Kollmorgen Automation Suite

Release Notes

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Valid for KAS Software Revision 2.11

Valid for AKD Drive firmware version: 1.15

Part Number: 959720

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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- pugixml, an XML and XPath parsing library (distributed under the MIT License).
- Qwt project (distributed under the terms of the GNU Lesser General Public License).
- U-Boot, a universal boot loader is used by the AKD-PDMM (distributed under the terms of the GNU General Public License, http://www.gnu.org/licenses/gpl-2.0.html). The U-Boot source files, copyright notice, and readme are available on the distribution disk that is included with the AKD-PDMM.
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1 Table of Contents

2 Introduction

Welcome to KAS v2.11! This release contains new features and many improvements. This document is intended to help existing users understand the differences between this and KAS v2.10. 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. 6) — this section covers system requirements as well as provides firmware, software, and hardware information.
- "What's New" (➜ p. 10) — an overview of new features.
- "What's Changed" (➜ p. 14) — 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" (➜ p. 15) — a list of issues addressed in this release.
- "Known Issues" (➜ p. 16) — this section contains issues we are aware of, and methods for avoiding or working around them.

NOTE

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 on KDN. We point to KDN with absolute links so you can use this PDF from any directory.

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 http://kdn.kollmorgen.com, take a look around, and don’t forget to register.

3 Installation

3.1 System Requirements

Element	Description
Operating System	Microsoft® Windows® 7 SP1 (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 or greater (which is recommended for complex applications)
Storage	1 GB hard drive or compact flash space
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 Internet Explorer (IE9 or later, see Note #3)  , Mozilla FireFox  , or Google Chrome  .

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 KAS 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 IDE, Controller, and Programmable Drive Software

Software Images	Recommended Version	Download
KAS IDE	2.11.1	n/a
PDMM & PCMM 800MHz Runtime Firmware	2.11.1	
PDMM & PCMM 1.2GHz Runtime Firmware	2.11.1	
PAC master image (Previous KVB 1.2 runtime pre-installed)	2.11.1	n/a

3.2.2 AKD Drive Firmware Requirement

KAS is compatible with AKD-M (PDMM Drive), AKD-P (Motion Tasking Drive or Position Indexer), AKD-C, and AKD-N drives. The recommended firmware version is dependent upon your drive's model and revision. The operational image recommended with this release is 01-15-00-001.

AKD firmware to use with version 2.11		Download
PDMM Servo Drive Firmware	AKD-M-M1EC-V01-15-00-001.i00 AKD-M-MCEC-V01-15-00-001.i00	
AKD-N	AKD-N-xxEC-V01-15-00-001.i00	
AKD EtherCAT drive, up to r.8	AKD-P-NACC-V01-15-00-001.i00 AKD-P-NAEC-V01-15-00-001.i00	
AKD EtherCAT drive, r.9	AKD-P-NBCC-V01-15-00-001.i00 AKD-P-NBEC-V01-15-00-001.i00	
Resident image	R_00-00-55-000.i00	n/a
Resident image for AKD-C/N	R_00-00-55-000	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.

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

The recommended resident firmware is v55 (R_00-00-55-000). The recommended resident firmware for AKD-C and AKD-N is v55 (R_00-00-55-000). 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) master image	2.15	

The new installation package contains both the IDE and runtime for PAC. KVB runtime installation on the PAC requires that:

IMPORTANT

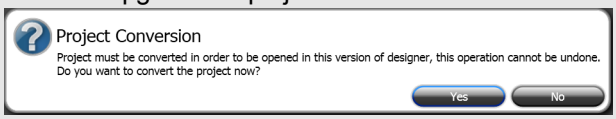
Windows firewall on the PAC should be disabled to allow this feature to work.

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.
KVB is already installed	NeoSetup.msi	This package will update your current installation to v2.0

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 2.1.



