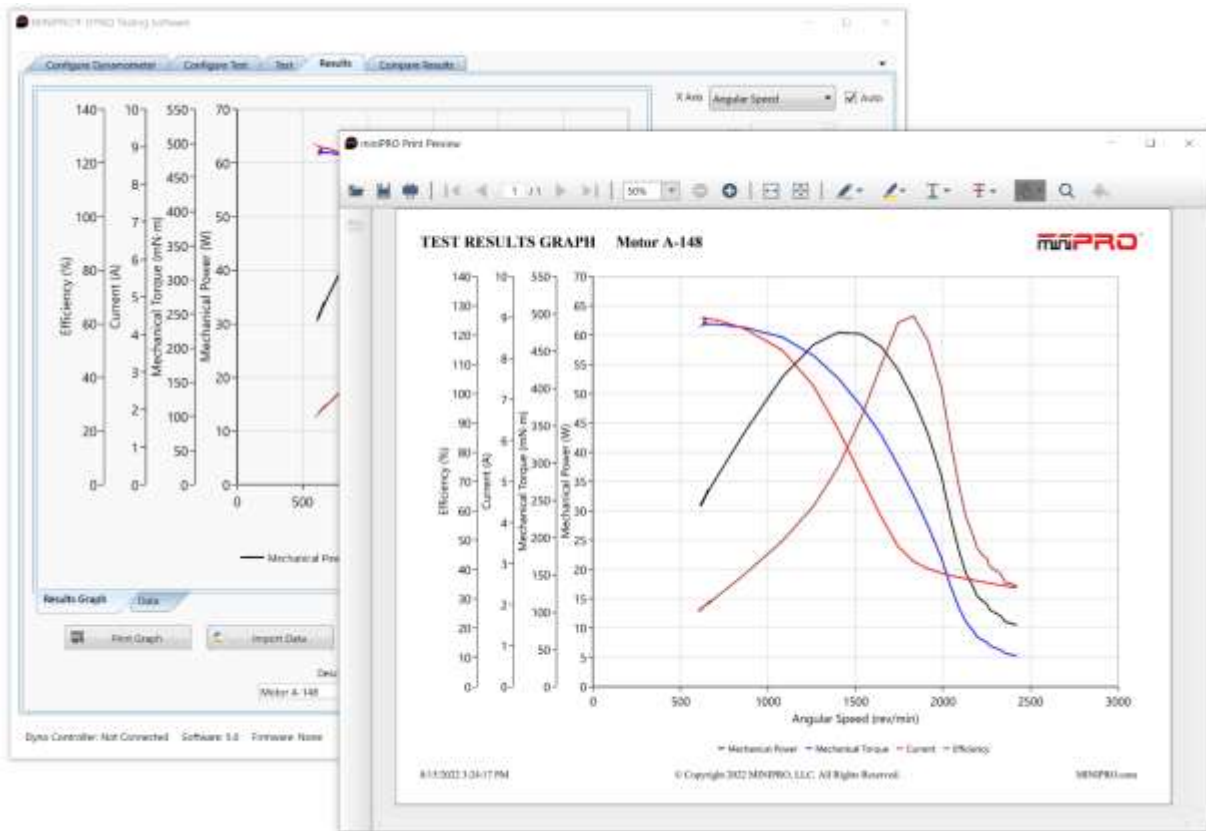


MINIPRO[®] DYNO TESTING SOFTWARE

USER'S MANUAL



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WARNING

The MINIPRO® Dyno Analyzer makes calculations based on equations and data found in various published and heretofore reliable documents. The program is designed for use by skilled professionals experienced with motors, rotating machineries and tests. The following processes are hazardous, particularly if done by an unskilled or inexperienced user:

- Obtaining data to input to the program
- Interpreting the program's results

Before making measurements of or modifications to any Test, engine or driving situation, DO NOT FAIL TO:

- Regard the safety consequences
- Consult with a skilled and cautious professional
- Read the entire user's manual
- Obey all federal, state & local laws
- Respect the rights and safety of others

REVISIONS TO THIS MANUAL

The contents of this manual are subject to change without prior notice. Should revisions be necessary, updates to all MINIPRO® User's Manuals can be found at MINIPRO's website at <http://support.minipro.com/119376-Manuals>

Please compare the date of this manual with the revision date on the web site, then refer to the manual's Table of Revisions for any changes/updates that have been made since this edition.

Latest Manual Revision:
Revision No. 09

Table of Revisions:

DATE	REVISIONS	CHANGES
05/31/2018	00	Release of manual for v4.0 software
06/18/2018	01	Fix bugs and typos
04/25/2018	02	Installation and Legends update
06/12/2019	03	Major updates to functions
02/18/2020	04	New graph functions
12/18/2021	05	New configuration file
07/18/2022	06	Major software update
10/28/2023	07	Inertia Dyno for Hobby Grade
01/25/2024	08	New software features
08/01/2025	09	New software features
03/10/2026	10	Inertia dyno typo on manual.

SAFETY PRECAUTIONS

1. Make sure that dynamometers and motors under test are equipped with appropriate safety guards.
2. Make sure that all electronic products are earth grounded.
3. Do not exceed dynamometer specifications.



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PREFACE

PURPOSE OF THIS MANUAL

This manual contains information required for the installation and general use of MINIPRO® Dyno Analyzer. To achieve maximum capability and ensure proper use, please read this manual in its entirety before operating. Keep the manual in a safe place for quick reference whenever a question should arise.

WHO SHOULD USE THIS MANUAL?

This manual is intended for bench test operators who are going to use any MINIPRO® Dynamometer in order to determine the torque and power of a motor in relation to its speed. It is assumed that the user has enough knowledge in motors, rotating machinery, and electronics to be able to install/operate these Dynamometers without risk.

1. INTRODUCTION

1.1 OVERVIEW OF FEATURES

The MINIPRO® Dyno Software is a state-of-the-art dynamometer testing program for Windows® based data acquisition. Used with a MINIPRO® Dynamometer Controller Board, Software provides the control of any MINIPRO® Dynamometer and runs test sequences in a manner best suited to the overall accuracy and **efficiency of the Test System. The data that is generated by MINIPRO's Testing Software can be stored,** displayed and printed in tabular or graphic formats, and can be easily imported into a spreadsheet. Written in C# and LabVIEW™ (Optional), MINIPRO® Dyno Analyzer has the flexibility to test a majority of motor types in a **variety of ways. MINIPRO's Dyno Software is ideal for simulating loads, cycling the unit under test and motor** ramping. Because it is easy to gather data and duplicate tests, the software is ideal for use in engineering labs. Tests can be programmed to run on their own and saved for future use allowing for valuable time savings in **production testing and incoming/outgoing inspection. LabVIEW's version** allows obtaining data from other sources (e.g. thermocouples), controlling motor power and providing audio/visual indicators relatively easy.

Basic Features:

- Capability to configure and calibrate the software for most any combination of sensors you have installed on the MINIPRO® Dyno Electronic Board.
- Capability to tailor the program to work with most any type of dynamometer, including inertia wheel types, absorber types (with load cells and lever arms), and even chassis dynamometers.
- User friendly, Windows interface, compatible with Windows 10 or later.
- Can print results using most any Windows compatible printer, many times in color.
- Save nearly unlimited number of tests for recall, comparison, and analysis in the future.
- Allows several reporting and graphing options for analysis, either vs RPM or vs time in seconds.

