Kollmorgen Automation Suite

Getting Started

KOLLMORGEN

Because Motion Matters™

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Table of Contents

1 Introduction

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

- **Hardware Installation** (Connection and Wiring)
  Hardware details, connectors, system diagrams
- **Hardware Configuration**
  Basic configuration and settings needed to start the HW components
  (HMI + Industrial PC + Fieldbus + I/O)
- **KAS IDE Installation**
  KAS software setup

1.1 Related Documents

In addition to this Guide, you need the following manuals to install KAS

Title	Description
AKD Quick Start	Contains all information needed to safely install and setup an AKD drive
AKD 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
AKD EtherCAT Communication	Describes the installation, setup, and software protocol for the EtherCAT AKD product series

1.2 Alerts and Warnings

When alert symbols are seen in a manual, be alert to 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. The purpose of this section is to alert 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.

CAUTION

Directs attention to general precautions, which if not followed, could result in personal injury and/or equipment damage

WARNING

Alerts you to potential physical danger or harm. Not following warning notices could result in personal injury

NOTE

Provides important information to ensure a thorough understanding of product use.

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2 System Overview

Kollmorgen Automation Suite is a complete system solution. This includes a variety of powerful software packages designed to give you complete control over your hardware.

2.1 Software Packages

Software	Description
KAS IDE	Provides you with all the 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)	This application is optional and assists in designing an HMI panel
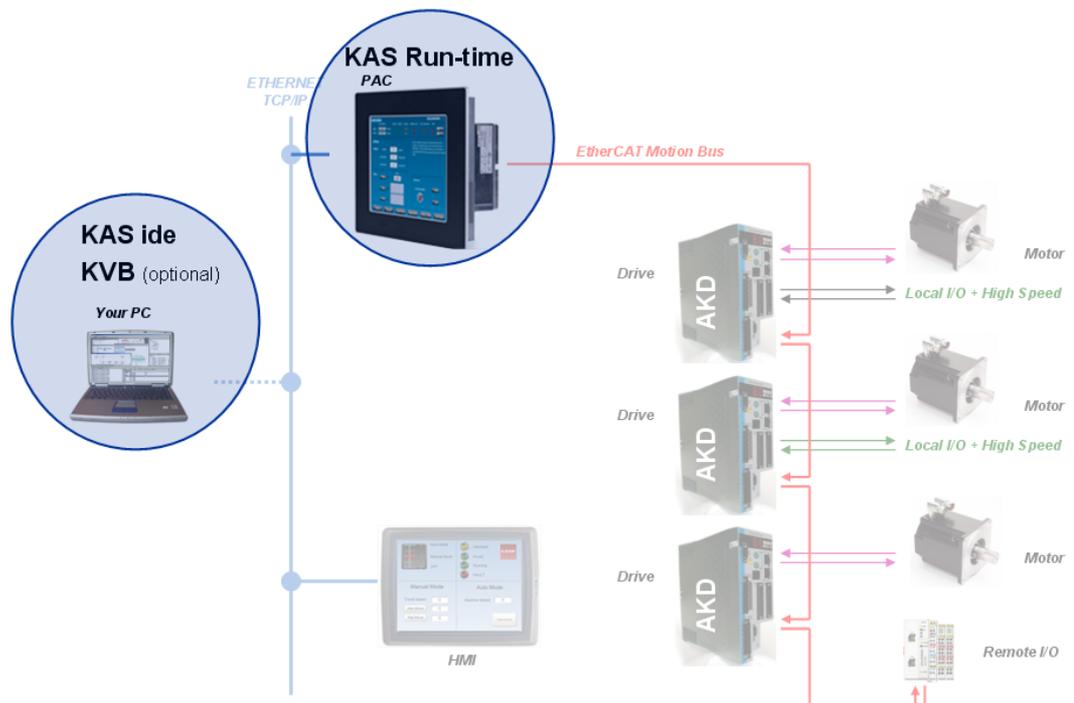
IMPORTANT Do not install KAS IDE on the Kollmorgen PAC controllers. The two are **not** compatible.

2.2 Hardware Components

The KAS system is build using the following hardware components.

Component	Name	Description
Industrial PC	AKC	Controls all the network devices (remote I/O, drives...) by managing the PLC and motion engines
Remote I/O	AKT	Refers to the communication and acquisition of data between your automation system and the outside world
HMI	AKI	This component provides an interface for controlling the KAS Runtime
Drive	AKD	Servo drives specifically designed with versatility, communications, and the power to expand machine performance and increase integration speeds
Motor	AKM	The servo motor is an engine that can drive to different setpoint positions and then maintains these in the sense of a control drive
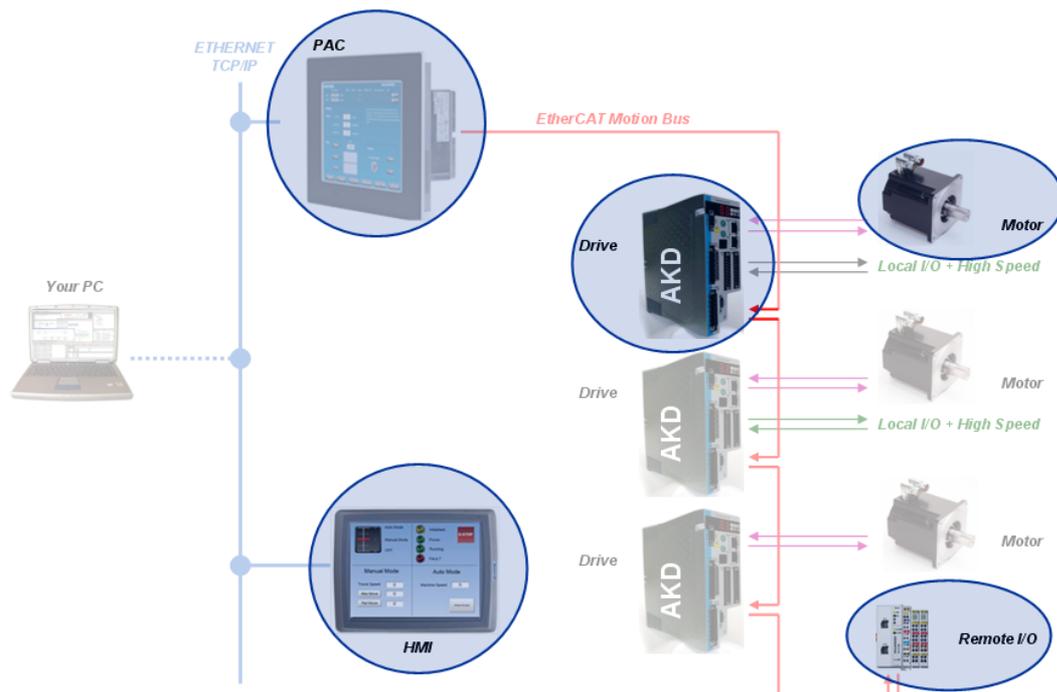
3 Installing KAS IDE

3.1 System Requirements

KAS IDE minimum system requirements:

Element	Description
Operating System	Microsoft® Windows® XP (32-bit XP Pro SP3 or above) and Windows 7 (32 and 64-bit).
	ⓘ *TIP* 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	512 MB 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
	✎ **NOTE** Better results are achieved with OpenGL and 3D cards
Connectivity	1 Ethernet port, at either 100Mbits/s or 1Gbits/s.
	ⓘ **IMPORTANT** A 100Mb network is required in order to allow the IDE to Runtime communication to work in all conditions. The AKD WorkBench AutoTuner and Scope both require 100Mb of bandwidth to function properly.
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 .

ⓘ **IMPORTANT**   KAS IDE and KAS Simulator should not be installed on a Kollmorgen Industrial PC (PAC). The IDE and Simulator are for use on PCs only.

3.2 Download

The latest version of the Kollmorgen Automation Suite is available at www.kollmorgen.com.

3.3 Installation Procedure

How to proceed if you have a CD?

After inserting the installation CD, a web browser automatically displays the installation start page.

ⓘ *TIP*   If the installation start page does not automatically display, double-click on the file **Index.html** file.

To start the installation of Kollmorgen Automation Suite, click the corresponding link and confirm that you want to execute **KAS-Setup.exe**.

Follow the procedure below to proceed with the KAS IDE software installation.

ⓘ **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 the following installation steps:

1. Double-click the **KAS-Setup.exe** file to run the installation Wizard.

✎ NOTE	A Security Warning dialog displays as a result of security certification. Do not be alarmed.

2. Click **Run** to start the installation Wizard.
3. While the setup is loading, wait for the setup splash screen to vanish after being displayed.

4. If a previous version of the KAS IDE is installed then an uninstall notice is displayed. The previous version must be uninstalled before the installation can continue. All content of the previous repository is deleted during the uninstall.
5. The following Welcome Wizard displays with the version and build number of the KAS IDE. Click **Next** to continue.
6. Review the License Agreement and click "I Agree" to continue the installation.

✎ NOTE	You must accept the agreement to install Kollmorgen Automation Suite.

7. Select the **Development Environment** installation type from the drop-down menu.

Installation type	Description
Development Environment	This kind of installation is typically used for creating and developing a new application. When you need to install the KAS IDE and the KAS Runtime Simulator, you can select Development Environment as the type of installation.
Run-time Industrial PC	This installation is typically used when you have an industrial PC (IPC). You are able to view and run your application. You need to install Kollmorgen Visualization Builder and the KAS Runtime. Kollmorgen Visualization Builder is specially designed to view and control your application. The KAS Runtime only executes the application.
Custom	You can manually select the specific KAS components to install.

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

① TIP	Kollmorgen strongly recommends accepting the default destination folder under C:\Program Files\Kollmorgen\Kollmorgen Automation Suite\Kollmorgen Automation Suite.

10. The software installation begins. Wait until the installation process is complete.
11. You are done; click **Finish.**

① TIP	Adding the **KAS IDE** application as an exception in your firewall settings is recommended to avoid security issues

3.3.1 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 PACs, AKD PDMMs, as well as Simulator files.

4 Installing KAS Runtime

The PAC controller comes with all the necessary software already installed (including KAS Runtime). The image version is displayed on the background image of the desktop.

> **✎ NOTE**   KAS Runtime is only supported with Kollmorgen controllers.

