

Size, Select and Configure Kinetix® and PowerFlex® Drives Using Motion Analyzer Online Tool



For Classroom Use Only!

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THINK.
SOLVE.®

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**Rockwell
Automation**

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- staying informed of all Product updates and alerts and implementing all updates and fixes; and
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Throughout this manual we use the following notes to make you aware of safety considerations:

WARNING

Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.

IMPORTANT

Identifies information that is critical for successful application and understanding of the product.

ATTENTION

Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you:

- identify a hazard
- avoid a hazard
- recognize the consequence

SHOCK HAZARD

Labels may be located on or inside the drive to alert people that dangerous voltage may be present.

BURN HAZARD

Labels may be located on or inside the drive to alert people that surfaces may be dangerous temperatures.

Size, Select and Configure Kinetix® and PowerFlex® Drives Using Motion Analyzer

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Before You Begin

About This Lab

Welcome to the “Size, Select and Configure Kinetix® and PowerFlex® Drives Using Motion Analyzer online tool” lab. Experience the speed and simplicity of using the new Motion Analyzer to size and select motion and drive systems. This session will premiere the new web based selection tool.

As you complete the exercises in this hands-on session, you will:

- Log in to the new Motion Analyzer website
- Follow along on a guided tour of the Motion Analyzer site
- Review a completed project
- Create a new project and select a motor and drive for a vertical lift application

This hands-on lab is ideal for:

- Individuals who size, select, and optimize motion control applications
- Mechanical engineers and controls engineers designing machines with motion control
- Machine users trying to improve an existing machine with motion control
- System integrators selling motion control

This lab takes approximately **90** minutes to complete.

Tools & Prerequisites

For this hands-on lab, the following is required to complete the exercises:

Software Required:

- Internet Explorer Browser

Additional Requirements:

- Valid user credentials to access the website

Log In to the Motion Analyzer Website

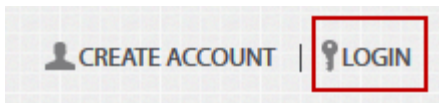
Motion Analyzer has become an online tool that can be accessed from anywhere with an internet connection. By logging in, you can create new applications, access existing application data, or simply browse for drive or motor product information. Let's begin by logging into the site.

Entering Lab User Credentials

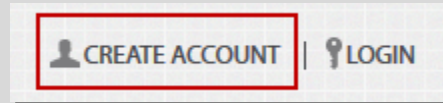
1. Open Internet Explorer web browser.
2. Click in the web address bar and type "**motionanalyzer.rockwellautomation.com**" to navigate to the Motion Analyzer website.

Note: Do not type "www." prior to the web address, or the link will not take you to the correct site.

3. Enter your email address and Password by clicking on LOGIN



If you do not have an account, please register using the Create Account button.



Take the Motion Analyzer Guided Tour

In this section of the Hands-On lab, you will explore the Motion Analyzer site to get accustomed to the interface.

Understanding the Home Page

Upon logging in to the Motion Analyzer website, the home page appears. Let's take a moment to understand the key areas on this page. In the next sections we will begin to navigate through the site.

Motion Analyzer Home Button TLSTONE@RA.ROCKWELL.COM Notifications 43 Rockwell Automation

PRODUCTS LIBRARY TOOLS SUPPORT Profile Management Enter keyword or product # Products Search Tool

Navigation Tabs Learn. Select. Size. Find the solution for your application from Rockwell Automation and our PartnerNetwork. New to Motion Analyzer? Click [here](#) for an introductory lab

Core Sizing/Selecting Paths Additional References

START BUILDING
Ready to start building, sizing and selecting?
Click here to start a new project to size your application.
[Start A New Project](#) [View Current Projects](#)

BROWSE PRODUCT
Fast access to detailed information and product comparisons to help select the products you need.
Keyword or product number ...

All Products Drives Motors Linear Actuators Gearboxes Linear Mechanisms iTRAK

LATEST NEWS
[Thermal model change](#)
[Unit defaults selection](#)
[Current calculation change](#)
[Stober gearbox update](#)
[October Quarterly update](#)

LINKS
[Allen Bradley](#)
[Rockwell Automation](#)
[Literature](#)

NOTIFICATIONS
[Library Item Modified](#)
[Library Item Modified](#)
[Library Item Shared](#)
[Library Item Shared](#)
[Library Item Modified](#)
[See all notifications](#)

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Home Button: In the upper left corner of the webpage, you will find the Home button. This button is accessible from any point within the tool and will bring you back to this home page.

Profile Management: In the upper right corner of the webpage, you will notice your user email address and a Notifications button. This is where you modify User Profile information, manage shared library items, and access your notifications. These links are available from any point within the tool.

Navigation Tabs: On the left side of the toolbar at the top of the page, you will see several Navigation tabs labeled Products,

Library, Tools and Support. These tabs provide convenient access to the main Motion Analyzer tools from anywhere in the website.

Search Tool: On the right side of the toolbar at the top of the page, you will see the Search Tool. This tool can be used to search for specific product information or general support topics.

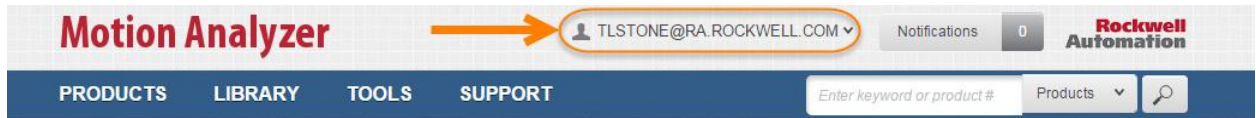
Additional References: Along the right side of the webpage, you will find links to additional references. Using these links, you can quickly view the latest Motion Analyzer news or external websites, such as the Rockwell Automation website and Literature Library. Additionally, any notifications you receive are displayed here.

Core Sizing & Selecting Paths: In the center of the page, you will see the two primary starting points for sizing and selecting products to meet your application requirements. The Start Building path guides you through the process of entering specific system parameters to properly size a motor and drive for your application. The Browse Product path provides access to detailed product information so that you can compare product features and options across families.

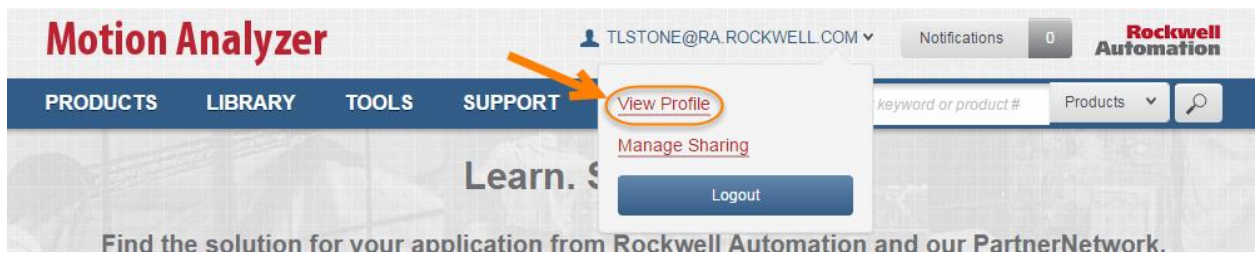
Managing Your User Profile

Now that we have reviewed the key areas on the Motion Analyzer Home page, let's begin by taking a look at the Profile Management page.

1. Click on the **lab user email address** in the top right corner of the page.



2. Select the **View Profile** option.



3. The User Profile page will appear.

In the Overview tab of the User Profile page, you can change your password, update your personal information and modify the settings for units used throughout the site. For this lab, we will be entering information in metric units, which are the default settings, so there is no need to make a selection.

Motion Analyzer

TLSTONE@RA.ROCKWELL.COM ▾

Notifications 43

Rockwell Automation

PRODUCTS LIBRARY TOOLS SUPPORT

Enter keyword or product # Products ▾ 🔍

🏠 \ User Profile

User Profile

The User Profile allows you to update your information, control your shared projects and see all notifications.

Overview Shared Notifications Units

LOGIN INFORMATION

Username/Email TLStone@ra.rockwell.com

Old Password

New Password

Repeat New Password

Update

PERSONAL INFORMATION

First Name

Last Name

Company

Job Function

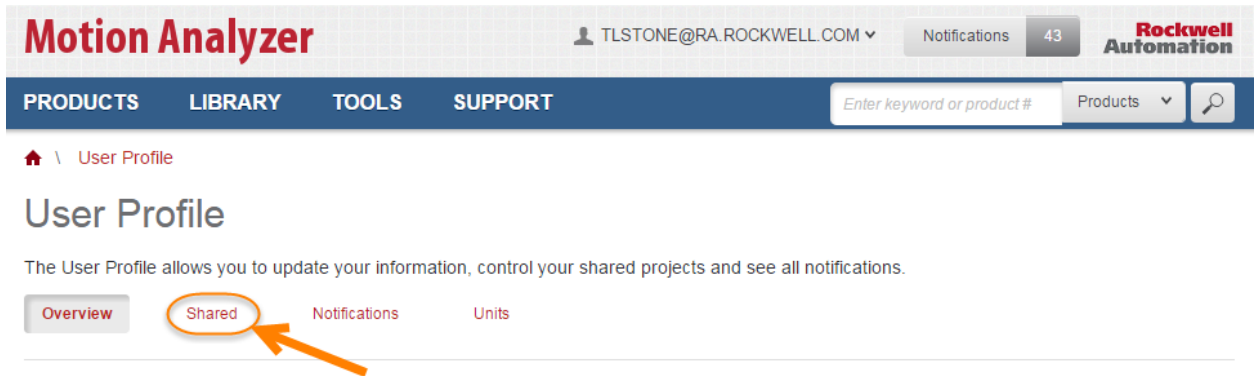
Industry

Location

Save Personal Information

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- Click on the **Shared** tab at the top of the User Profile page.



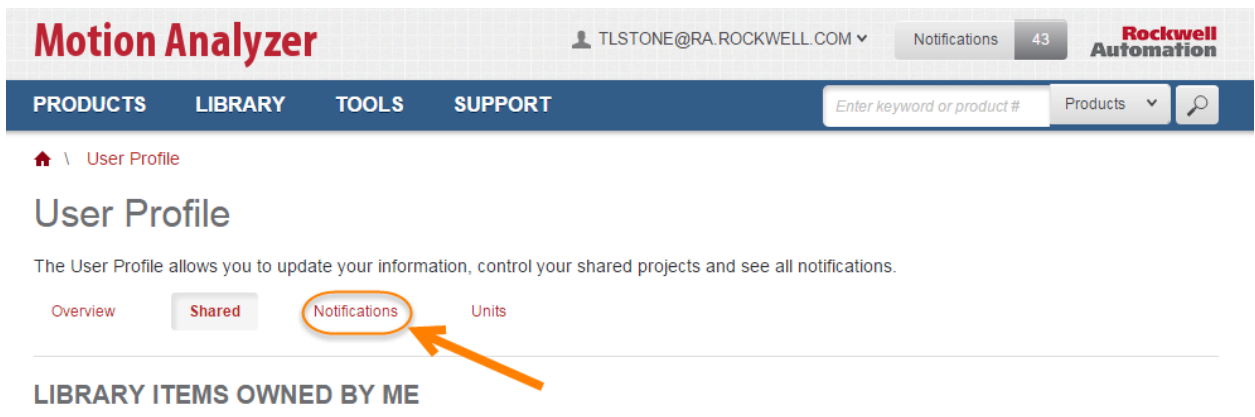
LOGIN INFORMATION

Username/Email TLStone@ra.rockwell.com

Old Password

In the Shared tab of the User Profile page, you can manage your projects. Here you can share projects with other Motion Analyzer users or change the owner of a project.

- Click on the **Notifications** tab at the top of the User Profile page.



In the Notifications tab of the User Profile page, you can access your notifications and change your email notification preferences.

6. Click on the **Units** tab.

The screenshot shows the Motion Analyzer web application. At the top, there's a header with the logo, user email (TLSTONE@RA.ROCKWELL.COM), and a notification count (43). Below the header is a navigation bar with links for PRODUCTS, LIBRARY, TOOLS, and SUPPORT. A search bar is also present. The main content area is titled 'User Profile' and includes a sub-header explaining its purpose. Below this, there are four tabs: Overview, Shared, Notifications, and Units. The Units tab is circled in orange, and an orange arrow points to it from the right.

Motion Analyzer TLSTONE@RA.ROCKWELL.COM Notifications 43 **Rockwell Automation**

PRODUCTS LIBRARY TOOLS SUPPORT Enter keyword or product # Products

Home \ User Profile

User Profile

The User Profile allows you to update your information, control your shared projects and see all notifications.

Overview Shared Notifications **Units**

The **Units** tab allows you to choose the units used in your profile.

This screenshot shows the 'Units' tab selected in the User Profile. It displays a 'SETTINGS' section with two buttons: 'Set Metric Units' and 'Set Imperial Units'. Below these are two columns of unit selection options. The first column lists various physical quantities like Linear Distance, Diameter, Velocity, Acceleration, Jerk, Angular Distance, Angular Velocity, Angular Acceleration, Angular Jerk, Density, and Efficiency. The second column lists corresponding units like mm, kg, kg·cm², N, N·m, kW, s, °C, deg, mm/rev, and m. An orange arrow points from the right towards the 'Time' unit selection area. At the bottom of the settings section is a 'Save Settings' button. Below the settings section, there is a footer with legal notices and copyright information.

Motion Analyzer TLSTONE@RA.ROCKWELL.COM Notifications 43 **Rockwell Automation**

PRODUCTS LIBRARY TOOLS SUPPORT Enter keyword or product # Products

Home \ User Profile

User Profile

The User Profile allows you to update your information, control your shared projects and see all notifications.

Overview Shared Notifications **Units**

SETTINGS

Set Metric Units Set Imperial Units

Linear Distance	mm	Mass	kg
Diameter	mm	Inertia	kg · cm ²
Velocity	mm/s	Force	N
Acceleration	mm/s ²	Torque	N · m
Jerk	mm/s ³	Power	kW
Angular Distance	rev	Time	s
Angular Velocity	RPM	Temperature	°C
Angular Acceleration	RPM/s	Inclination	deg
Angular Jerk	RPM/s ²	Lead	mm/rev
Density	kg/cm ³	Altitude	m
Efficiency	%		

Save Settings

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Navigating Through the Website

Next, let's begin looking around the site in more detail by exploring the Navigation tabs.

Products Navigation Tab

1. Click on the **Products** navigation tab on the toolbar at the top of the page.

Motion Analyzer TLSTONE@RA.ROCKWELL.COM ▾ Notifications 43 **Rockwell Automation**

PRODUCTS LIBRARY TOOLS SUPPORT Enter keyword or product # Products ▾ 🔍

🏠 \ User Profile

User Profile

The User Profile allows you to update your information, control your shared projects and see all notifications.

Overview Shared Notifications **Units**

SETTINGS

Set Metric Units Set Imperial Units

Linear Distance	mm	Mass	kg
Diameter	mm	Inertia	kg · cm ²
Velocity	mm/s	Force	N
Acceleration	mm/s ²	Torque	N · m
Jerk	mm/s ³	Power	kW

2. The Browse Products page will appear.

Motion Analyzer

TLSTONE@RA.ROCKWELL.COM ▾Notifications43

Rockwell Automation

PRODUCTSLIBRARYTOOLSUPPORT

Enter keyword or product #Products ▾

[Home](#) \ [Products](#)

Browse Products

DRIVES

Our PowerFlex® family of AC drives & Kinetix family of servo drives includes a wide variety of products that offer the right size and feature set to handle a broad range of applications. We offer solutions designed to help you simplify machine design while improving system performance through a broad range of control modes, features, options, and packaging.

[Browse DRIVES](#)

MOTORS

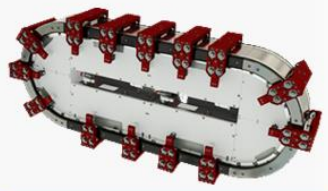
Motors from Rockwell Automation and our encompass partners are designed to provide maximum performance in a wide range of applications. A wide range of available features and technologies allow you to find the best choice for your machine.

[Browse MOTORS](#)



iTRAK®

The iTRAK® independent mover system can be used to increase your machine throughput, reduce your changeover time, reduce your maintenance, and optimize machine space. The iTRAK® system is today's solution for motion control challenges, providing flexibility while enhancing performance significantly. The independent movers give machine designers the opportunity to design a 'pitchless' machine that can be easily adjusted to your specific application. Configure the product to create high speed tracks of varying shapes and power ranges to solve many different applications.

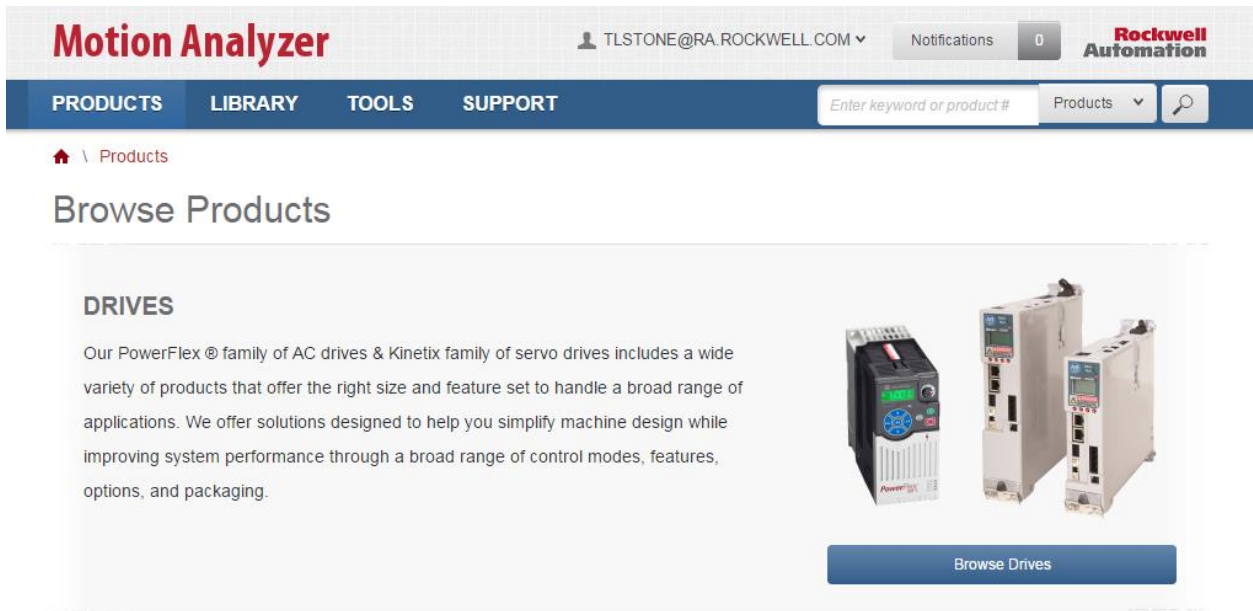
[Browse iTRAK®](#)

LINEAR ACTUATORS

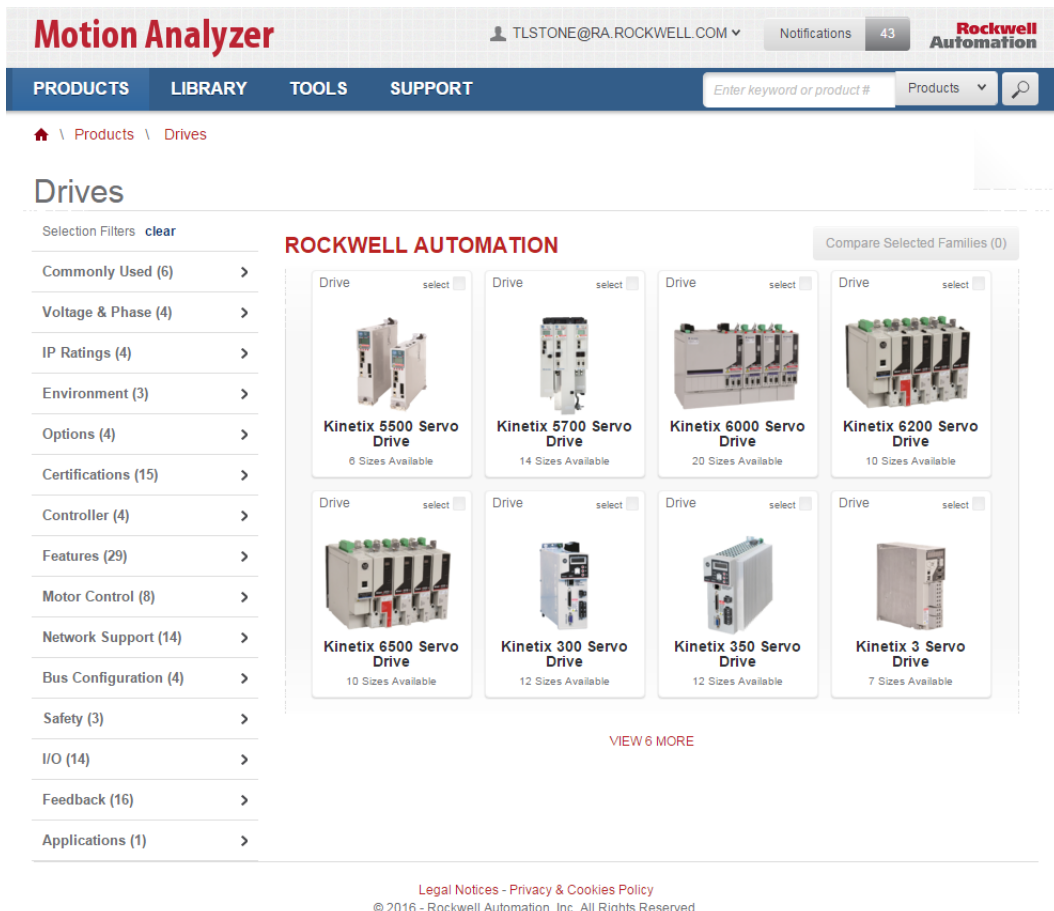


The Browse Products page is where you go to browse and compare drives, motors, linear actuators and gearboxes.

- Click on the **Browse Drives** button.



- The Browse Drives page will appear.



Here, you can select one or more drive families to see the features and options that are available for the various platforms.

5. Click **View More** to see more of the drive product families.

Motion Analyzer

TLSTONE@RA.ROCKWELL.COM ▾Notifications43

Rockwell Automation

PRODUCTSLIBRARYTOOLSUPPORT

Enter keyword or product #Products

[Home](#) \ [Products](#) \ [Drives](#)

Drives

Selection Filters [clear](#)

Commonly Used (6) >

Voltage & Phase (4) >

IP Ratings (4) >

Environment (3) >

Options (4) >

Certifications (15) >

Controller (4) >

Features (29) >

Motor Control (8) >

Network Support (14) >

Bus Configuration (4) >

Safety (3) >

I/O (14) >

Feedback (16) >

Applications (1) >

ROCKWELL AUTOMATION

Compare Selected Families (0)

Drive

**Kinetix 5500 Servo Drive**
6 Sizes Available

Drive

**Kinetix 5700 Servo Drive**
14 Sizes Available

Drive

**Kinetix 6000 Servo Drive**
20 Sizes Available

Drive

**Kinetix 6200 Servo Drive**
10 Sizes Available

Drive

**Kinetix 6500 Servo Drive**
10 Sizes Available

Drive

**Kinetix 300 Servo Drive**
12 Sizes Available

Drive

**Kinetix 350 Servo Drive**
12 Sizes Available

Drive

**Kinetix 3 Servo Drive**
7 Sizes Available

Drive

**Kinetix 7000 Servo Drive**
7 Sizes Available

Drive

**PowerFlex 523**
33 Sizes Available

Drive

**PowerFlex 525**
38 Sizes Available

Drive

**PowerFlex 527**
38 Sizes Available

Drive

**PowerFlex 753**
205 Sizes Available

Drive

**PowerFlex 755**
422 Sizes Available

[VIEW LESS](#)

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6. Let's narrow the list of drive families by utilizing the product feature filters.

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Enter keyword or product # Products ▾ 🔍

🏠 \ Products \ Drives

Drives

Selection Filters clear

Commonly Used (6) >

Voltage & Phase (4) >

IP Ratings (4) >

Environment (3) >

Options (4) >

Certifications (15) >

Controller (4) >

Features (29) >

Motor Control (8) >

Network Support (14) >

Bus Configuration (4) >

Safety (3) >

I/O (14) >

Feedback (16) >

Applications (1) >

ROCKWELL AUTOMATION

Compare Selected Families (0)

Drive select



Kinetix 5500 Servo Drive
6 Sizes Available

Drive select



Kinetix 5700 Servo Drive
14 Sizes Available

Drive select



Kinetix 6000 Servo Drive
20 Sizes Available

Drive select



Kinetix 6200 Servo Drive
10 Sizes Available

Drive select



Kinetix 6500 Servo Drive
10 Sizes Available

Drive select



Kinetix 300 Servo Drive
12 Sizes Available

Drive select



Kinetix 350 Servo Drive
12 Sizes Available

Drive select



Kinetix 3 Servo Drive
7 Sizes Available

[VIEW 6 MORE](#)

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7. Expand the **Motor Control** heading and check the **Induction Volts/Hz Control** check box.

The screenshot shows the Rockwell Automation Motion Analyzer website. The top navigation bar includes the "Motion Analyzer" title, a user profile "TLSTONE@RA.ROCKWELL.COM", a "Notifications 43" badge, and the "Rockwell Automation" logo. Below this is a secondary navigation bar with "PRODUCTS", "LIBRARY", "TOOLS", and "SUPPORT" links, along with a search bar and a "Products" dropdown menu.

The main content area is titled "Drives" and features a "Selection Filters" sidebar on the left. The sidebar lists various filter categories with expandable arrows: "Commonly Used (6)", "Voltage & Phase (4)", "IP Ratings (4)", "Environment (3)", "Options (4)", "Certifications (15)", "Controller (4)", "Features (29)", "Motor Control (8)", "Interior Permanent Magnet Control", "Surface Mount Permanent Magnet Control", "Induction Volts/Hz Control", "Synchronous Reluctance Volts/Hz Control", "Induction Sensorless Vector Control", "Synchronous Reluctance Sensorless Vector Control", "Adjustable Voltage Control (for non-motor loads)", "Induction Flux Vector Control", "Network Support (14)", "Bus Configuration (4)", "Safety (3)", "I/O (14)", "Feedback (16)", and "Applications (1)".

An orange arrow labeled "1" points to the "Motor Control (8)" filter category, which is currently expanded. Within this expanded section, the "Induction Volts/Hz Control" checkbox is checked, indicated by an orange arrow labeled "2".

The main product display area, titled "ROCKWELL AUTOMATION", shows a grid of drive products. The visible products are: "Kinetix 5500 Servo Drive" (6 Sizes Available), "Kinetix 5700 Servo Drive" (14 Sizes Available), "PowerFlex 523" (33 Sizes Available), "PowerFlex 525" (38 Sizes Available), "PowerFlex 527" (38 Sizes Available), "PowerFlex 753" (205 Sizes Available), and "PowerFlex 755" (422 Sizes Available). Each product card includes a "Drive" label and a "select" button. A "VIEW LESS" link is located below the product grid.

At the bottom of the page, there is a footer with "Legal Notices - Privacy & Cookies Policy" and "© 2016 - Rockwell Automation, Inc. All Rights Reserved."

The list will narrow to the Kinetix 5500, Kinetix 5700, PowerFlex 520 and PowerFlex 750 drive families.

8. Let's compare a few features for two of these drives. Check the **Select** boxes for the Kinetix 5500 Servo Drive and the PowerFlex 527 drive and then click on the **Compare Selected Families** button.

