# Sizing & Selecting Drive/Motor Solutions Using Motion Analyzer Online Tool



For Classroom Use Only!





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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 hazardavoid 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.



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

# Sizing & Selecting Drive/Motor Solutions Using Motion Analyzer Online Tool Size

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# **Before You Begin**

### About this lab

With advancement in the cloud platform and demand of accessibility, Motion Analyzer was re-introduced as a web-based platform to enable engineers to easily share, access, and store information via the cloud. A user with a Motion Analyzer online account can create new applications, access existing application data, share sizing information, or simply browse for drive or motor product information.

By offering a broad range of functionality, Motion Analyzer online tool helps you evaluate your options earlier in the design process, expands your options to find the best solution, provides the latest offerings from Rockwell Automation and our PartnerNetwork<sup>™</sup>, optimizes ramp up time, and ultimately helps you build a better machine.

In this lab, we will explore an application popular among motion specialists and distributors. The goal of the lab is to help you understand how to use the online tool to size a drive system with Direct Front Ends and Dual Axis Inverters.

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

### **Pick and Place Application**

The Pick and Place machine below accepts packages at random, stages packages to be picked up from assembly and places packages into a case on a synchronized product belt before cases are taken away for shipment.



Figure 1: Pick & Place machine

# **Customer Briefing**

The ABC Foods Company has Pick and Place machines that are exactly like the machine in the above example. The company is going green and has been working with OEM Packenship to make their machines more energy efficient. ABC Foods is also making a huge commitment to remove all safety relays and older model VFDs from their control panels and to integrate all motion control over Ethernet using a **GuardLogix Controller**; so, Packenship is eager to propose an upgrade for the original Allen Bradley control system on the first machine installed at ABC Foods. Unfortunately, Packenship engineers cannot agree on which drives to use for a complete CIP Motion Solution. Luckily, you happen to stop by Packenship and here's what you found out:

The original Allen Bradley control systems at ABC Foods include L63 CPUs and 8-axis SERCOS modules used to control Kinetix 6000 drives. Packenship has an inventory of L72S GuardLogix controllers and they are certain ABC Foods will agree to purchase a complete set of L72S GuardLogix controllers and EN2TR Ethernet modules along with Safety I/O modules for every machine. *ABC Foods attended Automation Fair to learn about CIP Safety Drives and wants to take advantage of this new technology.* Packenship is certain that ABC Foods will want to replace the older model servomotors and asynchronous motors used on their belt actuators and conveyors. *ABC Foods is using Wittenstein Alpha SP+ gearheads for the original smartbelt design and prefer to use them if still necessary.* 

Packenship engineers realize this application needs servo drives that can support more than 3kW and that it does not need a Safety Drive like the Kinetix 6500; so, the Kinetix 5500 does appear to be the right drive for the job. After all, it is a more efficient drive and it can even control the induction motors on the two outer conveyors. Packenship is certain that ABC Foods will want to replace the older model servomotors and asynchronous motors used on their belt actuators and conveyors, especially after hearing about how VP-series motors are designed to be more energy efficient.

The problem is, Packenship engineers heard about plans for a new Kinetix 5700 dual-axis inverter drive that can support both VP and MP series motors without the need for a Hiperface converter and began debating the Kinetix 5500 drive cannot support the MP-series Actuators without adding a Hiperface Converter for each lead screw actuator.

One Packenship engineer suggested that using a Kinetix 5500 for all 7 axes might take up more room than (1) Kinetix 5700 DFE Module and (4) Dual-axis inverter modules while another engineer argued that the existing panel space is not an issue since they used to have Kinetix 6000 drives and older model VFDs in their system.

Still another Packenship engineer pointed out, "At least ABC Foods doesn't have a need for a hard-wired auxiliary encoder; otherwise, they would not be able to use the Kinetix 5500".

### Objectives

You've received a call from one of the OEM Packenship engineers. The engineer shares the information with you and asked for your thoughts. After reviewing the customer requirements, you figured the Kinetix 5700 will be the most efficient solution for the application.

You are meeting with your OEM Packenship contact, and you suggested to use Motion Analyzer online tool. The engineer is more familiar with Motion Analyzer desktop tool, however the desktop tool does not offer the latest and greatest from Rockwell Automation and the encompass partners. Using your diplomatic skills, you convinced the distributor to work with you to model the application on Motion Analyzer online tool. You would be able to determine if the application requires more than 15kW for any axis. After all, if the Kinetix 5500 and Kinetix 5700 do come up as adequate drive solutions, one still needs to consider other costs (e.g. Drive hardware, installation/labor, cables and accessories, etc.) as you optimize a final drive/motor solution.

## **General Requirements**

Motion Analyzer online supports many filters to eliminate incompatible products from drive/motor solutions; so be sure to utilize the following data to optimize your search:

- Plant operates at 460Vac with an ambient temp of 30 degrees (C)
- GuardLogix L72S Controllers are used for Machine Safety
- All Motion Control must be over *EtherNet/IP* and use *CIP Safety*
- Servo Drives and Motors must be more energy efficient

#### **Belt Actuator Requirements**

#### Assembly Index Belt - for each Assembly Index belt axis:

- Package weight <1.5kg, and two packages at a time = 3kg total</p>
- Belt Weight = .7 kg
- Drive Rolls, Quantity (2):
  - 100mm diameter (about 4")
  - 600mm long (about 24")
  - Rolled Steel
- Motor Coupling Moment of Inertia = 2.6g-cm<sup>2</sup>
- Move 250mm (about 10") in 1 sec. and dwell for 1 sec.

#### Product Index Belt

In this section of the exercise, you will use the axis data from the Assembly Index Belts as the starting point for sizing this axis, but be sure to enter the differences below:

- Package weight <1.5kg, and four packages per case x 3 cases = 18kg total
- Belt Weight = 2 kg
- Move 250mm (about 10") in 1 sec. and dwell for 2 sec.

### Lead Screw Actuator Requirements

#### Horizontal Lead Screw Axis Setup Data:

- Package weight to be moved < 3 kg</li>
- Total Slide Mass (Includes Mass of Vertical Axis) = 45 kg
- Coefficient of Friction = 0.01 (= 1%)
- Lead Screw Specification:
  - Lead = 25 mm/rev
  - Length = 1200 mm
  - Diameter = 25 mm
  - Material = Steel
  - Efficiency = 90%
- Motor Coupling Moment of Inertia = 2.6g-cm<sup>2</sup>
   Bi-directional move of 600 mm in 6 seconds overall. See profile drawing.

Extend 600 mm in 2 seconds	Dwell for 1 second		Dwell for 1 second
		Retracts 600 mm in 2 seconds	

The move profile is described as "extending the horizontal actuator to transfer packages to the **Product Index Belt**, pausing for 1 second to complete the drop off, retracting the actuator back to the **Assembly Index Belt** and pausing for 1 second to pick up the next product."

### Vertical Lead Screw Axis Setup Data:

In this section of the exercise, you will use the axis data from the horizontal lead screw as the starting point for sizing the vertical lead screw axis, but be sure to enter the differences below:

- Total Slide Mass = 25 kg (including fixtures and product grippers)
- Bi-directional move of 300 mm in 6 secs overall. See profile drawing.

Lower 300 mm in 2 seconds	Dwell for 1 second		Dwell 1 sec	for
		Raise 300 mm in 2 seconds		

The move profile is described as a Lower/Raise cycle which must occur at each end of the horizontal lead screw for

- Picking up packages from the Assembly Index Belt, remaining raised while the horizontal actuator finishes its move to a location over the Product Index Belt
- Placing packages into a case, remaining raised while the horizontal actuator finishes its move back to the start location over the Assembly Index Belt

Note: In an effort to use the worst case profile, the dwells in the above profile do not include the time for the horizontal actuator movements.

#### **Constant Speed Conveyor Requirements**

#### Infeed Conveyor Axis Setup Data:

- Package weight <1.5kg, up to two packages at a time = 3kg total
- Belt Weight = .7 kg
- Drive Rolls, Quantity (2):
  - 100mm diameter (about 4")
  - 600mm long (about 24")
  - Rolled Steel
- Motor Coupling Moment of Inertia = 2.6g-cm<sup>2</sup>
- Move at a constant velocity near < 250mm/sec.</li>

#### Takeaway Conveyor Axis Setup Data:

In this section of the exercise, you will use the axis data from the Infeed Conveyor as the starting point for sizing this axis, but be sure to enter the differences below:

- Package weight <1.5kg, and 4 packages per case x 3 cases = 18kg total</p>
- Belt Weight = 2 kg
- Move at a constant velocity < 300mm/sec.</li>

# **Tools & Prerequisites**

The following are required to complete the exercises:

- Internet Explorer web browser
- > Valid Motion Analyzer online user credentials to access the website

### Login to the Motion Analyzer Website

Motion Analyzer online tool requires a valid account for full access to the features of the tool. 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, the link will take you to an unavailable webpage.

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

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

# Partitioning the Machine

You've visited ABC Foods facility with the OEM Packenship engineer. You were able to see the machine run and you documented it in the picture below:



Figure 2: Pick & Place machine

You've partitioned the application into 3 sections with a total of 7 axes.

Section 1: Belt Actuator

Part A: Assembly Index Belt 1

Part B: Assembly Index Belt 2

Part C: Product Index Belt

Section 2: Lead Screw Actuator

Part A: Horizontal Lead Screw Axis

Part B: Vertical Lead Screw Axis

Section 3: Constant Speed Conveyor

Part A: Infeed Conveyor Axis

Part B: Takeaway Conveyor Axis

At this point, we will begin to create our project and size our application.

## **Motion Profile**

When you have logged into Motion Analyzer, you can see the following:



The current view offers you access to your project library in

So what is available from the Home page? On the next page, we will describe the navigation buttons and Link sections that are available on the Home page.



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Home Button: is accessible from any point within the tool and will bring you back to this home view.

<u>Products Button</u>: takes you to the Browse Product page where you can view drives, motors, iTrak, linear Actuators, linear mechanisms, and gearboxes. You can select to browse any family of products from Rockwell Automation and from our Encompass Partners.

<u>Library Button</u>: takes you to your projects list where you can view the projects by name, last modified or date created, owner, shared status, and actions (share, duplicate, or delete).

<u>Tools Button</u>: provides the Compatibility Browser, to quickly find compatible product combinations; Inertia Calculator, to find the inertia of an object based on size and material; Common Bus Estimator, for guidelines, considerations, and limitation for the proper application of drives used in common bus configurations; and cable selector, to select cables.

**Support Button:** provides support topics ranging from Library object descriptions, benefits and security of the cloud, lab resources and tutorials, calculation changes, updates information, etc...

<u>User Profile</u>: displays the email used to login. You can click on the dropdown arrow to View Profile, Manage Sharing, and Logout.

Notifications Quick View Button: similar to "See All Notifications", provides a quick view of the number of notifications.

<u>Search Toolbar</u>: provides a faster search for specific products.

Start A New Project Button: start building your system profile using this button

View Current Projects: takes you to your projects library

Browse Product: select a product to view detailed information or compare between product families

Latest News: post section for released noted, changes to features, and updates news

Links: portals to Allen Bradley website, Rockwell Automation website, and Rockwell Automation Literature library

**NOTE:** For more details on Navigation, please review the Motion Analyzer Online Tool Navigation Guide found in the Support page of the online tool under Additional Resources.

#### **Belt Actuator**

#### Part A: Assembly Index Belt 1

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



Legal Notices - Privacy & Cookies Policy © 2016 - Rockwell Automation, Inc. All Rights Reserved. 2. In **Create A Project** dialog box, you will enter a name for *Project Name* and a description (optional) in the *Project Description* input box, and click the **Create Project** button.

CREATE A PRO	DJECT
New Blank Project	Import Project XML
Project Name:	Pick n Place Application
Project Description:	This machine accepts packages at random, stages packages to be picked up from assembly and places packages into a case on a synchronized product belt before cases are taken away for shipment
	Cancel Create Project

3. Enter customer data in the Customer Information section and fill the Site section of this lab. The Ambient Temp can be entered at this point. Click the **Go to project** button.

CREATE A PR	OJECT		
New Blank Project	Import Project XML		
Project Name:	Pick n Place Application		
Project Description:	This machine accepts packages at random, sta case on a synchronized product belt before cas	ges packages to be pions are taken away for	cked up from assembly and places packages into a shipment
CUSTOMER INF	ORMATION	SITE	
Client	ABC Foods	Altitude (above sealevel)	0 m
Contact	OEM Packenship	Ambient Temp.	30  oC
E-mail	OEMPackenship@OEM.com		
Phone	Phone Number		
USE			
Industry	Enter an Industry Tag Add		
Application	Enter an Application Tag Add		
			Cancel Go to project

**NOTE:** In the Use section, you can enter filters in the *Industry and Application* tabs by entering the information and clicking *Add.* You then will be able to filter your Library by industry and application specific projects.

4. The Project Detail page will appear. Click the Create New Axis & Profile button in the Project Actions section.



**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."

**NOTE:** The blue higlighted section shows quick access links to home\Library\Name of Project. At any point in the lab, you can go to the Home page, Library, or Component details page of your project. Make sure to Save your project when needed.

♠ \ Library \ Pick n Place Application

Pick n Place Application /

0 Shared Users Y 0 Comments Y

5. The Belt Actuator axes are linear axes with mechanism types. 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 dropdown list and click the OK button.

SELECT MOTION TYPE				
Choose an option.	×			
Choose an option.				
Rotary Axis				
Linear Axis with Mechanism				
Linear Axis				

6. Select Weight from the Initial Load dropdown list.

I	INITIAL LOAD	
	Enter Name	
	Select a load type 🗸 🗸	
	Select a load type	
	Weight	
Í	Force	
	Friction Coefficient	

7. The Assembly Index Belt is moving up to two packages at a time. Each packages is 1.5 kg, therefore our load mass is 3 kg. The belt weight will be entered at a different section.

Enter "Assembly" for the name of the load. Since the profile starts with the load on the conveyor, enter "3" kilograms as the initial point, and click the Submit button

INITIAL LOAD	INITIAL POINT	
Assembly Weight 🗸	LOAD MASS	3
·		

#### **Defining a Motion Profile**

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



Since the Assembly Index Belt axis is running for 250 mm for 1 second then dwelling for 1 second. We have two segments in our position profile. Let's look at how to enter this information into the Profile page in Motion Analyzer.

A I	\Library \Pic	k n Pla	ce Applicat	ion \ Axis	s1 ∖ Mot	ion Profile								
						CONT	INUE TO	AXIS						
М	lotion Profile	e /			0 Shared	d Users ¥	0 Commer	nts ¥				START	EDITING	s
DU	JPLICATE DEI	ETE.	IMPORT P	ROFILE	EXPORT PR	ROFILE C	LEAR PROFI	LE						
N	leed help buildin	g a pro	file? Click I	nere for mo	re informa	tion								
[	Graph View	Та	ble View				I	🕎 Add Wind	ier 😭	Add Load	<b>≮</b> Add Po	vint	Scale 🗸	
					l	nclination	0		Ö Tir	meline Adjı	ustment:		+	
9	Seconds 🔻	000	00.500	01.000	01.500	02.000	02.500	03.000	03.500	04.000	04.500	05.000	05.500	06.
😥 Assembly <	65.000 48.800 38.000 23.400 10.200 3.600 10.200 3.600 8.800 10.200 3.600 8.800 10.200 8.800 10.200 8.800 10.200 8.800 10.2000 10.2000000 10.2000 10.20000000000													
9	Seconds 🔻	000	00.500	01.000	01.500	02.000	02.500	03.000	03.500	04.000	04.500	05.000	05.500	06.
🔎 Position <	68.400 49.800 38.600 33.000 18.800 19.200 10.200 3.000 10.200 3.000													

**NOTE:** Your highlighted page navigation links can now direct you to Home\Library\Component Detail\Axis properties\Motion Profile.

1. To enter a position profile data point, click anywhere on the **Position Plot**. The Add a Segment dialog box will appear at the Acceleration option.

ADD A SEGMENT						
	ATION		$\checkmark$	CAM		
Data Depiction Specify motion po	i int values. In	itial numbers may be based o	n click activity			
	previous point	<ul> <li>incremental</li> </ul>	<ul> <li>absolute</li> </ul>			
Time	0	281	281	ms		
Distance	0	26.643	26.643	m		
Velocity	0	189629.8932	189629.8932	mm/s		
Average Acceleration	0	0	0	$m/s^2$		
Jerk		50		%		
				CANCEL Submit		

2. Our first segment is an Index move. Click Index to add the index segment.

	ADD A SEGMENT	Сам
Data Depiction Specify motion point values. Initial numbers may	be based on click activity	

3. When selected, the Index segment will automatically preselect a Trapezoidal Index Segment.

	ADD A SEGMENT		e e
ACCELERATION		Сам	
	AR TRAPEZOIDAL		

4. With the **Absolute** entry method selected, change the units of *Time* to **s** and *Distance* to **mm**. Replace the pre-selected time value with "1" and the pre-selected distance value with "250".

		ADD	A SEGMENT	
ACCEL	ERATION		$\checkmark$	САМ
	$\wedge$		TRAPEZOIDAL	
Data Depicti	on			
Specify index s	egmnt values	s. Initial numbers may be bas	ed on click activity.	
	previou point	s O incremental	absolute	1
Time	0	1	1	s
Distance	0	250	250	mm
Final Velocity	0	0		m/s
			2	_
Jerk		acceleration	deceleration	
		0	0	% of time
(i)				
Absolute Velocity Limit		Specify Limit	0	m/s

5. Before clicking **Submit**, we will add an accel/decal *Jerk* for a smoother acceleration and deceleration profile. Enter 50 for both *acceleration* and *deceleration*.

Jerk	acceleration	deceleration	
	50	50	% of time
			1
1			
Absolute Velocity Limit	Specify Limit	0	m/s
			2
			CANCEL Submit

	Seconds 🔻	000	00.500	01.000	01.500	02.000	02.500	03.000	03.500	04.000	04.500	05.000	05.500	06.
	03.000													
	56.400													
	49.800													
÷.	43.200													
	36.600													
	30.000													
As	23.400													
	16.800													
	10.200													
	3.600	,												
	2.000													
Ð	kg													
	Seconds 👻	000	00.500	01.000	01.500	02.000	02.500	03.000	03.500	04.000	04.500	05.000	05.500	06.
				<b>—</b>										
	03.000													
×.	50.400													
E	49.000													
Ĕ	43.200													
S	30.000													
ă,	22,400													
	16,800													
	10.000													
	3.600													
Ð	m													

6. The first segment of our profile has been added and looks as follows:

 Let's add our second segment to the profile by clicking on the *Position* plot again. The second segment is a dwell segment, therefore we will use the Acceleration Segment. Enter the values to match the image below and click Submit

			~		
Data Depictio	n				
Specify motion p	oint values. Ir	nitial numbers may be ba	sed on click activity		
	previous point	<ul> <li>incremental</li> </ul>	absolute		
Гime	1	1	2	s	
Distance	250	0	250	mm	
/elocity	0	0	0	m/s	
Average Acceleration	0	0	0	$m/s^2$	
Jerk		0		%	

**NOTE:** When you enter values for an Acceleration segment, the velocity input will automatically change when you enter a time with prefixed distance. Motion Analyzer is assuming a Time/Distance entry and will estimate the velocity and Average Acceleration. When we have a specific velocity, we can enter Time/Velocity and Motion Analyzer will estimate the distance and Average Acceleration.

**NOTE:** With the *absolute* entry method, user needs to be conscious that absolute position = previous point + incremental. Motion Analyzer does the calculations to reflect *absolute* or *incremental* entry method. If we were to select the incremental entry method, our Time entry would be 1 second and the Distance 0.

- 00.000 56,400 49.800 Position 43.200 36.600 30,000 23.400 16.800 10.200 3,600 Ð Velocity Acceleration Jerk 000 00.500 Seconds 01.500 02. .00
- 8. After clicking the **Submit** button, we will see two points in our plot ending at 2 seconds.

9. To expand your view, click on <sup>Q</sup>. Your *Position* profile will look as follows

Position <	0.203 0.235 0.208 0.180 0.153 0.125 0.096 0.070 0.043 0.015	
	0.012	
Q	m	

10. Click on the dropdown arrows near your Velocity, Acceleration, and Jerk profiles.

^	Velocity
^	Acceleration
^	Jerk

11. You should be able to view a full plot for each profile after your expand and click on for your Velocity and Acceleration profiles.

# 12. Your completed profile should look as follows:



**NOTE:** You may notice that the *Position, Velocity, Acceleration,* and *Jerk* profiles extend to your 2 seconds but not your Assembly. Motion Analyzer is assuming your load is constant throughout the profile when you place only one point on the Load profile (applies to Force, inertia, torque, and Friction coefficient as well). If your load were to change at any segment, you will need to add the new point.

13. At this point, we will rename the profile by clicking on the pen near Motion Profile.

	CONTINUE TO AXIS	
Motion Profile	0 Shared Users ♥ 0 Comments ♥	START EDITING
LINEAR		

14. Enter Assembly Index Profile as your new Profile name and its description (optional). Click Save once done.

•	CONTINUE TO AXIS	
Assembly Index Profile	0 Shared Users ¥ 0 Comments ¥	3 A START EDITING
LINEAR	2	↑ CANCEL CHANGES
Assembly Index Belt Profile		

15. Your saved profile will look as follows

	CONTINUE TO AXIS	
Assembly Index Profile LINEAR Assembly Index Bel DUPLICATE DELETE IMPOR	0 Shared Users V 0 Comments V elt Profile RT PROFILE EXPORT PROFILE CLEAR PROFILE	START EDITING
Need help building a profile? Clic Graph View Table View	lick here for more information	Add Point Scale V
Seconds 🕶 300 00.50	00 01.000 01.500 02.000 02.500 03.000 03.500 04.000	djustment: — +
03.000         65.400           48.800         43.200           38.600         30.000           23.400         18.800           10.200         18.800           3.800         ,           \$		
Seconds		) 04.500 05.000 05.500 06.1

#### 16. Click on **Continue to Axis**.



**NOTE:** The highlighted section links to page navigations and you can go to Home \ Library \ Poject Component Detail \ Axis Components page \ Motion Profile.

17. After clicking **Continue to Axis**, you are sent to the *Axis Components* page. You can view your components in this project and any changes made in this page will be automatically saved.

▲ \ Library \ Pick n Place	A \ Library \ Pick n Place Application \ Axis 1				
	CONTINUE TO PROJECT				
Axis 1 > 0 Shared U Linear Axis with Mecha • DUPLICATE DELETE	lsers ♀ 0 Comments ♀		Auton	RT EDITING matically Saved TE A SNAPSHOT ORE FROM SNAPSHOT	
Components	Performance				
POWER REQUIREMENTS	S: Voltage Select V	Phase Select V	SEAR	CH FOR SOLUTIONS	
Voltage Tolerance V					
PROFILE		TRANSMISSION	MOTOR	DRIVE	
Edit Profile Assembly Index Profile Motion Type: Linear REMOVE	Add Partner Mechanism DEFINE CUSTOM IMPORT FROM LIBRARY	Add Partner Gearbox DEFINE CUSTOM IMPORT FROM LIBRARY	Add Motor	Add Drive	

18. Change the name of your axis from Axis 1 to Assembly Index Axis 1 by clicking 💋 to edit and save the name change.

	CONTINUE TO PROJECT	
Assembly Index Axis 1 🦯	0 Shared Users ¥ 0 Comments ¥	START EDITING
		Automatically Saved
Linear Axis with Mecha Y		🚔 CREATE A SNAPSHOT

#### **Defining your Mechanism**

Now we will enter the linear mechanism data for the application. From the requirements, we know that we have 2 drive rolls and the dimensions are 100mm diameter (about 4"), 600mm long (about 24"), and material is steel. We also know our belt is 0.7 kg. The mechanism translates the rotational motion from the motor into linear motion of the conveyor.

