Kollmorgen Automation Suite

Getting Started User Manual

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Part Number: 959713

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Keep for future use.

KOLLMORGEN

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PCMM2G

The PCMM2G's Operating System (OS) and boot loader (U-Boot) are based on free and open-source software, distributed under version 3 of the GNU General Public License as published by the Free Software Foundation. For more information about your rights and obligations with GPL-3.0, see the GNU website: GNU General Public License.

The individual copyright notices, license texts, and disclaimers of warranty for the software components are located in the controller, under the directory: /usr/share/common-licenses/.

For more information about accessing the PCMM2G's files, see SSH Login to a Controller.

The OS, bootloader, and their software component's source codes including modifications, copyright notices, license texts, disclaimers of warranty, and the compilation scripts to build the OS image are available from the Kollmorgen web-site Kollmorgen Support Network - Downloads.

The OS image and its corresponding sources file is identified by an "OS-Sources" designator, followed by its version number: OS-Sources-x.xx.x.xxxxx.

The compilation scripts and sources file used to build the OS image is identified by the "OS-Build-Sources" designator, followed by its version number: OS-Build-Sources-x.xx.x.xxxxx.

See PCMM2G - File Naming Conventions in the KAS online help.

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- 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 - GNU Lesser General Public 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

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Table of Contents

1 Introduction

This guide covers these main procedures to have your KAS system up and running:

- **Hardware (HW) Installation** (Connection and Wiring): Wiring and hardware details, connectors, system diagrams.
- **HW Configuration**: Basic configuration and settings needed to start the HW components (e.g., HMI, Industrial PC, Fieldbus, I/O).
- **Software (SW) Installation**: KAS software setup.

1.1 Related Documents

See the Kollmorgen Downloads page for documentation about controllers, drives, motors, and other components.

1.2 Alerts and Warnings

When alert symbols are seen in a manual, be aware of the potential for personal injury.

Follow the recommended precautions and safe operating practices included with the alert symbols.

- Safety notices in the manuals provide important information.
- Read and be familiar with these instructions before attempting to install, operate, or perform maintenance.
- This section alerts users to possible safety hazards associated with equipments and the precautions that need to be taken to reduce the risk of personal injury and damage to the equipment.
- Failure to observe these precautions could result in serious bodily injury, damage to the equipment, or operational difficulty.

2   System Overview

The Kollmorgen Automation Suite (KAS) is a complete system solution.

This includes a variety of software packages designed for complete control over your hardware.

2.1   Software Packages

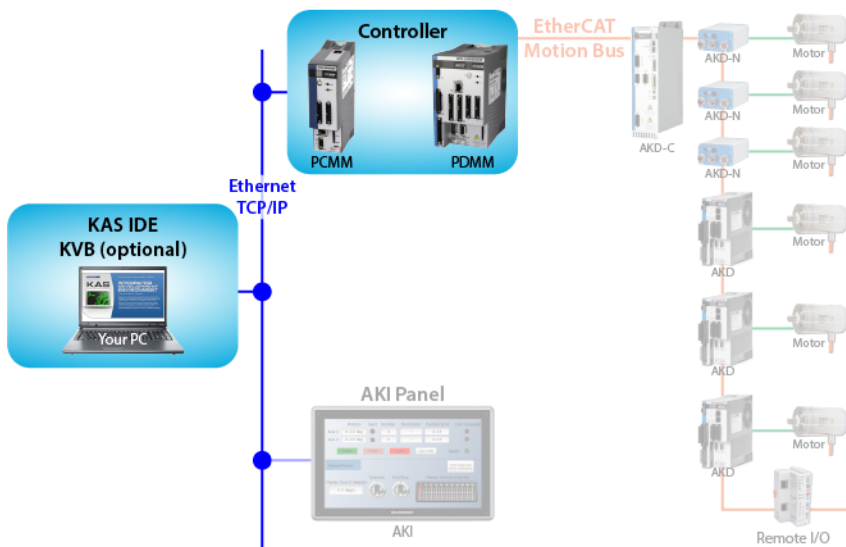| Software	Description
KAS-IDE	The KAS Integrated Development Environment (KAS-IDE) provides all necessary tools for designing, programming, configuring, debugging, and maintaining machine applications.
KAS Runtime	The KAS Runtime engine includes a soft PLC and a motion controller.
KVB (optional)	The Kollmorgen Visualization Builder assists in designing an HMI panel.

Figure 2-1: Software

2.2 Hardware Components

The KAS system is comprised of these hardware components.