4.1 System Requirements

Requirement	Description
Operating System	The KAS Runtime is supported under XP embedded (XPe) for the industrial PC.
Recommended network environment	Only a **Local Network** connection can ensure the communicate between the KAS IDE and the KAS Runtime. **⊘ IMPORTANT** The KAS IDE is not able to communicate to the KAS Runtime through NAT connection.
Supported Kollmorgen Industrial PC	KAS Runtime is compatible with AKC hardware models

4.2 Installation Procedure

Install the KAS Runtime software.

1. Double-click the **KAS-Setup.exe** file to run the installation Wizard
2. Click **Run** to launch the setup wizard
3. Wait for the setup splash screen to vanish after being displayed

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Figure 4-1: Setup splash screen

4. The welcome wizard appears and show you the version and build number, click **Next** to continue the wizard
5. In the drop-down menu, choose the type of installation to deploy: **Run-time Industrial PC**
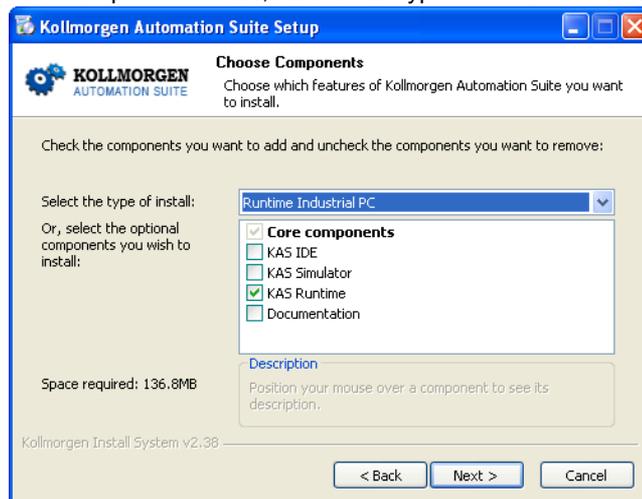
Figure 4-2: Install Run-time for Industrial PC

(See the different Types of Deployment in paragraph "Installing KAS IDE" on page 11)

6. Click **Next** to access the destination folder

7. Select where you want to install KAS

    Kollmorgen strongly recommends accepting the default destination folder under C:\Program Files\Kollmorgen\Kollmorgen Automation Suite

8. Keep the name proposed for the Start Menu Folder and click the **Install** button to install KAS

9. You have to wait until the end of the process

10. Wait until the installation is complete

NOTE	If your Wibu-Key driver is not already installed, a reminder is displayed saying that the WKRuntime.exe needs to be installed. If so, click **OK**.

11. Click **Finish**

NOTE	The EWF filter must be activated on the IPC when everything is ready and must not change anymore. If a significant change happens (like a new KAS version or downloading a new application), the recommendation is to turn off the EWF filter, make the change, and then reactivate it. For more details about this procedure, see page 38

NOTE	After the KAS Runtime installation, you have to restart the IPC.

5 Installing Hardware

Prior to have your motion application up and running, you first need to connect, wire and configure all your hardware components.

The **Getting Started** guide contains procedures for installing and configuring hardware components (HMI, PAC controllers, I/O Terminals, EtherCAT Motion Bus, AKD Drive, and AKM Motor).
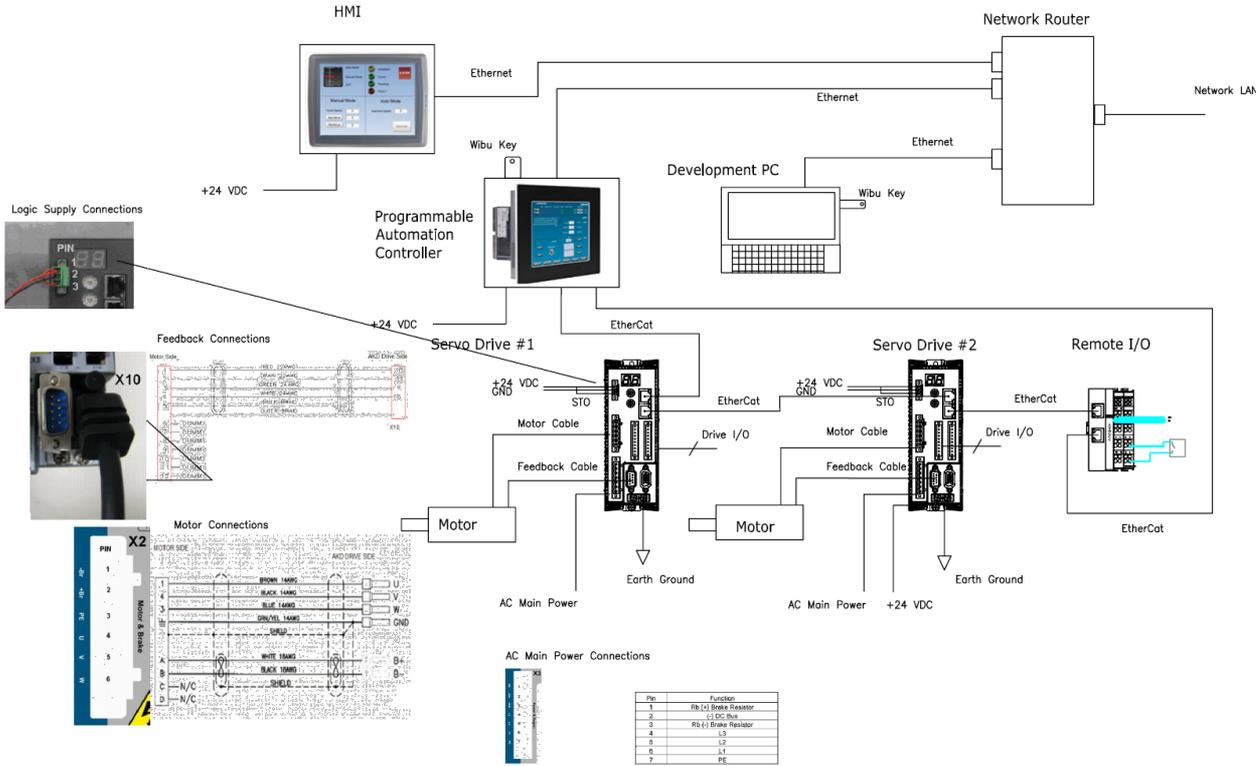
Figure 5-1: Connecting all the Hardware components

> **NOTE**
>
> For extensive information about installing the different hardware components, see the relevant documentation available on:
>
> - KollmorgenWeb site
> - KAS IDE online help (after it has been installed)

Links to installation instructions for hardware components can be found in the following table.

Component		Installation
HMI (Human-Machine Interface)		Install the graphic operator interface Install HMI

Component		Installation
Controller		Install the Panel or Box Programmable Automation Control (PAC) Install Industrial PC
EtherCAT Motion Bus		Set up EtherCAT Motion Bus Communication See AKD™ EtherCAT Communication
I/O Terminal		Install the remote Input/Output Terminal Install I/O Terminals
AKD Drive		Install the AKD Drive See AKD Installation Manual (and also AKD Quick Start)
AKM Motor		Install the AKM Motor Mechanical and Electrical installation Available in http://www.kollmorgen.com/website/com/ eng/download/document/akm_deis.pdf (pp 31-52)

Table 5-1: Kollmorgen Automation Suite Installation and Configuration

5.1 Installing EtherCAT Motion Bus

One EtherCAT master (e.g. PAC) has to be connected with all the slaves (drives and I/O terminals) of your system. Please find all the details about the installation procedure for the EtherCAT Motion Bus in the AKD EtherCAT Communication manual, available on Kollmorgen.com.

5.2 Installing AKD Drive

The official AKD firmware version is: **01-03-00-302**

To install the AKD drive as well as the AKD GUI Views, refer to chapters 7 to 9 in the **AKD Installation Manual**

5.3 Installing AKM Motor

To install rotary AKM Servomotors, refer to chapters 17 to 19 in: **AKM Synchronous Servomotors - Product Manual**

5.4 HMI - Graphic Operator Interface

Please find in the table below the list of each HMI component available:

| HMI part number	Description	Tech. Manual
AKI-CDA-MOD-04T-000	Graphical Display 4.3" TFT, LCD, 16.7M Colors, Touch Screen	
AKI-CDA-MOD-07T-000	Graphical Display 7" TFT, LCD, 262K Colors, Touch Screen	
AKI-CDA-MOD-10T-000	Graphical Display 10.4" TFT, LCD, 16.7M Colors, Touch Screen	
AKI-CDB-MOD-07T-000	Graphical Display 7" TFT, LCD, 262K Colors, Touch Screen	
AKI-CDB-MOD-12T-000	Graphical Display 12.1" TFT, LCD, 262K Colors, Touch Screen	
AKI-CDB-MOD-15T-000	Graphical Display 15.4" TFT, LCD, 262K Colors, Touch Screen	
AKI-CDC-MOD-12T-000	Graphical Display 12.1" TFT, LCD, 16M Colors, Touch Screen	
AKI-CDC-MOD-15T-000	Graphical Display 15.4" TFT, LCD, 16M Colors, Touch Screen	
AKI-CDC-MOD-21T-000	Graphical Display 21.5" TFT, LCD, 16M Colors, Touch Screen	

Table 5-2: List of KAS HMI

Please see the Kollmorgen website for specifications and Technical Manuals for more information.

5.5 Controller - Industrial PC (IPC)

First connect the keyboard and the mouse to the IPC (as well as the monitor if it is not built into the IPC) to be sure that the IPC correctly starts when it is powered by a supply voltage of 24v (not necessarily provided).

The box PAC is equipped with a DVI port, as seen to the right. DVI ports are backwards compatible for use with VGA monitors when using a DVI-to-VGA adapter. The first time the PAC is booted, an external monitor will only stay on for a brief time. The system needs to be configured from the keyboard, depending on what is connected to the DVI port. Press the keyboard combination shown below that matches your set-up. This configuration is automatically saved.
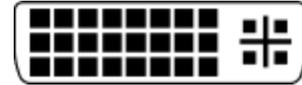
| DVI cable	DVI-VGA adapter
CTRL-ALT-F4	CTRL-ALT-F1

How to recover when the monitor seems to be unplugged or switched off?

The problem is probably due to the internal graphical card configuration and the currently known solution is the following:

- Restart the IPC and press the **F8** key to enter the advanced XP start-up mode
- Select the **VGA mode enable start-up** option
- Reboot the IPC and XP starts normally
- Ignore Windows comments on the screen
- Click the **Start** menu and select **Settings** then **Control Panel**
- Click the **System** command to explore the hardware configuration of the computer
- In the System Properties windows, select the **Device Manager** command in the **Hardware** tab
- In the Device Manager windows, expand the **Display Adapters** node
- Check that two Graphic Controllers are displayed
- Right-click on the first item and select the **Uninstall** command in the contextual menu
- Reboot your IPC as requested to validate the modification

After the reboot operation, your IPC should now work normally.