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



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



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



4. The Belt Drive Properties pages will open up and present the following:

↑ Library \ P	ick n Place App	blication \ Assemi	bly Index Axis	a 1 \ Assembly Belt			
			сс	ONTINUE TO AXIS	Naviga Comp	ations links for Home onent Detail \ Axis C	e \ Library \ Project components \ Linear
Assembly B	Belt 🖉 o si	hared Users 🖌 🛛 0 C	comments 🗸		Mecha	nism	
DUPLICATE D	ELETE			Visual descrip parameters m	tion of aking up the <i>i</i>	Axis	SAVE
BELT DRIVE	PROPERT	IES					
REQUIREMENT	SUMMARY	i	~ ~				Weight of Load + Table
Load:	3	kg	Noti entr	ce your initial y from the		Motion –	Applied Force      Diameter
Stroke:	0.25	m	prot	lie setup		Driver	TABLE of Roll
Speed:	0.375	m/s				<b>"</b>	Idler Group 1 Belt
Acceleration:	1.5	$m/s^2$				 Motor + Transmi	ssions + Gearbox
PARAMETERS		The Paramet your drive rol can calculate inertia calcula	ers section w ls dimension your inertia u ator.	ill contain s and you using the		IDLERS	
		_		GROUP 1		GROUP 2	GROUP 3
Diameter:	m	0		0			
Inertia:	kg $\cdot$ m <sup>2</sup>	0		0			
Friction Torque:	N·m	0		0			
Number of Rollers:		1		0		Enter your f	Belt and Table
ADDITIONAL LO	ADS	_	ſ			masses in t Loads section	he Additional on
Table Mass: 0		kg	Belt Mass:	0	kg		

5. Change the *Diameter* units to mm and enter the value for both the driver and idlers

	DRIVER		IDLERS
		GROUP 1	GROUP 2
Diameter: mm	100	100	

- 6. At this point, we will use the inertia calculator to find the inertia of the Assembly Index Belt.
- 7. Click on the Inertia Calculator button for the Driver.

		DRIVER	IDLERS			
			GROUP 1	GROUP 2	GROUP 3	
Diameter:	mm	100	100			
Inertia:	kg · cm <sup>2</sup>		0			
Friction Torque:	N·m	0	0			
Number of Rollers:		1				
ADDITIONAL LOADS						
Table Mass:   0   kg       Belt Mass:   0						

#### PARAMETERS

8. The Inertia Calculator tool will appear. Select **Solid Cylinder** as the Type, **Steel** as the Material and enter Driver Roll as **Name.** 

ype:		Material:		Name:	
Select A Type	~	Select A Material	~	Element (Option	al)
		Set Standard	Enter Custom		
Density: NaN kg/m^3		Mass: NaN kg	E	Element inertia: NaN kg-m^2	
OAD ELE	MENTS:				
NAME	DENSITY (KG/M^3)	MASS (KG)	INERTIA (I	(G-M^2)	ACTIONS
ew Total Mass 0 kg	5.	New Tota 0 kg-m^2	l Inertia		Apply Cancel

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

9. The length of each roll is **600 millimeters** and the diameter is **100 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.

F					
Solid Cylinder	*	Steel (AISI 1020)	~	Driver Roll	
		Select Standard	Enter Custom		
		Length :			
		600			
		mm			
				D	iameter :
					100
					mm
					_
Density:		Mass:		Element inertia:	
7900		37.228		0.047	
kg/m^3		kg		kg-m^2	
		Sav	e		
	113.				
AME DENS	ITY (KG/M^3)	MASS (KG)	INERTIA	(KG-M^2)	ACTIONS
w Total Mass:		New Tot	al Inertia		
		0			Apply

10. Once you have saved your roll values, click the Apply button to enter the total inertia of the Driver into the properties table.

LOAD ELE	MENTS:			
NAME	DENSITY (KG/M^3)	MASS (KG)	INERTIA (KG-M^2)	ACTIONS
Driver Roll	7900	37.228	0.047	Edit Remove
New Total Mass 37.228	:	New Total Ine	rtia	Apply
kg		kg-m^2		Cancel

11. 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've calculated. You can copy the inertia value of the Driver and paste it into the Inertia field for Idler Group 1 or you can click on the calculator and hit Apply again on the Idler Group 1.

		DRIVER		IDLER\$
			GROUP 1	GROUP 2
Diameter:	mm	100	100	
Inertia:	kg · cm <sup>2</sup>	465.3484		
Friction Torque:	N·m	0	0	

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

12. Enter "1" as the Number of Rollers for Idler Group 1 and enter the Belt Mass under Additional Loads.

			GROUP 1	GROUF		
Diameter:	mm	100	100			
Inertia:	kg · cm <sup>2</sup>	465.3484	465.3484			
Friction Torque:	N·m	0	0			
Number of Rollers:		1	1			
ADDITIONAL LOADS						
Table Mass:   0   kg   Belt Mass:   0.7   kg						

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



#### **Entering Transmission Components**

Now we will enter the transmission data for the application.

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



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



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



4. We are working on the motor side transmission. Enter "1" for the coupling transmission ratio (1 to 1 ratio), **2.6**  $g \cdot cm^2$  for motor coupling moment of inertia, and for **100%** for efficiency.

TRANSMISSION PROF	PERTIES	
Coupling ~		
Parameters		
Ratio:	1	û
Inertia (motor side)	0.0026	kg · cm <sup>2</sup> i
Efficiency:	100	% i
Friction Torque (motor side)	0	N·m i

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

**NOTE:**  $2.6g \cdot cm^2$  is converted to  $0.0026kg \cdot cm^2$ , you will notice that there is no  $g \cdot cm^2$  units for the inertia units. Also click on the information icon to learn more about each entry field.

5. Once the coupling data has been entered, click **Save** and **Continue to Axis**.



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

Components	Performance			
POWER REQUIREMENTS Voltage Tolerance V	: Voltage Select V	Phase Select V	SEARO	CH FOR SOLUTIONS
PROFILE	LINEAR MECH.	TRANSMISSION	MOTOR	DRIVE
	¢	$\Phi_{\phi}^{a}$		
Edit Profile		Add Another	Add Motor	Add Drive
Assembly Index Profile Motion Type: Linear	Assembly Belt Type: Belt Drive	Coupling Transmission	ADD CUSTOM MOTOR	
REMOVE	REMOVE	REMOVE		

7. Since you already know that you will be using a specific gearbox, you can filter your selection during your sizing process. Click on the **Add Partner Gearbox** button for the Transmission that you just added.

Components	Performance				
POWER REQUIREMENTS Voltage Tolerance 🗸	S: Voltage Select V	Phase Select ¥	SEAF	CH FOR SOLUTIONS	
PROFILE	LINEAR MECH.	TRANSMISSION	TRANSMISSION	MOTOR	DRIVE
	- <b></b> -	<b>\$</b> ,*	<b>\$</b> ,*	-	Į.
Edit Profile		Add Another	Add Partner Gearbox	Add Motor	Add Drive
Assembly Index Profile Motion Type: Linear REMOVE	Assembly Belt Type: Belt Drive REMOVE	Coupling Transmission REMOVE	DEFINE CUSTOM	ADD CUSTOM MOTOR	

8. From the Specify Partner Gearbox window, select Wittenstein Alpha.

;	SPECIFY PARTNER GEA	BOX	x
	Select a manufacturer 🗸 🗸	Select a method for adding your gearbox below	
	Stober Drives		
	Nidec-Shimpo		CANCEL
	Wittenstein Alpha		
	Apex Dynamics		
	Harmonic Drive		
Edit I	Select a manufacturer	Add Another Add Partner	Gearbox Add Moto

9. You will have two option on how to select your gearbox. *Option 1* would be used if you wanted to see all the Wittenstein Alpha gearbox families. *Option 2* is used when you know the specific gearbox family and its size.

SPECIFY PARTNER GEARBOX	x
Wittenstein Alpha   Select a method for adding your gearbox below	
Want to search for your gearbox? Select one or more families in browser below.	2 Know your gearbox? Enter it by Catalog Number.
Browse for Families, Products or Configuration	Enter Catalog Number
	Select a family
	ADD TO AXIS
	CANCEL

10. We will select the Browse for Families, Products or Configuration button.

SPECIFY PARTNER GEARBOX ×	
Wittenstein Alpha   Select a method for adding your gearbox below	
Want to search for your gearbox? Select one or more families in browser below.	2 Know your gearbox? Enter it by Catalog Number.
Browse for Families, Products or Configuration	Enter Catalog Number

11. At the Gearboxes Product page, you can see the Wittenstein Alpha products available on Motion Analyzer online tool.



**NOTE:** Motion Analyzer online tool incorporates Third Party Product Integration with our Encompass Partners to provide complimentary products that integrate with Rockwell Automation solutions. This provides a whole solution under one tool.

12. We will compare two families of Wittenstein Alpha gearbox families. Select the checkmark box on Bevel right-Angle and Planetary In-Line gearboxes, then select **Compare Selected Families**.


13. In the *Compare Products* page, you can compare features between different products from a single manufacturer. Click on *Add Feature* to see the remaining features to compare.

♠ \ Products \ Compare							
Compare Products (2) Go to Axis							
	BEVEL RIGHT-ANGLE	PLANETARY IN-LINE	×				
Compare Family Features							
Catalog Number	No	LPB090S-MF2-40-1G1*	×				
Configuration	Right-Angle	In-Line	×				
Manufacturer	Wittenstein Alpha	Wittenstein Alpha	×				
Туре	Bevel	Planetary	x				
Add Feature 🗸							
Add Feature Wittenstein Series	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.

14. The Customer, *ABC Foods* indicated that they will be using Wittenstein Alpha SP+ gearheads for the original smartbelt design and prefer to use them *if still necessary*. Click on the Planetary In-Line gearbox to filter your search to include the SP+ family.



15. At the *Planetary In-Line* product information page, we will set our filters to only include the SP series and the Planetary Inline family. Let's click on the **Commonly Used (3)**.

A L Avia L Constance L CS			
			Save Axis Go to Axis
5	SELECTION	SUMMARY	
	Size Selected:	Not Sele	ected
	Configuration:	Not Sele	ected
	Product Catalog N	o: Not Sele	ected
			Show Compatible Products
			Learn More
0 Filters Applied clear Base Product Info	Choose Size	$\checkmark$	Set Configuration
Commonly Used (3)			
Physical Dimension (6) FAMILY DESCRIPTION		FAMILY SPECIFIC	ATIONS
Torque & Speed Ratings (7) > Planetary In-line gearboxes from Wi	ttenstein. This	Manufacturer	Wittenstein Alpha
includes the CP, LP, LPB, SP and T	P series gearboxes.	Туре	Planetary
		Configuration	In-Line

## 16. From the *Wittenstein Series* list, select the SP check box.

1 Filters Applied clear	Base Product Info	Choose Size		Set Configuration
Commonly Used (3)				
Wittenstein Series: SP	FAMILY DESCRIPTION		FAMILY SPECIFICA	TIONS
Ratio	Planetary In-line gearboxes from Wittens	tein. This	Manufacturer	Wittenstein Alpha
	includes the CP, LP, LPB, SP and TP se	ries gearboxes.	Туре	Planetary
Low High			Configuration	In-Line
0 70 200				
Туре				
Planetary				
Worm				
Helical				
Hypoid				
Bevel				
Harmonic Gearing				
Wittenstein Series				
СР				
LP				
LPB				
SP 🗹				
ТР	_			
HG+				
SK+				
SPK+				
τν.				

**NOTE:** For the gearbox filter to take effect, you do need to select the Family with the rest of your filters.

17. Your selected filter will be reflected in the **Commonly Used (3)** section. Click on **Commonly Used (3)** to retract the dropdown selections.

1 Filters Applied clear		Base Product Info Choose Size
Commonly Used (3) Wittenstein Series: SP	>	MILY DESCRIPTION
Physical Dimension (6)	>	Planeta, In-line gearboxes from Wittenstein. This
Torque & Speed Ratings (7)	>	includes the CP, LP, LPB, SP and TP series gearboxes.

# 18. Click on the Choose Size tab.

						Learn More
1 Filters Applied clear		Base Product Info	Choose Size		Set Configuratio	n 🗸
Commonly Used (3) Wittenstein Series: SP	>	FAMILY DESCRIPTION		FAMILY	SPECIFICATIONS	
Physical Dimension (6)	>	Planetary In-line gearboxes from Wit	tenstein. This	Manufactu	rer Wittenstein A	lpha
Torque & Speed Ratings (7)	>	includes the CP, LP, LPB, SP and TP series gearboxes.		Туре	Planetary	
				Configurat	tion In-Line	

19. Even with a single filter, your selection seems to be numerous. We will change the view from *Vertical* View to *Horizontal* View.

Base Product Info	Choo	se Size	Set Configu	ration
394 total items (filte	red from 394)	<u>1</u> 23456	. 99 🕨	Ⅲ :=
SELECT A SIZE	SELECT	SELECT	SELECT	ST LECT
FEATURES				
Catalog Number	SP060S-MF1-10-0B1	SP060S-MF1-10-0C1	SP060S-MF1-10-0E1	SP060S-MF1-3-0B1
Axial Load	2400	2400	2400	2400

**NOTE:** When browsing through products, the default view is set to Vertical View, which allows only 4 products at a time. By switching to Horizontal Browse View, you can view 20 or more products at a time.

20. Scroll down the *Planetary In-Line* product information page and click on **View 20 More**.

SP060S-MF1-3-0C1	3	30	5999.999706665103	1
SP060S-MF1-3-0E1	3	30	5999.999706665103	1
SP060S-MF1-4-0B1	4	58	5999.999706665103	1
SP060S-MF1-4-0C1	4	58	5999.999706665103	1
SP060S-MF1-4-0E1	4	58	5999.999706665103	1
SP060S-MF1-5-0B1	5	60	5999.999706665103	1
SP060S-MF1-5-0C1	5	60	5999.999706665103	1
SP060S-MF1-5-0E1	5	60	5999.999706665103	1
SP060S-MF1-7-0B1	7	54	5999.999706665103	1
SP060S-MF1-7-0C1	7	54	5999.999706665103	1
SP060S-MF1-7-0E1	7	54	5999.999706665103	1
SP060S-MF2-100-				
0B1	100	32	5999.999706665103	2
SP060S-MF2-100-				
0C1	100	32	5999.999706665103	2
SP060S-MF2-16-0B1	16	58	5999.999706665103	2
SP060S-MF2-16-0C1	16	58	5999.999706665103	2
SP060S-MF2-20-0B1	20 🔰	58	5999.999706665103	2
	VIEW 2	0 MORE		

21. You can now view 40 products in the same page. We will not choose any size for this axis. Scroll up the *Planetary In-Line* product information page.

♠ \ Axis \ Gearboxes \ 65		
PLANETARY IN-LINE		
		Save Axis Go to Axis
	SELECTION SUM	IMARY
	Size Selected:	Not Selected
	Configuration:	Not Selected
	Product Catalog No:	Not Selected
Show Compatible Products takes yo	ou to the Compatibility	Show Compatible Products
Actuator is compatible with your pro	duct	Learn More
1 Filters Applied clear	Channa Sina	Loorn More sends you to the
Commonly Used (3)	Choose Size	manufacturer's website for more
Wittenstein Series: SP 394 total items (filtered from 394	,	detailed descriptions of the products.
Physical Dimension (6)	,	
Torque & Speed Ratings (7) > SELECT Catalog Number	Ratio Output	Max Torque Max Input Speed Stage Number

## 22. Select Save Axis

Axis \ Gearboxes \ 65 PLANETARY IN-LINE		Save Axis	Go to Axis
<b>5</b>	SELECTION SUMM	IARY	
	Size Selected:	Not Selected	
	Configuration:	Not Selected	
	Product Catalog No:	Not Selected	
If a size and configuration were selected, it would be reflected		Show	Compatible Products
in the Selection Summary.			Learn More
	,		Louin More

23. Clicking Save Axis will add the *Planetary In-Line* SP family to your axis components. Click **OK** to confirm your selection.

Successfully saved item. Go to	axis?	
	ок	
	CANCEL	

24. You are returned to your Axis Components page. As you see, the Gearbox selection has not been added. For the gearbox filter to take effect, you do need to select the Family. Click on the **Add Another** button under the Transmission heading.

Components	Performance			
POWER REQUIREMENTS Voltage Tolerance V	Voltage Select v	Phase Select ¥	SE	ARCH FOR SOLUTIONS
PROFILE		TRANSMISSION	MOTOR	DRIVE
Edit Profile Assembly Index Profile Motion Type: Linear REMOVE	Assembly Belt Type: Belt Drive REMOVE	Add Another Coupling Transmission REMOVE	Add Motor	Add Drive

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



26. From the Specify Partner Gearbox window, select Wittenstein Alpha.

	SPECIFY PARTNER GEARBOX								
	Select a manufacturer 🗸 🗸	Select a method for adding your gearbox below							
	Stober Drives								
	Nidec-Shimpo		CANCEL						
	Wittenstein Alpha								
	Apex Dynamics								
	Harmonic Drive		-						
Edit	Select a manufacturer	Add Another Add Partner Gearbox	Add Moto						

27. Select the Browse for Families, Products or Configuration button.

SPECIFY PARTNER GEARBOX	x
Wittenstein Alpha    Select a method for	r adding your gearbox below
Want to search for your gearbox? Select one or more families in browser below.	2 Know your gearbox? Enter it by Catalog Number.
Browse for Families, Products or Configuration	Enter Catalog Number

28. At the *Gearboxes Product* page, select the checkmark box on Planetary In-Line gearboxes and Click **Save Selection to Axis**.



29. Confirm your selection by click OK on the "Go to Axis?" prompt.

Successfully saved item. Go to	axis?	
	ок	
	CANCEL	

30. In the Axis Components page, your added gearbox is listed as component. At this point, we will start looking at solutions for our Assembly Index Axis 1.

Components	Performance				
POWER REQUIREMENTS	S: Voltage Select v	Phase Select v	SEAF	RCH FOR SOLUTIONS	
PROFILE	LINEAR MECH.	TRANSMISSION	TRANSMISSION	MOTOR	DRIVE
	- <b></b> -¢	<b>\$</b> ,*	<b>\$</b> ,*		<u></u>
Edit Profile		Add Another	Change Transmission	Add Motor	Add Drive
Assembly Index Profile Motion Type: Linear	Assembly Belt Type: Belt Drive	Coupling Transmission	1 Filters Applied	ADD CUSTOM MOTOR	
REMOVE	REMOVE		Families (1) PLANETARY IN-LINE		

31. The customer indicated that they will be operating at 460 Volts, 3 phase. In the *Power Requirements* section, select **460** for *Voltage* and **3** for *Phase*. The **Search for Solutions** button should now be enabled.



32. Select the Search for Solutions button.



SOLUTIONS LIST	View	ring 1 - 10 of 958 <b>&lt; <u>1</u> 2 3 4 5 6</b>	96	>	Sort b	y: Profile	e Match (9	%)	*	,
You have multiple pages of solution combinations	>	<ul> <li>Note: Some solution</li> <li>Filter Soluti</li> <li>Drive</li> <li>Kinetix 5500   219</li> </ul>	y selecti hich is r a partic leal" sol big, just	on is meant to cular ution. No right	er ot	cris na.	ŕ	Sele	ct	
Commonly Used (6)		Motor   MPM-B1151F-xxxxxxx	Match	Price	Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity	
Torque/Force Ratings (6)	>	Gearbox SP075S-MC1-3-0G1   SP075S-MC1-3-0G1	88.6%	\$\$\$\$\$S	0.96	75.2%	14.49	68%	68.4%	
Induction Motor (5)	>	Drive		_				0.1		
Physical Dimension (3)	>	Kinetix 5500   2198-H003-ERSx	View To	orque Spee	d Curve			Sele	ct	
Options (14)	>	Motor MPM Motor   MPM-B1151F-xxxxxxx	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity	
IP Ratings (5)	>	Gearbox SP075S-MC1-3-0E1   SP075S-MC1-3-0E1	88.5%	\$\$\$\$\$55	0.96	74.9%	16.27	67.7%	68.1%	
Certifications (3)	>	Drive								
Environment (3)	>	Kinetix 5500   2198-H003-ERSx	View To	orque Spee	d Curve			Sele	ct	
Feedback (2)	>	Motor M431-NXXX-9XXX   M431-NXXX-9XXX	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity	
Group (1)	>	Gearbox SP075S-MC1-3-0G1   SP075S-MC1-3-0G1	86.8%	<b>\$\$\$\$\$</b> \$	0.89	71.2%	47.52	68.5%	63.3%	
Drive Filters		Drivo								
Commonly Used (7)	>	Kinetix 5500   2198-H003-ERSx	View To	orque Spee	d Curve			Sele	ct	
Voltage & Phase (4)	>	Motor MPM Motor   MPM-B1151F-second	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity	
IP Ratings (5)	>	Gearbox	86.5%	<b>\$\$\$\$</b> \$\$	0.77	Utilization 63%	16.91	Utilization 55.5%	55.1%	
Environment (3)	>	SPUBUS-MF1-3-UE1   SPUBUS-MF1-3-UE1	•							
Options (4)	>	Drive Kinetix 5500   2198-H003-ERSx	View To	orque Spee	d Curve			Sele	ct	
Certifications (19)	)	Motor MPL Motor   MPL-B310P-xxxxxxx	Profile	Relative	Average	Force Or	Inertia	Peak	Thermal	
Controller (4)	>	Gearbox	86.3%	\$\$\$\$\$\$	0.81	Utilization 69.5%	36.50	Utilization 58.3%	57.6%	
Features (35)	>	SP100L-MC1-3-0G1   SP100L-MC1-3-0G1	•							
Motor Control (10)	>	Drive Kinetix 5500   2198-H003-ERSx	View To	orque Spee	d Curve			Sele	ct	
Network Support (14)	>	Motor MPM Motor   MPM-B1151F-xxxxxxx	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity	

33. The Solutions List window will open up and Motion Analyzer will search for solutions that match to your profile.

34. Let's take a second to review the *Solutions List* window.

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35. On the left of the *Solutions List* window, you can see a list of filters. Your filter options range from *Solutions Filters*, *Motor Filters*, *Drive Filters*, and *Transmission Filters*.

Solution Filters	Motor Filters	Drive Filters		Bus Configuration (4)	)
Solution Filters (6)	Commonly Used (6)	Commonly Used (7)	>	Safety (3)	>
Profile Match	Torque/Force Ratings (6)	Voltage & Phase (4)	>	I/O (14)	>
Low High	Induction Motor (5)	) IP Ratings (5)	>	Feedback (16)	)
0 70 100	Physical Dimension (3)	> Environment (3)	>	Applications (1)	)
% %	Options (14)	Options (4)	>	Control Options (3)	>
Average Current	IP Ratings (5)	Certifications (19)	>	Power Options (5)	>
Low High	Certifications (3)	Controller (4)	>	Transmission Filters	
0 <i>To</i> 100	Environment (3)	Features (35)	>	Commonly Used (5)	)
Force Or Torque Utilization	Feedback (2)	> Motor Control (10)	>	Physical Dimension (7)	)
	Group (1)	Network Support (14)	>	Torque & Speed Ratings (7)	)

36. You can also narrow your search by using *Filter Solutions by Product Family*.

Filter Solutions by Product Family	Note	Some solutions may have accessories added to meet your filter criteria.	
	>	Filter Solutions by Product Family	

37. Click on the dropdown of the Filter Solutions by Product Family.

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

38. Review your Motor Families. Click on the dropdown for the By Drive Family filter.

č	By Drive Family 🗙 and By Mo	otor Family		*		
oduct Family	<b>N</b>	KINETIX 300 SERVO DRIVE	KINETIX 350 SL O DRIV	Filter op	KINETIX	KINETIX K
by Pr	CM222 - AC SPINDLE MOTOR	0	0	Family	army and	
tions	MP-SERIES FOOD GRADE SERVO MOTOR	7	7	14	7	7
Solut	MP-SERIES LOW INERTIA SERVO MOTOR	14	City .		14	14
Filter	MP-SERIES MEDIUM INERTIA SERVO MOTOR	0	Motor	Families atible with	8	8
	MP-SERIES STAINLESS STEEL MOTOR	7	your s	olutions	7	7
	SX-SERIES EXPLOSION PROOF MOTOR	17	17	34	0	34
	VP FOOD GRADE SERVO MOTOR	0	0	87	95	0
	VP LOW INERTIA SERVO MOTOR	0	0	104	115	0
	VP STAINLESS STEEL SERVO MOTOR	0	0	20	20	0

39. You can see your filter combinations for the *Filter Solutions by Product Family*. You can choose your "and" combination by *Drive Family, Motor Family, Actuator family,* and *Gearbox family*.

By Drive Family 🗸		By Motor Family 🗸
By Drive Family		By Drive Family
By Motor Family		By Motor Family
By Actuator Family		By Actuator Family
By Gearbox Family	and	By Gearbox Family

40. Leave the selections to by Drive Family and by Motor Family. Scroll right on the Filter Solutions by Product Family dropdown.

