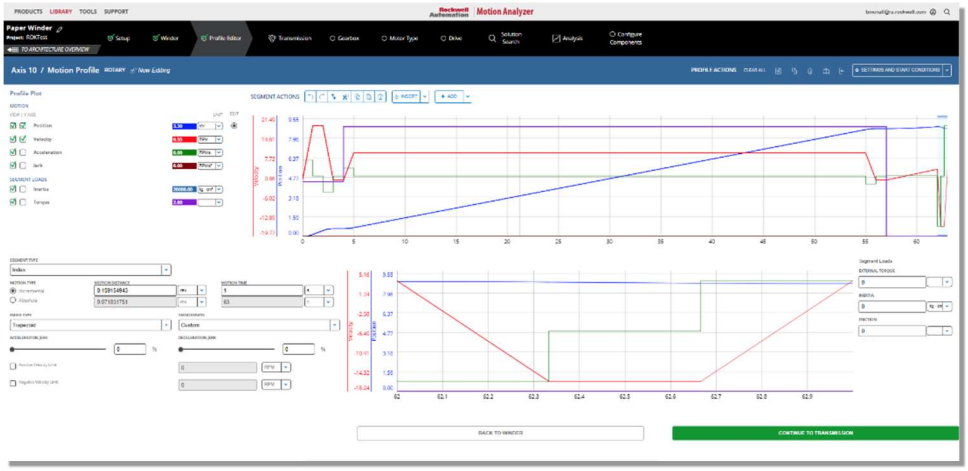
Motion Analyzer
Design Motion Control Systems



Motion Analyzer - Release 2 Announcement

Rockwell Automation is excited to release the latest update to Motion Analyzer – Release 2 (R2). These updates bring exceptional user experience and workflow to the tool. As a user, you will realize drastic improvements including:

- Architecture Overview
- Axis Navigation
- Product Filtering
- Component Configuration
- Motion Profile Import from 7.2
- Motion Profile Basic and Complex Motion
    - Index Advance
    - Additional Accel/Decel Permutations
- Updated Application Templates

R2 was developed with a goal of expediting the motion sizing process. Component selection, configuration, and axis navigation are all integrated into the workflow without the need to redirect. This is achieved by integrating technical application data, component details, and the component selection in one cohesive page per component. Ultimately, R2 is a continuation of efforts to improve software usability and performance.

You can find the latest version of Motion Analyzer yourself at:

https://motionanalyzer.rockwellautomation.com

Supported Browsers: Chrome, Internet Explorer 11, Safari

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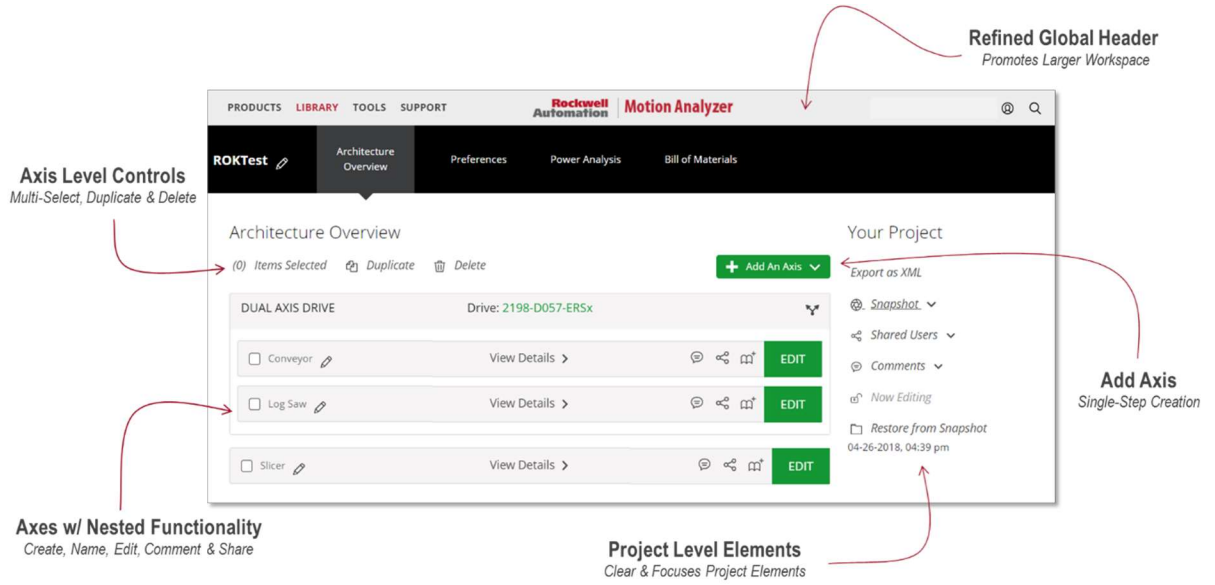
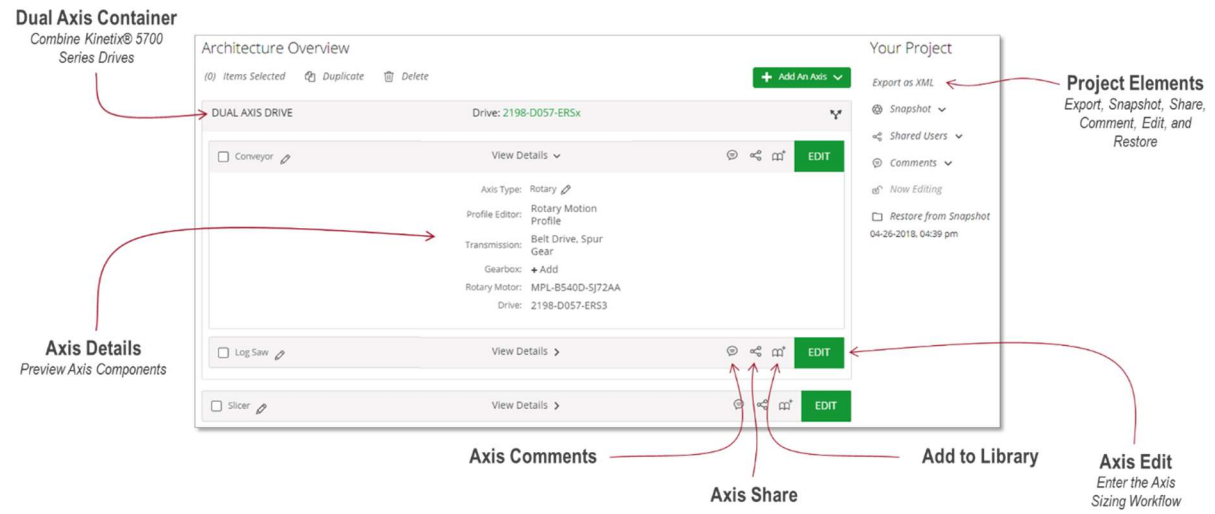
Architecture Overview