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	AKC-PCM-MC-80-00N-00-E00	800 MHz Standard Mutli-axis Controller
PCMM	AKC-PCM-M1-120-00N-00-E00	1.2 GHz High Performance Multi-Axis Controller
PDMM	AKD-M0xxxx-MCEC-0000	800 MHz Standard Drive Resident Controller
PDMM	AKD-M0xxxx-M1EC-0000	1.2 GHz High Performance Drive Resident Controller
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

NOTE

KAS IDE and Simulator should not be installed on a PAC, PDMM, or PCMM.

TIP

In order to prevent CF card corruption when shutting down the PAC, we recommend using the Enhanced Write Filter (EWF). This filter redirects all the write operations in memory in order to avoid making physical write operations in the compact flash.

The filter should be activated on the PAC when it is fully set up, programmed, and will not change. In case of a significant change, such as a new KAS version or downloading a new application, the recommendation

is to turn off the EWF, make the change, and then reactivate it. Please see the user help to learn how to use the EWF.

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 KAS Simulator in the online help.

4 What's New

4.1 Parabolic Cam Generation

Parabolic cam profiles can be generated using the MLProfileBuild function block. Parabolic profiles support the following.

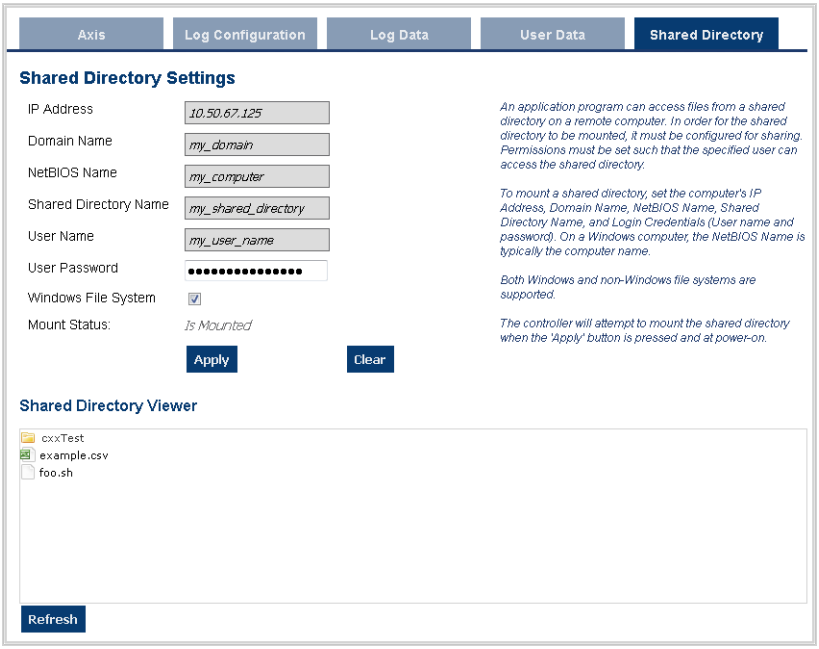
- Pipe Network and PLCopen motion engines
- Cyclic and non-cyclic execution
- Modifying cam profiles on-the-fly
- MC_CamIn, MC_CamOut, MC_CamStartPos, MC_CamResumePos, MLCamSwitch, MLProfileRelease

When creating a parabolic cam profile there are a few things to remember.

- The cam data elements must use `CAM_SEGMENT_TYPE_PARABOLIC` or `CAM_SEGMENT_TYPE_LINE` when defining the cam data array.
- Ensure that the MLProfileBuild **Option** argument is set to `CAM_PROFILE_OPTION_PARABOLIC`.
- Parabolic profiles only accept parabolic and line segments.

4.2 Accessing Shared Directories

PCMM and PDMM devices can be configured to mount a directory shared by a remote computer. Files in the directory may be accessed from a program once the directory is mounted. This is configured within **KAS Application** tab of the web server.



4.3 Use UDP to Send / Receive Variable Data

Data may be sent from a variable to another controller via UDP using the **udpSendToVar on KDN** function. The **udpRcvFromVar on KDN** function receives and copies the UDP data and into a variable of the exact same type. These functions send and receive any variable type, including complex data types such as structures and arrays. Using these functions requires less CPU time than serializing the data and using **udpSendToArray** / **udpRcvFromArray**.