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PRODUCTS LIBRARY TOOLS SUPPORT Enter keyword or product # Products

Home \ Products \ Drives

Drives

Selection Filters **clear**

- Commonly Used (6)
- Voltage & Phase (4)
- IP Ratings (4)
- Environment (3)
- Options (4)
- Certifications (15)
- Controller (4)
- Features (29)
- Motor Control (8)**
 - Interior Permanent Magnet Control
 - Surface Mount Permanent Magnet Control
 - Induction Volts/Hz Control ☒
 - Synchronous Reluctance Volts/Hz Control
 - Induction Sensorless Vector Control
 - Synchronous Reluctance Sensorless Vector Control
 - Adjustable Voltage Control (for non-motor loads)
 - Induction Flux Vector Control
- Network Support (14)
- Bus Configuration (4)
- Safety (3)
- I/O (14)
- Feedback (16)
- Applications (1)

ROCKWELL AUTOMATION

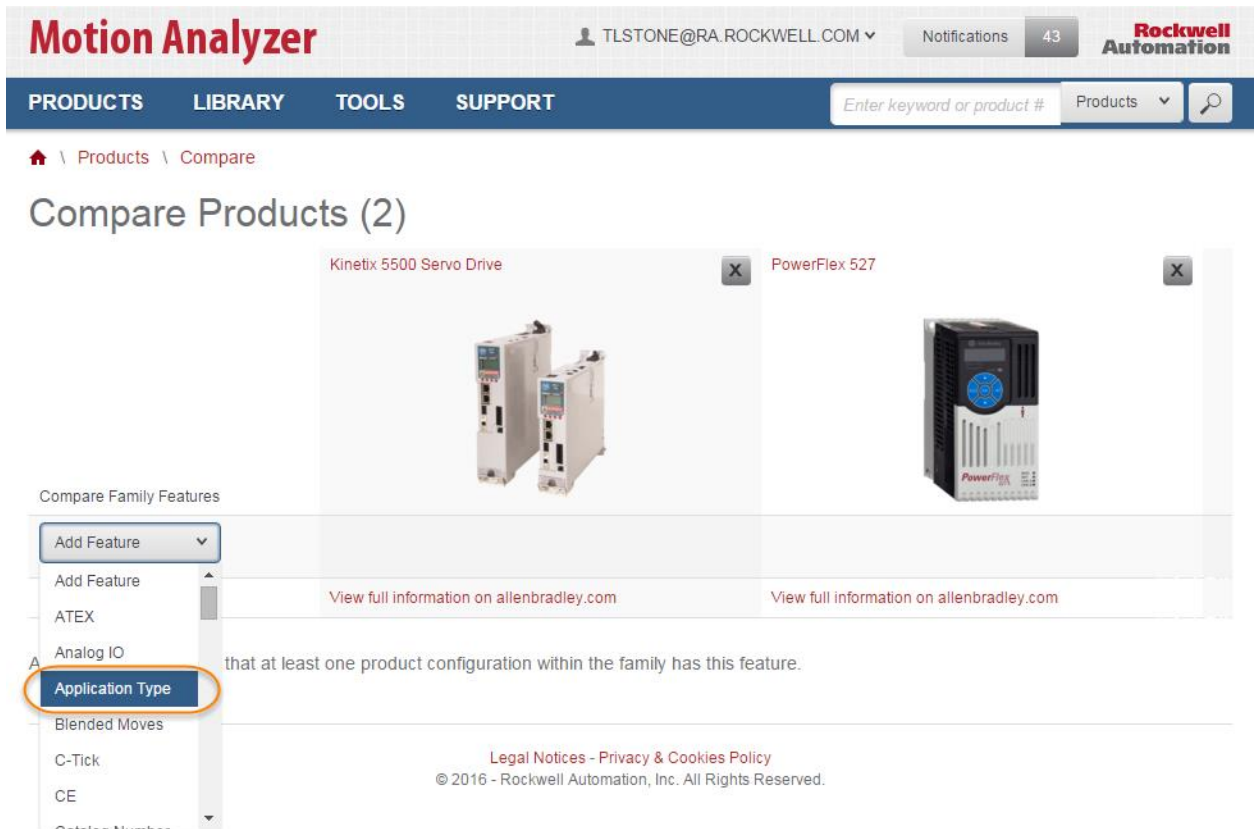
Drive	select	Drive	select	Drive	select	Drive	select
 Kinetix 5500 Servo Drive 6 Sizes Available	☒	 Kinetix 5700 Servo Drive 14 Sizes Available	☐	 PowerFlex 523 33 Sizes Available	☐	 PowerFlex 525 38 Sizes Available	☐
 PowerFlex 527 38 Sizes Available	☒	 PowerFlex 753 205 Sizes Available	☐	 PowerFlex 755 422 Sizes Available	☐		

[VIEW LESS](#)

Compare Selected Families (2)

9. When the Compare Products page appears, select the following features in the **Add Feature** drop down menu:

- Application Type
- Induction Flux Vector Control
- Surface Mount Permanent Magnet Control
- Hardwired Safe Torque Off
- Integrated Safe Torque Off



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PRODUCTS LIBRARY TOOLS SUPPORT Enter keyword or product # Products ▾ 🔍

🏠 \ Products \ Compare

Compare Products (2)

Kinetix 5500 Servo Drive



View full information on allenbradley.com

PowerFlex 527



View full information on allenbradley.com

Compare Family Features

Add Feature ▾

- Add Feature
- ATEX
- Analog IO
- Application Type**
- Blended Moves
- C-Tick
- CE
- Catalog Number

that at least one product configuration within the family has this feature.

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10. Here is the comparison of the selected features for the two drive families.

Motion Analyzer

[TLSTONE@RA.ROCKWELL.COM](#) [Notifications](#) [0](#)

Rockwell Automation

[PRODUCTS](#)
[LIBRARY](#)
[TOOLS](#)
[SUPPORT](#)
 Enter keyword or product #
 [Products](#)

[Home](#) \ [Products](#) \ [Compare](#)

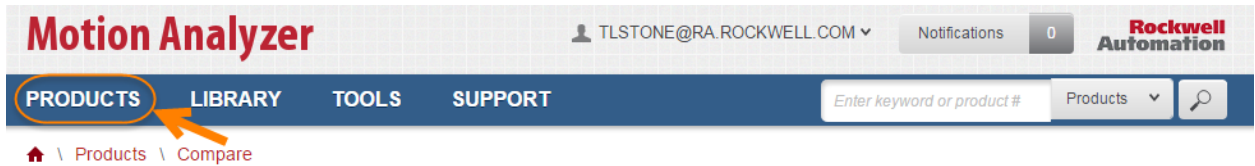
Compare Products (2)

	Kinetix 5500 Servo Drive	PowerFlex 527
Compare Family Features		
Application Type	Position Control, Torque Control, Velocity Control	Velocity Control
Induction Flux Vector Control	No	Yes
Surface Mount Permanent Magnet Control	Yes	No
Hardwired Safe Torque Off	Yes*	Yes
Integrated Safe Torque Off	Yes*	Yes
Add Feature		
More Information	View full information on allenbradley.com	View full information on allenbradley.com

An asterisk (*) indicates that at least one product configuration within the family has this feature.

Encompass Partners

1. Click on the **Products** navigation tab again.



2. Click on the **Browse Gearboxes** button.



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3. The Gearboxes page will appear.

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PRODUCTS LIBRARY TOOLS SUPPORT Enter keyword or product # Products

Products Gearboxes

Gearboxes

STOBER DRIVES

Compare Selected Families (0)

Gearbox select	Gearbox select	Gearbox select	Gearbox select
 C-Series 792 Sizes Available	 F-Series 227 Sizes Available	 KL-Series 8 Sizes Available	 K-Series 686 Sizes Available
 KS-Series 84 Sizes Available	 KSS-Series 93 Sizes Available	 PA-Series 171 Sizes Available	 PE-Series 297 Sizes Available

VIEW 12 MORE

NIDEC-SHIMPO

Compare Selected Families (0)

Gearbox select	Gearbox select	Gearbox select	Gearbox select
 EJ Right-angle Worm 6528 Sizes Available	 EV Right-angle Planetary 2302 Sizes Available	 ST Rotary and Indexing 331 Sizes Available	 VR Inline Planetary 3011 Sizes Available

WITTENSTEIN ALPHA

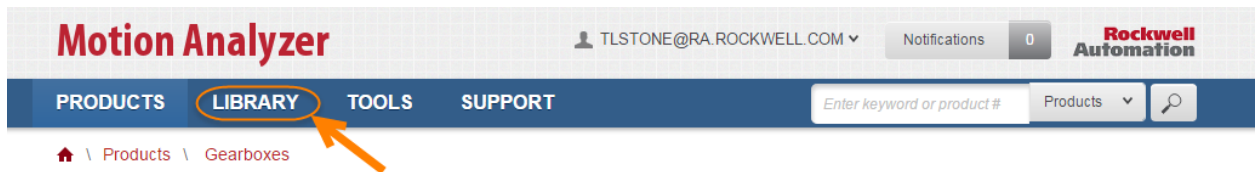
Compare Selected Families (0)

Gearbox select	Gearbox select	Gearbox select	Gearbox select
 BEVEL RIGHT-ANGLE 78 Sizes Available	 HYPOID RIGHT-ANGLE 1085 Sizes Available	 PLANETARY IN-LINE 1102 Sizes Available	 WORM RIGHT-ANGLE 110 Sizes Available

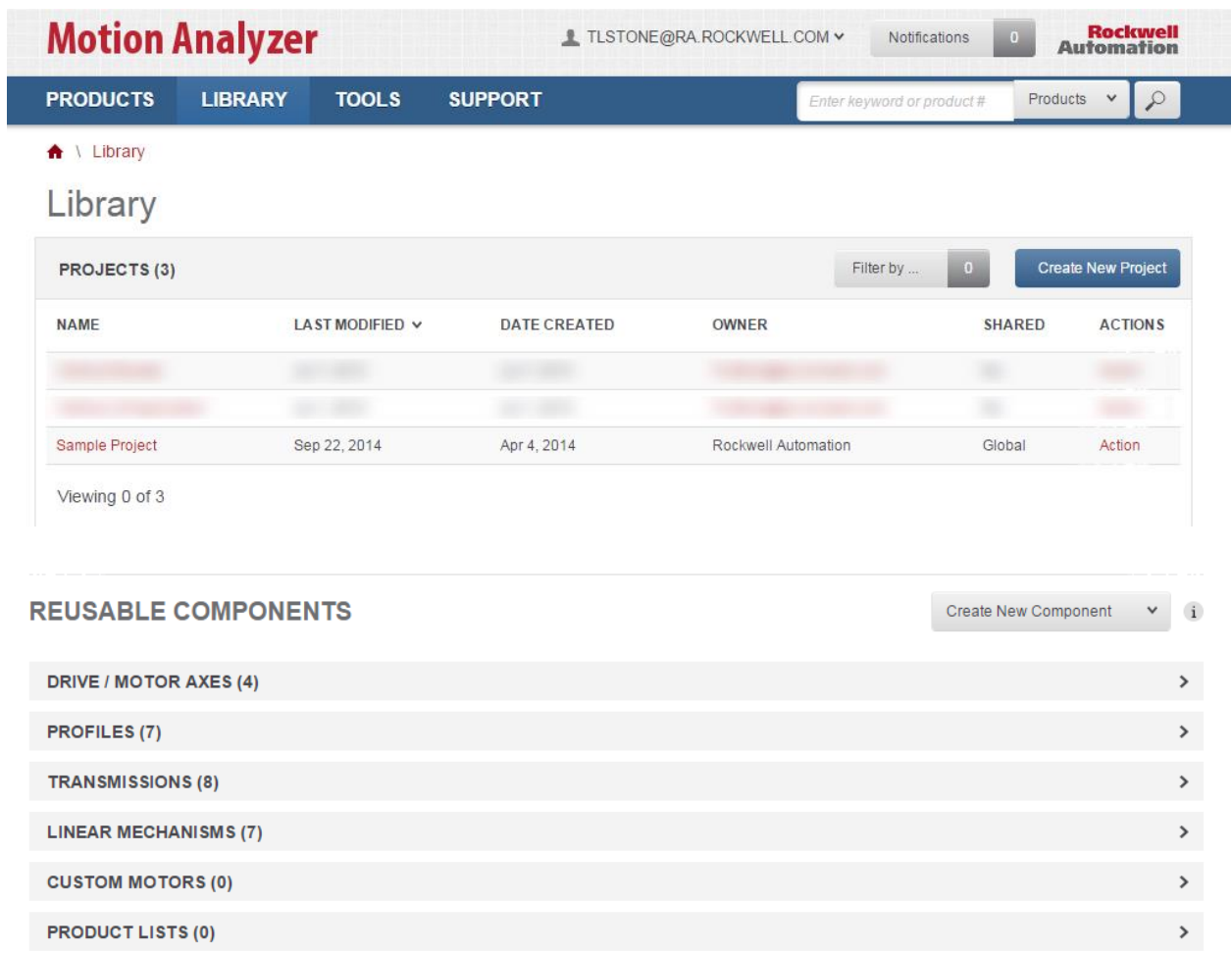
Here you can see there are a number of Encompass Partners and their product offerings.

Library Navigation Tab

1. Click on the **Library** navigation tab on the toolbar at the top of the page.



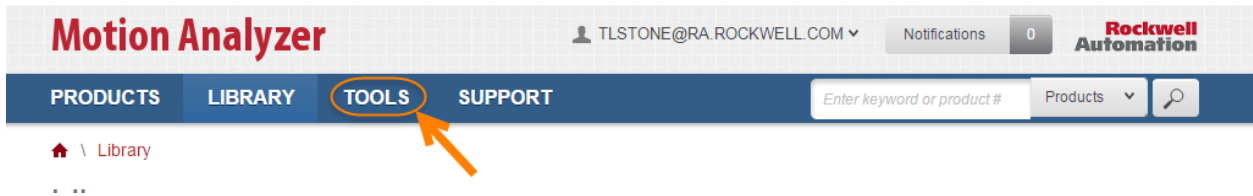
2. The Library page will appear.



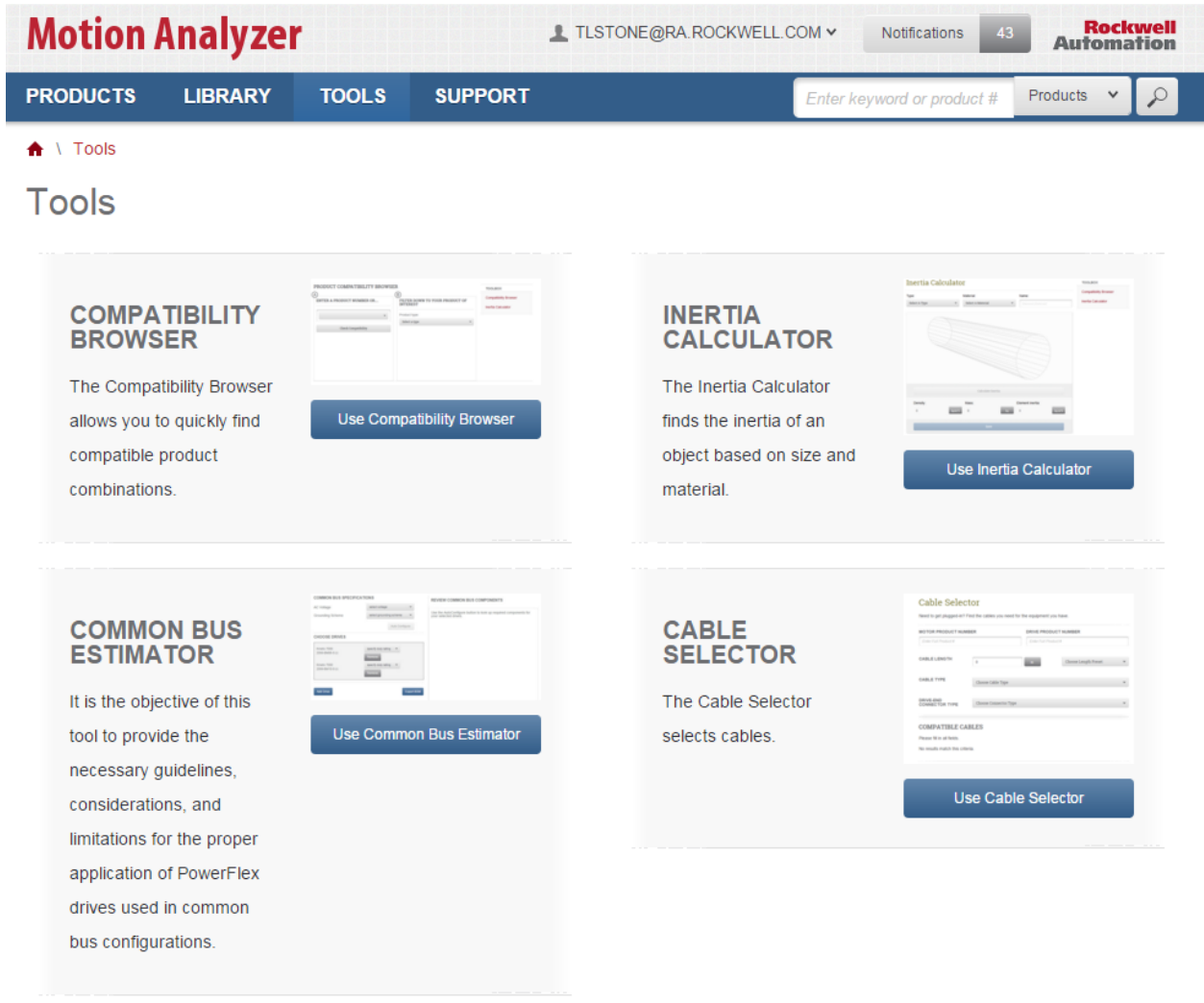
This is where you can access your Projects and Reusable Components. As you create application components, such as Axes, Profiles, and Transmissions, you can save them and reuse them in other Projects.

Tools Navigation Tab

1. Click on the **Tools** navigation tab on the toolbar at the top of the page.



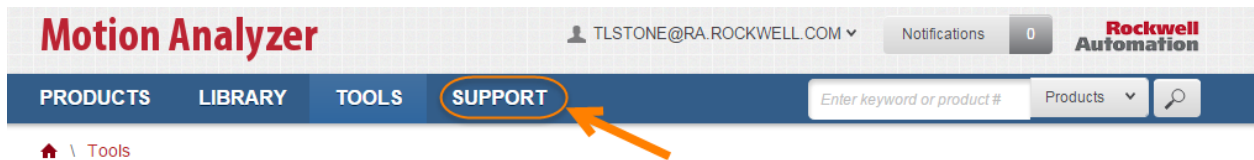
2. The Tools page will appear.



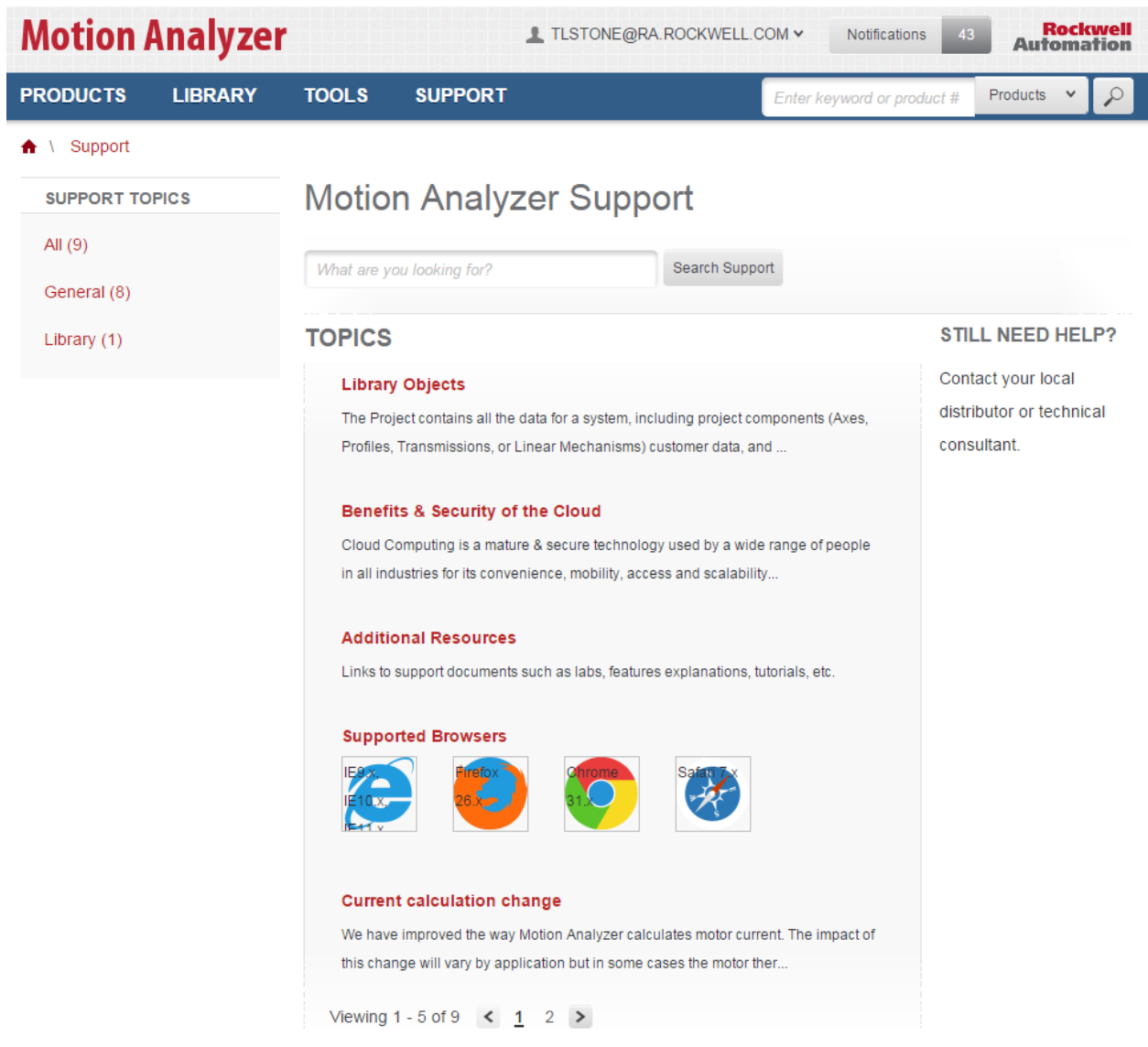
The Tools page can be used to quickly access the Compatibility Browser, Inertia Calculator, Common Bus Estimator, and Cable Selector tools. We will use the Inertia Calculator later in this lab.

Support Navigation Tab

1. Click on the **Support** navigation tab on the toolbar at the top of the page.



2. The Support page will appear.



The Support page is where you can go to find additional information on how to use Motion Analyzer. If you are not able to find the information you are looking for, you can find support contact information in the **Still Need Help** section of the page.

3. Click on the **Library Objects** topic.

The screenshot shows the 'Motion Analyzer Support' web page. At the top, there is a header with the 'Motion Analyzer' logo, a user profile 'TLSTONE@RA.ROCKWELL.COM', a 'Notifications' button with a '0' count, and the 'Rockwell Automation' logo. Below this is a navigation bar with 'PRODUCTS', 'LIBRARY', 'TOOLS', and 'SUPPORT' tabs. A search bar is also present. On the left, a 'SUPPORT TOPICS' sidebar lists 'All (9)', 'General (8)', and 'Library (1)'. The main content area is titled 'Motion Analyzer Support' and includes a search bar with the placeholder 'What are you looking for?'. Under the 'TOPICS' section, 'Library Objects' is highlighted with a red circle and an orange arrow. Below it, there are sections for 'Benefits & Security of the Cloud', 'Additional Resources', 'Supported Browsers' (showing icons for IE9.x, IE10.x, IE11.x, Firefox 26.x, Chrome 31.x, and Safari 7.x), and 'Current calculation change'. On the right, a 'STILL NEED HELP?' section suggests contacting a local distributor or technical consultant. At the bottom, there is a footer with 'Legal Notices - Privacy & Cookies Policy' and '© 2016 - Rockwell Automation, Inc. All Rights Reserved.'.

Motion Analyzer TLSTONE@RA.ROCKWELL.COM Notifications 0 **Rockwell Automation**

PRODUCTS LIBRARY TOOLS SUPPORT Enter keyword or product # Products

Support 0

SUPPORT TOPICS

- All (9)
- General (8)
- Library (1)

Motion Analyzer Support

What are you looking for? Search Support

TOPICS

Library Objects

The Project contains all the data for a system, including project components (Axes, Profiles, Transmissions, or Linear Mechanisms) customer data, and ...

Benefits & Security of the Cloud

Cloud Computing is a mature & secure technology used by a wide range of people in all industries for its convenience, mobility, access and scalability...

Additional Resources

Links to support documents such as labs, features explanations, tutorials, etc.

Supported Browsers

IE9.x, IE10.x, IE11.x, Firefox 26.x, Chrome 31.x, Safari 7.x

Current calculation change

We have improved the way Motion Analyzer calculates motor current. The impact of this change will vary by application but in some cases the motor ther...

Viewing 1 - 5 of 9 < 1 2 >

STILL NEED HELP?

Contact your local distributor or technical consultant.

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4. The Library Objects page will appear.

Motion Analyzer TLSTONE@RA.ROCKWELL.COM Notifications 43 **Rockwell Automation**

PRODUCTS LIBRARY TOOLS SUPPORT Enter keyword or product # Products

Support

SUPPORT TOPICS

- All (9)
- General (8)
- Library (1)

Motion Analyzer Support

What are you looking for? Search Support

LIBRARY OBJECTS

The Project contains all the data for a system, including project components (Axes, Profiles, Transmissions, or Linear Mechanisms) customer data, and the bill of materials. There are no restrictions to the number of axes in a project.

Project Axis Profile Transmission Linear Mechanism Custom Motor ProductList

There are five sections of the project:

- Summary**
Contains basic information and a list of available actions
- Components Detail**
Provides detailed information on the list of components in the project. Bus Sharing between compatible drives can also be configured on this page.
- Power Analysis**
Detailed power analysis and shunt and power supply selection for the different axes and shared bus systems.
- Customer/Site**
Project information including customer contact and project industry and application. Project Altitude and ambient temperature can also be configured here.
- Selected Products**
A bill of material for all products selected in the product. Products can be viewed on an axis by axis basis or by product type. Accessories for products can also be added. The bill of material can be exported to excel.

Projects and project components can all be shared with other users. If a project is shared with another user they have access to the entire project. However, a single component can be shared with another user without giving them access to the rest of the project. User access rights can be restricted to read/write, read/copy, or read only. Read/copy allows for users to duplicate a copy of the project to their library, but not make edits to the original.

This page has multiple tabs with information on the different types of library objects. The **Project** tab is displayed by default. The Support page will continue to be populated as the content is developed.

5. Click on Additional Resources

Motion Analyzer

TLSTONE@RA.ROCKWELL.COM

Notifications0

Rockwell Automation

PRODUCTSLIBRARYTOOLSSUPPORT

Enter keyword or product #

Products

Support0

SUPPORT TOPICS

All (9)
General (8)
Library (1)

Motion Analyzer Support

What are you looking for?

Search Support

TOPICS

Library Objects

The Project contains all the data for a system, including project components (Axes, Profiles, Transmissions, or Linear Mechanisms) customer data, and ...

Benefits & Security of the Cloud

Cloud Computing is a mature & secure technology used by a wide range of people in all industries for its convenience, mobility, access and scalability...

Additional Resources

Links to support documents such as labs, features explanations, tutorials, etc.

Supported Browsers

IE9.x
IE10.x
IE11.x

Firefox 26.x

Chrome 31.x

Safari 7.x

Current calculation change

We have improved the way Motion Analyzer calculates motor current. The impact of this change will vary by application but in some cases the motor ther...

STILL NEED HELP?

Contact your local distributor or technical consultant.