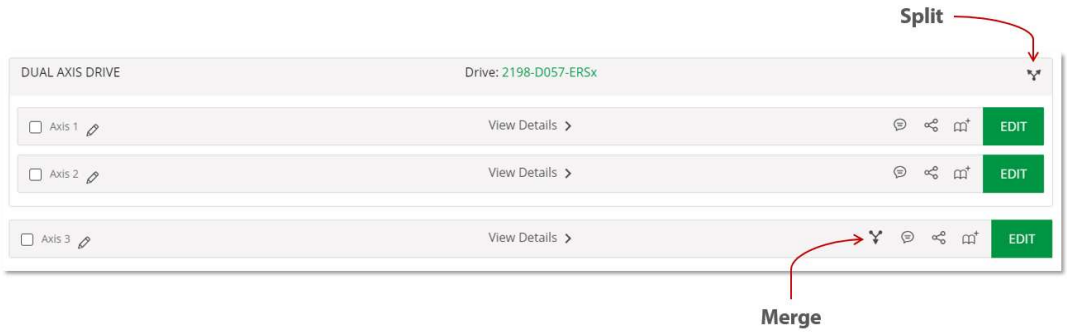
Motion axes now reside in a user experience called Architecture Overview. Axes are represented by a bar and can be rapidly generated with the “Add An Axis” button from your library or as a blank axis. The idea behind this user experience is simple, convenient and doesn’t require additional navigation to simply architect your machine. Other notable features include containers for Kinetix 5700 dual axes, axis/project sharing, axis/project commenting, project snapshot, multi-axis selection, delete, and duplicate.



Architecture Overview Major Elements



Architecture Overview Minor Elements

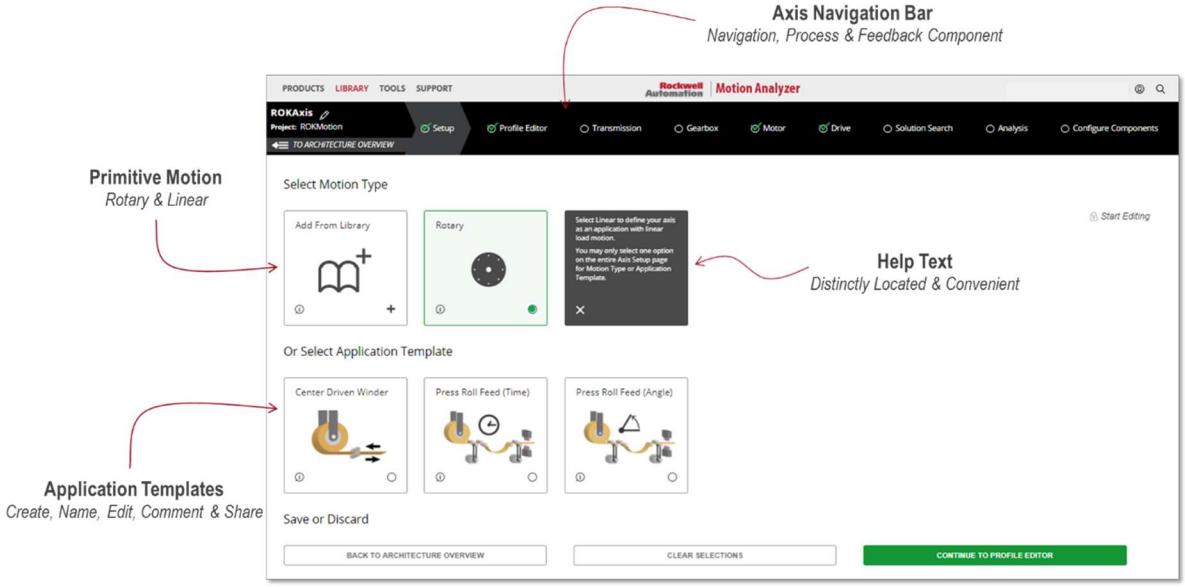


Dual Axis Merge and Split Buttons

Axis Setup

After creating a new axis in the Architecture Overview, you can define import an axis from the library, use a primitive motion type (rotary/linear), or select an application template. Furthermore, this new user interface design includes nested help text in the tile options for newer users. The design allows additional motion types and application templates to be added in the future.

At the top of the page you will notice the Axis Navigation Bar. This bar functions as both a navigation and axis completeness indicator. The Axis Navigation Bar updates in real time based on selected axis type and components.



Axis Setup

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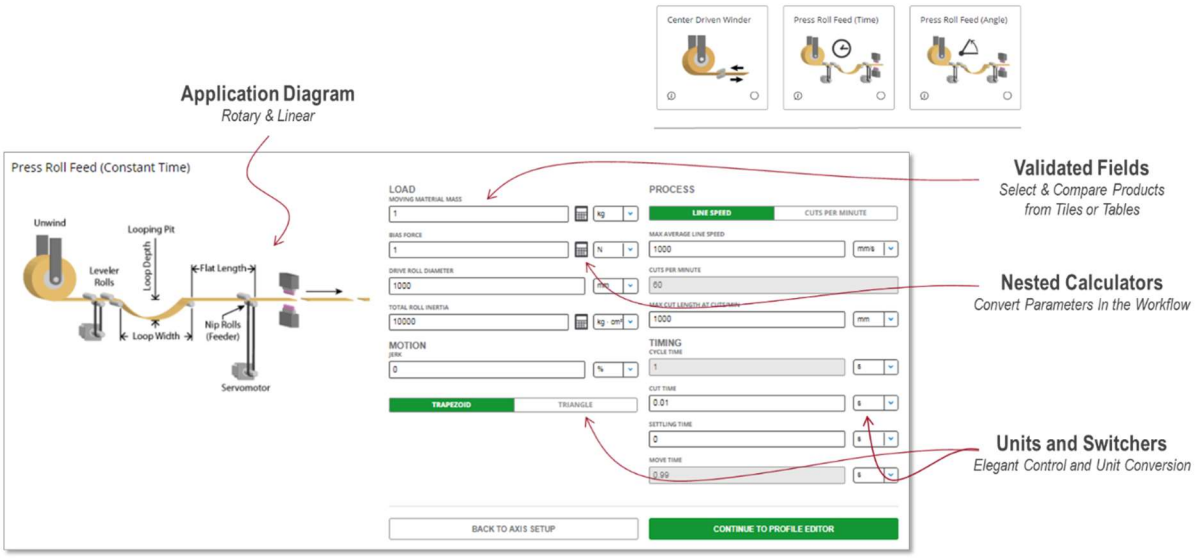
Application Templates

Application templates provide users with standardized design fields that translate automatically into motion profiles. Motion Analyzer currently offers Center Driven Winder, Press Roll Feed in the time domain, and Press Roll Feed in the angle domain. The updates to the application templates weren't limited to the user experience. Some fields and algorithms were improved to provide the most effective motion definition and sizing experience. You will notice some new fields that expose timing information that updates as you fill in other fields.