| Component	Models	Description
Controller	PCMM	• Standalone programmable controller. • Provides a real-time platform with a PLC engine and motion engine to execute application programs and communicate with all network devices (e.g., remote I/O, drives, HMI, other PLCs, etc.)
Controller + Drive	AKD PDMM	• Integrated programmable controller and servo drive. • Provides a real-time platform with a PLC engine and motion engine to execute application programs and communicate with all network devices (e.g., remote I/O, drives, HMI, other PLCs, etc.)
Drive	AKD AKD2G AKD-C AKD-N	Servo drives specifically designed with versatility, communications, and power to expand machine performance.
HMI	AKI AKI2G	Provides a graphical interface for the operator to manage the machine's operations.
Motor	AKM AKM2G	Servo motor is an actuator used for precise control of position, velocity, and acceleration by closing the control loop with a feedback device.
Remote I/O	AKT AKT2G	Digital and analog input and output signals . These signals provide sensor feedback and actuation between an automation system and the physical world.
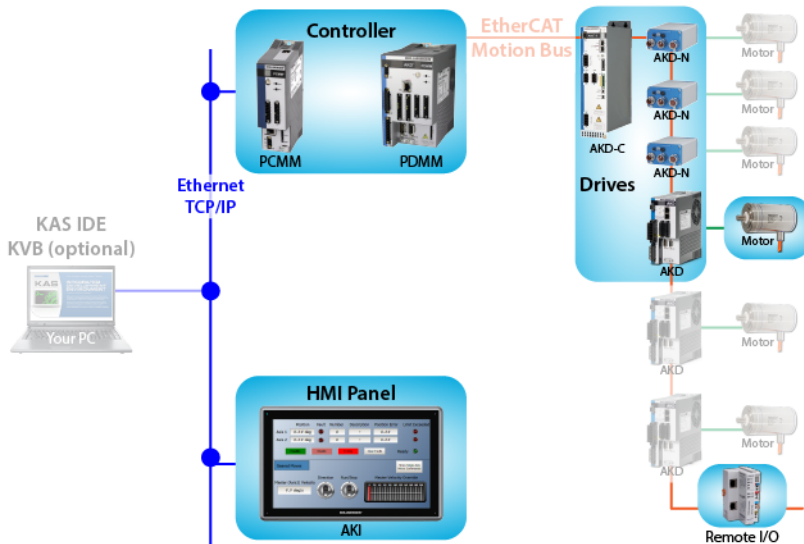
Figure 2-2: Hardware

2.3 Digital Signatures

The KAS-IDE Installer and the executables are digitally signed to protect the integrity of these files and identify the distributor of the software components.

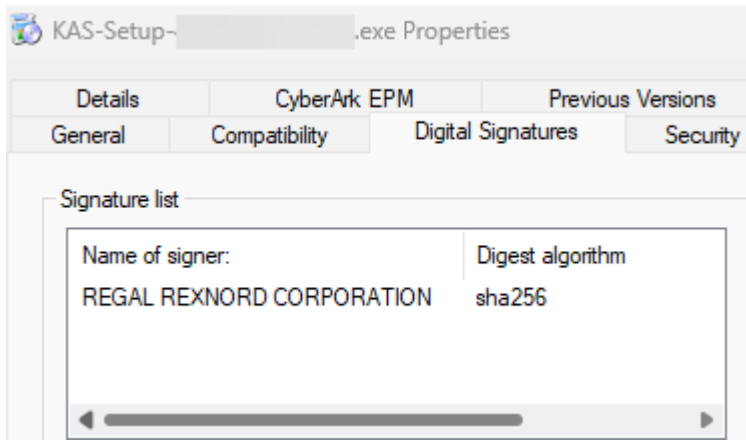The digital signature appears as part of the file properties.

Figure 2-3: Example: KAS Setup Properties Digital Signature

3   Install KAS-IDE

3.1   System Requirements

These are the minimum system requirements for the KAS-IDE.

Element	Description
Connectivity	• 1 Ethernet port, at either 100MB or 1GB. • See Note #2.
Display	• WXGA+ (1440 x 900) or higher-resolution monitor with 24-bit, 16.7M colors. • See Note #1.
Memory	1GB RAM (for 32-bit) or 2GB RAM (for 64-bit) or greater (recommended for complex applications).
.NET Framework	4.8.1
Processor Type	Intel® Pentium® M or equivalent processor at 1.5GHz or greater.
Storage	16GB (for 32-bit) or 20GB (for 64-bit) of free space on hard disk.
Supported Operating Systems	• Microsoft® Windows® 10 (32-bit or 64-bit). • Microsoft® Windows® 11 (64-bit). • For optimal performance, verify the operating system is fully updated with the latest patches.
Web Browser	• A modern web browser is required to access the web server and online help. • We recommend Microsoft Edge.

NOTE

1. Better results are achieved with OpenGL and 3D cards.
2. A 100MB network is required to allow the KAS-IDE to Runtime communication to work in all conditions. The AKD WorkBench AutoTuner and Scope both require 100MB of bandwidth to function properly.

↖ TIP

See Connect Remotely about the ports used by the KAS-IDE.
The ports may need to be opened to support connecting from an external network.

3.2   Digital Signatures

The KAS-IDE Installer and the executables are digitally signed to protect the integrity of these files and identify the distributor of the software components.

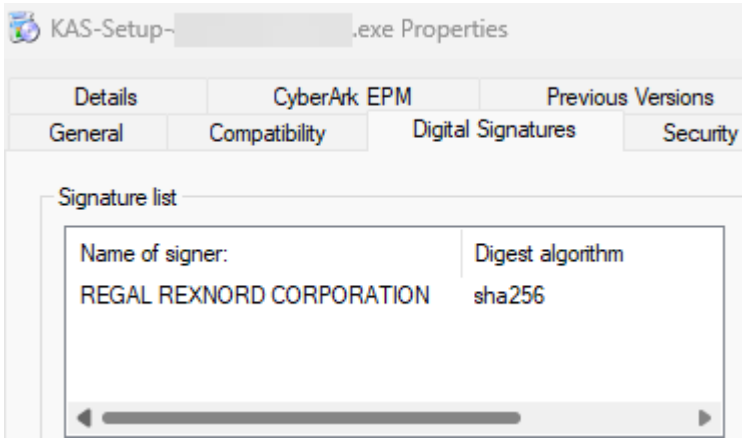The digital signature appears as part of the file properties.

Figure 3-1: Example: KAS Setup Properties Digital Signature

3.3   Download

The latest version of the Kollmorgen Automation Suite is available from KDN.

See KAS IDE Distribution to download the latest or older versions.

> **NOTE**
>
> This is a restricted community.
> You must be given access based on having purchased KAS.
> If you do not have access, contact Kollmorgen support.

