

# Kollmorgen Automation Suite

## KAS PAC Webserver



**Document Edition: J, June 2017**

Valid for KAS Software Revision 2.12

Part Number: 959718

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

## Trademarks and Copyrights

### Copyrights

Copyright © 2009-17 Kollmorgen™

Information in this document is subject to change without notice. The software package described in this document is furnished under a license agreement. The software package may be used or copied only in accordance with the terms of the license agreement.

This document is the intellectual property of Kollmorgen™ and contains proprietary and confidential information. The reproduction, modification, translation or disclosure to third parties of this document (in whole or in part) is strictly prohibited without the prior written permission of Kollmorgen™.

### Trademarks

- KAS and AKD are registered trademarks of [Kollmorgen™](#).
- [Kollmorgen™](#) is part of the [Fortive](#) 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.
- INtime® is a registered trademark of [TenAsys® Corporation](#).
- 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:
  - [Qwt](#) project (distributed under the [terms](#) of the GNU Lesser General Public License - see also [GPL terms](#))
  - [Zlib](#) software library
  - [Curl](#) software library
  - [Mongoose](#) software (distributed under the MIT License - [see terms](#))
  - JsonCpp software (distributed under the MIT License – [see terms](#))
  - [U-Boot](#), a universal boot loader is used by the PDMM (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 PDMM.

All other product and brand names listed in this document may be trademarks or registered trademarks of their respective owners.

### Disclaimer

The information in this document (Version J published on 6/22/2017) 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

---

<b>1 Table of Contents</b> .....	<b>3</b>
<b>2 Using the KAS Web Server</b> .....	<b>4</b>
<b>2.1 Web Server Home Page</b> .....	<b>5</b>
2.1.1 Security .....	5
2.1.1.1 Timeout After Inactivity .....	6
2.1.2 User Authentication .....	7
2.1.2.1 Logging In .....	7
2.1.2.2 Logging Out .....	7
2.1.2.3 Changing the Password .....	7
<b>2.2 KAS Application</b> .....	<b>8</b>
2.2.1 Axis .....	9
2.2.2 Log Configuration .....	10
2.2.3 Log Data .....	11
2.2.3.1 Log Message Content .....	11
2.2.3.2 PDMM and PCMM Log Files .....	12
2.2.3.3.1 Log File Naming Convention .....	12
2.2.3.4 PAC Log Files .....	12
2.2.3.5.1 Log File Naming Convention .....	12
2.2.4 User Data .....	13
2.2.5 Shared Directory .....	14
<b>2.3 Backup &amp; Restore from the Web Server</b> .....	<b>16</b>
2.3.1 Backup Tab .....	16
2.3.2 Restore Tab .....	18
2.3.3 Import/Export .....	18
<b>3 EtherCAT Devices Backup &amp; Restore - In Depth</b> .....	<b>19</b>
<b>3.1 EtherCAT Devices Backup and Restore</b> .....	<b>19</b>
3.1.1 EtherCAT Devices Backup .....	19
3.1.1.1 Backup Steps .....	20
3.1.2 EtherCAT Devices Restore .....	21
3.1.2.1 Steps .....	21
3.1.3 AKD Backup/Restore Compatibility .....	22
3.1.4 Autostart with Replacement drives and the unique ID .....	23
3.1.5 Export/Import EtherCAT Devices Backup .....	23
3.1.5.1 Export Procedure .....	23
3.1.5.2 Import Procedure .....	23
3.1.6 EtherCAT Devices Backup/Restore Limitations .....	24
3.1.7 Troubleshooting EtherCAT Devices Backup/Restore .....	24

## 2 Using the KAS Web Server

Kollmorgen Automation Suite™ comes with a web server that allows you to perform the following operations:

- Read information about the controller (model, Runtime/firmware version, version of your KAS application)
- Interact with your application (Start and Stop your KAS application)
- View real and simulated axes
- Connect to a shared directory
- See all the log messages
- Backup/Restore the controller ‡
- Backup/Restore EtherCAT devices

‡ PDMM and PCMM only

The web server may be accessed two ways:

1. Open a web browser and enter the controller's IP address.
2. From the Controller node in the Project tree in the KAS IDE.
  - Double-click the Controller node
  - Select "Access Webserver" from the right-mouse menu.

### NOTE

If you do not know the IP address assigned to the controller:

1. Press B3 once. The 7-segment display will flash the letters I and P.
2. Press B2 to select the IP option. The 7-segment display will show the IP address.

The web server consists of a home page, the [KAS Application](#) tab and Help. The Help tab is a link which opens the PAC Web Server manual.



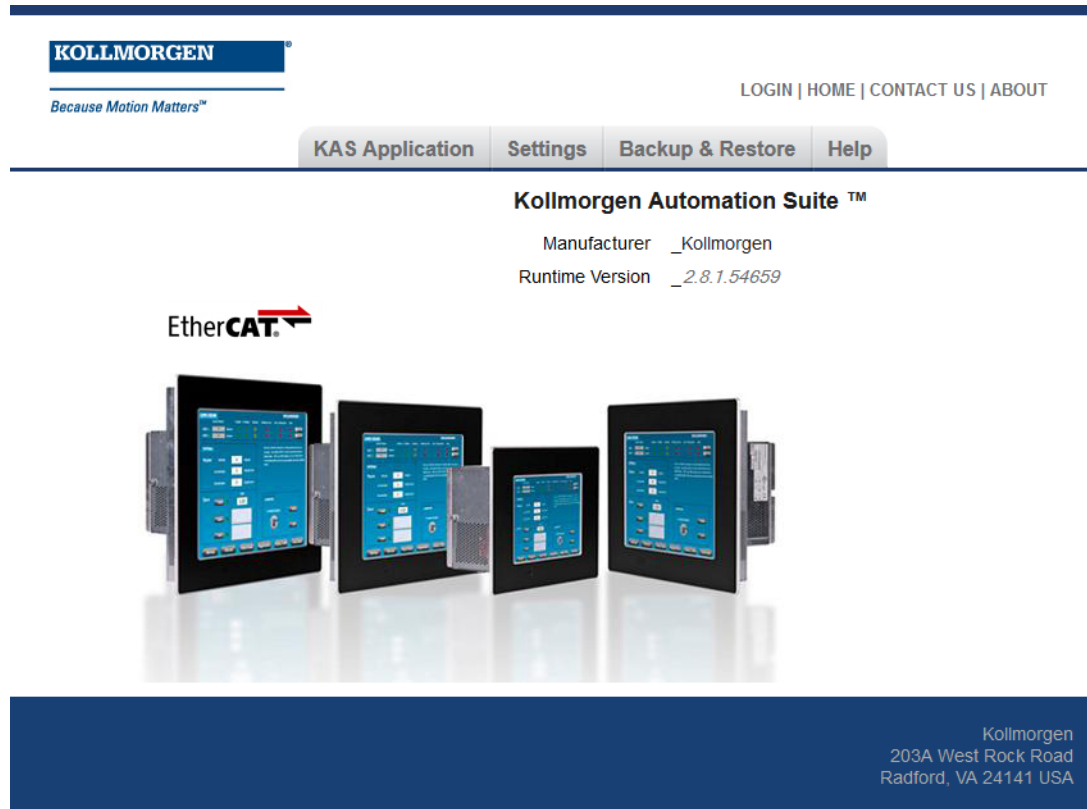
**Figure 3-1:** The Webserver Tabs as seen on an PDMM webserver.