To be sure that the modification has been done properly, explore again the hardware configuration and compare it with the figure below.
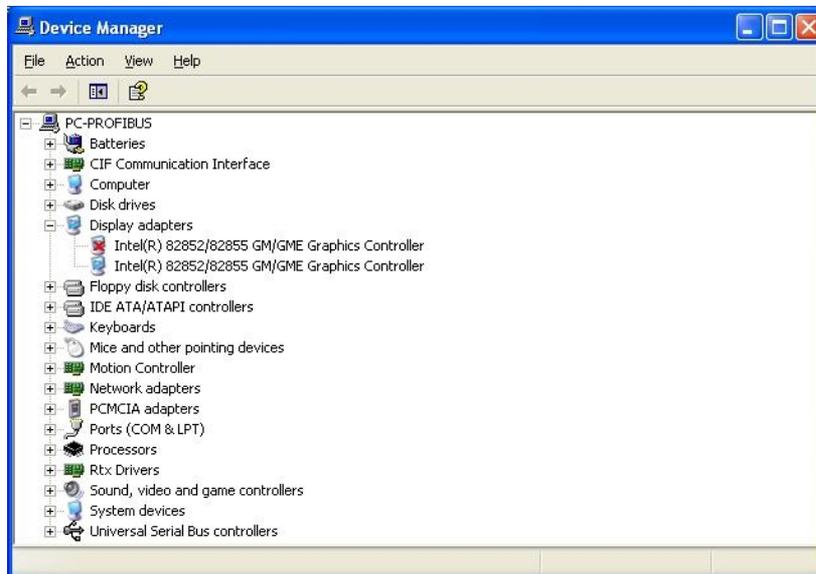
One of the controllers must be deactivated (see **red cross** on its icon).

Please find in the table below the list of each IPC component available:

PAC part number	Description	Tech. Manual
AKC-PLC-C1-224-00N-00-000	Box Controller, Celeron 1.2GHz CPU, 2G RAM, 4G CF, 128KB NVRAM	
AKC-PLC-D2-224-00N-00-000	Box Controller, Dual Core 2.26GHz CPU, 2G RAM, 4G CF, 128KB NVRAM	
AKC-PNC-C1-224-10N-00-000	10" Panel Controller, Celeron 1.2GHz CPU, 2G RAM, 4G CF, 128KB NVRAM	
AKC-PNC-C1-224-15N-00-000	15" Panel Controller, Celeron 1.2GHz CPU, 2G RAM, 4G CF, 128KB NVRAM	
AKC-PNC-D1-224-15N-00-000	15" Panel Controller, C2D 1.86GHz CPU, 2G RAM, 4G CF, 128KB NVRAM	
AKC-PNC-D1-224-17N-00-000	17" Panel Controller, C2D 1.86GHz CPU, 2G RAM, 4G CF, 128KB NVRAM	
AKC-RMC-D2-224-00N-00-000	Rackmount Controller, Dual Core 2.26GHz CPU, 2G RAM, 4G CF, 128KB NVRAM	

Table 5-3: List of KAS PAC

5.5.1 Deploying IPC standard image

The next step is to deploy the standard image that contains INtime Software with the correct settings for all the real-time part, as well as the EtherCAT option card settings. This step is done by Kollmorgen.

5.5.2 Configuring INtime

To finalize the INtime software installation, some fine tuning still has to be performed as follows:

1. Right-click on the INtime icon and select the **INtime Configuration** command in the contextual menu

2. Double-click the **Miscellaneous** icon
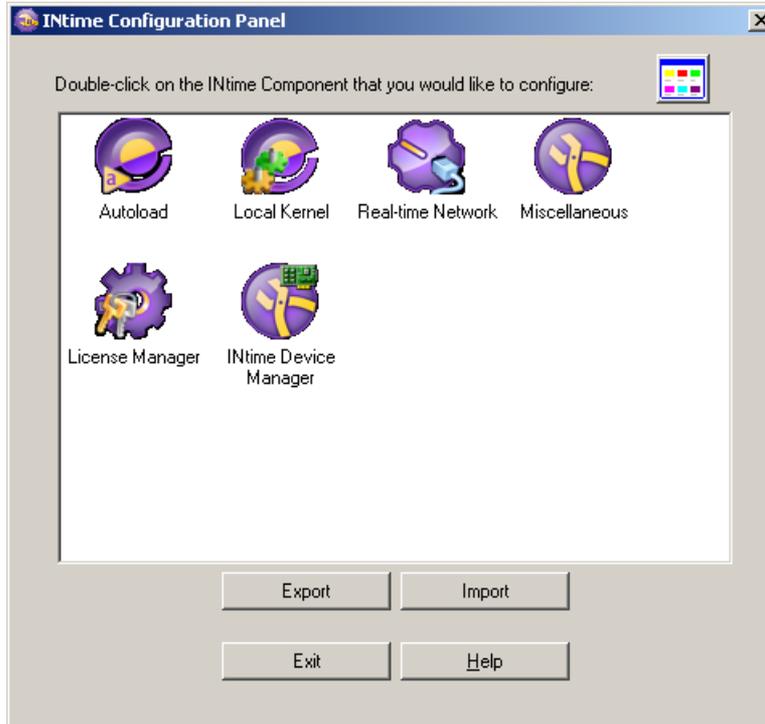
3. Select the **Display Fault Management Dialog** option
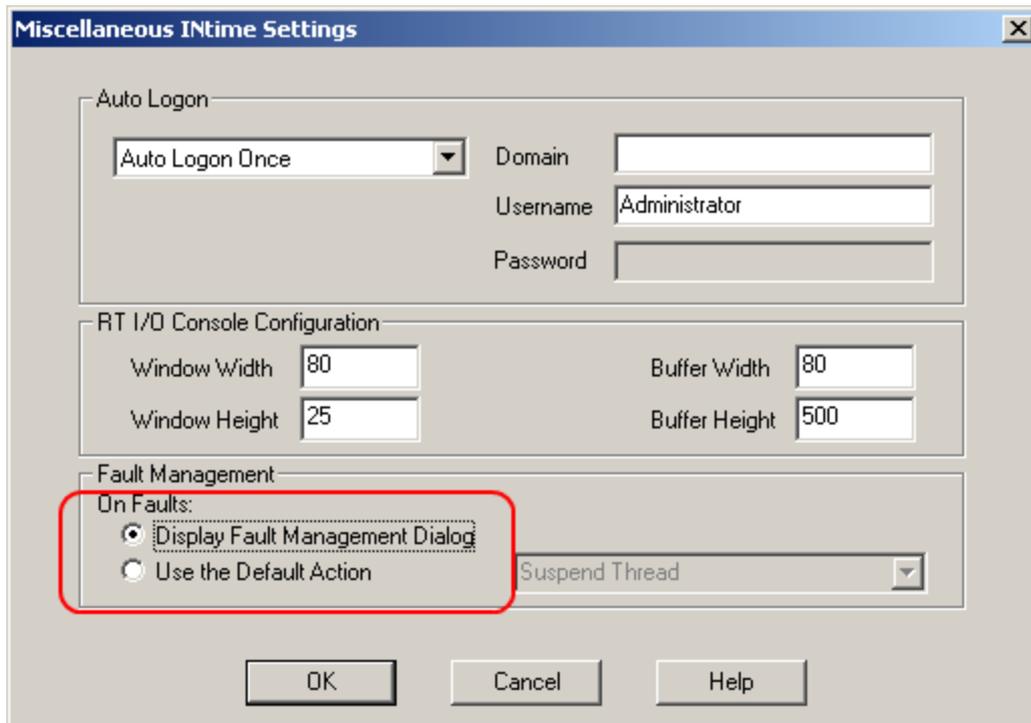
4. Click **OK**
5. In the INtime Configuration Panel, click on the **Autoload** icon
6. Enable the **Hilscher Profibus CIF diver** option, but disable the **SpinDoctor** and **iWin32** options as shown below
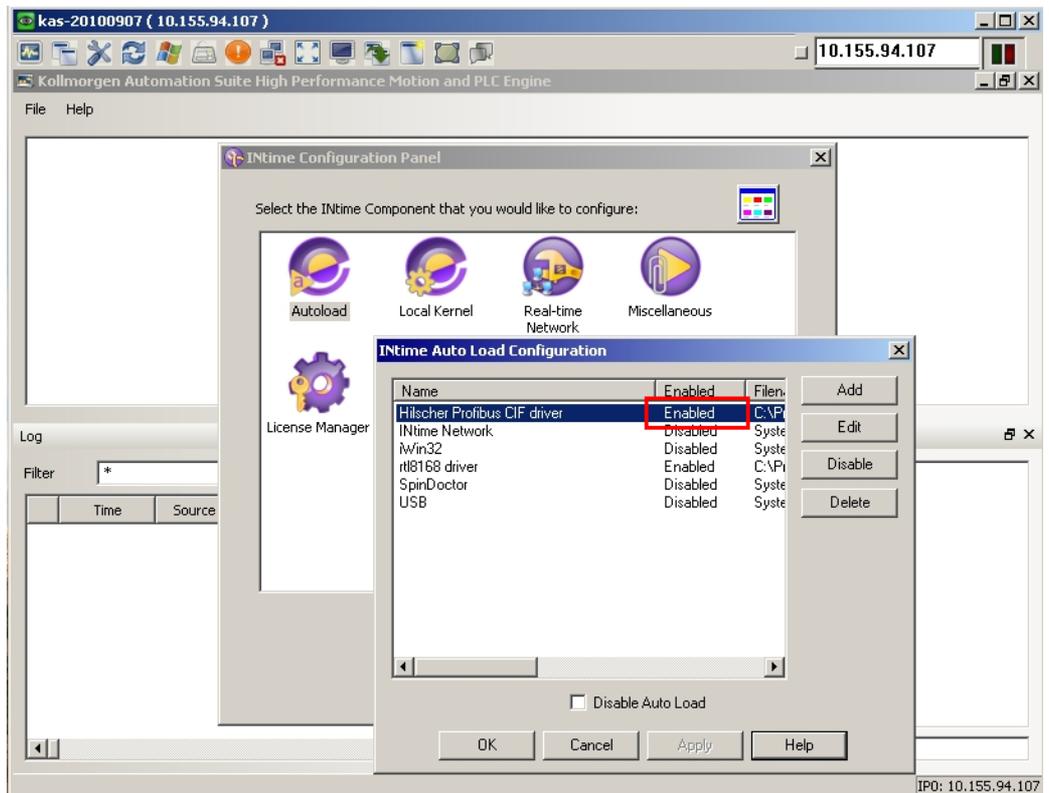
7. Click **OK**

8. Restart your IPC for the changes to become effective

After these changes, INtime is now successfully configured to run on your IPC.