3.4   Installation Procedure

> ⓘ **IMPORTANT**
>
> Installation of the KAS-IDE can require you to change your firewall setting.
> If you do not have sufficient privileges to configure your firewall, you must stop the relevant Windows Service.

Once KAS has finished downloading, complete these installation steps:

1. Double-click the **KAS-Setup-<<KAS-VERSION-ID>>.exe** file to run the installation Wizard.
    > ⓘ **IMPORTANT**
    >
    > The **Verified Publisher** in the installation wizard dialog must be **REGAL REXNORD CORPORATION**.
2. Click **Yes** to start the installation Wizard.
3. While the setup is loading, wait for the setup splash screen to vanish after being displayed.
    The Welcome Wizard displays with the version and build number of the KAS-IDE.
4. Click **Next** to continue.
5. Review the License Agreement and click **I Agree** to continue the installation.
    > **NOTE**
    >
    > You must accept the agreement to install KAS.
6. Select the **Development Environment** installation type from the drop-down menu.

Installation Type	Description
Development Environment	This installation is typically used for creating and developing a new application. When you need to install the KAS-IDE and the KAS Runtime Simulator, select Development Environment as the type of installation.
Custom	You can manually select the specific KAS components to install.

7. Click **Next** to access the destination folder.
8. Accept the recommended default location or
   Click **Browse** to specify a custom install directory.
9. When finished, click **Install** to continue.

   ↖ TIP

   Kollmorgen recommends accepting the default destination folder under C:\Program Files\Kollmorgen\Kollmorgen Automation Suite\Kollmorgen Automation Suite <<KAS-VERSION-ID>>.

10. The software installation begins.
    Wait until the installation process is complete.
11. Click **Finish**.

↖ TIP

- Adding the **KAS-IDE** application as an exception in your firewall settings is recommended to avoid security issues.
- See the FAQ entry How can I fix security issues? about firewall recommendations.

3.4.1 User Data

User-generated data such as log files, project sources, field bus configurations, function blocks, etc. are stored in the Windows® User directory and are maintained between installations. This applies to files on AKD PDMMs, PCMMs, and Simulator files.

3.5 Additional Literature

Document Title	Description	Download
Release Notes	The KAS Release Notes contain a summary of: • New features, fixed and known limitations, workarounds • Information on all hardware and software components that have been updated, changed, or added in the release.	
Getting Started	Contains these main steps to get the KAS system up and running. • **Hardware (HW) Installation** (Connection and Wiring): Wiring and hardware details, connectors, system diagrams. • **HW Configuration**: Basic configuration and settings needed to start the HW components (e.g., HMI, Industrial PC, Fieldbus, I/O). • **Software (SW) Installation**: KAS software setup.	

30 Minutes to Motion	Contains the main topics to get started quickly with KAS-IDE.
	The objective is to familiarize you with the basic principles and the way the program works by creating a simple motion application project.
	This document contains information about:
	
	• Key Features
	  • See the Key Features in KAS.
	• Explore the Workspace
	  • See Describing the KAS Graphical User Interface.
	• Build a Motion Project
	  • Almost every task performed in KAS falls under one of these basic steps (which may not always be completed in this order):
	    • **Start Projects** - Create a project from scratch or modify an existing project.
	    See Create a Project.
	    • **Add Components** - Add necessary elements to build the project and control the motion part of the system. This includes: Create Variables, Adding Motion, and Programs: Structure and Syntax.
	    • **Build Output** - Select a device and generate the application to deliver to users.
	    See Run the Project.
	    • **Run Output** - Make the output accessible to end-users.	

KAS-IDE User Manual	Contains content to help with KAS-IDE except the topics included in the Reference Manuals.	
Reference Manual - PLC Library	Contains Technical References on **PLC** Programming Languages and Library.	
Reference Manual - Motion Library	Contains Technical References on **Motion** Library for Pipe Network and PLCopen.	

4   Installing KAS Runtime

The controller has all the necessary software installed (including KAS Runtime).

NOTE

KAS Runtime is only supported with Kollmorgen controllers.

4.1   Update the Runtime on AKD PDMM and PCMM

The KAS Runtime is contained in the AKD PDMM and PCMM firmware and comes pre-installed.

This procedure is for updating the firmware and runtime using the KAS web server.

ⓘ IMPORTANT

The firmware files for "AKD PDMM and PCMM File Type: .IMG" (➔ p. 13) are different than those for "PCMM2G File Type: .ZIP" (➔ p. 14).

4.1.1 AKD PDMM and PCMM File Type: .IMG

- .IMG File Formats
  - "AKD PDMM" (➔ p. 13)
  - "PCMM" (➔ p. 13)
- "Model Code" (➔ p. 13)

4.1.1.1   AKD PDMM

Controller	File Name Format	Example File Name
AKD PDMM	`KAS-PDMM-M-{`**`Model-Code`**`}-{`**`Software-Version`**`}.img`	`KAS-PDMM-M-`**`K1EC-4.01.0.91992`**`.img`

4.1.1.2   PCMM

Controller	File Name Format	Example File Name
PCMM	`KAS-PCMM-M-{`**`Model-Code`**`}-{`**`Software-Version`**`}.img`	`KAS-PCMM-M-`**`M2EC-4.01.0.91992`**`.img`

4.1.1.3   Model Code

Model Code	CPU Speed	Core
KCEC and MCEC	800MHz	Single
K1EC and M1EC	1.2GHz	Single
M2EC	1.2GHz	Dual

4.1.2 PCMM2G File Type: .ZIP

- .ZIP File Formats
  - "Operating System (OS) + KAS Runtime (RT)" (➜ p. 14)
  - "OS Only" (➜ p. 14)
  - "KAS Runtime (RT) Only" (➜ p. 14)
- "Model Code" (➜ p. 14)

4.1.2.0.1   Operating System (OS) + KAS Runtime (RT)

- These files contain both the operating system and the KAS runtime.