### TIP

**Browser Requirements:** We recommend using [Firefox 11](#), [Google Chrome](#), or [Internet Explorer 9](#) or later for accessing the web server.

## 2.1 Web Server Home Page

To access the KAS web server home page, enter the controller's IP address.



This page provides an overview of the device including:

- Manufacturer

### NOTE

Please note that any reference to PDMM or PCMM refers to both the 800MHz and the 1.2GHz variants, unless otherwise noted.

### 2.1.1 Security

Some parts of the web server are locked in order to protect critical operations from unauthorized users. Simply log into the web server to enable access to the locked functions. See "User Authentication" (→ p. 7) for more information.

### NOTE

Functions will not be locked if you access the web server through the IDE. Doing so automatically grants administrator access.

The functions which are locked are:

- KAS Application Tab
  - Start/Stop/Cold Start an application
  - "Clear User Data"
  - "Clear all Errors"
  - Configure 'Auto-start'

- Settings tab
  - Firmware upgrade -->'Choose File' &'upgrade' ‡
  - Reboot ‡
  - "Reset to Factory Settings"
  - SD card Format ‡
  - Change password
  - Change the network settings ( IP address ) ‡
- Backup & Restore
  - Backup Controller ‡
  - Backup & Restore PDMM and PCMM only
  - Restore Controller ‡
  - Export Backup
  - Choose File & Replace Backup
- Diagnostics tab ‡
  - Reboot the controller
  - Clear Errors and alarms
  - Clear Crash dump

‡ PDMM and PCMM only

#### 2.1.1.1 Timeout After Inactivity

To prevent misuse, if the webserver has been idle (no keyboard activity or mouse clicks) for 20 minutes, the user account will be automatically logged out. A dialog box will open to alert you that the session has timed out.

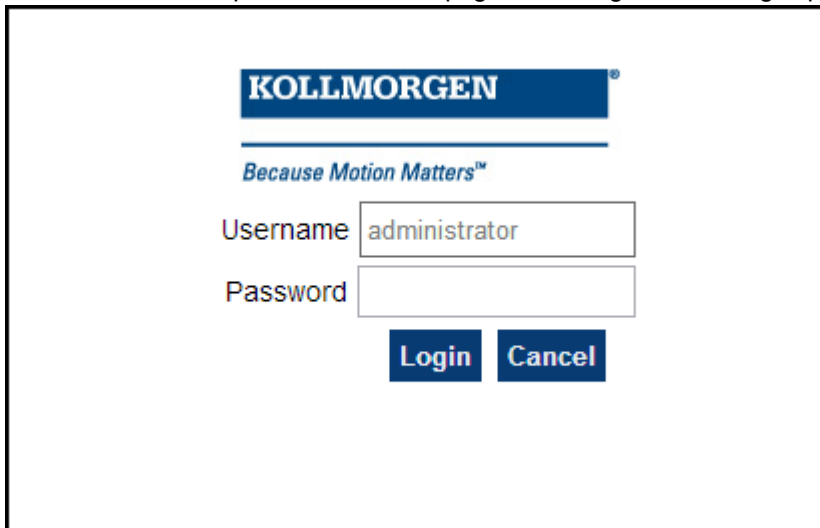
#### NOTE

The idle logout only occurs if you've logged into the webserver with a web browser. Logging in through the KAS IDE will never time out.

## 2.1.2 User Authentication

### 2.1.2.1 Logging In

Logging into the web server is required to prevent unauthorized access or changes. This is accessed from the **LOGIN** link at the top of all web server pages. Clicking the link brings up a form to enter user credentials.



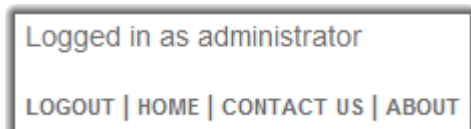
The login form features the Kollmorgen logo at the top, followed by the slogan "Because Motion Matters™". Below this, there are two input fields: "Username" with the text "administrator" and "Password" which is currently empty. At the bottom of the form are two buttons: "Login" and "Cancel".

Enter the password to log in. The factory default password is `administrator`. This can be changed after logging in.

#### NOTE

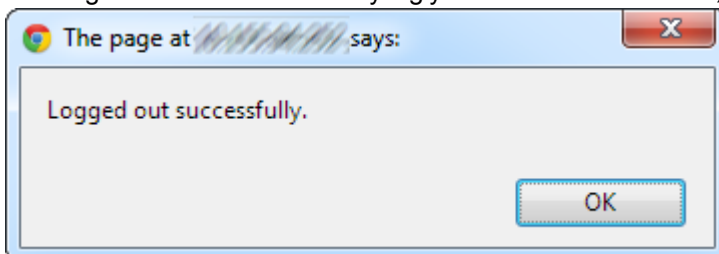
- As there is only one user Administrator, "administrator" is the default user name.
- You must re-enter the password each time you log in; the entered password is not stored in the login form.
- Accessing the webserver from the IDE automatically logs you in as *administrator*.

When you are successfully logged in, the user name will appear in the top-right corner of all web server screens.



### 2.1.2.2 Logging Out

After successfully logging in, the menu in the top right corner of the web server contains a link to **LOGOUT**. Clicking this link will immediately log you out of the web server, and informs you of this.




### 2.1.2.3 Changing the Password

The user password is managed from the User Account section of the Settings tab. See User Account for more information.

## 2.2 KAS Application

This tab allows you to:

- Display general information about your project that is currently loaded on the controller
- Start and stop the motion
- Display the Axes run by the controller from the "Axis" (→ p. 9) tab
- Manage log messages from the "Log Configuration" (→ p. 10) and "Log Data" (→ p. 11) tabs
- Display User Data present on the controller from the "User Data" (→ p. 13) tab
- Connect to a remote computer from the "Shared Directory" (→ p. 14) tab

Item	Description
<b>Version of KAS App</b>	<p>This label provides information about the name and version number of the application that is in the controller. The format is &lt;project_name&gt;:&lt;version&gt;.</p> <p>The application's source code may be downloaded to the local computer if it is present on the controller. This is accomplished by clicking on the download icon (  ). This icon is found by the name and version information and is only present when source code is available.</p>
<b>Status of KAS App</b>	The state of the application, <i>Started</i> or <i>Stopped</i> .
<b>Start</b>	Default mode (warm start) where the Retain Variables are loaded at the application startup. They are <b>Not</b> re-initialized; whereas other variables are started with their initial values.
<b>Cold Start</b>	Use retain variables with their default values. Such starts occurs from time to time but are few.
<b>Stop</b>	Stop the application
<b>Auto-start</b>	<p>Select this option to automatically start the KAS application when the controller is powered up. The application will start using retained variables (a "warm start") after the controller has booted up.</p> <p>To change this setting, click the <b>Auto-start</b> checkbox to either activate or deactivate this option and click the <b>Apply</b> button. The control will use the new setting at the next power-up. This option is recommended when the system is in production.</p>
<b>Clear all errors</b>	Clicking this button will clear the error log for all axes.