4.4 EtherCAT Diagnostic Log Messages

Troubleshooting EtherCAT communication errors has been made easier with the new EtherCAT Diagnostic Log messages (working counter errors, E30, or A38). The diagnostic values are automatically gathered and analyzed after the KAS application is stopped. The diagnostic values include the node number, followed by a diagnostic counter for each communication port. Each EtherCAT node has 4x ports, although not all ports may not be physically accessible or be physically connected to the network. Any diagnostic values that are non-zero indicate an EtherCAT communication error was detected at the node.

Log Message	Meaning or Source
Lost Link Counter	node connection reliability status
RX Error Counter	physical layer errors on incoming packet
Invalid Frame Error Counter	frame corruption
Error Forwarding Counter	if supported by the node, RX Error Counters that occurred at a previous node
ECAT Processing Unit Error Counter	frame structure errors

The Log messages identify the ports where the communication errors occurred. For example, a communication failure between Node 0 and 1 would generate the following Log messages:

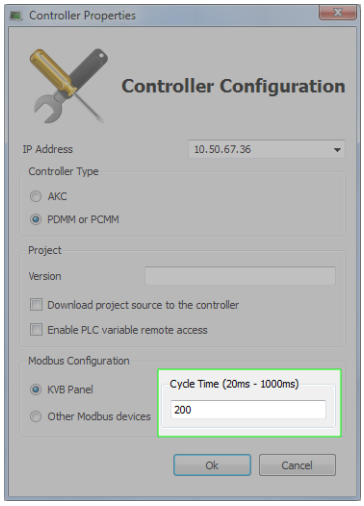
```
EtherCAT   | WARNING | EtherCAT diagnostics: Node 0, port B
(out), Rx Invalid Frame Counter Register is 255
EtherCAT   | WARNING | EtherCAT diagnostics: Node 1, port A
(in), Rx Invalid Frame Counter Register is 255
```

The EtherCAT Diagnostic log messages are displayed if the log level is set to *Debug* and/or *Warning*. The Log message node index is zero-based (0, 1, 2, etc.), where the IDE node index is one-based (1, 2, 3, etc.). If one or more nodes are not accessible due to a broken connection, then the node index in the diagnostics may not match the node number in the project:

```
EtherCAT   | ERROR   | EtherCAT diagnostics: Failed to detect
EtherCAT nodes. Expected 3 node(s), but discovered 1 node(s).
```

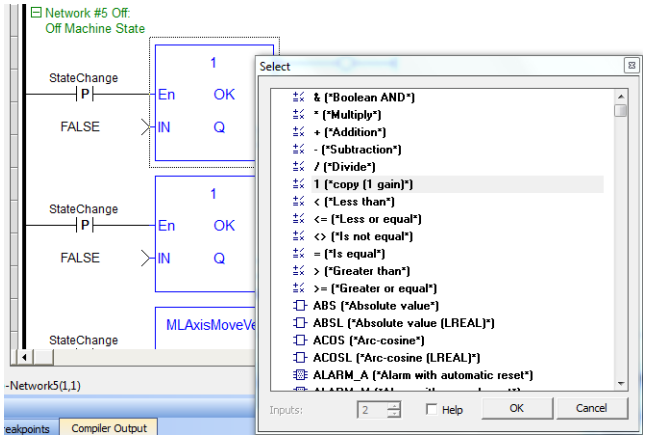
4.5 Configurable Modbus Slave Data Exchange Rate

The exchange rate (Cycle Time) of PLC variable values with Modbus is configurable. The default is 200ms, which is the same as previous versions. To set the new rate on the controller simply download the project; recompiling is not necessary.



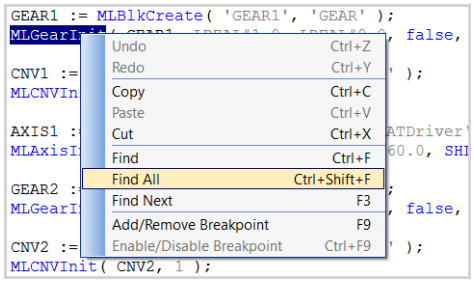
4.6 Double-Click Edit of FFLD or FBD

Double-clicking on a FFLD or the main area (not the name) of a FBD function or function block brings up a window which allows you to select any other operator, function, or function block to replace the current one.