Viewing 1 - 5 of 9<12>

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6. The Additional Resources page will appear.

Motion Analyzer TLSTONE@RA.ROCKWELL.COM Notifications 43 Rockwell Automation

PRODUCTS LIBRARY TOOLS SUPPORT Enter keyword or product # Products

Support

SUPPORT TOPICS

- All (9)
- General (8)
- Library (1)

Motion Analyzer Support

What are you looking for? Search Support

ADDITIONAL RESOURCES

Links to support documents such as labs, features explanations, tutorials, etc.

FULL INTRODUCTORY LAB
Introductory Lab - Build and Size and Axis

AXIS SIZING BASICS
Creating a Blank Axis and Axis Types
Building a Profile
Defining a Linear Mechanism
Defining a Transmission
Selecting a Motor and Drive

ADDITIONAL FEATURES
Share Projects, Axes and Components with other Users
Changing Language Settings
How to use Snapshots
Save Data to your Computer with an XML file

IMPORT DATA FROM MOTION ANALYZER 7.2 OPTIONS
Import data from Motion Analyzer 7.2 Method 1: Cam Profile
Import Data from Motion Analyzer 7.2 Method 2: Velocity Profile
Import Data from Motion Analyzer 7.2 Method 3: User Defined Profile
Import Data from Motion Analyzer 7.2 Method 4: Super Review

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The Additional Resources page is comprised of support documents such as tutorials, labs, etc. to help guide the user through different sections of Motion Analyzer.

7. When you are finished browsing, click on the **Home** button at the top of the page to return to the Home page.

Motion Analyzer TLSTONE@RA.ROCKWELL.COM Notifications 0 Rockwell Automation

PRODUCTS LIBRARY TOOLS SUPPORT Enter keyword or product # Products

Support

Reviewing a Completed Project

Now that you have become familiar with how to navigate through the website, let's take a look at the components of a completed Project.

1. In the Start Building section of the Home page, click the **View Current Projects** button.

Motion Analyzer TLSTONE@RA.ROCKWELL.COM ▾ Notifications 43 **Rockwell Automation**

PRODUCTS LIBRARY TOOLS SUPPORT Enter keyword or product # Products ▾ 🔍

Learn. Select. Size.
Find the solution for your application from Rockwell Automation and our PartnerNetwork.
New to Motion Analyzer? Click [here](#) for an introductory lab

START BUILDING
Ready to start building, sizing and selecting?
Click here to start a new project to size your application.

Start A New Project View Current Projects

BROWSE PRODUCT
Fast access to detailed information and product comparisons to help select the products you need.

Keyword or product number ... 🔍

All Products Drives Motors Linear Actuators Gearboxes Linear Mechanisms ITRAK

LATEST NEWS
[Thermal model change](#)
[Unit defaults selection](#)
[Current calculation change](#)
[Stober gearbox update](#)
[October Quarterly update](#)

LINKS
[Allen Bradley](#)
[Rockwell Automation](#)
[Literature](#)

NOTIFICATIONS
[Library Item Modified](#)
[Library Item Modified](#)
[Library Item Shared](#)
[Library Item Shared](#)
[Library Item Modified](#)
[See all notifications](#)

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2. The Library page will appear. Click on the **Sample Project**.

Motion Analyzer

Notifications 0

Rockwell Automation

PRODUCTS LIBRARY TOOLS SUPPORT

Enter keyword or product # Products

Library

Library

PROJECTS (2) Filter by ... 0 Create New Project

NAME	LAST MODIFIED	DATE CREATED	OWNER	SHARED	ACTIONS
Vertical Lift Application	Jan 4, 2016	Nov 17, 2014	Rockwell Automation	Global	Action
Sample Project	Sep 22, 2014	Apr 4, 2014	Rockwell Automation	Global	Action

Viewing 0 of 2

REUSABLE COMPONENTS

Create New Component

DRIVE / MOTOR AXES (2)

PROFILES (2)

TRANSMISSIONS (2)

LINEAR MECHANISMS (1)

CUSTOM MOTORS (0)

PRODUCT LISTS (0)

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Note: This is a Global Sample project that has been shared with all of the lab user accounts for demonstration purposes. For this reason, you will not be able to modify the objects within the project. You will be creating a new project in the next section of the lab.

3. The Project Detail page will appear.

The screenshot shows the 'Motion Analyzer' web application interface. At the top, there's a header with the 'Rockwell Automation' logo and a 'Notifications' button showing '0'. Below this is a navigation bar with 'PRODUCTS', 'LIBRARY', 'TOOLS', and 'SUPPORT' tabs. A search bar is present with the placeholder 'Enter keyword or product #'. The main content area shows the breadcrumb 'Library > Sample Project'. The project title 'Sample Project' is displayed, along with a 'READ ONLY' status and buttons for 'CREATE A SNAPSHOT' and 'RESTORE FROM SNAPSHOT'. Below the title, there are links for 'DUPLICATE', 'DELETE', and 'EXPORT AS XML'. A tabbed interface shows 'Summary', 'Component Detail' (selected), 'Power Analysis', 'Customer/Site', and 'Selected Products'. The 'Component Detail' tab displays 'Sample Project Components' as a list of two axes: 'Axis: Winder Axis' and 'Axis: Box Pusher Axis'. Each axis entry includes a diagram, a 'View' button, and a 'Delete' button. On the right side, there's a sidebar with 'AXES (2)' and 'PROJECT ACTIONS' (Create New Axis & Profile, Create New Blank Axis, Import Axis). At the bottom, there's a footer with 'Legal Notices - Privacy & Cookies Policy' and '© 2016 - Rockwell Automation, Inc. All Rights Reserved.'

There are several tabs for viewing different aspects of your project. Let's take a moment to examine the information contained in the various tabs.

Component Detail Tab

1. The Component detail tab appears as default when you open an existing project. In the center of the page you will see a list of the Project Components. This particular application contains two axes.

The screenshot displays the Rockwell Automation Motion Analyzer web application. At the top, the 'Motion Analyzer' title is in red. A navigation bar includes 'PRODUCTS', 'LIBRARY', 'TOOLS', and 'SUPPORT'. A search bar prompts 'Enter keyword or product #' and a 'Products' dropdown is visible. A notification badge shows '0'. The breadcrumb path is 'Home > Library > Sample Project'. The main header area for 'Sample Project' includes a 'READ ONLY' lock icon, a 'CREATE A SNAPSHOT' button, and a 'RESTORE FROM SNAPSHOT' button. Below this, there are buttons for 'DUPLICATE', 'DELETE', and 'EXPORT AS XML'. A tabbed interface shows 'Summary', 'Component Detail' (selected), 'Power Analysis', 'Customer/Site', and 'Selected Products'. An orange arrow points to the 'Component Detail' tab. The 'Sample Project Components' section lists two axes: 'Axis: Winder Axis' and 'Axis: Box Pusher Axis'. Each axis entry includes a diagram of the mechanical setup and 'View' and 'Delete' buttons. On the right, the 'AXES (2)' section contains a 'PROJECT ACTIONS' panel with buttons for 'Create New Axis & Profile', 'Create New Blank Axis', and 'Import Axis'. At the bottom, there is a footer with 'Legal Notices - Privacy & Cookies Policy' and '© 2016 - Rockwell Automation, Inc. All Rights Reserved.'

- Expand the **Box Pusher Axis** by clicking the carrot next to the axis name.

Motion Analyzer

Notifications 0 **Rockwell Automation**

PRODUCTS LIBRARY TOOLS SUPPORT Enter keyword or product # Products

Library \ Sample Project

Sample Project

READ ONLY

CREATE A SNAPSHOT

RESTORE FROM SNAPSHOT

Duplicate DELETE EXPORT AS XML

Summary **Component Detail** Power Analysis Customer/Site Selected Products

Sample Project Components

Axis: Winder Axis View Delete

Axis: Box Pusher Axis View Delete

AXES (2)

PROJECT ACTIONS

Create New Axis & Profile

Create New Blank Axis

Import Axis

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3. You can now see that the box pusher axis contains a load and motion profile, a motor and a drive but does not have a Linear Mechanism. These components can be modified by clicking on the Edit buttons.

The screenshot shows the Rockwell Automation Motion Analyzer web application. The top navigation bar includes 'PRODUCTS', 'LIBRARY', 'TOOLS', and 'SUPPORT'. Below this, a breadcrumb trail shows 'Library > Sample Project'. The main content area is titled 'Sample Project' and includes a 'READ ONLY' status, a 'CREATE A SNAPSHOT' button, and a 'RESTORE FROM SNAPSHOT' button. A tabbed interface shows 'Summary', 'Component Detail' (selected), 'Power Analysis', 'Customer/Site', and 'Selected Products'. The 'Component Detail' tab displays 'Sample Project Components' with two axes: 'Winder Axis' and 'Box Pusher Axis'. The 'Box Pusher Axis' is expanded, showing its components: 'Load/Profile: Box Pusher Profile | Linear Profile', 'Linear Mechanism: None Selected', 'Motor: MPL-B320P-xxxxxx', and 'Drive: 2094-BC01-MP5-M'. On the right side, the 'PROJECT ACTIONS' panel is visible, containing buttons for 'Create New Axis & Profile', 'Create New Blank Axis', and 'Import Axis'.

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Along the right side of the page there are buttons for Project Actions. The Project Actions buttons can be used to create or import an axis or motion profile.

Summary Tab

1. Click on the **Summary** tab of the Project Detail page.

The screenshot displays the Rockwell Automation Motion Analyzer web application. At the top, the header includes the 'Motion Analyzer' title, a user profile, a 'Notifications' badge with the number '0', and the 'Rockwell Automation' logo. Below the header is a navigation bar with tabs for 'PRODUCTS', 'LIBRARY', 'TOOLS', and 'SUPPORT'. A search bar is located to the right of these tabs, with the placeholder text 'Enter keyword or product #'. A dropdown menu for 'Products' and a search icon are also present.

The main content area shows the breadcrumb path 'Home \ Library \ Sample Project'. The project title 'Sample Project' is displayed, along with a 'READ ONLY' status indicator. Below the title, there is a description 'This is a sample project.' and three action buttons: 'DUPLICATE', 'DELETE', and 'EXPORT AS XML'. To the right, there are two more buttons: 'CREATE A SNAPSHOT' and 'RESTORE FROM SNAPSHOT'.

The 'Summary' tab is highlighted with an orange circle and an arrow. Other tabs in the sequence include 'Component Detail', 'Power Analysis', 'Customer/Site', and 'Selected Products'. Below the tabs, the section 'Sample Project Components' is visible. It contains two expandable components: 'Axis: Winder Axis' and 'Axis: Box Pusher Axis'. The 'Box Pusher Axis' is expanded, showing its details: 'Load/Profile: Box Pusher Profile | Linear Profile', 'Linear Mechanism: None Selected', 'Motor: MPL-B320P-xxxxxx', and 'Drive: 2094-BC01-MP5-M'. Each component has 'View' and 'Delete' buttons.

On the right side of the interface, there is a sidebar with the heading 'AXES (2)' and a section titled 'PROJECT ACTIONS'. This section contains three buttons: 'Create New Axis & Profile', 'Create New Blank Axis', and 'Import Axis'.

2. The Summary tab provides a quick overview of information in your project such as the number and type of products you have selected.

In the Action Items section, you can see a list of tasks which have not yet been completed, such as selecting a shunt or power supply or create a BOM.

In the New & Changed In This Project section, you can see a list of the changes that have been made to the project as well as details about those changes.

The screenshot displays the Motion Analyzer web application interface. At the top, the header includes the user email 'TLSTONE@RA.ROCKWELL.COM', a notifications bell with '0', and the Rockwell Automation logo. A navigation bar contains 'PRODUCTS', 'LIBRARY', 'TOOLS', and 'SUPPORT' tabs, along with a search bar and a 'Products' dropdown. The main content area is titled 'Sample Project' and includes a 'READ ONLY' status, a 'CREATE A SNAPSHOT' button, and a 'RESTORE FROM SNAPSHOT' button. Below this, a tabbed interface shows the 'Summary' tab selected, with other tabs for 'Component Detail', 'Power Analysis', 'Customer/Site', and 'Selected Products'. The 'Summary' tab is divided into three main sections: 'COMPONENTS', 'CONTROLLER', and 'PRODUCTS'. The 'COMPONENTS' section lists 'Winder Axis' and 'Box Pusher Axis' with icons and 'edit' buttons. The 'CONTROLLER' section has a 'Choose controller type' dropdown. The 'PRODUCTS' section shows a table of selected products: Drives (2), Cables (0), Motors (2), Gearboxes (2), and Accessories (0). To the right of the 'COMPONENTS' section is the 'ACTION ITEMS' section, which lists seven tasks: 'Create blank Axis', 'Create an Axis - Specify Load & Profile', 'Winder Axis — Set Shunt & Search', 'Winder Axis — Set Power Supply & Search', and 'Assemble and Export a Bill of Materials'. Below the 'ACTION ITEMS' section is the 'NEW & CHANGED IN THIS PROJECT' section, which lists five items: 'Made Global Project' (Jan 12, 2015 12:45:38 PM), 'Made Private Project' (Jan 12, 2015 11:28:59 AM), 'Made Global Project' (Sep 22, 2014 4:34:46 PM), 'Updated Project' (Sep 22, 2014 4:34:08 PM), and 'Updated Project' (Sep 22, 2014 4:34:04 PM). The footer contains 'Legal Notices - Privacy & Cookies Policy' and '© 2015 - Rockwell Automation, Inc. All Rights Reserved.'

Motion Analyzer

TLSTONE@RA.ROCKWELL.COM ▾ Notifications 0 **Rockwell Automation**

PRODUCTS LIBRARY TOOLS SUPPORT Enter keyword or product # Products ▾ 🔍

🏠 \ Library \ Sample Project

Sample Project

This is a sample project.

READ ONLY

CREATE A SNAPSHOT

RESTORE FROM SNAPSHOT

DUPLICATE DELETE EXPORT AS XML

Summary Component Detail Power Analysis Customer/Site Selected Products

COMPONENTS View All Components (2)

Winder Axis  edit

Box Pusher Axis  edit

CONTROLLER Choose controller type ▾

PRODUCTS View Selected Products

Drives 2

Cables 0

Motors 2

Gearboxes 2

Accessories 0

ACTION ITEMS [7] Actions Available

Create blank Axis

Create an Axis - Specify Load & Profile

Winder Axis — Set Shunt & Search

Winder Axis — Set Power Supply & Search

Assemble and Export a Bill of Materials

NEW & CHANGED IN THIS PROJECT [5] Items

mdlennard@ra.rockwell.com **Made Global Project** Jan 12, 2015 12:45:38 PM

mdlennard@ra.rockwell.com **Made Private Project** Jan 12, 2015 11:28:59 AM

mdlennard@ra.rockwell.com **Made Global Project** Sep 22, 2014 4:34:46 PM

mdlennard@ra.rockwell.com **Updated Project** Sep 22, 2014 4:34:08 PM

mdlennard@ra.rockwell.com **Updated Project** Sep 22, 2014 4:34:04 PM

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Power Analysis Tab

1. Click on the **Power Analysis** tab of the Project Detail page.

The screenshot displays the Motion Analyzer web application interface. At the top, the header includes the "Motion Analyzer" logo, a user profile for "TLSTONE@RA.ROCKWELL.COM", a notification bell with "0" alerts, and the "Rockwell Automation" logo. Below the header is a navigation bar with tabs for "PRODUCTS", "LIBRARY", "TOOLS", and "SUPPORT". A search bar is located to the right of these tabs. The main content area shows the "Sample Project" details, including a "READ ONLY" status, a "CREATE A SNAPSHOT" button, and a "RESTORE FROM SNAPSHOT" button. Below this, there are buttons for "DUPLICATE", "DELETE", and "EXPORT AS XML". The "Power Analysis" tab is highlighted with an orange circle and an arrow pointing to it. The tab bar also includes "Summary", "Component Detail", "Customer/Site", and "Selected Products". The "Power Analysis" section is divided into three main areas: "COMPONENTS", "CONTROLLER", and "PRODUCTS". The "COMPONENTS" section shows a list of components: "Winder Axis" and "Box Pusher Axis", each with a "View All Components (2)" button and an "edit" button. The "CONTROLLER" section has a "Choose controller type" dropdown menu. The "PRODUCTS" section has a "View Selected Products" button. The "ACTION ITEMS" section on the right lists seven actions: "Create blank Axis", "Create an Axis - Specify Load & Profile", "Winder Axis — Set Shunt & Search", "Winder Axis — Set Power Supply & Search", and "Assemble and Export a Bill of Materials". The "NEW & CHANGED IN THIS PROJECT" section on the right lists five items, each with a user email and a timestamp. At the bottom, there is a footer with "Legal Notices - Privacy & Cookies Policy" and "© 2015 - Rockwell Automation, Inc. All Rights Reserved."

Motion Analyzer TLSTONE@RA.ROCKWELL.COM Notifications 0 Rockwell Automation

PRODUCTS LIBRARY TOOLS SUPPORT Enter keyword or product # Products

Library \ Sample Project

Sample Project

This is a sample project.

READ ONLY

CREATE A SNAPSHOT

RESTORE FROM SNAPSHOT

DUPLICATE DELETE EXPORT AS XML

Summary Component Detail **Power Analysis** Customer/Site Selected Products

COMPONENTS View All Components (2)

Winder Axis edit

Box Pusher Axis edit

CONTROLLER Choose controller type

PRODUCTS View Selected Products

Drives 2

Cables 0

Motors 2

Gearboxes 2

Accessories 0

ACTION ITEMS [7] Actions Available

Create blank Axis

Create an Axis - Specify Load & Profile

Winder Axis — Set Shunt & Search

Winder Axis — Set Power Supply & Search

Assemble and Export a Bill of Materials

NEW & CHANGED IN THIS PROJECT [5] Items

mdlennard@ra.rockwell.com Made Global Project Jan 12, 2015 12:45:38 PM

mdlennard@ra.rockwell.com Made Private Project Jan 12, 2015 11:28:59 AM

mdlennard@ra.rockwell.com Made Global Project Sep 22, 2014 4:34:46 PM

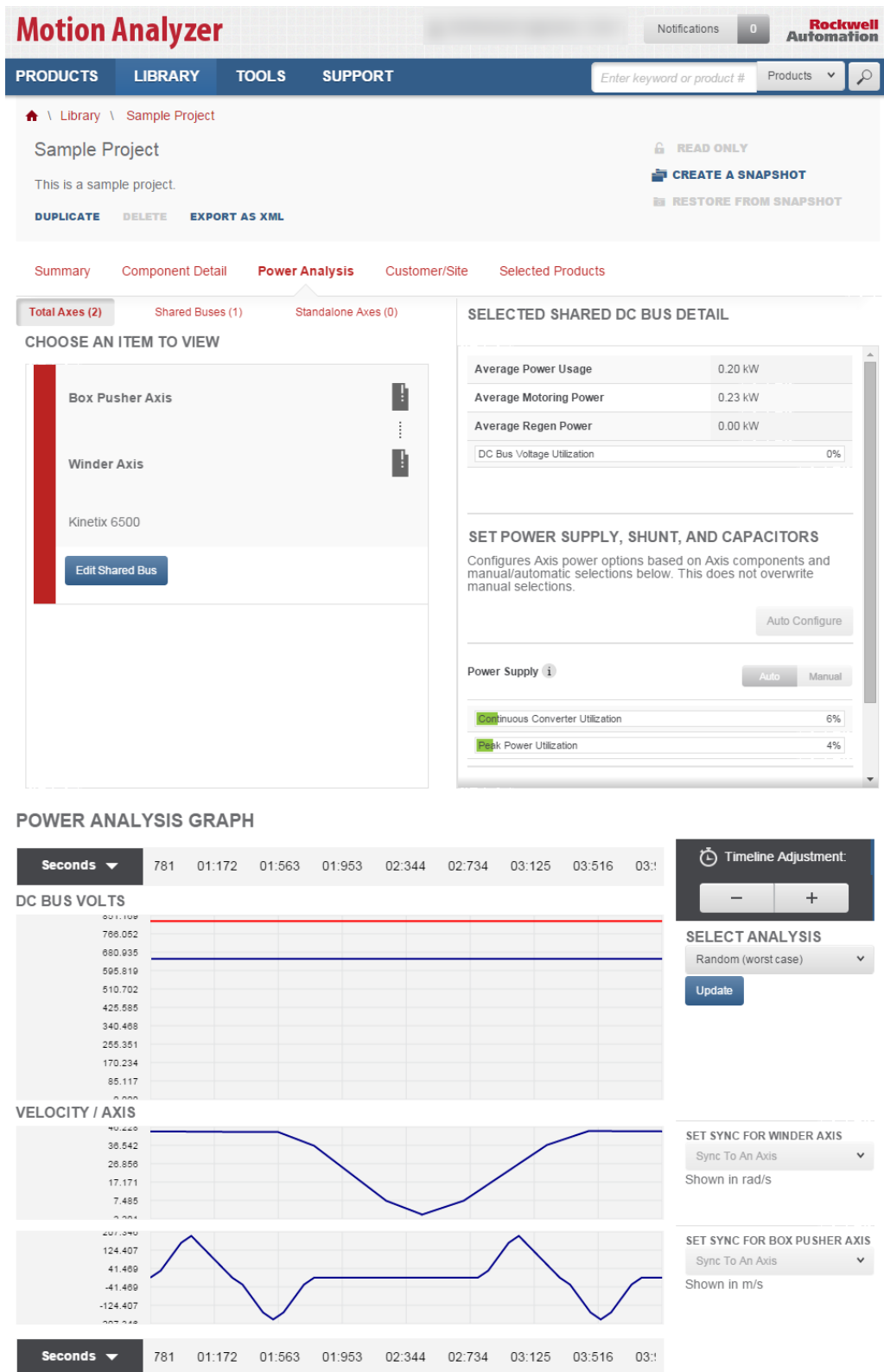
mdlennard@ra.rockwell.com Updated Project Sep 22, 2014 4:34:08 PM

mdlennard@ra.rockwell.com Updated Project Sep 22, 2014 4:34:04 PM

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2. The Power Analysis tab is where you go to see the power utilization for your application. If your application requires them, you can add capacitor modules, shunts and power supplies here. Also shown is a power analysis graph.



Customer/Site Tab

1. Click on the **Customer/Site** tab of the Project Detail page.

The screenshot displays the Rockwell Automation Motion Analyzer web application. At the top, the header includes the user email 'TLSTONE@RA.ROCKWELL.COM', a notification bell with '0', and the Rockwell Automation logo. Below this is a navigation bar with 'PRODUCTS', 'LIBRARY', 'TOOLS', and 'SUPPORT' tabs, along with a search bar. The main content area shows the 'Sample Project' details, including a 'READ ONLY' status, a 'CREATE A SNAPSHOT' button, and a 'RESTORE FROM SNAPSHOT' button. A sub-navigation bar contains 'Summary', 'Component Detail', 'Power Analysis', 'Customer/Site' (highlighted with an orange circle and an orange arrow), and 'Selected Products'. Below this, there are tabs for 'Total Axes (2)', 'Shared Buses (1)', and 'Standalone Axes (0)'. The 'Total Axes (2)' tab is active, showing a 'CHOOSE AN ITEM TO VIEW' section. The 'Selected Products' tab is also visible, showing a 'SELECTED SHARED DC BUS DETAIL' section.

2. The Customer/Site tab is where you update customer, industry and site information.

Motion Analyzer

TLSTONE@RA.ROCKWELL.COM ▾

Notifications0

Rockwell Automation

PRODUCTSLIBRARYTOOLSUPPORT

Enter keyword or product #Products ▾

LibrarySample Project

Sample Project

This is a sample project.

DUPLICATE

DELETE

EXPORT AS XML

READ ONLY

CREATE A SNAPSHOT

RESTORE FROM SNAPSHOT

SummaryComponent DetailPower AnalysisCustomer/SiteSelected Products

CUSTOMER INFORMATION

Client

John Doe

Contact

Doe Machines

E-mail

John@Doe.com

Phone

5555555555

USE

Industry

Enter an Industry Tag

Add

Packaging

X

Application

Enter an Application Tag

Add

Flow Wrapper

X

Candy Bars

X

SITE

Altitude (above sealevel)

0

m

Ambient Temp.

40

C

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Revision D

Page 42 of 113

2/8/2016

Selected Products Tab

1. Click on the **Selected Products** tab of the Project Detail page.

The screenshot displays the Rockwell Automation Motion Analyzer web application. At the top, the header includes the user 'TLSTONE@RA.ROCKWELL.COM', a notification count of 0, and the Rockwell Automation logo. Below this is a navigation bar with tabs for PRODUCTS, LIBRARY, TOOLS, and SUPPORT. A search bar is located to the right of the navigation bar. The main content area shows the 'Sample Project' details, including a 'READ ONLY' status, a 'CREATE A SNAPSHOT' button, and a 'RESTORE FROM SNAPSHOT' button. Below the project details are three tabs: Summary, Component Detail, and Power Analysis. The 'Customer/Site' tab is selected, and the 'Selected Products' sub-tab is highlighted with an orange arrow. The 'Customer/Site' tab contains two sections: 'CUSTOMER INFORMATION' and 'SITE'. The 'CUSTOMER INFORMATION' section includes fields for Client (John Doe), Contact (Doe Machines), E-mail (John@Doe.com), and Phone (5555555555). The 'USE' section includes fields for Industry (Packaging) and Application (Flow Wrapper, Candy Bars). The 'SITE' section includes fields for Altitude (0 m) and Ambient Temp. (40 C). At the bottom of the page, there is a footer with legal notices and copyright information.

Motion Analyzer TLSTONE@RA.ROCKWELL.COM Notifications 0 **Rockwell Automation**

PRODUCTS LIBRARY TOOLS SUPPORT Enter keyword or product # Products

Library \ Sample Project

Sample Project

This is a sample project.

READ ONLY

CREATE A SNAPSHOT

RESTORE FROM SNAPSHOT

DUPLICATE DELETE EXPORT AS XML

Summary Component Detail Power Analysis **Customer/Site** **Selected Products**

CUSTOMER INFORMATION

Client John Doe

Contact Doe Machines

E-mail John@Doe.com

Phone 5555555555

USE

Industry Enter an Industry Tag Add

Packaging X

Application Enter an Application Tag Add

Flow Wrapper X Candy Bars X

SITE

Altitude (above sealevel) 0 m

Ambient Temp. 40 C

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2. The Selected Products tab contains product catalog numbers of the particular drives and motors you have selected in your project. You can download the project report, save these products to a Product List or Export the Bill of Materials to another program such as Microsoft Excel.

Motion Analyzer

TLSTONE@RA.ROCKWELL.COM

Notifications43

Rockwell Automation

PRODUCTSLIBRARYTOOLSUPPORT

Enter keyword or product #

Products

LibrarySample Project

Sample Project

This is a sample project.