Added Features for Custom Dynamometer Versions

- Customize reporting graphs
- Customize dynamometer inertia
- Increase sampling frequency

Please read Sections 1.2 "Before You Start" and 1.3 "A Word of Caution" before you turn on the computer. Then **try running the program following the guidelines in 1.4 "Getting Started."** When you feel a little familiar with the program, take time to read this entire manual. It will show you all the things you can do with this powerful tool.

1.2 BEFORE YOU START

What you will need:

- Computer with AMD or Intel processor.
- 8 GB RAM Minimum.
- Hard disk 2 GB of available disk space. (More is required for storing large #s of tests.)
- Display 1280 x 800 screen resolution minimum
- Internet Connection (to unlock the software)
- Windows 10 or later

Many terms used by the MINIPRO® Dyno Analyzer and this user's manual are similar to terms used by other publications, i.e. Inertia, Correction Factor, etc. However, these terms may have different definitions. Therefore, read Chapter 2 to see what these terms mean to the MINIPRO® Dyno Analyzer.

Occasionally it will be necessary to identify "typos" in the manual, known "bugs" and their "fixes", etc. which were not known at the time of publication.

Unlocking Program Options:

The MINIPRO® Dyno Analyzer is equipped with copy protection. This ensures the legitimate users do not have to cover the costs for unauthorized distribution of the program. When you first download the program, it will ask for a serial number. An active internet connection is required to validate your serial number. Your software serial number (stamped) is in your MINIPRO® Dynamometer Datasheet. Type in the unlocking code number and click on OK. If you typed in the number correctly, you will be given access to install the MINIPRO® Dyno analyzer. The program will only run on this one computer.

2. INSTALLATION

1.1 INSTALLATION STEPS

Download the software from the provided link and double click the file to begin the installation. Press Next >> to continue.



Figure 2-1 Software Installation Welcome Screen

Add the Name, Organization and Serial Number.
Press Next >> to continue.

NOTE: Only one license can be used per PC. Additional licenses are available for purchase.

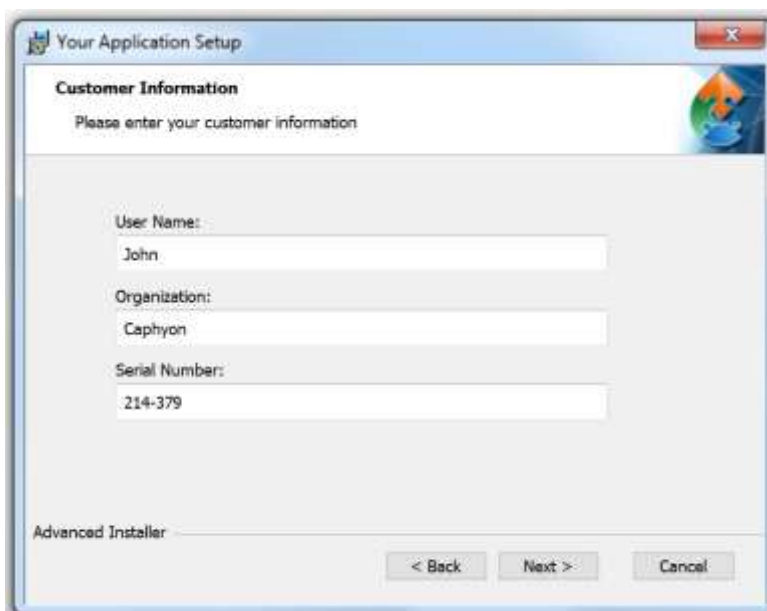


Figure 2-2 Software License Screen

Select the location where the software will be installed.
Press Next >> to continue.

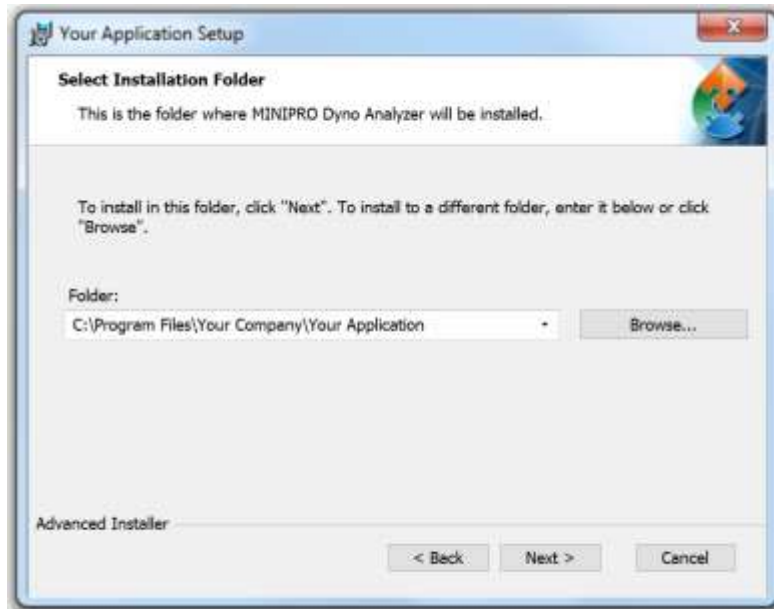


Figure 2-3 Folder Installation Screen

The software is ready to be installed.
Press Install to continue.

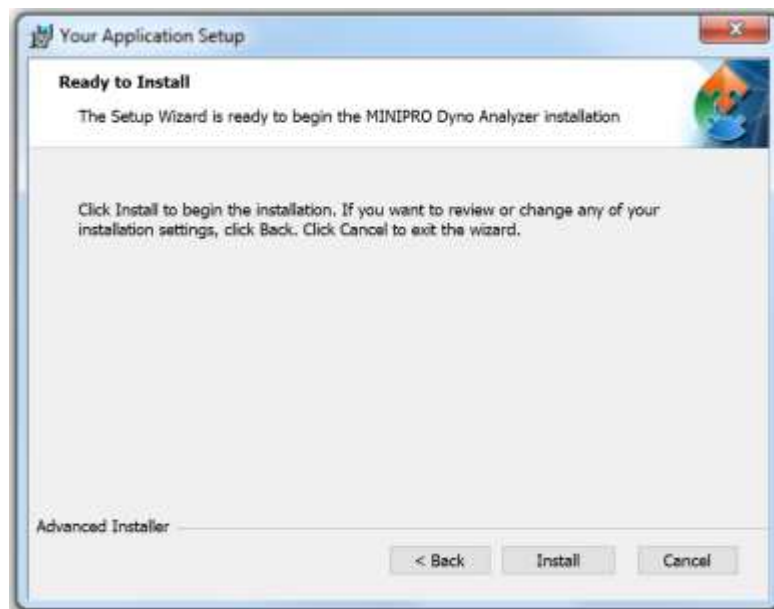


Figure 2-4 Ready to Install Screen

The software will begin installing. Please wait while the setup finishes. This may take several minutes.