Application Templates

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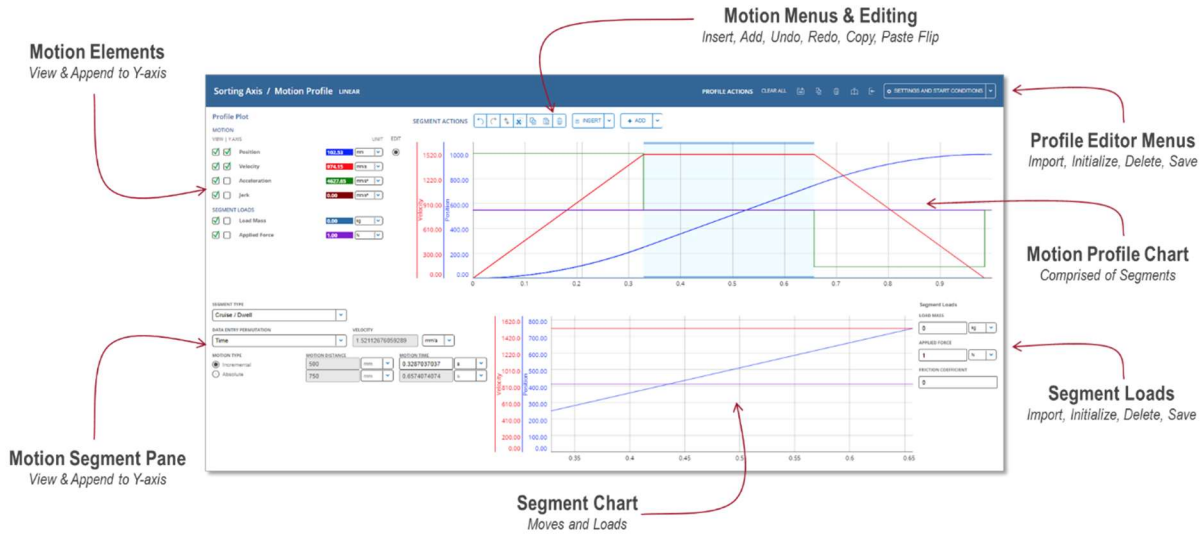
Profile Editor

The new profile editor was released in May of 2017, however, we didn't stop improving it then. Major areas of improvement were in the addition of Accel/Decel segment permutations, index advance, and profile import. Time-Acceleration, Distance-Velocity, Distance-Acceleration, and Velocity-Acceleration are now supported. Furthermore, the button allows users to import comma, semicolon, and tab separated CSV, TSV, TXT, and XLS(X) file types, as long as they are in the format of MA7 exported profiles. Import profiles that you have created in MA7 to save on motion definition time!



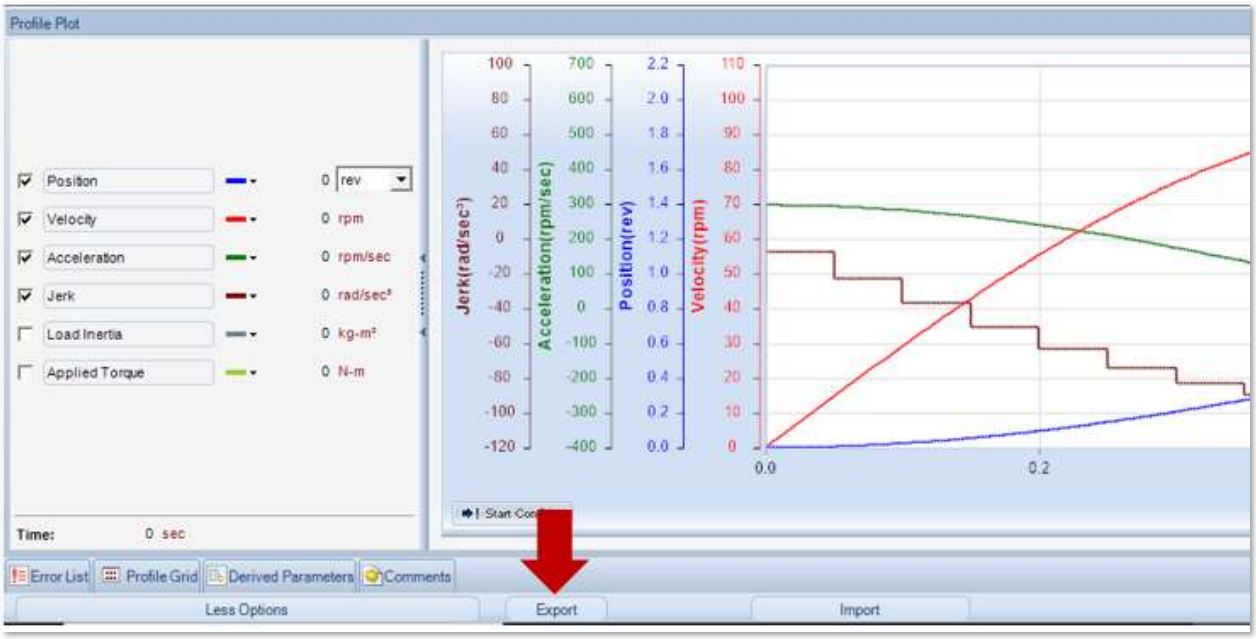
Motion Profile Editor

MA 7.2 Profile Import

```
Version;7.00
Master_Units(MU);1(sec)
Slave_Units(SU);0.001(m)
Master_Velocity(m/sec);0.001
Move_Type;Permutation;Input_Option;Absolute_Time;Absolute_Pos;Inc_Time;Inc_Distance;Final_Velocity;Peak_Accel;Peak_Decel;Accel
_Jerk;Decel_Jerk;Skew;Acc_FF;Velocity_Jerk;Mass;Force;Mass_X;Mass_Y;Mass_Z;No_Elements
-;-;-;MU;SU;MU;SU;SU/MU;SU/MU²;SU/MU²;-;-;-;-;-;kg;N;SU;SU;SU
SEG_START_CONDITION;;;0;0;0;0;0;0;0;0;-;-;-;0;0;0;0;0
SEG_ACCEL_DECEL;VALUE_TIME_DISTANCE;VALUE_INCREMENT;1;1000;1;1000;2000;2877.69784172662;0;61;61;0;44;-;0;0;0;0;0
SEG_ACCEL_DECEL;VALUE_TIME_VELOCITY;VALUE_INCREMENT;2;2500;1;1500;1000;0;-1020.40816326531;4;4;0;2;-;0;0;0;0;0
SEG_ACCEL_DECEL;VALUE_TIME_ACCELERATION;VALUE_INCREMENT;3;2140;1;-360;-1720;-4000;0;64;64;0;47;-;0;0;0;0;0
SEG_ACCEL_DECEL;VALUE_DISTANCE_VELOCITY;VALUE_INCREMENT;3.34965034965035;1140;0.34965034965035;-1000;-4000;-
12075.5555555556;0;92;92;0;85;-;0;0;0;0;0
SEG_ACCEL_DECEL;VALUE_DISTANCE_ACCELERATION;VALUE_INCREMENT;6.53291561494831;6140;3.18326526529796;5000;7141.42842
854285;4000;0;25;25;0;14;-;0;0;0;0;0
SEG_ACCEL_DECEL;VALUE_VELOCITY_ACCELERATION;VALUE_INCREMENT;7.30059416851081;9264.99999996175;0.7676785535625;3124
.99999996175;1000;0;-8000;0;0;0;0;-;0;0;0;0;0
```