4.7 Find All Variable Instances

All instances of a variable in a project can be found by right-clicking on the variable. Alternatively, if a variable is selected you may use the keyboard shortcut **Ctrl-Shift-F**.



4.8 F_Seek File Management Function

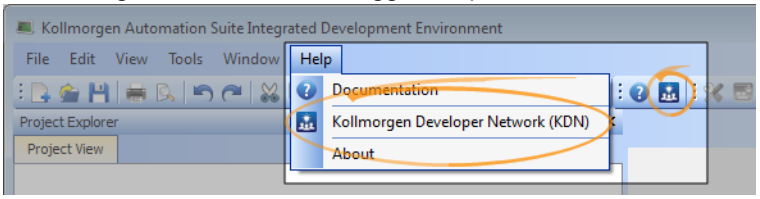
This new file management function allows you to set the current position in an open file.

4.9 Configurable Circle Center Point Tolerance

Coordinated motion supports a configurable point tolerance for the circle center point. Use the MC_GrpReadParam on KDN and MC_GrpWriteParam on KDN function blocks to read or write the MC_GRP_PARAM_CIRCLE_TOLERANCE.

4.10 Shortcuts to KDN in KAS IDE

Shortcuts to KDN (Kollmorgen Developer Network) have been added to the **Help** menu and the **Help** toolbar. KDN is a resource for product support. Ask the community questions, search the knowledge base for answers, get downloads, and suggest improvements.



5 What's Changed

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

5.1 GetCtrlErrors Optimized

The GetCtrlErrors system-level function has been optimized to reduce the execution time on PDMM/PCMM to less than 5 microseconds.

5.2 IDE Animation Colors for TRUE and FALSE

The IDE animation colors used for TRUE and FALSE values have been changed to green (TRUE) and red (FALSE) for greater ease-of-use. This affects all IDE editors (ST, FFLD, FBD, etc.), the Dictionary, and watch windows.

```
Repeat
MyCounter (TRUE, FALSE, 16#FFFF);
// CV := MyCounter.CV;
if MyCounter.CV.7 FALSE then
bToggleVal TRUE := TRUE;
Ledlight2 TRUE := bToggleVal TRUE ;
End_if;
bToggleVal TRUE := not bToggleVal TRUE ;
Ledlight2 TRUE := bToggleVal TRUE ;
Until MyCounter.Q FALSE = FALSE
end_repeat;
```

5.3 IDE Workbench Requires .NET v4.6.1

The integrated AKD WorkBench has been upgraded to v1-15. This version requires Microsoft .NET Framework v4.6.1. The KAS installer automatically checks for a compatible .NET framework version and launches the .NET installer as necessary. This installation requires more time and disk space.

6 What's Fixed

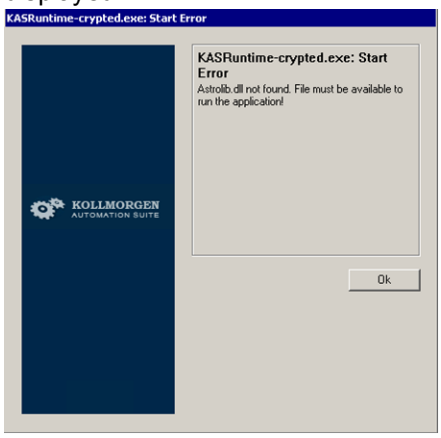
Following are the issues corrected by this release.

