

KAS Web Server User Manual for PAC



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Keep all manuals as a product component during the life span of the product.
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1 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 type, firmware version, version of your KAS application)
- Interact with your application (Start and Stop your KAS application)
- View real and simulated axes
- See all the log messages

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 PAC, press and briefly hold B2, the 7-segment display will show the IP.

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.

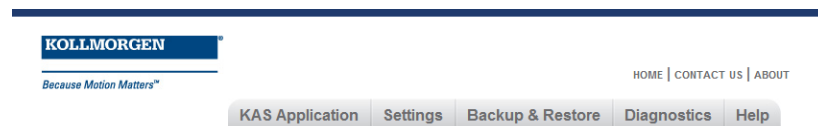


Figure 1-1: The Webserver Tabs as seen on an AKD PDMM webserver.

TIP

Browser Requirements: We recommend using Firefox 11, Google Chrome, or Internet Explorer 9 or later for accessing the web server.

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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
- Image

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3.1 KAS Application

This tab allows you to:

- Display general information about your project that is currently loaded on the controller (PAC or PAC)
- Start and stop the motion
- Display the Axes run by the controller from the "Axis" (see page 11) tab
- Manage log messages from the "Log Configuration" (see page 12) and "Log Data" (see page 13) tabs
- Display User Data present on the controller from the "User Data" (see page 15) tab

| Item | Description |
|---------------------------|---|
| Version of KAS App | This label provides information about the name and version number of the application that is in the controller. The format is <code><project_name>:<version></code> . 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. |
| Status of KAS App | The state of the application, <i>Started</i> or <i>Stopped</i> . |
| Start | Default mode (warm start) where the retain variables are loaded at the application startup. They are Not re-initialized; whereas other variables are started with their initial values. |
| Cold Start | Use retain variables with their default values. Such starts occurs from time to time but are few. |
| Stop | Stop the application |
| Auto-start | Select this option to automatically start the KAS application when the PDMM is powered up. The application will start using retained variables (a "warm start") after the controller has booted up. To change this setting, click the Auto-start checkbox to either activate or deactivate this option and click the Apply button. The control will use the new setting at the next power-up. <div>  NOTE You can choose to start the application manually when debugging with the Simulator. Whereas the Auto-start mode is recommended when the system is in production, in order to prevent from doing inappropriate actions. </div> |
| Clear all errors | Clicking this button will clear the error log for all axes. |

3.1.1 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 available by clicking on the axis | | | |
|---|---|--|---|
| Title | Image (PN axis) | Image (PLCopen axis) | Image (digitizing axis) |
| AXIS1 Axis status snapshot 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 | AXIS1 Axis positions snapshot 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 | PLCOpenAxis2 Axis positions snapshot Actual 3141.856728 Command 3141.856728 Normal 3141.856728 Phase 0.000000 Super imposed 0.000000 | Axis3 Axis positions snapshot Actual 0.000000 |

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

3.1.2 Log Configuration

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

| | Axis | Log Configuration | Log Data | User Data |
|---|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| Log Configuration | | | | |
| | IDE | Controller | EtherCAT | Drive |
| | PLC | Motion | System | All |
| Error | <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"/> |
| Info | <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="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



How to Choose the Appropriate Level?

TIP

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

Level

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

3.1.3 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.

KAS Application

Backup & Restore

Help

KAS Application
 Version of KAS App
 Status of KAS App
 Start/Stop
 Options
 Clear all axis errors