VP FOOD GRADE SERVO MOTOR	0	0	87	95	0	0
VP LOW INERTIA SERVO MOTOR	0	0	104	115	0	0
VP STAINLESS STEEL SERVO MOTOR	0	0	20	20	0	0
<		×				>

41. Your drive selections range from Kinetix Servo Drives to PowerFlex VFD Drives.

KINETIX 300 SERVO DRIVE	KINETIX 350 SERVO DRIVE	KINETIX 5500 SERVO DRIVE	KINETIX 5700 SERVO DRIVE	KINETIX 6000 SERVO DRIVE	KINETIX 6200 SERVO DRIVE	KINETIX 6500 SERVO DRIVE	KINETIX 7000 SERVO DRIVE	POWERFLEX 525	POWERFLEX 527	POWERFLEX 755
0	0	0	2	0	0	0	0	1	2	3
7	7	14	7	7	7	7	0	0	0	10
		14	1	'	1	1	0	0	0	14
14	14	25	14	14	14	14	0	n	0	16
8	8	16	8	8	8	8	0			
7	7	7	7	7	7	7	7	0	0	14
								0	0	0

42. ABC Foods had informed you that they attended Automation Fair to learn about CIP Safety Drive and that they wanted to take advantage of this technology. Your result should include a Drive with Integrated Safety.

43. In the *Drive Filters*, click on the dropdown for the **Safety** feature to see the three options available. Click on the checkbox for Integrated Safe Torque Off click on the **Safety** 

			•						
Drive Filters		Drive							
Commonly Used (7)	>	Kinetix 5500   2198-H003-ERSx	View To	orque Spee	d Curve			Sele	ct
Voltage & Phase (4)	>	Motor MPM Motor   MPM-B1151F-xxxxxxx	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity
IP Ratings (5)	>	Gearbox	86.5%	\$\$\$\$\$\$	0.77	63%	16.91	55.5%	55.1%
Environment (3)	,	3ruuus-miri-s-uei   3ruuus-miri-s-uei	•						
Options (4)	>	Drive Kinetix 5500   2198-H003-ERSx	View To	orque Spee	d Curve			Sele	ct
Certifications (19)	>	Motor MPL Motor   MPL-B310P-xxxxxxx	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity
Controller (4)	>	Gearbox	86.3%	\$\$\$\$\$\$	0.81	Utilization 69.5%	36.50	Utilization 58.3%	57.6%
Features (35)	>	SP100L-MC1-3-0G1   SP100L-MC1-3-0G1	•						
Motor Control (10)	>	Drive Kinetix 5500   2198-H003-ERSx	View To	orque Spee	d Curve			Sele	ct
Network Support (14)	>	Motor	Profile	Relative	Average	Force Or	Inertia	Peak	Thermal
Bus Configuration (4)	,	Cearbox	Match	Price	Current	Torque Utilization 61.2%	Ratio	Current Utilization	Capacity
Safety (3)	>	STDDL-MC1-3-0K1   SP100L-MC1-3-0K1	•	44444	0.15	01.270	0.05	3470	33.370
Integrated Safe Torque Off		Drive						Cala	-
Hardwired Advanced Safety	•	Kinetix 5500   2198-H003-ERSx	View To	orque Spee	d Curve			Sele	cı
Hardwired Safe Torque Off		Motor M431-NXXX-BXXX   M431-NXXX-BXXX	Profile Match	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current Utilization	Thermal Capacity
Integrated Safe Torque Off	¥	Gearbox SP075S-MC1-3-0E1   SP075S-MC1-3-0E1	86.1%	<b>\$\$\$\$\$</b> \$	0.89	70.9%	75.11	68.1%	63%

44. Your Solutions List is narrowed to 577 solutions. That is still a lot of products to review.

SOLUTIONS LIST	Viewing 1 - 10 of 577 < 1 2 3 4 5 6 58 > 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

- 45. We can that most Drives have the Integrated Safety feature.
- 46. We will narrow our search to the Kinetix 5700 Servo Drives. The Assembly Index has two axes and since the Kinetix 5700 Servo Drives offers Dual Axis Inverter modules, this drive might be one of the best solutions. Click on Kinetix 5700 Servo Drives.

~	Drive Family	۷	and	By Mo	tor Family		*				
oduct Family					KINETIX 300 SERVO DRIVE	KINETIX 350 SERVO DRIVE	KINI 55 SEF DR	etix 00 RVO IVE	KINETIX 5700 SERVO DRIVE	KINETIX 6000 SERVO DRIVE	KINETI) 6200 SERVO DRIVE
by Pro	CM222 - AC SPINDL	E MO	TOR		0	0	(	•	2	0	0
ions t	P-SERIES FOOD GRADE	SER	vo мо	TOR	7	7	1	4	7	7	7
Soluti	P-SERIES LOW INERTIA	SER	ом о	TOR	14	14		5	14	14	14
ilter	-SERIES MEDIUM INERT	ia se	RVO M	OTOR	8	8		6	8	8	8
<u> </u>	MP-SERIES STAINLESS	STEE	L MOT	OR	7	7	,	7	7	7	7

47. Click on the dropdown section of Filter Solutions by Product Family to retract the filter list.

č	Drive Family	۲	and	By Mo	tor Family		*			
oduct Family	K				KINETIX 300 SERVO DRIVE	KINETIX 350 SERVO DRIVE	KINETIX 5500 SERVO DRIVE	KINETIX 5700 SERVO DRIVE	KINETIX 6000 SERVO DRIVE	KINETD 6200 SERVO DRIVE
by Pr	CM222 - AC SPINDI	LE MO	TOR		0	0	0	2	0	0
ions	P-SERIES FOOD GRADE	E SER	<b>vo м</b> о	TOR	7	7	14	7	7	7
Solut	P-SERIES LOW INERTIA	SER	VO MO	TOR	14	14	25	14	14	14
ilter	-SERIES MEDIUM INERT	'IA SE	RVO M	OTOR	8	8	16	8	8	8
"	MP-SERIES STAINLESS	STEE	LMOT	OR	7	7	7	7	7	7
	SX-SERIES EXPLOSION	PROC	F MOT	OR	17	17	34	0	34	34
	VP FOOD GRADE SE	RVO I	NOTOR		0	0	87	95	0	0
	VP LOW INERTIA SEI	RVO N	OTOR		0	0	104	115	0	0
	VP STAINLESS STEEL	SERV	о мото	DR	0	0	20	20	0	0
	<									>

48. You can now see that your *Solutions List* moved from 577 solutions to 268 solutions of **Kinetix 5700 Servo Drives** combinations only.

LUTIONS LIST	Viewing	1-10 of 268 < <u>1</u> 2 3 4 5	5 6 27	>	Sort b	y: Profil	e Match (9	6)	*
Clear Filters	Not	e: Some solutions may have access	sories added	to meet y	our filter	criteria.			
olution Filters	>	Filter Solutions by Product Far	mily						
olution Filters (6)	<b>э</b> D	rive netix 5700 2198-D006-ERS3	View To	View Torque Speed Curve					
lotor Filters	N	lotor							-
commonly Used (6)	o Vi	PL Motor   VPL-B0633T-x000000	Match	Price	Average Current	Force Or Torque Utilization	Ratio	Peak Current Utilization	Capacity
orque/Force Ratings (6)	) SF	earbox P075S-MF1-3-0C1   SP075S-MF1-3-0C1	82% •	\$\$\$\$\$\$	2.62	79.5%	138.42	74.9%	75.3%
nduction Motor (5)	> D	Drive							
hysical Dimension (3)	) Ki	netix 5700   2198-D008-ERS3	View To	View Torque Speed Curve					
)ptions (14)	> VF	lotor PL Motor   VPL-B1001M-xcccccx	Profile Match	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current Utilization	Thermal Capacity
P Ratings (5)	) G	earbox P075S-MF1-3-0G1   SP075S-MF1-3-0G1	81.5%	\$\$\$\$\$\$	1.64	64.9%	53.60	46.9%	47.2%
ertifications (3)	» n	rive							
nvironment (3)	кі	netix 5700   2198-D006-ERS3	View To	orque Spee	d Curve			Sele	ct
eedback (2)	> M	lotor PL Motor   MPL-8220T->cccccx	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity
Froup (1)	, G	earbox	81.5%	\$\$\$\$\$5	1.90	61.6%	121.32	57.6%	54.7%

49. Click on **View Torque Speed Curve** on the first three solutions respectively to review the Torque/Speed plot. You can click away from the Torque/Speed plot to return to the *Solutions List* window.

Solution Filters		> Filter Solutions by Product Family	,							
Solution Filters (6)	>	Drive	View To	orque Spee	d Curve			Sele	ct	
Motor Filters		Motor							-	
Commonly Used (6)	>	VPL Motor   VPL-80633T-x00000x	Match	Price	Average Current	Force Or Torque Utilization	Ratio	Current Utilization	Capacity	
Torque/Force Ratings (6)	>	Gearbox SP075S-MF1-3-0C1   SP075S-MF1-3-00	82%	\$\$\$\$55	2.62	79.5%	138.42	74.9%	75.3%	
Induction Motor (5)	>	Drive	View To	angua Space	d Curue			Sele	ct	
Physical Dimension (3)	>	Kinetix 5700   2198-D008-ERS3	VIEW IC	nque opee	d Cuive					
Options (14)	>	VPL Motor   VPL-B1001M-second	Profile Match	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current Utilization	Thermal Capacity	
IP Ratings (5)	>	Gearbox SP075S-MF1-3-0G1   SP075S-MF1-3-0G1	81.5%	\$\$\$\$\$\$	1.64	64.9%	53.60	46.9%	47.2%	
Certifications (3)	>	Drive	e Victoria							
Environment (3)	>	Kinetix 5700   2198-D008-ERS3	View To	orque Spee	d Curve			Select		
Feedback (2)	>	Motor MPL Motor   MPL-B220T-x000000	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity	
Group (1)	>	Gearbox SP075S-MF1-3-0C1   SP075S-MF1-3-0C1	81.5%	<b>\$\$\$\$</b> \$\$	1.90	61.6%	121.32	57.6%	54.7%	
Drive Filters		Drive								
Commonly Used (7)	>	Kinetix 5700   2198-D008-ERS3	View To	orque Spee	d Curve			Sele	ct	
Voltage & Phase (4)	>	Motor VPF Motor   VPF-B1001M-xxxxxx	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity	
IP Ratings (5)	>	Gearbox	81.4%	\$\$\$\$\$\$	1.64	Utilization 64.8%	53.60	Utilization 46.7%	47%	
Environment (3)	>		•							
Options (4)	>	Drive Kinetix 5700   2198-D008-ERS3	View To	orque Spee	d Curve			Sele	ct	
Certifications (19)	>	Motor VPL Motor   VPL-B1001M-second	Profile	Relative	Average	Force Or	Inertia Ratio	Peak	Thermal	
Controller (4)	>	Gearbox	80.6%	\$\$\$\$\$\$	1.64	Utilization 64.5%	91.58	Utilization 46.7%	47%	
Features (35)	>	SP075S-MF1-3-0E1   SP075S-MF1-3-0E1	•							
Motor Control (10)	>	Drive Kinetix 5700   2198-D006-ERS3	View To	orque Spee	d Curve			Sele	ct	
Network Support (14)	>	Motor	Profile	Relative	Average	Force Or	Inertia	Peak	Thermal	
Bus Configuration (4)		VFF WIOTOF   VFF-B1UU1M-20000X	Match	Price	Current	Torque Utilization	Ratio	Current Utilization	Capacity	

50. The three Torque/Speed plots would look as follows respectively:







Second solution plot

Third solution plot

**NOTE:** Your Torque/Speed plots display the Drive/Motor performance versus your application demands. Our first solution passes the requirements of the application, therefore we will select it.

51. Let's select the first solution option. Click **Select** on the first option.

Solution Filters		> Filter Solutions by Product Fami	ly							
Solution Filters (6)	>	Drive Kinetix 5700   2198-D006-ERS3	View Te	orque Spee	d Curve	_		Select		
Motor Filters		Motor								
Commonly Used (6)	,	VPL Motor   VPL-B0633T-x00000	Match	Price	Average Current	Force Or Torque Utilization	Ratio	Peak Current Utilization	Thermal Capacity	
Torque/Force Ratings (6)	>	Gearbox SP075S-MF1-3-0C1   SP075S-MF1-3-0C1	82% ▼	\$\$\$\$\$\$	2.62	79.5%	138.42	74.9%	75.3%	
Induction Motor (5)	>	Drive	Drive View Torque Speed Curve							
Physical Dimension (3)	>	Kinetix 5700   2198-D006-ERS3								
Options (14)	>	Motor VPL Motor   VPL-B1001M-x000000	Profile Match	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current Utilization	Thermal Capacity	
IP Ratings (5)	>	Gearbox SP075S-MF1-3-0G1   SP075S-MF1-3-0G1	81.5%	\$\$\$\$\$\$	1.64	64.9%	53.60	46.9%	47.2%	
Certifications (3)	>	Drive								
Environment (3)	>	Kinetix 5700   2198-D008-ERS3	View To	View Torque Speed Curve Select						
Feedback (2)	>	Motor MPL Motor   MPL-B220T-x000000	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity	

NOTE: An error might pop up once you select your drive. Just click **OK** and we can move forward.

52. As you are taken to the Axis Components page, your selected solution will be displayed.



53. Notice that your axis components are automatically saved at this point. Click on Continue to Project.



54. At your project window, you can view your Component Detail by axis by clicking on the dropdown next to your axis.

Pick n Place Application /	0 Shared Users ♥ 0 Comments ♥										
This machine accepts packages at random, stages packages to be picked up from assembly and places packages into a case on a synchronized product belt before cases are taken away for shipment											
DUPLICATE DELETE EXPORT AS XML											
	START EDITING										
	Automatically Saved										
· · · · · · · · · · · · · · · · · · ·	CREATE A SNAPSHOT										
	RESTORE FROM SNAPSHOT										
Summary Component Detail Power Analysis Customer/Site The Dual Axis inverter is reflected here.											
Pick N Place Application Components	AXES (1)										
Nyis: Assembly Index Avis 1	PROJECT ACTIONS										
	Create New Axis & Profile										
Ax, Delete	Create New Blank Axis										
	Import Axis										



55. After clicking the dropdown of the Assembly Index Axis 1, you can see its selected components

- 56. We will return to the Components page by clicking on Edit for the Axis: Assembly Index Axis 1.
- 57. At the Components page, click on the Performance tab to review Application vs. Components performance.

Components	Performance	-	Dual Axis Drive (i) 1 +
POWER REQUIREMENTS: Voltage Tolerance 🗸	Voltage 460 🗸	Phase 3 v	SEARCH FOR SOLUTIONS

58. The *Performance* tab offers a visual interpretation of Application Needs vs Components Performance.



Summary Drive	Moto	or Gea	arbox								
Review how individual components											
fare against the a											
Average Power:	152.89	w	1	1700	w						
Peak Power:	308.16	W	4	4129	w						
Average Current:	2.62	A(pk)	3	3.50	A(pk)						
Peak Current:	6.09	A(pk)	8	8.50	A(pk)						
Peak Bus Volts Needed:	60.45	V(dc)	6	650.54	V(dc)						

59. From the *Performance* tab, you can see your Torque/Speed plot. Take time to review the *Torque/Speed* plot, *Power/Speed* plot, and *Thermal* plot.





# 60. Once done reviewing the Thermal plot, Review your Summary, Drive, Motor, and Gearbox.

- 61. We've completed the first axis in our project and will proceed to the remaining axes. Since Assembly Index Axis 1 is the exact same axis as Assembly Index Belt 2. We will be creating a duplicate of the axis to avoid repeating the work we just performed.
- 62. Click on **Components** to return to the *Components* tab.

	Components	- cmance	Dual Axis Drive 🧃 🕇 🕂
63.	Click on +	to add the second axis to our Dual Axis Drive.	
	Components	Performance	Dual Axis Drive

### Part B: Assembly Index Belt 2

### **Duplicating a Component**

Duplicating the components of the Assembly Index Axis 1 will minimize the time taken to build another Assembly Index Axis from scratch.

1. After clicking on + to add the second axis, your new view should look as follows:



2. We will begin by renaming our axis from Assembly Index Axis 1 Dual to Assembly Index Axis 2. Click **Continue to Project** once you've made the name change.



3. Your new axis will be reflected in your application components as seen here:



4. We are going to duplicate the components of the Assembly Index Axis 1. Click the dropdown on Axis: Assembly Index Axis 1

Pick N Place Application Compone	ents	
Axis: Assembly Index Axis 1	······	Edit Delete
Axis: Ass, nbly Index Axis 2		Edit Delete

5. Click Edit on the Assembly Index Profile.

∼ Axis: Assembly Index Axis 1	Edit Delete									
Axis: Assembly Index Axis 2	Edit Delete									
Assembly Index Axis 1										
Load/Profile: Assembly Index Profile   Linear Profile										
Linear Mechanism: None Selected										
Transmission: Gearbox SP075S-MF1-3-0C1	Edit									
- Motor: VPL-B0633T-xxxxxx										
Drive: 2198-D006-ERS3										

6. From the Assembly Index Profile page, click on Duplicate.



- 7. A prompt will ask to confirm your duplication. Rename [Copy]Assembly Index Profile to Assembly Index Profile 2. Then click **YES** to confirm your selection.
- 8. Your new profile will show up as a duplicated of your Assembly Index Profile.

	Library \ As	sembly	/ Index Prot	file 2										
A	ssembly Ind	lex F	Profile 2	/	0 Share	d Users ¥	0 Comme	nts ¥			1	START	EDITING	
	_										1	SAVE		
	LINEAR	mbly li	ndex Belt P	rofile							4	CANCE	L CHANGE	S
D	UPLICATE DEL	ETE	IMPORT P	ROFILE	EXPORT PF	ROFILE C	LEAR PROF	LE						
I	Need help building	g a pro	file? Click I	here for mo	ore informa	tion								
(	Graph View	Та	ble View				1	😭 Add Wind	der 📦	Add Load	Add Po	pint	Scale v	
					I	nclination	0		Ď Ті	meline Adji	ustment:	-	+	
	Seconds 👻	D00	00.500	01.000	01.500	02.000	02.500	03.000	03.500	04.000	04.500	05.000	05.500	06.
~	55.400													
2	49.800													
emp	38.600													
Ass	30.000 23.400													
	16.800													
	3.600													
Ð,	kg s nan													
	Seconds 🔻	000	00.500	00.00	01.500	02.000	02.500	03.000	03.500	04.000	04.500	05.000	05.500	06.0
~	58.400													
Ę	49.800													
sitio	43.200 38.600													
B	30.000													
	16.800													
	10.200 3.600													
Ð				Ť		Ť								
4														

9. Right click on *Library* and click **Open In New Tab**.

Library Assembly Index Profile 2	
Assembly, dex Profile 2 / 0 Shared Users v 0 Comments v	🔒 START EDITING
	SAVE
LINEAR Assen ly Index Belt Profile	↑ CANCEL CHANGES
DUPLICATE DELETE IMPORT PROFILE EXPORT PROFILE CLEAR PROFILE	

10. The new Internet Explorer tab will open at the Library page, go to the Library – Motion Analyzer tab.



11. Your duplicated profile will show up in the Profiles Components.

♠ \ Library						
Library						
PROJECTS (32)				Filter by .	0 Create	New Project
NAME	LA	ST MODIFIED 🗸	DATE CREATED	OWNER	SHARED	ACTIONS
Pick n Place Application	Feb 2	2, 2016	Feb 22, 2016	mnseck@ra.rockwell.co	m No	Action
Viewing 0 of 32 < <u>1</u> 2 3 4	>					
REUSABLE COMPONEN	ITS			l	Create New Component	t v (i)
DRIVE / MOTOR AXES (4)						>
PROFILES (7)						~
NAME	ТҮРЕ	LAST MODIFIED	DATE CREATED	OWNER	SHARED	ACTIONS
Assembly Index Profile 2	Linear Profile	Feb 24, 2016	Feb 24, 2016	mnseck@ra.rockwe	II.com No	Action

12. Click on the Pick n Place Application in your Library where we will reopen our Pick n Place Application.

Library					
.ibrary					
PROJECTS (32)			Filter by	. 0 Create	e New Proje
NAME	LAST MODIFIED ~	DATE CREATED	OWNER	SHARED	ACTION
Yick n Place Application	Feb 22, 2016	Feb 22, 2016	mnseck@ra.rockwell.cor	m No	Action
/iewing 0 of 32 < <u>1</u> 2 3 4	>				
	NTS			Create New Componer	nt Y
EUSABLE COMPONEN DRIVE / MOTOR AXES (4)	NTS			Create New Componer	nt V
EUSABLE COMPONEN DRIVE / MOTOR AXES (4) PROFILES (7)	NTS			Create New Componer	nt v
EUSABLE COMPONEN DRIVE / MOTOR AXES (4) PROFILES (7) NAME	NTS TYPE LAST MODIFI	IED Y DATE CREATED	D OWNER	Create New Componer	nt Y ACTION
EUSABLE COMPONEN DRIVE / MOTOR AXES (4) PROFILES (7) NAME ssembly Index Profile 2	NTS TYPE LAST MODIFI Linear Profile Feb 24, 2016	IED y DATE CREATED Feb 24, 2016	D OWNER mnseck@ra.rockwel	Create New Componer SHARED	nt v ACTION Action
EUSABLE COMPONEN DRIVE / MOTOR AXES (4) PROFILES (7) NAME essembly Index Profile 2	NTS TYPE LAST MODIFI Linear Profile Feb 24, 2016 dex Axis 2.	IED V DATE CREATED Feb 24, 2016	D OWNER mnseck@ra.rockwel	Create New Componer SHARED Loom No	nt v ACTION
EUSABLE COMPONEN DRIVE / MOTOR AXES (4) PROFILES (7) NAME ssembly Index Profile 2	NTS TYPE LAST MODIFI Linear Profile Feb 24, 2016 dex Axis 2. I Power Analysis Cust	IED × DATE CREATED Feb 24, 2016	D OWNER mnseck@ra.rockwel	Create New Componer SHARED	ACTION
EUSABLE COMPONEN DRIVE / MOTOR AXES (4) PROFILES (7) NAME ssembly Index Profile 2 Ck Edit on Axis: Assembly In Summary Component Detail	NTS TYPE LAST MODIFI Linear Profile Feb 24, 2016 dex Axis 2. Power Analysis Cust tents	IED × DATE CREATED Feb 24, 2016	D OWNER mnseck@ra.rockwell	Create New Componer SHARED	ACTION
EUSABLE COMPONEN DRIVE / MOTOR AXES (4) PROFILES (7) NAME ssembly Index Profile 2 Ck Edit on Axis: Assembly In Summary Component Detail Ck N Place Application Compor	TYPE LAST MODIFI Linear Profile Feb 24, 2016 dex Axis 2. Power Analysis Cust tents	IED V DATE CREATED Feb 24, 2016	O OWNER mnseck@ra.rockwel	Create New Componer SHARED Loom No AXES (2) Create New Axis	ACTION Action
EUSABLE COMPONEN DRIVE / MOTOR AXES (4) PROFILES (7) NAME ssembly Index Profile 2 Ck Edit on Axis: Assembly In Summary Component Detail ck N Place Application Compor > Axis: Assembly Index Axis 1	NTS TYPE LAST MODIFI Linear Profile Feb 24, 2016 dex Axis 2. Power Analysis Cust tents	IED V DATE CREATED Feb 24, 2016	DOWNER mnseck@ra.rockwel	Create New Componer SHARED Loom No AXE S (2) PROJECT ACTIO Create New Axis Create New Bia	ACTION ACTION Action N S & Profile

13.

- Dual Axis Drive 👔 Components Performance 1 Phase 3 v **POWER REQUIREMENTS:** Voltage 460 Voltage Tolerance v PROFILE TRANSMISSION MOTOR LINEAR MECH. DRIVE H E Add from Library Add Partner Mechanism Add Partner Gearbox Add Motor Kinetix 5700 Catalog: 2198-D006-ERS3 ADD CUSTOM MOTOR CREATE NEW DEFINE CUSTOM DEFINE CUSTOM SET CONFIGURATION PORT FROM LIBRARY IMPORT FROM LIBRARY CHANGE DRIVE REMOVE
- 14. At the Components, we will add Profile from Library by clicking Add from Library

15. Add Assembly Index Profile 2 from Library and click **OK** to confirm



16. Your Assembly Index Profile 2 profile component should be added and seen as below:

Components	Performance		Dual Av	tis Drive (i) 1 2
POWER REQUIREMENTS	S: Voltage 460 v	Phase 3 v	SEAR	CH FOR SOLUTIONS
PROFILE	LINEAR MECH.	TRANSMISSION	MOTOR	DRIVE
Edit Profile Assembly Index Profile 2 Motion Type: Linear REMOVE	Add Partner Mechanism DEFINE CUSTOM IMPORT FROM LIBRARY	Add Partner Gearbox DEFINE CUSTOM IMPORT FROM LIBRARY	Add Motor	Kinetix 5700 Catalog: 2198-D006-ERS3 SET CONFIGURATION CHANGE DRIVE REMOVE

17. Close the first tab containing the duplicated profile.



18. Click 1 to open the Assembly Index Axis 1 to copy the Linear Mechanism component.

Components	Performance		Dual A	is Drive i 1 2
POWER REQUIREMENTS	S: Voltage 460 v	Phase 3 v	SEAR	CH FOR SOLUTION
PROFILE			MOTOR	DRIVE
Edit Profile Assembly Index Profile 2 Motion Type: Linear	Add Partner Mechanism DEFINE CUSTOM IMPORT FROM LIBRARY	Add Partner Gearbox DEFINE CUSTOM IMPORT FROM LIBRARY	Add Motor ADD CUSTOM MOTOR	Kinetix 5700 Catalog: 2198-D006-ERS3 SET CONFIGURATION
REMOVE				REMOVE

19. Right click on Assembly Belt to open the Linear Mechanism of Assembly Index Axis 1 in a different tab.



- 20. Click **Duplicate** to duplicate the Assembly Belt. **Rename** [Copy]Assembly Belt to Assembly Belt 2. Click **YES** to confirm your selection.
- 21. The new component will open.