[DUPLICATE](#)[DELETE](#)[EXPORT AS XML](#)

READ ONLY

[CREATE A SNAPSHOT](#)

[RESTORE FROM SNAPSHOT](#)

SummaryComponent DetailPower AnalysisCustomer/Site**Selected Products**

[View by Type](#)[View by Axis](#)

[Download Project Report](#)[Save As Product List](#)[Export BOM](#)

DRIVES

CATALOG NUMBER	DESCRIPTION	QUANTITY	ACCESSORIES	ACTIONS
2094-BMP5-M / Kinetix 6500		1	1 show	View Detail
2094-BC01-MP5-M / Kinetix 6500		1	0	View Detail

MOTORS

CATALOG NUMBER	DESCRIPTION	QUANTITY	ACCESSORIES	ACTIONS
MPL-B210V-xxxxxx / MPL Motor / MPL-B210V-VJ72AA		1	2 show	View Detail
MPL-B320P-xxxxxx / MPL Motor / MPL-B320P-MJ72AA		1	2 show	View Detail

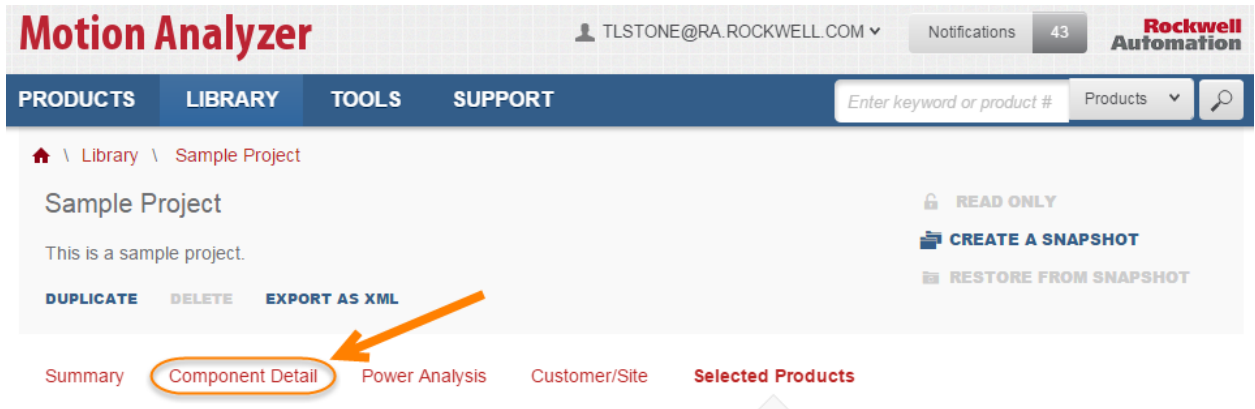
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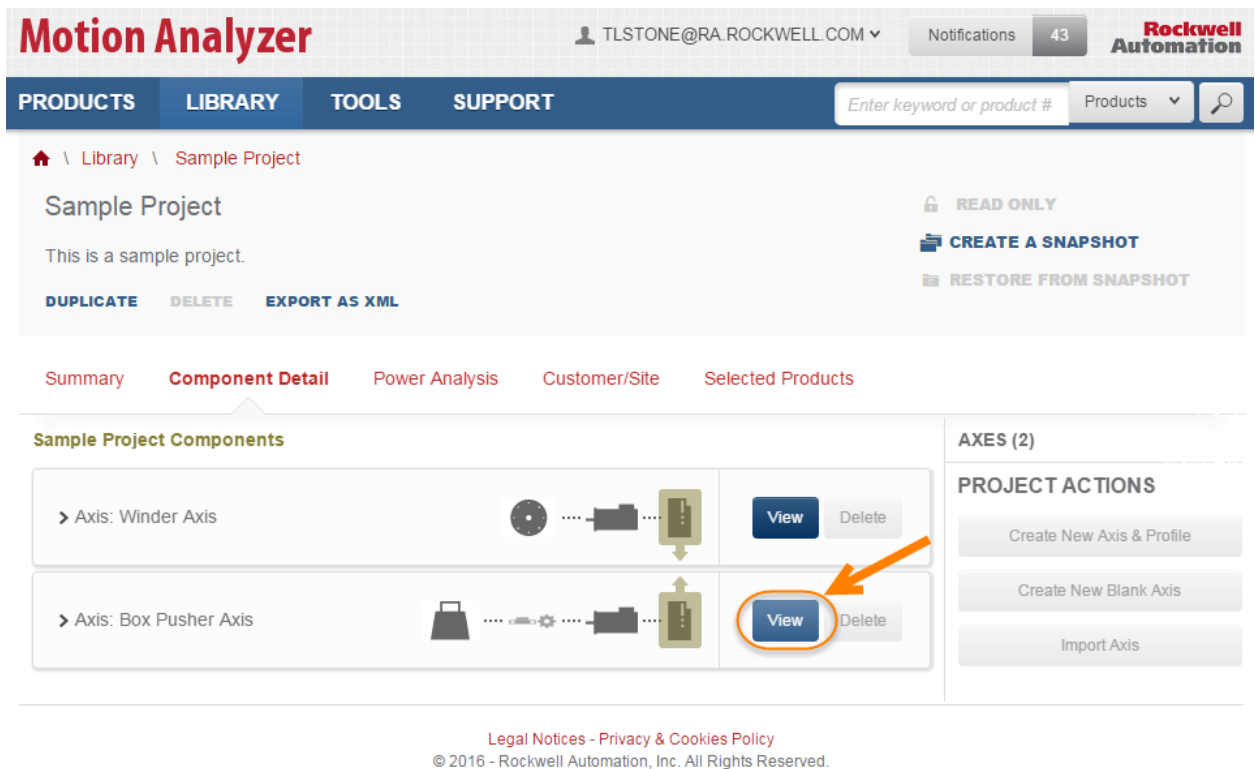
Reviewing a Completed Axis

Now that you have had the chance to review a completed project, let's take a closer look at the components of a completed axis.

1. Click on the **Component Detail** tab of the Sample Project page.



2. Click the **View** button for the Box Pusher Axis.



3. The Components tab of the Box Pusher Axis page will appear. Let's take a look at this page in more detail.

CONTINUE TO PROJECT

Box Pusher Axis 0 Shared Users ▾ 1 Comments ▾

 READ ONLY

 **RESTORE FROM SNAPSHOT**

Linear Axis with Mecha... ▾

DUPLICATE DELETE

Components

Performance

POWER REQUIREMENTS:

Voltage 460 ▼

Phase 3 ▼

Voltage Tolerance ▼

PROFILE

LINEAR MECH.

TRANSMISSION

MOTOR

DRIVE

[View Profile](#)

Box Pusher Profile
Motion Type: Linear



Ball Screw
Type: Lead Screw



Gear Reducer



MPL Motor
Catalog: MPL-B320P-
MJ72AA

CHANGE
CONFIGURATION

ADD ACCESSORY



Kinetix 6500
Catalog: 2094-BC01-MP5-M

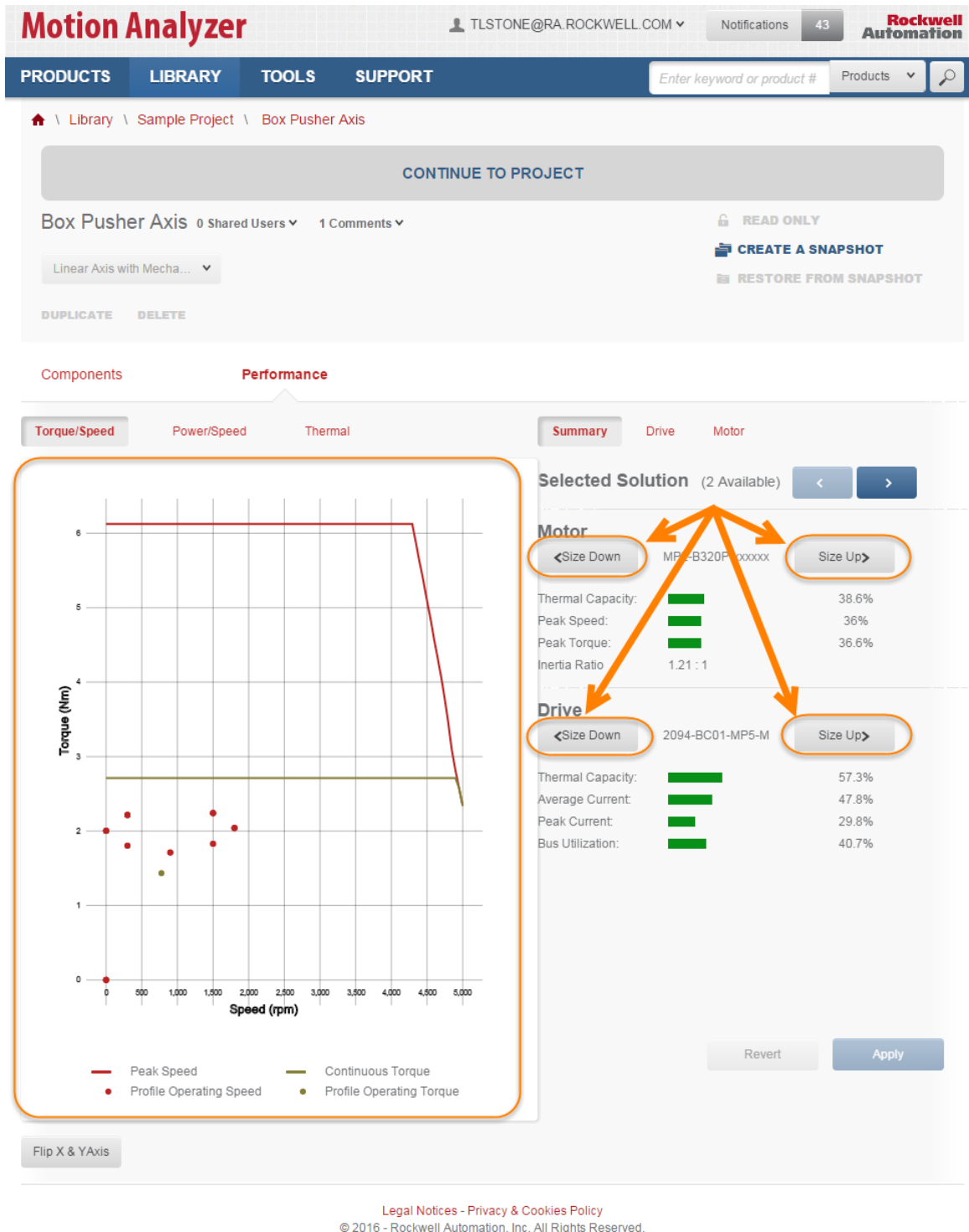
Along the top of the components tab is the Power Requirements section. This is where you select the Voltage, Phase, and Voltage Tolerance for the application.

In the center of the page you will find the axis components. This application contains load and profile information as well as information for a ball screw linear mechanism.

4. Since a drive and motor have been selected for the application, let's take a look at the performance plots for this solution. Click on the **Performance** tab of the Box Pusher Axis page.

The screenshot displays the Rockwell Automation Motion Analyzer web application. The top navigation bar includes the 'Motion Analyzer' title, a user profile for 'TLSTONE@RA.ROCKWELL.COM', a 'Notifications' badge with '43', and the 'Rockwell Automation' logo. Below this is a secondary navigation bar with 'PRODUCTS', 'LIBRARY', 'TOOLS', and 'SUPPORT' tabs, along with a search bar and a 'Products' dropdown. The breadcrumb trail shows the path: Home > Library > Sample Project > Box Pusher Axis. A large 'CONTINUE TO PROJECT' button is prominent. The project title 'Box Pusher Axis' is followed by '0 Shared Users' and '1 Comments'. A dropdown menu shows 'Linear Axis with Mecha...'. Action buttons include 'READ ONLY', 'CREATE A SNAPSHOT', and 'RESTORE FROM SNAPSHOT'. At the bottom, a tabbed interface shows 'Components' and 'Performance' tabs, with an orange arrow pointing to the 'Performance' tab.

5. The Box Pusher Axis Performance page will appear.



The Torque/Speed Curve appears first. Here you can see where the particular segments of the motion profile fall relative to the Torque/Speed curve.

You can see the curve for additional drives or motors by clicking on the Size Up and Size Down buttons.

If a gearbox is selected for the application, you could also see how changing the gearbox impacts the Torque/Speed results.

- Motion Analyzer

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PRODUCTSLIBRARYTOOLSSUPPORT

Enter keyword or product #Products

LibrarySample ProjectBox Pusher Axis

CONTINUE TO PROJECT

Box Pusher Axis

Linear Axis with Mecha...
DUPLICATEDELETE

ComponentsPerformance

Torque/SpeedPower/SpeedThermal

Torque (Nm)

Speed (rpm)

— Peak Speed — Continuous Torque
• Profile Operating Speed • Profile Operating Torque

SummaryDriveMotor

Selected Solution (2 Available)
< >

Motor

< Size DownMPL-B320P-xxxxxxSize Up >

Thermal Capacity:

Peak Speed:

Peak Torque:

Inertia Ratio

41.8%

36%

28.3%

1.21 : 1

Drive

< Size Down2094-BC01-M01-MSize Up >

Thermal Capacity:

Average Current:

Peak Current:

Bus Utilization:

25.7%

21.5%

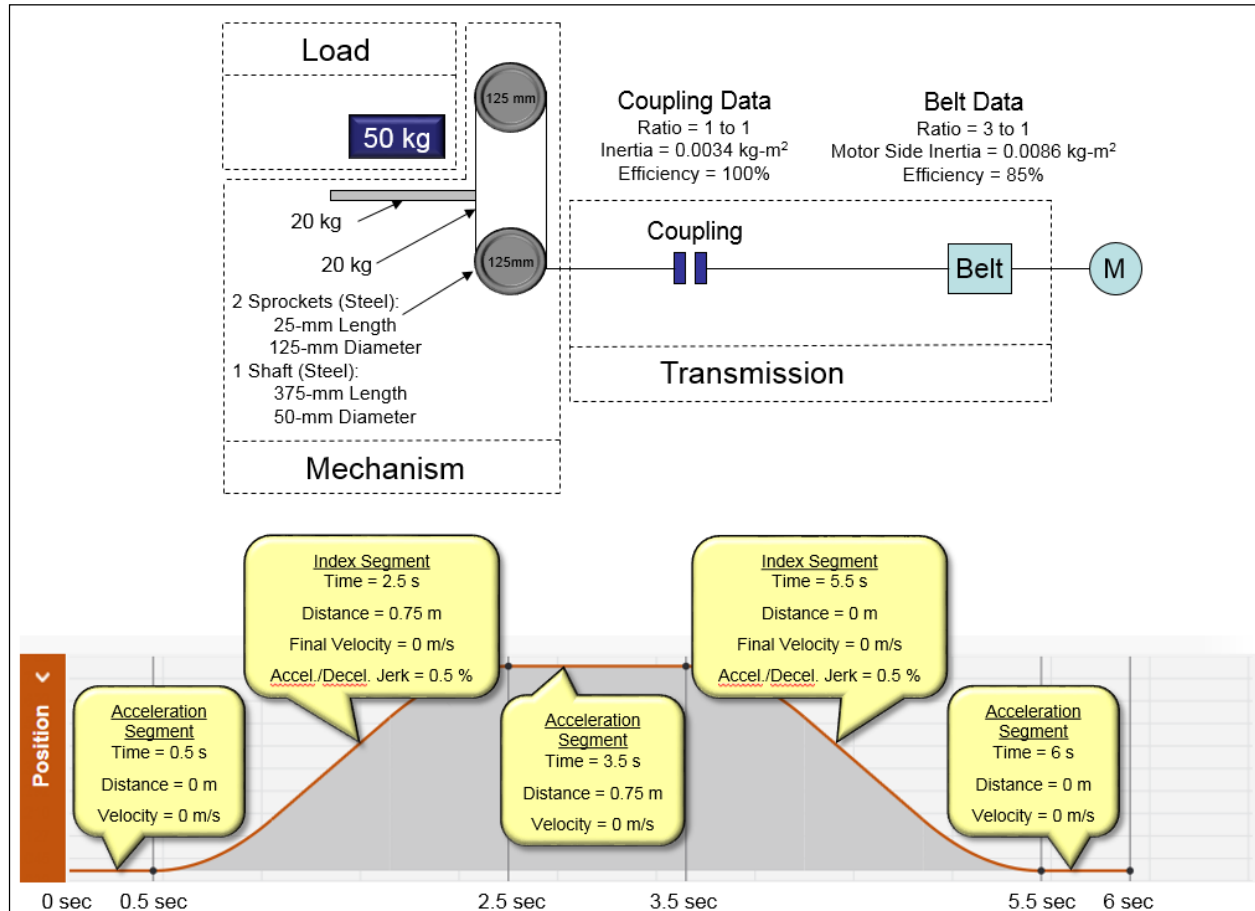
14%

46.4%

RevertApply

Size a System in Motion Analyzer

In this section of the Hands-On lab, you will model an axis in Motion Analyzer for a vertical lift and then identify an appropriate drive and motor that will meet the application requirements. You are given the following information for a new application.



Let's walk through entering this information in Motion Analyzer.

Creating a New Project

1. On the home page, click the **Start A New Project** button.

The screenshot shows the Rockwell Automation Motion Analyzer website. The header includes the site name, user email (MNSECK@RA.ROCKWELL.COM), notifications (0), and the Rockwell Automation logo. A navigation bar contains links for PRODUCTS, LIBRARY, TOOLS, and SUPPORT, along with a search bar. The main banner features the text "Learn. Select. Size." and "Find the solution for your application from Rockwell Automation and our PartnerNetwork." Below this, a link is provided for new users to click for an introductory lab.

START BUILDING

Ready to start building, sizing and selecting?
Click here to start a new project to size your application.

[Start A New Project](#) [View Current Projects](#)

BROWSE PRODUCT

Fast access to detailed information and product comparisons to help select the products you need.

[All Products](#) [Drives](#) [Motors](#) [Linear Actuators](#)

[Gearboxes](#) [Linear Mechanisms](#) [ITRAK](#)

LATEST NEWS

- [Thermal model change](#)
- [Unit defaults selection](#)
- [Current calculation change](#)
- [Stober gearbox update](#)
- [October Quarterly update](#)

LINKS

- [Allen Bradley](#)
- [Rockwell Automation](#)
- [Literature](#)

NOTIFICATIONS

[See all notifications](#)

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2. Enter a name for your project and a description (optional) in the **Create A Project** dialog box, and click the **Create Project** button.

CREATE A PROJECT

New Blank Project Import Project XML

Project Name: Vertical Lift Application

Project Description: This application moves a load vertically between two points

Cancel **Create Project**

3. The Customer Information section is used to enter customer specific data. You may enter some information at this point or fill it at the end section of this lab. The Ambient Temp can be entered at this point. Click the **Go to project** button.

CREATE A PROJECT

New Blank Project Import Project XML

Project Name: Vertical Lift Application

Project Description: This application moves a load vertically between two points

CUSTOMER INFORMATION

Client: Rockwell Automation

Contact: Smith John

E-mail: jsmith@email.com

Phone: 180-040-0080

USE

Industry: Elevators Add

Application: Lift Add

SITE

Altitude (above sealevel): 0 m

Ambient Temp.: 20 °C

Cancel **Go to project**

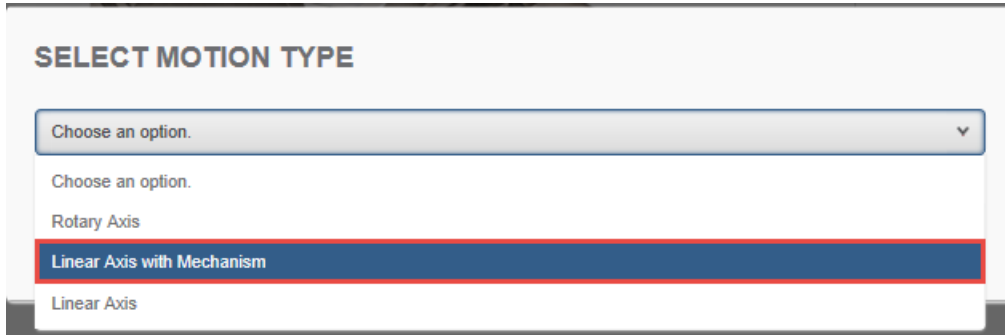
Starting Your First Axis

1. The Project Detail page will appear. Click the **Start your first Axis – Define Load & Profile** button.

NOTE: Both red encircled sections perform the same task in creating your profile. You may select to start your project using “Start your first Axis – Define Load & Profile” or “Create New Axis & Profile.”

2. For this application, we will be selecting a rotary motor, however the load will be moving linearly. We will be utilizing a mechanism which translates the rotary motion of the motor into linear motion of the load. The motion profile is entered for the load, so in our case, we will be entering linear motion profile data.

Select **Linear Axis with Mechanism** from the Select Motion Type drop-down list and click the **OK** button.



SELECT MOTION TYPE

Choose an option. ▼

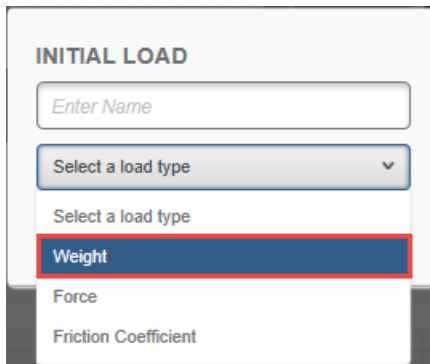
Choose an option.

Rotary Axis

Linear Axis with Mechanism

Linear Axis

3. Select **Weight** from the Initial Load drop-down list.



INITIAL LOAD

Enter Name

Select a load type ▼

Select a load type

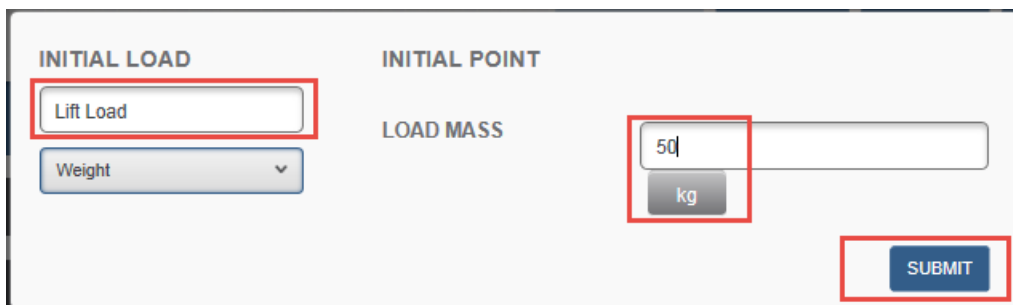
Weight

Force

Friction Coefficient

4. For this application, the profile begins with the load on the vertical lift table. The table then lifts the load, stops, and the load is removed. The table then returns to the starting position and the process repeats.

Enter **"Lift Load"** for the name of the load. Since the profile starts with the load on the table, enter **"50"** kilograms as the initial point, and click the **Submit** button



INITIAL LOAD

Lift Load

Weight ▼

INITIAL POINT

LOAD MASS

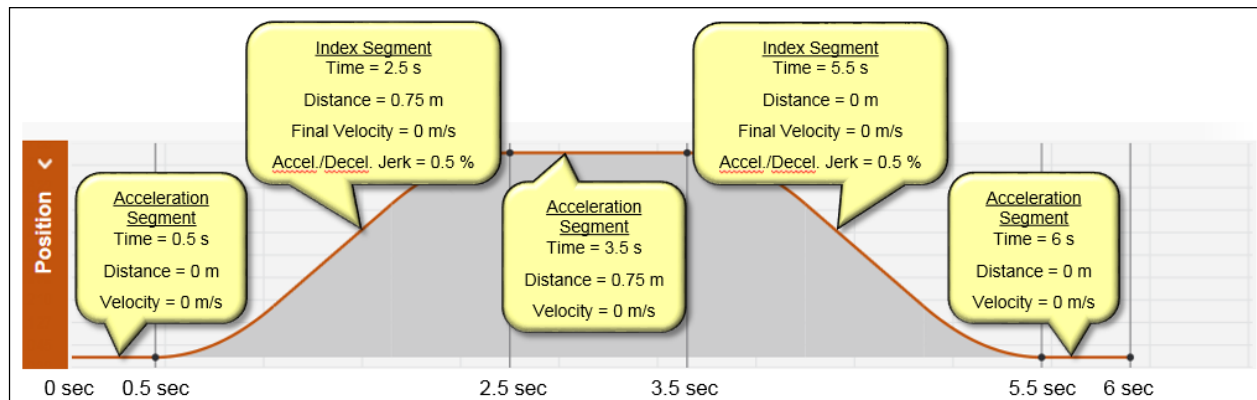
50

kg

SUBMIT

Defining a Motion Profile

Here is the motion profile that has been specified for the application.



Let's look at how to enter this information into the Profile page in Motion Analyzer.

1. The motion profile for this application is in terms of position. To enter a position profile data point, click anywhere on the **Position Plot**. The Add a Segment dialog box will appear.

The 'ADD A SEGMENT' dialog box is shown with three tabs: ACCELERATION, INDEX, and CAM. The 'INDEX' tab is selected. Below the tabs is the 'Data Depiction' section with the instruction: 'Specify motion point values. Initial numbers may be based on click activity'.

	previous point	☐ incremental	☒ absolute	
Time	0	976	976	ms
Distance	0	35.337	35.337	m
Velocity	0	72.4119	72.4119	m/s
Average Acceleration	0	0	0	m/s ²
Jerk		50		%

At the bottom right are 'CANCEL' and 'Submit' buttons.

2. Change the entry units to match the image, if different, by clicking on the units button and selecting the correct unit as seen on image.

ADD A SEGMENT

ACCELERATION

INDEX

CAM

Data Depiction

Specify motion point values. Initial numbers may be based on click activity

	previous point	☐ incremental	☒ absolute		
Time	0	976	976	1ms	2s
Distance	0	35.337	35.337	m	
Velocity	0	72.4119	72.4119	m/s	
Average Acceleration	0	0	0	m/s ²	
Jerk		50		%	

CANCEL

Submit

3. With the **Absolute** entry method selected, replace the pre-selected time value with “0.5 s” and the pre-selected velocity value with “0 m/s”. The distance value is calculated from the velocity and time values that you enter, so you do not need to enter a value for distance.

ADD A SEGMENT

ACCELERATION **INDEX** **CAM**

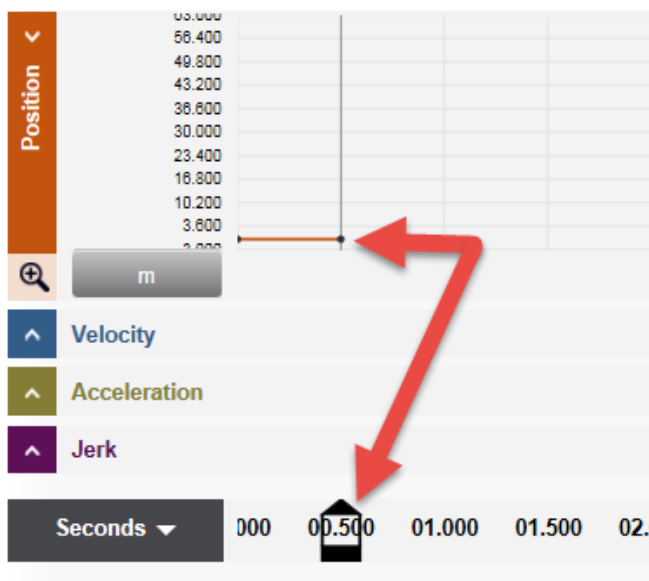
Data Depiction
Specify motion point values. Initial numbers may be based on click activity

previous point ☐ incremental ☒ absolute

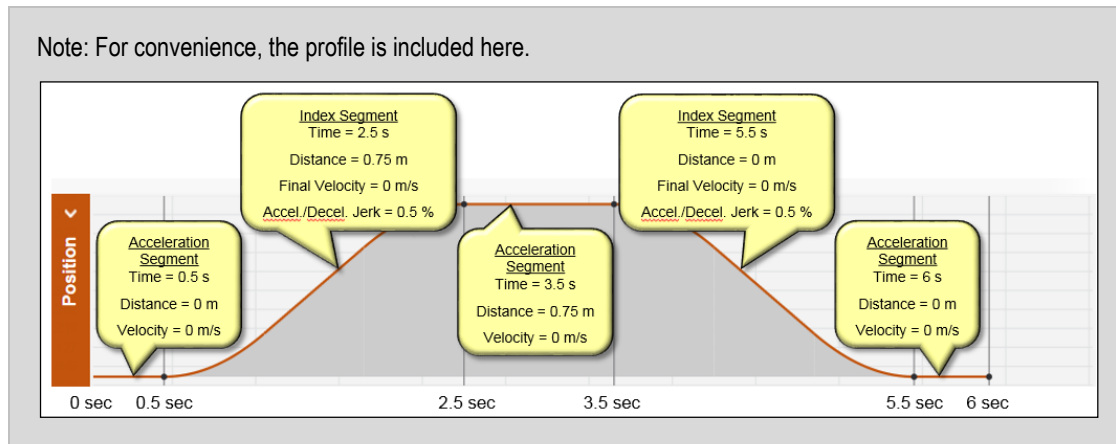
Time	0	0.5	0.5	s
Distance	0	0	0	m
Velocity	0	0	0	m/s
Average Acceleration	0	0	0	m/s ²
Jerk		0		%

CANCEL **Submit**

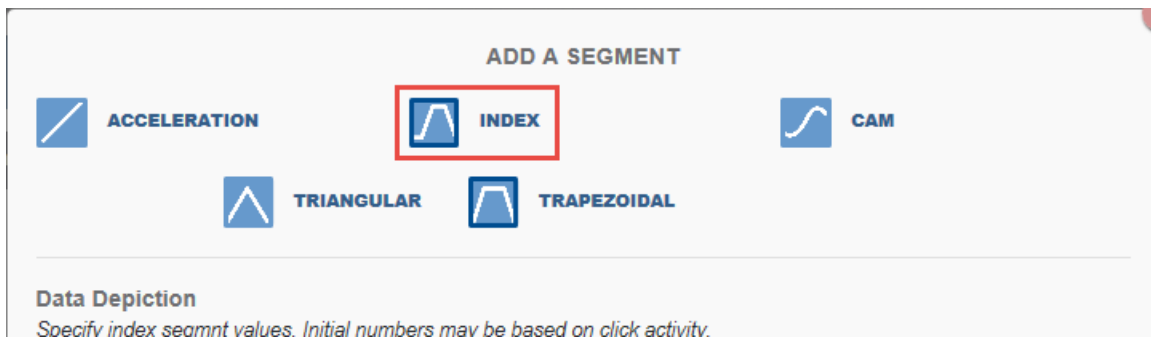
4. Click the **Submit** button. This will produce a dwell for 0.5 seconds at the beginning of the profile.