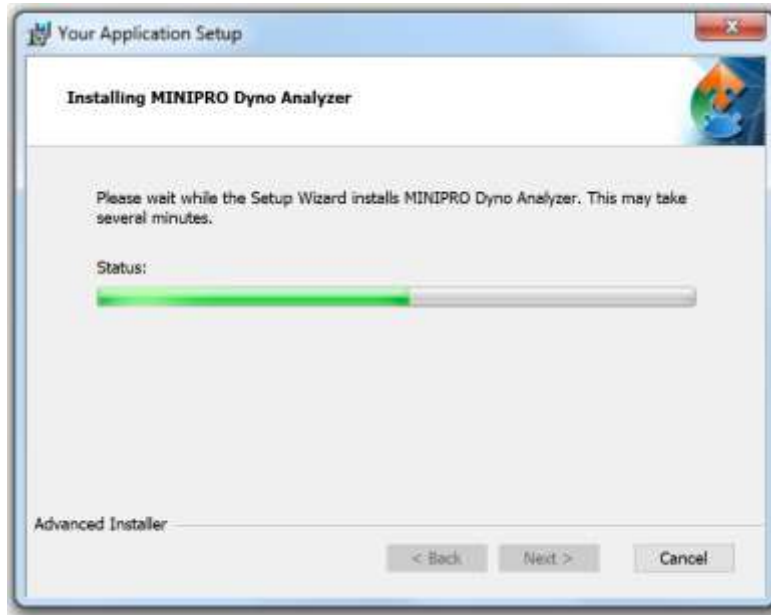


Figure 2-5 Installation Screen

The software finished installing.
Press Finish to complete the installation.



Figure 2-6 Installation Complete

3. CONTROLS AND USER INTERFACE

3.1 TABS

Each tab has a title and contains specific controls. To change to a different tab, left click your mouse on the tab tile. While running an actual test, the tabs will be disabled to prevent the user from interruption a test in progress.



Figure 3-1 Dyno Testing Software Tabs

3.2 TEXT BOX CONTROLS

Text box controls are used for text entered by user.



Figure 3-2 Text Box Controls

3.3 COMBO BOX CONTROLS

Combo box controls are pre-filled selections you may choose.



Figure 3-3 Text Box Controls

3.4 NUMERIC CONTROLS

Numeric controls are used to enter instrument settings and test parameters.



Figure 3-4 Numeric Controls

3.5 CHECK BOXES

Check boxes have a Boolean function where checking the box is True, On, Enable or Logic 1. An unchecked box is False, Off, Disabled or Logic 0.



Figure 3-5 Check Box Controls

3.6 BUTTONS

Buttons have the function name embedded on the button itself.

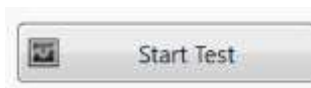


Figure 3-6 Button Controls

3.7 SLIDER CONTROLS

Sliders are used to increase or decrease a test parameter. Sliders may be horizontal or vertical.

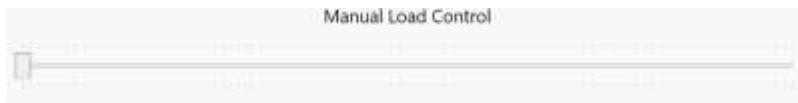


Figure 3-7 Slider Controls

3.8 TABLE CONTROLS

Table controls are used to enter test sequences or specific test/data parameters.

	Load %	Time (s)
1	0	3
2	2	3
3	4	3
4	6	3
5	8	3
6	0	STOP

Figure 3-8 Table Controls

4. CONFIGURATE DYNAMOMETER

4.1 CONFIGURATE DYNAMOMETER TAB

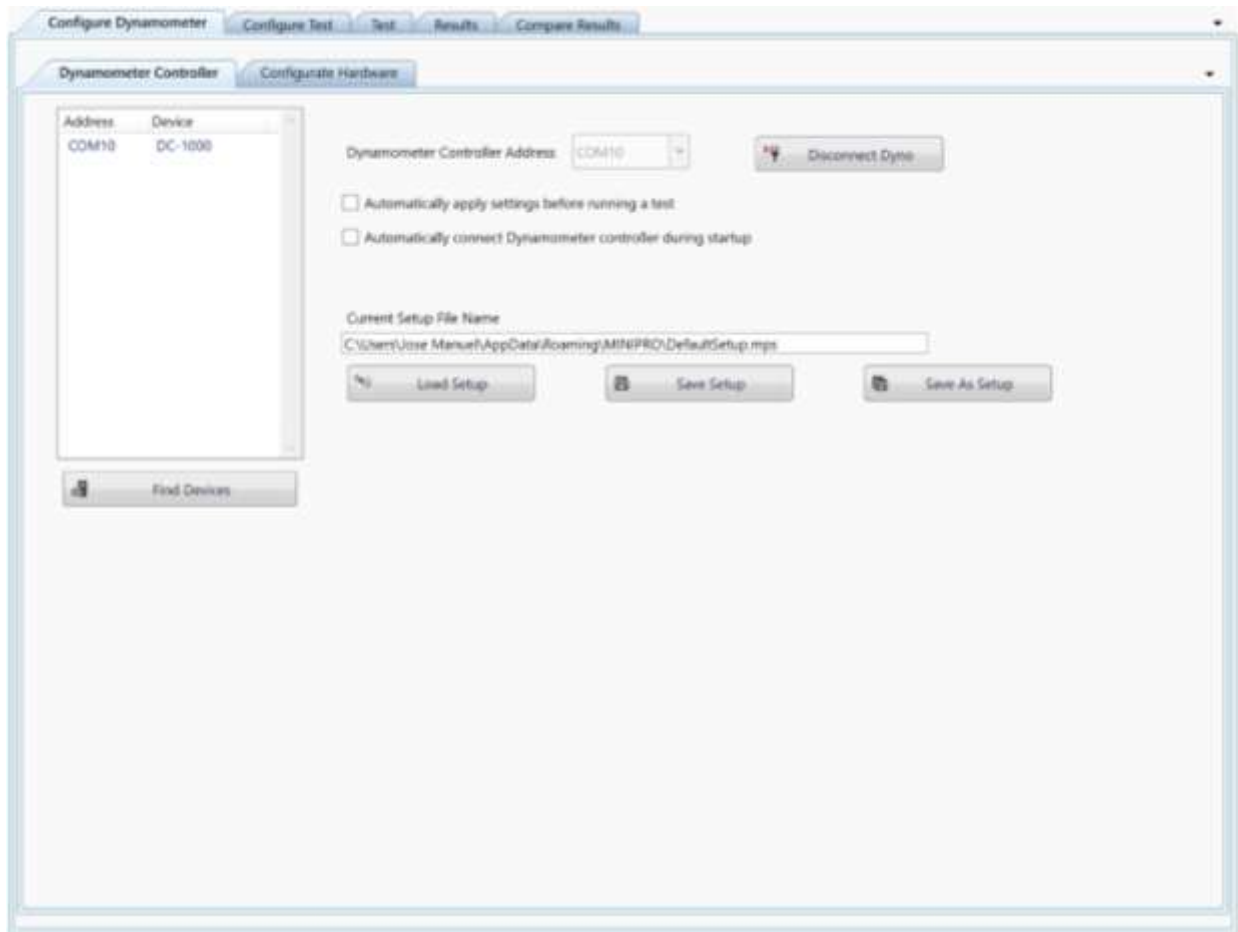


Figure 4-1 Configure Dynamometer Tab

4.1.1 CONFIGURE DYNAMOMETER TAB CONTROLS

CONTROL	FUNCTION
Dynamometer Controller	This tab shows the dynamometer controller settings and test setup file location.
Configure Hardware	This tab shows the dynamometer hardware settings.