5.6 EtherCAT Motion Bus

One EtherCAT master (e.g. PAC) has to be connected with all the slaves (drives and I/O terminals) of your system. Please find all the details about the installation procedure for the EtherCAT Motion Bus in the following deliverable **AKD™ EtherCAT Communication** listed in the list of References.

5.7 Remote Input/Output - I/O Terminal

Please find in the table below the list of each I/O component available.

I/O terminal part number	Description	Tech.Manual
AKT-ECT-000-000	ETHERCAT Coupler	
AKT-DNH-008-000	8 Channel Digital Input Module, 24 VDC 0.2ms	
AKT-DN-008-000	8 Channel Digital Input Module, 24 VDC 3ms	
AKT-DNH-004-000	4 Channel Digital Input Module, 24 VDC 0.2ms	
AKT-DN-004-000	4 Channel Digital Input Module, 24 VDC 3ms	
AKT-DT-008-000	8 Channel Digital Output Module, 24 VDC 0.5A	
AKT-DT-004-000	4 Channel Digital Output Module, 24 VDC 0.5A	
AKT-DT-2RT-000	2 Channel Relay Output Module, 250 V AC 2.0A Rel.2NO Pot.-Free	
AKT-AN-420-000	4 Channel Analog Input Module, 0-20 mA	
AKT-AN-410-000	4 Channel Analog Input Module, 0-10 VDC	
AKT-AN-820-000	8 Channel Analog Input Module, 0-20 mA	
AKT-AN-810-000	8 Channel Analog Input Module, 0-10 VDC	
AKT-AN-200-000	2 Channel Thermocouple Input Module	
AKT-AN-400-000	4 Channel Thermocouple Input Module	
AKT-AT-220-000	2 Channel Analog Output Module, 0-20 mA	
AKT-AT-420-000	4 Channel Analog Output Module, 0-20 mA	
AKT-AT-410-000	4 Channel Analog Output Module, 0-10 VDC	
AKT-AT-820-000	8 Channel Analog Output Module, 0-20 mA	
AKT-AT-810-000	8 Channel Analog Output Module, 0-10 VDC	
AKT-EM-000-000	End Module	
AKT-IM-000-000	Isolation Module	
AKT-PS-024-000	Power Supply, 24 VDC	
AKT-PSF-024-000	Fused Power Supply with diagnostics, 24 VDC	

Table 5-4: List of KAS I/O Terminals

5.7.1 Installing Bus Terminals on mounting rails

⚠ CAUTION Bring the bus terminal system into a safe, powered down state before starting installation, disassembly or wiring of the Bus Terminals!

5.7.1.1 Assembly

The Bus Coupler and Bus Terminals are attached to commercially available 35 mm mounting rails (DIN rails according to EN 50022) by applying slight pressure:

1. First attach the Fieldbus Coupler to the mounting rail.
2. The Bus Terminals are now attached on the right-hand side of the Fieldbus Coupler. Join the components with tongue and groove and push the terminals against the mounting rail, until the lock clicks onto the mounting rail.
   If the Terminals are clipped onto the mounting rail first and then pushed together without tongue and groove, the connection is not operational! When correctly assembled, no significant gap is visible between the housings.

During the installation of the Bus Terminals, the locking mechanism of the terminals must not come into conflict with the fixing bolts of the mounting rail.

5.7.1.2 Disassembly

Each terminal is secured by a lock on the mounting rail, which must be released for disassembly:

1. Carefully pull the orange-colored lug approximately 1 cm out of the disassembled terminal, until it protrudes loosely. The lock with the mounting rail is now released for this terminal, and the terminal can be pulled from the mounting rail without excessive force.
2. Grasp the released terminal with thumb and index finger simultaneous at the upper and lower grooved housing surfaces and pull the terminal away from the mounting rail.

5.7.1.3 Connections within a bus terminal block

The electric connections between the Bus Coupler and the Bus Terminals are automatically realized by joining the components:

- The six spring contacts of the Standard/Performance Coupler deal with the transfer of the data and the supply of the Bus Terminal electronics.
- The power contacts deal with the supply for the field electronics and thus represent a supply rail within the bus terminal block. The power contacts are supplied via terminals on the Bus Coupler.

✎ NOTE During the design of a bus terminal block, the pin assignment of the individual Bus Terminals must be taken account of, since some types (e.g. analog Bus Terminals or digital 4-channel Bus Terminals) do not or not fully loop through the power contacts.Power Feed Terminals (AKT-PS-024-000 or AKT-PSF-024-000) interrupt the power contacts and thus represent the start of a new supply rail.

5.7.1.4 PE power contact

The power contact labeled PE can be used as a protective earth. For safety reasons this contact mates first when plugging together, and can ground short-circuit currents of up to 125 A.

⚠ WARNING Note that, for reasons of electromagnetic compatibility, the PE contacts are capacitively coupled to the mounting rail. It can lead to incorrect results during insulation testing or to damage on the terminal (e.g. disruptive discharge to the PE line during insulation testing of a consumer with a nominal voltage of 230 V).

⚠ WARNING For insulation testing, disconnect the PE supply line at the Bus Coupler or the Power Feed Terminal! In order to decouple further feed points for testing, these Power Feed Terminals can be released and pulled at least 10 mm from the group of terminals.

The PE power contact must not be used for other potentials!

5.7.1.5 Wiring

Up to eight connections enable the connection of solid or finely stranded cables to the Bus Terminals. The terminals are implemented in spring force technology. Connect the cables as follows:

1. Open a spring-loaded terminal by slightly pushing with a screwdriver or a rod into the square opening above the terminal.
2. The wire can now be inserted into the round terminal opening without any force.
3. The terminal closes automatically when the pressure is released, holding the wire securely and permanently.

✎ NOTE Analog sensors and actors must always be connected with shielded, twisted paired wires.

5.7.2 Connection Details

Top view, contact assembly, connection
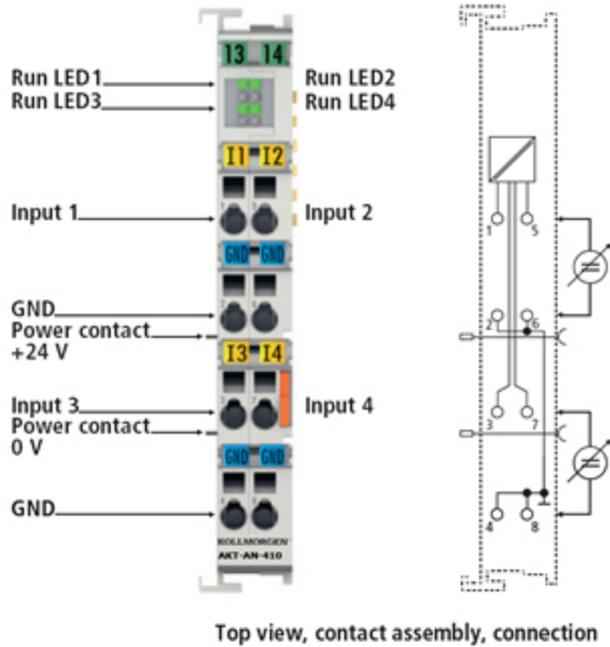
5.8 Installing AKD Drive

To install the AKD drive as well as the AKD GUI Views, refer to chapters 7 to 9 in the **AKD™- Installation Manual**

Drives Guide		Description
AKD Quick Start		Contains all information needed to safely install and setup an AKD drive
AKD and 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
AKD User Manual		Describes how to use your drive in common applications. It also provides tips for maximizing your system performance with the AKD
AKD Accessories Manual		Includes technical data and dimensional drawings of accessories such as cables, brake resistors, and mains supplies
AKD EtherCAT Manual		Describes the installation, setup, range of functions, and software protocol for the EtherCAT AKD product series
AKD CANopen Communication		This manual includes setup information for the CAN interface and describes the CANopen profile
AKD EtherNet/IP Communications Manual		This manual contains information for using an AKD EtherNet/IP drive.
AKD EtherNet/IP with RSLogix Manual		This manual contains information for using an AKD EtherNet/IP drive with RSLogix.
AKD Profinet Communication Manual		This manual contains information for using an AKD Profinet drive.
AKD SynqNet Communication Manual		This manual contains information for using an AKD SynqNet drive.
AKD HMI Modbus Communication Manual		This manual contains information on communication between an AKD and HMI through Modbus.
AKD sercos III Communication Manual		This manual contains information for using an AKD sercos III drive.
S300 Reference Documentation		Kollmorgen website that gives access to all **S300** manuals

Table 5-5: List of AKD Guides

5.9 Installing AKM Motor

To install rotary AKM Servomotors, refer to the following AKM deliverable:

- Chapters 17 to 19 in: **AKM™ Synchronous Servomotors - Product Manual**

NOTE This manual can be downloaded at http://www.kollmorgen.com/uploadedfiles/Files/Document/Motors_and_Drives_Overview_ Brochure.pdf

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6 Updating Firmware

Check the KAS software release notes to find the AKD PDMM firmware version that matches with your KAS software version. The latest version of the firmware can be downloaded from the Kollmorgen web site.

To ensure your installation is correct, you have to:

- Check the current AKD drive firmware
- Download the official version, if necessary
- Update the firmware

Check AKD PDMM Drive Firmware

To check AKD PDMM 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
6. If the version is not correct, continue following with the procedure below
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 (click here) and follow with the next procedure.

Download AKD PDMM Drive Firmware

Component	Download
AKD PDMM Drive FW - Version: AKD-M-MCEC-V01-10-00-003.i00	

To upgrade AKD PDMM drive Firmware with KAS IDE, continue from the previous procedure as follows:

1. In the toolbar, deactivate the **Online Configuration Mode**
2. Select the drives requiring the same firmware version to be updated
   (Note that the FW download is limited to 16 drives at a time)

   > ⓘ **TIP**   Please note that the firmware download is limited to 16 drives at a time.

