# Kollmorgen Automation Suite Release Notes



Kollmorgen Automation Suite

## INTEGRATED DEVELOPMENT ENVIRONMENT

"Because Motion Matters"

Kollmorgen Automation Suite Integrated Development Environment combines a market leading Motion Engine, tightly integrated PLC engine and HMI developer with the ability to configure an array of motion hardware such as motors, drives, gearboxes and actuators as well as automation hardware such as I/O modules and HMI's. Providing both process control capabilities and unsurpassed motion control programming delivers the very best in machine automation technology.

Document Edition: L, December 2019 Valid for KAS Software Revision 3.03 Valid for AKD firmware version: 01-19-00-002 Valid for AKD2G firmware version: 02-03-00-000 Part Number: 959720



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

**KOLLMORGEN** 

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- Qwt project (distributed under the terms of the GNU Lesser General Public License see also <u>GPL</u> terms)
- 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>U-Boot</u>, 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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## 2 Introduction

Welcome to KAS v3.03! This release contains new features and many improvements. This document is intended to help existing users understand the differences between this and KAS v3.02. 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" (p. 5) this section covers system requirements as well as provides firmware, software, and hardware information.
- "What's New in KAS v3.03" (p. 9) an overview of new features.
- "What's Changed in KAS v3.03" (p. 11) 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 v3.03" (p. 12) a list of issues addressed in this release.
- "Known Issues" (p. 13) this section contains issues we are aware of, and methods for avoiding or working around them.

#### ★ TIP

We recommend that you visit the <u>Kollmorgen Developer Network ("KDN"</u>). 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 3.03.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 <b>e</b> , Google Chrome <b>o</b> , Mozilla FireFox <b>a</b> , or Internet Explorer (IE9 or later, see Note #3) <b>e</b> .

#### 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 <u>Connect Remotely</u> 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	3.03.0

#### 3.2.2 Firmware Requirements

Description	Туре	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 3.03

Description	Туре	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-V02-03-00-000
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-02-03-00-000.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 nonvolatile 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 <u>contact Kollmorgen</u> 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 / Soft	ware	Versions
Operating Syste	ems	Windows® 7, Windows 8, Windows 10
Controllers HMI		PCMM, AKD PDMM
		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.

2	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?

#### **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 v3.03

KAS v3.03 introduces the following new features.

### 4.1 EtherCAT FSoE

The KAS IDE can now display the connections to transfer safety-critical process data sent via the EtherCAT frames. The new <u>FSoE/PDO Connections Tab</u> displays the Input (Tx) and Output (Rx) PDOs for discovered EtherCAT devices. PDOs can be selected and connected, and will generate the connected information in the ENI file. The KAS Runtime copies the PDO data between the connected PDOs. The FSoE protocol, communication, and state machine are handled by the EtherCAT Safety devices.

## 4.2 T-Bot, H-Bot, & Gantry Robotics

Kinematic transforms have been added to support H-Bot, T-Bot, and Gantry robots. For more details, see the following topics

- The KAS IDE's Project Explorer now supports Axes Groups for PLCopen axes.
- The <u>MC\_KIN\_REF Structure</u> has been added to define the robotic system transform type and its parameters.
- The <u>MC\_SetKinTra</u> function block has been added. This function block sets the kinematic transform between the Machine Coordinate System and the Axes Coordinate System. This allows the application to command motion in Cartesian coordinates for the robotic system.

### 4.3 AKD2G MDP Support

The AKD2G with SMM options #2 and #3 is supported by the KAS IDE. During scan/discovery the AKD2G default safety module profiles will be automatically added to the AKD2G device in the KAS IDE project tree. The module profiles can be changed in the project tree, by deleting the default modules under the AKD2G device and then adding different modules to the AKD2G device.

### 4.4 AKD2G Backup and Restore

The EtherCAT devices backup and restore supports the AKD2G models. For more details see <u>EtherCAT</u> <u>Devices Restore</u>.

## 4.5 AKD2G Support

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

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

#### ★ TIP

If you are using AKD2G drives, please consider contacting us to get the latest (beta) KAS IDE software package and drive firmware to have the latest AKD2G features.

#### 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.

#### 4.6 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 v3.03

The following changes have been implemented for this release.

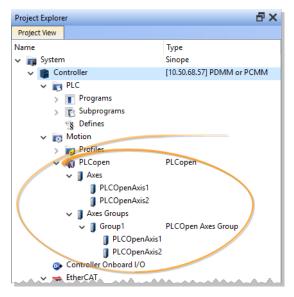
#### 5.1 WorkBench2 Integration

WorkBench has received a significant update to support AKD2G devices. It should be noted that AKD and AKD2G devices may not have the same views available, and the views they do have in common may or may not look alike. Reviewing the following topics is recommended.

- What's New in WorkBench 2.0?
- AKD2G vs. AKD

#### 5.2 PLCopen Axes Groups

The KAS IDE has been updated to contain Axes and Axes Groups nodes under PLCopen. The individual PLCopen axes are located in the Axes node. Axes Groups may be created and axes can be assigned to groups. The groups are a virtual association for coordinated motion and robotics. See <u>Axes Groups</u> for more information.



#### 

KAS IDEversions 3.02 (or older) cannot translate PLCopen Axes or Axes Groups in KAS projects from v3.03 (or higher). If a project file from v3.03 contains PLCopen Axes or Axes Groups, the axes cannot be edited or re-created in earlier versions. **Be sure to create a backup copy of the project file, before upgrading your project from v3.02 to v3.03.** For more details see <u>KAS IDE to Project File</u> Compatibility.