### 2.2.1 Axis

You can view a visual representation of the motors from the Axis tab. The axis wheels are visible after your application is started. The following can be monitored from the display:

- Real and Simulated axes
- Actual position with solid line and actual position value
- Command position with the dotted line and (command position value) in parentheses
- Axis State: Powered-off , Powered-On, or Error as well as Simulated Powered Off and ON
- Identify the axes from the label, as defined by the axis name in your application
- Axis status or positions snapshot



Information that is available by clicking on the axis																																																									
Title	Image (PN axis)	Image (PLCopen axis)	Image (digitizing axis)																																																						
<p><b>AXIS1</b></p> <p><b>Axis status snapshot</b></p> <table border="1"> <tr><td>Initialised</td><td>true</td></tr> <tr><td>Power ON</td><td>false</td></tr> <tr><td>Enable</td><td>true</td></tr> <tr><td>Found</td><td>true</td></tr> <tr><td>Configured</td><td>true</td></tr> <tr><td>Running</td><td>false</td></tr> <tr><td>Error</td><td>false</td></tr> <tr><td>Simulated</td><td>false</td></tr> <tr><td>Connected</td><td>false</td></tr> <tr><td>Warning</td><td>false</td></tr> <tr><td>Stopping</td><td>false</td></tr> <tr><td>Stopped</td><td>false</td></tr> </table>	Initialised	true	Power ON	false	Enable	true	Found	true	Configured	true	Running	false	Error	false	Simulated	false	Connected	false	Warning	false	Stopping	false	Stopped	false	<p><b>AXIS1</b></p> <p><b>Axis positions snapshot</b></p> <table border="1"> <tr><td>Actual</td><td>174.220505</td></tr> <tr><td>Current</td><td>0.000000</td></tr> <tr><td>Feedback</td><td>174.220505</td></tr> <tr><td>Generator</td><td>0.000000</td></tr> <tr><td>Pipe offset</td><td>0.000000</td></tr> <tr><td>Pipe</td><td>0.000000</td></tr> <tr><td>Power ON Delta Offset</td><td>0.000000</td></tr> <tr><td>Reference</td><td>0.000000</td></tr> <tr><td>Zero offset</td><td>0.000000</td></tr> </table> <p>See the Axis Pipe Block section of the KAS IDE documentation for information about the axis parameters.</p>	Actual	174.220505	Current	0.000000	Feedback	174.220505	Generator	0.000000	Pipe offset	0.000000	Pipe	0.000000	Power ON Delta Offset	0.000000	Reference	0.000000	Zero offset	0.000000	<p><b>PLCOpenAxis2</b></p> <p><b>Axis positions snapshot</b></p> <table border="1"> <tr><td>Actual</td><td>3141.856728</td></tr> <tr><td>Command</td><td>3141.856728</td></tr> <tr><td>Normal</td><td>3141.856728</td></tr> <tr><td>Phase</td><td>0.000000</td></tr> <tr><td>Super imposed</td><td>0.000000</td></tr> </table> <p>See Axis Parameters in the PLCopen Function Blocks - Overview section of the KAS IDE documentation for information about the axis parameters.</p>	Actual	3141.856728	Command	3141.856728	Normal	3141.856728	Phase	0.000000	Super imposed	0.000000	<p><b>Axis3</b></p> <p><b>Axis positions snapshot</b></p> <table border="1"> <tr><td>Actual</td><td>0.000000</td></tr> </table>	Actual	0.000000
Initialised	true																																																								
Power ON	false																																																								
Enable	true																																																								
Found	true																																																								
Configured	true																																																								
Running	false																																																								
Error	false																																																								
Simulated	false																																																								
Connected	false																																																								
Warning	false																																																								
Stopping	false																																																								
Stopped	false																																																								
Actual	174.220505																																																								
Current	0.000000																																																								
Feedback	174.220505																																																								
Generator	0.000000																																																								
Pipe offset	0.000000																																																								
Pipe	0.000000																																																								
Power ON Delta Offset	0.000000																																																								
Reference	0.000000																																																								
Zero offset	0.000000																																																								
Actual	3141.856728																																																								
Command	3141.856728																																																								
Normal	3141.856728																																																								
Phase	0.000000																																																								
Super imposed	0.000000																																																								
Actual	0.000000																																																								

Additionally, if an axis is in error, the error can be cleared by clicking the text below the axis title.

### 2.2.2 Log Configuration

You can configure the log to filter the messages that are displayed. Each [source](#) can be set with its own [level](#).

	IDE	Controller	EtherCAT	Drive	PLC	Motion	System	All
Error	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Warning	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Info	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Debug	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="button" value="Apply"/> <input type="button" value="Refresh"/>								

Each message has one of the following levels, with importance in descending order:  
 Error > Warning > Info > Debug

**TIP**

**How to Choose the Appropriate Level?**  
 When a level is set for a source, only messages with the same or higher importance are recorded. For example, if a source is set to WARNING, then all messages with levels WARNING, ERROR and CRITICAL are recorded (DEBUG and INFO messages are discarded).  
 Therefore, DEBUG is the most verbose and ERROR is the least verbose level. Filtering is quicker with less verbose levels, due to the number of messages.






**NOTE**

Critical messages are always recorded. Therefore, the Critical level is not visible.

**Source**

Source	Apply to...
<b>IDE</b>	Win32 applications: the KAS IDE and the KAS Runtime Server (also called the KAS Runtime Front-end)
<b>Controller</b>	For the KAS Runtime items: Drivers, IOEngine, SinopEngine...
<b>EtherCAT</b>	For all kinds of EtherCAT items: Motion bus, I/Os
<b>Drive</b>	Messages from Kollmorgen drives
<b>PLC</b>	For application engineers to create custom log within the PLC programs (similar to printf)
<b>Motion</b>	Messages coming from the Motion engines: PLCopen, Pipe network or VM
<b>System</b>	For common API and libraries. Also includes messages issued from the operating system.

**Level**

Level	Icon	Description
<b>DEBUG</b>		Any information logged for development purpose. You may safely ignore this log.
<b>INFO</b>		Information status of the current process. You may safely ignore this log.
<b>WARNING</b>		System is stable but the KAS IDE warns that an unexpected event can occur. You can ignore this log.
<b>ERROR</b>		The application does not behave as expected but the processes remain stable.
<b>CRITICAL</b>		Application crashes or becomes unstable. Data is corrupted. At this point the application behavior can be unpredictable.

### 2.2.3 Log Data

KAS log files may be viewed from the Log Data tab. These messages can help describe the current state of the system and to help identify any operation errors encountered when developing your system. A PAC will display as many as 20 files.