3. Click **Upgrade Firmware** button

   > ⓘ **IMPORTANT**   Give careful attention to any warning dialog that appears at this point. These warnings usually include important information about preventing damage to the drives.

4. Browse to select the new AKD firmware file
5. Click **Open** to start the updating procedure

6.1 AKD Firmware Update

Based on the FoE protocol, the AKD drive Firmware can be downloaded as follows:

1. Scan the devices and make sure 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
7. Click the Upgrade Firmware button

> **①IMPORTANT** Give careful attention to any warning dialog that appears at this point. These warnings usually include important information about preventing damage to the drives.

8. Browse to select the new AKD firmware file matching the AKD revision. Refer to the Release Notes for the latest supported firmware.
9. 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.

During the firmware download, the AKD Firmware Update window displays a progress bar and the following messages are displayed:

- Uploading firmware to the drive
  During the download process, the drive LED displays [dL]. Additional codes may appear during the download; see 3.2 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 logic power. If you remove the 24V 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.

> **①IMPORTANT** An AKD drive executing the resident firmware is detected as a different device than an AKD drive executing the operational firmware. Be sure to re-scan the network and compile it if a drive's executed firmware has changed since the last scan.

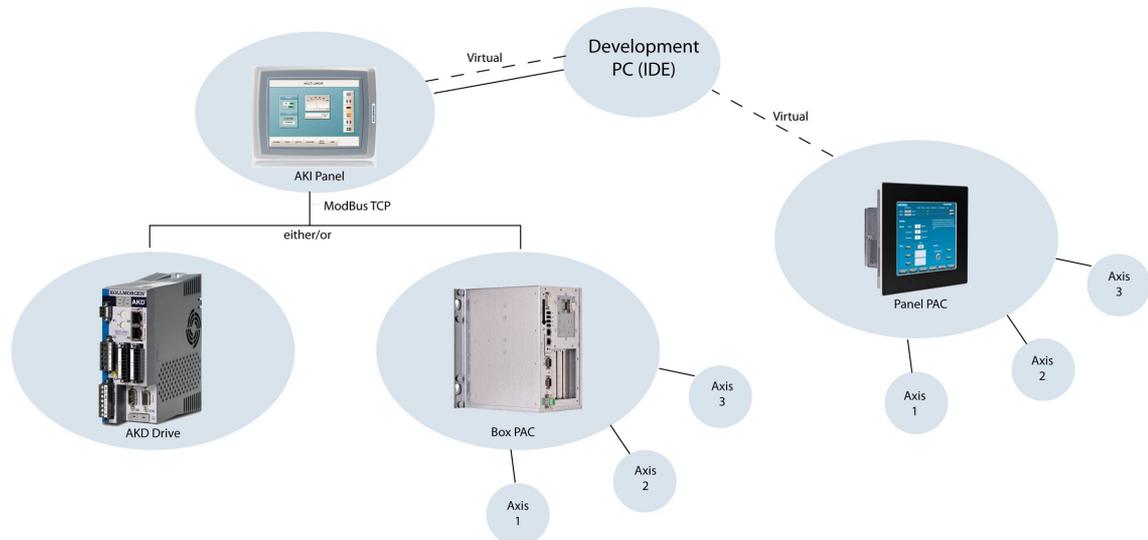# 7 Installing Kollmorgen Visualization Builder

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

Kollmorgen Visualization Builder allows you to design HMI panels running either on AKI or panel PAC.

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

7.1 Download

Component	Download
Kollmorgen_Visualization_Builder_IDE_en-US_v1.20.545	302.9 MB
Visualizer RT (KVB RT) - Version 1.20	78 MB

7.2 Installation Procedure

The following programs must be installed before KVB can be installed:

- **Microsoft .NET Compact Framework 3.5**
- **SQL Server Compact Edition**
- **Microsoft Visual C++ 2008 - Redistributable Setup** (vcredist_x86)

Once Kollmorgen Visualization Builder has finished downloading, complete the following 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. Click **Run** to launch the setup wizard
3. If not already done, you are requested to install the **Microsoft .NET Framework 3.5 Service Pack 1**
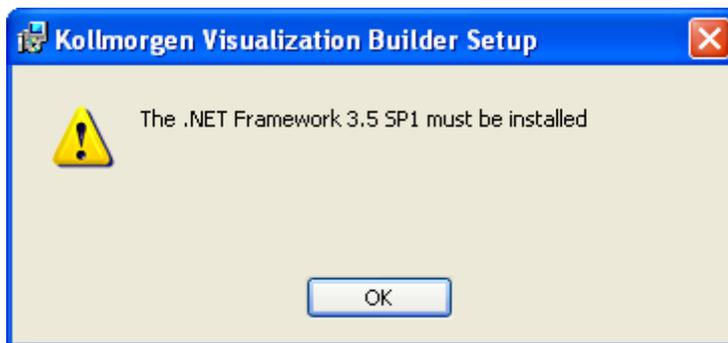
Note: A reboot is required after installing this service pack

4. Click **Next** and accept License Agreement to start **Kollmorgen Visualization Builder** install-ation

5. Click **Designer** (corresponds to the **Kollmorgen Visualization Builder** application)
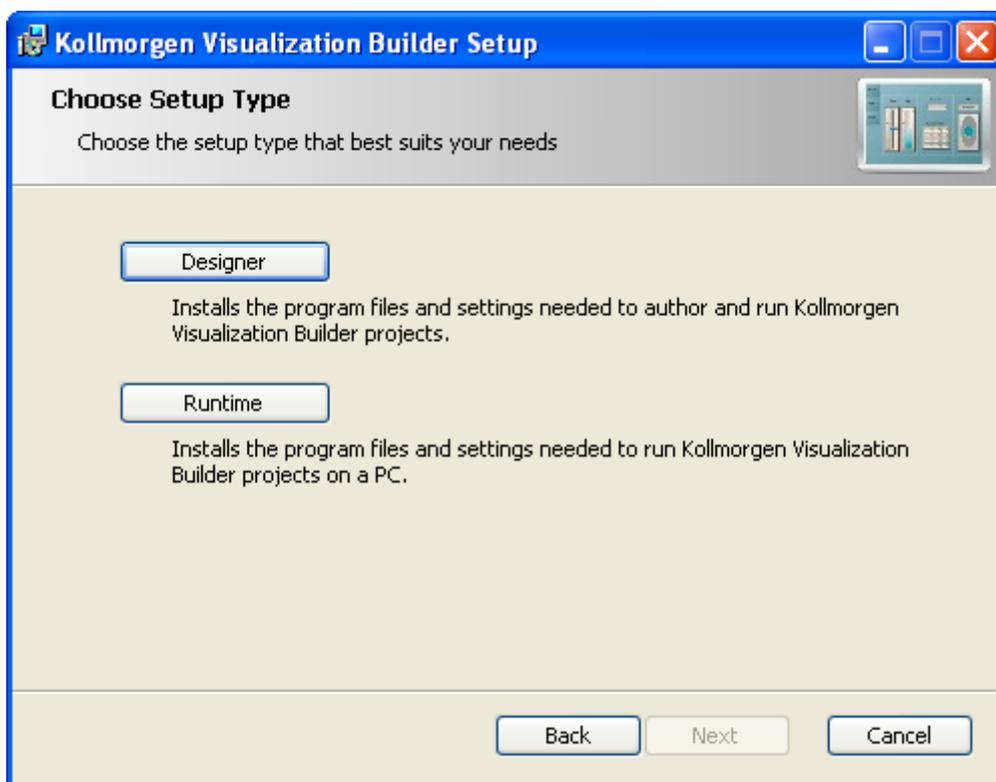

NOTE   The Runtime (also named Visualizer RT) is dedicated to the PAC only

6. Choose your language and click **Next**
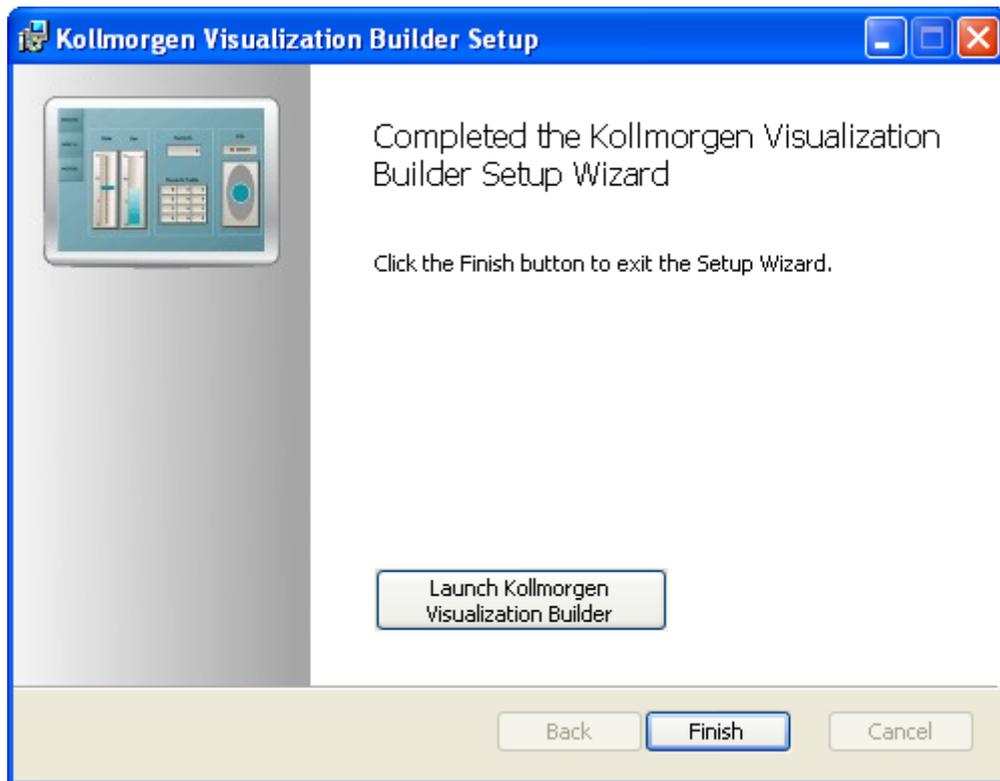7. Select where you want to install **Kollmorgen Visualization Builder** and click **Next**
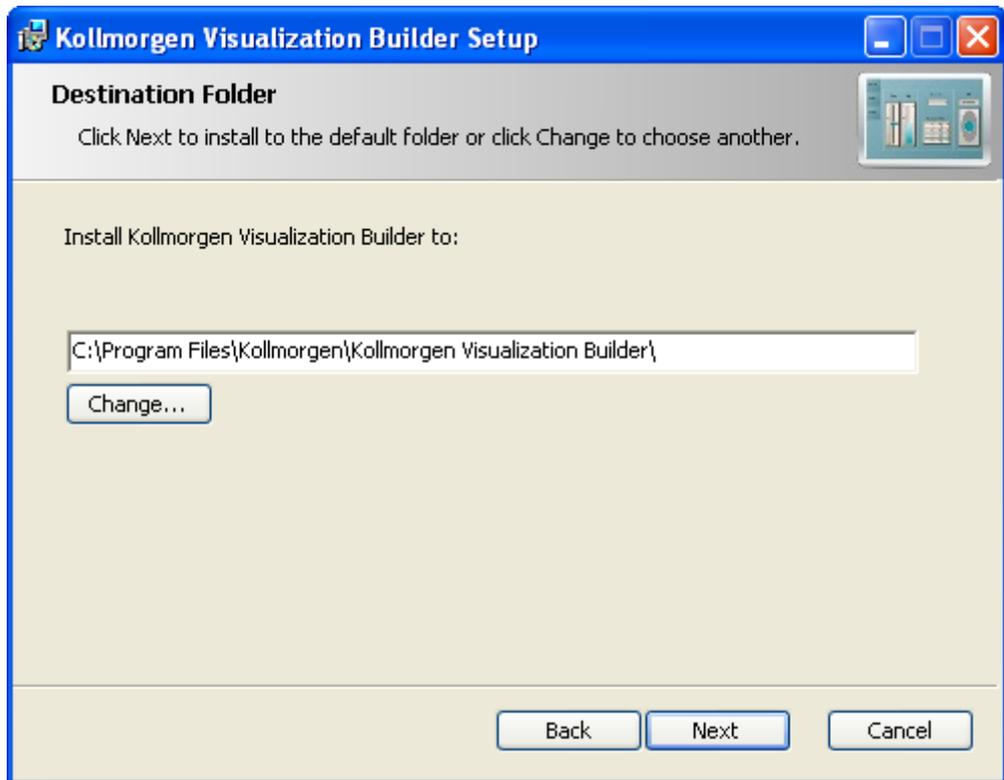
Kollmorgen strongly recommends accepting the default destination folder under C:\Program Files\Kollmorgen\Kollmorgen Visualization Builder\