Firmware File	File Name Format	Example File Name
Operating System (OS) + KAS Runtime (RT)	`KAS-PCMM2G-{Processor/RAM Code}-{Storage-Code}-{OS-Version}-{RT-Version}.zip`	`KAS-PCMM2G-Cx-08-OS-1.0.0.00288-RT-4.01.0.91998.zip`

4.1.2.0.2   OS Only

- Operating system security update.
- These are provided as security patches.
- The KAS Runtime is not affected, but must not be less than a specific version.

Firmware File	File Name Format	Example File Name
OS Only	`KAS-PCMM2G-{Processor/RAM Code}-{Storage Code}-{OS-Version}.zip`	`KAS-PCMM2G-Cx-08-OS-1.0.0.00281.zip`

4.1.2.0.3   KAS Runtime (RT) Only

- Unofficial runtime patch file.
  - These files are very small.
  - They may be sent to individual users when troubleshooting specific issues.

Firmware File	File Name Format	Example File Name
KAS Runtime (RT) Only	`KAS-PCMM2G-{Processor/RAM Code}-{Storage Code}-{RT-Version}.zip`	`KAS-PCMM2G-Cx-08-RT-4.01.0.91978.zip`

4.1.2.1   Model Code

Processor / RAM / Storage Code	CPU Speed	Core	RAM	Storage
Cx-08	1.5GHz	Quad	2 / 4 / 8GB	8GB
Cx-16	1.5GHz	Quad	2 / 4 / 8GB	16GB
Cx-32	1.5GHz	Quad	2 / 4 / 8GB	32GB

Procedure

1. Download the latest drive firmware and/or runtime firmware from Kollmorgen.com.
2. Open the controller's web server in your web browser by entering its IP address.
3. Select the **Settings** tabbed-page.
4. In the **Firmware** pane, click the **Choose File** button to select the new firmware image file for the KAS Runtime.

   The recommended file is shown in the **Firmware Information** section.
   Examples:

AKD PDMM and PCMM

Firmware Information

Firmware version	4.01.0.91992
Recommended file name	KAS-PDMM-M-M1EC-{version}.img

PCMM2G

Firmware Information

OS version	1.0.0.00281
Runtime version	4.01.0.91992
Recommended file name	KAS-PCMM2G-Cx-08-OS-{OS version}-RT-{Runtime version}.zip

5. Click **Upgrade** to start the procedure.

   ✦ *TIP*

   If the **Upgrade** button is disabled, log into the webserver.
   Click **Login** at the top of the web page and enter the password.

   A message and a throbber are shown across the web page, indicating that maintenance is in progress.
   The 7-segment display on the controller animates with chasing lights.

Successful Upgrade	• The controller automatically reboots with new firmware. • Press **<CTRL+F5>** in the web browser to force a page refresh so the **Firmware Version** updates to the new version number.
| Incompatible Firmware | **Example: AKD PDMM and PCMM Error Message**<br>An error message, similar to this, appears if the wrong firmware file was downloaded:<br><br>```
The file provided is not compatible with this device.
The file name should be...
"KAS-PDMM-M-MCEC-{version}.img"
```<br><br>**Example: PCMM2G Runtime Error Message**<br><br>```
Minimum runtime version requirement not met.
``` |

6. After the download is complete, click **Reboot**.

   A message and a throbber are shown over the web server while the reboot is in progress.

   The login session is no longer valid when the reboot is complete.
   The webserver displays a message to indicate the user has been logged out.

NOTE

   This step is not necessary if the controller automatically reboots during the upgrade (previous step).

7. Press **<CTRL+F5>** to force the web browser to refresh the page.

①IMPORTANT

   Do **not** try to refresh the web page until firmware upgrade is completed.

5   Install Hardware (HW)

Before a motion application can be up and running, all hardware components need to be connected, wired, and configured.

The **Getting Started** guide contains procedures for installing and configuring hardware components (e.g., HMI, controllers, I/O Terminals, EtherCAT Motion Bus, AKD2G Drive, and AKM2G Motor).

> **NOTE**
>
> For extensive information about installing the different hardware components, see:
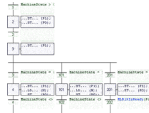> - KAS.Kollmorgen.com
> - KAS-IDE online help (after KAS has been installed)

This table has links to installation procedures for hardware components.

Domain	Product	Product Example Image	Concept (Technology)	Installation	Tasks (Tools)	Reference
Controller	AKD PDMM PCMM PCMM2G		Programmable Drive Multi-axis Master: Controllers	• Install the AKD PDMM, PCMM, or PCMM2G controller. • See "Install Controllers" (→ p. 23).	• Add the Controller • Configure the Controller	Controllers

Domain	Product	Product Example Image	Concept (Technology)	Installation	Tasks (Tools)	Reference

Drives	AKD
	AKD-C
	AKD-N
	AKD2G
	S300
	S700
			• AKD
			• AKD-C
			• AKD-N
			• AKD2G
			• S300
			• S700
				• Install a AKD or AKD2G Drive.
				• See either the:
				  • AKD Installation Manual
				  • AKD Quick Start
				• Available from: AKD Downloads.
					• Add and Configure a Servo Drive
					• AKD Drive Configuration
					• "Download AKD PDMM Drive Firmware" (➜ p. 28)
					• "AKD/AKD2G Firmware Update" (➜ p. 29)
						Drives