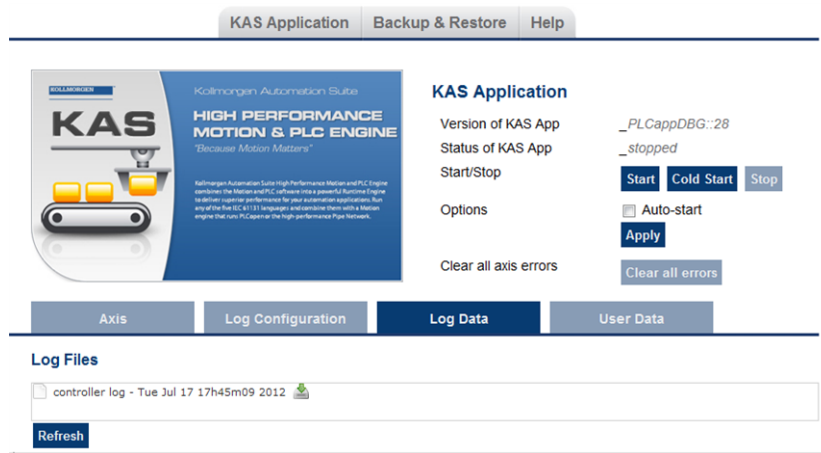


Figure 3-2: Example of log files displayed from a PAC webserver.

Clicking on a listed log file will open it in your web browser. The log file may be downloaded by clicking on the green download icon next to the log entry. The default name is the same as the file's name. If you try to open a file that no longer exists, the message `"/logfiles/<selected file name> not found."` Refresh your browser window and try again.

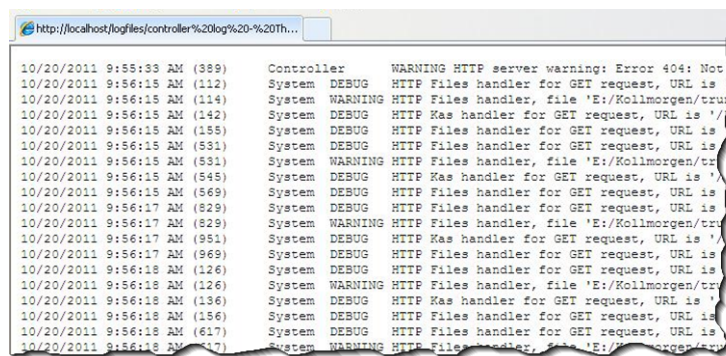


Figure 3-3: Example of a log file's content, displayed in a browser.

#### NOTE

Log data is collected and updated every 15 seconds on a PDMM or PCMM. A new log file will be created when the current file is full. You may need to wait for up to 15 seconds for a log to show up in the list. The PDMM and PCMM log files both have the same file naming scheme (pdmm\_log\_XXXXXXXXXX).

#### 2.2.3.1 Log Message Content

Every log message in the table has the following information:

Field	Description
<b>Time</b>	Time when the log was recorded with the format: DD-MMMM-YY hh:mm:ss (millisecond)
<b>Source</b>	Identifies a software or hardware component issuing the messages. Each source is configured with a specific Level.
<b>Level</b>	Each message has one of the following levels with importance in ascending order: DEBUG > INFO > WARNING > ERROR > CRITICAL

Field	Description
Message	Text of the message issued from the source

Table 3-1: Log Messages - List of Field

### TIP

Log messages is an important source of information when you are troubleshooting your project. When reporting an issue to Support, copy/paste the logs in your report.

## 2.2.3.2 PDMM and PCMM Log Files

Logs generated on a PDMM or PCMM are stored in flash memory at `/mount/flash/log`. The files are stored in a rotating pool consisting of a maximum of 10 files. The files have a maximum size of 200 kilobytes each; the most amount of space the log files will consume is 2 MB. Once an "eleventh" file is created the earliest file is flushed to make room for the new file.

The PDMM and PCMM generated log levels can be controlled from the KAS IDE and Web Server. From the IDE, the log levels can be filtered in the configuration window in the *Logs and Information* tab.

### 2.2.3.3.1 Log File Naming Convention

The logs have the naming format `pdmm_logs_n` where *n* is a value ranging from 0000000000 to 4294967295, which is the maximum value a 32-bit location can store.

As an example, when the files are first created they will be named `pdmm_logs_0000000000`, `pdmm_logs_0000000001`, `pdmm_logs_0000000002` and so on. The file that will be created after `pdmm_logs_4294967295` is `pdmm_logs_0000000000`. The naming gets reset and continues.

## 2.2.3.4 PAC Log Files

Logs generated on a PAC are stored in compact flash memory at `C:\Documents and Settings\User Account\Local Settings\Application Data\Kollmorgen\KAS\Sinope Runtime\Application\logs`, where the User Account is the Windows XP Embedded User Account.

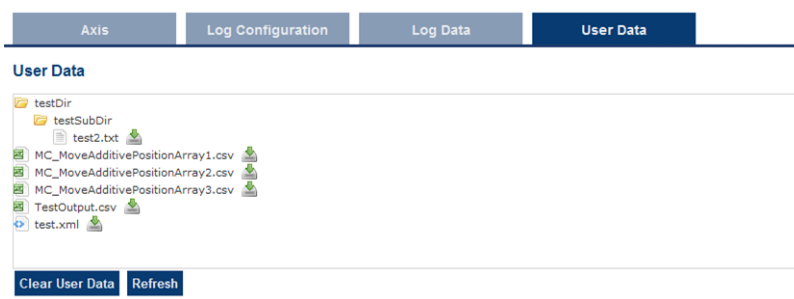
The PAC generated log levels can be controlled from the KAS IDE and Web Server. From the IDE, the log levels can be filtered in the configuration window in the *Logs and Information* tab.

### 2.2.3.5.1 Log File Naming Convention

The logs have the naming format `controller log - date / time stamp`. Where the date and time stamp are generated at the time when the log file is generated.

## 2.2.4 User Data

This tab lists any user-generated files or folders found in the PAC's compact flash drive, PDMM's, or PCMM's flash memory. Clicking a folder will display the folders contents. Clicking on the green download icon will immediately download the file.



The **Clear User Data** button will erase all of the files in the user data folder.

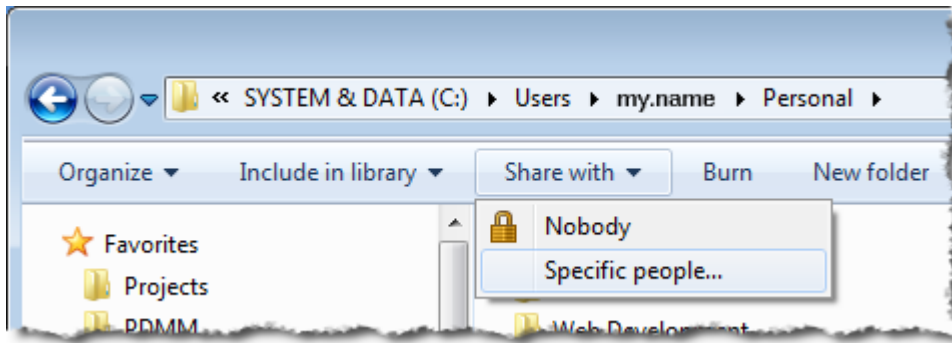
### 2.2.5 Shared Directory

This tab provides the ability to connect to and mount a shared directory on a remote computer (Windows® 7 or better, and non-Windows). This allows a program to read and parse instructions for motion. Once the shared directory is mounted, the contents may be navigated in the **Shared Network Directory Viewer** section of this tab. The following fields must be set to connect to the share.

