Kollmorgen Automation Suite

KAS v2.6 KAS Release Notes

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Valid for Software Revision 2.6

Keep all manuals as a product component during the life span of the product.
Pass all manuals to future users / owners of the product.

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Table of Contents

1 Introduction

Welcome to KAS v2.6! This release contains new features and many improvements. This document is intended to help existing users understand the differences between this and the prior release. If you are new to KAS, you will be better suited starting off with other documents, such as the Installation Guide.

This document has five sections:

- "Installation" (see page 9) — this section covers system requirements as well as provides firmware, software, and hardware information.
- "What's New" (see page 11) — an overview of new features.
- "What's Changed" (see page 19) — 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" (see page 23) — a list of issues addressed in this release.
- "Known Issues" (see page 25) — this section contains issues we are aware of, and methods for avoiding or working around them.

ⓘ *TIP*

This document contains links to more complete descriptions in the online help.

Wherever you find this icon ⓘ, you may click it and go to the help topic. Please note that these links will not work if this PDF is opened from a location other than the KAS install directory.

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2 Installation

2.1 System Requirements

Element	Requirement
KAS IDE	KAS IDE and Simulator are compatible with any PC running the following operating systems: ● Windows® XP (32- or 64-bit) ● Windows Vista® (32- or 64-bit) ● Windows® 7 (32- or 64-bit) ⓘ **TIP** Please be sure your operating system is fully updated with the latest patches. The PC must meet the minimum requirements specified by the operating system manufacturer for CPU speed and RAM.
WebServer	A modern web browser is required to access the web server. We recommend Internet Explorer 9, Mozilla FireFox (v.11 or later), or Google Chrome.

2.2 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.

2.2.1 IDE, Controller, and Programmable Drive Software

Software Images	Recommended Version	Download
KAS IDE	2.6.0	n/a
AKD PDMM Runtime Firmware	2.6.0	
PAC master image (includes KVB 1.20.542)	2012-04-30	n/a

2.2.2 AKD Drive Firmware Requirement

KAS is compatible with AKD-M (AKD PDMM Drive) and AKD-P (Motion Tasking Drive or Position Indexer) drives. The recommended firmware version is dependent upon your drive's model and revision. The operational image associated with this release is 01-08-00-003.

AKD firmware to use with version 2.6		Download
AKD PDMM Servo Drive Firmware	AKD-M-MCEC-V01-08-00-003.i00	
AKD EtherCAT drive, up to r.8	AKD-P-NAEC-V01-08-00-003.i00	
AKD EtherCAT drive, r.9	AKD-P-NBEC-V01-08-00-003.i00	
Resident image	R_00-00-40-000	n/a

ⓘ **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.

2.2.2.1 Mandatory Resident Firmware

The recommended resident firmware is v40. 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.

2.2.3   Kollmorgen Visualization Builder

Software Images	Recommended Version	Download
Kollmorgen Visualization Builder (KVB) master image	1.20.545	

2.3   KAS Compatible Controls

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

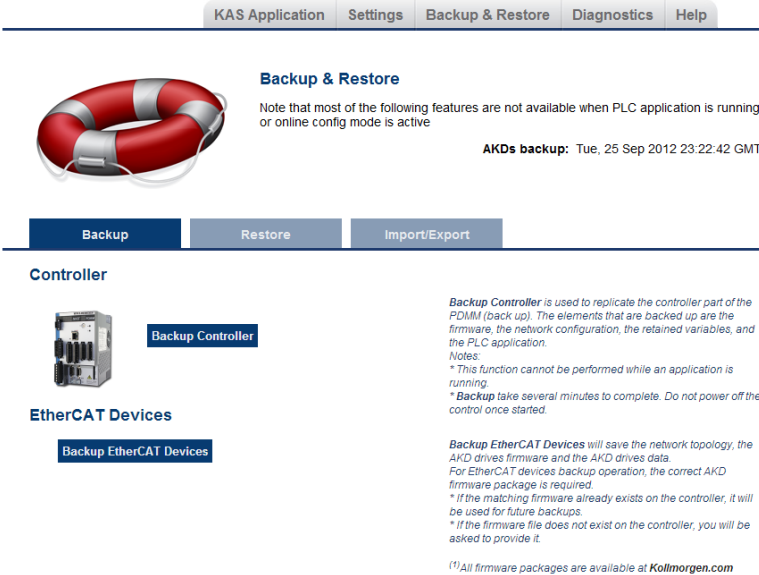| Description	Model Number	Main Characteristics
Panel PAC	AKC-PNC-C1-224-10N-00-000	Mono-core 1.2 GHz CPU, 2GB RAM, 10" display
Panel PAC	AKC-PNC-C1-224-15N-00-000	Mono-core 1.2 GHz CPU, 2GB RAM, 15" display
Panel PAC	AKC-PNC-D1-224-15N-00-000	Dual-core 1.86 GHz CPU, 2GB RAM, 15" display
Panel PAC	AKC-PNC-D1-224-17N-00-000	Dual-core 1.86 GHz CPU, 2GB RAM, 17" display
Performance Box Controller	AKC-PLC-C1-224-00N-00-000	Mono-core 1.2 GHz CPU, 2GB RAM
Performance Box Controller	AKC-PLC-D2-224-00N-00-000	Dual-core 1.86 GHz CPU, 2GB RAM
Performance Box Controller	AKC-RMC-D2-224-00N-00-000	Dual-core 1.86 GHz CPU, 2GB RAM
AKD PDMM	various	