22. We will return to the Axis tab and import the linear mechanism to our Assembly Index Axis 2.



23. Click on 2 to navigate to the Assembly Index Axis 2 and click **Import From Library** to import the Assembly Belt 2 Linear mechanism.

Components	Performance		Dual Ax	tis Drive (i) 1 2
POWER REQUIREMENTS	S: Voltage 460 v	Phase 3 v	SEAR	CH FOR SOLUTIONS
PROFILE	LINEAR MECH.	TRANSMISSION	MOTOR	DRIVE
		<b>\$</b> \$		E.
Edit Profile	Add Partner Mechanism	Add Partner Gearbox	Add Motor	Kinetix 5700 Catalog: 2198-D006-ERS3
Assembly Index Profile 2	DEFINE CUSTOM	DEFINE CUSTOM	ADD CUSTOM MOTOR	SET CONFIGURATION
REMOVE	IMPORT FROM LIBRARY	IMPORT FROM LIBRARY		CHANGE DRIVE
				REMOVE

24. Select Assembly Belt 2 from Library and then click **OK** to confirm your selection.

Choose an option.	1
Choose an option.	
Sample Belt Mechanism	

25. Open Assembly Index Axis 1 (Step 18), right click on *Coupling Transmission* and select **Open in new tab**. Your Internet Explorer window should display 3 tabs. Click on the Powertrain tab.



- 26. Click **Duplicate** to duplicate the *Coupling Transmission*. **Rename** [Copy]Coupling Transmission to Coupling Transmission 2. Click **YES** to confirm your selection.
- 27. The duplicated transmission will be saved in the Library's Reusable Components section under Transmission. **Return** to the Axis Motion Analyzer tab and **close** the other two Internet Explorer tabs.



28. Open Assembly Index Axis 2 (Step 23), and click Import From Library to import the Coupling Transmission 2 transmission.



29. Select Coupling Transmission 2 from Library and then click OK to confirm your selection.

Choose an option.		*
hoose an option.		
ample Belt Transmission		
	•	

#### 30. Your axis components should look as follows:



31. From the Assembly Index Axis 1, we know our gearbox is selected as SP075S-MF1-3-0C1. Click **Add Another** on the *Coupling Transmission 2* component.



### 32. Select Add Partner Gearbox



33. Select *Wittenstein Alpha* as our manufacturer, enter *SP075S-MF1-3-0C1* as the catalog number of the gearbox, and click **Add to Axis**.

Wittenstein Alpha	r adding your gearbox below
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. SP075S-MF1-3-0C1 Select a family ¥ ADD TO AXIS 3

34. You can select **Search For Solutions** to add a motor to your axis.



- Viewing 1 10 of 10 SOLUTIONS LIST Sort by: Profile Match (%) v Note: Some solutions may have accessories added to meet your filter criteria. Clear Filters Filter Solutions by Product Family Solution Filters > Solution Filters (6) ) Drive Select View Torque Speed Curve Kinetix 5700 | 2198-D006-ERS3 Motor Filters Motor Force Or Torque Utilization Profile Relative Average Inertia Peak Thermal VPF Motor | VPF-B0752F-xxxxxx Match Price Current Ratio Current Capacity Commonly Used (6) ) 71.9% 62.6% 82.5% \$\$\$\$\$\$ 2.18 134.28 62.2% Gearbox Torque/Force Ratings (6) SP075S-MF1-3-0C1 | SP075S-MF1-3-0C1 0 • Induction Motor (5) ) Drive Select View Torque Speed Curve Kinetix 5700 | 2198-D006-ERS3 Physical Dimension (3) ) Motor Profile Relative Average Current Force Or Inertia Peak Thermal VPL Motor | VPL-B0752F-x00000 Options (14) ) Match Price Torque Ratio Current Capacity 82.5% \$\$\$\$\$\$ 2.18 134.28 62.8% Gearbox 72.1% 62.4% IP Ratings (5) ) SP075S-MF1-3-0C1 | SP075S-MF1-3-0C1 • Certifications (3) Э Drive View Torque Speed Curve Select Kinetix 5700 | 2198-D006-ERS3 Environment (3) 3
- 35. Your Solutions List will display 10 solutions, select the second Drive, Motor, Gearbox solution on the list.

NOTE: If an error message pops up, click ok to close it.

- 36. You've completed the sizing and selection for your Assembly Index axes. Click Continue to Project.
- 37. Your project Component Detail page will display your two axes and the dual axis inverter.

Pick n Place Application /	0 Shared Users ¥ 0 Comments ¥
This machine accepts packages at random, stages packages to be picked up from assembly and places pack product belt before cases are taken away for shipment	ages into a case on a synchronized
DUPLICATE DELETE EXPORT AS XML	
	START EDITING
1	Automatically Saved
	CREATE A SNAPSHOT
	RESTORE FROM SNAPSHOT
Commence Commence Data 11 David Anthriz Contempol(2) Collected Destants	
Summary Component Detail Power Analysis Customer/Site Selected Products 'ick N Place Application Components	AXES (2)
Summary Component Detail Power Analysis Customer/Site Selected Products Vick N Place Application Components	AXES (2) PROJECT ACTIONS
Summary       Component Detail       Power Analysis       Customer/Site       Selected Products         Vick N Place Application Components         > Axis: Assembly Index Axis 1	AXES (2) PROJECT ACTIONS Create New Axis & Profile
Summary       Component Detail       Power Analysis       Customer/Site       Selected Products         Vick N Place Application Components         > Axis: Assembly Index Axis 1       Image: Customer/Site       Selected Products         Axis: Assembly Index Axis 2       Image: Customer/Site       Selected Products	AXES (2) PROJECT ACTIONS Create New Axis & Profile Create New Blank Axis
Summary       Component Detail       Power Analysis       Customer/Site       Selected Products         Vick N Place Application Components         > Axis: Assembly Index Axis 1       Image: Customer/Site       Selected Products         Axis: Assembly Index Axis 2       Image: Customer/Site       Selected Products	AXES (2) PROJECT ACTIONS Create New Axis & Profile Create New Blank Axis Import Axis

38. Click on the dropdown of the Axis: Assembly Index



39. You can view your individual components by axis.

Pick N Place Application Components
✓ Axis: Assembly Index Axis 1
Axis: Assembly Index Axis 2
Assembly Index Axis 1
Load/Profile: Assembly Index Profile   Linear Profile
Cinear Mechanism: None Selected
Transmission: Gearbox SP075S-MF1-3-0C1
- Motor: VPL-B0633T-xxxxxx
Drive: 2198-D006-ERS3
Assembly Index Axis 2
Load/Profile: Assembly Index Profile 2   Linear Profile
Cinear Mechanism: None Selected
Transmission: Gearbox SP075S-MF1-3-0C1
- Motor: VPL-B0752F-xxxxx
Drive: 2198-D006-ERS3
40. We will navigate to the Power Analysis tab

					6	START EDITING
						Automatically Saved
						CREATE A SNAPSHOT
						RESTORE FROM SNAPSHOT
Summary	Component Detail	Power Analysis	Customer/Site	Selected Products		
Pick N Place	Application Componer	nts				AXES (2)

41. The calculations will be performed once you select **Auto Configure** 

Summary	Component Detail	Power Analysis	Customer/Sit	e Selected Products	
Total Axes (2)	Shared Buses (1)	Standalone Ax	(es (0)	OTHER REQUIREMENTS	
CHOOSE AN	ITEM TO VIEW			Please click Auto Configure to add (products/accessories) to your sys	d the following stem.
Assom	hly Inday Avis 1 / Ass	ambly Inday Avis 2	<b>B</b>	Kinetix 5700 platform must have a powe	er supply.
Assem	DIY IIIUCA MAIS 17 M33	CHIDIY HIGEA MAIS Z	•	SELECTED SHARED DC BU	SDETAIL
Kinetix	5700			Average Power Usage	0.00 kW
Edit Sh	ared Bus			Average Motoring Power	0.00 kW
				Average Regen Power	0.00 kW
				DC Bus Voltage Utilization	0%
				SET POWER SUPPLY, SHU Configures Axis power options ba manual/automatic selections below selections.	NT, AND CAPACITORS sed on Axis components and w. This does not overwrite manual Auto Configure
				Power Supply i	Auto Manual
				Continuous Converter Utilization	0%
				Peak Power Utilization	0%
					`

**NOTE:** The Power Analysis Guide can be found in motionanalyzer.rockwellautomation.com/Support/Resources for explanations and details of the calculations done.

42. Your calculations will be shown in the Selected Shared DC Bus Detail section.

ELECTED SHARED DC BO	5 DE TAIL		SELECTED SHARED DC BUS D	ETAIL
Average Power Usage	0.09 kW	^		Auto Contigure
Average Motoring Power	0.12 kW			
Average Regen Power	0.00 kW		Power Supply	Auto Manual
DC Bus Voltage Utilization		0%	2198-P031	x
DC Bus Rms Current Utilization		0%	Continuous Converter Utilization	1%
DC Bus Peak Current Utilization		%	- Peak Power Utilization	2%
Cable Length Utilization		0%		
ET POWER SUPPLY, SHU	IT, AND CAPACITO	ORS	Shunt	Auto Manual
onfigures Axis power options bas anual/automatic selections belov elections.	sed on Axis component v. This does not overwr	s and ite manual	Continuous Shunt Utilization	0%
	Auto	Configure	Capacitor (i)	Auto Manual

43. Return to the Component Detail tab by clicking on Component Detail.

You've completed the first two axes of this project, five to go.

#### Part C: Product Index Belt

The Product Index Belt will use the axis data from the Assembly Index Belts as starting point for sizing. Be sure to enter the differences below:

- Package weight <1.5kg, and four packages per case x 3 cases = 18kg total</p>
- Belt Weight = 2 kg
- Move 250mm (about 10") in 1 sec. and dwell for 2 sec.

#### **Creating New Blank Axis**

1. From *Pick n Place Application Component Detail*, select **Create New Blank Axis**.

A \ Library \ Pick n Place Application							
Pick n Place Application / 0 Shared Users v 0 Comments v							
This machine accepts packages at random, stages packages to be picked up from assembly and places packages product belt before cases are taken away for shipment	ges into a case on a synchronized						
DUPLICATE DELETE EXPORT AS XML							
A	START EDITING						
	Automatically Saved						
an 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 19	CREATE A SNAPSHOT						
ia la	RESTORE FROM SNAPSHOT						
Summary Component Detail Power Analysis Customer/Site Selected Products							
Pick N Place Application Components	AXES (2)						
Avis: Assembly Index Avis 1	PROJECT ACTIONS						
	Create New Axis & Profile						
Axis: Assembly Index Axis 2	Create New Blank Axis						
	Import Axis						

2. The Product Index axis is a linear axis with mechanism, select *Linear Axis with Mechanism* from the **Select Motion Type** window.

	SELECT MOTION TYPE	
	Choose an option.	۲
	Choose an option. Rotary Axis	
	Linear Axis with Mechanism	
Ĺ	Linear Axis	

## 3. Click OK to confirm your selection

SELECT MOTION TYPE	
Linear Axis with Mechanism	×
	ок
c	ANCEL

4. Your new axis will open up within the same project. Change the name AXIS 3 to Product Index Axis.

↑ Library \ Pick n Place Application \ Axis 3							
CONTINUE TO PROJECT							
Axis 3 / 0 Shared Users V 0 Comments V Linear Axis with we ba V DUPLICATE DELETE DELETE DECETE							
Components     Performance       POWER REQUIREMENTS:     Voltage       Select     Phase       Select     Select							
PROFILE	LINEAR MECH.	TRANSMISSION	MOTOR	DRIVE			
Add from Library	Add Partner Mechanism DEFINE CUSTOM IMPORT FROM LIBRARY	Add Partner Gearbox DEFINE CUSTOM IMPORT FROM LIBRARY	Add Motor ADD CUSTOM MOTOR	Add Drive			

5. The name change will be reflected in two areas as highlighted below:

A \ Library \ Pick n Place Application \ Product Index Axis						
CONTINUE TO PROJECT						
Product Index Axis   0 Shared Users   0 Comments	A START EDITING					

6. As we are using the axis data from the Assembly Index Belts, we will import the components we've saved in the previous sections. Click **Add From Library** on the *Profile* component.



7. Select Assembly Index Profile 2 to add the profile from Library, and click OK to confirm your selection



- 8. Import the Linear Mechanism and Transmission from Library to the Product Index Axis.
- 9. Once you've finished importing the components to your new axis, we will edit them to match the specifics of the Product Index Axis requirements.

10. Open the Profile component,

A \ Library \ Pick n Place Application \ Product Index Axis							
CONTINUE TO PROJECT							
Product Index Axis        0 Shared Users        0 Comments							
Components     Performance       POWER REQUIREMENTS:     Voltage     Select     Phase     Select     SEARCH FOR SOLUTIONS							
PROFILE		TRANSMISSION	MOTOR	DRIVE			
Edit Profile Assembly Index Profile 2 Motion Type: Linear REMOVE	Assembly Belt 2 Type: Belt Drive REMOVE	Add Another Coupling Transmission 2 REMOVE	Add Motor ADD CUSTOM MOTOR	Add Drive			

11. Rename the Profile component from Assembly Index Profile 2 to Product Index Profile. And remove the description of the profile.

A \ Library \ Pick n Place Application \ Product Index Axis \ Assembly Index Profile 2						
CONTINUE TO AXIS						
Assembly Index Profile 2	<ul> <li>A START EDITING</li> <li>■ SAVE</li> <li>↑ CANCEL CHANGES</li> </ul>					
DUPLICATE DELETE IMPORT PROFILE EXPORT PROFILE CLEAR PROFILE						

12. Click on the *k* to edit or close the edit section.

#### 13. Open the Table View for the profile.

Graph View	Table View		😭 Add Winder	Add Load	Add Point	Scale 🗸
	<b></b>	Inclination	0	🖒 Timeline Adj	ustment:	- +

### 14. Select Add Load

Graph View	Table View	Add Winder Add Load	Add Point Scale 🗸
Loads			
ASSEMBLY - WE	IGHT		
	TIME [ms]	MASS [kg]	EDIT
0		3	Edit

## 15. Make your field entries to match the image below, and click **Submit**

NEW LOAD	INITIAL POINT			
Product Weight	LOAD MASS			
Weight 🗸		18 ka		
		ng		
			CANCEL	SUBMIT

16. You will have two loads present in your profile. We will remove the Assembly load by clicking on 💌 .

Loads			
ASSEMBLY - WEIGHT			×
TIME [ms]	MASS	[kg]	EDIT
0	3		Edit
PRODUCT WEIGHT - WEIGHT			X
TIME [ms]	MASS	[ kg ]	EDIT
0	18		Edit

17. Confirm the selection by clicking **OK** on the prompt.



18. In the *Motion* section, we will change our dwell point to match the dwell of the Product index axis. Click **Edit** on the second acceleration segment.

Motion						
ТҮРЕ	TIME [ms]	POSITION [m]	VELOCITY [m/s]	$\begin{array}{c} \text{ACCELERATION} \\ [\text{ m/s}^2 ] \end{array}$	ЈЕКК [ m/s <sup>3</sup> ]	EDIT
Acceleration	0	0	0	0	0	Edit
Index	1000	0.25	0	0	18	Edit
Acceleration	2000	0.25	0	0	•	Edit

19. Change the absolute time from 2000 ms to 3000 ms. Then click Submit to confirm the entry.

EDIT SEGMENT				
	RATION		ĸ 📃	САМ
Data Depiction	ı			
Specify motion po	oint values.	Initial numbers may be bas	sed on click activity	
	previous point	o incremental	<ul> <li>absolute</li> </ul>	0
Time	2000	1000	3000	ms
Distance	0.25	0	0.25	m
Velocity	0	0	0	m/s
Average Acceleration	0	0	0	$m/s^2$
Jerk		0		%
				<b>9</b>
				CANCEL <u>व</u> Delete Submit

20. Your *Loads* and *Motion* should look as below:

## Loads

PRODUCT WEIGHT - WEIGHT

TIME	[ ms ]	MASS [kg]	EDIT
0	18		Edit

## **Motion**

ТҮРЕ	TIME [ms]	POSITION [m]	VELOCITY [m/s]	$\frac{\text{ACCELERATION}}{[\text{ m/s}^2]}$	[	JERK [m/s <sup>3</sup> ]	EDIT
Acceleration	0	0	0	0	0		Edit
Index	1000	0.25	0	0	18		Edit
Acceleration	3000	0.25	0	0	0		Edit

### 21. Click Save then click Continue to Axis.

♠ \ Library \ Pick n Place Application \ Pr	roduct Index Axis \ Product Index Profile	
Product Index Profile >	0 Shared Users ♥ 0 Comments ♥	
LINEAR		
DUPLICATE DELETE IMPORT PROFILE	EXPORT PROFILE CLEAR PROFILE	

22. We will now edit the Linear Mechanism component. Click on **Assembly Belt 2** to open the *Belt Mechanism Properties* page.

Components	Performance			
POWER REQUIREMENTS Voltage Tolerance V	S: Voltage Select V	Phase Select ¥	SEAR	CH FOR SOLUTIONS
PROFILE		TRANSMISSION	MOTOR	DRIVE
Edit Profile Product Index Profile Motion Type: Linear REMOVE	Assembly Belt 2 Type: Belt Drive REMOVE	Add Another Coupling Transmission 2 REMOVE	Add Motor ADD CUSTOM MOTOR	Add Drive

23. Start by changing the name of the Belt Mechanism from Assembly Belt 2 to Product Belt. Click on 🖊

A \ Library \ Pick n Place Application \ Product Index Axis \ Assembly Belt 2			
CONTINUE TO AXIS			
Assembly Belt 2 🖉 0 Shared Users 🗸 0 Comments 🗸			
DUPLICATE DELETE	CANCEL CHANGES		

24. After the name change, click on the pen 🖉 to exit the name field, change the belt weight to 2 kg.



25. Your completed mechanism fields should match as the image below:

♠ \ Library \ Pick n Place Application \ Product Index Axis \ Product Belt					
CONTINUE TO AXIS					
Product Belt	/ 0 Shar	ed Users 🖌 0 Comments 🗸			<ul> <li>▲ START EDITING</li> <li>■ SAVE</li> <li>◆ CANCEL CHANGES</li> </ul>
BELT DRIVE F	PROPERT	IES			
REQUIREMENT S	UMMARY	(i)			Weight of Load + Table
Load:	18	kg		Motion Friction Surfac	LOAD     Diameter
Stroke:	0.25	m		Driver	TABLE of Roll
Speed:	0.375	m/s		<b>**</b>	Idler Group 1 Belt
Acceleration:	1.5	m/s <sup>2</sup>		Motor + Transm	issions + Gearbox
PARAMETERS					
		DRIVER		IDLERS	
			GROUP 1	GROUP 2	GROUP 3
Diameter:	m	0.1	0.1		
Inertia:	kg $\cdot$ m <sup>2</sup>	0.0465	0.0465		
Friction Torque:	N·m	0	0		
Number of Rollers:		1	1		
ADDITIONAL LOADS					
Table Mass: 0		kg Belt Mass:	2 kg		

26. Click Save then click Continue to Axis.

27. Click on Coupling Transmission 2 to open the Transmission Properties page

Components	Performance			
POWER REQUIREMENTS Voltage Tolerance V	: Voltage Select v	Phase Select ¥	SEAR	CH FOR SOLUTIONS
PROFILE		TRANSMISSION	MOTOR	DRIVE
Edit Profile Product Index Profile Motion Type: Linear REMOVE	Product Belt Type: Belt Drive REMOVE	Add Another Coupling Transmission 2 REMOVE	Add Motor ADD CUSTOM MOTOR	Add Drive

- 28. Change the name of the transmission from *Coupling Transmission 2* to *Product Belt Coupling*. Click **Save** then click **Continue to Axis**.
- 29. Add the gearbox SP075S-MF1-3-0C1 to your axis. Follow steps 31-33 in Duplicating a Component.
- 30. Click on Product Index Axis to refresh your window

A \ Library \ Pick n Place Application Product Index Axis				
CONTINUE TO PROJECT				
Product Index Axis 🖉 0 Shared Users 🗸 0 Comments 🗸	A START EDITING			
	Automatically Saved			
Linear Axis with Mecha Y	TREATE A SNAPSHOT			

31. Set the *Power Requirements* to **460** for *Voltage* and **3** for *phase*. Now you are able to click **Search for Solutions**. Click **Search for Solutions** to find Drive/Motor solutions for your axis.

You can set your % voltage tolerances if applicable	Performance	
POVER REQUIREMENTS:	Voltage 460 v Phase 3 v	SEARCH FOR SOLUTIONS

32. As done before, we are going to filter the solutions by product family and you will select to view only Kinetix 5700 Servo Drive solutions.