_PLCappDBG::28
 _stopped

Start

Cold Start

Stop

☐ Auto-start

Apply

Clear all errors

Axis

Log Configuration

Log Data

User Data

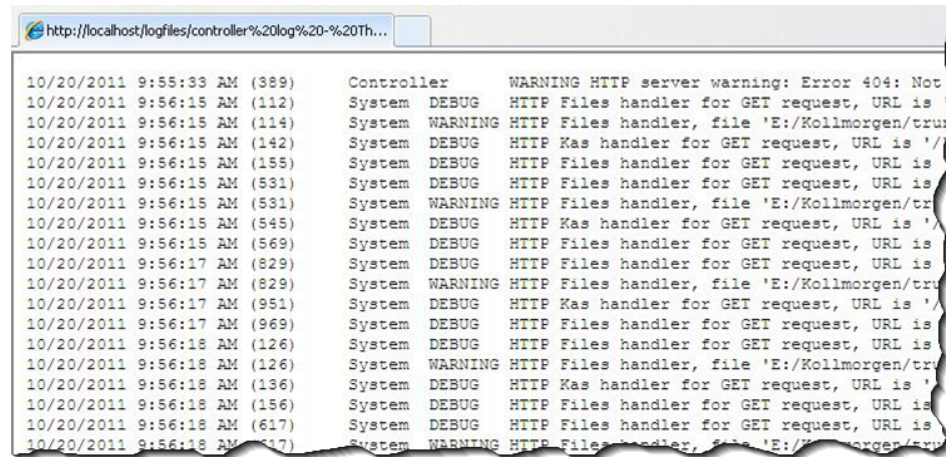
Log Files

controller log - Tue Jul 17 17h45m09 2012

Refresh

Figure 3-1: 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 3-2:** Example of a log file's content, displayed in a browser.**NOTE**

Log data is collected and updated every 15 seconds on a PAC and 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.

3.1.3.1 Log Message Content

Every log message in the table has the following information:

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

3.1.3.2 PAC Log Files

Logs generated on a PAC 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 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.

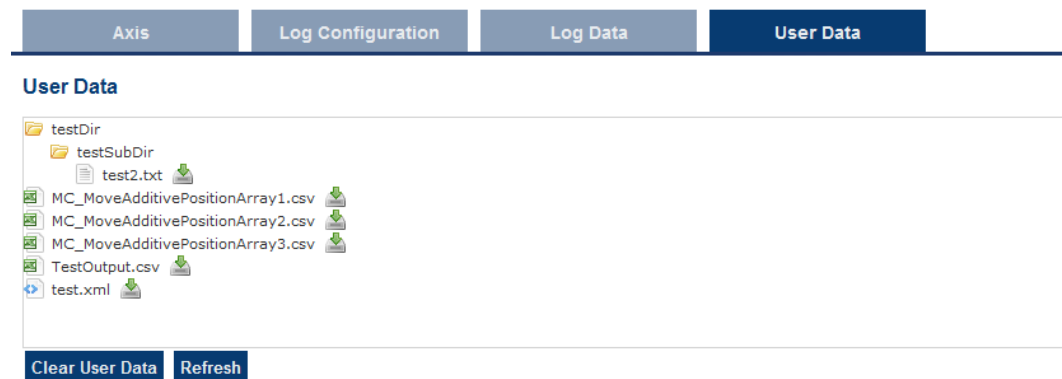
Log File Naming Convention

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.

3.1.4 User Data

This tab lists any user-generated files or folders found on the flash drive. 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.

3.2 Backup & Restore

These functions are used to replicate a PDMM (*Backup* and then *Restore*). The elements that are backed up or restored are the firmware, the network configuration, the retained 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 PDMM is rebooted after a *Restore*.

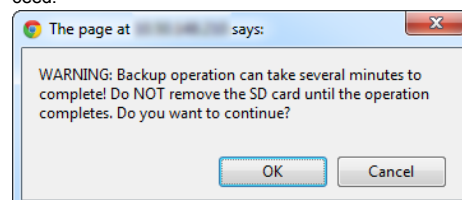
TIP

This section provides an overview of the backup and restore processes. For a deeper discussion, see "EtherCAT Devices Backup and Restore" (see page 17).

3.2.1 Backup Tab

Backup Controller

This function is used to replicate the controller part of the PDMM. Clicking the button will save the data to the SD card. An alert will be presented to confirm the backup should proceed.



Backup EtherCAT Devices

This function replicates the network topology as well as the drives' 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 browser for one. A link to the Kollmorgen website is provided; all firmware packages can be found on the site.