4.2 DYNAMOMETER CONTROLLER TAB

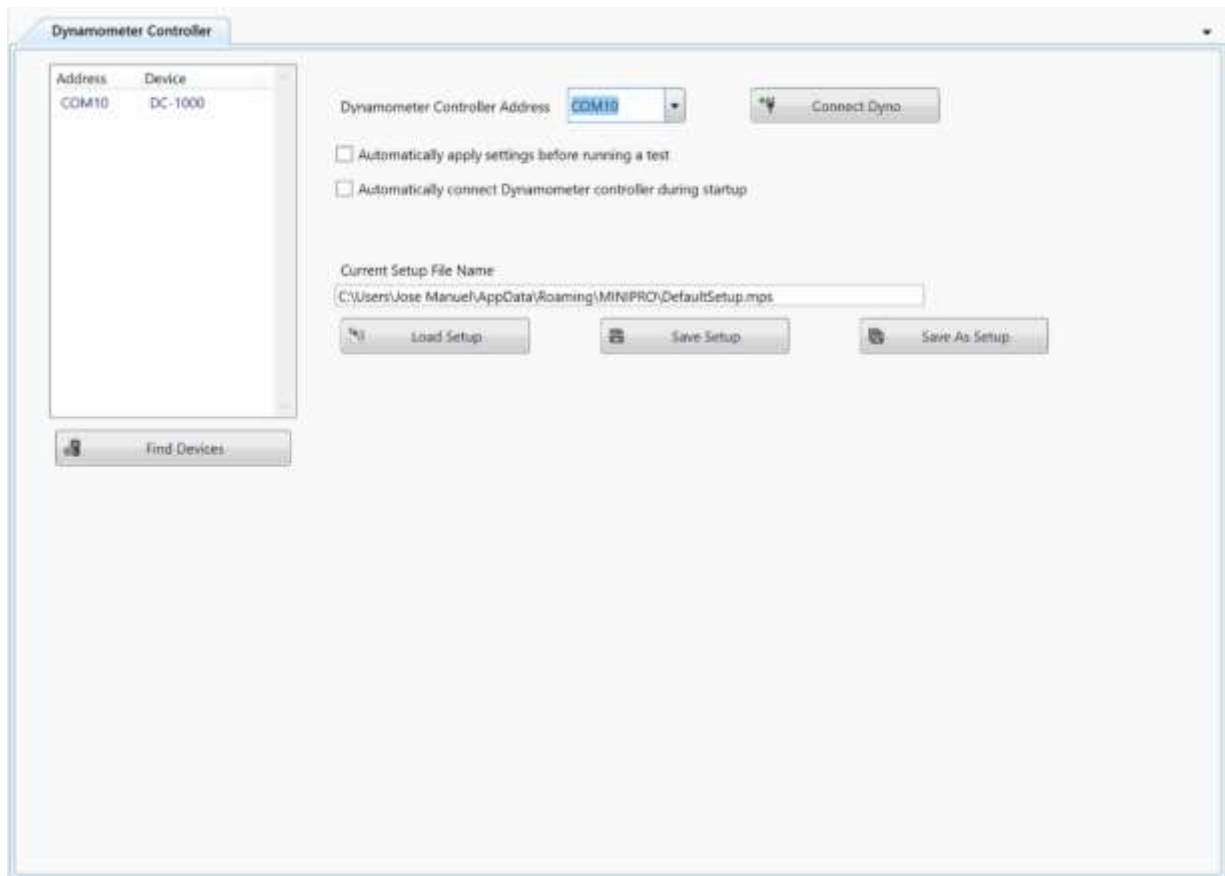


Figure 4-2 Configure Dynamometer Tab and Dynamometer Controller Tab

4.2.1 DYNAMOMETER CONTROLLER TAB CONTROLS

CONTROL	FUNCTION
Find Devices	This control will allow the user to view the address and name of the dynamometer controller. Press to find available dynamometer controllers.
Connect Dyno	Press to connect to selected address of the dynamometer controller. Once you press "Connect Dyno," a Disconnect button and the Configure Hardware tab will show.
Disconnect Dyno	Press to disconnect dynamometer controller
Auto Apply Settings	This control will allow the user to apply the test configuration and dynamometer controller before running a test.
Auto Connect	This control will allow the user to automatically connect the dynamometer during start-up of the program.
Load Setup	Press to specify and load the desired test configuration file.
Save Setup	Press to save to existing test file configuration.
Save As Setup	Press to save a new test file configuration.

4.3 CONFIGURATE HARDWARE TAB

The screenshot displays the 'Configure Hardware' window with the following settings:

- Dynamometer Type:** Brake Dynamometer
- Test Equipment Type:** Motor Dynamometer
- Controller Sampling Rate:** 100hz (100 samples per second)
- Voltage SF:** 3.968
- Current SF:** 6.250
- Filter Signal:** Off
- Ext. Sensor Pulse per rev.:** 1 (ppr)
- Motor Ratio:** 1.000
- Dyno Pulse per Rev.:** 30 (ppr)
- Torque Sensor SF:** 0.375

Figure 4-3 Configure Hardware Tab

4.3.1 CONFIGURATE HARDWARE CONTROLS

CONTROL	Function
Dynamometer Type (Inertia Dynamometer, Brake Dynamometer)	Selects the type of dynamometer to use.
Test Equipment Type (Motor Dynamometer, Chassis Dyno - Rollers, Chassis Dyno - Hubs)	Selects the type of dynamometer equipment to use.
Speed Pule Per Rev.	The pulse count per revolution of the encoder being used.
Torque Sensor SF	The full-scale torque value of the torque sensor.
Voltage SF	The full-scale voltage value for the voltage sensor.
Current SF	The full-scale current value for the current sensor.
Filter Signal	Select to reduce the noise from the dynamometer controller.
Apply Settings	Press to apply existing options to dynamometer controller and test file.
Save Setup	Press to save to existing test file configuration.

4.4 INERTIA DYNAMOMETER

The screenshot displays the 'Dynamometer Hardware' tab of the software. It features a grid of settings for an inertia dynamometer. On the left side, settings include: Dynamometer Type (Inertia Dynamometer), Test Equipment Type (Motor Dynamometer), Flywheel Type (124D-11t Aluminum Flywheel), Flywheel Inertia (709.960 kg-mm²), Extra Dyno Inertia (0.670 kg-mm²), Power Source Inertia (0.100 kg-mm²), Controller Sampling Rate (10hz, 10 samples per second), Motor Ratio (2.000), and Dyno Pulse per Rev. (4 ppr). On the right side, settings include: Angular Speed (rev/min), Torque Units (mN-m), Power Units (W), Temp. Units (°F), Linear Speed U (MPH), Voltage SF (4.127), and Current SF (50.000). Each numerical value is in a spin box, and units are in dropdown menus. At the bottom right, there are 'Apply Settings' and 'Save Setup' buttons.