- Now we will add an Index segment to the plot. Click anywhere on the **Position Plot** to add a second point.



- In the Add Point dialog box, change the segment type to **Index Segment** followed by Trapezoidal



NOTE: The Trapezoidal segment is automatically selected when entering an index segment. If you want to select a triangular segment, you will need to make the selection after clicking on Index.

7. With the **Absolute** entry method selected, replace the pre-selected time value with “**2.5 s**”, the pre-selected Distance value with “**0.75 m**”, and the final velocity value with “**0 m/s**”. Next, set the Accel. and Decel. Jerk values to “**0.5 %**”.

ADD A SEGMENT

ACCELERATION **INDEX** **CAM**

TRIANGULAR **TRAPEZOIDAL**

Data Depiction
Specify index segmnt values. Initial numbers may be based on click activity.

	previous point	☐ incremental	☒ absolute	
Time	0.5	2	2.5	s
Distance	0	0.75	0.75	m
Final Velocity	0	0	0	m/s

Jerk

	acceleration	deceleration	% of time
	0.5	0.5	

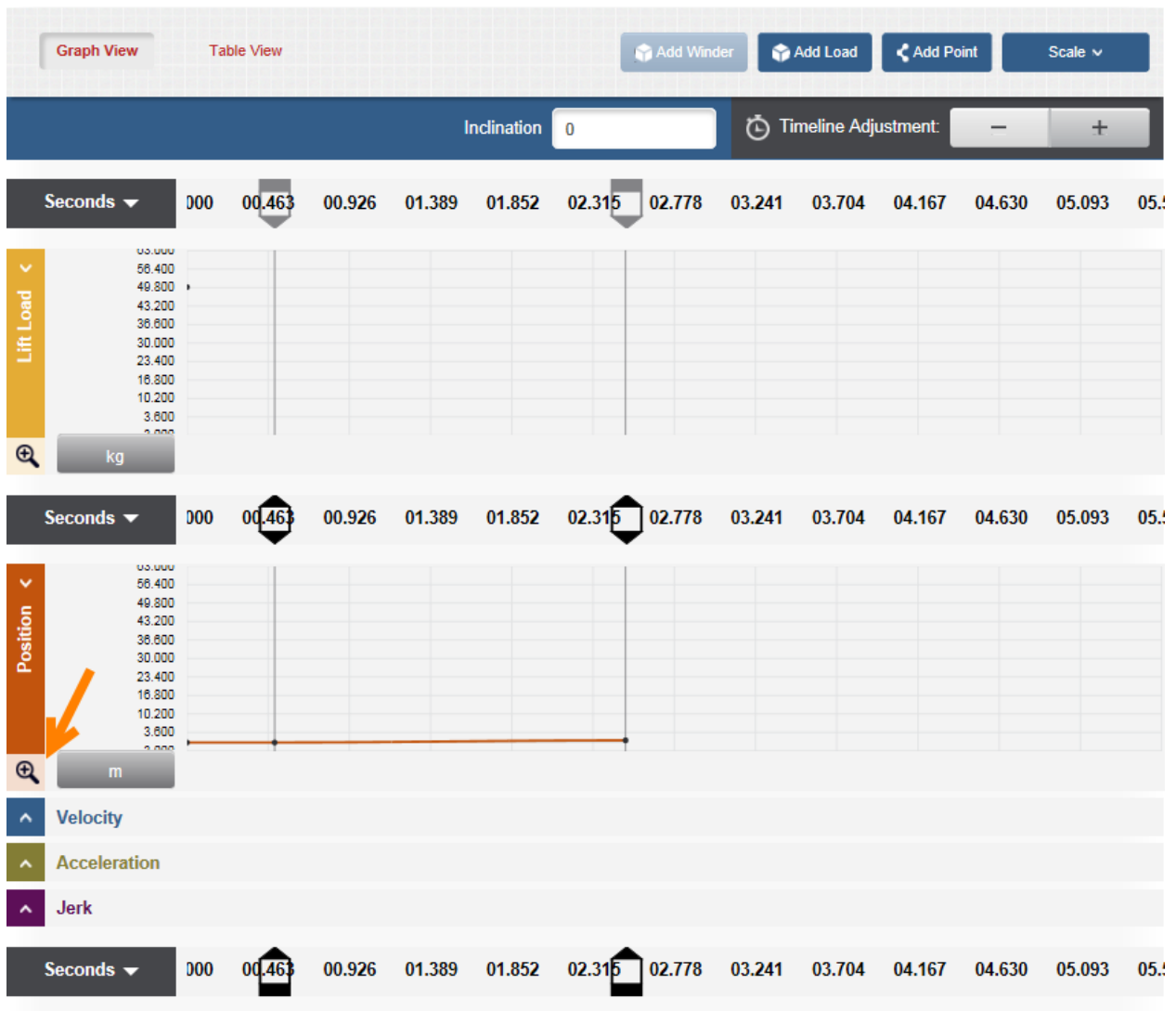
Absolute Velocity Limit ☐ Specify Limit 0 m/s

CANCEL **Submit**

NOTE: The incremental section changes as you enter your values in the absolute section. The incremental section calculates as absolute point – previous point i.e. absolute point is 2.5 s, previous point is 0.5 s, therefore incremental time is $2.5\text{ s} - 0.5\text{ s} = 2.0\text{ s}$.

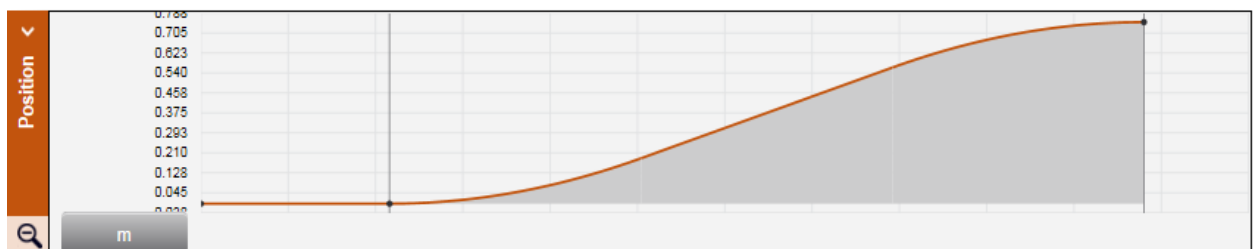
8. Click the **Submit** button.

9. Click the  icon on the Position Plot to automatically zoom the Position Plot.

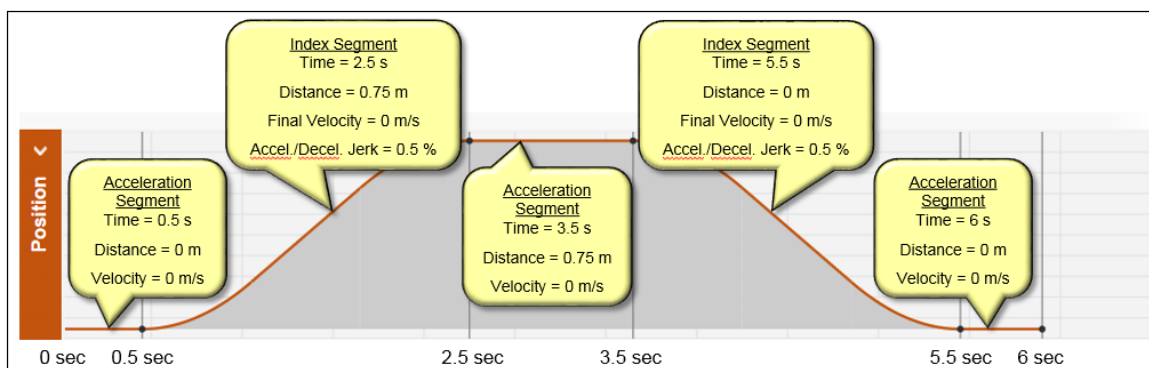


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10. You can now clearly see that we have created a 0.5 second dwell segment and an index segment which moves the load to the 0.75 meter position at 2.5 seconds.



11. Enter the remaining profile points for the application.



Note: If you need to edit any of the points that you have entered on the plot, there are three methods you can use.

Click and Drag Method: To adjust the value of a point on a plot, hover your mouse over the point until the icon appears. Click and drag the point to adjust the point value. Similarly, to adjust the time value of a point, hover your mouse over the time line until the icon appears. Click and drag the line to adjust the time value.

Single Click Point Method: To adjust the value of a point on the velocity plot, hover your mouse over the point until the icon appears and click the point. The edit window will re-open. You can use this method to fine tune after using click and drag.

Table Edit Method: Alternatively, Click on the Table View button and the Table entry page will appear.



Click on the Edit button of the point you would like to edit.

Motion

TYPE	TIME (ms)	POSITION (m)	VELOCITY (m/s)	ACCELERATION (m/s^2)	JERK (m/s^3)	EDIT
Acceleration	0	0.000	0.000	0.000	0.000	Edit
Acceleration	500	0.000	0.000	0.000	0.000	Edit
Index	2,500	0.750	-0.000	-0.000	507.519	Edit

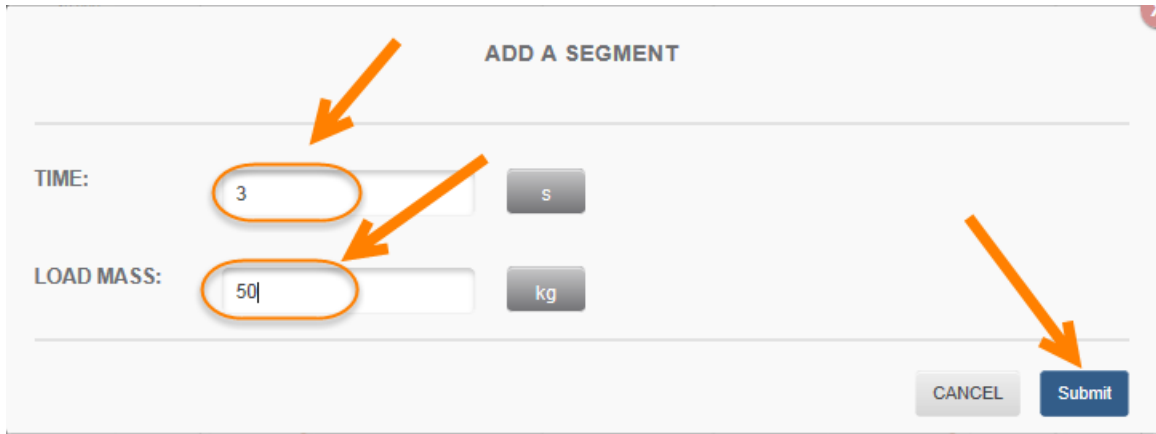
Enter the new values in the Edit Point dialog box.

12. Since this is a vertical application, enter “90” degrees for the inclination.



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13. Click anywhere on the **Lift Load Plot** to add a point. The Add dialog opens.
14. Add the “**50 kilogram**” load point at “**3 seconds**” on the Load Plot. Click the **Submit** button.



ADD A SEGMENT

TIME: 3 s

LOAD MASS: 50 kg

CANCEL Submit

NOTE: If you were to leave the Lift Load plot without performing the above step, Motion Analyzer would assume the weight is constant at 50 kg throughout the whole profile.

15. Click on the  icon under the Lift Load Plot. This will automatically zoom the plot.

16. When you have finished entering all of the Motion profile information, your load, position and velocity plots should look like this:



NOTE: If we needed to scale the entire profile, we could select **Scale** then the entire profile or horizontally and set a scale time. Our Profile plot would reflect the scale in the time x-axis.



17. Click the **Save** button to save the Motion Profile for the application. Then click the **Continue to Axis** button to return to the Axis page.

Motion Analyzer MNSECK@RA.ROCKWELL.COM Notifications 0 **Rockwell Automation**

PRODUCTS LIBRARY TOOLS SUPPORT Enter keyword or product # Products

Library \ Vertical Lift Application \ Axis 1 \ Motion Profile

CONTINUE TO AXIS

Motion Profile 0 Shared Users 0 Comments

LINEAR

DUPLICATE DELETE IMPORT PROFILE EXPORT PROFILE CLEAR PROFILE

Need help building a profile? [Click here for more information](#)

Graph View Table View Add Winder Add Load Add Point Scale

Once you are at the axis page, you can see that it automatically saves.

Motion Analyzer MNSECK@RA.ROCKWELL.COM Notifications 0 **Rockwell Automation**

PRODUCTS LIBRARY TOOLS SUPPORT Enter keyword or product # Products

Library \ Vertical Lift Application \ Axis 1

CONTINUE TO PROJECT

Axis 1 0 Shared Users 0 Comments

Linear Axis with Mecha...

DUPLICATE DELETE

START EDITING

Automatically Saved

CREATE A SNAPSHOT

RESTORE FROM SNAPSHOT

Entering a Mechanism

Now that the load and profile information has been entered, let's begin entering the data for the mechanism. The mechanism translates the rotational motion from the motor into linear motion of the lift table.

1. Click on the **Define Custom** button for the Linear Mechanism.

The screenshot shows the 'Axis 1' configuration page in the Rockwell Automation software. The breadcrumb trail at the top indicates the path: Home > Library > Vertical Lift Application > Axis 1. A 'CONTINUE TO PROJECT' button is at the top. Below it, the 'Axis 1' title is followed by '0 Shared Users' and '0 Comments'. A dropdown menu shows 'Linear Axis with Mecha...'. On the right, there are buttons for 'START EDITING', 'Automatically Saved', 'CREATE A SNAPSHOT', and 'RESTORE FROM SNAPSHOT'. Below these are 'DUPLICATE' and 'DELETE' buttons. The main section is titled 'Components' and 'Performance'. Under 'Components', there are five tabs: 'PROFILE', 'LINEAR MECH.', 'TRANSMISSION', 'MOTOR', and 'DRIVE'. Each tab has an icon and a button. The 'LINEAR MECH.' tab is selected, and its 'Add Partner Mechanism' button has a 'DEFINE CUSTOM' sub-button highlighted with a red box and a red arrow. The 'TRANSMISSION' and 'MOTOR' tabs also have 'DEFINE CUSTOM' sub-buttons. The 'DRIVE' tab has an 'Add Drive' button. At the bottom, there is a 'Legal Notices - Privacy & Cookies Policy' link and a copyright notice: '© 2016 - Rockwell Automation, Inc. All Rights Reserved.'

2. Select **Belt Drive** in the *Pick A Type* drop-down list, and click the **OK** button.

The screenshot shows the 'PICK A TYPE' dialog box. It has a dropdown menu with the text 'Choose an option.' and a downward arrow. The dropdown is open, showing a list of options: 'Belt Drive', 'Rack & Pinion', 'Chain & Sprocket', and 'Lead Screw'. The 'Belt Drive' option is highlighted with a red box and a red arrow. There is an 'OK' button at the bottom right of the dialog.

3. Enter a **Name** for the Belt Drive in the next dialog box, and click the **OK** button.

A screenshot of a software dialog box titled "Enter a name for your new Belt Drive." The dialog box has a light gray background. At the top, the title text is in a small, dark font. Below the title is a text input field containing the text "Belt Mechanism". A red circle with the number "1" is positioned above the input field, and a red arrow points from this circle to the text inside the field. Below the input field is a dark blue horizontal bar. On this bar, there are two buttons: "OK" and "CANCEL". The "OK" button is highlighted with a red rectangle, and a red circle with the number "2" is positioned above it. The "CANCEL" button is located to the right of the "OK" button and is not highlighted.

- Before entering the diameter of the driver, make sure the units are in mm.

PARAMETERS

	DRIVER	IDLER		
		GROUP 1	GROUP 2	GROUP 3
Diameter:	m	0		
Inertia:	kg · m ²	0		
Friction Torque:	N · m	0		

Units dropdown: m, cm, mm, km, in, ft

- Enter “125” millimeters as the diameter of the Driver and Idler (Group 1) in the Parameters table.

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PRODUCTS LIBRARY TOOLS SUPPORT Enter keyword or product # Products ▾ 🔍

🏠 \ Library \ Vertical Lift Application \ Axis 1 \ Belt Mechanism

CONTINUE TO AXIS

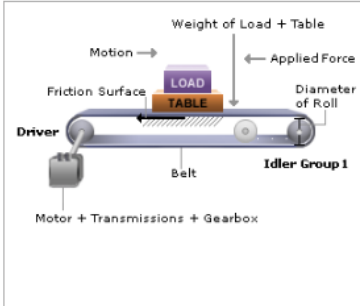
Belt Mechanism ✎ 0 Shared Users ▾ 0 Comments ▾

🔒 START EDITING
💾 SAVE
↶ CANCEL CHANGES

BELT DRIVE PROPERTIES

REQUIREMENT SUMMARY ⓘ

Load:	50	kg
Stroke:	0.75	m
Speed:	0.5625	m/s
Acceleration:	0.8459	m/s ²



PARAMETERS

	DRIVER	IDLERS		
		GROUP 1	GROUP 2	GROUP 3
Diameter:	mm	125		
Inertia:	kg · m ²	0		
Friction Torque:	N · m	0		
Number of Rollers:	1	0		

ADDITIONAL LOADS

Table Mass: 0 kg Belt Mass: 0 kg

Motion Analyzer

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Rockwell Automation

PRODUCTS
LIBRARY
TOOLS
SUPPORT

Enter keyword or product #

Products ▾
🔍

🏠 \ Library \ Vertical Lift Application \ Axis 1 \ Belt Mechanism

CONTINUE TO AXIS

Belt Mechanism
0 Shared Users ▾
0 Comments ▾

🔒 START EDITING
SAVE
↩ CANCEL CHANGES

DUPLICATE
DELETE

BELT DRIVE PROPERTIES

REQUIREMENT SUMMARY i

Load:	50	kg
Stroke:	0.75	m
Speed:	0.5625	m/s
Acceleration:	0.8459	m/s ²

PARAMETERS

	DRIVER	GROUP 1	GROUP 2	GROUP 3
Diameter:	125 mm	125		
Inertia:	🧮 0 kg · m²	🧮 0	🧮	🧮
Friction Torque:	0 N · m	0		
Number of Rollers:	1	0		

ADDITIONAL LOADS

Table Mass: kg

Belt Mass: kg

6. The Inertia Calculator tool will appear. Select **Solid Cylinder** as the Type, **Steel** as the Material and enter Sprocket 1 as **Name**.

Type: Material: Name:

Density: Mass: Element inertia:

LOAD ELEMENTS:

NAME	DENSITY (KG/M^3)	MASS (KG)	INERTIA (KG-M^2)	ACTIONS
------	------------------	-----------	------------------	---------

New Total Mass: New Total Inertia:

NOTE: Your Load Elements section might be already prefilled. Please delete the current values before entering the new calculations.

7. The length of each sprocket is **25 millimeters** and the diameter is **125 millimeters**. Enter this information into the calculator, and then click the **Save** button to add the inertia of the first sprocket to the Load Elements list.

Type: Solid Cylinder Material: Steel (AISI 1020) Name: Sprocket 1

Select Standard Enter Custom

Length : 25 mm

Diameter : 125 mm

Density: 7900 kg/m³ Mass: 2.424 kg Element inertia: 0.005 kg-m²

Save

LOAD ELEMENTS:

NAME	DENSITY (KG/M ³)	MASS (KG)	INERTIA (KG-M ²)	ACTIONS
------	------------------------------	-----------	------------------------------	---------

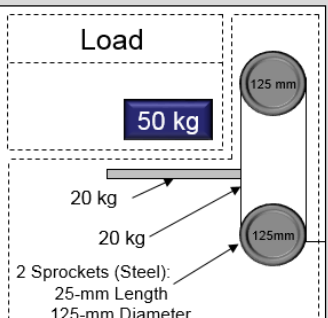
New Total Mass: 0 kg New Total Inertia: 0 kg-m²

Apply Cancel

- Repeat steps 6 and 7 for the second sprocket and the shaft.

Note: For convenience, the mechanical requirements for the belt mechanism are repeated here:

Load



50 kg

20 kg

20 kg

125 mm

125mm

2 Sprockets (Steel):
25-mm Length
125-mm Diameter

1 Shaft (Steel):
375-mm Length
50-mm Diameter

Mechanism

- Once you have saved all three inertia values, click the **Apply** button to enter the total inertia of the Driver into the properties table.

LOAD ELEMENTS:

NAME	DENSITY (KG/M ³)	MASS (KG)	INERTIA (KG-M ²)	ACTIONS
Sprocket 1	7900	2.424	0.005	Edit Remove
Sprocket 2	7900	2.424	0.005	Edit Remove
Shaft	7900	5.817	0.002	Edit Remove

New Total Mass:

10.664

kg

New Total Inertia

0.011

kg-m²

Apply

Cancel

10. For this application, there is a Single Idler group that has identical parameters to the Driver group, so we can reuse the inertia value that we calculated. **Copy** the inertia value of the Driver and **paste** it into the **Inertia field** for **Idler Group 1**.

PARAMETERS

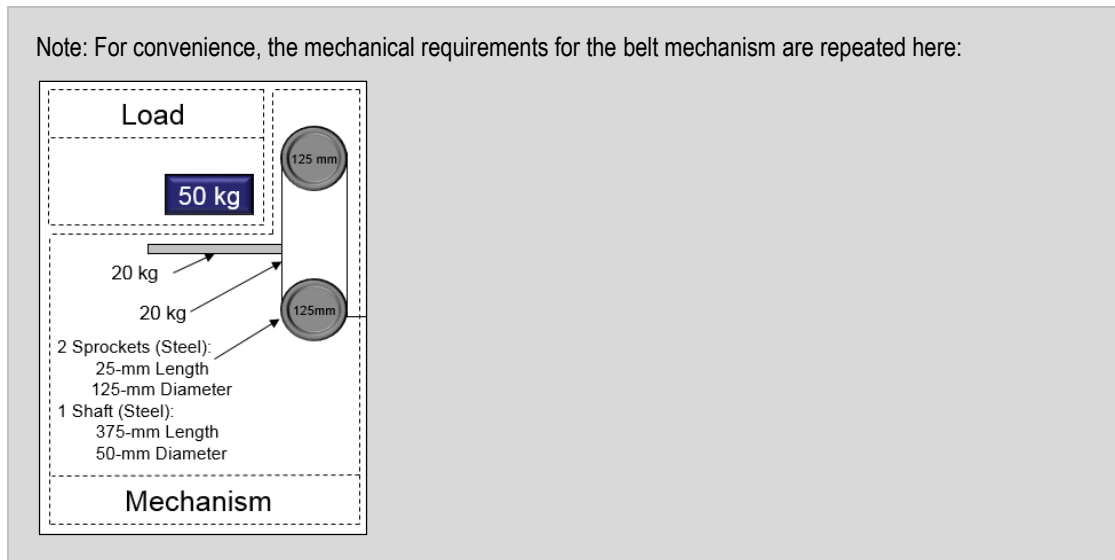
		DRIVER	IDLERs		
			GROUP 1	☐ GROUP 2	☐ GROUP 3
Diameter:	mm	125	125		
Inertia:	kg · m ²	0.0113	0.011285		
Friction Torque:	N · m	0	0		
Number of Rollers:		1	0		

ADDITIONAL LOADS

Table Mass: kg Belt Mass: kg

Note: When copying, make sure to select the entire number (the entire number is not visible in the box) by double clicking on the number.

11. Enter “1” as the Number of Rollers for Idler Group 1 and enter the **Table Mass** and the **Belt Mass** under Additional Loads.



PARAMETERS

		DRIVER	IDLERS		
			GROUP 1	☐ GROUP 2	☐ GROUP 3
Diameter:	mm	125	125		
Inertia:	kg · m ²	0.0113	0.0113		
Friction Torque:	N · m	0	0		
Number of Rollers:		1	1		

ADDITIONAL LOADS

Table Mass: kg Belt Mass: kg

12. Once you have entered all of the data for the Belt Mechanism, click the **Save** button and then the **Continue to Axis** button.

Motion Analyzer

MNSECK@RA.ROCKWELL.COM

Notifications0

Rockwell Automation

PRODUCTS

LIBRARY

TOOLS

SUPPORT

Enter keyword or product #

Products

Library

Vertical Lift Application

Axis 1

Belt Mechanism

CONTINUE TO AXIS

1

SAVE

2

START EDITING

CANCEL CHANGES

Belt Mechanism

0 Shared Users

0 Comments

DUPLICATE

DELETE

BELT DRIVE PROPERTIES

REQUIREMENT SUMMARY

Load:

50

kg

Stroke:

0.75

m

Speed:

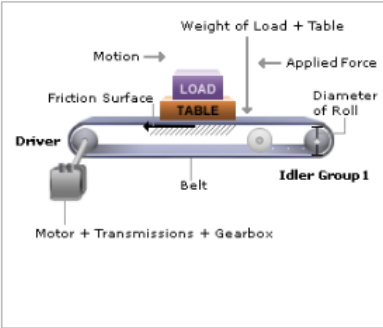
0.5625

m/s

Acceleration:

0.8459

m/s²



PARAMETERS

		DRIVER	IDLERS		
			GROUP 1	☐ GROUP 2	☐ GROUP 3
Diameter:	mm	125	125		
Inertia:	kg · m ²	0.0113	0.0113		
Friction Torque:	N · m	0	0		
Number of Rollers:		1	1		

ADDITIONAL LOADS

Table Mass:

20

kg

Belt Mass:

20

kg

Entering Transmission Components

Now we will enter the transmission data for the application.