NOTE   KAS IDE and Simulator should not be installed on a PAC or AKD PDMM.

3 What's New

3.1 EtherCAT Devices Backup & Restore

The PAC and AKD PDMM support backup/restore of AKD drives on the EtherCAT network. This feature is useful as a maintenance procedure to replace any AKD drives in an operational machine.

Accessed from the controller's web server, this functionality allows you to backup and restore the firmware and parameters of all AKD drives as well as all EtherCAT devices' Unique IDs. This document provides an overview of the functionality. See the Help for complete coverage of this subject. ⓘ

> **ⓘ TIP**   AKD PDMM system backup or restore is a two-step process:
>
> 1. Backup or Restore the AKD PDMM.
> 2. Backup or Restore the AKDs (including the AKD drive inside the AKD PDMM).

3.1.1 AKD Firmware

The AKD Backup and Restore feature requires an AKD firmware package containing the AKD firmware for all hardware variants. All the drives must have the same version for the backup to be performed. When a backup is performed, the system checks the firmware. If the correct firmware package is not present on the SD Card for AKD PDMM or on the flash for PAC, you will be prompted to specify a firmware package.

The AKD firmware package is available in the KAS install (in the folder `Astrolabe\DrivesFW`) or on our website (click here), in the "Firmware for KAS" section.

AKD™ Advanced
Kollmorgen Drives™

The Kollmorgen AKD™ Series includes a complete range of Ethernet-based servo drives that are fast, feature-rich, flexible and easy to integrate into any application. These next-generation drives offer plug-and-play commissioning for instant, seamless access to everything in your machine. Paired with our best-in-class servo components, AKD drives offer industry-leading performance, communication options and power levels—all in a smaller footprint.

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| Features | Specification | Manuals | Literature | Drawings | Software/Firmware | Application Notes | Archive |

Type	Title	Size	Date	
Firmware for KAS				
	AKD-Firmware-for-KAS-V01-07-00-002	7.5 MB	10/2/2012	Email
Sample Projects				
	AKD EtherNet-IP_Sample_Projects_en-us_revV01-07-00-002	1.1 MB	10/4/2012	Email
General				

3.1.2 Restore

Clicking on **Restore EtherCAT Devices** will automatically scan the network, identify replaced drives, and restore them. Clicking the **Advanced** button allows you to scan the network and view the topology, including any differences. From here you may manually select and restore devices.

Restore with a compatible drive
If the results of the network scan show that the replaced drive is compatible, the new drive is selected in the topological map, and you can restore the device with backed-up parameters.

EtherCAT Devices

Restore EtherCAT Devices

<< Advanced

Restore operation allowed: topologies match (Backup date: Thu, 01 Nov 2012 07:37:02 GMT)
Physical topology
PDMM Controller
☐ 0: AKD AKD-P00306-NAEC-0000 (SN: 2753724427)
☐ 1: AKD AKD-P00606-NAEC-0000 (SN: 2753003540)
☐ 2: Coupler (SN: 0)
Please select the devices to restore   Refresh

Restore with an incompatible drive or network with different topology
If the results of the network scan show that the replaced drive is not compatible or that the network topology does not match, the differences are shown so you can correct the physical topology.

EtherCAT Devices

Restore EtherCAT Devices

<< Advanced

Restore operation not allowed: topologies are not matching (Backup date: Thu, 01 Nov 2012 07:37:02 GMT)

Physical topology	**Backup topology**
PDMM Controller	PDMM Controller
0: AKD AKD-P00306-NAEC-0000 (SN: 2753724427)	0: AKD AKD-P00306-NAEC-0000
1: Coupler (SN: 0) new !	1: AKD AKD-P00606-NAEC-0000
2: AKD AKD-P00606-NAEC-0000 (SN: 2753003540) new !	2: Coupler

Refresh

3.1.3 Import/Export

This functionality is used to copy an AKD drive's backup to/from a local machine. If a backup file exists you may export the backup file, otherwise only Import is available.
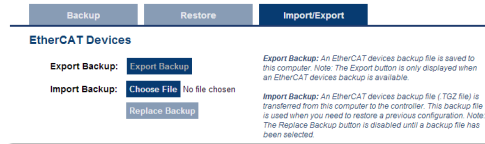
3.2 Motion Programming

3.2.1 PLCopen Registration

KAS supports two forms of registration within PLCopen, Mark to Mark and Mark to Machine.