Fieldbus	EtherCAT		EtherCAT	• Set up EtherCAT Motion Bus Communication. • See AKD®EtherCAT Communication.	Configure EtherCAT Motion Bus	Motion Bus and Fieldbuses Cables
HMI	Human-Machine Interface			• Install the graphic operator interface. • See "HMI - Graphic Operator Interface" (➜ p. 23).	• Using Kollmorgen Visualization Builder • Add an HMI Device	HMI

Domain	Product	Product Example Image	Concept (Technology)	Installation	Tasks (Tools)	Reference
I/O Terminal			EtherCAT	• Install the remote Input/Output Terminal. • See "Remote Input/Output - I/O Terminal" (➜ p. 24).	• Add and Configure I/O Slices • Map Input and Output to Variables	Remote Input/Output Terminals

Domain	Product	Product Example Image	Concept (Technology)	Installation	Tasks (Tools)	Reference
Mechanical						Linear Actuators Gearheads
Motion Engines			Motion Concept: • Pipe Network Concept • PLCopen®		• Design Pipe Network • Pipe Network Editor • Create Cam Profile • Cam Profile Editor • Soft Oscilloscope	

Motors	AKM
	AKM2G
			Kollmorgen Servomotor	• Install the AKM or AKM2G Motor.
				• Mechanical and Electrical installation.
				• Available from:
				  • AKM Downloads
				  • AKM2G Downloads
						• AKM
						• AKM2G
						• Cartridge DDR
						• Direct Drive Linear
						• Housed DDR
						• KBM
						• TBM

PLC			IEC 61131-3		• Free Form Ladder Diagram (FFLD) Editor • Function Block Diagram (FBD) Editor • Sequential Function Chart (SFC) Editor • Soft Oscilloscope (Softscope) • Structured Text (ST) / Instruction List (IL) Editor • Variables tab for Dictionary	• FBD Language • FFLD Language • IL Language • SFC Language • ST Language

Domain	Product	Product Example Image	Concept (Technology)	Installation	Tasks (Tools)	Reference
Safety			Safety over EtherCAT	"SafePLC2 Projects" (➜ p. 27)	1. "SafePLC2 Projects" (➜ p. 27) 2. Set Up a Variable to Monitor Safety Data 3. AKD2G Safety Parametrization Using FSoE with SCU-1-EC and PxMM / PCMM2G 4. Set Up FSoE Master and an AKD2G with SafeMotion Monitor	• BBH FSoE Master • Related Documents • AKT2G-SDI-004-000 • AKT2G-SDO-004-000

5.1   HMI - Graphic Operator Interface

This is a list of HMI available component:

HMI Part Number	Description	KVB	Manual
AKI-CDC-MOD-21T-000	Graphical Display 21.5" TFT LCD, Touchscreen	v2.0	
AKI-CDC-MOD-15T-000	Graphical Display 15.4" TFT LCD, Touchscreen	v2.0	
AKI-CDC-MOD-12T-000	Graphical Display 12.1" TFT LCD, Touchscreen	v2.0	
AKI2G-CDA-MOD-07T-000	Graphical Display 5" TFT LCD, Touchscreen	v2.20	
AKI2G-CDA-MOD-05T-000	Graphical Display 7" TFT LCD, Touchscreen	v2.20	
AKI2G-CDB-MOD-12T-000	Graphical Display 12" TFT LCD, Touchscreen	v2.20	
AKI2G-CDB-MOD-07T-000	Graphical Display 7" TFT LCD, Touchscreen	v2.20	

See the Kollmorgen Support Network for specifications and Technical Manuals.

5.2   Install Controllers

The controller installation information is found here:

Document Title	Description	Manual
AKD PDMM Installation Manual	• Covers the most important points to install the drive hardware and software. • Provides instructions for basic drive setup and connection to a network.	
PCMM Installation Manual	Covers the most important points of the installation and setup of the controller.	
PCMM2G Installation Manual	Covers the most important points of the installation and setup of the controller.	

5.3   EtherCAT Motion Bus

One EtherCAT master must be connected with all the slaves (drives and I/O terminals) of your system.

Details about the installation procedure for the EtherCAT Motion Bus are here:

- AKD2G: Website - Installation and Setup
    - Click **Apply** to set the Fieldbus filters on the website.
- AKD: Website - Download - AKD EtherCAT Communications Manual
    - Select the PDF from the list.

5.4 Remote Input/Output - I/O Terminal

This is a list of available I/O components.

See the AKT2G I/O Manual or the online help for detailed information on setting up I/O.

I/O Terminal Part Number	I/O Terminal Description
AKT2G-AC-FAN-001	Fan cartridge for EtherCAT and Bus Terminals.
AKT2G-AN-240-000	• 2-channel input terminal PT100 (RTD) for resistance sensors. • 16-bit, 2-, 3-wire system.
AKT2G-AN-400-000	• 4-channel thermocouple input terminal. • Preset to type K, with wire breakage detection. • 16-bit
AKT2G-AN-430-000	• 4-channel analog input. • Parameter capable • -10/0 to 10V • -20/0/+4 to +20mA • 16-bit
AKT2G-AT-410-000	• 4-channel analog output terminal. • 0 to 10V • 1-wire system • 12-bit
AKT2G-AT-425-000	• 4-channel analog output terminal. • -10V to +10V • 4 x 2-wire system • 12-bit
AKT2G-BRC-000-000	Brake Chopper Terminal
AKT2G-DN-002-000	• Up/down counter $24V_{DC}$ • 100 kHz • 32-bit counter depth
AKT2G-DN-008-000	• 8-channel digital input terminal $24V_{DC}$. • Filter 3.0ms • 1-wire system
AKT2G-DNH-008-000	• 8-channel digital input terminal $24V_{DC}$. • Filter 10µs • 1-wire system
AKT2G]-DT-008-000	• 8-channel digital output terminal $24V_{DC}$ • 0.5A • 1-wire system
AKT2G-ECT-000-000	EtherCAT Coupler for E-bus terminals
AKT2G-EM-000-000	• Bus end cover for E-bus terminals • Cover for power and E-bus contacts, gray
AKT2G-ENC-180-000	• 1-channel incremental encoder interface • 32-bit
AKT2G-ENC-190-000	• Incremental encoder interface with differential input • 16-bit / 32-bit