1. Click on the **Define Custom** button for the Transmission.

The screenshot shows the Rockwell Automation Motion Analyzer web application. The top navigation bar includes 'PRODUCTS', 'LIBRARY', 'TOOLS', and 'SUPPORT'. The user is logged in as MNSECK@RA.ROCKWELL.COM. The breadcrumb trail indicates the current location: Library > Vertical Lift Application > Axis 1. A large 'CONTINUE TO PROJECT' button is prominent. Below this, the 'Axis 1' configuration is shown with options for '0 Shared Users' and '0 Comments'. A dropdown menu for 'Linear Axis with Mecha...' is visible. On the right, there are buttons for 'START EDITING', 'Automatically Saved', 'CREATE A SNAPSHOT', and 'RESTORE FROM SNAPSHOT'. The 'Components' tab is active, showing a grid of component categories: PROFILE, LINEAR MECH., TRANSMISSION, MOTOR, and DRIVE. Each category has an icon and a button to 'Add' or 'Edit' it. In the TRANSMISSION category, the 'DEFINE CUSTOM' button is highlighted with an orange circle and an arrow pointing to it. The 'IMPORT FROM LIBRARY' button is also visible. At the bottom, there is a footer with 'Legal Notices - Privacy & Cookies Policy' and '© 2016 - Rockwell Automation, Inc. All Rights Reserved.'

2. The first transmission we will create is the coupling. Enter a **name** for the transmission component, and click the **OK** button.

The screenshot shows a dialog box titled 'Enter a name for your new Transmission - Custom.' It contains a text input field with the text 'Coupling Transmission' and a red arrow pointing to it, labeled with a red circle containing the number '1'. Below the input field are two buttons: 'OK' and 'CANCEL'. The 'OK' button is highlighted with a red circle containing the number '2'.

3. Select **Coupling** as the Transmission Type.

Motion Analyzer MNSECK@RA.ROCKWELL.COM ▾ Notifications 0 **Rockwell Automation**

PRODUCTS LIBRARY TOOLS SUPPORT Enter keyword or product # Products ▾ 🔍

🏠 \ Library \ Vertical Lift Application \ Axis 1 \ Coupling Transmission

CONTINUE TO AXIS

Coupling Transmission ✎ 0 Shared Users ▾ 0 Comments ▾

START EDITING

SAVE

CANCEL CHANGES

DUPLICATE DELETE

TRANSMISSION PROPERTIES

Choose a transmission type ▾

- Choose a transmission type
- Belt Drive
- Chain & Sprocket
- Spur Gear
- Coupling**

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4. Enter “1” for the coupling transmission ratio.

🏠 \ Library \ Vertical Lift Application \ Axis 1 \ Coupling Transmission

CONTINUE TO AXIS

Coupling Transmission ✎ 0 Shared Users ▾ 0 Comments ▾

START EDITING

SAVE

CANCEL CHANGES

DUPLICATE DELETE

TRANSMISSION PROPERTIES

Coupling ▾

Parameters

Ratio: 1 ⓘ

Inertia (motor side) 0 kg · m² ⓘ

Efficiency: % ⓘ

Friction Torque (motor side) 0 N · m ⓘ

Coupling must be chosen carefully to avoid backlash and provide a high degree of stiffness.

NOTE: For efficiency, your initial unit may be a dash “-” if you have not set the unit to % in the units tab of your user Profile.

5. Enter the remaining data that was provided for the coupling.

Note: For convenience, the mechanical requirements for the coupling are repeated here:

Coupling Data
Ratio = 1 to 1
Inertia = 0.0034 kg-m²
Efficiency = 100%

Coupling



6. Once the coupling data has been entered, click on the **Save** button and then the **Continue to Axis** button.

Library \ Vertical Lift Application \ Axis 1 \ Coupling Transmission

CONTINUE TO AXIS

Coupling Transmission / 0 Shared Users 0 Comments

SAVE

CANCEL CHANGES

TRANSMISSION PROPERTIES

Coupling

Parameters

Ratio: 1

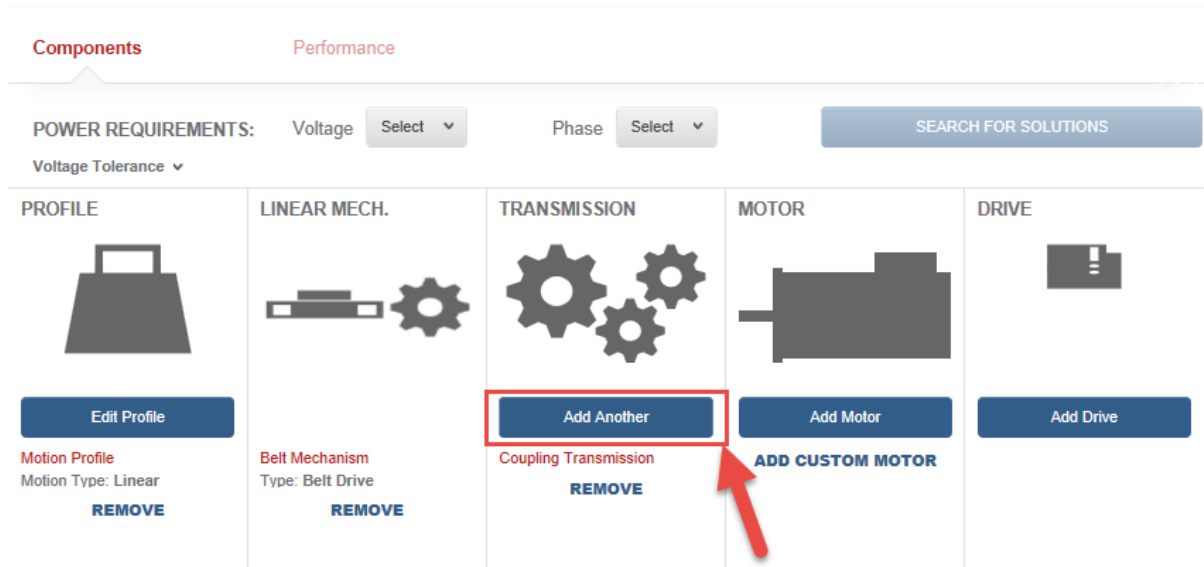
Inertia (motor side) 0.0034 kg · m²

Efficiency: 100 %

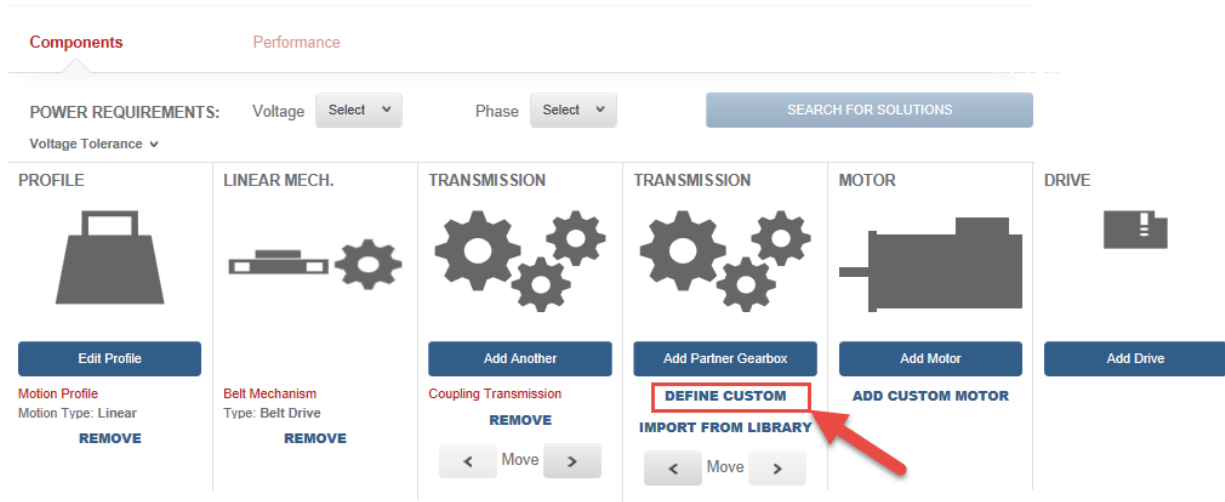
Friction Torque (motor side) 0 N · m

Coupling must be chosen carefully to avoid backlash and provide a high degree of stiffness.

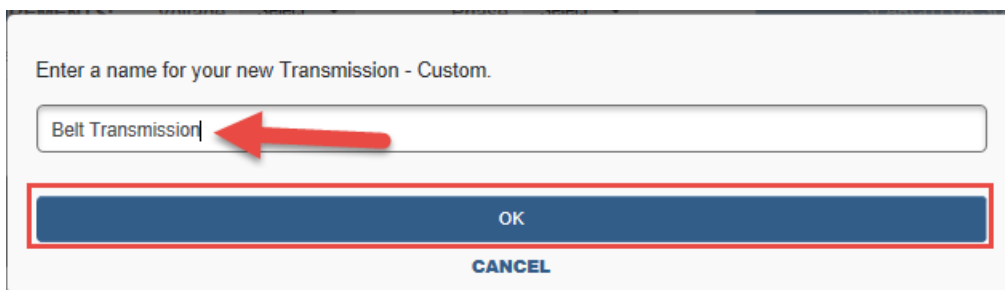
7. Now we will add the second transmission component. Click on the **Add Another** button under the Transmission heading.



8. Click on the **Define Custom** button under the new transmission heading you just added.



9. The second transmission we will create is the belt. Enter a name for the transmission component, and click the **OK** button.



10. Select **Belt Drive** as the transmission type.

🏠 \ Library \ Vertical Lift Application \ Axis 1 \ Belt Transmission

CONTINUE TO AXIS

Belt Transmission ✎ 0 Shared Users ▼ 0 Comments ▼

START EDITING

SAVE

CANCEL CHANGES

DUPLICATE DELETE

TRANSMISSION PROPERTIES

Choose a transmission type ▼

Choose a transmission type

Belt Drive

Chain & Sprocket

Spur Gear

Coupling

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11. Enter the data that was provided for the belt.

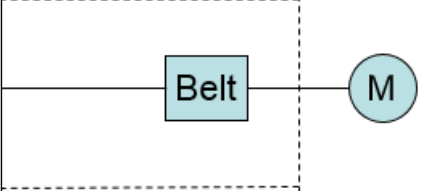
Note: For convenience, the mechanical requirements for the belt transmission are repeated here:

Belt Data

Ratio = 3 to 1

Motor Side Inertia = 0.0086 kg-m²

Efficiency = 85%



12. Once the belt data has been entered, click on the **Save** button and then click the **Continue to Axis** button.

Library > Vertical Lift Application > Axis 1 > Belt Transmission

CONTINUE TO AXIS

Belt Transmission 0 Shared Users 0 Comments

START EDITING

SAVE

CANCEL CHANGES

DUPLICATE DELETE

TRANSMISSION PROPERTIES

Belt Drive

Parameters

Ratio: 3

Inertia (motor side): 0.0086 $\text{kg} \cdot \text{m}^2$

Efficiency: 85 %

Friction Torque (motor side): 0 $\text{N} \cdot \text{m}$

13. Although a gearbox is not needed for this application, let's take a look at the steps you would follow to add one. Begin by clicking the **Add Another** button.

Components Performance

POWER REQUIREMENTS: Voltage Select Phase Select SEARCH FOR SOLUTIONS

Voltage Tolerance

PROFILE LINEAR MECH. TRANSMISSION TRANSMISSION MOTOR DRIVE

Edit Profile Add Another Add Another Add Motor Add Drive

Motion Profile Motion Type: Linear REMOVE

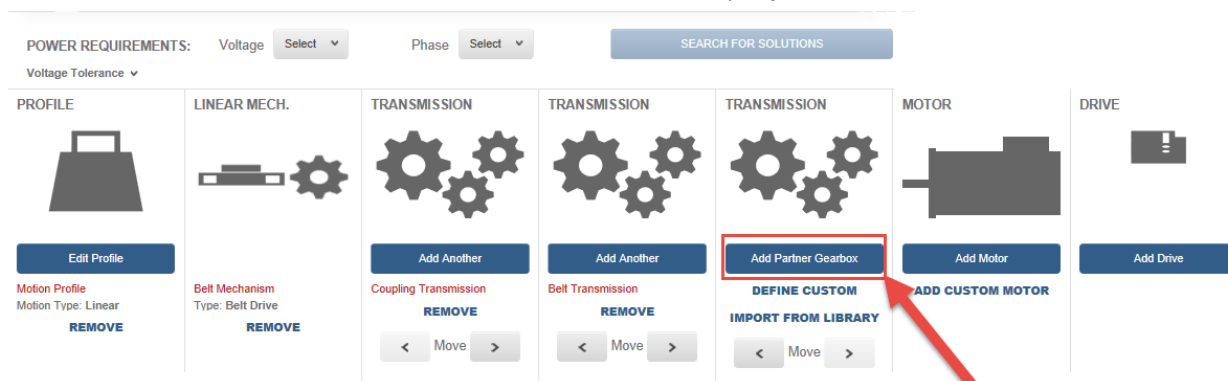
Belt Mechanism Type: Belt Drive REMOVE

Coupling Transmission REMOVE

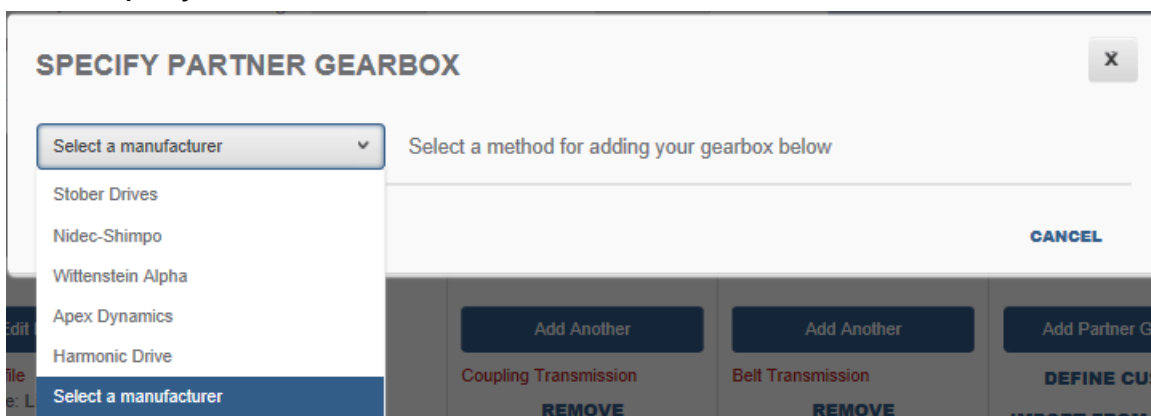
Belt Transmission REMOVE

ADD CUSTOM MOTOR

14. Click on the **Add Partner Gearbox** button for the Transmission that you just added.



15. From the **Specify Partner Gearbox** window, select a manufacturer.



NOTE: We selected Wittenstein Alpha gearbox on this lab, you can select any manufacturer to compare its available gearboxes. Here is an example of 3 products compared:

[Home](#) \ [Products](#) \ [Compare](#)

Compare Products (3)

	C-Series	KL-Series	PA-Series
Compare Family Features			
Catalog Number	C402_0310MT30*	KL202_0160MQ*	PA722_0320MF/35*
Configuration	In-Line	Right-Angle	In-Line
Manufacturer	Stober Drives	Stober Drives	Stober Drives
Type	Helical	Helical	Planetary
More Information	View full information on allenbradley.com	View full information on allenbradley.com	View full information on allenbradley.com

An asterisk (*) indicates that at least one product configuration within the family has this feature.

16. You will have two option on how to select your gearbox. Let's select option 1.

SPECIFY PARTNER GEARBOX

Wittenstein Alpha

Select a method for adding your gearbox below

1

Want to search for your gearbox? Select one or more families in browser below.

Browse for Families, Products or Configuration

2

Know your gearbox? Enter it by Catalog Number.

Enter Catalog Number

Select a family

ADD TO AXIS

CANCEL

NOTE: On the new update of MA online tool, the gearbox selection has been changed to allow you to add filters of either families or individual products. If you would like to add a specific gearbox directly to your axis (instead of specifying a prefilter for search), use the section on the right side of the Add Partner Gearbox model and type in the gearbox you want to use.

17. Your selected manufacturer's Gearboxes will be displayed

Motion AnalyzerMNSECK@RA.ROCKWELL.COMNotifications 0**Rockwell Automation**

PRODUCTS LIBRARY TOOLS SUPPORT

Enter keyword or product # Products

[Home](#) \ [Axis](#) \ [Gearboxes](#)

Gearboxes

Add Selected Families to Axis Go to Axis

Selection Filters **clear**

Commonly Used (4) >

Physical Dimension (6) >

Torque & Speed Ratings (7) >

WITTENSTEIN ALPHA

Gearbox select



BEVEL RIGHT-ANGLE
78 Sizes Available

Select

Gearbox select



HYPOID RIGHT-ANGLE
1085 Sizes Available

Select

Gearbox select



PLANETARY IN-LINE
1102 Sizes Available

Select

Gearbox select



WORM RIGHT-ANGLE
110 Sizes Available

Select

Compare Selected Families (0)

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Revision D

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2/8/2016

18. Select to compare the Bevel Right-Angle and Planetary In-Line gearboxes.

🏠 \ Axis \ Gearboxes

Gearboxes

Save Selections to Axis (2) Go to Axis

0 Filters Applied [clear](#)

- Commonly Used (4) >
- Physical Dimension (6) >
- Torque & Speed Ratings (7) >

WITTENSTEIN ALPHA



BEVEL RIGHT-ANGLE
78 Sizes Available

Select



HYPOID RIGHT-ANGLE
1085 Sizes Available

Select



PLANETARY IN-LINE
1102 Sizes Available

Select



WORM RIGHT-ANGLE
110 Sizes Available

Select

Compare Selected Families (2)

19. The Compare Products window will open up and the comparison fields will be load

🏠 \ Products \ Compare

Compare Products (2)

Go to Axis

BEVEL RIGHT-ANGLE



PLANETARY IN-LINE



Compare Family Features

Catalog Number	No	LPB090S-MF2-40-1G1*	X
Configuration	Right-Angle	In-Line	X
Manufacturer	Wittenstein Alpha	Wittenstein Alpha	X
Type	Bevel	Planetary	X
	View full information on allenbradley.com	View full information on allenbradley.com	

Add Feature ▼

Add Feature

Wittenstein Series

An asterisk (*) indicates that at least one product configuration within the family has this feature.

NOTE: You can add features to your selected comparisons for more options. This “Add Feature” option is available for all product comparisons.

20. Assuming you prefer the Planetary In-Line gearboxes, click on the product name



This will take you to the product detail page where you can choose size and set configuration

21. Click on Choose Size.

Home \ Axis \ Gearboxes \ 65

PLANETARY IN-LINE



Save Axis Go to Axis

SELECTION SUMMARY

Size Selected: Not Selected

Configuration: Not Selected

Product Catalog No: Not Selected

Show Compatible Products

Learn More

0 Filters Applied clear

Base Product Info Choose Size Set Configuration

Commonly Used (3)

Physical Dimension (6)

Torque & Speed Ratings (7)

FAMILY DESCRIPTION

Planetary In-line gearboxes from Wittenstein. This includes the CP, LP, LPB, SP and TP series gearboxes.

FAMILY SPECIFICATIONS

Manufacturer	Wittenstein Alpha
Type	Planetary
Configuration	In-Line

22. You are able to view the different selections in two formats

Vertical View - 4 products per page

0 Filters Applied [clear](#)

Commonly Used (3) >

Physical Dimension (6) >

Torque & Speed Ratings (7) >

Base Product Info Choose Size ☒ Set Configuration ☒

1102 total items (filtered from 1102) < 1 2 3 4 5 6 ... 276 >

Vertical View ☒ **Horizontal View** ☐

SELECT A SIZE ☐ SELECT ☐ SELECT ☐ SELECT ☐ SELECT

FEATURES				
Catalog Number	CP040-MO1-10-111	CP040-MO1-4-111	CP040-MO1-5-111	CP040-MO1-7-111
Axial Load	230	230	230	230
Max Input Speed (rad/s)	8000.000563816463	8000.000563816463	8000.000563816463	8000.000563816463
Output Max Torque (Nm)	10.5	10.5	11.5	11.5
Radial Load	200	200	200	200
Ratio	10	4	5	7
Stage Number	1	1	1	1
Weight (kg)	0.31	0.31	0.31	0.31

Horizontal View - 20 products or more per page

0 Filters Applied [clear](#)

Commonly Used (3) >

Physical Dimension (6) >

Torque & Speed Ratings (7) >

Base Product Info Choose Size ☒ Set Configuration ☒

1102 total items (filtered from 1102) **Vertical View** ☒ **Horizontal View** ☐

SELECT	Catalog Number	Ratio	Output Max Torque (Nm)	Max Input Speed (rad/s)	Stage Number
☐	CP040-MO1-10-111	10	10.5	8000.000563816463	1
☐	CP040-MO1-4-111	4	10.5	8000.000563816463	1
☐	CP040-MO1-5-111	5	11.5	8000.000563816463	1
☐	CP040-MO1-7-111	7	11.5	8000.000563816463	1
☐	CP040-MO2-100-111	100	10.5	8000.000563816463	2
☐	CP040-MO2-16-111	16	10.5	8000.000563816463	2
☐	CP040-MO2-20-111	20	10.5	8000.000563816463	2
☐	CP040-MO2-25-111	25	11.5	8000.000563816463	2
☐	CP040-MO2-35-111	35	11.5	8000.000563816463	2
☐	CP040-MO2-50-111	50	11.5	8000.000563816463	2
☐	CP040-MO2-70-111	70	11.5	8000.000563816463	2
☐	CP060-MO1-10-111	10	29	5999.999706665103	1
☐	CP060-MO1-4-111	4	32	5999.999706665103	1
☐	CP060-MO1-5-111	5	32	5999.999706665103	1
☐	CP060-MO1-7-111	7	32	5999.999706665103	1
☐	CP060-MO2-100-111	100	29	5999.999706665103	2
☐	CP060-MO2-16-111	16	32	5999.999706665103	2
☐	CP060-MO2-20-111	20	32	5999.999706665103	2
☐	CP060-MO2-25-111	25	32	5999.999706665103	2
☐	CP060-MO2-35-111	35	32	5999.999706665103	2

[VIEW 20 MORE](#)

23. We will not be adding a gearbox to this project. Please select **Go to Axis** button to return to the axis page without selecting a gearbox.

[Home](#) \ [Axis](#) \ [Gearboxes](#) \ 65

PLANETARY IN-LINE



[Save Axis](#) [Go to Axis](#)

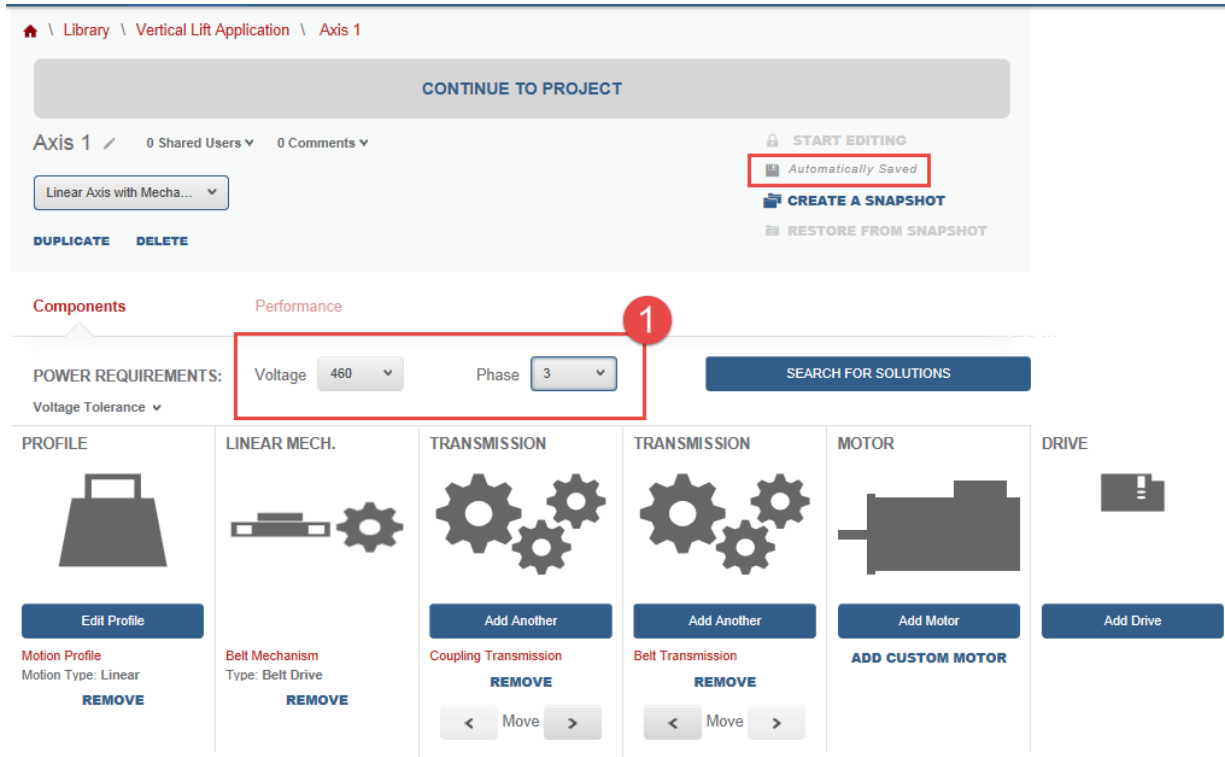
SELECTION SUMMARY

Size Selected:	Not Selected
Configuration:	Not Selected
Product Catalog No:	Not Selected

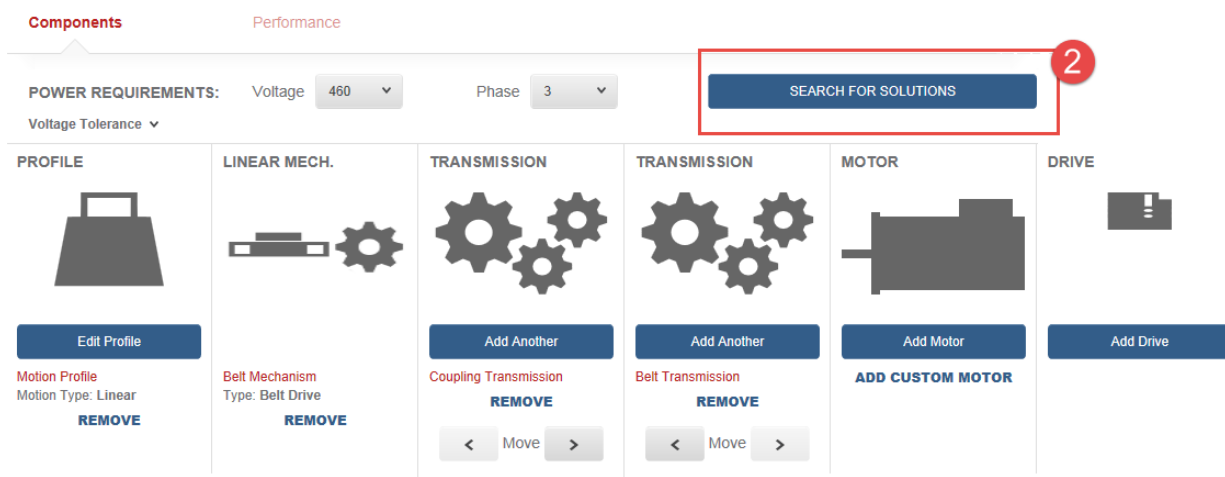
Selecting a Motor and Drive

Now that you have entered all of the mechanical and motion profile data into Motion Analyzer, you are ready to select a Drive and Motor for the application.

1. Begin by selecting **460** for the Voltage and **3** for the Phase in the Power Requirements section of the Axis page. Your axis is now automatically saved.