Mark to Mark Registration is implemented with the function block *MC_MarkRegist* and is based on the desired distance between two registration marks. This distance is used to qualify a "good" mark and then calculate a registration correction.

Mark to Machine Registration is implemented with the function block *MC_MachRegist* and is based on a desired target position on a machine axis. Like Mark to Mark registration, Mark to Machine registration uses the desired distance between two registration marks to qualify a "good" mark but it uses an axis position as its basis for correction.

For more detailed information please see Registration Application Guide in the help.

3.2.2 Superimposed Axes with PLCopen

This feature allows the application program to superimpose the moves of multiple axes ("Superimposed Axes") on top of the move of another axis ("Receiving Axis"). This is performed internally by adding the command deltas of the Superimposed Axes to the command delta of the Receiving Axis. Up to four different Superimposed Axes can be superimposed upon a Receiving Axis.

- **MC_AddSuperAxis**. This function block provides the ability to have an axis simultaneously geared and cammed to a master axis. This allows for adding a phase shift to the slave axis over a determined distance on the master axis while the master axis is moving.
- **MC_RemSuperAxis**. This function block removes an individual and/or all superimposed axes from an axis. This allows for disabling some or all of the superimposed axes added to the command position or velocity directly from an application.
- **MC_ReadParam**. This function block has been updated to allow reading the interpolated command position and velocity for each axis. This allows you to properly debug and monitor an application that contains Superimposed Axes.

3.2.3 Cam On The Fly

CAM on the fly is the ability to create and compile a Cam Profile from an application using the new MLProfileBuild function block.

- **MLProfileBuild**. This FB provides the ability to create, modify, and compile CAM Profiles in an application.
- **MLProfileRelease**. This FB is used to release a profile before creating a new one.

3.3 PDMM-Specific New Features

3.3.1 Ethernet/IP

The KAS Runtime includes a fully integrated Ethernet/IP Adapter driver and Scanner driver for exchanging data with Ethernet/IP tag-based devices such as PLCs. Ethernet/IP Adapter, Scanner, Tag Client, and FlexIO/Point IO configurations are supported. The mapping of PLC variables to Profinet is as simple as a drag and drop. See Motion Bus and Fieldbuses in the help for more information. ⓘ
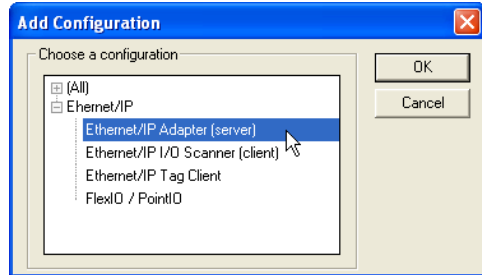
3.3.2 Profinet

An AKD PDMM can be configured either as a Profinet controller or as a Profinet slave. From there, the mapping of PLC variables to Profinet is as simple as a drag and drop. KAS IDE also supports network scans to automatically find and configure each Profinet device that is on a given network, and GSDML to import to configure all type of devices. All the standard Profinet configuration options are available: watchdog, alarms, send rate, Ethernet 802.3ac packets, virtual LAN, etc.. See Motion Bus and Fieldbuses in the help for more information. ⓘ
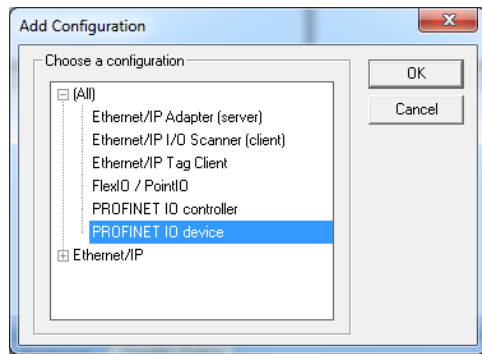
3.4 New Features in the IDE