<b>IP Address</b>	Enter the IP Address of the computer that has a shared directory.
<b>Domain Name</b>	The network domain of the computer that is sharing the directory. This field may or may not be necessary.
<b>NetBIOS Name</b>	The unique name that identifies the computer on the network. For Windows computers, this is typically the computer name.
<b>Shared Directory Name</b>	Enter the name of the shared directory as defined on the remote computer. The contents of this directory will be displayed in the viewer.
<b>User Name</b>	The name of a user that is allowed access to the shared directory.
<b>User Password</b>	The password of a user that is allowed access to the shared directory.
<b>Windows File System</b>	Indicate whether the remote computer is Windows or a different operating system. This is used to automatically set file permissions.
<b>Mount Status</b>	This field indicates whether the directory <b>Is Mounted</b> or <b>Is Not Mounted</b> .
<b>Apply</b>	Pressing this button will mount the share and save the configuration to flash memory so it can be automatically mounted at power-on. This button is disabled when the application is running and when the user is not logged in.
<b>Clear</b>	Pressing this button will clear the above fields, unmount the share, and clear the configuration from flash memory. This button is disabled when the application is running and when the user is not logged in.
<b>Refresh</b>	Refresh the contents of the fields and the Shared Directory Viewer.

**Example of how to share a directory from Windows:**

1. In Windows Explorer, navigate to the directory you wish to share.
2. Select **Share with** from the Toolbar.



3. Using the resulting window, select the users and/or groups who that should have access to the directory.

**TIP**

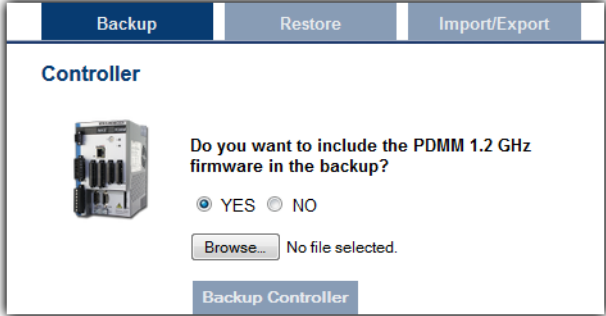
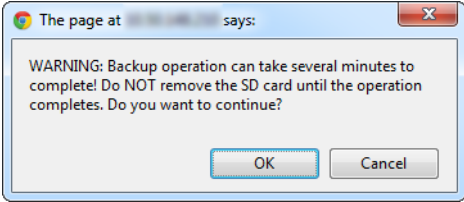
We strongly recommend consulting with your IT department for setting up and connecting to a shared directory. With differences between operating systems and the variability of security settings, this can become challenging.

## 2.3 Backup & Restore from the Web Server

These functions are used to replicate a PDMM or PCMM (*Backup* and then *Restore*) to or from the SD card. The elements that are backed up or restored are the firmware, the network configuration, the Retain Variables, and the PLC application.

- These functions cannot be performed while an application is running.
- *Restore* and *Backup* take several minutes to complete. Do not power off the control once started.
- The Controller is rebooted after a *Restore*.

### 2.3.1 Backup Tab

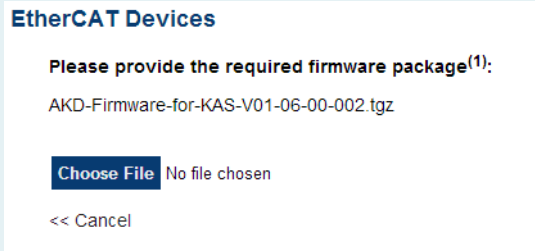
<b>Backup Controller</b>	<p>This function is used to replicate a PCMM or the controller portion of the PDMM. Clicking the button will save the data to the SD card.</p> <p>The 1.2 GHz Runtime firmware file is optional. If provided, an 800 MHz model can be replaced with a 1.2 GHz model. If the 1.2 GHz Runtime firmware file is not included, then an 800 MHz model can only be replaced with another 800 MHz model.</p> <div style="border: 1px solid #ccc; padding: 10px; margin: 10px 0;">  </div> <p>After starting the Backup, an alert will be presented to confirm the backup should proceed.</p> <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;">  </div>
--------------------------	---



### Backup EtherCAT Devices

This function replicates the network topology as well as the AKD, PDMM, AKD-C, and AKD-N drives' unique ID, firmware and data. To accomplish the backup, a copy of the firmware package is required. There are several possible scenarios upon clicking this button.

- If an archived copy of the same firmware package is on the controller as is used on the drives then clicking the button will start the backup.
- If a copy of the firmware package cannot be found, you will be prompted to browse for one. A link to the Kollmorgen website is provided; all firmware packages can be found on the site.



- If an archive is found on the controller but it does not match the network configuration then you will be prompted to browse for one or download one from the website.

For all other EtherCAT devices, such as couplers, IOs, ServoStar drives, and third-party devices, only the unique ID is backed up.

#### TIP

Files on the website are saved in ZIP format. You must unzip the download to access the TGZ file.

### 2.3.2 Restore Tab

<b>Restore Controller</b>	This function restores a PDMM or PCMM's firmware, network configuration, retained variables and PLC application from the SD card.
<b>Restore EtherCAT Devices</b>	This function automatically restores the data and firmware of any replaced AKD drives, and the station alias of other EtherCAT devices.
<b>Advanced</b>	Clicking this button creates a map of the network and it's components. If a valid firmware file is found and the current topology matches the backup file you may select the device(s) that need to be restored. Clicking <i>Restore selected devices</i> will restore the drive's firmware.

**EtherCAT Devices**

**Restore EtherCAT Devices**

<< Advanced

**Restore operation allowed:** topologies match (Backup date: Tue, 28 Oct 2014 20:03:42 GMT)

**Physical topology**

- PDMM Controller
- 0: AKD AKD-M00306-MCEC-0000 (SN: R-1251-00134)
- 1: AKD AKD-P00306-NAEC-0000 (SN: R-1116-00094)
- 2: AKT Coupler

**Restore selected devices** **Refresh**

### 2.3.3 Import/Export

These functions allow you to save a copy of the EtherCAT configurations backup file to a computer and Import the backup file so it may be used for restore functions.

Backup   Restore   **Import/Export**

**EtherCAT Devices**

Export Backup: **Export Backup**

Import Backup: **Choose File** No file chosen

*Export Backup:* An EtherCAT devices backup file is saved to this computer. Note: The Export button is only displayed when an EtherCAT devices backup is available.  
*Import Backup:* An EtherCAT devices backup file (.T02 file) is transferred from this computer to the controller. This backup file is used when you need to restore a previous configuration. Note: The Replace Backup button is disabled until a backup file has been selected.


