Kollmorgen Automation Suite

Release Notes

Document Edition: N, December 2020

Valid for KAS Software Revision 3.05

Valid for AKD firmware version: 01-20-00-001

Valid for AKD2G firmware version: 02-05-00-000

Part Number: 959720

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

Trademarks and Copyrights

Copyrights

Trademarks

- KAS and AKD are registered trademarks of Kollmorgen.
- Kollmorgen is part of the Altra Industrial Motion Company.
- EnDat is a registered trademark of Dr. Johannes Heidenhain GmbH
- EtherCAT is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH
- Ethernet/IP is a registered trademark of ODVA, Inc.
- Ethernet/IP Communication Stack: copyright (c) 2009, Rockwell Automation
- HIPERFACE is a registered trademark of Max Stegmann GmbH
- PROFINET is a registered trademark of PROFIBUS and PROFINET International (PI)
- SIMATIC is a registered trademark of SIEMENS AG
- Windows is a registered trademark of Microsoft Corporation
- PLCopen is an independent association providing efficiency in industrial automation.
- Codemeter is a registered trademark of WIBU-Systems AG.
- SyCon® is a registered trademark of Hilscher GmbH.

Kollmorgen Automation Suite is based on the work of:

- 7-zip (distributed under the terms of the LGPL and the BSD 3-clause licenses - see terms)
- The C++ Mathematical Expression Library (distributed under the MIT License)
- curl software library
- JsonCpp software (distributed under the MIT License – see terms)
- Mongoose software (distributed under the GNU GPL v2 - see terms)
- Qt cross-platform SDK (distributed under the terms of the LGPL3; Qt source is available on KDN)
- Qwt project (distributed under the terms of the Qwt License)
- 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.
- Zlib software library

Disclaimer

The information in this document (Version N published on 12/2/2020) is believed to be accurate and reliable at the time of its release. Notwithstanding the foregoing, Kollmorgen assumes no responsibility for any damage or loss resulting from the use of this help, and expressly disclaims any liability or damages for loss of data, loss of use, and property damage of any kind, direct, incidental or consequential, in regard to or arising out of the performance or form of the materials presented herein or in any software programs that accompany this document.

All timing diagrams, whether produced by Kollmorgen or included by courtesy of the PLCopen organization, are provided with accuracy on a best-effort basis with no warranty, explicit or implied, by Kollmorgen. The user releases Kollmorgen from any liability arising out of the use of these timing diagrams.

1 Table of Contents

2 Introduction

Welcome to KAS v3.05! This release contains new features and many improvements. This document is intended to help existing users understand the differences between this and KAS v3.04. 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 v3.05 — an overview of new features.
- What's Changed in KAS v3.05 — 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 v3.05 — 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 3.05.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	3.05.0

3.2.2 Firmware Requirements

Controller Firmware to use with KAS version 3.05

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 3.05

Description	Type	Name
AKD Firmware for KAS	Operational	AKD-Firmware-for-KAS-V01-20-00-001
	Resident	R_00-00-67-000.i00
AKD2G Firmware for KAS		AKD2G-Firmware-for-KAS-V02-05-00-000
Firmware for drive built into AKD PDMM	800 MHz AKD PDMM	AKD PDMM Servo Drive Firmware AKD-M-MCEC-01-20-00-001.i00
	1.2 GHz AKD PDMM	AKD PDMM Servo Drive Firmware AKD-M-M1EC-01-20-00-001.i00
AKD Drive Firmware	AKD-N	AKD-N-xxEC-01-20-00-001.i00
	AKD-P	AKD-P-NBxC-01-20-00-001.i00
AKD2G Drive Firmware	AKD2G-SPE	AKD2G-S-(E)-A-02-05-00-000.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 R_00-00-67-000. The recommended resident firmware for AKD-C and AKD-N is R_00-00-67-000. 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:

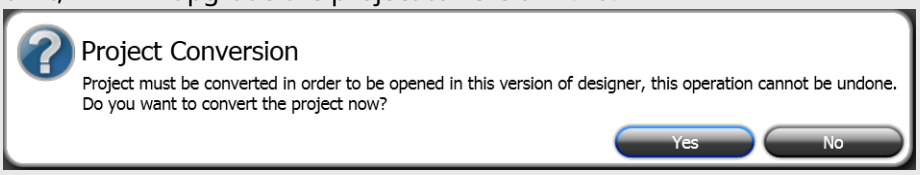
Install Type	File	Notes
New installation	setup.exe	This is the complete package which will install all prerequisite components.
Runtime	RuntimeSetup.exe	This package contains runtime software for TxC panels.