- **Application Templates:** The application templates now include PipeNetwork and PLCopen motion engine templates that are written purely in FFLD or ST.
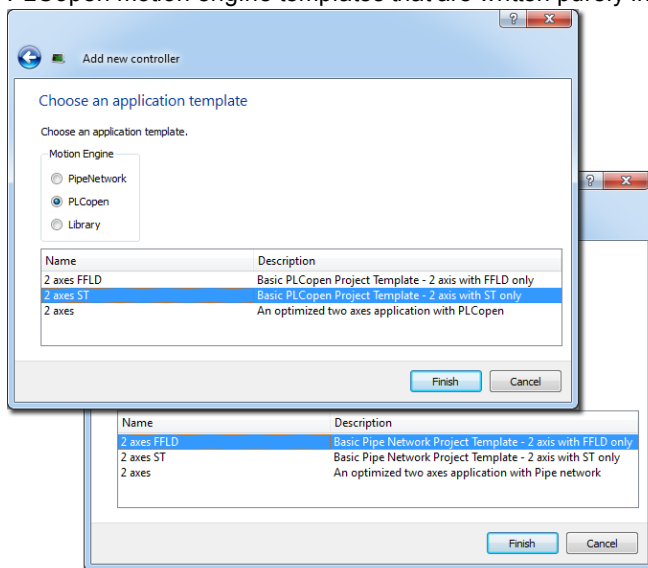
- **ST Intellisense.** Intellisense is now available for Library projects. ⓘ
- **Start application from Online Configuration Mode.** If you are in Online Configuration mode and click the Start button, Online Configuration mode is automatically stopped and the application is started. ⓘ
- **AKD analog output.** AKD analog output is available on the AKD onboard IO mapping. The analog output is therefore available in the PDO. ⓘ
- **Controller's IP**. The controller's IP address is displayed in the project tree.
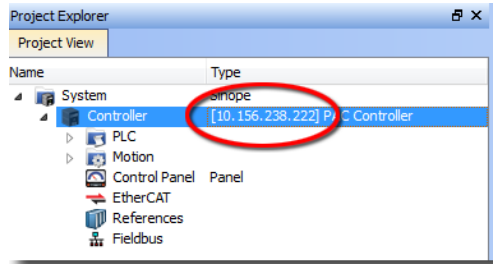
- **Functions/Function Blocks Reorganized**. Motion functions and function blocks that are used by both Pipe Network and PLCopen have been reorganized in the library tree. These common motion functions and FBs have been moved to *Motion/Common*. There is also a Motion/Common tree in the Kollmorgen UDFBs. ⓘ

- **UDFB animated values while application is running.** Double clicking on a UDFB in the project tree will directly animate the value if there is only one instance of this UDFB. You will be prompted to select which instance to animate if there are multiple instances. ⓘ
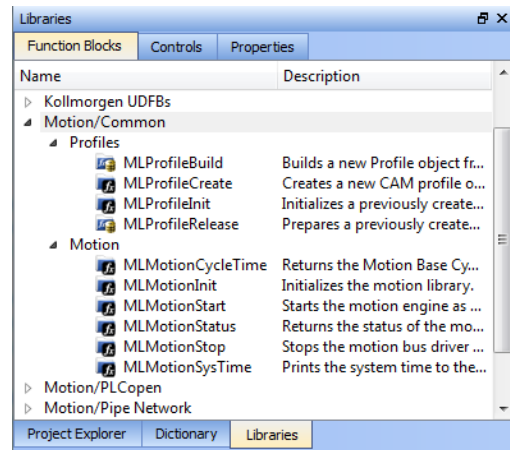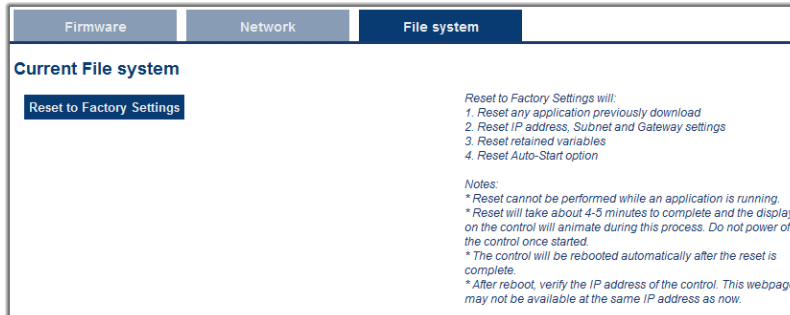
> ✎ **NOTE**   If the UDFB was open before starting the application, it will not be animated until it is double clicked in the project tree.

- **Keystrokes.** ⓘ
    - The `DEL` key can now be used to delete any deleteable node in the project tree.
    - `Alt + Shift + O` is the new shortcut to open a project from the controller. See "New Project Management Features" (see page 16) for more information on this function.
    - `Alt + Shift + C` is the new shortcut to Compare Projects. See "New Project Management Features" (see page 16) for more information on this function.