Figure 4-4 Inertia Dynamometer Screen

4.4.1 INERTIA DYNAMOMETER CONTROLS

CONTROL	FUNCTION
Flywheel Type	Select the flywheel size to use.
Flywheel Inertia	The total inertia of the flywheel
Extra Dyno Inertia	The additional inertia connected to the flywheel. Example: Pulley
Power Source Inertia	The inertia attached to the power source. Example: Pulley
Motor Ratio	The rotation difference between the power source and the dyno. Example: Flywheel Pulley of 32T and Motor Pulley of 16T = $32 / 16 = 2$
Dyno Pulse per Rev.	The number of markers available on the flywheel. This determines the resolution of your angular speed.
Tire Diameter (Chassis Dyno Only)	The tire diameter in millimeters.

IMPORTANT: SOME OF THE FEATURES OF THE SOFTWARE ARE NOT AVAILABLE FOR INERTIA DYNAMOMETERS (i.e. BRAKING, PROFILE CURVES, EXTRAPOLATIONS, ETC).

4.5 BRAKE DYNAMOMETER

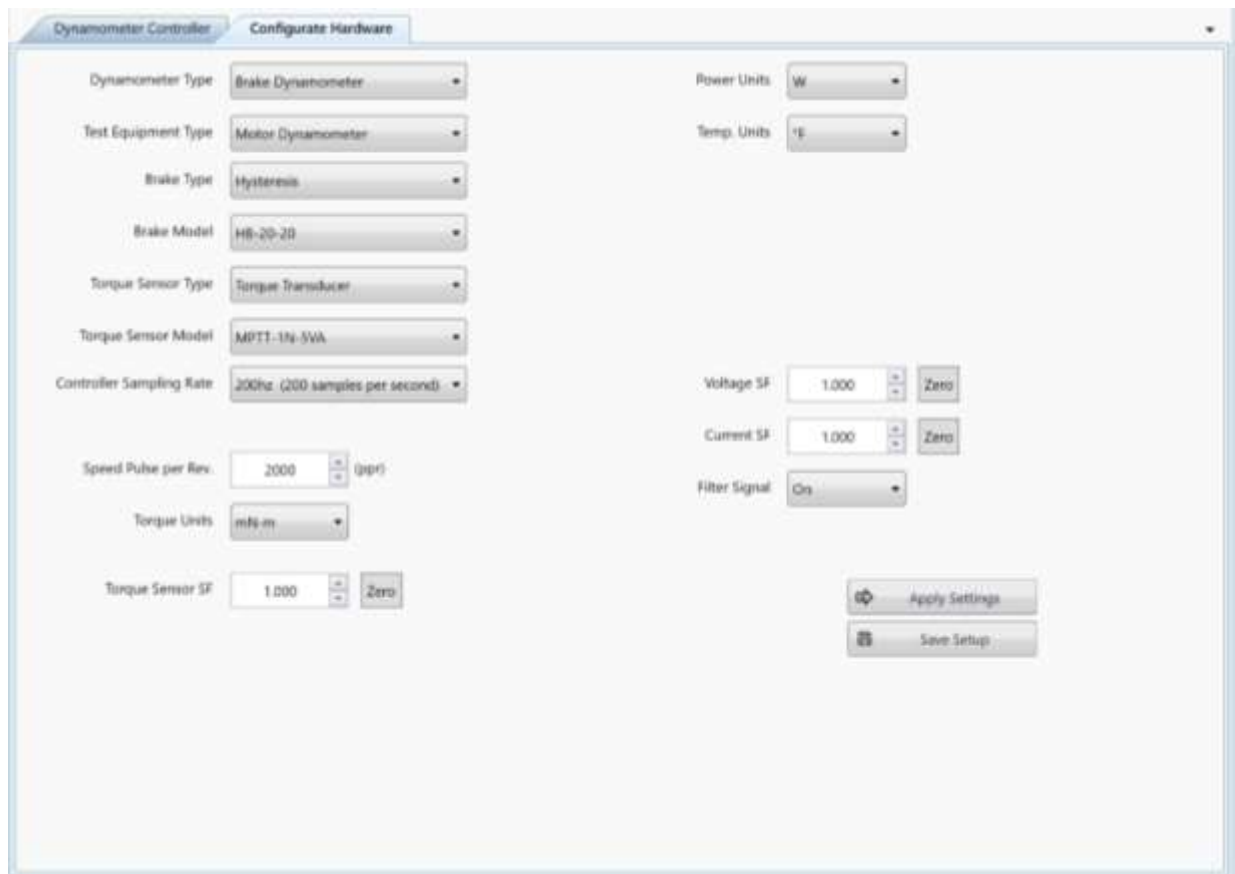


Figure 4-5 Brake Dynamometer Screen

CONTROL	FUNCTION
Brake Type (Hysteresis, Motor Generator, Eddy Current, Water Brake)	Select the type of brake used in your dynamometer.
Brake Model	Select the brake model.
Torque Sensor Type (Torque Transducer, Load Cell)	Select the type of torque sensor.
Torque Sensor Model	Select the torque sensor model.
Torque Sensor SF	The full-scale torque value of the torque sensor.