<b>Export Backup</b>	This button allows you to save a backup of the EtherCAT configuration to a computer.
<b>Choose File</b>	This button allows you to select a previously exported backup file to be imported.
<b>Replace Backup</b>	This button imports the selected backup file, replacing any existing backup.

## 3 EtherCAT Devices Backup & Restore - In Depth

### 3.1 EtherCAT Devices Backup and Restore

The PAC and PDMM or PCMM can backup/restore EtherCAT devices (at present, only AKD drives) on an EtherCAT network. This feature is useful as a maintenance operation to replace any AKD drives in an operational machine. This feature reduces the manual steps for saving/loading each AKD drive's firmware and parameters into a few simple automated steps. The Backup/Restore functionality is located in the controller's web server and is accessible from a web browser. For details about the web server see "Using the KAS Web Server" (→ p. 4).

KAS Application
Settings
Backup & Restore
Diagnostics
Help




#### Backup & Restore

Note that most of the following features are not available when PLC application is running or online config mode is active

**EtherCAT devices backup:** Mon, 06 Jul 2015 21:22:42 GMT

Backup
Restore
Import/Export

#### Controller



Backup Controller

*Backup Controller* is used to replicate a PCMM or the controller portion of a PDMM. The elements that are backed up are the firmware, network configuration, retained variables, and PLC application.

Notes:

- \* This function cannot be performed while an application is running.
- \* **Backup Controller** takes several minutes to complete.
- Do not power off the controller once started.

#### EtherCAT Devices

Backup EtherCAT Devices

*Backup EtherCAT Devices* will save the network topology, the AKD drives firmware and the AKD drives parameters. For EtherCAT devices backup operation, a matching AKD firmware package is required.

- \* If the matching firmware package already exists on the controller, it will be used for future backups.
- \* If the firmware package does not exist on the controller, you will be asked to provide it.

<sup>(1)</sup>All firmware packages are available at [Kollmorgen.com](http://Kollmorgen.com)

#### 3.1.1 EtherCAT Devices Backup

The Backup operation discovers all the devices on the EtherCAT network and stores the topology information, AKD firmware files, and AKD parameters to the controller's local storage.

Controller	Local Storage
PAC	Compact Flash Card
PDMM or PCMM	SD Memory Card

Before starting a backup of the EtherCAT Devices, you will need:

- The AKD firmware files package, AKD-Firmware-for-KAS-Vxx-xx-xx-xxx.tgz. This package is included in the KAS software installation directory (\Program Files (x86)\Kollmorgen\Kollmorgen Automation Suite\Astrolabe\DrivesFW) or is available for download from the Kollmorgen [website](http://www.kollmorgen.com/en-us/website-resources/other/akd-software/) (www.kollmorgen.com/en-us/website-resources/other/akd-software/).

- An SD memory card must be in the SD slot if you are using an PDMM or PCMM. PACs have a built-in Compact Flash card.
- All the EtherCAT network devices must be connected to the PAC or PDMM or PCMM, and configured as necessary for machine operation.

**TIP**

Make sure the devices are in the order as expected. The topology information is stored in the backup and is used to check for identical topology during a restore function.

- A PLC application downloaded to the PAC or PDMM / PCMM, containing the EtherCAT device map.

**NOTE**

The PLC application cannot be running and the IDE must not be in Online Configuration Mode. Please stop your PLC application or disable Online Configuration Mode before a Backup or Restore.

### 3.1.1.1 Backup Steps

1. From the web server home page, click on the Backup & Restore tab:
2. Under the Backup tab, press the Backup EtherCAT Devices button.

The web server will ask you to choose a firmware package file and suggest the filename that matches the firmware version on your drives. Selecting the firmware package file is a one-time event. The controller will remember your selection and will not ask you again for future backups.

**Controller**

**Backup Controller**

*Backup Controller is used to replicate a PCMM or the controller portion of a PDMM. The elements that are backed up are the firmware, network configuration, retained variables, and PLC application.*

*Notes:*

- \* This function cannot be performed while an application is running.
- \* Backup Controller takes several minutes to complete. Do not power off the controller once started.

**EtherCAT Devices**

Please provide the required firmware package<sup>(1)</sup>:

AKD-Firmware-for-KAS-V01-12-00-003.tgz

Browse... No file selected.

<< Cancel

**Continue Backup EtherCAT Devices**

<sup>(1)</sup>All firmware packages are available at [Kollmorgen.com](http://Kollmorgen.com)

3. Press the Continue Backup EtherCAT Devices button. It will take a couple of minutes or longer, depending on the number of AKDs in the system.

**Controller**

**Backup Controller**

*Backup Controller is used to replicate a PCMM or the controller portion of a PDMM. The elements that are backed up are the firmware, network configuration, retained variables, and PLC application.*

*Notes:*

- \* This function cannot be performed while an application is running.
- \* Backup Controller takes several minutes to complete. Do not power off the controller once started.

**EtherCAT Devices**

**Continue Backup EtherCAT Devices**

<< Cancel

<sup>(1)</sup>All firmware packages are available at [Kollmorgen.com](http://Kollmorgen.com)

When the backup is complete, the web server will indicate whether the backup was successful.

**TIP**

After the backup is complete, it is a good idea to export the backup to an off-site location for safe keeping.

### 3.1.2 EtherCAT Devices Restore

The Restore operation discovers the devices on the EtherCAT network and compares the physical topology information to the topology information stored in the backup. A Restore will detect the replaced AKD devices and restore them. Advanced users can manually select the specific AKD devices and restore them. The backup files containing the topology information, AKD firmware file, and AKD parameters are retrieved from the controller's local storage.

Controller	Local Storage
PAC	Compact Flash Card
PDMM or PCMM	SD Memory Card

#### 3.1.2.1 Steps

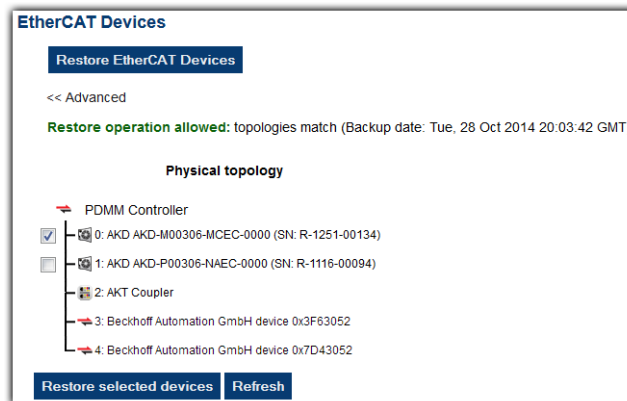
##### ⚠ IMPORTANT

The application will start immediately after the Restore operation is complete if the Autostart option is enabled on the controller. Be sure to Restore all of the replaced devices and the EtherCAT device order is correct. *Disable the Autostart option before commanding the Restore operation if you want to check the devices before starting the application.*

##### NOTE

The EtherCAT Devices Backup and Restore feature may be used in EtherCAT networks which have third party devices, but only the Kollmorgen AKDs can be backup and restored. Specific configurations applied to third party devices with non-Kollmorgen tools have to be reapplied when the third party device is replaced.