3.5   New Controller Features

- **Reset to factory settings.** Resetting to factory settings allows you to restore a PAC or PDMM to the factory-defined state. ⓘ This action will remove all of the following data:

- any application
- project sources
- logs & log configuration
- user data (all the files created via the file FB)
- runtime configuration (auto-start and Profibus)
- retained variables
- controller and AKD backup
- crash dump

Firmware	Network	File system

Current File system

Reset to Factory Settings

Reset to Factory Settings will:
1. Reset any application previously download
2. Reset IP address, Subnet and Gateway settings
3. Reset retained variables
4. Reset Auto-Start option

Notes:
* Reset cannot be performed while an application is running.
* Reset will take about 4-5 minutes to complete and the display on the control will animate during this process. Do not power off the control once started.
* The control will be rebooted automatically after the reset is complete.
* After reboot, verify the IP address of the control. This webpage may not be available at the same IP address as now.

- **EtherCAT receive frame error.** The controller raises an A30 alarm when it's not able to send an EtherCAT frame. An A38 alarm is raised when a frame will not be received or is received too late by the controller. ⓘ

- **User data storage.** User data on the PAC and Simulator is stored in the Windows user folder instead of Program Files. On Windows 7 this folder is `C:\Users\<-userlogin>\AppData\Local\Kollmorgen\KAS`. The main benefits of this are:
    - Application data (source of the project, compiled application, runtime configuration, auto-start, fieldbuses, logs, files created with the file FB) are preserved after re-installation.
    - Simulator can be run under Windows 7 with normal privileges. Admin privileges are not necessary.

3.6 New Project Management Features

- **Save KAS project on controller.** This saves a copy of the complete KAS project file to the controller. This option is found in the Controller Properties. ⓘ

    If PLC Online Change is activated, the previous KAS file is kept in the controller. The correct KAS project file is restored if an online change revert is performed.

- **Open project from controller.** A project can be opened directly from the controller. This functionality is accessed from the *File* menu, or the shortcut `Alt-Shift-O`. ⓘ

- **Open project from controller & view animated values.** The animated values will be displayed in the IDE after the project is opened from the controller.

- **Upload the KAS source code.** Projects that have been stored on the controller can be uploaded to the local machine via the web server. ⓘ

- **Project comparison.** Projects can be compared with other local projects or with projects running on the controller.
    - **With a local project:** The File menu item *Compare Projects* (`Alt-Shift-C`) allows you to compare the open project with any project on your hard drive.
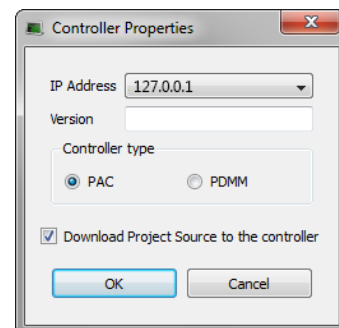
The comparison is currently limited to the PLC source code. 🛈

- **With the project on the controller:** Clicking the Compare PLC programs button on the status bar compares the local project's code to the source code on the controller. For this to work you must be connected to the controller and have downloaded the project's source code. 🛈

- **Password protection.** Projects can be password-protected. A company name may also be assigned to identify the owner. This functionality is available in the File menu. 🛈.

  - The status bar has an icon to indicate if the project is password protected.
  - Project files downloaded to the controller retain the password protection, if it was applied.
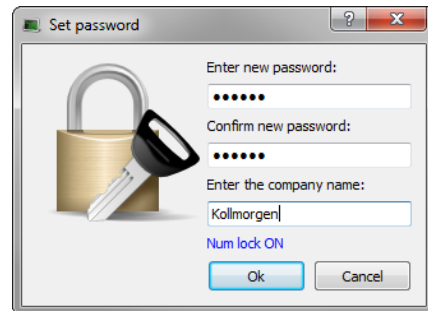
> ✎ **NOTE**　This feature requires additional compilation time. This is because the source is re-encrypted at the end of each compilation in order to download the protected project to the controller.

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4 What's Changed

This section discusses changes in products that you should be aware of.

4.1 Project Download Manager

Faster Project Download Manager. The IDE's Project Download Manager is now 50% faster and more reliable. The new interface displays a unique progress bar.

4.2 AKD Workbench GUI Integration

The Kollmorgen WorkBench is a software tool for configuring, operating, and diagnosing AKD drives. The WorkBench views have been re-integrated into the KAS IDE. The new integration enables future IDE and WorkBench releases to be synchronized, so the IDE will contain the latest WorkBench features.

New Views are available:

- Settings
- Wake & Shake
- Feedback 2
- Gain Scheduling
- Position Capture

There are a few differences in the user interface and operation, which are outlined below.

4.2.1 Connection

To access the AKD views, the IDE must be connected to the controller

and *Online Configuration Mode* should be enabled or an application should be running on the controller.