I/O Terminal Part Number	I/O Terminal Description
AKT2G-PSF-024-000	- Power supply terminal with fuse $24V_{DC}$
AKT2G-SDI-004-000	4-channel digital input terminal $24V_{DC}$. - Safety
AKT2G-SDO-004-000	4-channel digital input terminal $24V_{DC}$. - Safety 0.5A
AKT2G-SM-L15-000	- Stepper motor terminal $24V_{DC}$ 1.5A - Vector control
AKT2G-SM-L50-000	- Stepper motor terminal $50V_{DC}$ 5A - Vector control

5.5 Install AKD Drives

Drive Manuals	Description
AKD EtherCAT Manual	Describes the installation, setup, range of functions, and software protocol for the EtherCAT AKD product series.
AKD Installation Manual	• Installation manual for AKD and AKD PDMM drives. • Describes the AKD series of digital drives and includes mechanical, electrical, and software installation information needed to safely install AKD.
AKD PDMM Fault Card	• Describes the AKD PDMM (including AKD) faults, warnings, error messages, and alarms. • Provides cause and remedy instructions to determine the specifics of the failure and to correct the underlying problem.
AKD PDMM User Manual	• Describes the software installation, setup, and operation for the AKD PDMM drive. • Includes basic topics and examples to help set up and use the various features in the drive.
AKD, AKD2G, S700 (in NA) Accessories Manual	Describes the accessories for Kollmorgen digital drive systems and servo drive motors.
AKD2G EtherCAT Manual	Describes the installation, setup, range of functions, and software protocol for the AKD2G product series.
AKD2G Installation Manual	• Describes the AKD2G series of digital drives. • Includes mechanical, electrical, software, and functional safety options.
MKD Installation Manual	• Installation manual for MKD-N power supply and MKD-C drives. • Describes the MKD devices and includes mechanical, electrical, and software installation information needed to safely install the devices.
S300 Reference Documentation	Kollmorgen website with access to all S300 manuals.
S700 Reference Documentation	Kollmorgen website with access to all S700 manuals.

5.6 Install AKM or AKM2G Motors

See either the AKM Instructions Manual or the AKM2G Installation Manual.

5.7 SafePLC2 Projects

A node can be added to the Project tree connected to a SafePLC2 project.

- This is used to synchronize a SafePLC2 project with a KAS project.
- The KAS-IDE automatically generates the PDOs for the connected devices and establishes the Black Channel with the EtherCAT Safety network.

See the online help or the AKT2G I/O Manual for more information.

6   Updating Firmware

Check the KAS software Release Notes to find the AKD PDMM firmware version that matches your KAS software version. The latest version of the firmware can be downloaded from the Kollmorgen website.
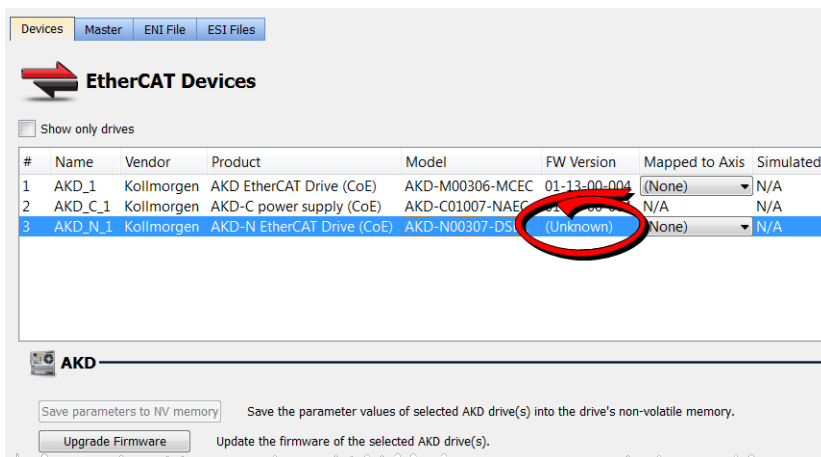
To ensure your installation is correct, you have to:

1. Check the current AKD or AKD2G drive firmware.
2. Download the official version, if necessary.
3. Update the firmware.

6.1   Check AKD / AKD2G Drive Firmware with KAS-IDE

1. Create a new project.
2. Set the controller type and IP address.
3. In the Project Explorer, double-click the **EtherCAT** node to open the EtherCAT Devices summary window.
4. In the Devices tab, click the **Scan Devices** button.
5. Choose the **Create...** option to map the physical device to a new device.

> **NOTE**
>
> If a Kollmorgen drive is showing the firmware version as **Unknown**, the drive has valid resident firmware (to boot from), but does not have valid operational firmware.
> Download and install the latest operational firmware and reboot the AKD / AKD2G.

6. If the version is not correct, continue with this procedure:
7. Compile the project.
8. Connect to the controller.
9. Download the project to the controller.
10. If the version is not correct, download the new firmware from the Media & Downloads website.
11. Continue with "Download AKD PDMM Drive Firmware" (➜ p. 28).