Clear Filters         Pitter Solutions may have accessories added to meet your filter criteria.           Solution Filters         Prive         Pitter Solutions by Product Family           Solution Filters         Prive         Prive         Prive         Solution           Commonly Used (6)         Pitter Solutions in MPL-B222T-account         Prive         Prive <t< th=""><th>DLUTIONS LIST</th><th>Viev</th><th>wing 1 - 10 of 32 &lt; <u>1</u> 2 3 4 &gt;</th><th>Sort I</th><th>by: Prof</th><th>ile Match (</th><th>%)</th><th>*</th><th></th><th></th></t<>	DLUTIONS LIST	Viev	wing 1 - 10 of 32 < <u>1</u> 2 3 4 >	Sort I	by: Prof	ile Match (	%)	*		
Solution Filters         Pitter Solutions by Product Family         Vew Torque Speed Curve         Solution           Motor Filters         Drive Motor (IMers 0700   2169-0006-ERS3         Profile Masket 0700   2169-0006-ERS	Clear Filters		Note: Some solutions may have accesso	ries added	to meet y	our filter	criteria.			
Solution Filters (6)         Drive Knettic 6700   2 198-0006-ERS3         View Torque Speed Curve         Solution           Motor Filters         Motor MMC Markin   MF-B220T-scoock         Pails (1)         Pails (	Solution Filters		> Filter Solutions by Product Fam	ily						
Motor Filters         Production         Prod	Solution Filters (6)	>	Drive	View To	orque Spee	ed Curve			Sele	ct
Mrt. Mater         Mrt. Later         Mrt. La	Notor Filters		Motor	Destin	Deletion		5 0-	la dia	Death	Theresel
Drive         SP0755-MF1-3-0C1         SP0755-MF1-3-0C1         YB-M355         1.7.3         72.6%         168.32         61.3%         50%           aduction Motor (5)         >         Drive         SP0755-MF1-3-0C1         >         SP0755-MF1-3-0C1         SS555         1.7.3         72.6%         168.32         61.3%         50%           aduction Motor (5)         >         Drive         View Torque Speed Curve         Select           Patisities (50)         >         Gearbox         SP0755-MF1-3-0C1         2198-0006-ERS3         View Torque Speed Curve         Select           Drive         Wheth         VIEw Motor         VIEw Torque Speed Curve         Select         Current	Commonly Used (6)	>	MPL Motor   MPL-B220T-x000000	Match	Price	Current	Torque Utilization	Ratio	Current Utilization	Capacity
Induction Motor (5)       >       Drive Medice 5700   2109-D006-ERS3       View Torque Speed Curve       Select         Diptions (14)       >       Motor VPL.Motor   VPL-8005334-coccccc       Profile Match       Ratine Price       Average Average       Force Or Torque Speed Curve       India Torque Speed Curve	Forque/Force Ratings (6)	>	Gearbox SP075S-MF1-3-0C1   SP075S-MF1-3-0C1	75.4%	\$\$\$\$\$	1.73	72.6%	168.32	61.3%	50%
Note:       5100   2198-0006-ERS3       View Torque Speed Curve       Curvet       Curv	nduction Motor (5)	>	Drive	View T	argua Spac	d Curvo			Solo	.ct
Mictor     Profile     Relative     Average     Force Or     Initial Current     Thermal Utilization       P Ratings (5)     SP0758-MEF1-3-0C1     SP0758-MEF1-3-0C1     72.3%     \$	Physical Dimension (3)	>	Kinetix 5700   2198-D006-ERS3	view ro	orque Spee	ed Curve			Sele	
P Ratings (5)       Gearbox       SP0785-MF1-3-0C1       SP0785-MF1-3-0C1       72.3%       \$\$\$\$\$\$\$       1.65       67.7%       192.04       65.9%       59.9%         Certifications (3)       Drive       Nemetic 5700       2198-0006-ER53       View Torque Speed Curve       Select         Motor       VPF Motor       VPF-B0333M-accococc       Profile       Relative       Average       Force Cr       Inertia       Peak       Current       Current </td <td>Options (14)</td> <td>&gt;</td> <td>VPL Motor   VPL-B0633M-xxxxxx</td> <td>Profile Match</td> <td>Relative Price</td> <td>Average Current</td> <td>Force Or Torque</td> <td>Inertia Ratio</td> <td>Peak Current</td> <td>Thermal Capacity</td>	Options (14)	>	VPL Motor   VPL-B0633M-xxxxxx	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity
Drive Knetk: 5700   2199-0006-ERS3       View Torque Speed Curve       Select         Motor VFF Motor   VFF.B0033M-scccccc       Profile Match       Relative Price       Average Current       Force Or Utilization       Inertia Ratio       Peak Current       Termal Carrent         Group (1)       Select       Select       Torque Speed Curve       Select         Drive Filters       Gearbox SP075S-MF1-3-0C1   SP075S-MF1-3-0C1       Torque Speed Curve       Select         Drive Knetk: 5700   2199-D006-ERS3       View Torque Speed Curve       Select         Motor VPL Motor   VPL-B0752E-scccccc       Profile Relative Select       Average Force Or Utilization       Force Or Inertia       Peak Current       Thermal Capacity Utilization         P Patings (5)       Select       Motor VPL Motor   VPL-B0752E-sccccccc       Profile Relative Select       Average Inertia       Force Or Inertia       Peak Inertia       Thermal Capacity Utilization         Options (4)       Select       Motor VPF Motor   VPF-B0752E-scccccc       Profile Relative Select       Average Inertia       Force Or Inertia       Inertia Relative Utilization       Peak Inertia       Peak Relative Select       Profile Relative Current       Relative Utilization       Relative Inertia       Peak Relative Relative Select       Profile Relative Select         Drive Kinetik: 5700   2198-D000-ERS3       View Torque Speed Curve	P Ratings (5)	>	Gearbox SP075S-MF1-3-0C1   SP075S-MF1-3-0C1	72.3%	\$\$\$\$\$S	1.65	67.7%	192.04	65.9%	<b>59.9%</b>
Drive Finite         Commonly Used (7)         Drive Finite: 5700   2199-D006-ERS3         View Torque Speed Curve         Select           Drive Finite: S700   2199-D006-ERS3         Profile Profile Profile         Relative Profile Profile         Average Force Or VPF. Motor         Force Or VPF. Motor         Inertia Current VPF. Botor         Current VPF. Motor         Thermal Current VPF. Motor           Commonly Used (7)         Subtract         Drive Kinetic 5700   2199-D006-ERS3         View Torque Speed Curve         Select           Motor VPL Motor         VPL-B0752E-xxxxxxxx         Profile Relative VPL-B0752E-xxxxxxx         Profile Profile         Relative Profile         Average Force Or VPL Motor         Force Or VPL Motor         Inertia VPL-B0752E-xxxxxx         Profile Match         Relative Profile         Average Force Or VPL Motor         Force Or VPL Motor         Inertia VPL-B0752E-xxxxxx         Profile Match         Profile Profile         Average Force Or VPL Motor         Force Or VPL Motor         Inertia VPL-B0752E-xxxxxx         Profile Match         Profile Profile         Average Force Or VPL Motor         Force Or VPL Motor         Inertia VPL-B0752E-xxxxx         Profile Match         Profile Profile         Average Force Or VPL Motor         Force Or VPL Motor         Profile VPL Motor <td< td=""><td>Certifications (3)</td><td>&gt;</td><td>Drive</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	Certifications (3)	>	Drive							
Motor     VPF Motor     VPF-B0033M-soccocx     Profile     Relative Match     Average Price     Force Or     Inetfile     Reak     Current     Thermal       Group (1)     Sp0755-MF1-3-0C1     Sp0755-MF1-3-0C1     Sp0755-MF1-3-0C1     72.2%     \$\$\$\$\$\$\$     \$\$	Environment (3)	>	Kinetix 5700   2198-D006-ERS3	View To	orque Spee	ed Curve			Sele	ct
Gearbox SP078S-MF1-3-0C1       SP078S-MF1-3-0C1       72.2% SS\$\$\$       \$\$\$\$\$\$       1.63       67.1%       192.04       65.3%       59.4%         Orive Filters       Drive Kinetix 5700       2169-D006-ERS3       View Torque Speed Curve       Select         Motor VPL Motor       VPL-B0752E-xxxxxxx       Profile Match       Average Profile Match       Force Or Ulilization       Inertia Ratio Ulilization       Peak Current       Thermal Ulilization         Drive VPL Motor       VPL-B0752E-xxxxxx       Profile Match       Relative Profile Match       Average Profile Profile Match       Force Or Ulilization       Inertia Carent Ulilization       Peak Current       Thermal Capacity         Drive Kinetix 5700       2169-D006-ERS3       View Torque Speed Curve       Select       Ver         Drive Kinetix 5700       2169-D006-ERS3       View Torque Speed Curve       Select       Ver         Drive Kinetix 5700       2169-D006-ERS3       View Torque Speed Curve       Select       Ver         Certifications (19)       Notor VPF Motor       VPF-B0752E-xxxxxx       Profile Match       Average Profile Profile       Force Or Torque Ulilization       Inertia Current Ulilization         Controller (4)       SP075S-MF1-3-0C1       SP075S-MF1-	Feedback (2)	>	Motor VPF Motor   VPF-B0633M-xxxxxxx	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity
Drive Filters       Drive       View Torque Speed Curve       Select         Voltage & Phase (4)       Motor       VPL-B0752E-xxxxxx       Profile       Relative       Average       Force Or       Inertia       Peak       Thermal Capacity         P Ratings (5)       >       Gearbox       SP075S-MF1-3-0C1       \$P05We Torque Speed Curve       Select       Allow         Divious (4)       >       Drive       Nettri ST00       \$2198-D006-ERS3       Yew Torque Speed Curve       Select       Allow         Divious (19)       >       Drive       Notor       YPF-B0752E-xxxxxx       Profile       Relative       Average       Force Or       Inertia       Peak       Thermal Capacity         Certifications (19)       >       Current       VPF-B0752E-xxxxxxx       Profile       Relative       Average       Force Or       Inertia       Peak       Thermal Capacity         Controller (4)       >       Gearbox       \$P075S-MF1-3-0C1       \$P075S-MF1-3-0C1       Profile       Relative       Average       Force Or       Inertia       Peak       Thermal Capacity         Sp075S-MF1-3-0C1       YPF-B0752E-xxxxxxx       Profile       Relative       Average       Force Or       Inertia       Peak       Thermal Capacity	Group (1)	>	Gearbox SP075S-MF1-3-0C1   SP075S-MF1-3-0C1	72.2%	\$\$\$\$\$S	1.63	0tilization 67.1%	192.04	0tilization 65.3%	59.4%
Commonly Used (7)     Drive Kinetix 5700   2198-D006-ERS3     View Torque Speed Curve     Select       Motor VPL Motor   VPL-80752E-xxxxxx     Profile Match     Relative Price     Average Current Utilization     Force Or Torque     Inertia Ratio     Peak Current Utilization     Peak Current Utilization     Peak Current Utilization     Thermal Capacity       P Ratings (5)     >     Gearbox SP075S-MF1-3-0C1   SP076S-MF1-3-DC1     70.4%     \$\$\$\$\$\$\$     1.43     66.4%     186.31     52.8%     48%       Dive Kinetix 5700   2198-D006-ERS3     View Torque Speed Curve     Select     Select     48%       Drive Kinetix 5700   2198-D006-ERS3     View Torque Speed Curve     Select     186.31     52.8%     48%       Controller (4)     >     Motor VPF Motor   VPF-B0752E-xxxxx     Profile Match     Relative Price     Average Current VPF Motor     Force Or Torque St\$\$\$\$\$     Inertia Ratio     Peak Current Utilization     Thermal Capacity       Controller (4)     >     Gearbox SP075S-MF1-3-0C1   SP075S-MF1-3-0C1     Profile St\$\$\$\$\$     Relative Current VPF Motor     Average Current VPF Motor     Force Or Torque S\$\$\$\$\$     Inertia Ratio     Peak Current VPF Motor     Thermal Capacity       Searbox SP075S-MF1-3-0C1   SP075S-MF1-3-0C1     SP075S-MF1-3-0C1     S\$\$\$\$\$     1.41     66.1%     186.31     52.3%     47.6%	Drive Filters		Deius							
Motor       Wotor       VPL-B0752E-xxxxxx       Profile Match       Relative Profile Match       Average Current       Force Or Torque Utilization       Inertia Ratio       Peak Current       Thermal Capacity         P Ratings (5)       >       Gearbox       SP075S-MF1-3-0C1       SP075S-MF1-3-0C1       SP075S-MF1-3-0C1       SS\$\$\$\$       1.43       66.4%       186.31       52.8%       48%         Doptions (4)       >       Drive Kinetix 5700       2198-D006-ERS3       View Torque Speed Curve       Select       Select       Select       Current Utilization       Peak Current Utilization       Peak Current Utilization       Peak Current Utilization       Select       S	Commonly Used (7)	>	Kinetix 5700   2198-D006-ERS3	View To	orque Spee	ed Curve			Sele	ct
Image: Problement Proble	Voltage & Phase (4)	>	Motor VPL Motor   VPL-B0752E-xxxxxxx	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity
Derive Kinetik 5700       Drive 2198-D006-ERS3       View Torque Speed Curve       Select         Certifications (19)       Motor VPF Motor       VPF-B0752E-xxxxxxx       Profile Match       Relative Proise       Average Current Utilization       Fore Or Torque Speed Curve       Inertia Ratio       Peak Current Utilization       Peak Current Utilization       Thermal Capacity         Controller (4)       Sep075S-MF1-3-0C1       SP075S-MF1-3-0C1       70.2%       \$\$\$\$\$\$       \$\$\$\$\$\$       1.41       66.1%       186.31       52.3%       47.6%	IP Ratings (5)	>	Gearbox	70.4%	\$\$\$\$\$\$	1.43	Utilization 66.4%	186.31	Utilization 52.8%	48%
Dptions (4)     Drive Kinetik 5700   2198-D006-ERS3     View Torque Speed Curve     Select       Certifications (19)     Motor VPF Motor   VPF-B0752E-x0000x     Profile Match     Relative Price     Average Current     Force Or Torque     Inertia Ratio     Peak Current     Thermal Capacity       Controller (4)     Gearbox SP075S-MF1-3-0C1   SP076S-MF1-3-0C1     70.2%     \$\$\$\$\$\$     1.41     66.1%     186.31     52.3%     47.6%	Environment (3)	>	3-0703-WE1-3-001   SP0703-WE1-3-001	•						
Certifications (19)     Motor     VPF-B0752E-xxxxxxx       Controller (4)     Profile     Profile       Gearbox     SP075S-MF1-3-0C1     SP075S-MF1-3-0C1	Options (4)	>	Drive Kinetix 5700   2198-D006-ERS3	View To	orque Spee	ed Curve			Sele	ct
Controller (4)         Gearbox         70.2%         \$\$\$\$\$\$         1.41         66.1%         186.31         52.3%         47.6%           Features (35)         >	Certifications (19)	>	Motor VPF Matar   VPF-B0752E-x000000	Profile	Relative	Average	Force Or	Inertia Ratio	Peak	Thermal
SP075S-MF1-3-0C1   SP075S-MF1-3-0C1 -	Controller (4)	>	Gearbox	70.2%	\$\$\$\$\$\$	1.41	Utilization 66.1%	186.31	Utilization 52.3%	47.6%
	Features (35)	>	SP075S-MF1-3-0C1   SP075S-MF1-3-0C1	•						

33. After filtering your Solutions List to Kinetix 5700 Servo Drives solutions, your results should looks as the image below:

34. Select the solution with the VPL motor (2<sup>nd</sup> solution on the list).

35. Your axis components should look as follows:



36. Click on the Performance tab.





#### 37. You can review your Torque/Speed curve and summary of your selected solution.

#### 38. Click Continue to Project



You've completed the Belt Actuator Requirement of this project. 3 axis down, 4 more to go.

## Lead Screw Actuator

The lead Screw actuator has two axes, a horizontal axis and a vertical axis, as shown in the image below.



#### Part A: Horizontal Lead Screw Axis

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

]	Extend 600 mm in 2 seconds	Dwell for 1 second			Dwell 1 sec	for
				Retracts 600 mm in 2 seconds		

The move profile is described as "extending the horizontal actuator to transfer packages to the **Product Index Belt**, pausing for 1 second to complete the drop off, retracting the actuator back to the **Assembly Index Belt** and pausing for 1 second to pick up the next product."

You will be moving a 3kg package with a total slide mass of 45 kg at a friction coefficient of 1%. The lead screw actuators specs are: Lead = 25 mm/rev, Length = 1200 mm, Diameter = 25 mm, Material = Steel, Efficiency = 90%. The motor coupling moment of inertia is  $2.6g \cdot cm^2$ .

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

#### New Axis & Profile in Project Actions

1. From the Pick N Place Application project page, click **Create New Axis & Profile**.



2. Select the Linear Axis with Mechanism motion type and click OK to confirm your selection

SELECT MOTION TYPE	
Linear Axis with Mechanism	~
ОК	
CANCEL	

## 3. Set your *Initial Load* as follows:

	INITIAL POINT		
Package		2	
Weight	LOAD MASS	3	
-	1	kg	3
			SUBMIT

**NOTE:** You can add any additional load to your profile by clicking **Add Load**.

Graph View Table View		Add Winder	Add Load	🕻 Add Point		Scale 🗸
	Inclination 0		ے Timeline Adjı	ustment:	-	÷

And then select the load type to be added. In our case, we could have included the friction coefficient to our load.

NEW LOAD		
Enter Name		
Select a load type	*	
Select a load type		
Select a load type Weight		
Select a load type Weight Force		

4. To enter a position profile data point, click anywhere on the **Position Plot**. The Add a Segment dialog box will appear at the Acceleration option. Select the **Index** segment and enter the values of the first point and click **Submit**:

ACCELE			A SEGMENT	САМ
Data Depictic Specify index se	on egmnt values.	Initial numbers may be bas	ed on click activity.	2
	point	<ul> <li>incremental</li> </ul>	<ul> <li>absolute</li> </ul>	
Time	0	2000	2000	ms
Distance	0	600	600	mm
Final Velocity	0	0	0	m/s
Jerk		acceleration	deceleration	3
		50	50	% of time
i Absolute Velocity Limit		Specify Limit	0	m/s
				CANCEL Submit

5. Let's add our second segment to the profile by clicking on the *Position* plot again. The second segment is a dwell segment, therefore we will use the **Acceleration** Segment. Enter the values to match the image below and click **Submit** 

	EDIT SEGMENT										
	RATION		×	Сам							
Data Depictio	n										
Specify motion p	oint values.	Initial numbers may be ba	sed on click activity								
	previous point	s O incremental	<ul> <li>absolute</li> </ul>	1							
Time	2000	1000	3000	ms							
Distance	600	0	600	mm							
Velocity	0	0	0	m/s							
Average Acceleration	0	0	0	$m/s^2$							
Jerk		0 2		%							
				CANCEL Submit							

6. Now we will add the retracting segment. Click on the *Position* plot, select the **Index** segment, and enter the values of the retracting point and click **Submit**.

ACCELE			IT SEGMENT K	Сам
Data Depiction	on egmnt values	. Initial numbers may be ba	ased on click activity.	
	previous point	incremental	<ul> <li>absolute</li> </ul>	
Time	3000	2000	5000	ms
Distance	600	-600	0	mm
Final Velocity	0	0	0	m/s
Jerk		acceleration	deceleration	3
		50	50	% of time
(i) Absolute Velocity Limit		Specify Limit	0	m/s
				CANCEL Delete Submit

7. We will add the last point of the profile. Click on the Position plot, with the preselected Acceleration Segment, enter the values to match the image below and click Submit

		ADE	A SEGMENT	
	RATION		x	Сам
Data Depiction	n			
Specify motion p	oint values.	Initial numbers may be bas	sed on click activity	
	previou: point	s 🔘 incremental	<ul> <li>absolute</li> </ul>	1
Time	5000	1000	6000	ms
Distance	0	0	0	mm
Velocity	0	0	0	m/s
Average Acceleration	0	0	0	m/s <sup>2</sup>
Jerk		0		%
				3
				CANCEL Submit

8. You've completed setting up the profile. **Zoom** in the *Position* Plot by clicking on the magnifying glass and open the Velocity plot by clicking on the dropdown button next to it.

	03.000							
× .	56.400							
-	49.800							
.0	43.200							
-	36.600							
ğ	30.000							
	23.400							
	16.800							
	10.200							
	3.600							
	0.000	,		1				
Ð	m							
-								
	Mala - 14 -							
^	velocity							

9. **Zoom** in the *Velocity* Plot by clicking on the magnifying glass



10. Rename your motion profile to *Horizontal Lead Profile*, and click **Save** to save this new profile.



#### Part B: Vertical Lead Screw Axis

In this section of the exercise, you will use the axis data from the horizontal lead screw as the starting point for sizing the vertical lead screw axis, but be sure to enter the differences below:

- Total Slide Mass = 25 kg (including fixtures and product grippers)
- Bi-directional move of 300 mm in 6 secs overall. See profile drawing.

/	Lower 300 mm in 2 seconds	Dwell for 1 second		Dwell 1 sec	for
			Raise 300 mm in 2 seconds		

11. Since we you will use the axis data from the horizontal lead screw as the starting point for sizing the vertical lead screw axis, we will duplicate this motion profile. Select **Duplicate**.

LINEAR			
DUPLICATE DELETE IMPORT PROFILE	EXPORT PROFILE	CLEAR PROFILE	

12. Name this copy "Vertical Lead Profile" and click Yes to confirm your selection.



13. With the new motion profile opened, change the position points to match your vertical lead screw axis profile. Go to **Table View** 

A	\Library \Ver	tical L	ead Profile.											
\	/ertical Lead	Prot	file 🗸		0 Share	d Users 🖌	0 Comme	nts ¥				START	EDITING	
											1	SAVE		
	LINEAR										4	CANCE	L CHANGE	s
			IN DODT		EVENET DE									
	JUPLICATE DEL	ETE	IMPORT	ROFILE	EXPORT PF	ROFILE C	LEAR PROF	ILE						
	Need help building	g a pro	ofile? Click I	here fr	ore informa	tion								
	Graph View	Та	able View					Add Winde	ar 👔	Add Load	Add Po	pint	Scale 🗸	
											_	_		
					1	nclination	0		фъ	meline Adi	ustmont.	_	+	
					•	ncanation	0		G		usunent.			
	Conneda	000	00 500	04.000	04 500	00.000	00.500	00.000	02 500		04.500	05.000	05 500	0.5.4
	Seconds 🗸	000	00.500	01.000	01.500	02.000	02.500	03.000	03.500	04.000	04.500	05.000	05.500	06.0
	58,400													
å	49.800													
ğ	43.200													
S.	30.000													
đ	23.400													
	16.800													
	10.200													
	2.000													
Ð	kg													
	Seconds 🔻	000	00.500	01.000	01.500	02.000	02.500	<b>0</b> β.000	03.500	04.000	04.500	05.000	05.500	06.
	03.000					•		•				•		
~	56.400													
E	49.800													
iti	43.200 38.600													

14. Edit the *Motion* segments to match the image below:

# Motion

ТҮРЕ	TIME [ms]	POSITION [m]	VELOCITY [m/s]	ACCELERATION [ m/s <sup>2</sup> ]	JERK [ m/s <sup>3</sup> ]	EDIT
Acceleration	0	0	0	0	0	Edit
Index	2000	0.3	0	0	2.7	Edit
Acceleration	3000	0.3	0	0	0	Edit
Index	5000	0	0	0	-2.7	Edit
Acceleration	6000	0	0	0	0	Edit

15. Save your changes.

## 16. **Return** to your Library



- 17. Reopen the Pick n Place Application
- 18. Click on Edit on Axis 4 to edit the axis components

♠ \ Library \ Pick n Place Application	n		
Pick n Place Application /		C	Shared Users ♥ 0 Comments ♥
This machine accepts packages at rar product belt before cases are taken av	dom, stages packages to be picked up from ass ray for shipment	sembly and places packag	es into a case on a synchronized
DUPLICATE DELETE EXPORT AS	ML		
		<b>A</b>	START EDITING
		[13]	Automatically Saved
		÷	CREATE A SNAPSHOT
		in	RESTORE FROM SNAPSHOT
Summary Component Detail	Power Analysis Customer/Site Select	cted Products	
Pick N Place Application Component	5		AXES (4)
			PROJECT ACTIONS
Axis: Assembly Index Axis 1	·····=································	Edit Delete	Create New Axis & Profile
Axis: Assembly Index Axis 2	······································	Edit Delete	Create New Blank Axis
			Import Axis
> Axis: Product Index Axis	······	Edit Delete	
Axis:	🚔	Delete	
Axis: Axis 4	·····	Edit Delete	

19. Change the name Axis 4 to Horizontal Lead Screw Axis.

Axis 4 0 Shared Users ¥ 0 Comments ¥	START EDITING     Automatically Saved
Linear Axis with Mecha 👻	CREATE A SNAPSHOT
Description	E RESTORE FROM SNAPSHO
DUPLICATE DELETE	

20. Define your Linear Mechanism by click on Define Custom



21. Select the Lead Screw mechanism type and click OK to confirm your selection

I	PICK A TYPE	
	Choose an option.	۲
	Choose an option.	
	Belt Drive	
	Rack & Pinion	
	Chain & Sprocket	- 1
	Lead Screw	

22. Enter Lead Screw Mechanism as name and click **OK** to confirm your selection.

Enter a name for your new Lead					
Lead Screw Mechanism					
		2			
	ок				
CANCEL					

23. Before editing your Lead Screw Properties, right click on Horizontal Lead Screw Axis and select Open in new tab.

♠ \ Library \ Pick n Place Application	Horizontal Le	ead Screw Axis	Lead Screw Mechanism
		Open	
		Open in	new tab
		Open in	new window
Lead Screw Mechanism 🖌	0 Shared User	Save tar	get as

24. Enter your Slide Mass of 45 kg, Efficiency of 90%,

	PARAMETERS			L		
	Lead (per Rev):	0 m/rev	Pre-Load:	0	N · m	
	Inertia:	$\blacksquare \qquad  0 \qquad $	Efficiency:	90	-	
	ADDITIONAL LOA	DS kg	Notice how this field is man due to the unit not being se	ked red. This is at to %.		
25.	Set the unit of the E	fficiency field to %				
	90					
26.	Re-enter the 90 for	efficiency.				
27.	Click on the Inertia	Calculator				
	PARAMETERS					
	Lead (per Rev):	0 m/rev	Pre-Load:	0	N	• m
	Inertia:	0 kg	• m <sup>2</sup> Efficiency.	90		%
		DADS				
	Slide Mass:	45 kg				

28. The Inertia Calculator will open up, you should be able to see the Driver Roll under the *Load Elements* sections. Delete this element by clicking **Remove** 

LOAD ELEMENTS:						
NAME	DENSITY (KG/M^3)	MASS (KG)	INERTIA (KG-M^2)	ACTIONS		
Driver Roll	7900	37.228	0.047	Edit Remove		
New Total Mass: 37.228 kg		New Total Ine 0.047 kg-m^2	ertia	Apply Cancel		



29. Set Type to Solid Cylinder, Material to Steel, and Name to Lead Screw

30. Enter your element's dimensions and Click Save

	Length : 1200 mm	Diameter : 2 25 mm
Density: 7900 kg/m^3	Mass: 4.653 kg Save	Element inertia: 0.000364 kg-m^2

31. Once the element is saved in the *Load Elements* section, **Copy** the *New Total Inertia* value and click **away** from the inertia calculator window to exit the Inertia Calculator.