EtherCAT Devices

Please provide the required firmware package⁽¹⁾:

AKD-Firmware-for-KAS-V01-06-00-002.tgz

Choose File No file chosen

<< Cancel

- 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.



TIP

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

3.2.2 Restore Tab

| | |
|---------------------------------|---|
| Restore Controller | This function restores a PDMM's firmware, network configuration, retained variables and PLC application from the SD card. |
| Restore EtherCAT Devices | This function automatically restores the data and firmware of any replaced drives. |
| Advanced | <p>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.</p> <p>EtherCAT Devices</p> <p>Restore EtherCAT Devices</p> <p><< Advanced</p> <p>Restore operation allowed: topologies are matching (Backup date: Tue, 16 Oct 2012)</p> <p>Physical topology</p> <p>PDMM Controller</p> <p><input type="checkbox"/> 0: AKD AKD-P00606-NAEC-0000 (SN: 2754674789)</p> <p><input checked="" type="checkbox"/> 1: AKD AKD-P00606-NAEC-0000 (SN: 2754674787)</p> <p>Restore selected devices Refresh</p> |

3.2.3 Import/Export

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

| Backup | Restore | Import/Export |
|---|---------|---------------|
| <p>EtherCAT Devices</p> <p>Export Backup: Export Backup</p> <p>Import Backup: Choose File No file chosen Replace Backup</p> <p><small>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.</small></p> <p><small>Import Backup: An EtherCAT devices backup file (TGZ 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.</small></p> | | |

| | |
|-----------------------|--|
| Export Backup | This button allows you to save the backup file to a computer. |
| Choose File | This button allows you to select a previously exported backup file to be imported. |
| Replace Backup | This button imports the selected backup file, replacing any existing backup. |


3 EtherCAT Devices Backup & Restore - In Depth

This section discusses device backup and restore in greater depth.

3.0.1 EtherCAT Devices Backup and Restore

The PAC and AKD PDMM 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 PAC and AKD PDMM web server and is accessible from a web browser. For details about the web server see "Using the KAS Web Server" (see page 7).

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

AKDs backup: Tue, 25 Sep 2012 23:22:42 GMT

Backup
Restore
Import/Export

Controller



Backup Controller

EtherCAT Devices

Backup EtherCAT Devices

Backup Controller is used to replicate the controller part of the PDMM (back up). The elements that are backed up are the firmware, the network configuration, the retained variables, and the PLC application.

Notes:

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

Backup EtherCAT Devices will save the network topology, the AKD drives firmware and the AKD drives data.

For EtherCAT devices backup operation, the correct AKD firmware package is required.

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

(1) All firmware packages are available at Kollmorgen.com

3.0.1.1 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 |
| AKD PDMM | SD Memory Card (see SD Card Support for more information) |

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 (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 AKD PDMM. PACs have a built-in Compact Flash card.
- All the EtherCAT network devices must be connected to the PAC or AKD PDMM, 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



TIP function.

- A PLC application downloaded to the PAC or AKD PDMM, 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.

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.

Backup

Restore

Import/Export

Controller



Backup Controller

EtherCAT Devices

Please provide the required firmware package⁽¹⁾:

AKD-Firmware-for-KAS-V01-06-00-002.tgz

Choose File

No file chosen

<< Cancel

Backup Controller is used to replicate the controller part of the PDMM (back up). The elements that are backed up are the firmware, the network configuration, the retained variables, and the PLC application.

Notes:

* This function cannot be performed while an application is running.

* Backup take several minutes to complete. Do not power off the control once started.

Backup EtherCAT Devices will save the network topology, the AKD drives firmware and the AKD drives data.

For EtherCAT devices backup operation, the correct AKD firmware package is required.

* If the matching firmware already exists on the controller, it will be used for future backups.

* If the firmware file does not exist on the controller, you will be asked to provide it.

⁽¹⁾All firmware packages are available at 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.

Backup

Restore

Import/Export

Controller



Backup Controller

EtherCAT Devices

Continue Backup EtherCAT Devices

<< Cancel

Backup Controller is used to replicate the controller part of the PDMM (back up). The elements that are backed up are the firmware, the network configuration, the retained variables, and the PLC application.