Profile Import - File Content Example

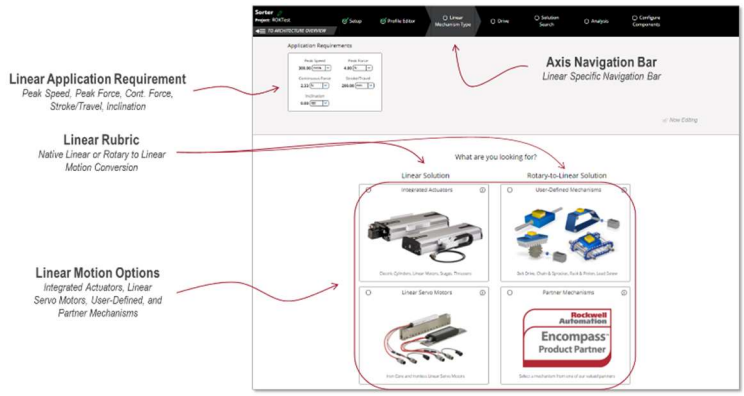
You can export profiles from MA7 using the export button at the bottom of the editor:



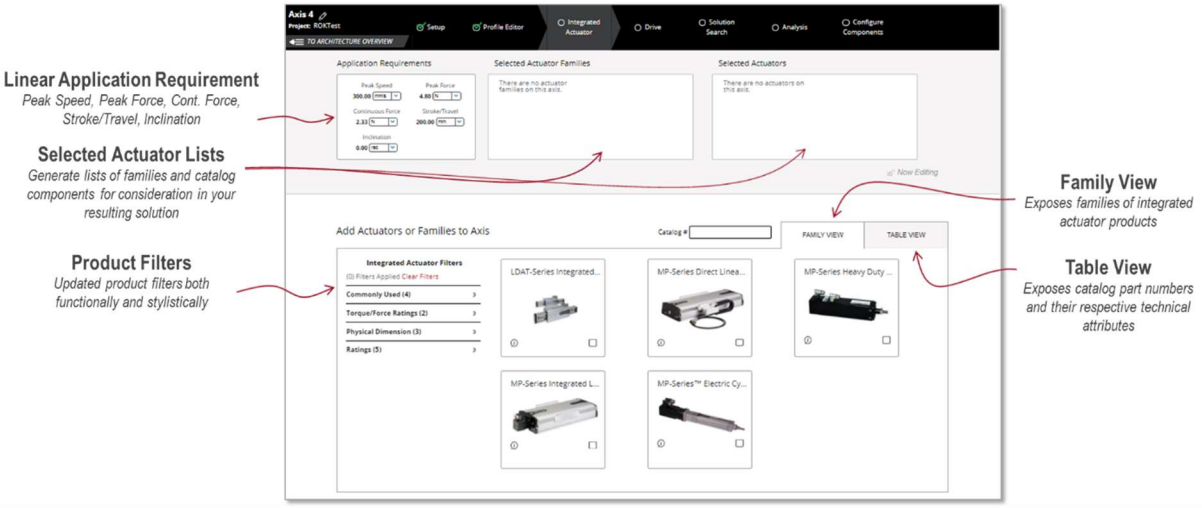
Linear Motion Components

The linear product options have their own landing page to provide the distinction between four options: integrated actuators, linear servo motors, user-defined mechanisms, and partner mechanisms. This was done to promote the difference in each of the potential technical solutions. Furthermore, all linear catalog components adopted a new product page. The product pages exhibits new features such as the Axis Navigation Bar, Application Requirements, Product Filters, and product family/component selection.

Application Requirements is a new feature that provides a perspective to rotary or linear motion specific parameters derived from the motion profile. The Application Requirements' parameters also update to reflect component influence on the axis performance. Furthermore, user-defined mechanisms functionally remain the same with new page styling.



