ-10550	Online Config Mode Fault with large EtherCAT networks.
BZ-10568	KAS IDE Fieldbus Editor view fails to open properly.
BZ-10577	Actual position jitter via EtherCAT.
BZ-10581	KAS IDE O-Scope w/ large time base blocks the forcing variable pop-up.
BZ-10593	PDO size in the KAS IDE **FSoE/PDO connections** tab view does not include padding.
BZ-10598	KAS IDE WorkBench unresponsive with slow Ethernet and Control Panel.
BZ-10599	MLAxisReAlign doesn't work if DeltaPos input is greater than the modulo.

7 Known Issues

| Defect	Description
BZ-10575	PipeNetwork Trigger block does not support a non-modulo input.
BZ-10458	PLC Variable Creation Wizard don't show the mapping.
BZ-10451	Cannot start application with direct Ethernet connection.
BZ-10419	Drag 'n' drop variable from UDFB instance to watch window does not display the value.
BZ-10275	PxMM controller bus time not synchronized with DC master time.
BZ-9975	KAS IDE crashes in the Workbench Performance Servo Tuner Window.
BZ-9928	ESI file list is not updated when good and bad ESI files are added at the same time.
BZ-9835	Non-ASCII characters in projects not handled properly in the KAS IDE.
BZ-9834	Import/export from/to non-ascii file names does not work correctly.
BZ-9496	AKD-N firmware download fails if 4x drives are selected.
BZ-9359	PDO objects not defined in the object dictionary (or 24bit size) will not work properly with MLSmpXxxxx(...) functions.
BZ-8659	PLCopen move blending with jerk. If the blending move is commanded with an unreachable velocity, the move may abruptly decelerate to the final position within one sample, exceeding the specified deceleration rate.
BZ-8654	E21 when KAS IDE running O-Scope is disconnected.
BZ-8645	Adding ESI File After Scanning Results in No Selected PDOs.
BZ-8644	PLCopen S-Curve move may not reach target with small Jerk.
BZ-8643	EtherCAT scan fails after a AKD drive firmware download failure with a wrong EtherCAT topology.
BZ-8636	Recovered projects don't recover imported libraries (.kal files).
BZ-8608	KAS IDE views do not scale if Windows text scaling is > 100%.
BZ-8605	MLInitTrig does not configure the AKD Capture engine correctly for a negative edge trigger.
BZ-8588	ECAT network restore fails to recover from drive FW download failure.
BZ-8508	PDOs need padding to meet byte boundary requirement. The IDE PDO Editor does not automatically pad PDOs on non-byte boundaries. The problem can be avoided by manually adding dummy objects to pad the PDO size to line-up on byte boundaries. For more details, see the article on KDN.
BZ-8504	KL3314 Operation. Temperature values are not calibrated properly to the thermocouple. To work-around the problem, use ECATWriteData to setup the control word (16xE0) and send value (16x2006) to Register R32 and a second ECATWriteData to write zero (0) to the control word to set up the continual output of the temperature.
BZ-8482	Modbus renumber address does not work with String variables. In the Fieldbus Editor Modbus configurator, if you right click input registers and choose the renumber address option, it will make the addresses overlap.
BZ-8212	Modified cam file is not downloaded when forcing an Online Change.
BZ-8138	WebBrowser component not working for TxB panels.
BZ-8132	K-Bus slices analog inputs Offset parameter does not work.
BZ-7985	IDE disconnects from the controller after several days.
BZ-7759	Breakpoint with For(...) loop, increases VM load significantly.
BZ-7728	IDE animation with non-matching project versions.
BZ-6240	IDE always reports the project has been modified.

8   Known Limitations

- The KAS IDE drive status bar cannot detect if an AKD2G is active or inactive while in pre-op mode. This feature will be available in a future firmware release.
- Only WorkBench safety parameter modules ae supported with the BBH SCU-EC-1.
- The undo action is not possible for all operations.
- Find/Search/Replace function: Search & Replace function is not supported in Pipe Network. Search and replace for HMI are supported only with local CTRL+F.
- In SFC programs, breakpoints can only be set on transitions (i.e. in First Level diagram), and not in steps or conditions. With a breakpoint set on transition, you can debug cycle by cycle.
- SFC programs are limited to 64kByte size due to the bytecode engine. If the SFC program exceeds 64kBytes, the compiler will generate a warning message: **Warning: limit is 64KB!**
- Plugging the EtherCAT cable to the OUT port is not detected and is not reported as an error.
- PLC Variable mapping: each PLC variable can be mapped to an EtherCAT IO and exclusively to:
    - Modbus for an HMI
    - Or to an PDMM Onboard IO
    - Or to an external driver

  For example, a PLC variable cannot be mapped to Modbus and Onboard PDMM IO at the same time.

8.1   FFLD Animation Limitation

The animation of FFLDs defined as UDFBs has a limitation where connected rails are not being animated. This is not the case when FFLDs are defined as programs or subprograms.
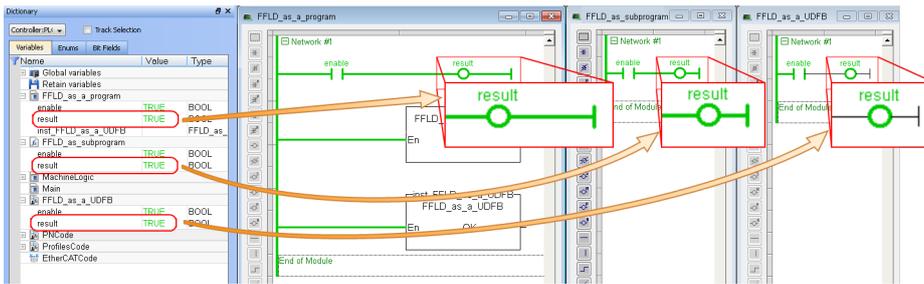
8.2   EtherCAT Limitations

- **Cabling:** Plugging the EtherCAT cable from an OUT port to an OUT port is not detected and not reported as an error.
- **External EtherCAT Configuration:** If an external EtherCAT XML file needs to be used, the file `AKD-for-KAS.xml` should be used as the ESI file for AKD. This ensures proper operation with KAS. It can be found at
  `C:\Users\<user.name>\AppData\Local\Kollmorgen\KAS\Astrolabe\ESI\.`

9 Third Party EtherCAT Device Support

This section summarizes the known capabilities and limitations with KASsupport for 3rd party EtherCAT devices:

9.1 Requirements

- All 3rd party devices must have an ESI file containing the device information, features, and settings.
- MDP devices must support automatic module discovery at EtherCAT network scan.

9.2 Limitations

- KAS may not discover MDP fieldbus gateway devices that require MDP gateway profiles, implemented to the ETG 5001.3 specification. This includes gateway protocols: CAN, CANopen, DeviceNet, Interbus, and IO Link.
- PDO upload is not supported.
- Manual slot configuration is not supported with MDP devices.
- IAI RCON/MCON Gateways (RCGW-ECT) may fail to reach op-mode with specific EtherCAT network topologies. The RCGW-ECT may generate a CoE emergency message. These gateways are presently not supported.

About KOLLMORGEN

Kollmorgen is a leading provider of motion systems and components for machine builders. Through world-class knowledge in motion, industry-leading quality and deep expertise in linking and integrating standard and custom products, Kollmorgen delivers breakthrough solutions that are unmatched in performance, reliability and ease-of-use, giving machine builders an irrefutable marketplace advantage.

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