8. Click **Install** to start **Kollmorgen Visualization Builder** installation
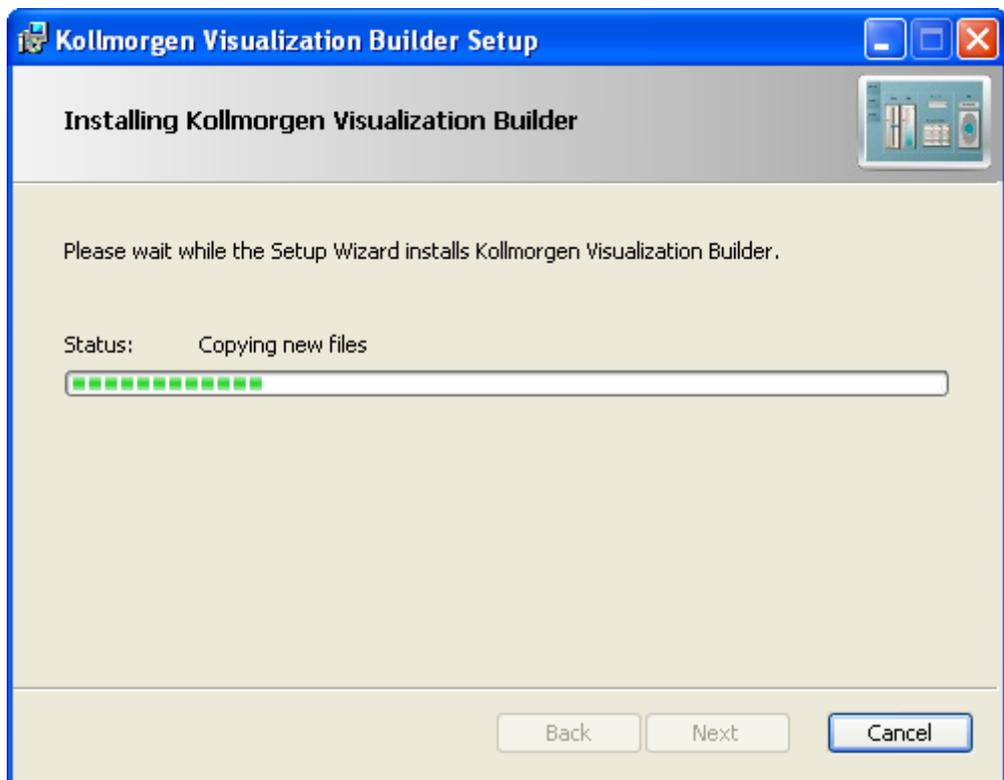
9. Click **Finish**

NOTE	When **Kollmorgen Visualization Builder** starts for the first time, a dialog box requests a registration key. Entering this key provides unlimited access to all program functionality and software updates. Also, to allow the runtime (Visualizer RT) to run on the PAC, ensure the USB hardware key is plugged in.

8   Finalizing Installation

To complete the KAS installation, you can optionally:

- Test the system
- Create a backup image

8.1 Testing Installation

To conclude your 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 (refer to **KAS 30 Minutes to Motion**).

8.2 Saving Installation

This chapter defines how to:

- Save the IPC image on a CompactFlash card (aka USB memory stick)
- Prevents from files corruptions in the PC's CompactFlash memory

To prevent corruption and be able to quickly restore your IPC image, Acronics SW and Microsoft Enhanced Write Filter (EWF) can be used. The procedure described below explains how to use these proposed tools.

> ✎ **NOTE**
> **Acronis True Image** software is **not** part of Kollmorgen Automation Suite. For more details, refer to: www.acronis.com.
> **EWF** software is included in Windows® XP Embedded. For more details, refer to: msdn.microsoft.com/en-us/library/ms912915.aspx

8.2.1 Backup IPC Image

As soon as all the hardware has been tested and validated, you can proceed to a complete backup on a CompactFlash card (aka USB memory stick) with the **Acronis True Image** software.

#### 8.2.1.1   Prepare the bootable USB Stick

You first need a USB Stick (with a minimum of 2GB capacity) to be prepared as follows:

- Install HP USB Disk Format Storage Tool (HP_USB Boot_Utility.exe)
- Create a folder for the system files
  C:\Documents and Settings*Myname*\My Documents\IPC Backup Files\HP_USB\DOS

- Copy the following system files in this folder

Name ▲	Size	Type	Date Modified
COMMAND.COM	91 KB	MS-DOS Application	6/8/2000 5:00 PM
CONFIG.SYS	1 KB	System file	1/18/2008 9:30 AM
DISPLAY.SYS	17 KB	System file	6/8/2000 5:00 PM
EGA2.CPI	58 KB	CPI File	6/8/2000 5:00 PM
EGA3.CPI	58 KB	CPI File	6/8/2000 5:00 PM
EGA.CPI	58 KB	CPI File	6/8/2000 5:00 PM
KEYB.COM	22 KB	MS-DOS Application	6/8/2000 5:00 PM
KEYBOARD.SYS	34 KB	System file	6/8/2000 5:00 PM
KEYBRD2.SYS	32 KB	System file	6/8/2000 5:00 PM
KEYBRD3.SYS	31 KB	System file	6/8/2000 5:00 PM
KEYBRD4.SYS	13 KB	System file	6/8/2000 5:00 PM
MODE.COM	29 KB	MS-DOS Application	6/8/2000 5:00 PM

- Insert the USB stick into the USB port of your computer
- Launch the HP format tool program (HPUSBFW.EXE) from the installed directory
- Under the **device** drop-down list, make sure that your USB stick is selected
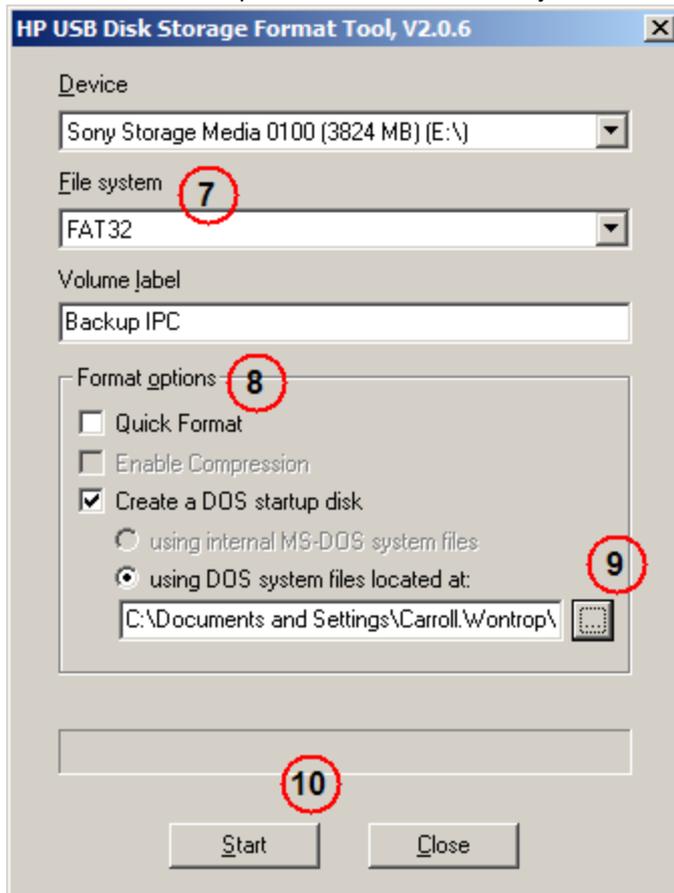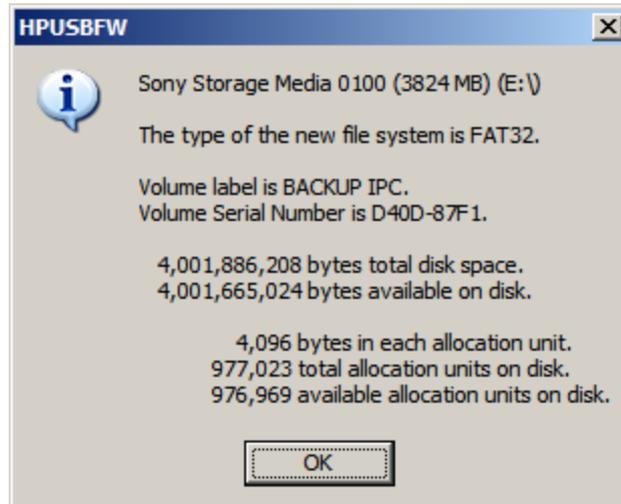