1. From the web server home page, click on the *Backup & Restore* tab:
2. Under the *Restore* tab, you can choose to restore the replaced EtherCAT AKD devices or manually select the AKD devices with the Advanced view.
  - To restore the replaced AKD devices, press the *Restore EtherCAT Devices* button. When the restore is complete, the web server will indicate whether it was successful.
  - To select the AKD devices and manually restore:
    1. Press the *Advanced* link.
    2. Select the AKD devices you want to restore. The controller will identify the replaced AKDs and pre-select them for you.
    3. Press *Restore selected devices*.



When the restore is complete, the web server will indicate whether it was successful.

### 3.1.3 AKD Backup/Restore Compatibility

The replacement AKD must have the same model number as the AKD that was originally stored in the backup. The *Restore* operation compares the model numbers between the backup and the replacement AKD. The restore will not be allowed if they are not compatible.

- To check the model number on your AKD, see the sticker on the side of the drive.
- To check compatibility between your replacement drive and the backup, replace the AKD on the EtherCAT network, and press the Scan network button.
  - The web server displays the physical topology and allows you to restore the selected drives if the backup and replacement drives are compatible.

**Backup & Restore**

Note that most of the following features are not available when PLC application is running or online config mode is active

EtherCAT devices backup: Mon, 29 Oct 2012 08:40:08 GMT

Backup | **Restore** | Import/Export

**Controller**

Restore Controller

*Restore Controller is used to replicate a PCMM or the controller portion of a PDMM. The elements that are restored are the firmware, network configuration, retained variables, and PLC application.*

*Notes:*  
 \* Restore Controller takes several minutes to complete.  
 Do not power off the controller once started.  
 \* The controller is rebooted after a Restore.

**EtherCAT Devices**

Restore EtherCAT Devices

<< Advanced

**Restore operation allowed:** topologies match (Backup date: Tue, 07 Jul 2015 18:12:48 GMT)

**Physical topology**

- Controller
  - 0: AKD AKD-M00306-M1EC-D000 (SN: R-1432-00169)
  - 1: AKD AKD-P00306-NAEC-0000 (SN: R-0934-00008)
  - 2: Beckhoff Automation GmbH device 0x4602C22

Restore selected devices | Refresh

- The web server displays the backup and physical topology and indicates the non-compatible drives if the backup and replacement drive are not compatible, .

**Backup & Restore**

Note that most of the following features are not available when PLC application is running or online config mode is active

EtherCAT devices backup: Tue, 07 Jul 2015 22:11:15 GMT

Backup | **Restore** | Import/Export

**Controller**

Restore Controller

*Restore Controller is used to replicate a PCMM or the controller portion of a PDMM. The elements that are restored are the firmware, network configuration, retained variables, and PLC application.*

*Notes:*  
 \* Restore Controller takes several minutes to complete.  
 Do not power off the controller once started.  
 \* The controller is rebooted after a Restore.

**EtherCAT Devices**

Restore EtherCAT Devices

<< Advanced

**Restore operation not allowed:** topologies are not matching (Backup date: Tue, 07 Jul 2015 22:11:15 GMT)

**Physical topology**

- Controller
  - 0: AKD AKD-P00306-NAEC-0000 (SN: R-1116-00140) **new!**
  - 1: AKD AKD-P00306-NAEC-0000 (SN: R-1116-00091)
  - 2: Beckhoff Automation GmbH device 0x4602C22

**Backup topology**

- Controller
  - 0: AKD AKD-M00306-M1EC-0000
  - 1: AKD AKD-P00306-NAEC-0000

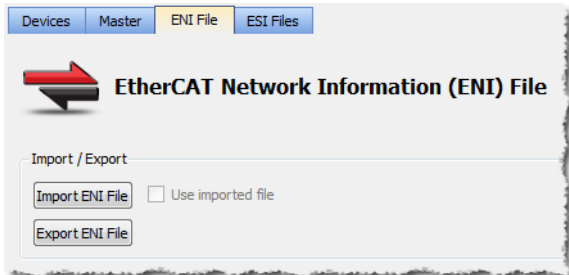
Refresh

**TIP**

The serial number (SN) is displayed in the Physical topology web server view and on the sticker affixed to the AKD. You can use the serial number to match the actual hardware with its representation on the web server.

### 3.1.4 Autostart with Replacement drives and the unique ID

The EtherCAT unique ID option will write a unique identifier into each EtherCAT device. It can be enabled or disabled in the IDE, from the Project View -> EtherCAT -> XML Configuration File tab. If the unique ID option is enabled, the unique ID will be stored in the AKD backup. Later, when the drive is replaced and restored, the same unique ID will be restored to the replacement drive.



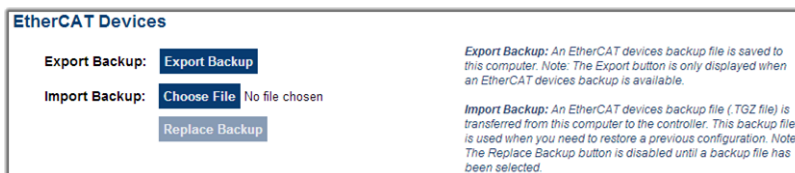
When the unique ID option is enabled, a replacement drive must be restored before the PLC program can be started. If the option is disabled, then the PLC program can be started without checking that the replaced drive has been restored.

**TIP**

If you enable the Autostart option in the controller and you plan to use the AKD Backup and Restore functions, it is strongly recommended that you enable the unique ID option. This will prevent the controller from automatically starting a PLC application with a replacement AKD, that has *not* been restored.

### 3.1.5 Export/Import EtherCAT Devices Backup

A network backup may be exported and imported. The export procedure saves a backup file to the computer running the web browser. The import procedure allows you to transfer a backup file onto the controller to be used later for restoring a previous configuration.



#### 3.1.5.1 Export Procedure

**NOTE**

The Export button is only displayed if an AKD backup is available.

1. Click on the "Export Backup" button. The browser starts transferring a backup file. Depending upon the browser being used, this may involve a prompt confirming that you wish to receive the file.
2. You may move the file to a different directory once the file is saved. The file may be renamed to help identify the backup file with the machine.

#### 3.1.5.2 Import Procedure

1. Specify a backup file to import by clicking on the "Browse" button. This backup file will be used to replace the current backup on the controller.

2. After a backup file is specified, click on the "Replace Backup" button. This creates a backup on the controller with the data stored in the specified backup file. Any previously existing backup will be replaced. If the import fails, the previous backup will not be replaced.

**NOTE**

- The Replace Backup button is disabled until a backup file has been selected.
- On some browsers, the "Browse" button may be labeled "Choose File".