Linear Component Landing Page



Integrated Actuators Selection Page

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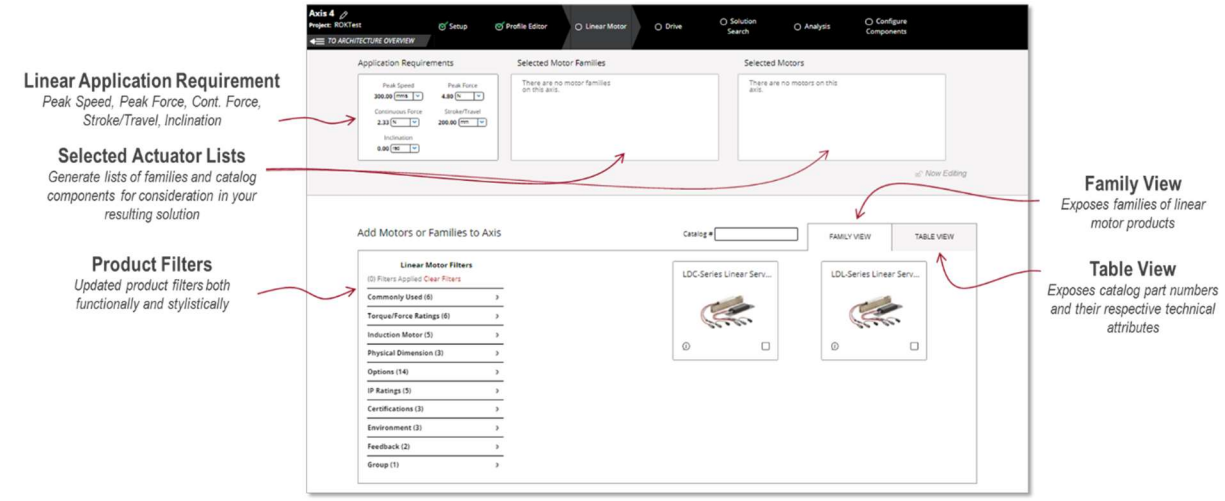
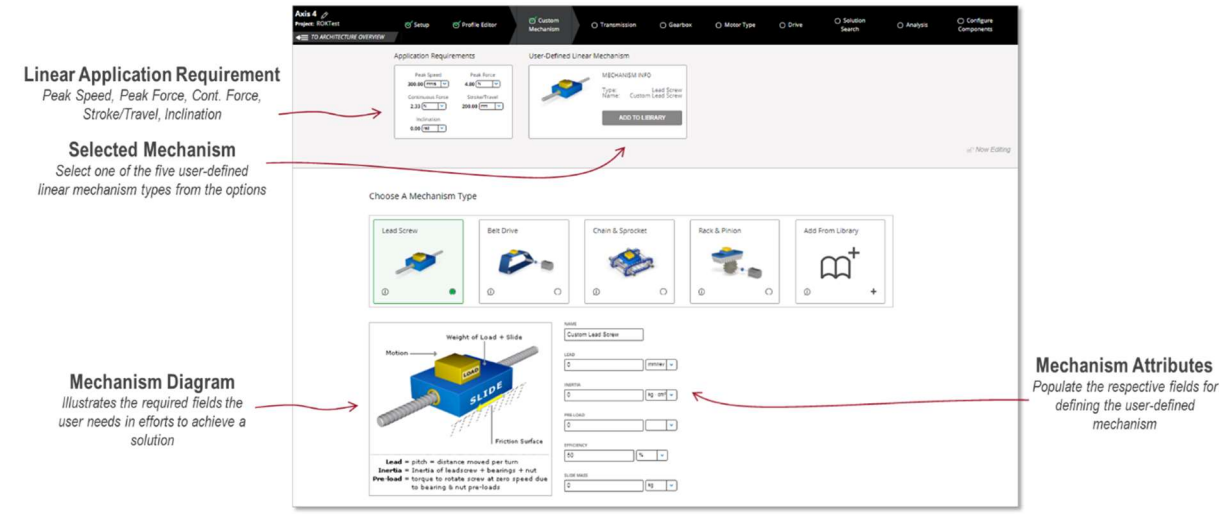
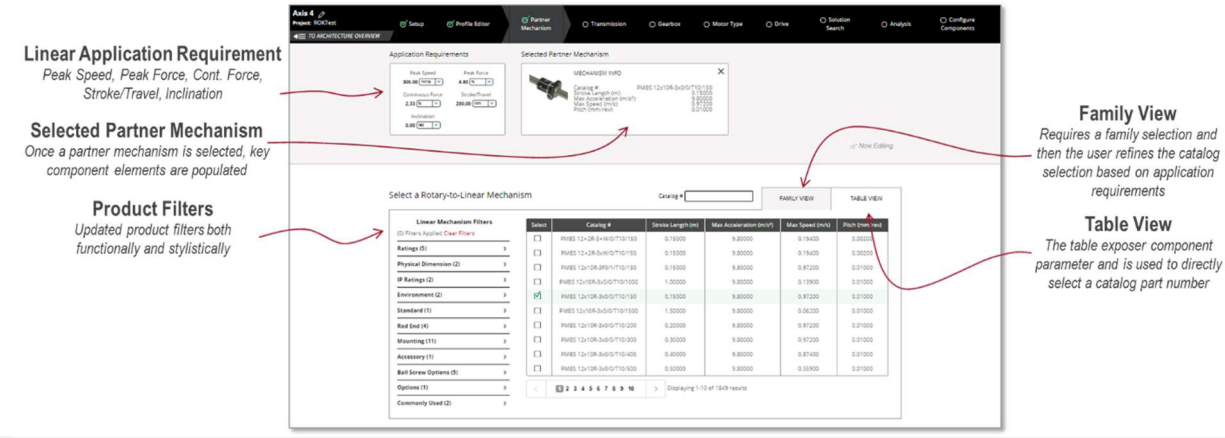


Linear Servo Motors Selection Page



User-Define Mechanisms

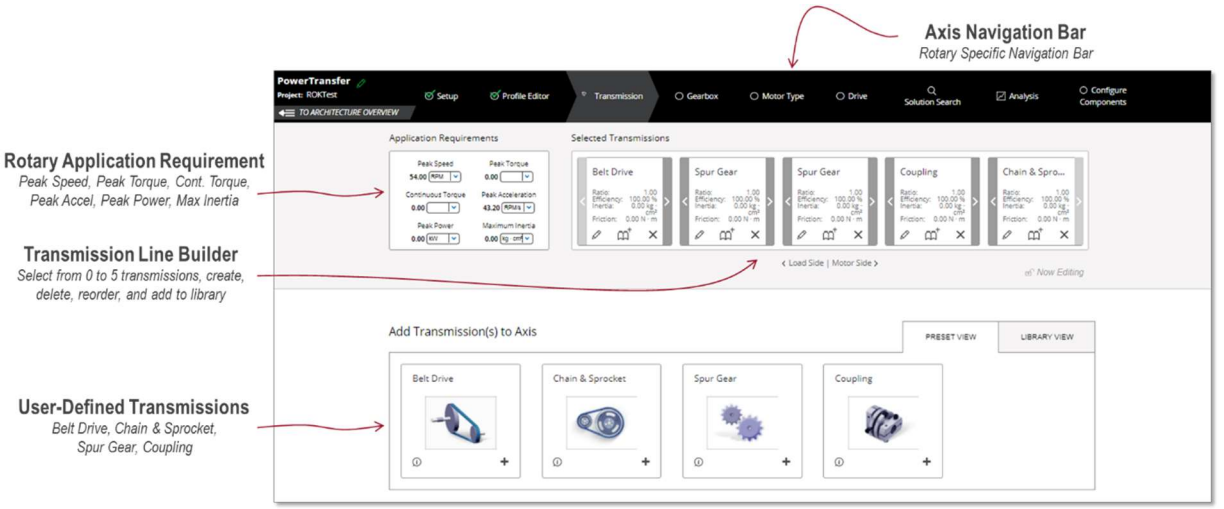


Partner Linear Component Selection Mechanisms

Transmissions

User-Defined transmissions are a completely new user experience. The transmission component page consists of Application Requirements, Selected Transmission (AKA Transmission Line Builder), and the Transmission Selection Workspace. The orientation of the Transmission Line Builder is as follows: motion load is inherently on the left-had side of the transmission line and the motor is to the right.

The transmission line supports zero to five transmissions. Additionally, the user experience supports re-ordering and editing the transmissions after they've been added to the powertrain. The Transmission Workspace permits the selection of blank transmissions and previously defined transmissions that you can populate from your library – given you have created them and saved them to your library in the past.