5. CONFIGURE TEST

5.1 CONFIGURE TEST TAB

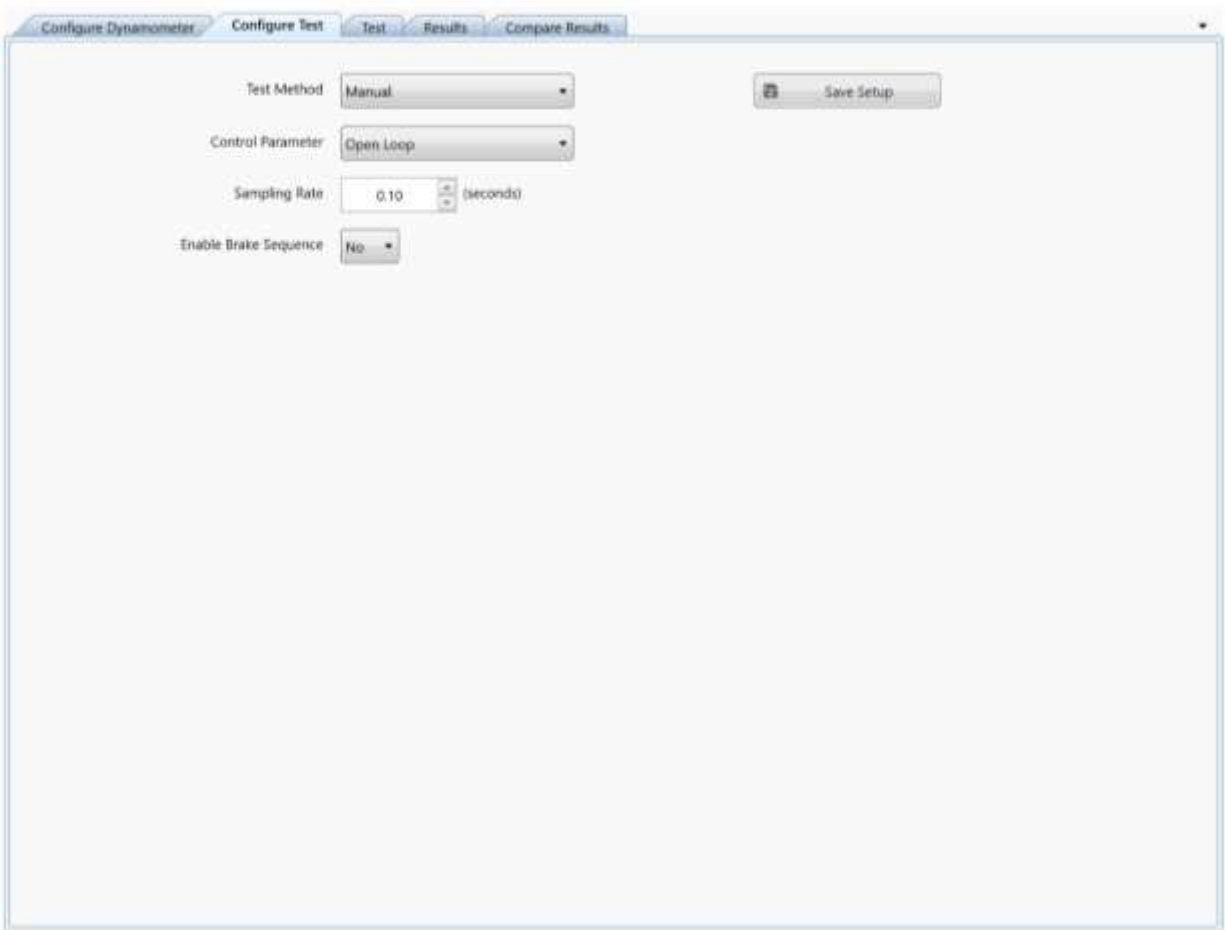


Figure 5-1 Configure Test Tab

5.1.1 CONFIGURE TEST TAB CONTROLS

CONTROL	FUNCTION
Test Method (Manual)	Select the type of test to perform
Save Setup	Press to save to existing test file configuration.

5.2 MANUAL TEST

Figure 5-2 Manual Test Screen

5.2.1 MANUAL TEST CONTROLS

CONTROL	FUNCTION
Control Parameter (Open Loop, Profile Curve)	Select the type of control parameter.
Sampling Rate	The time interval at which the data point will be stored in the results graph.

5.2.2 OPEN LOOP CONTROL PARAMETER

	Load %	Time (s)
1	0	6
2	2	6
3	4	6
4	6	6
5	8	6
6	0	STOP

Edit Brake Load Sequence

Figure 5-3 Open Loop Test Screen

5.2.3 OPEN LOOP CONTROL PARAMETER CONTROLS

CONTROL	FUNCTION
Enable Brake Sequence (Yes, No)	The sequence of load percentages to be run within the test. Load % is the amount of load the brake will apply to the unit under test. Time (s) is the time duration in seconds that the brake will be set at that load.

	<p>To add new points, press “Edit Brake Load Sequence” double click the last row and type the load percentage and time. Last row must be 0% load and “STOP” in the time column. Press save to finish.</p> <p>To edit new existing points, press “Edit Brake Load Sequence” to modify the points. Press Save to finish.</p>
--	--

5.2.4 PROFILE CURVE CONTROL PARAMETER

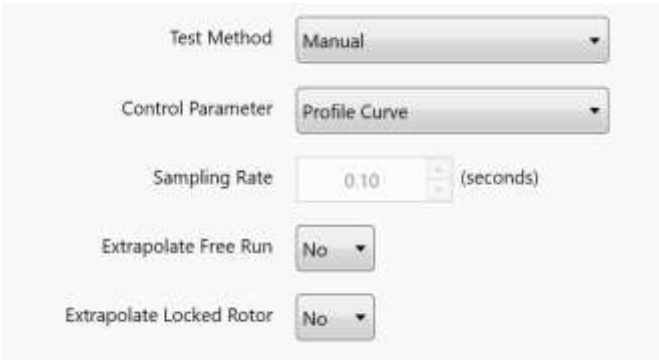


Figure 5-4 Profile Curve Test Screen

5.2.5 PROFILE CURVE CONTROL PARAMETER CONTROLS

CONTROL	FUNCTION
Extrapolate Free Run (Yes, No)	The test will extrapolate the “Free Run” (no load) speed.
Extrapolate Locked Rotor (Yes, No)	The test will extrapolate the “Locked Rotor” (stalled) maximum torque.