### 5.3 Miscellaneous

- Updated project comparison function. See Compare PLC Programs
- Create Variables from editors. See Overview: Create Variables
- Improvements to the ST Editor including expand/collapse of On Do End\_DO loops and comments are recognized with group/ungroup lines.

## 6 What's Fixed in KAS v3.03

### Items fixed by KAS v3.03

Defect	Descriotion
BZ-6554	Add Variable window in Dictionary Window is not getting closed when dim of 0 or 1 is selected and clicked on ok
BZ-8655	Multi-dimension cannot be set when adding a variable
BZ-10340	MC_GrpReadCmdVel doesn't report correct value for group velocity when axes group is in e- stop state.
BZ-10370	E22 on simulator with ECATCommErrors function block
BZ-10383	IDE Crashes when opening SoftScope if OpenGL is not supported
BZ-10384	Web-server wheel position value wrong for PLCopen custom units
BZ-10385	Lower part of main view is cut-off when switching windows
BZ-10407	MC_MoveAbsolute() to apply the cumulative Superimposed move distance. For more details, see the MC_AXIS_PARAM_APPLY_SUPERIMPOSED_DISTANCE parameter in: Understanding KAS > Motion Concepts > PLCopen > Axis Parameters
BZ-10412	EtherCAT Slave Station Alias EEPROM CRC checksum should include the reserved locations 0x5, 0x6 data. BBH SCU FSoE EtherCAT master has non-zero values in reserved locations, causing EEPROM corruption with KAS IDE versions 3.03.0.80412 (or older).
BZ-10420	IDE-Workbench crash when user variable is selected in WB Scope view
BZ-10421	IDE fails to find zlibwapi.dll if a disconnected network is in the Windows Path
BZ-10422	Velocity compensation factor and filter parameters can not be set for digitizing axes
BZ-10429	Save KAS file from Coordinated motion template is corrupted
BZ-10450	IDE disconnects when IDE-WB Scope view is opened
BZ-10454	Compile error: Create new library
BZ-10455	KAS Simulator crashes When Closing 2nd Instance

## 7 Known Issues

Defect De	escription
<b>BZ-10485</b> Du	plicate CoE InitCmds for AKD2G Safety Models with Modules
BZ-10465 IDI	E AKD2G Safety drive views take a long time to open
	C Variable Creation Wizard don't show the mapping
BZ-10456 IDI	E-WB freeze, partial tree/no views, or crash occur with heavy loading
<b>BZ-10453</b> ES	I CheckRevisionNo Algorithms are not Implemented
<b>BZ-10451</b> Ca	nnot start application with direct Ethernet connection
BZ-10419 Dra	ag 'n' drop variable from UDFB instance to watch window does not display the value
BZ-10275 Px	MM controller bus time not synchronized with DC master time
BZ-9975 KA	S IDE crashes in the Workbench Performance Servo Tuner Window
<b>BZ-9928</b> ES	I file list is not updated when good and bad ESI files are added at the same time
BZ-9848 KA	S IDE broken if Windows user name contains non-ascii characters
BZ-9835 No	n-ASCII characters in projects not handled properly in the KAS IDE
BZ-9834 Im	port/export from/to non-ascii file names does not work correctly
<b>BZ-9832</b> Ca	nnot add libraries (.KAL files) with non-ASCII file names
BZ-9496 AK	D-N firmware download fails if 4x drives are selected
	O objects not defined in the object dictionary (or 24bit size) will not work properly with .SmpXxxxx() functions
vel	Copen move blending with jerk. If the blending move is commanded with an unreachable locity, the move may abruptly decelerate to the final position within one sample, exceeding a specified deceleration rate.
<b>BZ-8654</b> E2	1 when KAS IDE running O-Scope is disconnected
<b>BZ-8645</b> Ad	ding ESI File After Scanning Results in No Selected PDOs
BZ-8644 PL	Copen S-Curve move may not reach target with small Jerk
	nerCAT scan fails after a AKD drive firmware download failure with a wrong EtherCAT pology
<b>BZ-8636</b> Re	covered projects don't recover imported libraries (.kal files)
	nen a crash report fails due to error (ex - timeout, connection failure, …) report is lost. User nnot resend.
BZ-8608 KA	S IDE views do not scale if Windows text scaling is > 100%
BZ-8605 ML	InitTrig does not configure the AKD Capture engine correctly for a negative edge trigger.
BZ-8588 EC	CAT network restore fails to recover from drive FW download failure.
aut add	OOs need padding to meet byte boundary requirement. The IDE PDO Editor does not tomatically pad PDOs on non-byte boundaries. The problem can be avoided by manually ding dummy objects to pad the PDO size to line-up on byte boundaries. For more details, e the article on KDN.
wo val	3314 Operation. Temperature values are not calibrated properly to the thermocouple. To ork-around the problem, use ECATWriteData to setup the control word (16xE0) and send lue (16x2006) to Register R32 and a second ECATWriteData to write zero (0) to the control ord to set up the continual output of the temperature.
COI	odbus renumber address does not work with String variables. In the Fieldbus Editor Modbus nfigurator, if you right click input registers and choose the renumber address option, it will ake the addresses overlap.
BZ-8242 Mis	ssed cycles while doing file operations

#### Release Notes | 7 Known Issues

Defect	Description
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

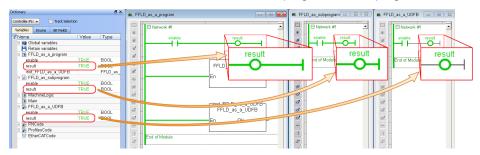
## 8 Known Limitations

- The 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.

#### About KOLLMORGEN

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