Transmission Selection Page

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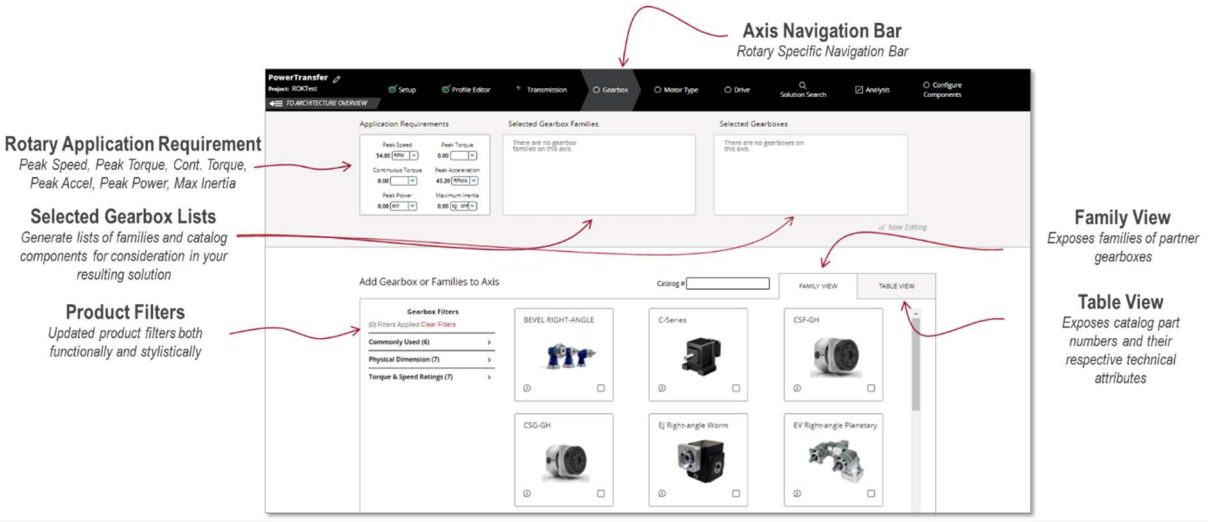
Gearboxes

The partner gearboxes page now has Application Requirements, the capability to select product families and/or individual catalog parts numbers, a new product filter, and component selection workspace.

There are two tabular view in the Gearbox Workspace. The family view exposes gearbox families based on the organizational methods dictated by their respective manufacturers. Simply select a tile and it will populate the gearbox family or families in the Selected Gear Families window. Use the table view to add catalog products to the Selected Gearboxes window. During the Solution Search (sizing process), both families and individual components will be taken into consideration for solutions.

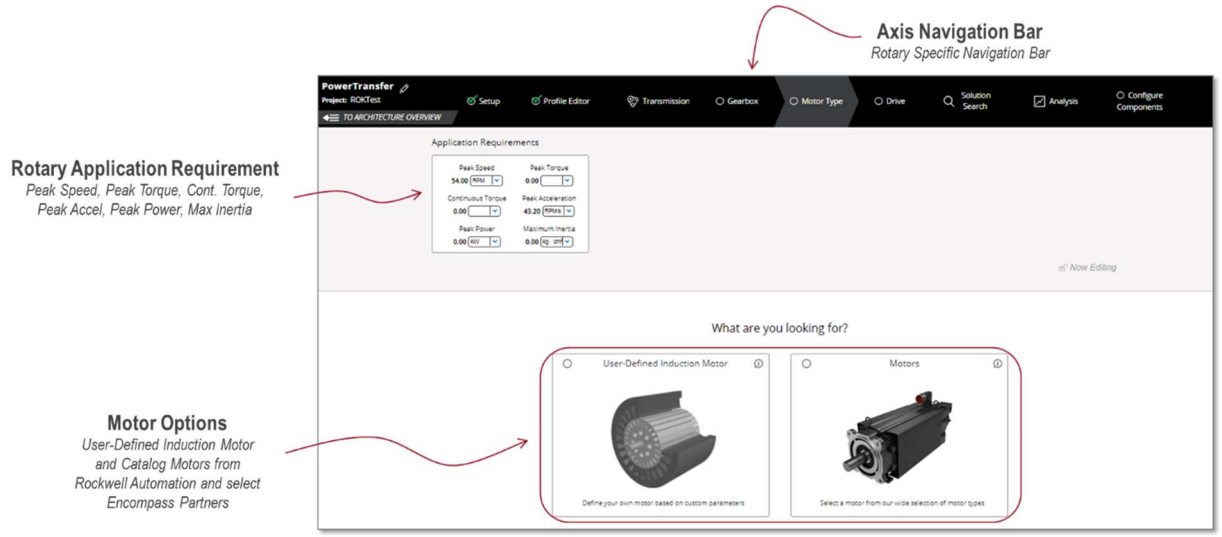


Gearbox Component Selection Page

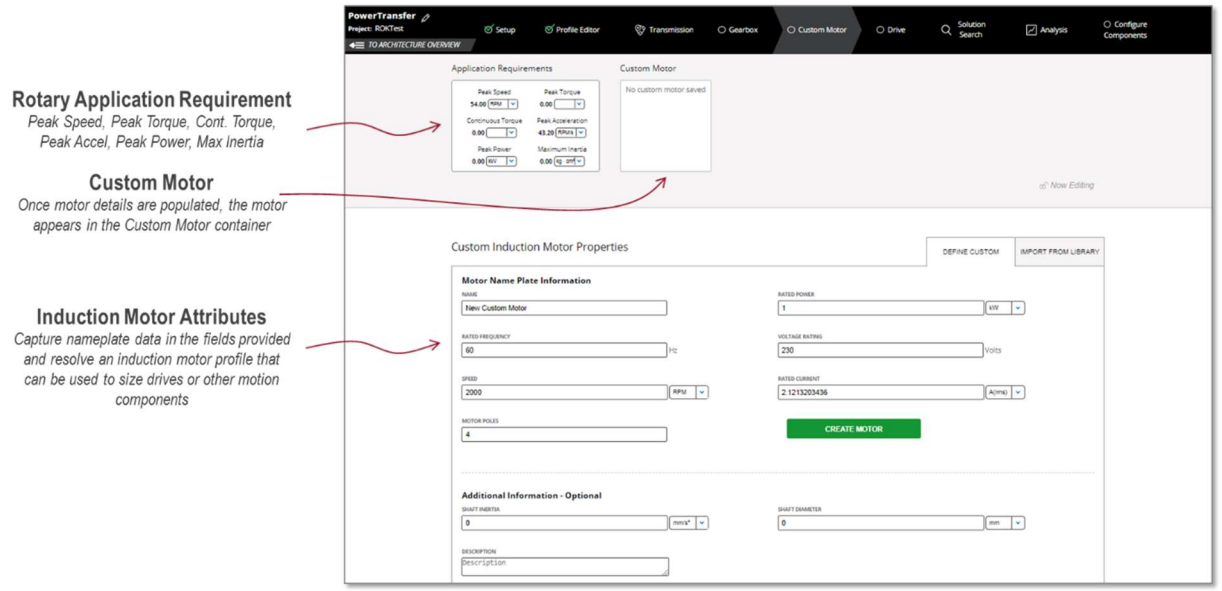
Motors

The rotary motors were designated a landing page to provide the distinction between two options: user-defined custom induction motor and catalog motors. User-defined custom induction motor was designed to allow users to define an induction motor from the name plate data. This enables the user to perform analysis on an axis and perform activities such as component migration. The catalog motors allow user to search a variety of components from Rockwell Automation's portfolio and participating Encompass Partner's portfolios.