6. TEST

6.1 MANUAL TEST – OPEN LOOP

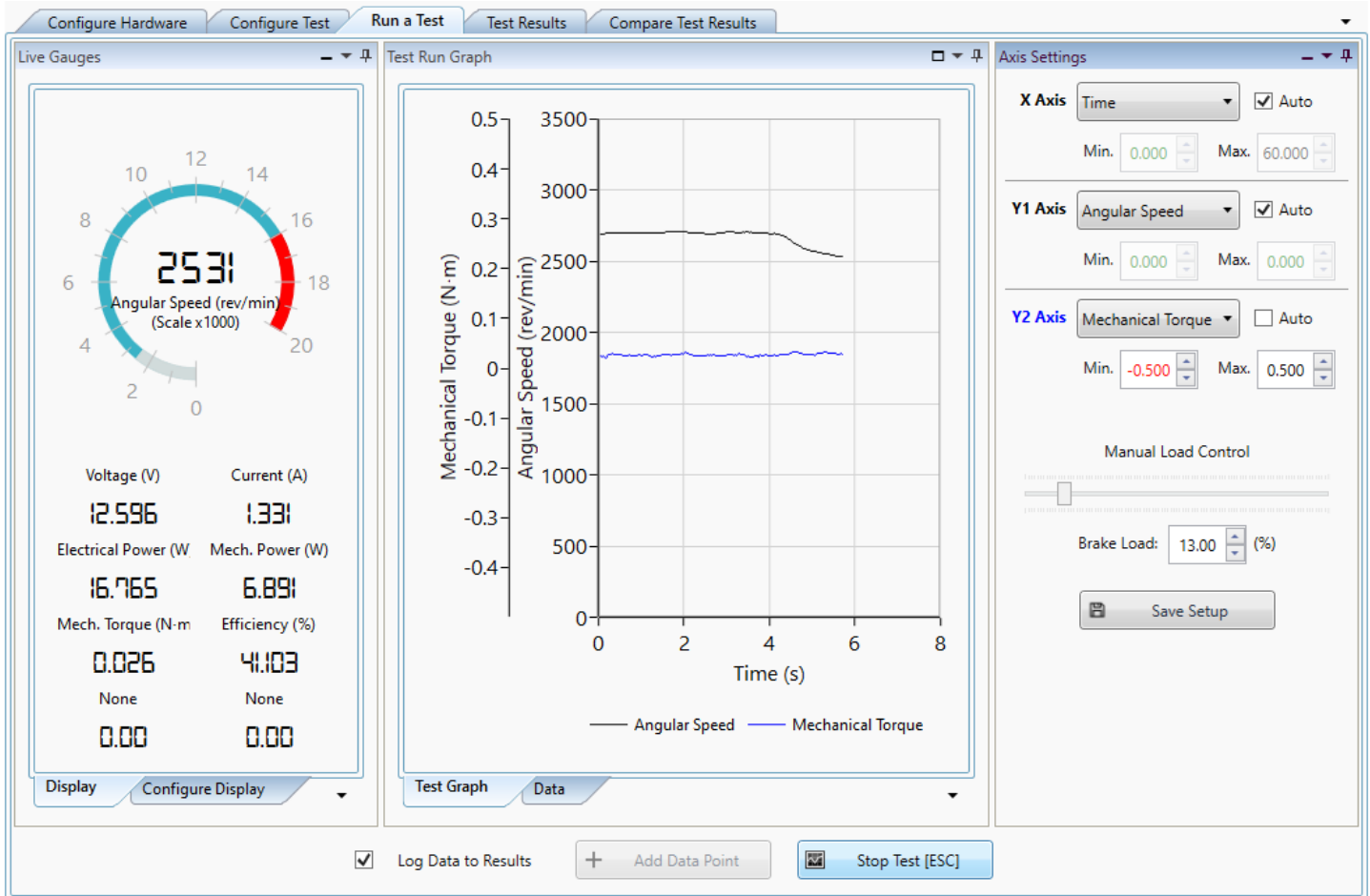


Figure 6-1 Manual Test – Open Loop Screen

6.1.1 OPEN LOOP PARAMETER CONTROLS

CONTROL	FUNCTION
Display Tab	Displays real-time data without starting a test.
Configure Display Tab	Configure the display parameters.
Test Graph Tab	Display real-time graph once you start a test.
Data Tab	Display all parameters stored during selected test
Manual Load Control Slider	Provides manual control to your brake.
X-Axis	Selects the parameter to be plotted during test.
Auto Scale X-Axis	Enables auto-scaling of the X-axis parameter. NOTE: Disable this feature during long tests.
X-Axis Min.	Indicates the minimum value to be displayed on the graph.
X-Axis Max.	Indicates the maximum value to be displayed on the graph.
Y1-Axis	Selects the parameter to be plotted during test.
Auto Scale Y1-Axis	Enables auto-scaling of the Y1-axis parameter. NOTE: Disable this feature during long tests.

Y1-Axis Min.	Indicates the minimum value to be displayed on the graph.
Y1-Axis Max.	Indicates the maximum value to be displayed on the graph.
Y2-Axis	Selects the parameter to be plotted during test.
Auto Scale Y2-Axis	Enables auto-scaling of the Y2-axis parameter. NOTE: Disable this feature during long tests.
Y2-Axis Min.	Indicates the minimum value to be displayed on the graph.
Y2-Axis Max.	Indicates the maximum value to be displayed on the graph.
Log Data to Results	It will log all the data to the Results graph using the time intervals selected in your Sampling Rate (see Open Loop parameter)
Add Data Point	Press to add individual points to the Results graph.
Start Test	Press to begins the test.
Stop Test	Press to end the test.
Save Setup	Press to save to existing test file configuration.