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.



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.

3.2.4 BBH Safety Software

The following BBH Safety software and firmware minimum versions are required to operate with the AKD2G, AKT2G-SDO-04-000, AKT2G-SDI-04-000, PCMM, AKD PDMM, and KAS IDE software. Please contact BBH for the latest software and firmware release information and details.

Description	Type	Minimum Version
SCU-1-EC FSoE Master firmware	Firmware	03.00.00.62
SafePLC2 safety programming software	Software	1.7.1.8111

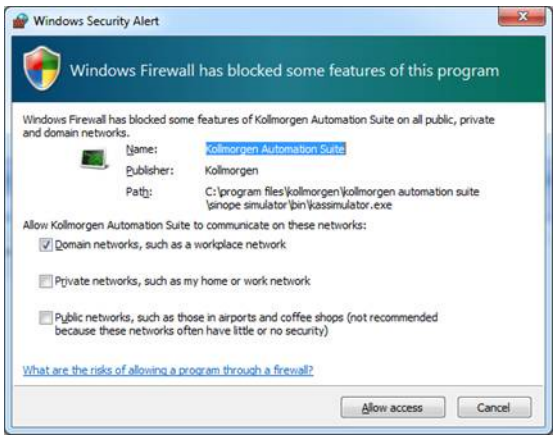
3.3 KAS Controls

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 v3.05

KAS v3.05 introduces the following new features.

- Integration of the BBH SCU-1-EC with the KAS IDE and BBH1 SafePLC2 software. This entails:
  - BBH SCU-1-EC FSoE Master device support
  - Safety parameterization via the SCU-1-EC
  - KAS IDE / BBH SafePLC2 topology export/import

  See BBH FSoE Master for information about the device. The following sections in the online help are recommended for setting up and configuring the BBH-SCU-1-EC.

  - Add & Configure Third Party Devices
  - EtherCAT Scan and Association
  - Working with SafePLC2 Projects
  - AKD2G Safety Parametrization Using FSoE with SCU-1-EC and PCMM/AKD PDMM

  See the help topic Set Up FSoE Master and an AKD2G with SafeMotion Monitor if you are integrating a different third-party FSoE master into a KAS system.

- Kollmorgen E-Bus I/O Integration
  - Digital and Analog I/O
  - Safety I/O. See Safety I/O Information for instructions.
  - Miscellaneous I/O (counter, encoder, PT100, power supply)

  Digital and Analog I/O

AKT2G-ECT-000-000	EtherCAT Coupler for E-bus terminals
AKT2G-DN-008-000	8-channel digital input terminal 24 V DC, filter 3.0 ms
AKT2G-DNH-008-000	8-channel digital input terminal 24 V DC, filter 10 µs
AKT2G-DT-008-000	8-channel digital output terminal 24 V DC, 0.5 A
AKT2G-AN-430-000	4-channel analog input, parameterisable, -10/0...+10 V, -20/0/+4...+20 mA, 16 bit
AKT2G-AN-400-000	4-channel thermocouple input terminal, wire breakage detection, 16 bit
AKT2G-AT-410-000	4-channel analog output terminal 0...10 V, 12 bit
AKT2G-AT-425-000	4-channel analog output terminal -10 V...+10 V, 12 bit
AKT2G-EM-000-000	Bus end cover, cover for power and E-bus contacts, grey

  Safety I/O

AKT2G-SDI-004-000	4-channel digital input terminal, Safety, 24 V DC
AKT2G-SDO-004-000	4-channel digital output terminal, Safety, 24 V DC, 0.5 A

  Miscellaneous I/O

AKT2G-DN-002-000	Up/down counter 24 V DC, 100 kHz, 32 bit counter depth
AKT2G-AN-240-000	2-channel input terminal PT100 (RTD) for resistance sensors, 16 bit
AKT2G-ENC-190-000	Incremental encoder interface with differential input, 16/32 bit
AKT2G-ENC-180-000	1-channel incremental encoder interface, 32 bit
AKT2G-PSF-024-000	Power supply terminal with fuse, 24 V DC

  See Remote Input/Output Terminals for information on specific models.