The user-defined custom induction motor template was updated to meet new styling requirements. The catalog motors selection page was migrated to the new catalog component selection pages. This includes family/component selection, product filters, and application requirements.



Motor Selection Landing Page



User-Defined Custom Induction Motor Page

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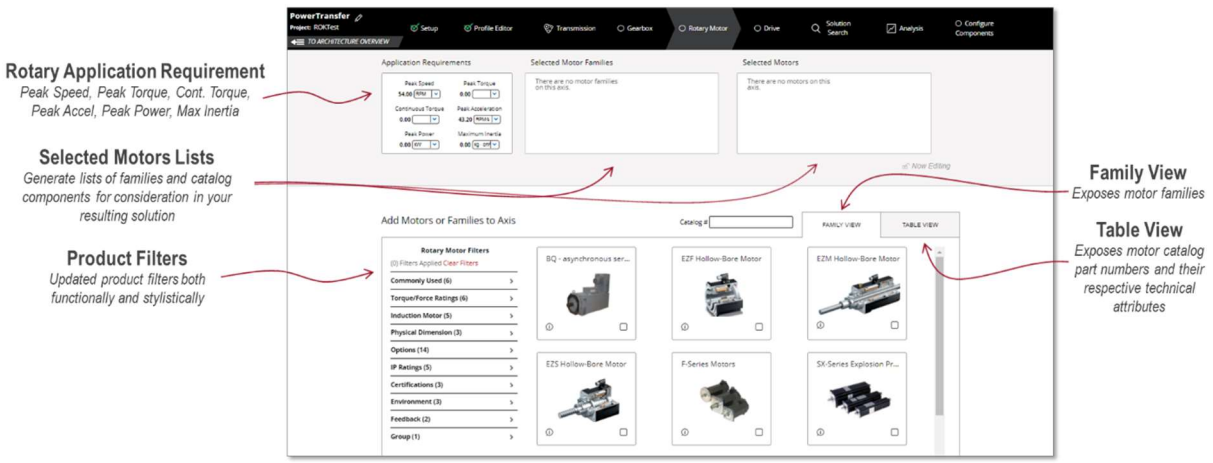

Catalog Motor Component Selection Page

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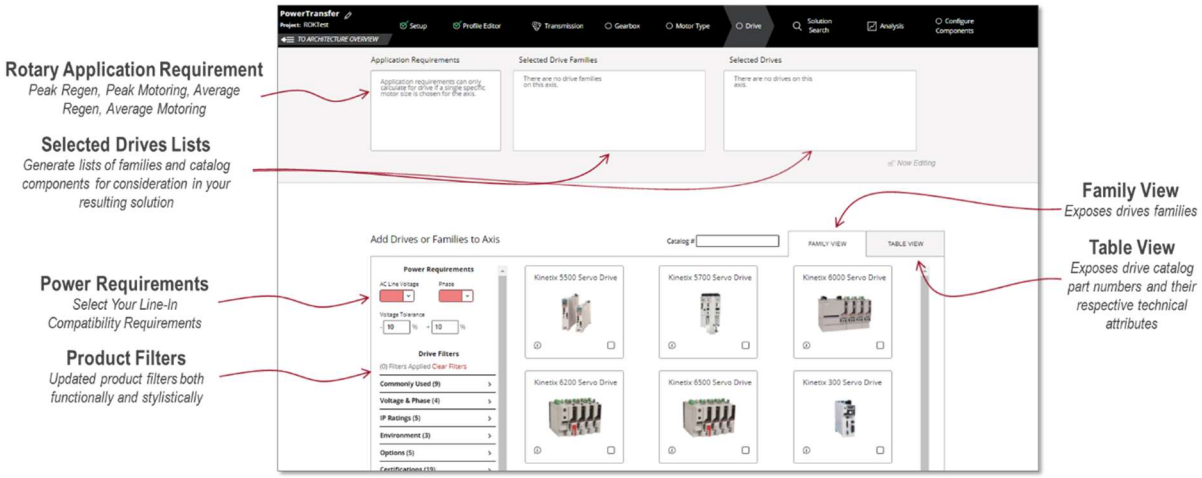
Drives

Similar to other catalog components, the drives page consists of application requirements, updated product filters, and the ability to select product families and/or catalog part numbers. Additionally, this page is the only area of the tool that permits the implementation of power requirements – voltage, phase, and tolerance.



Drives Component Selection Page

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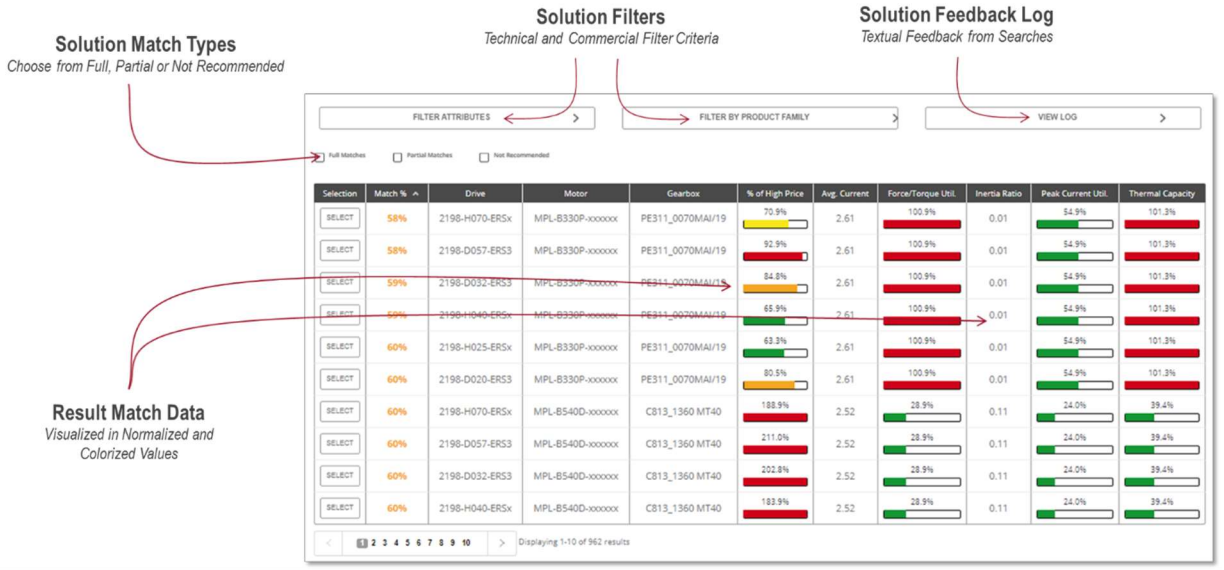
Solution Search

The Solution Search feature has been completely reconfigured to offer many of the benefits of the original Motion Analyzer Solution Search. The table conveniently presents all of the possible solutions with their respective component combinations. Solutions can also be filtered by technical attributes, commercial elements, and match criteria. The table even has a header sorting function – simply click the column header.