6.2   Download AKD PDMM Drive Firmware

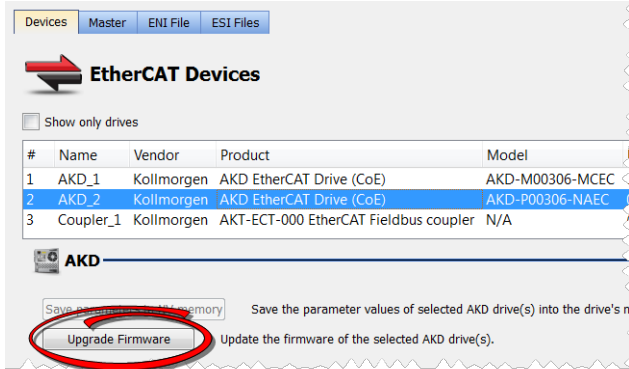| Component	Title	Download Link
800MHz AKD PDMM Drive FW	AKD PDMM Servo Drive Firmware (AKD-M-MCEC-[firmware version])	
1.2GHz AKD PDMM Drive FW	AKD PDMM Servo Drive Firmware (AKD-M-M1EC-[firmware version])	

6.2.1 Update the AKD PDMM Drive Firmware with KAS-IDE

1. In the toolbar, deactivate the Online Configuration Mode.
2. Select the drives requiring the same firmware version to be updated.

   > **➤ TIP**
   >
   > The firmware download is limited to 16 drives at a time.

3. Click the **Upgrade Firmware** button.

   > **① IMPORTANT**
   >
   > Warning dialogs may appear at this point.
   > These warnings include important information about preventing damage to the drives.

4. Browse to the new AKD/AKD2G firmware file.
   See the Release Notes for the latest supported firmware.
5. Click **Open** to start the updating procedure.

   > **NOTE**
   >
   > This procedure is not possible when applications are running and when the drive is in Online Configuration Mode.

6.3   AKD/AKD2G Firmware Update

Based on the File Access over EtherCAT (FoE) protocol, the AKD / AKD2G drive Firmware can be downloaded.

> **① IMPORTANT**
>
> This procedure is not possible when applications are running and when the drive is in Online Configuration Mode.

Procedure

1. Scan the devices and verify all devices are created.
2. Compile the project.
3. Connect to the controller.
4. Download the project to the controller.
5. Open the **EtherCAT Devices** summary form.
6. Select the drives requiring the same firmware version to be updated.
   - Multiple drives of the same type can be selected.
     This allows the same firmware file to be downloaded to the selected drives simultaneously.

- **AKD-C**: Devices with the product description **AKD-C String 2** do not support firmware download.

- **AKD-N**: The last four characters can be different.
  However, the firmware file selected to download must support all the selected models.
  The file `AKD-N-xxEC-********.i00` supports multiple AKD-N models.
- **AKD-P**: The last four letters of the model number must be the same for simultaneous firmware download.

7. Click the **Upgrade Firmware** button.

> ⓘ**IMPORTANT**
>
> Warning dialogs may appear at this point.
> These warnings include important information about preventing damage to the drives.

8. Browse to the new AKD/AKD2G firmware file.
   See the Release Notes for the latest supported firmware.
9. Click **Open** to start the updating procedure.

> ⓘ**IMPORTANT**
>
> This procedure is not possible when applications are running and when the drive is in Online Configuration Mode.
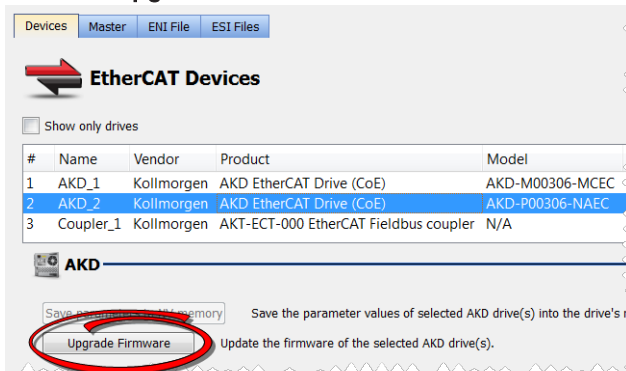
During the firmware download, the AKD/AKD2G Firmware Update window displays a progress bar and these messages appear:

- Uploading firmware to the drive.
    - During the download process, the drive LED displays [dL].
    - Additional codes may appear during the download.
        - See either AKD or AKD2G Display Codes for a description of codes related to the firmware download.
- Resetting the drive.
- Firmware update is complete.

> ⚠**CAUTION**
>
> While the firmware is downloading to your drive, **do not** remove the $24V_{DC}$ logic power.
> If you remove the $24V_{DC}$ logic power during a firmware download, a severe drive crash can occur.
> If a crash occurs, the drive will restart in a special mode and prompt you to reload the firmware.

ⓘ IMPORTANT

An AKD drive executing the resident firmware is detected as a different device than an AKD or AKD2G drive executing the operational firmware.

Re-scan the network and compile it if a drive's executed firmware has changed since the last scan.

↖ TIP

Power cycling is recommended after completing the update for all drives.

7   Installing Kollmorgen Visualization Builder

Kollmorgen Visualization Builder (KVB) is used to design HMI running on AKI panels.

KVB is an optional feature that is only included in some licenses.

> **NOTE**
>
> Kollmorgen Visualization Builder contains these two installation packages:
> - Kollmorgen Visualization Builder(KVB IDE) for development PC
> - Visualizer RT (KVB RT) for AKI panel runtime

7.1   Download

Component	Version
Latest Version of Kollmorgen Visual Builder	v.2.40 [2.43.17.0]
Visualizer RT (KVB RT)	v.2.40 [2.43.17.0]

7.2   Installation Procedure

These programs automatically install during the KVB installation.