32. Paste the inertia value into the *inertia* field.



33. Enter 25 mm/rev into the Lead (per rev) field. Make sure to change the units first.

PARAMETERS		m/rev		
Lead (per Rev):	0 m/rev	mm/rev	PARAMETERS	
u /		in/rev	Lead (per Rev):	25 mm/rev
Inertia:	0.0004 kg·			

34. Your completed entries should looks as follows:

LEAD SCREW PROPERTIES		
REQUIREMENT SUMMARY (i)		Weight of Load + Slide
Load: 3 kg		Motion
Stroke: 0.6 m		LOP TO A STATE
Speed: 0.45 m/s		Starting Starting
Acceleration: 0.9 m/s <sup>2</sup>		Friction Surface
		Lead = pitch = distance moved per turn Inertia = Inertia of leadscrew + bearings + nut Pre-load = torque to rotate screw at zero speed due to bearing & nut pre-loads
PARAMETERS		
Lead (per Rev): 25 mm/rev	Pre-Load:	0 N · m
Inertia: 0.0004 kg · m <sup>2</sup>	Efficiency:	90 %
ADDITIONAL LOADS Slide Mass: 45 kg		

35. Verify that you have all values entered.

36. Save your changes and Duplicate the Lead Screw Mechanism



37. Confirm Yes on the pop up to duplicate the mechanism to your Library.



38. The [Copy] Lead Screw Mechanism duplicated mechanism will replace the original Lead Screw Mechanism window.



39. We will navigate to the Axis tab, which we opened earlier. You can close the linear mechanism tab



40. Click on Define Custom to edit your Transmission

Components	Performance			
POWER REQUIREMENTS	S: Voltage Select v	Phase Select v	SEAR	CH FOR SOLUTIONS
PROFILE		TRANSMISSION	MOTOR	DRIVE
Edit Profile Horizontal Lead Profile Motion Type: Linear REMOVE	Lead Screw Mechanism Type: Lead Screw REMOVE	Add Partner Gearbox DEFINE CUSTOM IMPORT FROM LIBRAR	Add Motor ADD CUSTOM MOTOR	Add Drive

41. Enter Lead Transmission as name of your transmission and click OK to confirm your selection.

Enter a name for your new smission - Custom.
Lead Transmission
ок
CANCEL

42. Select Coupling for your transmission type

TRANSMISSION PROPERTIES



43. Enter the following values in your *Parameters* fields. Remember to change the units for the *Efficiency* field before entering your value

	EITHEO	
Coupling ~		
Parameters		
Ratio:	1 i	
Inertia (motor side)	0.0026 kg · m <sup>2</sup> i	
Efficiency:	100 % i	
Friction Torque (motor side)	0 N · m (i	

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

#### 44. Click Save and Continue to Axis

♠ \ Library \ Pick n Place Application \ Horizontal Lead Screw Axis \ Lead Transmission	
CONTINUE TO AXIS	
Lead Transmission / 0 Shared Users v 0 Comments v	
DUPLICATE DELETE	

45. You've completed configuring your components. For the Lead Screw Actuator, we will not select any gearbox. In the *Power Requirements* section, select **460** for *Voltage* and **3** for *Phase*, click **Search for Solutions** once enabled.



## TRANSMISSION PROPERTIES

- 46. The Solutions List will open and you will have multiple combinations of Drive and Motor results. We will look for Kinetix 5700 Servo Drive results. Set the filter to show only Kinetix 5700 Servo Drive solutions. \*Review steps 36-43 of Entering Transmission Components if not sure how to filter.
- 47. Your Solutions List should look as follows:

OLUTIONS LIST	Vie	wing 1 - 10 of 16 < <u>1</u> 2 >	Sort by: P	rofile Match	1 (%)	~			
Clear Filters		Note: Some solutions may have access	ories added	to meet y	our filter	criteria.			
Solution Filters		> Filter Solutions by Product Fan	nily						
Solution Filters (6)	>	Drive	View T	orque Spee	ed Curve			Sele	ct
Motor Filters		Motor							
Commonly Used (6)	>	CM222 Induction Motor	Profile Match	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current Utilization	Thermal Capacity
Forque/Force Ratings (6)	>	Gearbox	69.8%	<b>\$</b> 55555	0.89	23.9%	0.88	42.1%	38.2%
nduction Motor (5)	>	Drivo							
Physical Dimension (3)	>	Kinetix 5700   2198-D008-ERS3	View T	orque Spee	ed Curve			Sele	ct
Options (14)	>	Motor MPM Motor   MPM-B1151F-xxxxxxx	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity
IP Ratings (5)	>	Gearbox	69.6%	<b>\$</b> \$\$\$\$\$	0.61	Utilization 24.1%	5.73	Utilization 22.4%	26%
Certifications (3)	>								
Environment (3)	>	Drive Kinetix 5700   2198-S086-ERS3	View T	orque Spee	ed Curve			Sele	ct
Feedback (2)	>	Motor HPK-B1307C-x00000x   HPK-B1307C-x00000x	Profile	Relative	Average	Force Or	Inertia Patio	Peak	Thermal
Group (1)	>	Gearbox	69.6%	\$\$\$\$\$\$	16.67	Utilization 8.8%	0.05	Utilization 34.6%	31.4%
Drive Filters			•						
Commonly Used (7)	>	Drive Kinetix 5700   2198-S130-ERS3	View T	orque Spee	ed Curve			Sele	ct
Voltage & Phase (4)	>	Motor	Profile	Relative	Average	Force Or	Inertia	Peak	Thermal
IP Ratings (5)	>	Gearbox	68.8%	Price \$\$\$\$\$\$	Current 16.67	Torque Utilization 8.8%	Ratio 0.05	Current Utilization 34.6%	Capacity 31.4%
Environment (3)	>		•						
Options (4)	>	Drive Kinetix 5700   2198-D012-ERS3	View T	orque Spee	ed Curve			Sele	ct
Certifications (19)	>	Motor	Profile	Relative	Average	Force Or	Inertia	Peak	Thermal
Controller (4)	>	CM222 Induction Motor CM222-NV00118AXZCA	Match 68.7%	Price	Current	Torque Utilization	Ratio	Current Utilization	Capacity
Features (35)	>	Gearbox	•		0.00	201070	0.00		0012.70
Motor Control (10)	>	Drive							
Network Support (14)	>	Kinetix 5700   2198-D006-ERS3	View T	orque Spee	ed Curve			Sele	ct
Bus Configuration (4)	>	Motor   MPL-8210V-xxxxxxx	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity
Safety (3)		Gearbox	68.2%	\$55555	1.42	81.2%	248.26	81.2%	73.8%

48. We will use the motor filters and only search for Rockwell Automation and Stober products. Click on **Commonly Used (6)** dropdown list.

OLUTIONS LIST	Viev	wing 1 - 10 of 16 <	<u>1</u> 2	>	Sort by: Pr	rofile Match	1 (%)	~			
Clear Filters		Note: Some solutions	may hav	/e access	ories added	to meet y	our filter	criteria.			
Solution Filters		> Filter Solutions	s by Pro	duct Fan	nily						
Solution Filters (6)	>	Drive Kinetix 5700   2198-D0	06-ERS3		View To	orque Spee	d Curve			Sele	ct
Motor Filters		Motor									_
Commonly Used (6)	>	CM222 Induction Motor	CA		Profile Match	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current Utilization	Thermal Capacity
Torque/Force Ratings (6)	>	Gearbox			€9.8%	<b>3</b> 00000	0.89	₹3.9%	0.88	4 <b>∠.</b> 1%	J <b>ö.2</b> %

49. Select the checkmarks for Rockwell Automation and Stober in the Manufacturer filters.

W	W	HPK-B1307C-x00000x   HPK-B1307C-x00000x	Profile Match	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current	Thermal Capacity
Catalog Number		Gearbox	68.8%	\$\$\$\$\$S	16.67	8.8%	0.05	34.6%	31.4%
			•						
Manufacturer		Driv etix 5700   2198-D012-ERS3	View To	orque Spee	d Curve			Sele	ct
Rockwell Automation	•	Motor CM222 Induction Motor CM222-NV00118AXZCA	Profile Match	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current Utilization	Thermal Capacity
Stober Drives		Gearbox	68.7%	\$55555	0.89	23.9%	0.88	42.1%	38.2%
Elwood									
Nook Industries		Drive Kinetix 5700   2198-D008-ERS3	View To	orque Spee	d Curve			Sele	ct
Wittenstein Alpha		Motor	Profile	Relative	Average	Force Or	Inertia	Peak	Thermal

50. Click on Commonly Used (6) to retract the dropdown list. Notice how your filters are applied to the results.

Motor Filters			
Commonly Used (6 Manufacturer: Rockwell Stober Drives	5) I Automation,	>	
Voltage			
Low	High		

51. Scroll down the Solutions List window to review your results

eedback (16)									
	)	Motor VPL Motor   VPL-B0832F-x000000	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Therma Capacity
Applications (1)	>	Gearbox	59.3%	\$55555	0.54	49%	191.95	44.9%	40.8%
Control Options (3)	>								
Power Options (5)	2	Drive Kinetix 5700   2198-D006-ERS3	View To	orque Spee	d Curve			Sele	ct
ransmission Filters		Motor VPF-B0832F-xxxxxxx	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Therma Capacity
Commonly Used (5)	>	Gearbox	59.3%	<b>\$</b> 55555	0.54	Utilization 48.7%	191.95	Utilization 44.8%	40.7%
Physical Dimension (7)	)		•						
orque & Speed Ratings (7)	>	Drive Kinetix 5700   2198-D012-ERS3	View To	orque Spee	d Curve			Sele	ct
		Motor VPL Motor   VPL-B0832F-xxxxxx	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Therma Capacity
		Gearbox	58.6%	\$55555	0.54	49%	191.95	44.9%	40.8%
		Drive Kinetix 5700   2198-D012-ERS3	View To	orque Spee	d Curve			Sele	ct
		Motor VPF Motor   VPF-80632F-xxxxxx	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Therma Capacity
		Gearbox	58.6%	\$55555	0.54	48.7%	191.95	44.8%	40.7%

52. Select the solution with MPL motor.

Certifications (19)	>	CM222-NV0D118AXZCA	68.7%	Price \$555555	0.89	Utilization 23.9%	0.88	Utilization	Capacity 38.2%
Controller (4)	>	Gearbox	•						
Features (35)	>	Drive	16 mm Tr		10			Colo	ot
Motor Control (10)	>	Kinetix 5700   2198-D006-ERS3	view 10	orque Spee	d Curve			Sele	cı ,
Network Support (14)	>	Motor MPL Motor   MPL-B210V-xxxxxxx	Profile Match	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current Utilization	Thermal Capacity
Bus Configuration (4)	>	Gearbox	68.2%	\$55555	1.42	81.2%	248.26	81.2%	73.8%
Safety (3)	>	Drive							_
I/O (14)	>	Kinetix 5700   2198-D006-ERS3	View To	orque Spee	d Curve			Sele	ct
Feedback (16)	>	Motor VPL-80832F-xxxxxx	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity
Applications (1)		Gearbox	59.3%	\$55555	0.54	49%	191.95	44.9%	40.8%
Applications (1)	,		_						
Control Options (3)	>		•						

53. You've completed sizing and selecting a solution for the Horizontal Lead Screw Axis. Your components should look as follows:

♠ \ Library \ Pick n Place Application \ Horizontal Lead Screw Axis				
CONTINUE TO PROJECT				
Horizontal Lead Sc Linear Axis with Mecha V	rew Axis 🖌 0 Shared U	START EDITING Automatically Saved CREATE A SNAPSHOT RESTORE FROM SNAPSHOT		
Components Performance			Dual Axis Drive 👔 🔰 🕂	
POWER REQUIREMENTS:     Voltage     460     Phase     3     Voltage       Voltage Tolerance V     Voltage     Voltage     Voltage     Voltage			SEARCH FOR SOLUTIONS	
PROFILE		TRANSMISSION	MOTOR	DRIVE
Edit Profile Horizontal Lead Profile Motion Type: Linear REMOVE	Lead Screw Mechanism Type: Lead Screw REMOVE	Add Another Lead Transmission REMOVE	Select MPL Motor Catalog: MPL-B210V-XXXXXX SET CONFIGURATION CHANGE MOTOR	Cable Kinetix 5700 Catalog: 2198-D006-ERS3 SET CONFIGURATION CHANGE DRIVE
			REMOVE	REMOVE
54. We will add the Vertical Lead Screw Axis to the second axis of the Dual Axis Drive. Click on + to add the dual axis. Your new axis should look as follows:



55. Let's begin by changing the name of the axis from Horizontal Lead Screw Axis Dual to Vertical Lead Screw Axis.

♠ \ Library \ Pick n Place Application \ Vertical Lead Screw Axis	
CONTINU	E TO PROJECT
Vertical Lead Screw Axis 0 Shared Users v 0 Comments v	
Linear Axis with Mecha 🗸	
1	i RESTORE FROM SNAPSHOT
DOPLICATE DELETE	

- PROFILE LINEAR MECH. TRANSMISSION MOTOR DRIVE Add Partner Gearbox Add Partner Mechanism Add from Library Add Motor Kinetix 5700 Catalog: 2198-D006-ERS3 DEFINE CUSTOM DEFINE CUSTOM ADD CUSTOM MOTOR CREATE NEW SET CONFIGURATION MPORT FROM LIBRARY IMPORT FROM LIBRARY CHANGE DRIVE REMOVE
- 56. Once the name change has been accomplished, import the Vertical Lead Profile from Library. Click on Add from Library.

57. Select the Vertical Lead Profile and click **OK** to confirm your answer.

ADD PROFILE FROM			
Vertical Lead Profile		-	~
		2	
	ОК		
	CANCEL		

58. Next we will import the Linear Mechanism. Click Import from Library



59. Select the [Copy] Lead Screw Mechanism and click **OK** to confirm your answer.

ADD LINEAR MECH. FROM	LIBRARY	
[Copy]Lead Screw Mechanism		*
		2
	ок	
	CANCEL	·

60. Let's import the Transmission since it is the same as the coupling transmission of the Belt Actuator. Click **Import from** Library



61. Select Coupling Transmission 2 and click **OK** to confirm your answer.

.....

Coupling Transmission 2	
2	
ок	
CANCEL	

62. Before we search for solution, we will edit the Vertical Lead Profile's Inclination. Click on Vertical Lead Profile

PROFILE	LINEAR MECH.	TRANSMISSION	MOTOR	DRIVE
		$\phi_{\phi}^{\phi}$	-	Ē
Edit Profile		Add Another	Add Motor	Kinetix 5700 Catalog: 2198-D006-ER \$3
Vertical Lead Profile Motion Type: Linear	[Copy]Lead Screw Mechanism Type: Lead Screw	Coupling Transmission 2	ADD CUSTOM MOTOR	SET CONFIGURATION
REMOVE	REMOVE	REMOVE		CHANGE DRIVE
				REMOVE

63. Since this is a vertical axis, change the Inclination from 0 to 90.

Graph View Table View	2	Add Winder	Add Load	🕻 Add Po	int	Scale v
Indi	ination	0	🖒 Timeline Adju	ustment:	-	÷

#### 64. Click Save and Continue to Axis.



#### 65. You can now click on Search for Solutions

Components	Performance		Dual As	tis Drive (i) 1 2
POWER REQUIREMENTS	: Voltage 460 v	Phase 3 v	SEAR	CH FOR SOLUTIONS
PROFILE	LINEAR MECH.	TRANSMISSION	MOTOR	DRIVE
		0,0	-	
Edit Profile		Add Another	Add Motor	Kinetix 5700 Catalog: 2198-D006-ERS3
Vertical Lead Profile	[Copy]Lead Screw Mechanism	Coupling Transmission 2	ADD CUSTOM MOTOR	SET CONFIGURATION

#### 66. Find the solution that has the MPL motor and **Select** the solution.

continuations (5)	~	Drive							
Environment (3)	>	Kinetix 5700   2198-D008-ERS3	View Torque Speed Curve					Select	
Feedback (2)	>	Motor MPS Motor   MPS-B330P-x000000	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity
Group (1)	>	Gearbox	81.8%	\$\$\$\$\$\$	2.27	72.1%	31.03	64.8%	65.1%
Drive Filters									
Commonly Used (7)	>	Drive Kinetix 5700   2198-D006-ERS3	View To	orque Spee	d Curve			Sele	ct
Voltage & Phase (4)	>	Motor CM222 Induction Motor CM222-NV1F518AXZCA	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity
IP Ratings (5)	>	Gearbox	78.9%	\$\$\$\$\$\$	2.07	29.8%	0.88	63.7%	59.1%
Environment (3)			•						
Options (4)	>	Drive Kinetix 5700   2198-D006-ERS3	View To	orque Spee	d Curve			Sele	ct
Certifications (19)	>	Motor	Duffe	Deletive		5 mm 0 m	Incoder	Death	Thomas
Controller (4)	>	MPL Motor   MPL-B230P-x00000x	Match	Price	Current	Torque Utilization	Ratio	Current Utilization	Capacity
Features (35)	>	Gearbox	78.6%	\$\$\$\$\$\$	2.16	85.6%	59.11	83.1%	75.6%
Motor Control (10)	>	Drive	View To	orque Spee	d Curve			Sele	ct
Network Support (14)	>	Motor		-					

67. Your completed axis should look as follows:



#### 68. Click on the Performance tab.

♠ \ Library \ Pick n Place Application \ Vertical Lead S	Screw Axis	
c		
Vertical Lead Screw Axis / 0 Shared Users	✓ 0 Comments ✓	START EDITING     Automatically Saved
Linear Axis with Mecha V		CREATE A SNAPSHOT
Components Performance		Dual Axis Drive (i) 1 2
POWER REQUIREMENTS: Voltage 460 Voltage Tolerance V	Phase 3 🗸	SEARCH FOR SOLUTIONS

#### 69. Your Torque/Speed curve should look as:



#### 70. Click Size Up on the Motor

Components	Perfo	Dual Axis Drive (i) 1 2	
orque/Speed	Power/Speed	Thermal	Summary Drive Motor
1 1	1 1 1		Selected Solution (2 Available)
6.5			Motor
6.0			
5.5		<b>\  \</b>	Thermal Capacity: 75.6%
			Peak Speed: 10.8%
5.0			Peak Torque: 40.6%
			Inertia Ratio 59.11 : 1
4.5			



71. Your Torque/Speed curve should have a steady continuous torque that will not drop off. Visuals look as:

72. Apply this new motor size by clicking Apply on your Summary window



73. Select **Continue To Project** to move to the Project page



74. Your Project components should look as:

♠ \ Library \ Pick n Place Application			
Pick n Place Application /			) Shared Users V 0 Comments V
This machine accepts packages at random, product belt before cases are taken away for	stages packages to be picked up from as shipment	sembly and places packag	ges into a case on a synchronized
DUPLICATE DELETE EXPORT AS XML			
		<b>A</b>	START EDITING
			Automatically Saved
			CREATE A SNAPSHOT
		8	RESTORE FROM SNAPSHOT
Summary Component Detail Pow	er Analysis Customer/Site Sele	cted Products	
Pick N Place Application Components			AXES (5)
	**		PROJECT ACTIONS
Axis: Assembly Index Axis 1	·····	Edit Delete	Create New Axis & Profile
Avis: Assembly Index Avis 2		Edit Dalata	Create New Blank Axis
	······································	Luit Delete	Import Axis
Axis: Product Index Axis	······································	Edit Delete	
Axis:	· · · · · · · · · · · · · · · · · · ·	Delete	
> Axis: Horizontal Lead Screw Axis		Edit Delete	
Axis: Vertical Lead Screw Axis	·····	Edit Delete	

You've size and selected a solution for your Vertical Lead Axis. You've finished configuring five axes of this project, two to go.

## **Constant Speed Conveyor**

The Infeed and Takeaway conveyors are operating at constant velocity. This means that our motion profile would be a constant velocity profile. Motion Analyzer will perform an extended constant evaluation of the move as it repeats the profile and uses the Position, Velocity, Acceleration, and Jerk to calculate the thermal utilization of the motor. Our profile will look as below:



#### Part A: Infeed Conveyor Axis

#### Importing an Axis

When an axis has already been created in a previous project, you can duplicate it as a component in your Library as we've done in previous steps. A Library Component can be imported and used in a newer project to save time on creating new axis components. We will import a constant speed conveyor axis into our Pick and Place application.

1. From the Pick n Place Application Components page, click Import Axis

Summary	Component Detail	Power Analysis	Customer/Site	Selected Produc	cts	
Pick N Place	Application Component	s				AXES (5)
<ul> <li>Avio: Aor</li> </ul>	ombly Inday Avia 1	-		<b></b>	Delata	PROJECT ACTIONS
AXIS. ASS	Sembly muex Axis T		*¢		Delete	Create New Axis & Profile
Axis: Ass	sembly Index Axis 2	<b>_</b>	<b>0.</b> 0	Edit	Delete	Create New Blank Axis
	,			_		Import Axis
Axis: Pro	duct Index Axis	<b>_</b>	¢	Edit	Delete	1
Axis:			····		Delete	
> Axis: Ho	rizontal Lead Screw Axis	<u> </u>		Edit	Delete	
Axis: Ver	tical Lead Screw Axis	<b>—</b>	- • • · · - <b>- • •</b>	Edit	Delete	

2. From the Import Axis From Library, select Conveyors and click OK to confirm your selection.



3. The **Conveyors** Axis was created and shared as a Library Component by a Motion Analyzer Support engineer. Your new axis will be displayed in the Pick n Place Application Components page.



4. Select the dropdown button on the new axis



#### 5. Click **Edit** on the Load/Profile

✓ Axis: [Copy] Conveyors	·····	Edit Delete
[Copy] Conveyors		
Load/Profile: Constant Speed	Profile   Linear Profile	Edit
Linear Mechanism: None Select	cted	1
- Motor: None Selected		
Drive: None Selected		

- 6. Go to **Table View** to edit your load
- 7. Click Edit and change the Load Mass from 0 to 3 kg.
- 8. Click **Submit** after entering the load mass

	EDIT SEGMENT	
TIME: 0		
LOAD MASS:	3 kg	+
		CANCEL Submit

9. Click Save and Continue To Axis

A \ Library \ Pick n Place Application \ [Copy] Conveyors \ Constant Speed Profile					
Constant Speed Profile / 0 Share	d Users ♥ 0 Comments ♥				

10. Change the Axis name from [Copy] Conveyors to Infeed Axis.

 The drive rolls requirements for the Constant Speed Conveyor match the Assembly Index Belt drive rolls requirement. As we've duplicated the Linear Mechanism of the Assembly Index, we can import this component to our new axis. Click Import From Library

Infeed Axis / 0 Shared Users v 0 Comments v Geometric V Geometric V Geometric V Geometric V Saved							
Linear Axis with Mecha 🗸			CRE/	TE A SNAPSHOT			
DUPLICATE DELETE			ia REST	ORE FROM SNAPSHOT			
Components	Performance						
POWER REQUIREMENTS	: Voltage Select v	Phase Select v	SEAR	CH FOR SOLUTIONS			
Voltage Tolerance V							
PROFILE	LINEAR MECH.	TRANSMISSION	MOTOR	DRIVE			
		$\phi_{\phi}^{\ \phi}$					
Edit Profile	Add Partner Mechanism	Add Partner Gearbox	Add Motor	Add Drive			
Constant Speed Profile Motion Type: Linear REMOVE	DEFINE CUSTOM	DEFINE CUSTOM	ADD CUSTOM MOTOR				

12. Select Assembly Belt 2 and click **OK** to confirm your selection.

ADD LINEAR MECH. FROM LIBRARY	
Assembly Belt 2	*
ок	
CANCEL 2	

13. The *Transmission* for the motor coupling was duplicated as a component as well. Click **Import From Library** on the Transmission component



14. Select Coupling Transmission 2 and click OK to confirm your selection

Coupling Transmission 2	¥
ок	

15. Your Infeed Axis should have the following components at this moment.



#### **Custom Induction Motor**

While you are completing this project, you are informed by the engineer from OEM Distribution that ABC Foods would like to keep their induction motors for each of the constant speed conveyors. They provided the following motor plates information for each conveyor.