Also, it conveniently allocates coloring to the table to promote visual sorting. This concept was borrowed from Motion Analyzer 7.2 and modernized for the web. This feature has a variety of filters that will allow the user to distill their available solutions for final selection.



Solution Search Page

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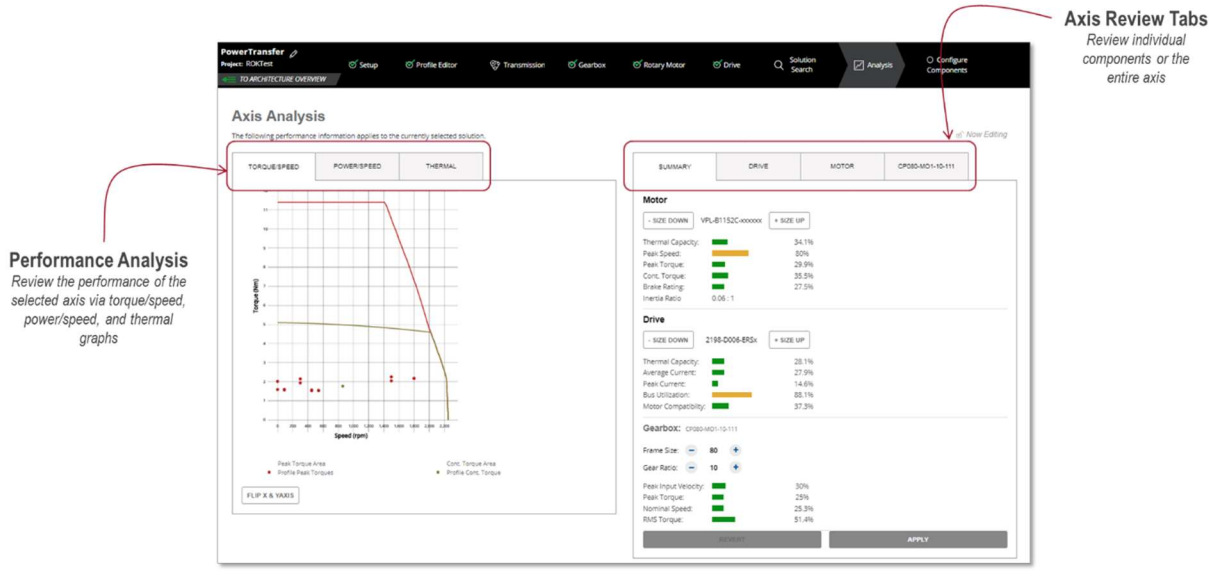
Axis Analysis

Axis Analysis remains largely the same in regards to functionality. The styling was refactored to promote commonality with new user experience.



Axis Analysis Page

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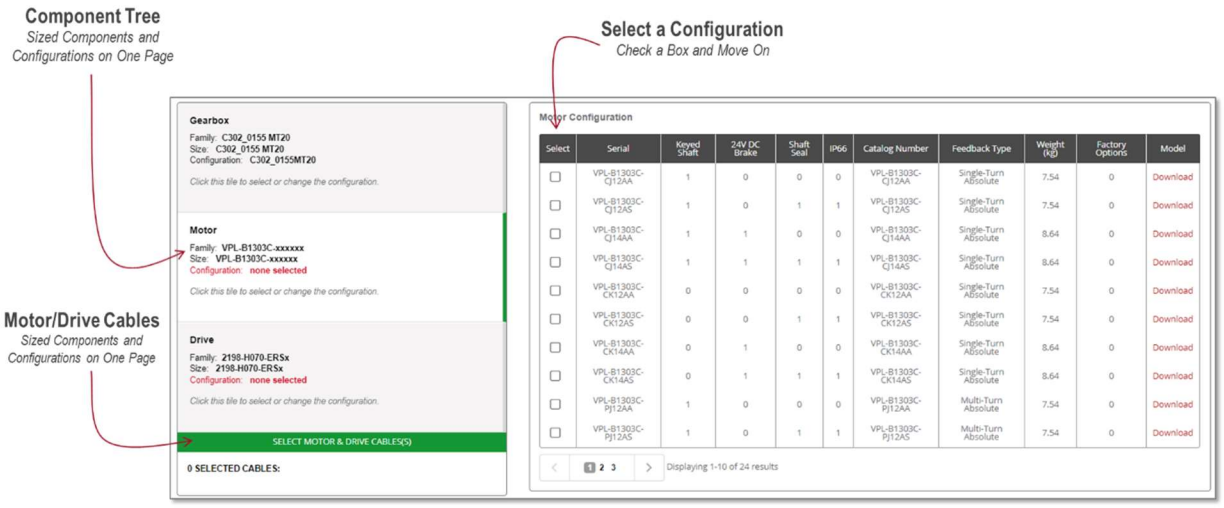
Configure Components

Configuring axis components no longer requires the need to navigate through product pages – one page does it all. Simply select the component that needs to be configured from the list on the left-hand side and select a configuration from the right-hand side. Once the component is configured, you now have a full catalog part number for your bill of material. Properties that are the same for all configurations have been separated out into a separate table so you can focus on quickly choosing the configuration you want.



Configure Components Page

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Summary of Other Notable Changes

- Removed Version 1 Profile Editor – all version 1 profiles will be migrated forward for the user without user intervention. Additional loads, such as multiple inertia profiles, have been combined into a single inertia profile. If you encounter errors with this feature, please contact motion analyzer support.
- Project Report was removed for re-introduction at a later release.
- Multi-language was removed for re-introduction at a later release.

Have ideas? Need Help?

As always, we love hearing from you to find out how we can make your sizing and selection experience better. We also want to make sure you are able to quickly and easily build your systems and find the information you need. We are constantly folding suggestions from you into our development plans. You can email us at motionanalyzersupport@ra.rockwell.com with comments, suggestions, bug reports or requests for help.

Tell us what you think:

How are we doing? Please fill in a quick survey to let us know how we can make this tool even better:

https://www.surveymonkey.com/r/FH9TBXJ