- Microsoft .NET Compact Framework 3.5
- Microsoft SQL Server Compact 3.5
- Microsoft Visual C++ 2013 - Redistributable Setup

Once Kollmorgen Visualization Builder has finished downloading, complete these installation steps:
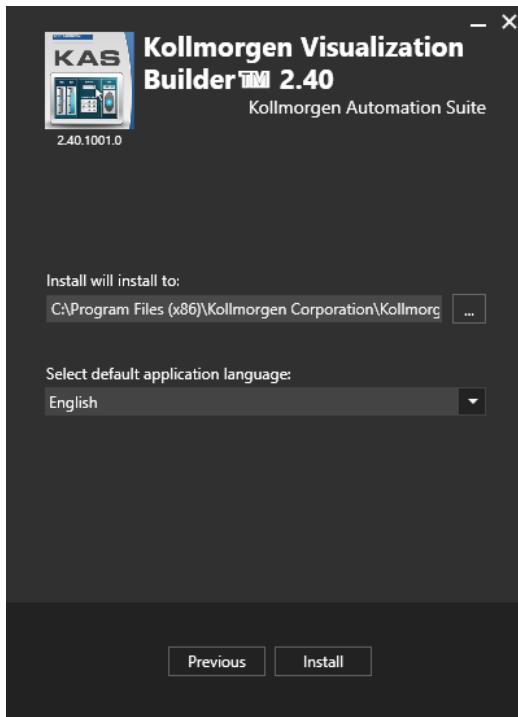
1. Double-click the **Setup.exe** file to run the installation Wizard.

   > **NOTE**
   >
   > If KVB was already installed and you want to update to a new version, then running **NeoSetup.msi** is enough.
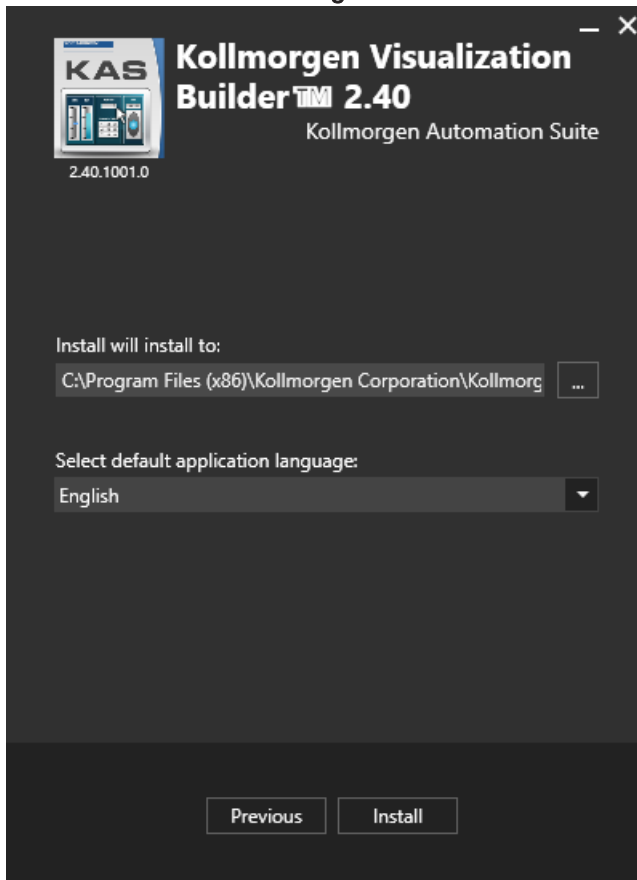
2. Select the check box to accept the License agreement and click **Next** to start installing **Kollmorgen Visualization Builder**.
3. Select where you want to install **Kollmorgen Visualization Builder** and the application language, then click **Next**.

Kollmorgen strongly recommends accepting the default destination folder under `C:\Program Files (x86)\Kollmorgen\Kollmorgen Visualization Builder\`.

4.   Click **Install** to start **Kollmorgen Visualization Builder** installation.

5.   Click **Close** or to start using KVB right away, click **Launch**.

KVB Manuals	Description
Kollmorgen Visualization Builder™ Quick Start Guide	The Quick Start covers these important points to: • Install and use Kollmorgen Visualization Builder. • Configure HMI Panels and PC operated control applications.
Kollmorgen Visualization Builder™ User Manual	Contains all the content to help with Kollmorgen Visualization Builder.

8   Finalize Installation

Optional: To complete the KAS installation, either:

- Test the system.
- Create a backup image.

8.1   Test the Installation

To conclude the installation, the whole system has to be tested.

A test could be done with the standard Two-Axis Template that corresponds to a simple application.

See the KAS **30 Minutes to Motion** User Manual.

9   Troubleshooting

Faults occur for a variety of reasons, depending on the conditions in your installation.

The causes of faults in multi-axis systems can be especially complex.

↖ TIP

Find more information here:

- The **Troubleshooting** section in the online help.
- The **Faults and Warnings** section of the online help.
- Search the Kollmorgen Developer Network (KDN) at www.kollmorgen.com/developer-network for answers or submit a question.

Support and Services

About Kollmorgen

When you need motion and automation systems for your most demanding applications and environments, count on Kollmorgen - the innovation leader for more than 100 years. We deliver the industry's highest-performing, most reliable motors, drives, AGV control solutions and automation platforms, with over a million standard and easily modifiable products to meet virtually any motion challenge. We offer manufacturing facilities, distributors and engineering expertise in all major regions around the world, so you can bring a better machine to market faster and keep it profitable for many years to come.

Kollmorgen Developer Network

See the Kollmorgen Support Network for product support.

Search the knowledge base for answers and get product downloads.

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