Infeed Conveyor

H.P.	5	Hertz	60
AMPS.	8.0	R.P.M	1785
Voltage	460	PH	3

Takeaway Conveyor				
H.P.	15	Hertz	60	
AMPS.	19.7	R.P.M	176	

460

Voltage

Let's enter this information for our Infeed Conveyor motor.

#### 1. Click on Add Custom Motor



2. Enter a name for your motor and select Create Motor.

ADD A CUSTOM INDUCTION MOTOR		
Create a new Custom Motor	2 Import a Custom Motor from your library.	
Custom 1	Select A Motor v	
CREATE MOTOR	ADD MOTOR	
	CANCEL	

3. The Custom Induction Motor Properties page will look at follows:



4. You will enter the information provided by OEM Distribution in the Motor Name Plate Information

Rated Power 0 W HP	Rated Frequency	1	Hz
kW			
Voltage Ra The rated power is the max	Speed	1	RPM
continuous power needed to operate	-		
the motor. User can set the unit of	1		
Rated Curr the Rated Power and enter the	Motor Poles	2	
value.			
Voltage Ra The rated power is the max continuous power needed to operate the motor. User can set the unit of the Rated Power and enter the value.	Speed Motor Poles	2	RPM

5. Change the Rated Power unit to **HP** and enter **5** as your value.

MOTOR NAME P					
Rated Power	5	НР	Rated Frequency	1	Hz
		,			
Voltage Rating (s)	230	Volts	Speed	1	RPM
		a			
Rated Current	1	A(pk)	Motor Poles	2	

6. Change the *Voltage Rating* from 230 to **460** Volts; set the *Rated Frequency* to **60** Hz; and enter **8.0** A(pk) for the *Rated Current*. Your completed entries should look as follow:

# **Custom Induction Motor Properties**

MOTOR NAME P	LATE INFORM				2
Rated Power	5	НР	Rated Frequency	60	TIZ
	(	1			
Voltage Rating (s)	460	Volts	Speed	1	RPM
		2			
Rated Current	8	A(pk)	Motor Poles	2	

- 7. For the *Motor Poles*, we can calculate its value by using the formula,  $poles = \frac{120*f}{RPM}$ ,
- 8. Enter **4** as your *Motor Poles*

9. The *Speed* field requires your Rated Full Load Speed. This is different from the Synchronous Speed as induction motors require slip to turn the rotor. Enter **1785** as your Speed.

# **Custom Induction Motor Properties**

MOTOR NAME PLATE INFORMATION ()

Rated Power	5	НР	Rated Frequency	60	Hz
Voltage Rating (s)	460	Volts	Your Rated Full	1785	RPM
Rated Current	8	A(pk)	Load Speed Motor Poles	4	

10. Click Save to save your custom motor

♠ \ Library \ Pick n Place Application \ Infeed Axis \ Custom 1	
CONTINUE TO AXIS	
Custom 1 🖌 0 Shared Users 🖌 0 Comments 🗸	
DUPLICATE DELETE	

11. Your motor name plate entries should match this view:



Shaft Inertia	kg · m <sup>2</sup>	Optional entries if values were provided	ter	m

#### EQUIVALENT CIRCUIT DATA (PER PHASE) - Optional

Stator Resistance	0.3121	Ohms	Rotor Leakage Motion Analyzer will perform these estimations based off	0.0301	Henrys
Stator Leakage Inductance	0.0232	Henrys	your motor name plate values	0.2201	Henrys
Rotor Resistance	0.2401	Ohms	Core Loss Resistance		Ohms

#### 12. Click Continue To Axis

13. The Infeed Axis components have been configured. Set your *Power Requirements Voltage* and *Phase* to **460** and **3** respectively.



#### 14. Click Search For Solutions

		CONTINUE TO PROJECT		
Infeed Axis / 0 si	hared Users ♥ 0 Comments ♥			START EDITING  Automatically Saved  CREATE A SNAPSHOT  RESTORE FROM SNAPSHOT
Components POWER REQUIREMENTS	Performance : Voltage 460 Y	Phase 3 v		SEARCH FOR SOLUTIONS
PROFILE		TRANSMISSION	MOTOR	DRIVE
Edit Profile Constant Speed Profile Motion Type: Linear REMOVE	Assembly Belt 2 Type: Belt Drive REMOVE	Add Another Coupling Transmission 2 REMOVE	Custom 1 Catalog: Custom REMO	Add Drive

15. The Solutions List will provide solutions based on Drives / Induction Motor results. Click on the dropdown of the Filter Solutions by Product Family to view your drive solutions

OLUTIONS LIST	Viev	wing 1 - 8 of 8 Sort by: Pro	file Match (%)	~					
Clear Filters		Note: Some solutions may have ac	cessories added	to meet y	our filter	criteria.			
Solution Filters		Filter Solutions by Product	t Family						
Solution Filters (6)	>	Driv	View To	orque Spee	d Curve			Sele	ct
Motor Filters		Motor							-
Commonly Used (6)	>	Custom 1   Custo	Match	Price	Average Current	Torque Utilization	Ratio	Current Utilization	Capacity
Torque/Force Ratings (6)	>	Gearbox	• • •	200000	0.00	0%	0.00	0%	0%
Induction Motor (5)	>	Drive	View T	France Space	d Curuo			Sala	ct
Physical Dimension (3)	>	25C-Dx43N1x4   25C-Dx43N1x4	View 10	nque opee	u curve				
Options (14)	>	Custom 1   Custom 1	Profile Match	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current Utilization	Thermal Capacity
IP Ratings (5)	>	Gearbox	66.7%	\$\$\$\$\$\$	0.00	0%	0.00	0%	0%
Certifications (3)	>	Drive						_	
Environment (3)	>	25C-D010N1x4   25C-D010N1x4	View To	orque Spee	d Curve			Sele	ct
Feedback (2)	>	Motor Custom 1   Custom 1	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity
Group (1)	>	Gearbox	66.7%	<b>\$\$</b> 5555	0.00	0%	0.00	0%	0%
Drive Filters		Deiter	•						
Commonly Used (7)	>	PowerFlex 755   20G11FC5P0xx0NNNN	N View To	orque Spee	d Curve			Sele	ct
Voltage & Phase (4)	>	Motor Custom 1   Custom 1	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity
IP Ratings (5)	>	Gearbox	66.7%	\$\$\$\$\$\$	0.00	Utilization 0%	0.00	Utilization 0%	0%
Environment (3)	>		•						
Options (4)	>	Drive PowerFlex 755   20G11GC5P0xx0NNNN	IN View To	rque Spee	d Curve			Sele	ct
Certifications (19)	>	Motor Custom 1   Custom 1	Profile	Relative	Average	Force Or	Inertia	Peak	Thermal
Controller (4)	>	Gearbox	66.7%	\$\$\$\$\$\$	0.00	Utilization 0%	0.00	Utilization	0%
Features (35)	>		•						
Motor Control (10)	>	Drive Kinetix 5500   2198-H008-ERSx	View To	orque Spee	d Curve			Sele	ct
Network Support (14)	>	Motor	Profile	Relative	Average	Force Or	Inertia	Peak	Thermal
Bus Configuration (4)	>	Gustom 1   Gustom 1	Match 55.6%	Price \$\$\$\$\$\$	Current	Torque Utilization 0%	Ratio 0.00	Current Utilization 0%	Capacity
Safety (3)		Starbox	•						

16. Your drive results include the Kinetix 5500 Servo Drive, Kinetix 5700 Servo Drive, PowerFlex 525, PowerFlex 527, and PowerFlex 755.

<b>~</b>	By Drive Family	✓ and By Moto	r Family	~	
t Family	KINETIX 5500 SERVO DRIVE	KINETIX 5700 SERVO DRIVE	POWERFLEX 525	POWERFLEX 527	POWERFLEX 755
oduct	1	2	1	2	2
y Pr					

17. We will review the solutions of the PowerFlex 527. Click on **PowerFlex 527** 

~	By Drive Family	✓ and By Moto	r Family	~	
t Family	KINETIX 5500 SERVO DRIVE	KINETIX 5700 SERVO DRIVE	POWERFLEX 525	POWERFLEX 527	POWERFLEX 755
oduc	1	2	1	2	2
by Pr					
tions					
r Solut					

18. Click on the dropdown of the *Filter Solutions by Product Family* to retract the drive solutions.

~	By Drive Family	~ ~	and By Moto	or Family	~	
t Family	KINETIX SERVO D	5500 K DRIVE SE	INETIX 5700 ERVO DRIVE	POWERFLEX 525	POWERFLEX 527	POWERFLEX 755
oduc	1		2	1	2	2
y Pro						

19. Your solutions list is now filtered to show only **PowerFlex 527** solutions.

Drive 25C-Dx43N1x4   25C-Dx43N1x4	View Torque Speed Curve					Select		
Motor Custom 1   Custom 1	Profile Match	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current Utilization	Thermal Capacity	
Gearbox	66.7% T	\$\$\$\$\$\$	0.00	0%	0.00	0%	0%	
Drive 25C-D010N1x4   25C-D010N1x4	View To	orque Spee	d Curve			Sele	ct	
Motor Custom 1   Custom 1	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity	
Gearbox	66.7% T	<b>\$\$</b> 5555	0.00	0%	0.00	0%	0%	
Drive 25C-Dx43N1x4   25C-Dx43N1x4	View To	orque Spee	d Curve			Sele	ct	
Drive           25C-Dx43N1x4           25C-Dx43N1x4           Motor           Custom 1           Custom 1	View To Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Sele Peak Current	ct Thermal Capacity	
Drive 25C-Dx43N1x4   25C-Dx43N1x4 Motor Custom 1   Custom 1 Gearbox	View To Profile Match 66.7%	Relative Price	Average Current 0.00	Force Or Torque Utilization 0%	Inertia Ratio 0.00	Peak Current Utilization 0%	ct Thermal Capacity 0%	
Drive 25C-Dx43N1x4   25C-Dx43N1x4 Motor Custom 1   Custom 1 Gearbox	View To Profile Match 66.7%	Relative Price	Average Current 0.00	Force Or Torque Utilization 0%	Inertia Ratio 0.00	Peak Current Utilization 0%	ct Thermal Capacity 0%	
Drive         25C-Dx43N1x4         25C-Dx43N1x4           Motor         Custom 1         Custom 1           Gearbox         Drive         25C-D010N1x4         25C-D010N1x4	View To Profile Match 66.7%	Relative Price \$\$\$\$\$\$	Average Current 0.00	Force Or Torque Utilization 0%	Inertia Ratio 0.00	Sele Peak Current Utilization 0%	ct Thermal Capacity 0% ct	
Drive         25C-Dx43N1x4         25C-Dx43N1x4           Motor         Custom 1         Custom 1           Gearbox         Custom 1         Custom 1           Drive         25C-D010N1x4         25C-D010N1x4           Motor         Custom 1         Custom 1	View To Profile Match 66.7% View To Profile Match	Relative Price SSSSSS orque Speet Relative Price	Average Current 0.00 Average Current Average Current	Force Or Torque Utilization 0%	Inertia Ratio 0.00 Inertia Ratio	Sele Peak Current Utilization 0% Sele Peak Current	ct Thermal Capacity 0% ct Thermal Capacity	

20. The PF 527 is a Component and Motion capable Variable Frequency Drive. Select the second **Powerflex 527** solution.

Drive 25C-Dx43N1x4   25C-Dx43N1x4	View Torque Speed Curve Select						ct		
Motor Custom 1   Custom 1	Profile Relative Average Force Or Inertia Match Price Current Torque Ratio					Profile Relative Average Force Or Inertia Per Match Price Current Torque Ratio Cur		Peak Current Utilization	Thermal Capacity
Gearbox	66.7% ▼	\$\$\$\$\$\$	0.00	0%	0.00	0%	0%		
Drive 25C-D010N1x4   25C-D010N1x4	View Torque Speed Curve Select						ct		
Motor Custom 1   Custom 1	Profile Match	Relative Price	Average Current	For un	Inertia Ratio	Peak Current	Thermal Capacity		
Gearbox	66.7% ▼	<b>\$\$</b> 5555	0.00	0%	0.00	0%	0%		
Drive 25C-Dx43N1x4   25C-Dx43N1x4	View Torque Speed Curve Select						ct		
Motor Custom 1   Custom 1	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity		
Gearbox	66.7%	\$\$\$\$\$\$	0.00	0%	0.00	0%	0%		

21. Your complete Infeed Axis components should look as follows:



22. Click on Continue To Project.

♠ \ Library \ Pick n Place Application \ Infeed Axis			
	CONTINUE TO PROJECT		
Infeed Axis / 0 Shared Users v 0 Comments	. <b>v</b>	A	START EDITING
		· · · · ·	Automatically Saved
Linear Axis with Mecha 👻			CREATE A SNAPSHOT
DUPLICATE DELETE		13	RESTORE FROM SNAPSHOT

#### Part B: Takeaway Conveyor Axis

We've completed sizing and selecting a solution for our Infeed Axis. To this point, we've finished sizing and selecting solutions for the Assembly Index axes, the Horizontal and Vertical Lead Screw axes, the Product Index axis, and the Infeed axis. The Pick and Place Application components are shown below:

♠ \ Library \ Pick n Place Applicatio	n		
Pick n Place Application /			0 Shared Users ♥ 0 Comments ♥
This machine accepts packages at ran product belt before cases are taken aw	lom, stages packages to be picked up from a ay for shipment	ssembly and places packa	ges into a case on a synchronized
DUPLICATE DELETE EXPORT AS X	ML		
		<b>A</b>	START EDITING
			Automatically Saved
			CREATE A SNAPSHOT
		10	RESTORE FROM SNAPSHOT
Summary Component Detail	Power Analysis Customer/Site Sel	ected Products	
Pick N Place Application Components	1		AXES (6)
Axis: Infeed Axis		Edit Delete	PROJECT ACTIONS
¥743. IIICC0743		Edit	Create New Axis & Profile
Axis: Assembly Index Axis 1		Edit Delete	Create New Blank Axis
,			Import Axis
Axis: Assembly Index Axis 2	••••••••••••••••••••••••••••••••••••••	Edit Delete	
> Axis: Product Index Axis	······································	Edit Delete	
Axis:		Delete	
> Axis: Horizontal Lead Screw Axis		Edit Delete	
Axis: Vertical Lead Screw Axis		Edit Delete	

We will create a blank axis and import duplicated components from our Library to create the Takeaway Axis.

#### **Create New Blank Axis**

1. From the Pick n Place Application Components page, click Create Axis



2. Select Linear Axes with Mechanism for our Motion Type and click OK to confirm selection

SELECT MOTION TYPE	
Linear Axis with Mechanism	*
ок	

3. Your blank axis will open as such:

🔒 \Library \Pick n Place	e Application \ Axis 7 \			
		CONTINUE TO PROJECT		
AXIS 7 × 0 Shared U Linear Axis with Mecha × DUPLICATE DELETE	sers ♥ 0 Comments ♥		🔒 STAL 🔛 Auton 📑 CREA In REST	RT EDITING natically Saved ITE A SNAPSHOT ORE FROM SNAPSHOT
Components POWER REQUIREMENTS	Performance	Phase Select v	SEAR	CH FOR SOLUTIONS
ROFILE	LINEAR MECH.	TRANSMISSION	MOTOR	DRIVE
Add from Library	Add Partner Mechanism DEFINE CUSTOM IMPORT FROM LIBRARY	Add Partner Gearbox DEFINE CUSTOM IMPORT FROM LIBRARY	Add Motor	Add Drive

- 4. Import your Profile, Linear Mechanism, and Transmission from the Library as we've done in previous steps.
- 5. Once you've completed importing your components, open the Motion Profile by selecting Constant Speed Conveyor



#### 6. Go to **Table View** of your Motion Profile to edit your load

	Need help building	g a prot	file? Click	here for mo	ore informa	ition								
	Graph View	Tal	ble View				1	😭 Add Wind	der 📦	Add Load	🕻 Add Po	bint	Scale ∨	
						nclination	0		Ō Ti	meline Adji	ustment:	-	÷	
	Seconds 👻	000	00.500	01.000	01.500	02.000	02.500	03.000	03.500	04.000	04.500	05.000	05.500	06.(
Load weight 1 <	56,400 49,800 43,200 38,600 30,000 23,400 16,800 10,200 3,600													

7. Click Edit and change the Load Mass from 0 to 18 kg.



8. Click **Submit** after entering the load mass

		EDIT SEGMENT		ť
TIME: 0 0 LOAD MASS:	18	kg	CANCEL Submit	

9. While in **Table View**, we will edit the profile to match the move profile of the Takeaway Conveyor. Click **Edit** and change the velocity to 300 mm/sec. Click **Submit** to confirm your change.

Motio	n					
ТҮРЕ	TIME [ms]	POSITION [m]	VELOCITY [m/s]	ACCELERATION [m/s <sup>2</sup> ]	JERK [ m/s <sup>3</sup> ]	EDIT
Acceleration	0	0	0.25	0	•	Edit
Acceleration	1000	0.25	0.25	0	0	Edit

10. Repeat step 9 for the second *Acceleration* point. Click **Edit** and change the velocity to 300 mm/sec. Click **Submit** to confirm your change.

Motion	1					
ТҮРЕ	TIME [ms]	POSITION [m]	VELOCITY [m/s]	ACCELERATION [ m/s <sup>2</sup> ]	ЈЕКК [ m/s <sup>3</sup> ]	EDIT
Acceleration	0	0	0.3	0	0	Edit
Acceleration	1000	0.25	0.25	0	0	Edit

## 11. Your final entry points should look:

Loads						
LOAD WEIG	HT 1 - WEIGHT					
	TIME [ms]			MASS [kg]		EDIT
0			18			Edit
Motior	ı					
ТҮРЕ	TIME [ms]	POSITION [m]	VELOCITY [m/s]	ACCELERATION [ m/s <sup>2</sup> ]	JERK [ m/s <sup>3</sup> ]	EDIT
Acceleration	0	0	0.3	0	0	Edit
Acceleration	1000	0.3	0.3	0	0	Edit

## 12. Save your profile changes

CONTINUE TO AXIS	
Constant Speed Conveyor / 0 Shared Users v 0 Comments v	START EDITING
DUPLICATE DELETE IMPORT PROFILE EXPORT PROFILE CLEAR PROFILE	

## 13. Click Continue To Axis

CONTINUE TO AXIS	
Constant Speed Conveyor / 0 Shared Users v 0 Comments v	🔒 START EDITING
	SAVE
LINEAR	
DUPLICATE DELETE IMPORT PROFILE EXPORT PROFILE CLEAR PROFILE	

### Custom Induction Motor

Let's enter the information provided for our Takeaway Conveyor motor.

1. Change the name of your axis from Axis 7 to Takeaway Axis

A \ Library \ Pick n Place Application \ Axis 7						
CONTINUE TO PROJECT						
Axis 7 0 Shared Users ¥ 0 Comments ¥	🔒 START EDITING					
	Automatically Saved					
Linear Axis with Mecha Y	TREATE A SNAPSHOT					
Description	IN RESTORE FROM SNAPSHOT					
DUPLICATE DELETE						

## 2. Click on Add Custom Motor

Components	Performance			
POWER REQUIREMENTS	: Voltage Select v	Phase Select v	SEAR	CH FOR SOLUTIONS
PROFILE		TRANSMISSION	MOTOR	DRIVE
Edit Profile Constant Speed Profile Motion Type: Linear REMOVE	Assembly Belt 2 Type: Belt Drive REMOVE	Add Another Coupling Transmission 2 REMOVE	Add Motor	Add Drive

3. Enter a name for your motor and select **Create Motor**.

ADD A CUSTOM INDUCTION MOTOR		
Create a new Custom Motor	2 Import a Custom Motor from your library.	
Custom 2	Select A Motor	~
CREATE MOTOR	ADD MOTOR	
	CANCE	aL

4. The *Custom Induction Motor Properties* page will open and you will enter the information provided by OEM Distribution in the *Motor Name Plate Information*.

# **Custom Induction Motor Properties**

## MOTOR NAME PLATE INFORMATION (i)

Rated Power	15	НР	Rated Frequency	60	Hz
Voltage Rating (s)	460	Volts	Speed	1760	RPM
Rated Current	19.7	A(pk)	Motor Poles	4	
ADDITIONAL INF	FORMATION - O	otional (i)			
Shaft Inertia		$kg \cdot m^2$	Shaft Diameter		m
EQUIVALENT CI	RCUIT DATA (P	ER PHASE) - Optional			
Stator Resistance		Ohms	Rotor Leakage Inductance		Henrys
Stator Leakage Inductance		Henrys	Magnetizing Inductance		Henrys
Rotor Resistance		Ohms	Core Loss Resistance		Ohms

5. Note how the *Equivalent Circuit Data (Per Phase)* section is blank until you save your motor name plate information. Click **Save** to save your motor information.



6. Click Continue To Axis

♠ \ Library \ Pick n Place Application \ Takeaway Axis \ Custom 2	
CONTINUE TO AXIS	
Custom 2 / 0 Shared Users v 0 Comments v	START EDITING
DUPLICATE DELETE	☆ CANCEL CHANGES

7. Set your Power Requirements Voltage and Phase to 460 and 3 respectively.

Components	Performance			
POWER REQUIREMENT	S: Voltage Select v	Phase Select v	·	SEARCH FOR SOLUTIONS
PROFILE			MOTOR	DRIVE
Edit Profile Constant Speed Conveyor Motion Type: Linear REMOVE	Assembly Belt 2 Type: Belt Drive REMOVE	Add Another Coupling Transmission 2 REMOVE	Custom 2 Catalog: Custom 2 REMOVE	Add Drive

#### 8. Click Search For Solutions

Components	Performance		
POWER REQUIREMENTS: Voltage Tolerance V	Voltage 460 v	Phase 3 ×	SEARCH FOR SOLUTIONS

9.	The Solutions Lis	t will provide	solutions for	your axis
----	-------------------	----------------	---------------	-----------

OLUTIONS LIST	Viev	ving 1 - 8 of 8 Sort by: Profile M	atch (%)	×					
Clear Filters		Note: Some solutions may have access	ories added	to meet y	our filter	criteria.			
Solution Filters		> Filter Solutions by Product Far	nily						
Solution Filters (6)	>	Drive	View T	orque Spee	ed Curve			Sele	ct
Motor Filters		Motor	Profile	Palativa	A	Farma Or	Inactio	Beak	Thermal
Commonly Used (6)	>	Custom 2   Custom 2	Match	Price	Average Current	Torque Utilization	Ratio	Current Utilization	Capacity
Forque/Force Ratings (6)	>	Gearbox	• • •	222200	0.00	0%	0.00	0%	0%
nduction Motor (5)	>	Drive	View T	orque Spee	d Curue			Sele	ct
Physical Dimension (3)	>	25C-D017N1x4   25C-D017N1x4	VIEW I	orque opee	cu Cuive				са 
Options (14)	>	Custom 2   Custom 2	Profile Match	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current Utilization	Thermal Capacity
P Ratings (5)	)	Gearbox	66.7%	\$\$\$\$\$\$	0.00	0%	0.00	0%	0%
Certifications (3)	>	Drive							
Environment (3)	>	PowerFlex 755   20G11RD8P0xx0NNNNN	View T	orque Spee	ed Curve			Sele	ct
Feedback (2)	>	Motor Custom 2   Custom 2	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity
Group (1)	>	Gearbox	66.7%	\$\$\$\$\$\$	0.00	0%	0.00	0%	0%
Drive Filters		Deiter							
Commonly Used (7)	>	PowerFlex 755   20G11FC011xx0NNNNN	View T	orque Spee	ed Curve			Sele	ct
Voltage & Phase (4)	5	Motor Custom 2   Custom 2	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity
P Ratings (5)	>	Gearbox	66.7%	\$\$\$\$\$\$	0.00	Utilization 0%	0.00	Utilization 0%	0%
Environment (3)	5		•						
Options (4)	>	Drive Kinetix 5500   2198-H015-ERSx	View T	orque Spee	ed Curve			Sele	ct
Certifications (19)	>	Motor Custom 2   Custom 2	Profile	Relative	Average	Force Or	Inertia	Peak	Thermal
Controller (4)	>	Gearbox	55.6%	\$\$\$\$\$\$\$	0.00	Utilization 0%	0.00	Utilization 0%	0%
Features (35)	>		•						
Motor Control (10)	>	Drive Kinetix 5500   2198-H025-ERSx	View T	orque Spee	ed Curve			Sele	ct

10. In the *Drive Filters*, click on the dropdown for the **Safety** feature to see the three options available. Click on the checkbox for Integrated Safe Torque Off.