Defect	Description
DT-533	Printing a blank ST program causes the IDE to hang.
DT-715	Remove AntiPeriod FBs from IDE Library.
DT-1299	Copy / pasting functions keeps the same instance.
DT-1310	No error message displayed while importing a program/UDFB in online change mode.
DT-3066	Opening a KAS project with a device and associated ESI file that are not already imported in the local cache resets the device configuration.
DT-3244	PID FB locks up when certain setpoint values are used
DT-3315	E21 during project download when Ethernet communication is lost.
DT-3330	PDMM/PCMM firmware download fails with IE
DT-3353	ECATWrite/ReadSDO will not accept index values greater than 32767.
DT-3356	Watch window with AKD variable value does not update
DT-3361	MC_GrpReadActPos reads the individual axis positions (not the group axis positions).
DT-3362	Menu Command 'Edit -> Find...' does not always make 'Find and Replace' tab visible.
DT-3363	AKD-C DOut does not work with a mapped PLC variable
DT-3364	E33 Error on PDMM when AutoStart is enabled with AKD-C and AKD-N drives in the network. If you are using KAS v2.10 (or lower), please see KDN article "E33 Error on power cycling PDMM Controller with Auto start" for a work-around.
DT-3365	AKD firmware download does not work with M1EC model (1.2GHz PDMM).
DT-3368	Online Change lost without a VM stop.
DT-3371	MC_GearInPos can cause excessive acceleration. If the master start distance is less than the slave sync distance a warning message will be logged.
DT-3376	Two MC_TouchProbe instances do not work simultaneously with the same drive with different capture engines.
DT-3380	Incorrect Names for 0x3460 in KAS IDE COE Object-Dictionary screen.
DT-3386	EtherCAT network failure may cause AKD to stop motor w/o a controlled stop. This defect only occurred with applications using the Pipe Network motion engine, PLCopen is not affected.
DT-3394	IDE Crashes After Editing PDO of Balluff BNI ECT-508-105-Z015
DT-3395	Read and Write PLC variables via HTTP interface does not work for multi dimensional arrays
DT-3396	Profinet crash when the Client is trying to reconnect with the same ARUUID and same session key
DT-3397	MC_Phasing UU incorrect conversion
DT-3404	Online Change conflict with Modbus
DT-3407	“Unexpected Disconnection” with stopping the application after ECAT initialization failure
DT-3412	Breakpoint jumps to the first line of a program
DT-3414	MC_BUFFER_MODE_BLENDING_NEXT starts acceleration too early
Simulator Crash	There was an internal race condition in the Simulator during initialization which could cause it to crash at the time a KAS project was started. This race condition has been corrected.

7 Known Issues

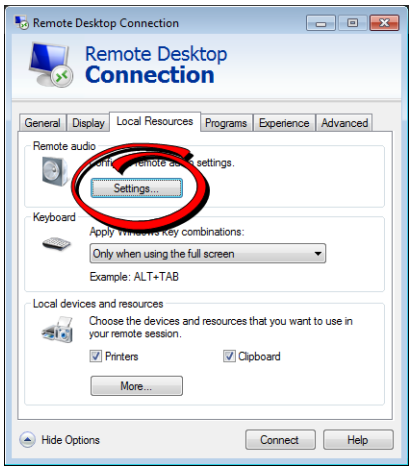
7.1 KAS Runtime Fails to Start on the PAC over Remote Desktop

Symptom: When accessing the PAC via Remote Desktop, KASRuntime fails to start. Instead, this pop-up is displayed:

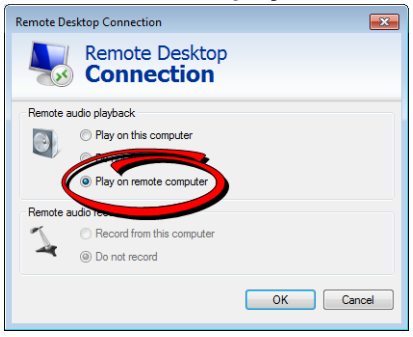


Workaround: Set the Remote Desktop "Remote audio playback" setting to "Play on remote computer":

1. In Remote Desktop, before connecting to the PAC, click on the **Show Options** arrow.
2. Click on the **Local Resources** tab and click **Settings…**.