- Under the **File system** drop down list, select **FAT32**
- In the **Format options**, choose to **Create a DOS startup disk** and select **using DOS system files located at:**
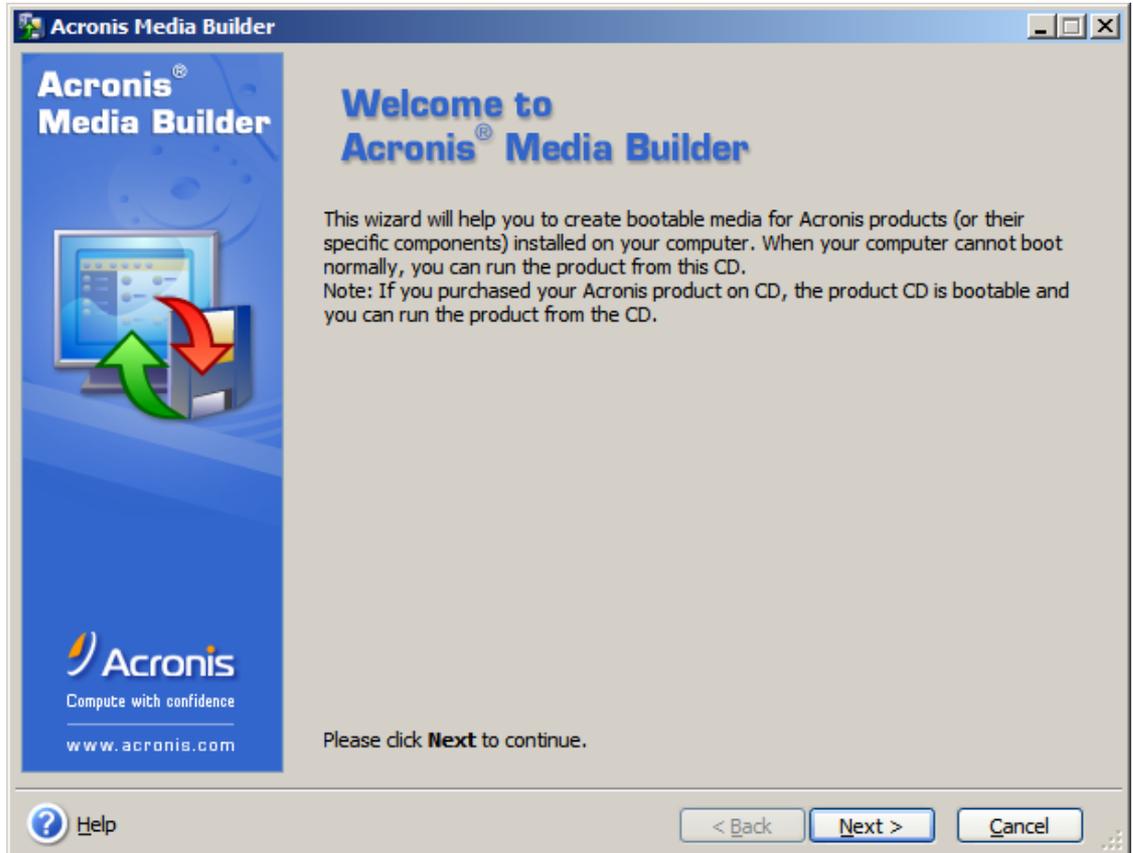
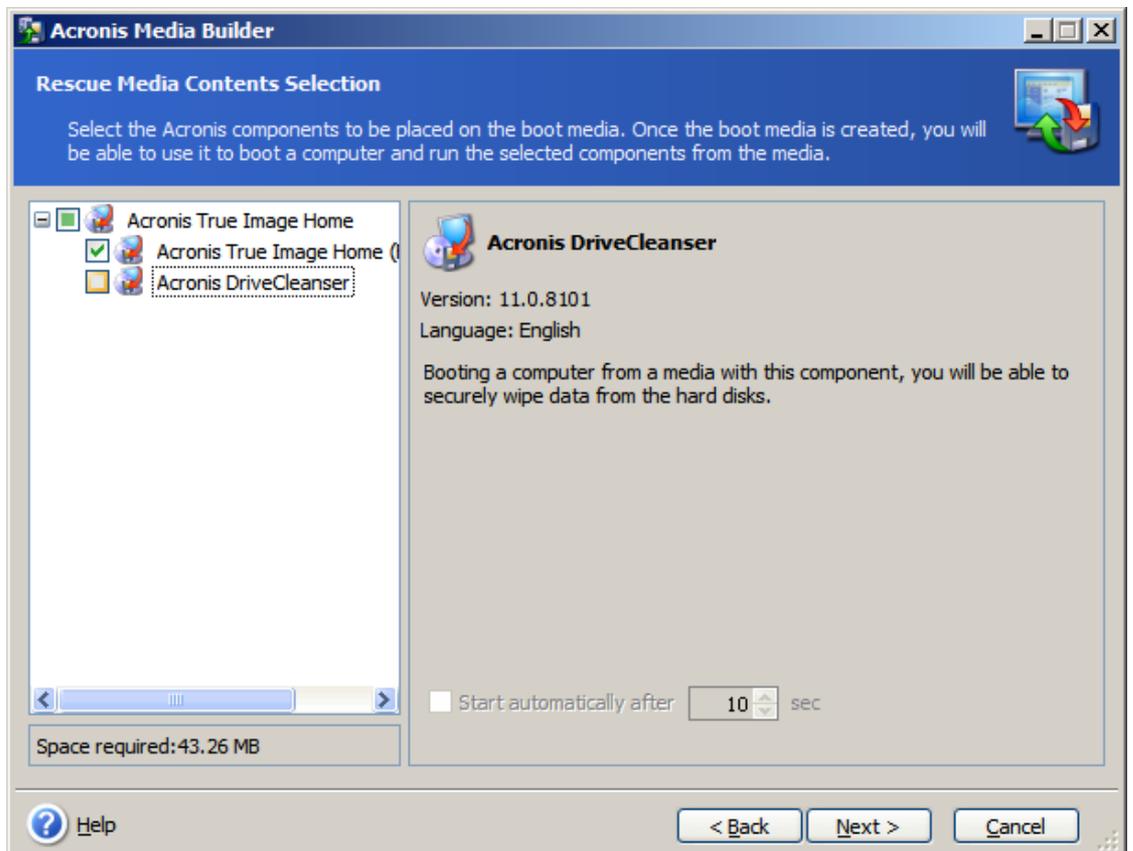- Specify the folder location created in step 2
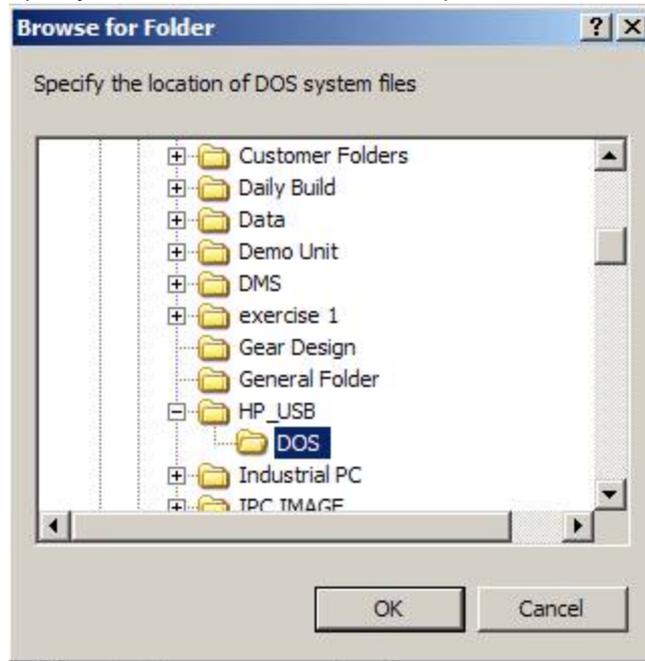
- Click the **Start** button to format as a Bootable device using DOS directory
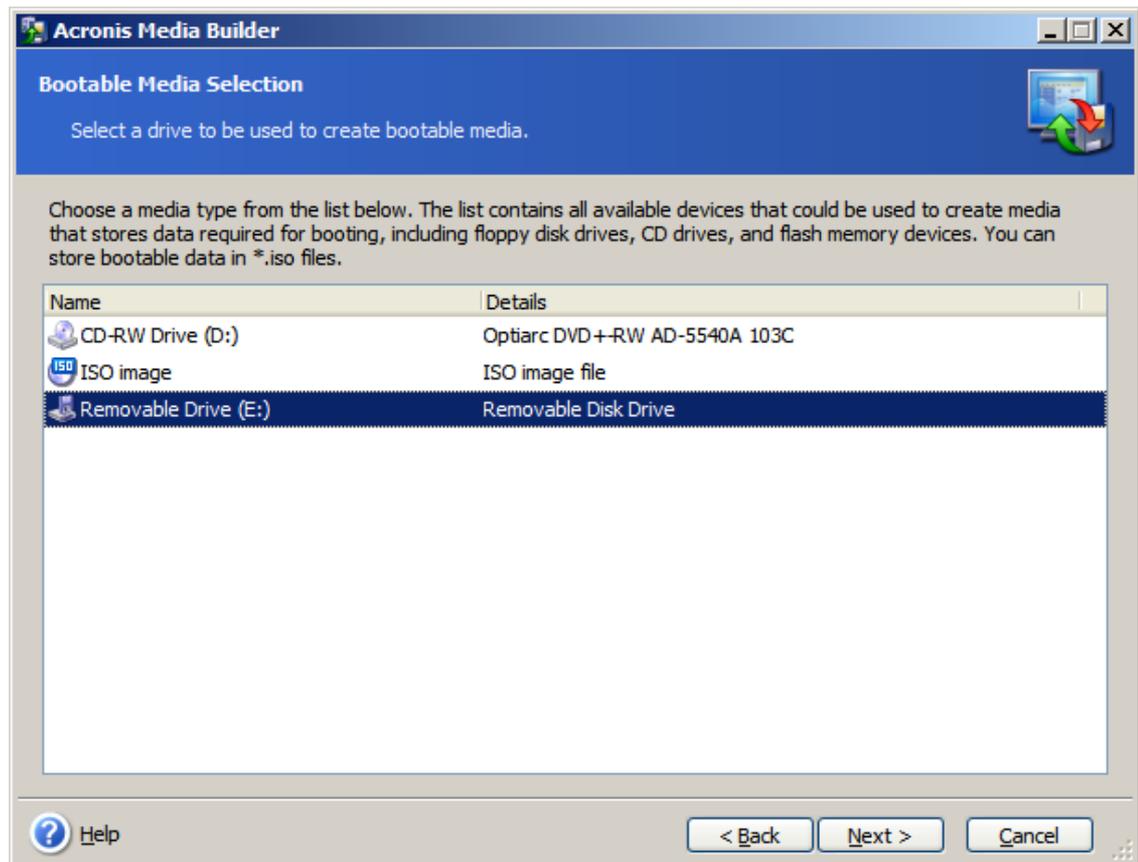