- KAS WorkBench Improvements

  The connection time has been reduced and the time needed to refresh views has been improved.

- MLAxisReadVel: This function reads the actual velocity of an axis, based on the data provided by the AKD2G drive's feedback device.

4.1 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 v3.05

The following changes have been implemented for this release.

- Mapping PLC Variables to EtherCAT I/O: PLC variables must be configured as "Read Only" to be mapped to EtherCAT Digital or Analog Inputs.

  Present Limitation: The KAS IDE drive status bar cannot detect if an AKD2G is active or inactive in pre-op mode. This feature will be available in a future KAS+ AKD2G firmware release.

6 What's Fixed in KAS v3.05

Items fixed by KAS v3.05

Defect	Description
BZ-10805	Unable to set the user units for a PLCopen Axis to "Count 16bit" when it's assigned to the second axis on the AKD2G
BZ-10786	MC_GrpSetPos returns ErrorID=32 with Gantry kinematics
BZ-10772	Gantry Skew Robotics motion jump with circle move
BZ-10760	Rename program, followed by a variable rename in the same program, erases the program
BZ-10753	ESI cache cannot be updated when FIPS is Enabled
BZ-10705	A38/E30 with EtherCAT at 4kHz and large ASCII SDO commands (drv.helpall)
BZ-10679	KAS IDE control panels are not fully updated with Dictionary view open
BZ-10644	Scaling with PipeNetwork Axis with defines is not possible
BZ-10597	PLCopen axes start in error state when drive has a fault
BZ-10575	PipeNetwork Trigger block does not support a non-modulo input

7 Known Issues

Defect	Description
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-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.

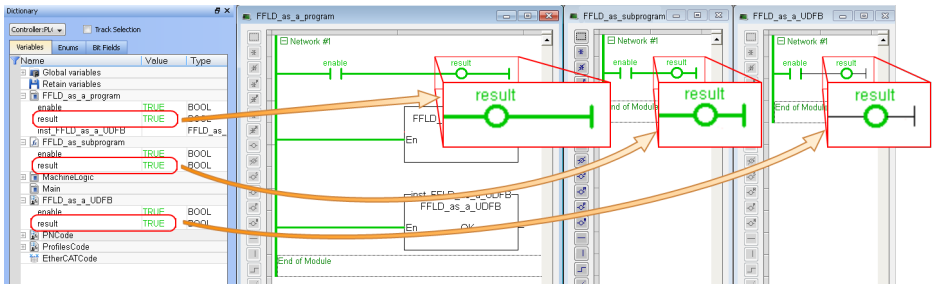
8 Known Limitations

- The 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 KAS support for third-party EtherCAT devices. See Add & Configure Third Party Devices in the online help for directions on integration.

See the help topic Set Up FSoE Master and an AKD2G with SafeMotion Monitor if you are integrating a different third-party FSoE master into a KAS system.

9.1 Requirements

- All third-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

- The KAS IDE does not support third-party drives. Please contact your local Kollmorgen representative for details.
- 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.

Join the Kollmorgen Developer Network for product support. Ask the community questions, search the knowledge base for answers, get downloads, and suggest improvements.

North America
KOLLMORGEN
201 West Rock Road
Radford, VA 24141, USA

Web:	www.kollmorgen.com
Mail:	support@kollmorgen.com
Tel.:	+1 - 540 - 633 - 3545
Fax:	+1 - 540 - 639 - 4162

Europe
KOLLMORGEN Europe GmbH
Pempelfurtstr. 1
40880 Ratingen, Germany

Web:	www.kollmorgen.com
Mail:	technik@kollmorgen.com
Tel.:	+49 - 2102 - 9394 - 0
Fax:	+49 - 2102 - 9394 - 3155

South America
KOLLMORGEN
Avenida João Paulo Ablas, 2970
Jardim da Glória, Cotia – SP
CEP 06711-250, Brazil

Web:	www.kollmorgen.com
Mail:	contato@kollmorgen.com
Tel.:	+55 11 4615-6300

China and SEA
KOLLMORGEN
Room 302, Building 5, Lihpao Plaza,
88 Shenbin Road, Minhang District,
Shanghai, China.

Web:	www.kollmorgen.cn
Mail:	sales.china@kollmorgen.com
Tel.:	+86 - 400 668 2802
Fax:	+86 - 21 6248 5367