Drive Filters	
Commonly Used (7)	5
Voltage & Phase (4)	3
IP Ratings (5)	>
Environment (3)	>
Options (4)	>
Certifications (19)	>
Controller (4)	>
Features (35)	>
Motor Control (10)	>
Network Support (14)	3
Bus Configuration (4)	>
Safety (3)	)
Integrated Safe Torque Off	
Hardwired Advanced Safety	
Hardwired Safe Torque Off	
Integrated Safe Torque Off	

#### 11. Your results are now limited to

Drive 25C-D013N1x4   25C-D013N1x4	View To	rque Spee	d Curve			Sele	ct
Motor Custom 2   Custom 2	Profile Match	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current Utilization	Thermal Capacity
Gearbox	66.7% •	\$\$\$\$\$55	0.00	0%	0.00	0%	0%
Drive 25C-D017N1x4   25C-D017N1x4	View To	rque Spee	d Curve			Sele	ct
Motor Custom 2   Custom 2	Profile Match	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current Utilization	Thermal Capacity
Gearbox	66.7% •	\$\$\$\$\$\$	0.00	0%	0.00	0%	0%
Drive Kinetix 5500   2198-H015-ERSx	View To	rque Spee	d Curve			Sele	ct
Motor Custom 2   Custom 2	Profile Match	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current Utilization	Thermal Capacity
Gearbox	55.6% •	\$\$\$\$\$\$	0.00	0%	0.00	0%	0%
Drive Kinetix 5500   2198-H025-ERSx	View To	rque Spee	d Curve			Sele	ct
Drive Kinetix 5500   2198-H025-ERSx Motor Custom 2   Custom 2	View To Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Sele Peak Current Utilization	ct Thermal Capacity
Drive Kinetix 5500   2198-H025-ERSx Motor Custom 2   Custom 2 Gearbox	View To Profile Match 55.6%	Relative Price \$\$\$\$\$\$	Average Current 0.00	Force Or Torque Utilization 0%	Inertia Ratio 0.00	Peak Current Utilization 0%	ct Thermal Capacity 0%
Drive Kinetix 5500   2198-H025-ERSx Motor Custom 2   Custom 2 Gearbox Drive Kinetix 5700   2198-D012-ERS3	View To Profile Match 55.6%	Relative Price \$\$\$\$\$5	d Curve Average Current 0.00 d Curve	Force Or Torque Utilization 0%	Inertia Ratio 0.00	Sele Peak Current Utilization 0%	ct Thermal Capacity 0% ct
Drive Kinetix 5500   2198-H025-ERSx Motor Custom 2   Custom 2 Gearbox Drive Kinetix 5700   2198-D012-ERS3 Motor Custom 2   Custom 2	View To Profile Match 55.6% View To Profile Match	Relative Price SSSSSS orque Spee Relative Price	d Curve Average Current 0.00 d Curve Average Current	Force Or Torque Utilization 0%	Inertia Ratio 0.00	Peak Current Utilization 0% Sele	ct Thermal Capacity 0% ct
Drive Kinetix 5500   2198-H025-ERSx Motor Gearbox Drive Kinetix 5700   2198-D012-ERS3 Motor Custom 2   Custom 2 Gearbox	View To Profile Match 55.6% View To Profile Match 55.6%	Relative Price \$\$\$\$\$\$\$ rque Spee Relative Price \$\$\$\$\$\$\$	d Curve Average Current 0.00 d Curve Average Current 0.00	Force Or Torque Utilization 0%	Inertia Ratio 0.00 Inertia Ratio 0.00	Peak Current Utilization 0% Sele Peak Current Utilization 0%	ct Thermal Capacity 0% ct Chermal Capacity 0%
Drive         Kinetix 5500       2198-H025-ERSx         Motor       Custom 2         Custom 2       Custom 2         Gearbox       Custom 2         Motor       2198-D012-ERS3         Motor       2198-D012-ERS3         Gearbox       Custom 2         Gearbox       Custom 2         Drive       Custom 2         Kinetix 5700       2198-D020-ERS3	View To Profile Match 55.6% View To View To View To	Relative Price SSSSSSS rque Spee Relative Price SSSSSS SSSSSS	d Curve Average Current 0.00 d Curve Average Current 0.00 d Curve	Force Or Torque Utilization 0%	Inertia Ratio 0.00 Inertia Ratio 0.00	Peak Current Utilization 0% Sele Veak Current Utilization 0%	ct Thermal Capacity 0% ct Thermal Capacity 0% ct
Drive         Kinetix 5500       1       2198-H025-ERSx         Motor       Custom 2       Custom 2         Gearbox       Gearbox       Custom 2         Drive       Kinetix 5700       1       2198-D012-ERS3         Motor       Custom 2       1       Custom 2         Gearbox       Custom 2       1       Custom 2         Drive       Kinetix 5700       1       2198-D020-ERS3         Drive       Custom 2       1       2198-D020-ERS3         Motor       1       2198-D020-ERS3       Motor         Custom 2       1       2198-D020-ERS3       Custom 2	View To Profile Match 55.6% View To Profile Match View To Profile Match	Relative Price SSSSSSS rque Spee Relative Price SSSSSSS rque Spee Relative Price	d Curve Average Current 0.00 d Curve Average Current 0.00 d Curve Average Current 0.00	Force Or Torque Utilization 0%	Inertia Ratio 0.00 Inertia Ratio Inertia Ratio	Sele Peak Current Utilization 0% Sele Peak Current Utilization 0%	ct Thermal Capacity 0% ct Thermal Capacity 0% ct

12. We will select the first solution available with the PowerFlex 527. Click Select

					_		_
Drive 25C-D013N1x4   25C-D013N1x4	View To	Sele	ct				
Motor Custom 2   Custom 2	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity
Gearbox	66.7%	\$\$\$\$\$55	0.00	0%	0.00	0%	0%
Drive 25C-D017N1x4   25C-D017N1x4	View To	orque Spee	d Curve			Sele	ct
Motor Custom 2   Custom 2	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity
Gearbox	66.7% •	\$\$\$\$\$\$	0.00	0%	0.00	0%	0%
Drive Kinetix 5500   2198-H015-ERSx	View To	orque Spee	d Curve			Sele	ct
Motor Custom 2   Custom 2	Profile Match	Relative Price	Average Current	Force Or Torque Utilization	Inertia Ratio	Peak Current Utilization	Thermal Capacity
Gearbox	55.6% •	\$\$\$\$\$\$\$	0.00	0%	0.00	0%	0%
Drive Kinetix 5500   2198-H025-ERSx	View To	orque Spee	d Curve			Sele	ct
Motor Custom 2   Custom 2	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity
Gearbox	55.6% •	\$\$\$\$\$\$	0.00	0%	0.00	0%	0%
Drive Kinetix 5700   2198-D012-ERS3	View To	orque Spee	d Curve			Sele	ct
Motor Custom 2   Custom 2	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity
Gearbox	55.6% •	\$\$\$\$\$\$	0.00	0%	0.00	0%	0%
Drive Kinetix 5700   2198-D020-ERS3	View To	orque Spee	d Curve			Sele	ct
Motor Custom 2   Custom 2	Profile Match	Relative Price	Average Current	Force Or Torque	Inertia Ratio	Peak Current	Thermal Capacity
Gearbox	55.6%	\$\$\$\$\$\$	0.00	0%	0.00	0%	0%

- ♠ \ Library \ Pick n Place Application \ Takeaway Axis CONTINUE TO PROJECT Takeaway Axis / 0 Shared Users Y 0 Comments Y Automatically Saved Linear Axis with Mecha... TREATE A SNAPSHOT **IN RESTORE FROM SNAPSHOT** DUPLICATE DELETE Components Performance SEARCH FOR SOLUTIONS **POWER REQUIREMENTS:** Voltage 460 v Phase 3 v Voltage Tolerance v PROFILE LINEAR MECH. TRANSMISSION MOTOR DRIVE Edit Profile Add Another Assembly Belt 2 Constant Speed Conveyor Coupling Transmission 2 25C-D013N1x4 Custom 2 Motion Type: Linear Type: Belt Drive Catalog: 25C-D013N1x4 REMOVE Catalog: Custom 2 REMOVE REMOVE REMOVE SET CONFIGURATION CHANGE DRIVE REMOVE
- 13. You've finished sizing and selecting a solution for the Takeaway Axis.

#### 14. Click Continue To Project


15. Your Pick and Place Application Components will be displayed. You can review your 7 axes individually at any point



You've finished configuring the seven axes of the Pick n Place Application. On the next section, we will review the Power Analysis feature.

### **Power Analysis**

You've sized and selected a solution for each of your seven axes. You have a *Profile*, entered your *Mechanism*, completed the *Transmissions*, and selected a *Motor* and *Drive*. You've reviewed the *Performance* of each axes, and are satisfied with all the **Components** in your project. At this point you want to validate your selections and decided to check the **Power Analysis** tab. Power Analysis helps you determine how to handle the incoming and outgoing power from the drive system. It calculates system parameters from the hardware configuration; aligns profiles from all axes; add power usage for all profiles to find the **Power Profile** (Total Power over time).

#### **DC Bus Simulations**

To view the Bus simulation,

1. At the Pick and Place Application Components page, click on the **Power Analysis** tab



2. The Power Analysis will open

Sun	nmary	Component Detail	Power Analysis	Customer/Sit	e Selected Products		
Total	Axes (7)	Shared Buses (2)	Standalone Axe	es (3)	OTHER REQUIREMENTS		
сно	OSE AN	ITEM TO VIEW			Please click Auto Configure to add (products/accessories) to your systematics	d the following stem.	
	T-1	A			This platform does not support power an	nalysis operations.	
	25C-D0	13N1x4			SELECTED AXIS DETAIL		
					Average Power Usage	0.00 kW	^
	Share				Average Motoring Power	0.00 kW	
Ť					Average Regen Power	0.00 kW	
•	Infeed	Axis			DC Bus Voltage Utilization	0%	
I	25C-D0	10N1x4			SET POWER SUPPLY SHU	NT. AND CAPACITORS	1
	Share				Configures Axis power options ba manual/automatic selections below selections.	sed on Axis components and w. This does not overwrite manua	al
÷	Assem	bly Index Axis 1 / Asse	embly Index Axis 2			Auto Configure	
				Ť	Power Supply i	Auto Manual	

3. Under *Choose An Item To View*, scroll the window to see your axis. Click on **Shared Buses** to view which axes are on the share DC Bus

Total Axes (7)	Shared Buses (2) Standalone Axes (3)		Total Axes (7)	Shared Buses (2)	Standalone Axes	(3)
CHOOSE A	N ITEM TO VIEW		CHOOSE AN	ITEM TO VIEW		
Edit S	Shared Bus Share	^	Edit Sha	ared Bus Share		^
Produ	uct Index Axis /		Product	t Index Axis /		!
Kineti	x 5700		Kinetix 5	5700		
Share	8		Share			1
↑ Horiz Axis	ontal Lead Screw Axis / Vertical Lead Screw		↑ Horizon Axis	tal Lead Screw Axis / Ve	rtical Lead Screw	0
Kineti	x 5700		Kinetix 5	5700		
Edito	Charad Rus Chara	$\sim$	Edit Sha	and Rus Share		~

4. You can see that you have 2 dual axes drives with 2 axes each. Click on Standalone Axes

Total /	Axes (7)	Shared Buses (2)	Standalone Axes (3)	Total	Axes (7)	Shared Buses (2)	Standalone Axes (3)
сно	OSE AN ITE	M TO VIEW		сно	OSE AN ITE	M TO VIEW	
÷	Assembly In	ndex Axis 1 / Assem	ibly Index Axis 2	٠	Assembly In	ndex Axis 1 / Assemb	oly Index Axis 2
	Kineux 5700		-				
	Edit Shared I	Bus Share			Edit Shared I	Bus Share	
Ť	Horizontal I	Lead Screw Axis / Vo	ertical Lead Screw Axis	Ť	Horizontal I	Lead Screw Axis / Ver	rtical Lead Screw Axis
	Kinetix 5700	1	2		Kinetix 5700	I	
	Edit Shared I	Bus Share			Edit Shared	Bus Share	

#### 5. Your standalone axes are listed as:



6. Return to Total Axis



# Selected Shared DC Bus Detail

1. Click Share on the Takeaway Axis

Total Axes (7)	Shared Buses (2)	Standalone Axes (3)	
CHOOSE AN ITE	M TO VIEW		
Takeaway A	xis	1	^
25C-D013N1	1x4		
Share			
<ul> <li>Infeed Axis</li> </ul>		ŀ	
25C-D010N1	1x4		
Share			
↑ Product Ind	ex Axis /	B	
Kinetix 5700			~

2. You can share power between the two PowerFlex drives. Click Add to Group

[POWERFLEX 527] SET DC BUS SHARING	
Takeaway Axis [25C-D013N1x4]	
2 SPACE(S) REMAINING - CLICK "ADD TO	GROUP" TO SHARE POWER
Infeed Axis [25C-D010N1x4]	Add to Group
	Cancel Save

3. Once you've set DC bus sharing for your PowerFlex drives, you will see your drives in one group. Click Save



4. Notice how your number of Standalone Axes changes.



5. Click on the Kinetix Dual Axis module



6. A Power Analysis will be performed for this axis, and you can view the results in Selected Shared DC Bus Detail window



NOTE: The Selected Shared DC Bus Detail window will not display values for PowerFlex Drives at the moment. Only Kinetix Drives products will display power utilization values.

7. Scroll through the Selected Shared DC Bus Detail window to review your Power Supply data, shunt utilization and capacitance.

10 11 5700		Power Supply i	Auto Manual
Kinetix 5700		2198-P031	x
Edit Shared Bus Share		Continuous Converter Utilization	1%
Takeaway Axis		Peak Power Utilization	2%
Infeed Axis		Shunt	Auto Manual
25C-D013N1x4		Continuous Shunt Utilization	0%
Edit Shared Bus	~	Capacitor (i)	Auto Manual

8. Check the other Kinetix drive axes' power utilization by clicking on the axis and selecting Auto Configure

Total Axes (7)	Shared Buses (3)	Standalone Axes (1)	OTHER REQUIREMENTS	
CHOOSE AN	ITEM TO VIEW		Please click Auto Configure to add (products/accessories) to your sys	d the following stem.
Edit Shar	red Bus	^	Kinetix 5700 platform must have a powe	er supply.
+ Horizont	al Lead Screw Axis / Ve	tical Lead Screw	SELECTED AXIS DETAIL	
Axis			Average Power Usage	0.00 kW
	700		Average Motoring Power	0.00 kW
Kinetix 5	700		Average Regen Power	0.00 kW
Edit Sha	red Bus Share		DC Bus Voltage Utilization	0%
Product	Index Axis /	B.	SET POWER SUPPLY, SHU	NT, AND CAPACITORS
Kinetix 5	700		manual/automatic selections below selections.	w. This does not overwrite manual
Share		1		Auto Configure
			Power Supply i	Auto Manual
		6	continuous Converter Utilization	0%
		4	Peak Power Utilization	0%

9. Your axis should display the Average Power Usage, Average Motoring Power, and Average Regen Power

Total	Axes (7) Shared Buses (3) Standalone Ax	(es (1)	SELECTED AXIS DETAIL		
сно	OSE AN ITEM TO VIEW				-
	Edit Shared Bus	•	Average Power Usage	0.11 kW	^
			Average Motoring Power	0.17 kW	
£			Average Regen Power	0.00 kW	
	Horizontal Lead Screw Axis / Vertical Lead Screv		DC Bus Voltage Utilization	0%	
	Axis	:	DC Bus Rms Current Utilization	0%	
			DC Bus Peak Current Utilization	0%	
	Kinetix 5700		Cable Length Utilization	0%	
	Edit Shared Bus Share	- 1			1
£			SET POWER SUPPLY, SHU	NT, AND CAPACITORS	
	Product Index Axis /		Configures Axis power options ba manual/automatic selections below selections.	sed on Axis components and w. This does not overwrite manua	al
	Kinetix 5700			Auto Configure	
	Share	~	Power Supply 1	Auto Manual	~

- 10. Repeat step 8 for our last axis.
- 11. We see that our Lead Screw axes have more power usage. The Average Motoring Power (power from Drive to Motor) is at 0.09 KW, Average Regen Power (power from Motor to Drive) is at 0.05 KW, and the Average Power Usage is 0.05 KW.

Total	Axes (7)	Shared Buses (3)	Standalone Axes (1)		SELECTED SHARED DC BU	S DETAIL	
сно	OSE AN ITE	M TO VIEW					_
	Edit Shared E	Bus		•	Average Power Usage	0.05 kW	^
					Average Motoring Power	0.09 kW	
1	Ussissatell	and Samu Aria (Mar	dial land Carry		Average Regen Power	0.05 kW	
	Horizontai L	ead Screw Axis / Vei			DC Bus Voltage Utilization		72%
	Axis		:		DC Bus Rms Current Utilization		0%
	14 .1 5700				DC Bus Peak Current Utilization		0%
	Kinetix 5/00				Cable Length Utilization		0%
	Edit Shared B	Bus Share		Ŀ			_
Ť			_		SET POWER SUPPLY, SHU	NT, AND CAPACITORS	
	Product Ind	ex Axis /	1 		Configures Axis power options based manual/automatic selections below selections.	sed on Axis components and w. This does not overwrite m	anual
I	Kinetix 5700					Auto Config	gure
	Share			~	Power Supply i	Auto Ma	nual 🗸

### 12. Click Edit Shared Bus



13. You can set the DC bus sharing from this window and also select to share a single control power source for all your drives.



14. We will not add cluster since all axes can be shared in a single entity

[KINETIX 5700 SERVO DRIVE] SET DC BUS SHARING
Share Control Power Add Cluster
Hori You can set your axes in clusters (individual groups of shared buses) and make them separate entities. This will require a DFE at one group but a capacitor for each cluster entity.
Assembly Index Axis 1 / Assembly Index Axis 2 [2198-D006-ERS3] Add to Group
Product Index Axis / [2198-D006-ERS3] Add to Group
Cancel Save

15. Click on the Share Control Power checkbox. Click on Add to Group twice to add all axes on the shared DC bus.



16. Click **Save** to save your configuration

[KINETIX 5700 SERVO DRIVE] SET DC	BUS SHARING
	Share Control Power Add Cluster
Horizontal Lead Screw Axis / Vertical Lea	ad Screw Axis [2198-D006-ERS3] Remove from Group
Assembly Index Axis 1 / Assembly Index	x Axis 2 [2198-D006-ERS3] Remove from Group
Product Index Axis / [2198-D006-ERS3]	Remove from Group
	Save

17. Motion Analyzer will update the bus simulation and recalculate power usage.

18. The completed simulation should show:

otal Axes (7)	Shared Buses (2) Standalone A	xes (0)	SELECTED SHARED DC BU	IS DETAIL
25C-D013	'EM TO VIEW N1x4		Average Power Usage	0.08 kW
_	_	^	Average Motoring Power	0.12 kW
Edit Share	d Bus		Average Regen Power	0.05 kW
1			DC Bus Voltage Utilization	
Horizonta	Lead Screw Axis / Vertical Lead Scre	w	DC Bus Rms Current Utilization	
Axis			DC Bus Peak Current Utilization	
		- E	Cable Length Utilization	
Assembly	Index Axis 1 / Assembly Index Axis 2			
		÷	SET POWER SUPPLY, SHU	NT, AND CAPACITORS
Product Ir	idex Axis /	1	Configures Axis power options ba manual/automatic selections below selections.	sed on Axis components and w. This does not overwrite ma
Kinetix 570	00			Auto Config

19. Return to the Component Detail page by clicking on the project shortcut

♠ \ Library . Pick n Place Application		
Pick n Place Application /	0 Shared Users ¥	0 Comments ♥
This machine accepts packages at random, stage poackages to be picked up from assembly and places pack product belt before cases are taken away for shipment	ages into a case on	a synchronized
DUPLICATE DELETE EXPORT AS XML		
		G
	Automatically Sav	ved

20. Your Pick and Place Application Components should show:

♠ \ Library \ Pick n Place Application	
Pick n Place Application /	0 Shared Users ♥ 0 Comments ♥
This machine accepts packages at random, stages packages to be picked up from assembly and places pa product belt before cases are taken away for shipment	ackages into a case on a synchronized
DUPLICATE DELETE EXPORT AS XML	
	START EDITING
	Automatically Saved
	TREATE A SNAPSHOT
	I RESTORE FROM SNAPSHOT
Summary Component Detail Power Analysis Customer/Site Selected Products	
Pick N Place Application Components	AXES (7)
	PROJECT ACTIONS
Axis: Infeed Axis	Create New Axis & Profile
	Create New Blank Axis
Axis. Takeaway Axis	Import Axis
> Axis: Assembly Index Axis 1	
Axis: Assembly Index Axis 2	
> Axis: Product Index Axis Edit Delete	
Axis: Delete	
> Axis: Horizontal Lead Screw Axis Edit Delete	
Axis: Vertical Lead Screw Axis	

### **Selected Products**

We will use the Selected Products page to review the selected products and create our Bill of Material and a Project Report

1. Click on the **Selected Products** tab

					RESTORE FROM SNAPSHOT
Summary	Component Detail	Power Analysis	Customer/Site	Selected Products	

2. The **Selected Products** will be shown by type and you can view your Drives, Gearbox, Motors, and Accessories selections.

Summary	Component Detail	Power Analysis	Customer/Site	Selected Products		
View by T	ype View by Axis		•	Download Project Report	Save As Product List	Export BOM
DRIVES						
	CATALOG NUMBER		DESCRIPTION	QUANTITY	ACCESSORIES	ACTIONS
25C-D010N1x4				1	0	View Detail
25C-D013N1x4				1	0	View Detail
2198-D006-ERS	S3 / Kinetix 5700			3	0	View Detail
2198-P031 / Kin	netix 5700			1	0	View Detail

#### GEARBOXES

CATALOG NUMBER	DESCRIPTION	QUANTITY	ACCESSORIES	ACTIONS
SP075S-MF1-3-0C1		3	0	View Detail

### MOTORS

CATALOG NUME	ER DESCRIPTION	QUANTITY	ACCESSORIES	ACTIONS
Custom 1		1	0	View Detail
Custom 2		1	0	View Detail
VPL-B0633T-xxxxxx / VPL Motor		1	0	View Detail
VPL-B0752F-xxxxxx / VPL Motor		1	0	View Detail
VPL-B0633M-xxxxxx / VPL Motor		1	0	View Detail
MPL-B210V-xxxxxx / MPL Motor		1	0	View Detail
MPL-B320P-xxxxxx / MPL Motor		1	0	View Detail

## PLATFORM ACCESSORIES

CATALOG NUMBER	DESCRIPTION	QUANTITY
2198-TCON-24VDCIN36		1
2198-H040-P-T	T-connector and bus-bars for control power on Frame 1 or 2 follower drives	3

3. To create an excel file containing the catalog number of your selected products, you select Export BOM

Summary	Component Detail	Power Analysis	Customer/Site	Selected Products		
View by T	ype View by Axis	]	+	Download Project Report	Save As Product List	Export BOM
DRIVES						
You can s selected p	select to view your		DESCRIPTION	QUANTITY	ACCESSORIES	ACTIONS
2				1	0	View Detail
25C-D013N1x4				1	0	View Detail
2198-D006-ER5	S3 / Kinetix 5700			View Detail provide	e detailed	View Detail
2198-P031 / Kin	netix 5700			information of your	selected	View Detail
GEARBOX	(ES			product		

- 4. Click Open to open the .csv file and review your selected products and their catalog number
- 5. You can also download a PDF file containing your project report by clicking Download Project Report

Summary	Component Detail	Power Analysis	Customer/Site	Selected Products		
View by Typ	View by Axis			Download Project Report	Save As Product List	Export BOM
DRIVES						
	CATALOG NUMBER	-	DESCRIPTION	QUANTITY	ACCESSORIES	ACTIONS
25C-D010N1x4				1	0	View Detail
25C-D013N1x4				1	0	View Detail
2198-D006-ERS3	/ Kinetix 5700			3	0	View Detail
2198-P031 / Kinet	ix 5700			1	0	View Detail

#### GEARBOXES

- 6. Click **Open** to open the .pdf file and review your project report document
- 7. Close both documents without saving them.

This section of the lab is complete

# Visualization



## Extra

Power Cables were not selected throughout the Project. Go into each axis and add in a power cable if available. Review your Power Analysis page to see the cable utilization calculation.

Notes:

# motionanalyzer.rockwellautomation.com

START BUILDING			09 0
Ready to start building, sizing and se	electing?		(AR)
		OFTIONAL	

MA online tool – Pick N Place Application – 02/2016

# motionanalyzersupport@ra.rockwell.com for support and questions.



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