- Click the **Close** button once the operation is completed
- Install **Acronis True Image 11** on your IPC
- Start **Acronis True Image** application

- Go to **Management** tool

- Create Bootable Rescue Media

8.2.1.2   Create the Backup

To the complete backup, proceed as follows:

- Connect the keyboard and the mouse to the IPC (as well as the monitor if it is not built into the IPC)
  For more details, refer to paragraph "Controller - Industrial PC (IPC)" on page 17
- Start your IPC
- During startup press the **F2** key to enter the setup
- Set the priority by selecting the first boot device to look for the USB stick (you only need to do it once)
- Insert the USB stick into a free USB port
- Reboot your IPC
- Start **Acronis True Image** application
- Select True Image Home
- Select **Backup**
- Select **My Computer**
- Select what is to be backed up (i.e. **Disk1: Volume C**)
- Exclude nothing (do not select any exclusions)
- Select the store location: A: Removable drive/Image/*FILENAME* (modify with a meaningful FILENAME)
- Select **Create a new full backup archive**
- Choose **Compression level** and set to the maximum
- Add notes if desired
- Store in file name xxxxx_Original (create a full backup)
- Do not have to enter password

- Compression level: Max
- Finally click **Proceed**

8.2.2 Enhanced Write Filter

The Enhanced Write Filter (EWF) is a Microsoft® Windows®
XP embedded operating system feature which provides write-
protection to a partition on the compact flash (CF) card. All
write requests to the partition are redirected to RAM when
EWF is enabled. The EWF feature protects the CF image
from changes due to sudden power loss, improper shutdown, or other user
configurations.When the EWF is active its icon is shown in the system tray, as seen to the
right. When the EWF is disabled its system tray icon is a red slashed-circle 🚫.

The EWF should be activated on the PAC after the system is running and the PAC
configuration is complete. If you want to change the CF image (such as a new KAS version
or downloading a new application), then turn off the EWF filter, make the change, and then
reactivate EWF.

There are two ways to manage the EWF:

- With the **EwfWinDllcaller.exe** application, located in `C:\WINDOWS\system32`. This is the pre-
  ferred method. See "Enhanced Write Filter Operational Procedures Using the Application"
  (see page 38) for more information.
- From the command line interface. The command line offers more functions than the applic-
  ation *but is recommended only for advanced users*. See "Enhanced Write Filter Operational
  Procedures using the command line" (see page 39) for more information.

8.2.2.1 Practical Applications

- For the **KAS Runtime installation**, using the "commitanddisable" method (via either com-
  mand line or the application) is strongly recommended. If some operations have been per-
  formed previously, the remaining memory will not be sufficient using another method.
- For a **New PLC application download**, the ""Perform Small Changes on a Protected Volume"
  (see page 40)" method is convenient because the usual PLC application does not exceed
  10 MB.

8.2.2.2 Enhanced Write Filter Operational Procedures Using the Application
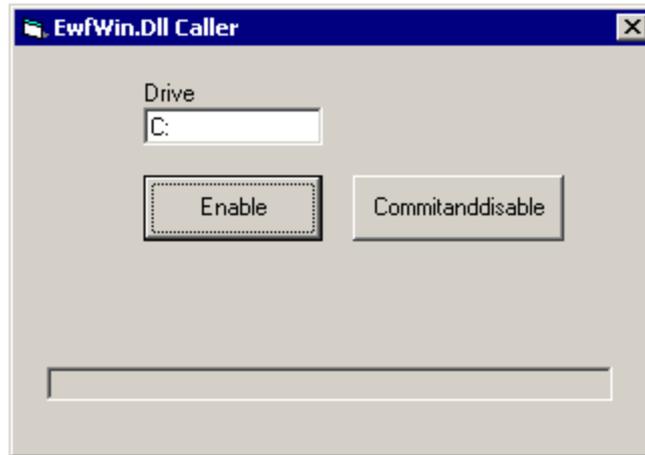
Protect the PAC Image with EWF

The EWF must be activated to protect a stable version of the PAC image from data
corruption.

1. Close all applications
2. Launch EwfWinDLLcaller.exe by pressing Start > Run and typing: EwfWindDLLcaller
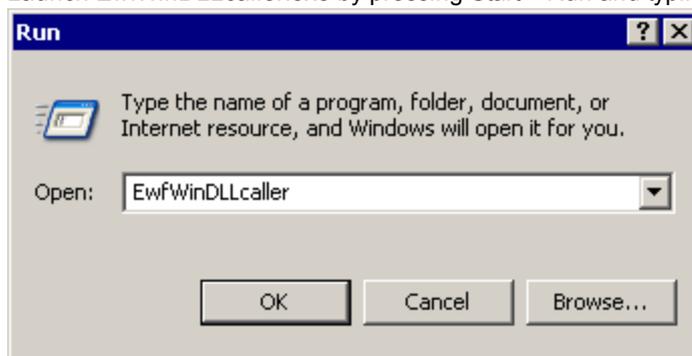
3. Click the Enable button

You will receive a message about the Enable being successful.

4. Restart the computer
    If the icon in the system tray is green 🟢 then EWF is active.

Perform Changes on a Protected Volume

The EWF has to be disabled to perform changes on a PAC.

1. Close all applications.
2. Launch EwfWinDLLcaller.exe
3. Click on the **Commitanddisable** button
    Any configuration change written to RAM will be committed to the CF and then EWF will be disabled. You will receive a message about the Disable being successful.
4. Restart the computer.
    If the icon in the system tray is a red slashed-circle 🚫 then EWF is disabled.

①IMPORTANT   After pressing the **Commitanddisable** button you *must restart the computer*. The EWF is not fully disabled until the computer is restarted and making any changes to the system in this state can be troublesome.

After changes are made to the system, the EWF should be re-enabled to protect the PAC image. See "Protect the PAC Image with EWF" (see page 38).

8.2.2.3 Enhanced Write Filter Operational Procedures using the command line

①IMPORTANT   Using the EWF from the command line should only be performed by advanced users. Using the application is easier and more reliable.

Protect the PAC Image with EWF

The EWF should be activated on the PAC after the system is running and the PAC configuration is complete. If you want to change the CF image (such as a new KAS version or downloading a new application), then turn off the EWF filter, make the change, and then reactivate EWF.

1. Open a command prompt by pressing Start > Run and type: **cmd**
2. From the command prompt, type: **ewfmgr C: -enable**
3. Reboot the PAC to activate the EWF

To ensure that the command has been entered correctly, execute the DOS command shell `ewfmgr c:` prior to rebooting the PAC. Check the field `Boot Command`, which should be set to "`ENABLE`", as seen in the image below.

```
C:\WINDOWS\system32\cmd.exe                                    _ □ X
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\Administrator>ewfmgr c:
Protected Volume Configuration
    Type              RAM (REG)
    State             DISABLED
    Boot Command      ENABLE
        Param1        0
        Param2        0
    Volume ID         01 00 00 00 00 7E 00 00 00 00 00 00 00 00 00 00
    Device Name       "\Device\HarddiskVolume1" [C:]
    Max Levels        1
    Clump Size        512
    Current Level     N/A

    Memory used for data 0 bytes
    Memory used for mapping 0 bytes
```

①IMPORTANT   If several commands are executed, only the latest will take effect after the reboot. To be sure about the latest command, execute the process described above.

Perform Changes on a Protected Volume

The EWF has to be disabled to perform changes on a PAC. After the changes are made the EWF is re-enabled.

1. Open a command prompt by pressing Start > Run and type: **cmd**
2. From the command prompt, type: **ewfmgr C: -commitanddisable**
3. Reboot the PAC to commit the changes and disable EWF
4. Make the desired changes (program installation, files record, etc.)
5. From the command prompt, type: **ewfmgr C: -enable**
6. Reboot the PAC to activate the EWF

✎ NOTE   It is important to note that the maximum overlay size is a little more than 300 MB. Windows runs out of memory and crashes if this available space is exceeded, resulting in the error "**Delayed Write Failed. Windows was unable to save all data for the file**". As a consequence, when making important changes or file copy actions, do not forget to disable EWF first, and re-enable it when the operations are complete.

Perform Small Changes on a Protected Volume

To commit changes without disabling and re-enabling EWF, a single commit can be commanded:

1. From the command prompt, type: **ewfmgr C: -commit**
2. Reboot the PAC to commit the changes (EWF remains active).

8.2.3 Restore IPC backup Image

To restore the complete backup, proceed as follows:

- Connect the keyboard and the mouse to the IPC (as well as the monitor if it is not built into the IPC)
  For more details, refer to paragraph "Controller - Industrial PC (IPC)" on page 17
- Insert the bootable USB stick into a free USB port
- Reboot your IPC
- Start **Acronis True Image** application
- Select **Restore**
- Select the restored backup file on the USB stick (.tib file)
- Choose Restoration Method
- Restore whole Disks and partitions
- Select both Volume C and Master Boot record (MBR)
- Select the Destination of Disk 1

- Select option **yes, I want to delete all the partitions on the destination hard drive before restoring**
- Then start the restore operation

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9 Troubleshooting KAS

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**   You can find more details in:

- the **Troubleshooting** chapter in the online help
- the **FAQ** section in MyKAS.kollmorgen.com Web site

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