**3.1.6 EtherCAT Devices Backup/Restore Limitations**

- The EtherCAT Devices Backup and EtherCAT Devices Restore functions are not permitted while a PLC application is running or when the IDE is in Online Configuration Mode. Please stop your PLC application or disable Online Configuration Mode before a Backup or Restore.
- Only a single backup is supported in the controller at one time.

**NOTE**

If you want to keep multiple backup configurations, you can perform the backup and then export it to a local PC or USB flash memory stick. Later, when you are ready to restore, you can import the specific backup file to the controller, and then perform the restore.

**TIP**

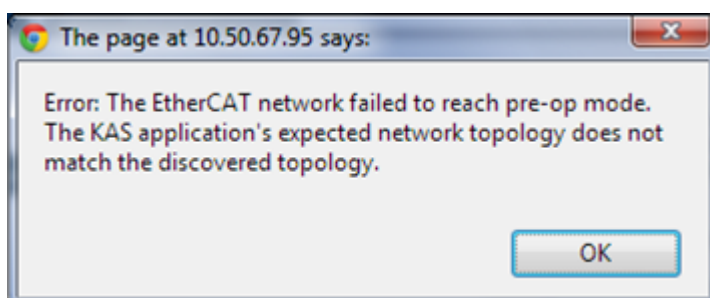
Beware that an import will overwrite any backup existing in the controller or PDMM SD card. If you are using an PDMM, the alternative method is to use a separate SD card for each backup/restore configuration.

- All AKD drives on the EtherCAT network must have the same AKD firmware version.
- The AKD firmware version must be 01-06-00-003 or higher.
- AKD firmware packages are available for all production releases.
- Only AKD drives are supported for backup/restore. Kollmorgen S300/S700 drives are not supported by backup/restore.
- PDMM or PCMM system backup or restore is a two-step process:
  1. Backup or Restore the PDMM or PCMM controller
  2. Backup or Restore the AKDs (including the AKD drive inside the PDMM).

**3.1.7 Troubleshooting EtherCAT Devices Backup/Restore**

The web server displays an error message if an EtherCAT Device backup or restore fails. The message describes the cause of the failure and a possible remedy. Please be sure to note any error message(s), as they will be helpful with remedying the problem.

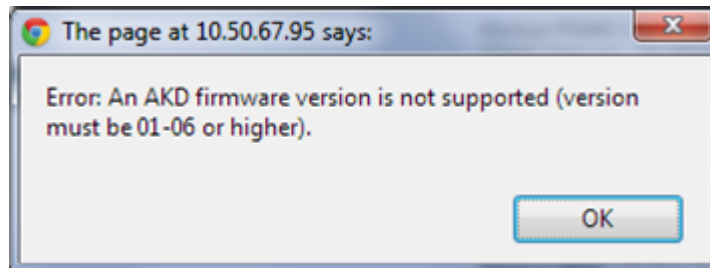
Described below are some common error messages and remedies. The message box format may appear differently depending on the web browser, but the message content is the same.

**During AKD backup, EtherCAT fails to reach pre-op mode:**

1. Using the IDE, open the EtherCAT view and scan the network.
2. Compare the nodes, their order, and types to the topology in your application.
3. After you identify the differences do one of the following:
  - Modify the application's devices to match the physical network.
  - Correct the physical network by adding/moving/removing nodes.

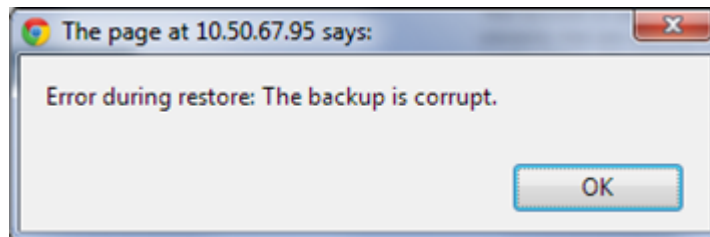


**During AKD backup, at least one AKD has an unsupported firmware error for backup:**



1. Using the IDE, open the EtherCAT view.
2. Upgrade all of the AKDs drive firmware to at least version 01-06.

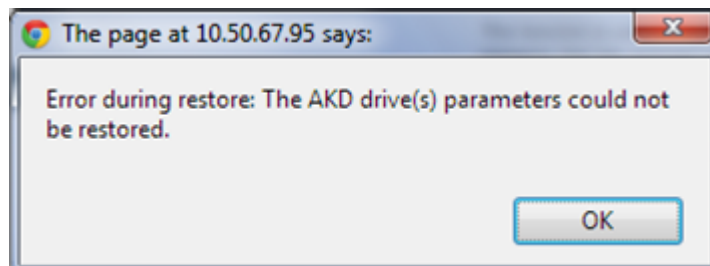
**During AKD restore, the backup file is corrupt:**



Before restoring AKD(s), the backup file must be valid. To correct a bad backup file on a controller, import a known good backup file from another source (local hard drive, network drive, USB flash stick, etc.). If you do not have a valid backup file, then you will need to manually configure the replacement AKDs by downloading firmware and modifying the drive's parameters using the AKD views in the IDE.

**Not able to restore AKDs successfully.**

The error message will describe at which step the restore failed. For example, failing to restore parameters:



1. If an AKD restore fails and you have already verified the controller has a valid backup and the network topology is correct, then retry the Restore.
2. If you still cannot restore successfully after two or three attempts, check your network cables and try a different replacement AKD drive(s). This test will isolate the problem to the specific drive(s) or the controller problem.
3. If you still cannot restore a replacement AKD, then you will need to manually configure the replacement AKDs by downloading firmware and modifying the drive's parameters using the AKD views in the IDE.

## 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

203A West Rock Road  
Radford, VA 24141  
USA

**Web:** [www.kollmorgen.com](http://www.kollmorgen.com)  
**Mail:** [support@kollmorgen.com](mailto:support@kollmorgen.com)  
**Tel.:** +1 - 540 - 633 - 3545  
**Fax:** +1 - 540 - 639 - 4162

### South America

#### KOLLMORGEN

Avenida Tamboré, 1077 Tamboré - Barueri - SP Brasil  
CEP: 06460-000

**Web:** [www.kollmorgen.com](http://www.kollmorgen.com)  
**Mail:** [support@kollmorgen.com](mailto:support@kollmorgen.com)  
**Tel.:** +55 11 4191-4771

### Europe

#### KOLLMORGEN Europe GmbH

Pempelfurtstraße 1  
40880 Ratingen  
Germany

**Web:** [www.kollmorgen.com](http://www.kollmorgen.com)  
**Mail:** [technik@kollmorgen.com](mailto:technik@kollmorgen.com)  
**Tel.:** +49 - 2102 - 9394 - 0  
**Fax:** +49 - 2102 - 9394 - 3155

### China and SEA

#### KOLLMORGEN

Room 202, Building 3, Lane 168,  
Lin Hong Road, Changning District  
Shanghai

**Web:** [www.kollmorgen.cn](http://www.kollmorgen.cn)  
**Mail:** [sales.china@kollmorgen.com](mailto:sales.china@kollmorgen.com)  
**Tel.:** +86 - 400 661 2802