The Online Configuration Mode can be enabled or disabled from a new toggle button on the menu bar.
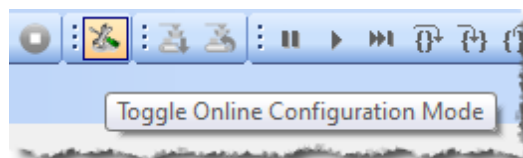
4.2.2 Navigation

The individual AKD GUI views are accessible from the new navigation tree. This replaces the horizontal tabbed navigation interface in the previous IDE versions.
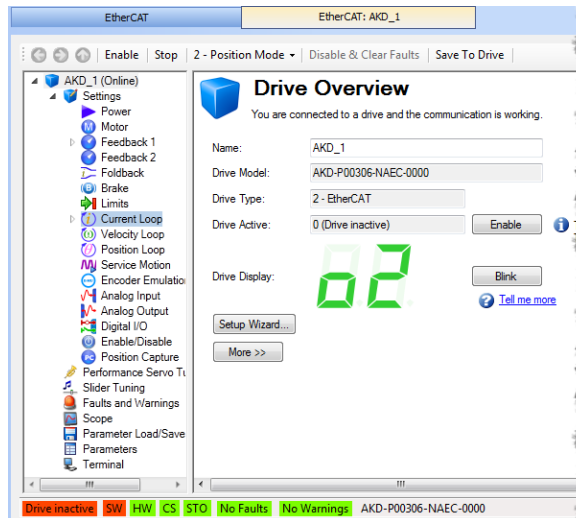
4.2.3 AKD GUI Tool Bar

The AKD GUI tool bar has been updated to provide additional buttons to navigate the tree and save the AKD parameters to NV memory. The Clear Faults button changed to *Disable & Clear Faults* and the Panic button has been removed.
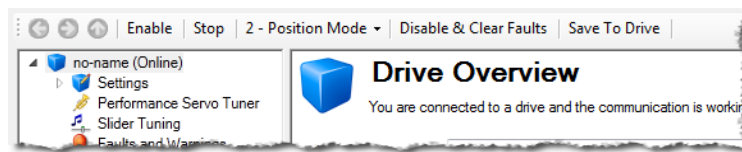
4.2.4 Watch Window

Adding AKD variables to the watch window is only available when in Online Configuration Mode or when an application is running. When adding a variable to the watch window, the PLC Variable Selector window provides access to the AKD variables for all the AKD drives on the EtherCAT network. The variable name is based on the AKD parameter and also includes a simple text description.
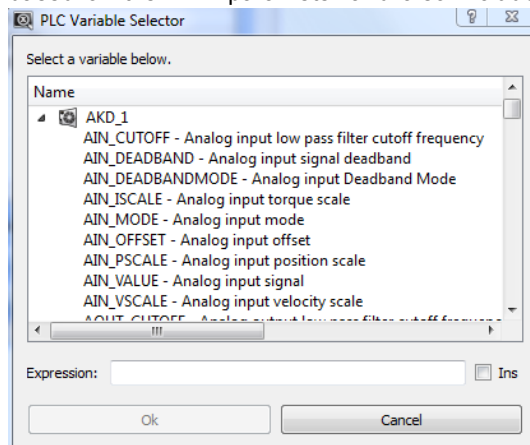
4.2.5 User Options

The AKD GUI scope view settings can be preserved and reloaded automatically. This option can be enabled/disabled from the Tools > User Options menu.
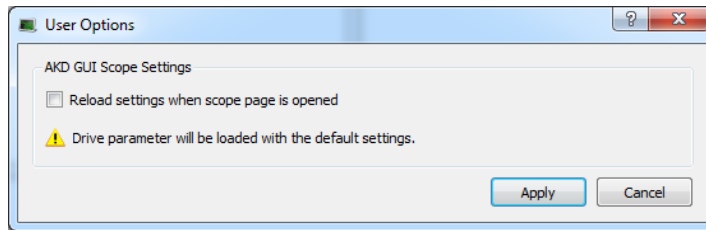
4.3 IDE

- **IDE & Web Server log configuration.** Local and Controller log configuration may be set individually. Local and runtime log configuration are separate. See Log Messages for more information. 🛈

  > ✎ **NOTE**   Only the IDE can setup the log configuration for Local logs. Controller logs can be configured from IDE or the WebServer.

4.4 Kollmorgen Visualization Builder (KVB)

4.4.1 Version 1.20.545

With this version, KVB is compatible with Windows 7.

> ✎ **NOTE**   Version 1.20.545 is compatible with VS2010 redistributables.