3. Set **Remote audio playback** to **Play on remote computer**.



4. Click **OK** and connect as usual.

7.2 Miscellaneous Known Issues

DT-1134	IDE always reports the project has been modified
DT-2111	KVB - Objects font is getting changed, when switching between different panels
DT-2112	KVB - ReadOnly variable data is not getting refreshed, until there will a change in the variable
DT-2204	KVB - No message for wrong panel address during project transfer
DT-2523	On windows 7 Home Premium Edition on HP computers, there is a known issue when using the simulation. This issue documented on MSDN (http://blogs.msdn.com/b/brandonwerner/archive/2010/03/14/the-nasty-visual-studio-platform-mcd-error-in-visual-studio-2010-rc.aspx).
DT-2560	IDE animation with non-matching project versions
DT-2570	Comm err keeps displaying on HMI after Modbus communication is reestablished
DT-2590	Breakpoint with For(…) loop, increases VM load significantly
DT-2798	IDE disconnects from the controller after several days
DT-2935	K-Bus slices analog inputs Offset parameter does not work
DT-2940	WebBrowser component not working for TxB panels
DT-3013	Modified cam file is not downloaded when forcing an Online Change.
DT-3198	MLAxisAbs with new velocity causes overshoot. Multiple calls to MLAxisAbs with same target position and different velocities, made before the move completes, will cause the position to overshoot the target position.
DT-3245	Structure values not shown in IDE. The UDFB animation will be incorrect, if a structure is passed to a UDFB, where the structure instance is the first Retain variable in the dictionary. To avoid the issue, use a non-structure value as the first Retain variable.
DT-3261	EOT Drive limits and KAS profile generator. The AKD-series drives will ignore the KAS command position when the EOT limits are activated.
DT-3265	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.
DT-3276	PLCOpen: negative UserUnits prevents MC_GearInPos working. To avoid this problem, only use positive values for UserUnits, negative values are not supported.
DT-3281	KVB unhandled exception error. To work around the problem: 1. Open "Configure Text" and activate only the tag. 2. Close the configure window and reopen the "Configure Text" again. 3. Set your conditions and press OK.
DT-3287	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.
DT-3290	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 (http://kdn.kollmorgen.com/content/how-do-i-insert-pdo-padding-kas-pdo-editor)
DT-3294	Help button in “PROFINET IO device” view is broken.
DT-3307	Data Exchange Direction parameter in KVB tag setup is being erased
DT-3328	PipeNetwork Trigger block inaccuracies due to 6 sample latency
DT-3367	EtherCAT network restore fails to recover from drive firmware download failure
DT-3382	MLInitTrig does not configure the AKD Capture engine correctly for a negative edge trigger
DT-3383	IDE displays LREAL with same precision as REAL

DT-3392	Cannot add new tags to KVB project without Rebuild
DT-3399	Multi-dimensional array variable export to HMI causes compiler error
DT-3408	When a crash report fails due to error (ex: timeout, connection failure, …) report is lost. User cannot resend.
DT-3410	Recovered projects don't recover imported libraries (.kal files)
DT-3413	KAS IDE cannot open projects with Korean characters in path
DT-3415	MC_BUFFER_MODE_BLENDING_NEXT may cause excessive acceleration
DT-3418	PLCopen S-Curve move may not reach target with small jerk.

7.3 Known Limitations

7.3.1 EtherCAT Limitations

- **Cabling:** Plugging the EtherCAT cable from an OUT port to an OUT port is not detected and not reported as an error.
- **Cabling:** The following pertains to cases where an Ethernet hub is present between the PAC and the first EtherCAT device. If the cable between the hub and the EtherCAT device is disconnected, the controller will not stop the motion and the axis will not be shown as being in fault. The axis will only display the fault state after the cable is reconnected. To recover from this situation the PAC must be power cycled.
- **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\`.

8 Third Party EtherCAT Device Support

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

8.1 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.

8.2 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, Profibus, Interbus, and IO Link.
- 3rd party drives are not supported by the motion engine. Mapping axes to 3rd party drive is not supported.
- PDO upload is not supported.
- Manual slot configuration is not supported with MDP devices.
- KAS does not have third-party drivers for network gateway devices.

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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