Notes:

* This function cannot be performed while an application is running.

* Backup take several minutes to complete. Do not power off the control once started.

Backup EtherCAT Devices will save the network topology, the AKD drives firmware and the AKD drives data.

For EtherCAT devices backup operation, the correct AKD firmware package is required.

* If the matching firmware already exists on the controller, it will be used for future backups.

* If the firmware file does not exist on the controller, you will be asked to provide it.

⁽¹⁾All firmware packages are available at 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. See Export/Import below.

3.0.1.2 EtherCAT Devices Restore

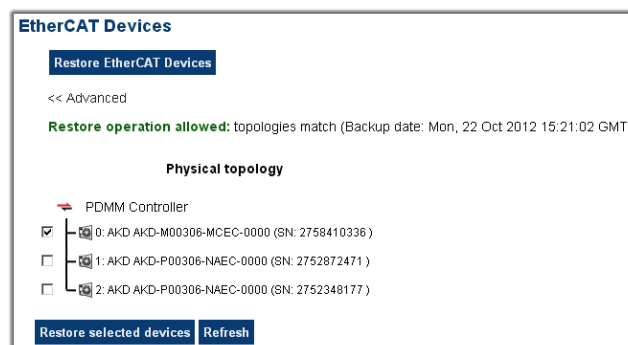
The Restore operation discovers the devices on the EtherCAT network and compares the physical topology information to the topology information stored in the backup. A Restore will detect the replaced devices and restore them. Advanced users can manually select the specific devices and restore them. The 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 |
| AKD PDMM | SD Memory Card (see SD Card Support for more information) |

Steps

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

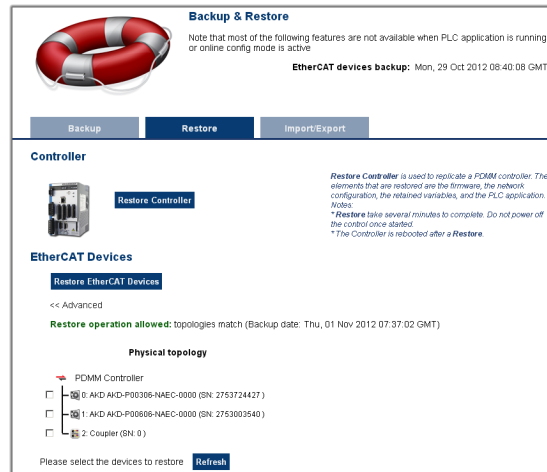


When the restore is complete, the web server will indicate whether it was successful.

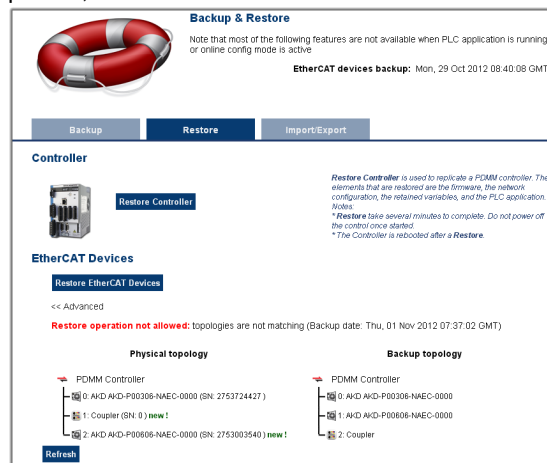
3.0.1.3 AKD Backup/Restore Compatibility

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.



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



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.

3.0.1.4 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.

3.0.1.5 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.

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.

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.

NOTE

- On some browsers, the "Browse" button may be labeled "Choose File".