2. Next, click on the **Search for solutions** button.



- After Motion Analyzer performs the necessary calculations, the Solution List will appear with a list of the motor and drive combinations which meet the application requirements.

SOLUTIONS LIST

Viewing 1 - 10 of 35

<

1

2

3

4

>

Sort by: Profile Match (%)

Clear Filters

Note: Some solutions may have accessories added to meet your filter criteria.

Solution Filters

Solution Filters (6)

Motor Filters

Commonly Used (6)

Torque/Force Ratings (6)

Induction Motor (5)

Physical Dimension (3)

Options (14)

IP Ratings (5)

Certifications (3)

Environment (3)

Feedback (2)

Group (1)

Drive Filters

Commonly Used (7)

Voltage & Phase (4)

IP Ratings (5)

Environment (3)

Options (4)

Certifications (19)

Controller (4)

Features (35)

>

Filter Solutions by Product Family

Drive Kinetix 6500 2094-BM02-M	View Torque Speed Curve Select						
Motor Stober EZM Motor EZM702WS_O	Profile Match	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current Utilization	Thermal Capacity
Gearbox	80.2%	\$\$\$\$\$	7.55	59.1%	8.84	57.6%	58.7%

Drive Kinetix 5500 2198-H040-ERSx	View Torque Speed Curve Select						
Motor VPL Motor VPL-B1306C-xxxxxx	Profile Match	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current Utilization	Thermal Capacity
Gearbox	79.6%	\$\$\$\$\$	9.43	86.3%	62.17	87.3%	79.4%

Drive Kinetix 5700 2198-D032-ERS3	View Torque Speed Curve Select						
Motor VPL Motor VPL-B1306C-xxxxxx	Profile Match	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current Utilization	Thermal Capacity
Gearbox	79.6%	\$\$\$\$\$	9.43	86.3%	62.17	87.3%	79.4%

Drive Kinetix 6500 2094-BM02-M	View Torque Speed Curve Select						
Motor Stober EZS Motor EZS702US_O	Profile Match	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current Utilization	Thermal Capacity
Gearbox	79.3%	\$\$\$\$\$	7.80	82.5%	19.75	84.4%	76.7%

Drive Kinetix 6500 2094-BM01-M	View Torque Speed Curve Select						
Motor Stober EZF Motor EZF505US_O	Profile Match	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current Utilization	Thermal Capacity
Gearbox	79.1%	\$\$\$\$\$	7.08	85.3%	18.79	78.6%	91.8%

- Click the **Expand** button next to Product Family Matrix.

SOLUTIONS LIST Viewing 1 - 10 of 35 < 1 2 3 4 > Sort by: Profile Match (%)

Clear Filters Note: Some solutions may have accessories added to meet your filter criteria.

Solution Filters

Filter Solutions by Product Family

Solution Filters (6) >

Motor Filters

Commonly Used (6) >

Torque/Force Ratings (6) >

Induction Motor (5) >

Physical Dimension (3) >

Options (14) >

Drive	Motor	Profile Match	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current Utilization	Thermal Capacity
Kinetix 6500 2094-BM02-M	Stober EZM Motor EZM702WS_O	80.2%	\$\$\$\$\$	7.55	59.1%	8.84	57.6%	58.7%
Kinetix 5500 2198-H040-ERSx	VPL Motor VPL-B1306C-xxxxxx							

View Torque Speed Curve Select

- Here you can view a table of all the drives and motors that fit the solution.

Note: Some solutions may have accessories added to meet your filter criteria.

By Drive Family and By Motor Family

	KINETIX 5500 SERVO DRIVE	KINETIX 5700 SERVO DRIVE	KINETIX 6000 SERVO DRIVE	KINETIX 6200 SERVO DRIVE	KINETIX 6500 SERVO DRIVE	KINETIX 700 SERVO DRIVE
EZF HOLLOW-BORE MOTOR	0	0	0	0	4	0
EZM HOLLOW-BORE MOTOR	0	0	0	0	4	0
EZS HOLLOW-BORE MOTOR	0	0	0	0	4	0
HPK-SERIES SERVO MOTORS	0	2	0	0	0	2
MP-SERIES LOW INERTIA SERVO MOTOR	0	0	0	0	0	1
RDD-SERIES DIRECT DRIVE	0	0	4	3	3	0
SX-SERIES EXPLOSION PROOF MOTOR	0	0	1	1	1	0
VP LOW INERTIA SERVO MOTOR	2	3	0	0	0	0

- Let's narrow the search results by selecting the Kinetix 5700 Servo Drive Family. Click on the **KINETIX 5700 SERVO DRIVE** heading in the Product Family table.

Note: Some solutions may have accessories added to meet your filter criteria.

Filter Solutions by Product Family	By Drive Family	and	By Motor Family		KINETIX 5500 SERVO DRIVE	KINETIX 5700 SERVO DRIVE	KINETIX 6000 SERVO DRIVE	KINETIX 6200 SERVO DRIVE	KINETIX 6500 SERVO DRIVE	KINETIX 7000 SERVO DRIVE
	EZF HOLLOW-BORE MOTOR				0	0	0	0	4	0
	EZM HOLLOW-BORE MOTOR				0	0	0	0	4	0
	EZS HOLLOW-BORE MOTOR				0	0	0	0	4	0
	HPK-SERIES SERVO MOTORS				0	2	0	0	0	2
	MP-SERIES LOW INERTIA SERVO MOTOR				0	0	0	0	0	1
	RDD-SERIES DIRECT DRIVE				0	0	4	3	3	0
	SX-SERIES EXPLOSION PROOF MOTOR				0	0	1	1	1	0
	VP LOW INERTIA SERVO MOTOR				2	3	0	0	0	0

- Collapse the Product List by clicking on the carrot for the list.

Note: Some solutions may have accessories added to meet your filter criteria.

Filter Solutions by Product Family	By Drive Family	and	By Motor Family		KINETIX 5500 SERVO DRIVE	KINETIX 5700 SERVO DRIVE	KINETIX 6000 SERVO DRIVE	KINETIX 6200 SERVO DRIVE	KINETIX 6500 SERVO DRIVE	KINETIX 7000 SERVO DRIVE
	EZF HOLLOW-BORE MOTOR				0	0	0	0	4	0
	EZM HOLLOW-BORE MOTOR				0	0	0	0	4	0
	EZS HOLLOW-BORE MOTOR				0	0	0	0	4	0
	HPK-SERIES SERVO MOTORS				0	2	0	0	0	2
	MP-SERIES LOW INERTIA SERVO MOTOR				0	0	0	0	0	1
	RDD-SERIES DIRECT DRIVE				0	0	4	3	3	0
	SX-SERIES EXPLOSION PROOF MOTOR				0	0	1	1	1	0
	VP LOW INERTIA SERVO MOTOR				2	3	0	0	0	0

8. Next, sort the solution list by **Bus Utilization** in the Sort by dropdown menu.

The screenshot shows the 'SOLUTIONS LIST' interface. At the top, it says 'Viewing 1 - 5 of 5' and 'Sort by: Choose Sort...'. The 'Sort by' dropdown menu is open, showing options: 'Choose Sort...', 'Profile Match (%)', 'List Price', 'Average Power', 'Bus Utilization' (highlighted), 'Winding Temp.', and 'Inertia Ratio'. A red arrow points to the 'Bus Utilization' option. Below the dropdown, there are filter sections: 'Solution Filters (6)', 'Motor Filters', 'Commonly Used (6)', 'Torque/Force Ratings (6)', 'Induction Motor (5)', 'Physical Dimension (3)', 'Options (14)', and 'IP Ratings (5)'. The main content area displays a table of solutions. The first solution is a 'Drive' (Kinetix 5700) and 'Motor' (VPL Motor) combination. The table shows various metrics: Profile Match (76.1%), Relative Price (\$\$\$\$), Average Current (9.43), Force Or Torque Utilization (87.8%), Inertia Ratio (62.17), Peak Current Utilization (87.3%), and Thermal Capacity (84.5%). A 'View Torque Speed Curve' button is visible. The second solution is also a 'Drive' and 'Motor' combination, with a 'View Torque Speed Curve' button and a 'Select' button.

Profile Match (%)	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current Utilization	Thermal Capacity
76.1%	\$\$\$\$	9.43	87.8%	62.17	87.3%	84.5%
79.6%	\$\$\$\$	9.43	86.3%	62.17	87.3%	79.4%

9. Select the first solution option as shown below by clicking the **Select** button next to that combination.

SOLUTIONS LIST

Viewing 1 - 5 of 5

Sort by: Bus Utilization

Clear Filters

Solution Filters

Solution Filters (6)

Motor Filters

Commonly Used (6)

Torque/Force Ratings (6)

Induction Motor (5)

Physical Dimension (3)

Options (14)

IP Ratings (5)

Certifications (3)

Environment (3)

Feedback (2)

Group (1)

Drive Filters

Commonly Used (7)

Voltage & Phase (4)

IP Ratings (5)

Environment (3)

Options (4)

Certifications (19)

Controller (4)

Features (35)

Note: Some solutions may have accessories added to meet your filter criteria.

> Filter Solutions by Product Family

Unable to calculate solutions for this axis.

Drive

Kinetix 5700 | 2198-D020-ERS3

View Torque Speed Curve

Select

Motor

VPL Motor | VPL-B1306C-xxxxxx

Profile Match

Relative Price

Average Current

Force Or Torque Utilization

Inertia Ratio

Peak Current Utilization

Thermal Capacity

76.1%

\$\$\$\$\$

9.43

87.8%

62.17

87.3%

84.5%

Drive

Kinetix 5700 | 2198-D032-ERS3

View Torque Speed Curve

Select

Motor

VPL Motor | VPL-B1306C-xxxxxx

Profile Match

Relative Price

Average Current

Force Or Torque Utilization

Inertia Ratio

Peak Current Utilization

Thermal Capacity

79.6%

\$\$\$\$\$

9.43

86.3%

62.17

87.3%

79.4%

Drive

Kinetix 5700 | 2198-D057-ERS3

View Torque Speed Curve

Select

Motor

VPL Motor | VPL-B1306C-xxxxxx

Profile Match

Relative Price

Average Current

Force Or Torque Utilization

Inertia Ratio

Peak Current Utilization

Thermal Capacity

74.3%

\$\$\$\$\$

9.43

86.3%

62.17

87.3%

79.4%

Drive

Kinetix 5700 | 2198-S086-ERS3

View Torque Speed Curve

Select

Motor

HPK-B1307C-xxxxxx | HPK-B1307C-xxxxxx

Profile Match

Relative Price

Average Current

Force Or Torque Utilization

Inertia Ratio

Peak Current Utilization

Thermal Capacity

71%

\$\$\$\$\$

24.78

9.9%

0.62

51.4%

46.7%

Drive

Kinetix 5700 | 2198-S130-ERS3

View Torque Speed Curve

Select

Motor

HPK-B1307C-xxxxxx | HPK-B1307C-xxxxxx

Profile Match

Relative Price

Average Current

Force Or Torque Utilization

Inertia Ratio

Peak Current Utilization

Thermal Capacity

69.6%

\$\$\$\$\$

24.78

9.9%

0.62

51.4%

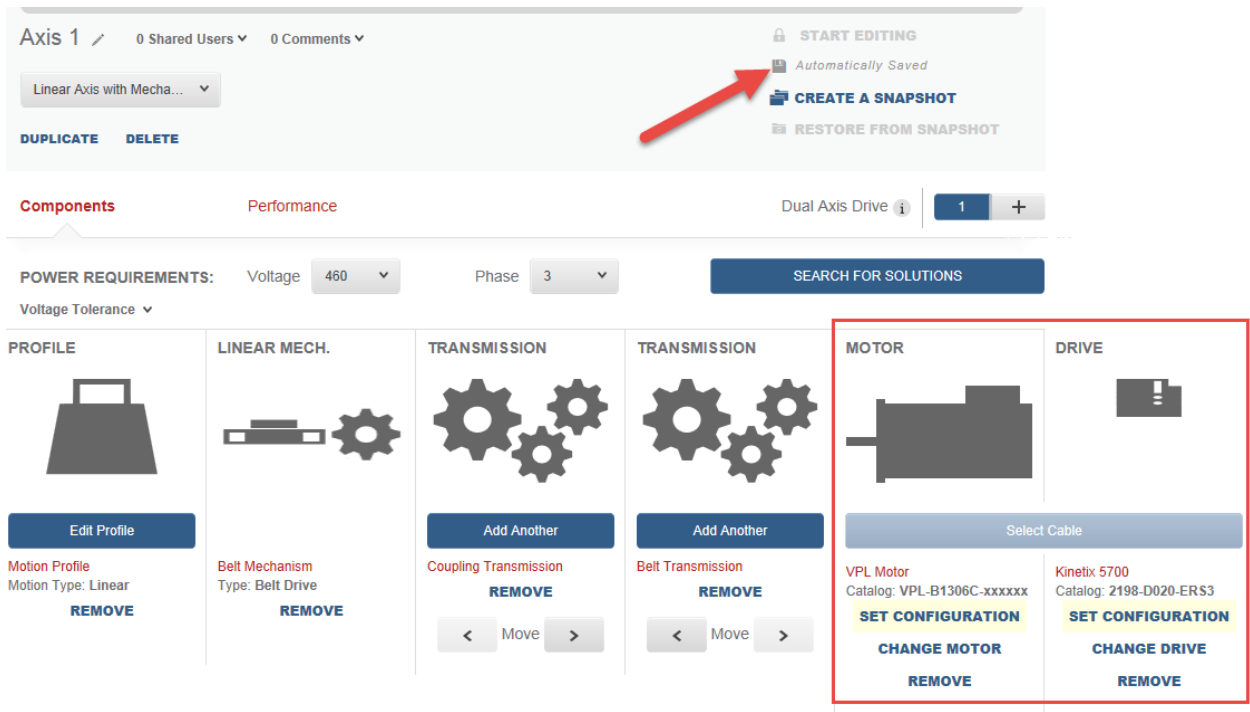
46.7%

Revision D

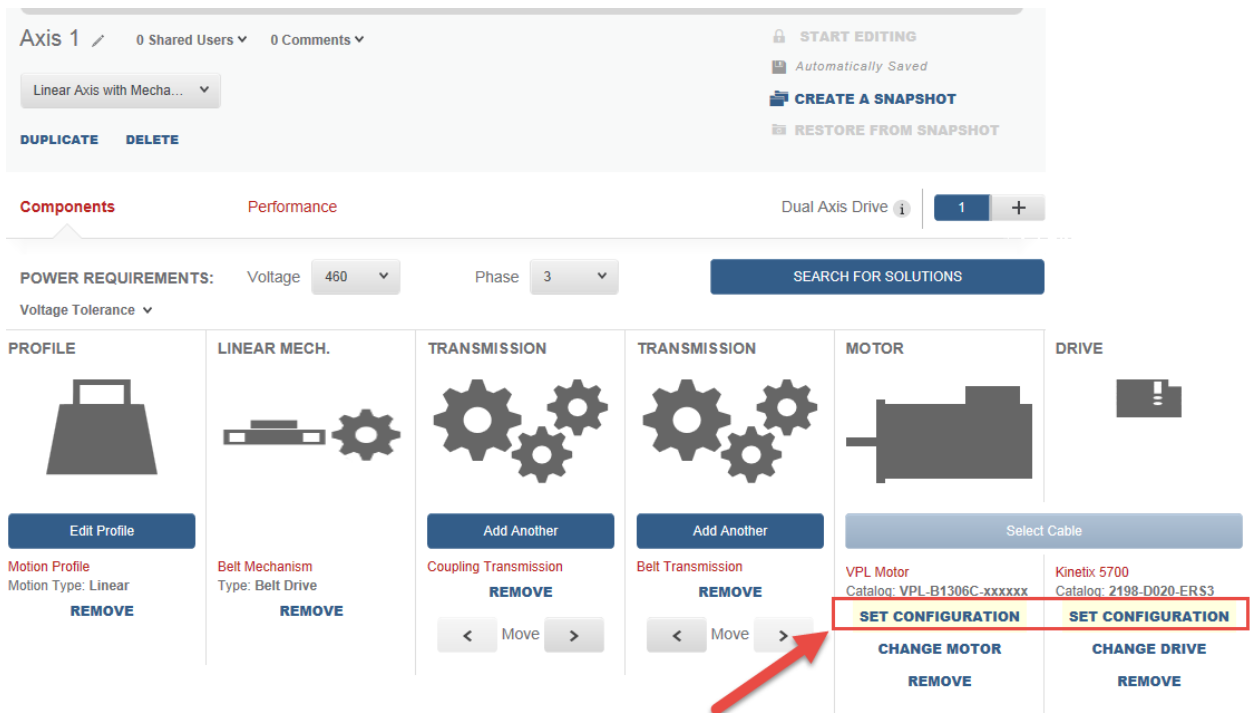
Page 94 of 113

2/8/2016

10. Notice how your selection is added to your project while the project is then automatically saved.



11. Next, we will select the configuration for the motor and drive. Click on the **Select Configuration** for the VPL motor.



12. The new page will display the product line and opens at the VP Low Inertia Servo Motor Configuration Selection page. Select the first option with no DC brake and the single-turn absolute feedback type.

🏠 \ Axis \ Motors \ 19

VP Low Inertia Servo Motor



Save Axis Go to Axis

SELECTION SUMMARY

Size Selected: **VPL Motor**

Configuration: **Not Selected**

Product Catalog No: **VPL-B1306C-xxxxxx**

Show Compatible Products

Learn More

0 Filters Applied [clear](#)

Commonly Used (4) >

Torque/Force Ratings (6) >

Induction Motor (5) >

Physical Dimension (2) >

Options (3) >

IP Ratings (1) >

Feedback (1) >

Base Product Info

Choose Size (1) ☒

Set Configuration ☒

Select a size to view configurations.

16 items (filtered from 16) < 1 2 3 4 >

SELECT A CONFIGURATION	VPL-B1306C-CJ12AA	VPL-B1306C-CJ12AS	VPL-B1306C-CJ14AA	VPL-B1306C-CJ14AS
FEATURES	SELECT	SELECT	SELECT	SELECT
Keyed Shaft	No	Yes	Yes	Yes
24V DC Brake	Yes	No	No	Yes
Shaft Seal	No	No	Yes	No
IP66	No	Yes	No	Yes
Catalog Number	VPL-B1306C-CJ12AA	VPL-B1306C-CJ12AS	VPL-B1306C-CJ14AA	VPL-B1306C-CJ14AS
Feedback Type	Single-Turn Absolute	Single-Turn Absolute	Single-Turn Absolute	Single-Turn Absolute
Weight (kg)	12.21	12.21	13.32	13.32
3D Model	View Model	View Model	View Model	View Model

13. Click the **Save Axis** button to set the configuration.

🏠 \ Axis \ Motors \ 19

VP Low Inertia Servo Motor



Save Axis **Go to Axis**

SELECTION SUMMARY

Size Selected: **VPL Motor**

Configuration: **VPL-B1306C-CJ12AS**

Product Catalog No: **VPL-B1306C-xxxxxx**

Show Compatible Products

Learn More

0 Filters Applied **clear**

Commonly Used (4) >

Torque/Force Ratings (6) >

Induction Motor (5) >

Physical Dimension (2) >

Options (3) >

IP Ratings (1) >

Feedback (1) >

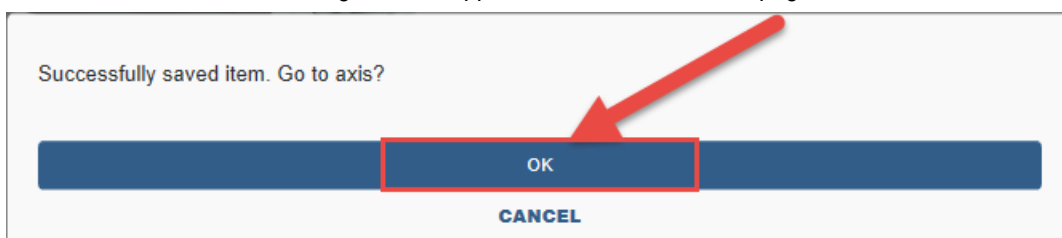
Base Product Info **Choose Size (1)** **Set Configuration** ✓

Select a size to view configurations.

16 items (filtered from 16) < 1 2 3 4 >

SELECT A CONFIGURATION	VPL-B1306C-CJ12AA	VPL-B1306C-CJ12AS	VPL-B1306C-CJ14AA	VPL-B1306C-CJ14AS
FEATURES	SELECT	SELECTED	SELECT	SELECT
Keyed Shaft	No	Yes	Yes	Yes
24V DC Brake	Yes	No	No	Yes
Shaft Seal	No	No	Yes	No

14. Click the **OK** button in the dialog box that appears to return to the Axis page.



15. Next, we will select the configuration for the Kinetix 5700 drive. Scroll to the right in the Components section of the page to see the options for the selected Drive. Then, click the **Select Configuration** button for the Kinetix 5700 drive.

POWER REQUIREMENTS: Voltage Phase [SEARCH FOR SOLUTIONS](#)

Voltage Tolerance ▾

PROFILE	LINEAR MECH.	TRANSMISSION	TRANSMISSION	MOTOR	DRIVE
					
Edit Profile		Add Another	Add Another	Select Cable	
Motion Profile Motion Type: Linear REMOVE	Belt Mechanism Type: Belt Drive REMOVE	Coupling Transmission REMOVE < Move >	Belt Transmission REMOVE < Move >	VPL Motor Catalog: VPL-B1306C-CJ12AS CHANGE CONFIGURATION CHANGE MOTOR REMOVE ADD ACCESSORY	Kinetix 5700 Catalog: 2409-D030-5062 SET CONFIGURATION CHANGE DRIVE REMOVE

16. Select the Dual Axis Inverter feature of the Kinetix 5700 drive, then click the **Save Axis** button to set the configuration.

Home \ Axis \ Drives \ 94

Kinetix 5700 Servo Drive



2 Save Axis Go to Axis

SELECTION SUMMARY

Size Selected:	Kinetix 5700
Configuration:	Not Selected
Product Catalog No:	2198-D020-ERS3

Show Compatible Products

0 Filters Applied [clear](#)

Commonly Used (4) >

Voltage & Phase (4) >

Base Product Info Choose Size (1) Set Configuration

Select a size to view configurations.

1 items (filtered from 1)

SELECT A CONFIGURATION

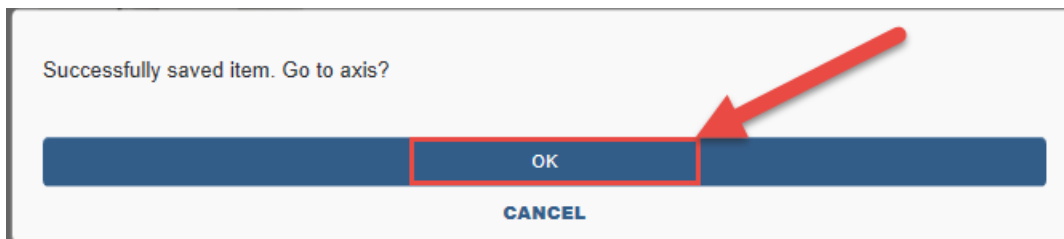
FEATURES

Drive Module Type	Dual Axis Inverter
3D Model i	View Model

1 2198-D020-ERS3

SELECT

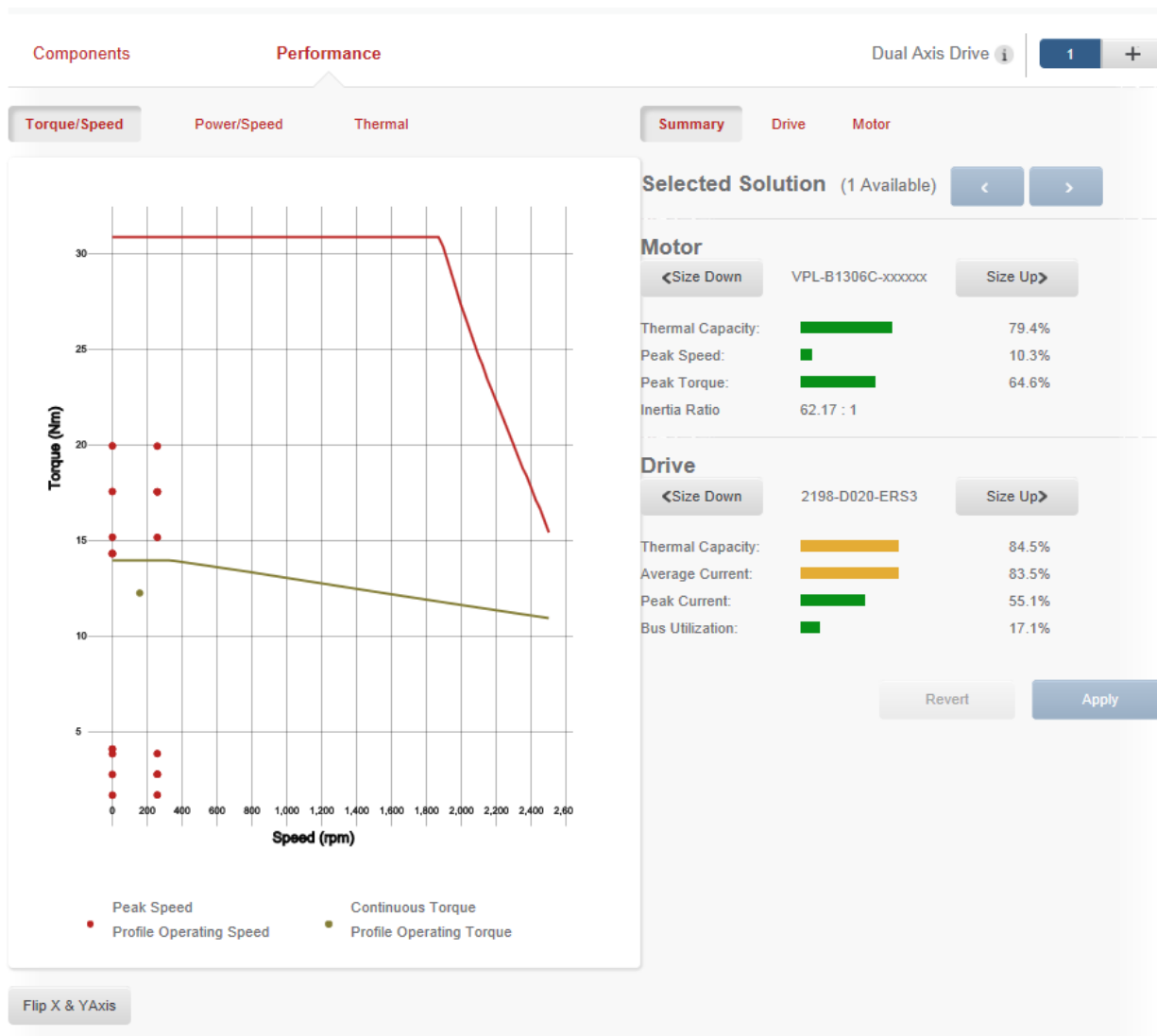
17. Click the **OK** button in the dialog box that appears to return to the Axis page.