### 4.4.2 Troubleshooting

If a project seems to be corrupted, clean the iX project. To do so:

- Open your KAS Project
    - Open the KAS project's "temp" folder
    - Open the "HMI/iX" folder
    - Delete the following:
        - "BuildFiles" folder
        - "Temp" folder
        - all .CRI files

4.5 Backward Compatibility

- **Function calls in ST** must now be terminated by "`;`". Versions of KAS prior to v2.6 did not enforce this condition. Existing projects that have ST code which is not terminated by a semicolon will result in compiler errors which you will need to fix.
- **AKD Analog Output** is now part of the default PDO object. Any application that used the Analog Output SDO (0x3470/3) needs to be updated to use the PDO instead of the SDO object. SDO objects that are sent will be overwritten by the PDO.
- **AKD Digital IO mode** was previously found on the PLC IO mapping dialog. With the new AKD GUI Integration it is now done directly inside the AKD Digital IO screens. If a mode was set via the old KAS IO Mapping dialog, you should redo it manually, via the AKD Digital I/O View.

You will be presented with a warning if the IO mapping is not modified.
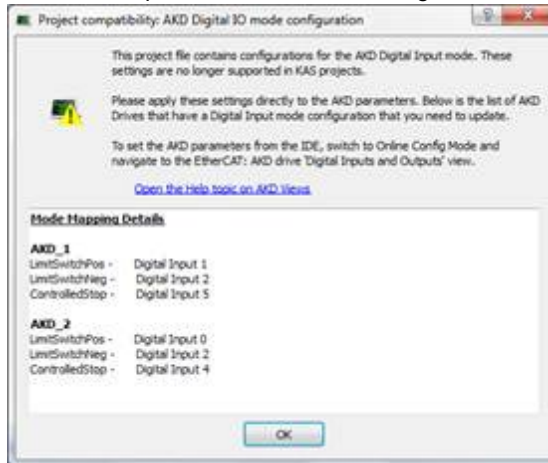
A remapped version of the AKD_1 shown above would look similar to the following image.
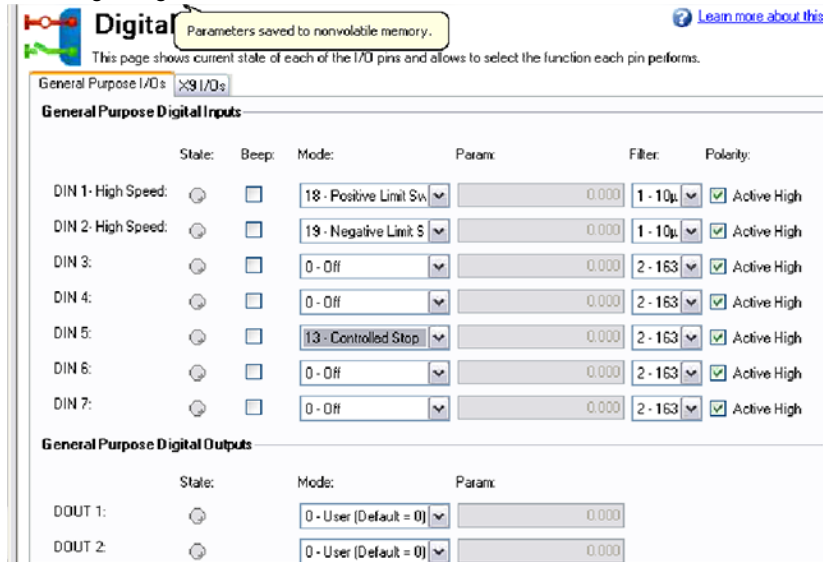
5   What's Fixed

Following are the issues corrected by this release.

Item #	Issue
D-03746	Logs were not written to a file on Windows 7 under a standard User account.
D-03639	An application could not be started if a drive was enabled.
D-03583	AKD firmware parameters were lost when drives were upgraded.
D-03389	IO couplers were in error after writing a Unique ID and cycling the power.
D-03730	A cyclic error occurred when using DC with a SICK Safe device.
DT2674	Drive interface unit changes in PLCopen affected gearing and camming moves.
DT2676	Cam output had a position spike.
DT2627	Adjust RefPos in the case of autonomous move by the drive.
DT2633	Some HMI panels were no longer visible after loading project from controller.

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6 Known Issues

Following is a list of known issues and methods to work around them.