3.0.1.6 EtherCAT Devices Backup/Restore Limitations

- The "EtherCAT Devices Backup" (see page 17) and "EtherCAT Devices Restore" (see page 18) 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

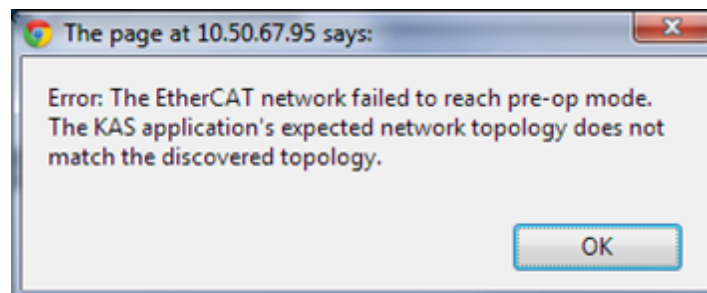
Beware that an import will overwrite any backup existing in the controller or AKD PDMM SD card. If you are using an AKD PDMM, the alternative method is to use a separate SD card for each backup/restore configuration.

- 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 drives are not supported by backup/restore.
- AKD PDMM system backup or restore is a two-step process:
 1. Backup or Restore the AKD PDMM
 2. Backup or Restore the AKDs (including the AKD drive inside the AKD PDMM).

3.0.1.7 Troubleshooting EtherCAT Devices Backup/Restore

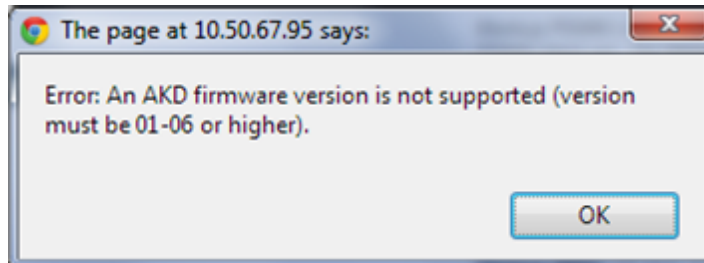
The web server displays an error message if an EtherCAT Device backup or restore fails. The message describes the cause of the failure and a possible remedy. Please be sure to note any error message(s), as they will be helpful with remedying the problem.

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:

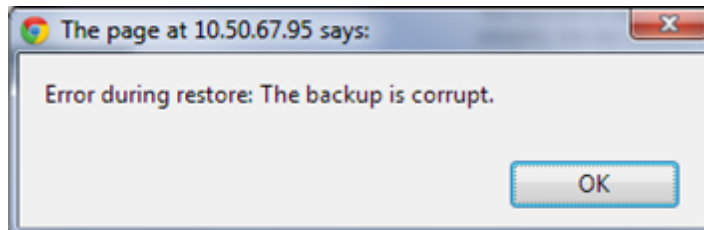
1. Using the IDE, open the EtherCAT view and scan the network.
2. Compare the nodes, their order, and types to the topology in your application.
3. After you identify the differences do one of the following:
 - Modify the application's devices to match the physical network.
 - Correct the physical network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

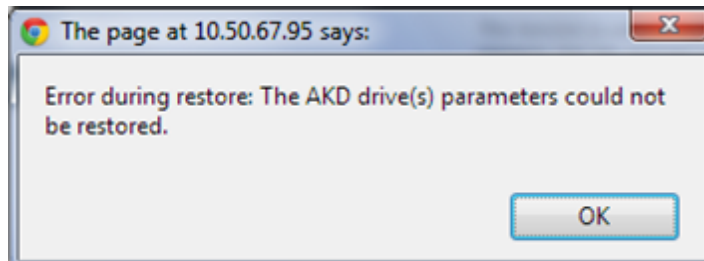
During AKD restore, the backup file is corrupt:



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.

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Global Support Contacts

North America
KOLLMORGEN
203A West Rock Road
Radford, VA 24141 USA

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

Europe
KOLLMORGEN Europe GmbH
Pempelfurtstraße 1
40880 Ratingen, Germany

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

Asia
KOLLMORGEN
Rm 2205, Scitech Tower, China
22 Jianguomen Wai Street

Web: www.kollmorgen.com
Mail: sales.asia@kollmorgen.com
Tel.: +86 - 400 666 1802
Fax: +86 - 10 6515 0263