18. Click on the **Performance** tab to see the performance curves for the solution you have selected.

The screenshot shows a software interface for configuring a mechanical system. At the top, there is a breadcrumb trail: **Library \ Vertical Lift Application \ Axis 1**. Below this is a large grey button labeled **CONTINUE TO PROJECT**. Underneath, the text **Axis 1** is followed by **0 Shared Users** and **0 Comments**. A dropdown menu shows **Linear Axis with Mecha...**. To the right, there are links for **START EDITING**, **Automatically Saved**, **CREATE A SNAPSHOT**, and **RESTORE FROM SNAPSHOT**. Below these are **DUPLICATE** and **DELETE** buttons. A red arrow points to the **Performance** tab in the **Components** section. The **Components** section also includes **Dual Axis Drive** and a counter showing **1** with a **+** button. Below the components section, there are **POWER REQUIREMENTS:** with **Voltage** set to **460** and **Phase** set to **3**, and a **SEARCH FOR SOLUTIONS** button. The main area is divided into six columns: **PROFILE**, **LINEAR MECH.**, **TRANSMISSION**, **TRANSMISSION**, **MOTOR**, and **DRIVE**. Each column contains an icon, a button, and a list of actions. The **PROFILE** column has a **Edit Profile** button and **Motion Profile** (Motion Type: Linear) with a **REMOVE** button. The **LINEAR MECH.** column has a **Belt Mechanism** (Type: Belt Drive) with a **REMOVE** button. The first **TRANSMISSION** column has an **Add Another** button, **Coupling Transmission**, a **REMOVE** button, and **Move** buttons. The second **TRANSMISSION** column has an **Add Another** button, **Belt Transmission**, a **REMOVE** button, and **Move** buttons. The **MOTOR** column has a **Select Cable** button, **VPL Motor** (Catalog: VPL-B1306C-CJ12AS), **CHANGE CONFIGURATION**, **CHANGE MOTOR**, **REMOVE**, and **ADD ACCESSORY** buttons. The **DRIVE** column has **Kinetix 5700** (Catalog: 2198-D020-ERS3), **CHANGE CONFIGURATION**, **CHANGE DRIVE**, **REMOVE**, and **ADD ACCESSORY** buttons.

19. The Performance page for the axis allows you to analyze the Torque/Speed, Power/Speed, and Thermal Performance plots for the solution you have selected.



NOTE: As you can notice, Motion Analyzer performed a simulation and provided results in regards to your selected solution. Given this notification on the drive side, you may select to size up your drive to provide the power necessary for your application.

20. Click **Size Up** on the Drive solution section.

Summary Drive Motor

Selected Solution (1 Available) < >

Motor

<Size Down VPL-B1306C-xxxxxx Size Up>

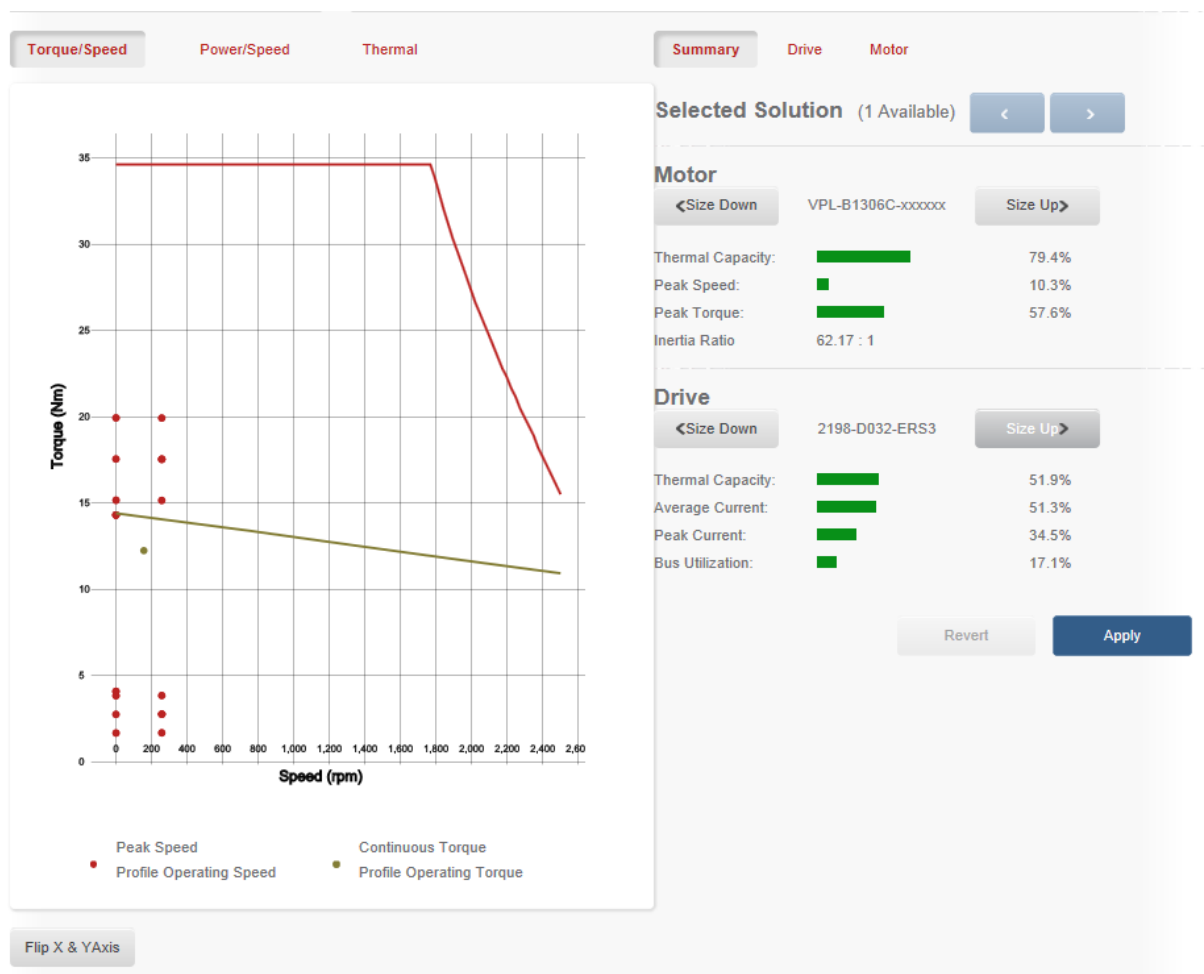
Thermal Capacity: 79.4%
Peak Speed: 10.3%
Peak Torque: 64.6%
Inertia Ratio: 62.17 : 1

Drive

<Size Down 2198-D020-ERS3 Size Up>

Thermal Capacity: 84.5%
Average Current: 83.5%
Peak Current: 55.1%
Bus Utilization: 17.1%

21. Your solution should now look as follows



22. Select **Apply** on the new solution and then select the **Duplicate** option to duplicate your axis.

Axis 1 0 Shared Users 0 Comments START EDITING
Automatically Saved
CREATE A SNAPSHOT
RESTORE FROM SNAPSHOT

DUPLICATE **DELETE**

2

Components Performance Dual Axis Drive 1 +

Torque/Speed Power/Speed Thermal Summary Drive Motor

Selected Solution (3 Available) < >

Motor
<Size Down VPL-B1306C-xxxxxx Size Up>

Thermal Capacity: 79.4%
Peak Speed: 10.3%
Peak Torque: 57.6%
Inertia Ratio: 62.17 : 1

Drive
<Size Down 2198-D032-ERS3 Size Up>

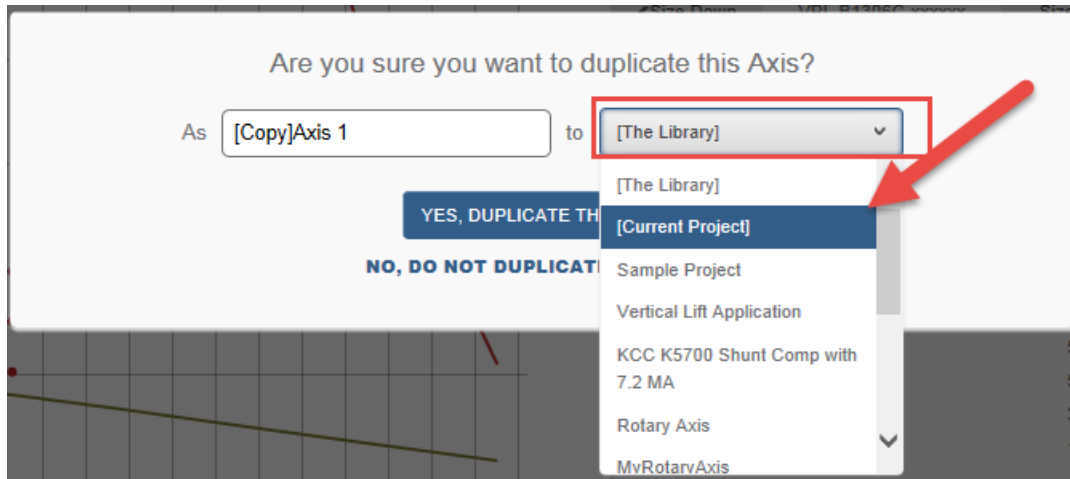
Thermal Capacity: 51.9%
Average Current: 51.3%
Peak Current: 34.5%
Bus Utilization: 17.1%

1

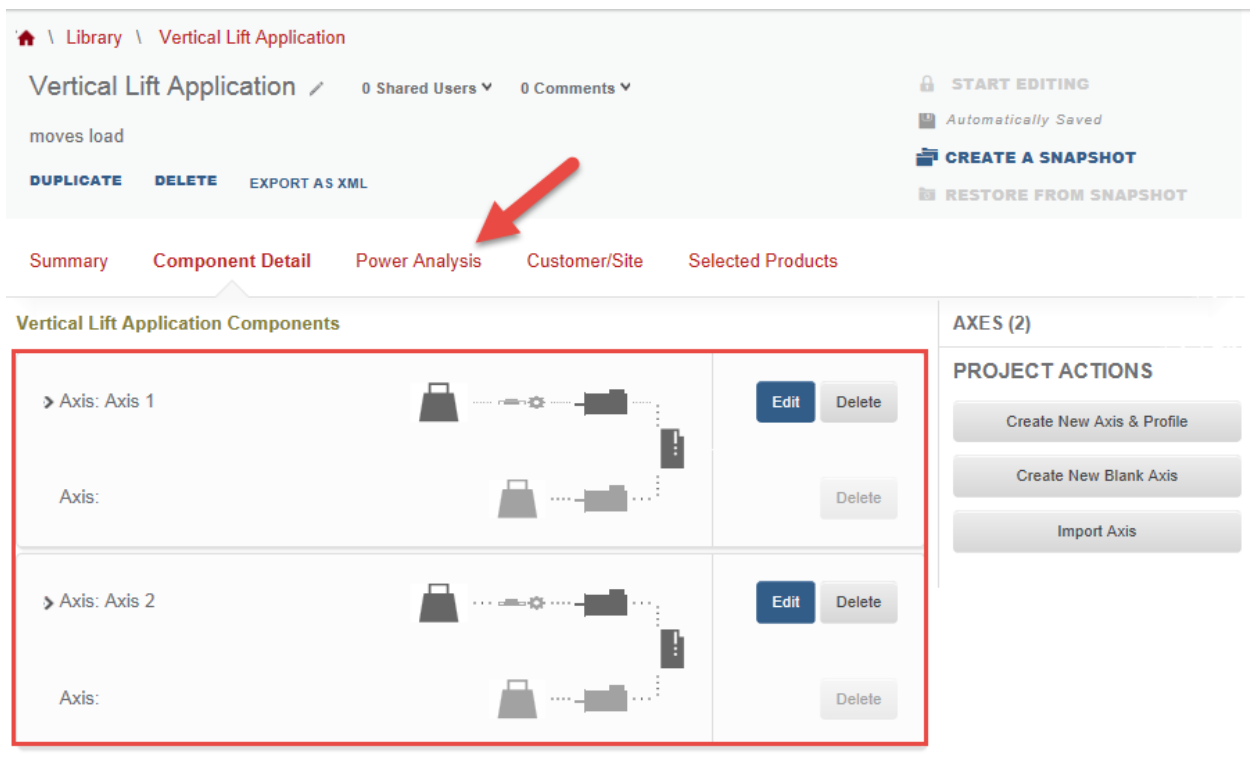
Revert **Apply**

Flip X & Y Axis

23. You will then be asked for a location for your duplicated axis. Select **[Current Project]**. Rename the new copy of the axis to Axis 2. Then select **Yes, Duplicate this Axis**.



24. Duplicating the axis will send you to the Component Detail page where you will see each created/copied axis. Click on the **Power Analysis** tab for the application.



25. The Power Analysis page includes information on power and bus utilization. Select **Auto Configure** option to see your DC bus Voltage Utilization.

Vertical Lift Application | 0 Shared Users | 0 Comments | [START EDITING](#) | [Automatically Saved](#) | [CREATE A SNAPSHOT](#) | [RESTORE FROM SNAPSHOT](#)

[Summary](#) | [Component Detail](#) | **[Power Analysis](#)** | [Customer/Site](#) | [Selected Products](#)

CHOOSE AN ITEM TO VIEW

- Axis 1 /**
Kinetix 5700
[Share](#)
- Axis 2 /**
Kinetix 5700
[Share](#)

OTHER REQUIREMENTS

Please click Auto Configure to add the following (products/accessories) to your system.

Kinetix 5700 platform must have a power supply.

SELECTED AXIS DETAIL

Average Power Usage	0.00 kW
Average Motoring Power	0.00 kW
Average Regen Power	0.00 kW
DC Bus Voltage Utilization	0%

SET POWER SUPPLY, SHUNT, AND CAPACITORS

Configures Axis power options based on Axis components and manual/automatic selections below. This does not overwrite manual selections.

[Auto Configure](#)

Power Supply ⓘ [Auto](#) [Manual](#)

Continuous Converter Utilization	0%
Peak Power Utilization	0%

POWER ANALYSIS GRAPH

Seconds ▼ 250 00:375 00:500 00:625 00:750 00:875 01:000 01:125 01:000

DC BUS VOLTS

Timeline Adjustment: - +

26. Repeat Step 25 once you select Axis 2 in your *Choose An Item To View* section. Your Selected Axis Detail should have the same calculation results as Axis 1.
27. Once done checking your utilization results, select the **Share** option to share the axes to a common bus.

Vertical Lift Application

moves load

Duplicate Delete Export As XML

START EDITING

Automatically Saved

CREATE A SNAPSHOT

RESTORE FROM SNAPSHOT

Summary Component Detail **Power Analysis** Customer/Site Selected Products

Total Axes (2) Shared Buses (0) Standalone Axes (2)

CHOOSE AN ITEM TO VIEW

Axis 1 /
Kinetix 5700
Share

Axis 2 /
Kinetix 5700
Share

SELECTED AXIS DETAIL

Average Power Usage	0.30 kW
Average Motoring Power	0.56 kW
Average Regen Power	0.05 kW
DC Bus Voltage Utilization	71%
DC Bus Rms Current Utilization	0%
DC Bus Peak Current Utilization	0%
Cable Length Utilization	0%

SET POWER SUPPLY, SHUNT, AND CAPACITORS

Configures Axis power options based on Axis components and manual/automatic selections below. This does not overwrite manual selections.

Auto Configure

Power Supply *i* Auto Manual

POWER ANALYSIS GRAPH

Seconds 500 02:250 03:000 03:750 04:500 05:250 06:000 06:750 07:000

DC BUS VOLTS

Timeline Adjustment: - +

28. Click on the **Add to Group** option and select the *Share Control Power* tab then **Save**.

[KINETIX 5700 SERVO DRIVE] SET DC BUS SHARING

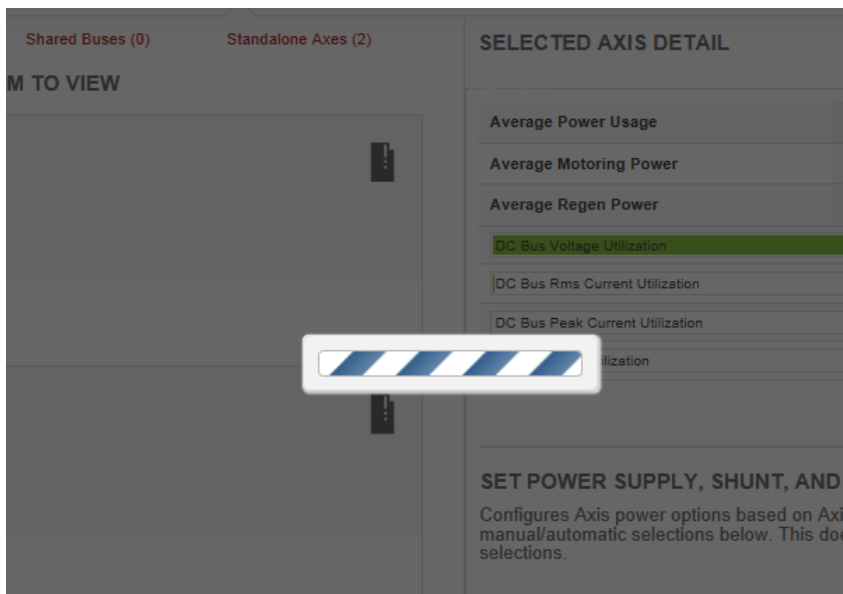
☐ Share Control Power **Add Cluster**

Axis 1 / [2198-D032-ERS3]

Axis 2 / [2198-D032-ERS3] **Add to Group**

Cancel **Save**

29. Your axes are now combined into a common bus and common control power. Motion Analyzer simulates these new calculations and provides updated results.



30. You can now view accurate data from the **Selected Shared DC Bus Detail** section. Sharing your DC bus is reflected in the new calculations of your DC Bus Voltage Utilization.

The screenshot shows the 'Vertical Lift Application' interface. At the top, there's a header with 'Library \ Vertical Lift Application', 'Vertical Lift Application' title, '0 Shared Users', '0 Comments', and buttons for 'START EDITING', 'Automatically Saved', 'CREATE A SNAPSHOT', and 'RESTORE FROM SNAPSHOT'. Below the header are tabs: 'Summary', 'Component Detail', 'Power Analysis' (selected), 'Customer/Site', and 'Selected Products'. Under 'Power Analysis', there are sub-tabs: 'Total Axes (2)', 'Shared Buses (1)', and 'Standalone Axes (0)'. The 'Shared Buses (1)' tab is active, showing a list of axes: 'Axis 1 /', 'Axis 2 /', and 'Kinetix 5700'. An 'Edit Shared Bus' button is visible. The 'SELECTED SHARED DC BUS DETAIL' section is highlighted with a red box. It contains a table with the following data:

Metric	Value
Average Power Usage	0.30 kW
Average Motoring Power	0.56 kW
Average Regen Power	0.05 kW
DC Bus Voltage Utilization	78%
DC Bus Rms Current Utilization	1%
DC Bus Peak Current Utilization	0%
Cable Length Utilization	0%

Below the table is a section titled 'SET POWER SUPPLY, SHUNT, AND CAPACITORS' with a description: 'Configures Axis power options based on Axis components and manual/automatic selections below. This does not overwrite manual selections.' There is an 'Auto Configure' button. At the bottom, there's a 'Power Supply' section with an 'Auto' button and a 'Manual' button.

31. Scroll down the **Selected Shared DC Bus Detail** to view the rest of your calculations

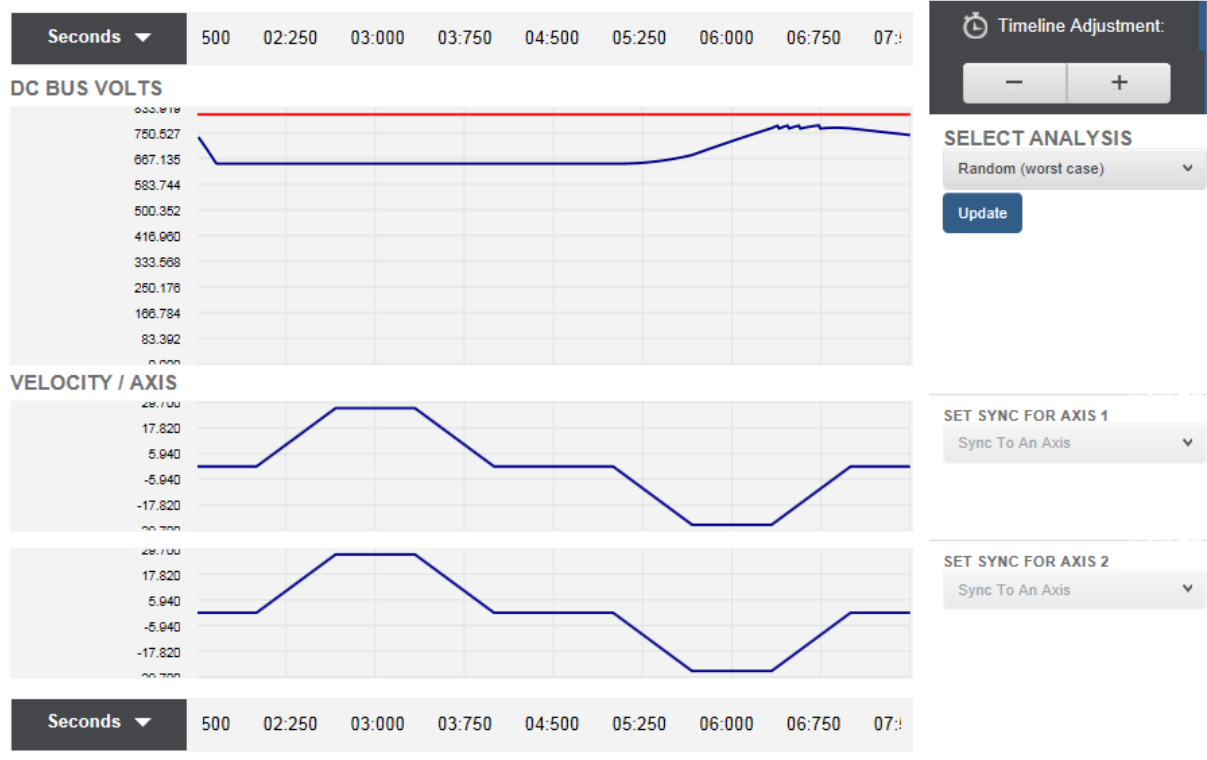
The screenshot shows the 'Selected Shared DC Bus Detail' section, specifically the 'Power Supply', 'Shunt', and 'Capacitor' calculations. The 'Power Supply' section is highlighted with a red box. It shows the 'Power Supply' dropdown set to '2198-P031'. Below it are two rows of utilization data:

Metric	Value
Continuous Converter Utilization	9%
Peak Power Utilization	11%

The 'Shunt' section is below, with a 'Shunt' dropdown set to 'Auto'. It shows 'Continuous Shunt Utilization' at 10%. The 'Capacitor' section is at the bottom, with a 'Capacitor' dropdown set to 'Auto'.

32. You can also review your *Power Analysis Graph* by scrolling through the Application page.

POWER ANALYSIS GRAPH

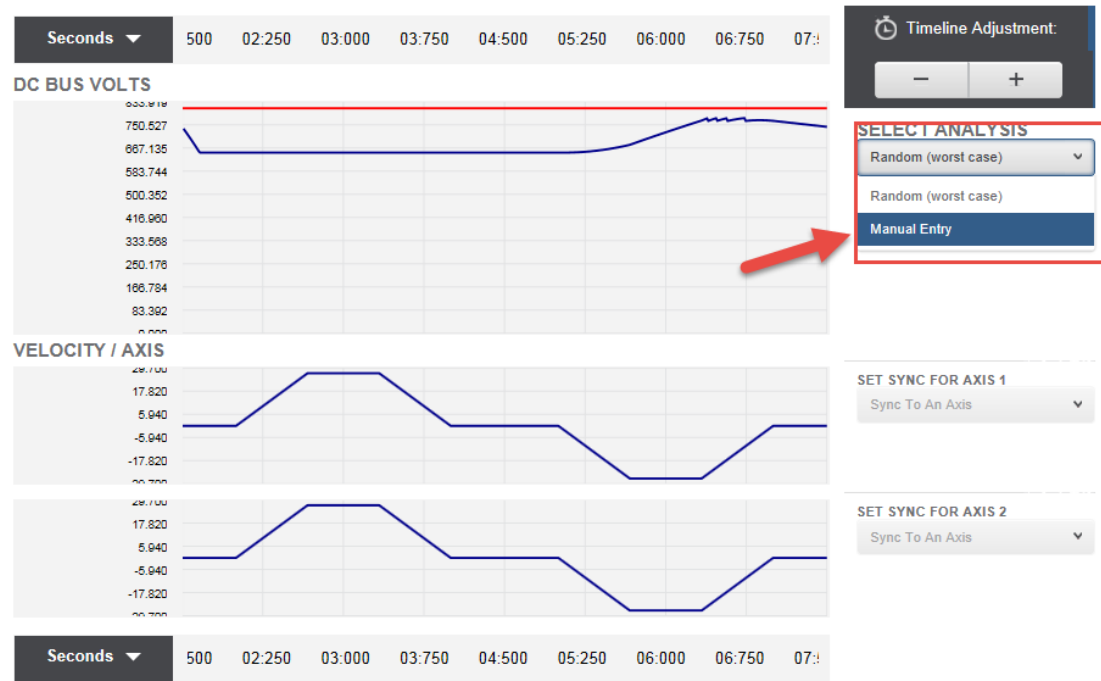


NOTE: For this application, the Shunt Utilization is within the acceptable range, so there is no need to add additional shunts or capacitor modules.

Extra:

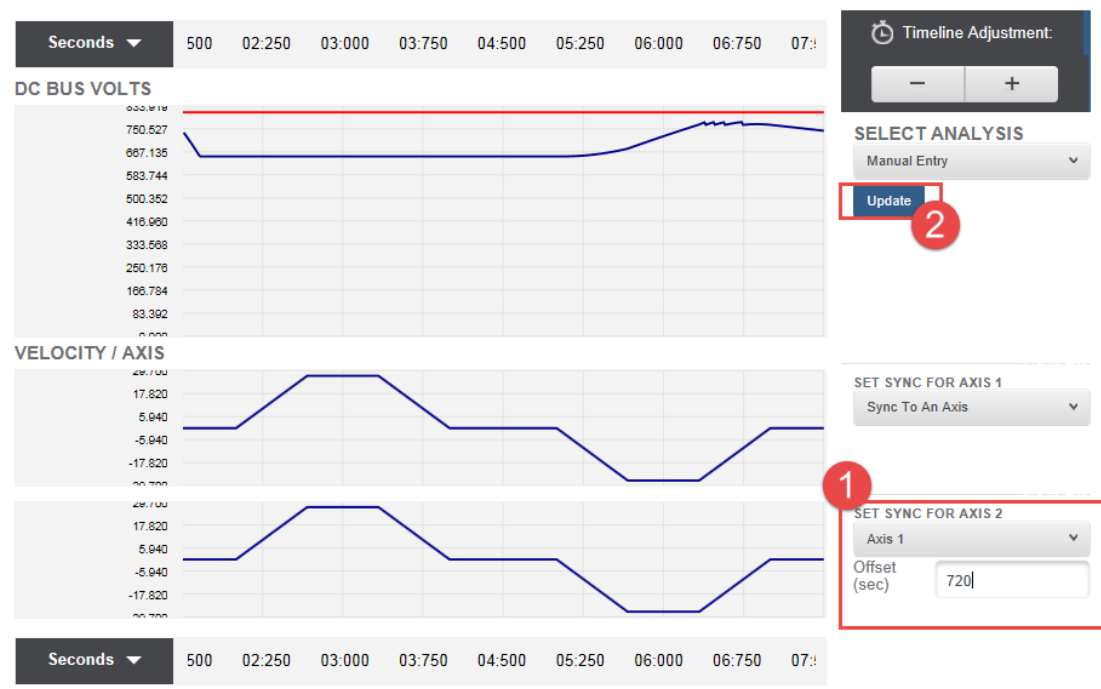
1. In your *Power Analysis Graph*, you can select to sync your axis by selecting Manual Entry from the *Select Analysis* dropdown.

POWER ANALYSIS GRAPH



2. Set Axis 2 to a 720 sec offset to Axis 1. Then select Update to view the recalculated values of your *Selected Shared DC Bus Detail*.

POWER ANALYSIS GRAPH



This completes the Motion Analyzer Lab.

Notes:

www.rockwellautomation.com

Power, Control and Information Solutions Headquarters

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