6.1 Allow Simulator to Use HTTP Communication

The Simulator needs to open TCP/IP 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.
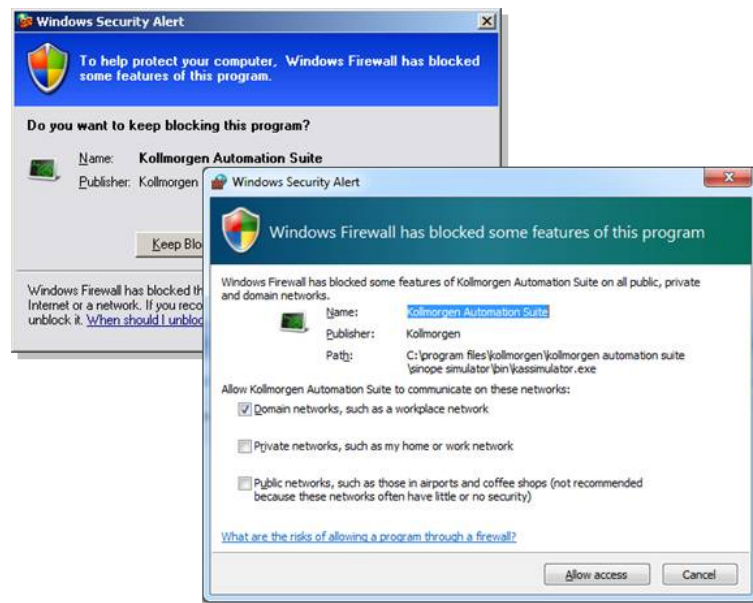

Figure 6-1: Security Alert on Windows 7 and Windows XP.

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 KAS Simulator in the online help.

6.2 Known Limitations

6.2.1 IDE

- **Undo:** The Undo action is not supported for AKD GUI views, control panel, or the EtherCAT view.
- **Find/Search/Replace function limitations**:
  - Search & Replace function is not supported in Pipe Network.
  - Search & Replace for HMI are supported only with using CTRL+F
- **Breakpoints:** In SFC programs, breakpoints can only be set on transitions (i.e. in First Level diagram), and not in steps or conditions. If a breakpoint is set on a transition, you can debug cycle by cycle.

- **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 like Profibus

  For example we cannot map the same PLC variable to Modbus and Onboard PDMM IO, but this is possible with a regular EtherCAT IO.

- **AKD WorkBench GUI:** You can experience an IDE disconnection the first time the AKD GUI is opened. The reason is linked to the Just In Time .Net compiler that is invoked the first time we call the AKD WorkBench GUI, which is CPU intensive and can last more than 15 seconds. This potentially causes a connection timeout. If this happens you will need to reconnect. A simple workaround is to double click on an AKD node in the project tree, one-time per IDE session, before connecting.

  > ⓘ **TIP**   Double-click on an AKD node before opening the AKD WorkBench GUI.

- **Intellisense:** Intellisense is not active in Sequential Function Chart (SFC) programs.

6.2.2   KVB

- **Variables:** The ModBus variables are imported to KVB when KVB is opened. They are not updated cyclically after opening. If other variables are exported in the IDE, KVB should be closed and reopened.
- **Import/Export:** There isn't a built-in feature to import/export KVB projects.
- **String export:** String export over Modbus TCP is not supported.
- **Alarm stops updating a tag value:** It's not advised to modify in the AlarmServer action on the same tag as the one used to trigger it. A different variable should be used.
- **Running KVB with Simulator:** There is a known issue when using Simulator on some PCs running Windows 7 Home Premium Edition. This issue documented here. To workaround this issue, delete the *Platform* system variable:
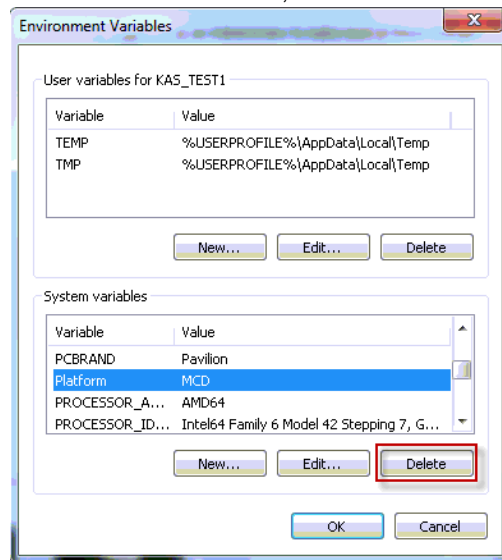
6.2.3   EtherCAT

- **Cabling:** Plugging the EtherCAT cable to the OUT port is not detected and not reported as an error.

- **External EtherCAT Configuration:** If you want to use an external EtherCAT XML file, the file `adaptedAKD.xml` should be used as the ESI file for AKD. This ensures proper operation with KAS.

6.2.4   PAC

- **A38 Alarm:** On the PAC High Range, at 4Khz, user may experience a A38 alarm when having roughly 20 or more drives. This issue means the ECAT frame does not return back to the controller within the same EtherCAT cycle.

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