6.2 MANUAL TEST – PROFILE CURVE

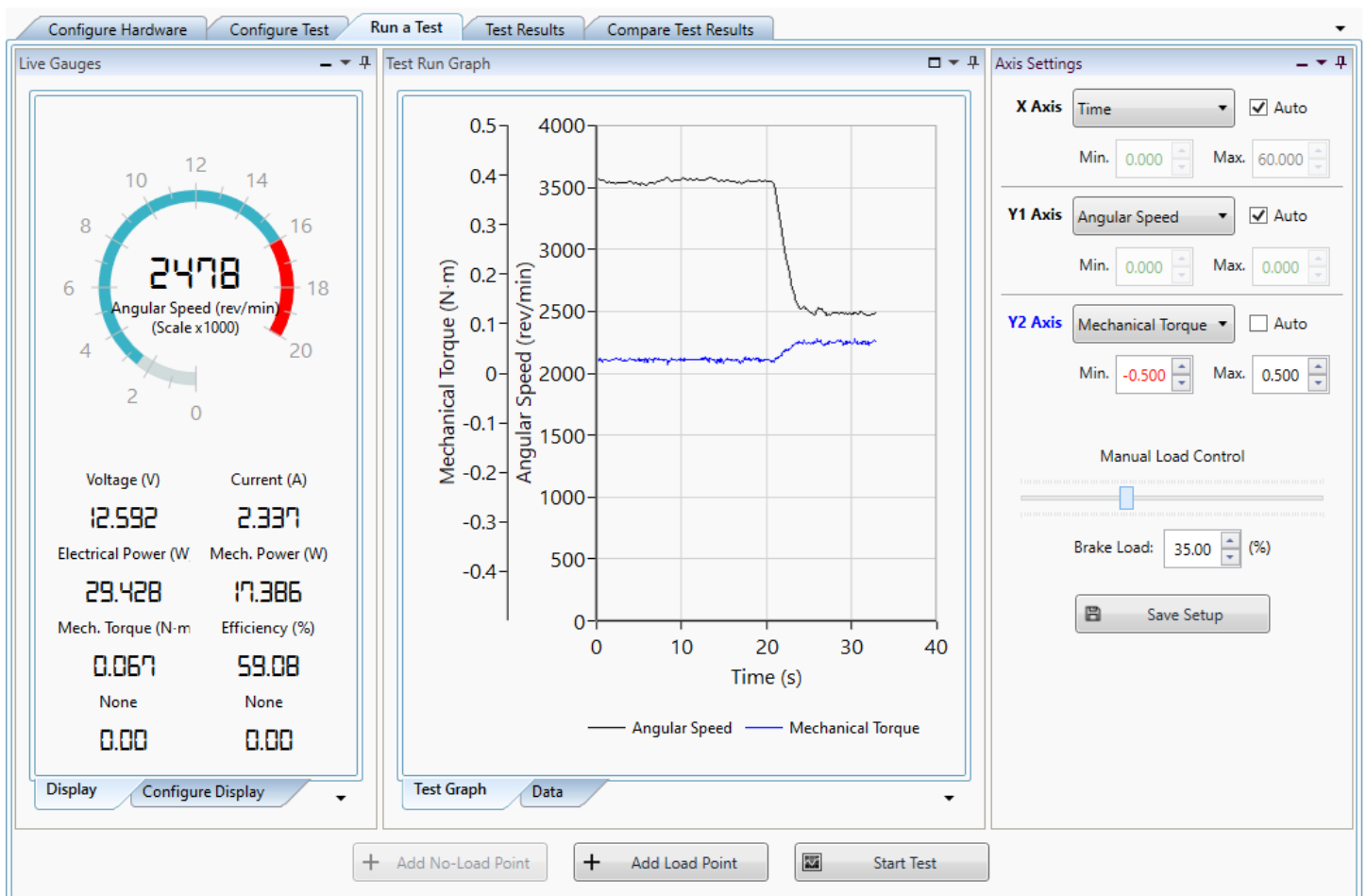


Figure 6-2 Manual Test – Profile Curve Screen

6.2.2 PROFILE CURVE PARAMETER CONTROLS

CONTROL	FUNCTION
Display Tab	Displays real-time data without starting a test.
Configure Display Tab	Configure the display parameters.
Test Graph Tab	Display real-time graph once you start a test.
Data Tab	Display all parameters stored during selected test
Manual Load Control Slider	Provides manual control to your brake.
X-Axis	Selects the parameter to be plotted during test.
Auto Scale X-Axis	Enables auto-scaling of the X-axis parameter. NOTE: Disable this feature during long tests.
X-Axis Min.	Indicates the minimum value to be displayed on the graph.
X-Axis Max.	Indicates the maximum value to be displayed on the graph.
Y1-Axis	Selects the parameter to be plotted during test.
Auto Scale Y1-Axis	Enables auto-scaling of the Y1-axis parameter. NOTE: Disable this feature during long tests.
Y1-Axis Min.	Indicates the minimum value to be displayed on the graph.
Y1-Axis Max.	Indicates the maximum value to be displayed on the graph.
Y2-Axis	Selects the parameter to be plotted during test.
Auto Scale Y2-Axis	Enables auto-scaling of the Y2-axis parameter. NOTE: Disable this feature during long tests.
Y2-Axis Min.	Indicates the minimum value to be displayed on the graph.
Y2-Axis Max.	Indicates the maximum value to be displayed on the graph.
Save Setup	Press to save to existing test file configuration.
Log Data to Results	It will log all the data to the Results graph using the time intervals selected in your Sampling Rate (see Open Loop parameter)
Add No-Load Point	Press to add no-load point.
Add Load Point	Press to add load point.
Start Test	Press to begins the test.
Stop Test	Ends the test.

7. RESULTS

7.1 RESULTS TAB

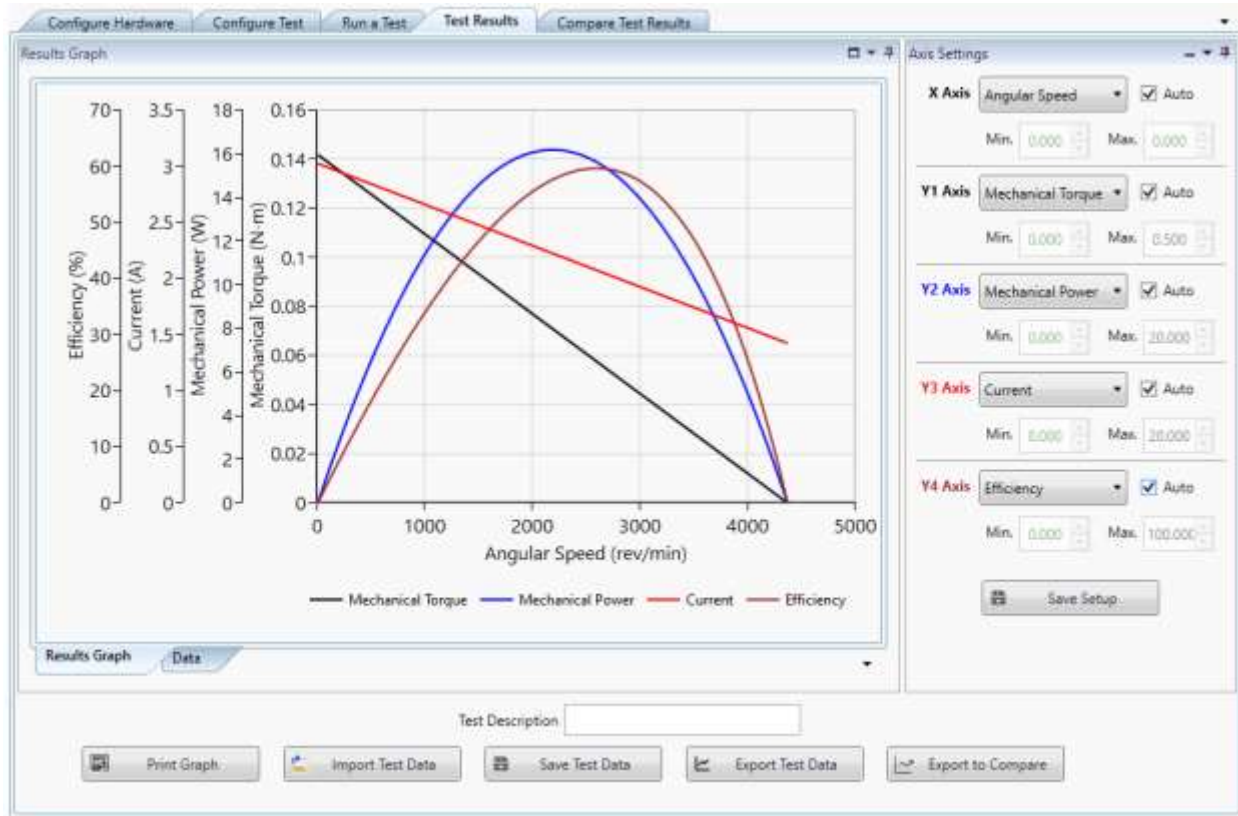


Figure 7-1 Test Results Tab

7.1.1 OPEN LOOP PARAMETER CONTROLS

CONTROL	FUNCTION
4 Axis Results Graph Tab	Displays logged data using selected Sampling Rate (see Open Loop parameter). This graph allows plotting of up to four parameter against a common X-Axis.
Data Tab	Display all parameters stored in your Results Graph.
X-Axis	Selects the parameter to be plotted during test.
Auto Scale X-Axis	Enables auto-scaling of the X-axis parameter.
X-Axis Min.	Indicates the minimum value to be displayed on the graph.
X-Axis Max.	Indicates the maximum value to be displayed on the graph.
Y1-Axis	Selects the parameter to be plotted during test.
Auto Scale Y1-Axis	Enables auto-scaling of the Y1-axis parameter.
Y1-Axis Min.	Indicates the minimum value to be displayed on the graph.
Y1-Axis Max.	Indicates the maximum value to be displayed on the graph.
Y2-Axis	Selects the parameter to be plotted during test.
Auto Scale Y2-Axis	Enables auto-scaling of the Y2-axis parameter.
Y2-Axis Min.	Indicates the minimum value to be displayed on the graph.
Y2-Axis Max.	Indicates the maximum value to be displayed on the graph.
Y3-Axis	Selects the parameter to be plotted during test.

Auto Scale Y3-Axis	Enables auto-scaling of the Y3-axis parameter.
Y3-Axis Min.	Indicates the minimum value to be displayed on the graph.
Y3-Axis Max.	Indicates the maximum value to be displayed on the graph.
Y4-Axis	Selects the parameter to be plotted during test.
Auto Scale Y4-Axis	Enables auto-scaling of the Y4-axis parameter.
Y4-Axis Min.	Indicates the minimum value to be displayed on the graph.
Y4-Axis Max.	Indicates the maximum value to be displayed on the graph.
Save Setup	Press to save to existing test file configuration.
Print Graph	Press to print preview graph.
Import Data	Press to import results test on .CSV format.
Export Data	Press to export results test on .CSV format.
Export to Compare	Press to export/copy results test to compare results graph.
Description	Type any notes you wish to retain with the data for this test, and also print on the title of the graph.

8. COMPARE RESULTS

8.1 COMPARE RESULTS TAB

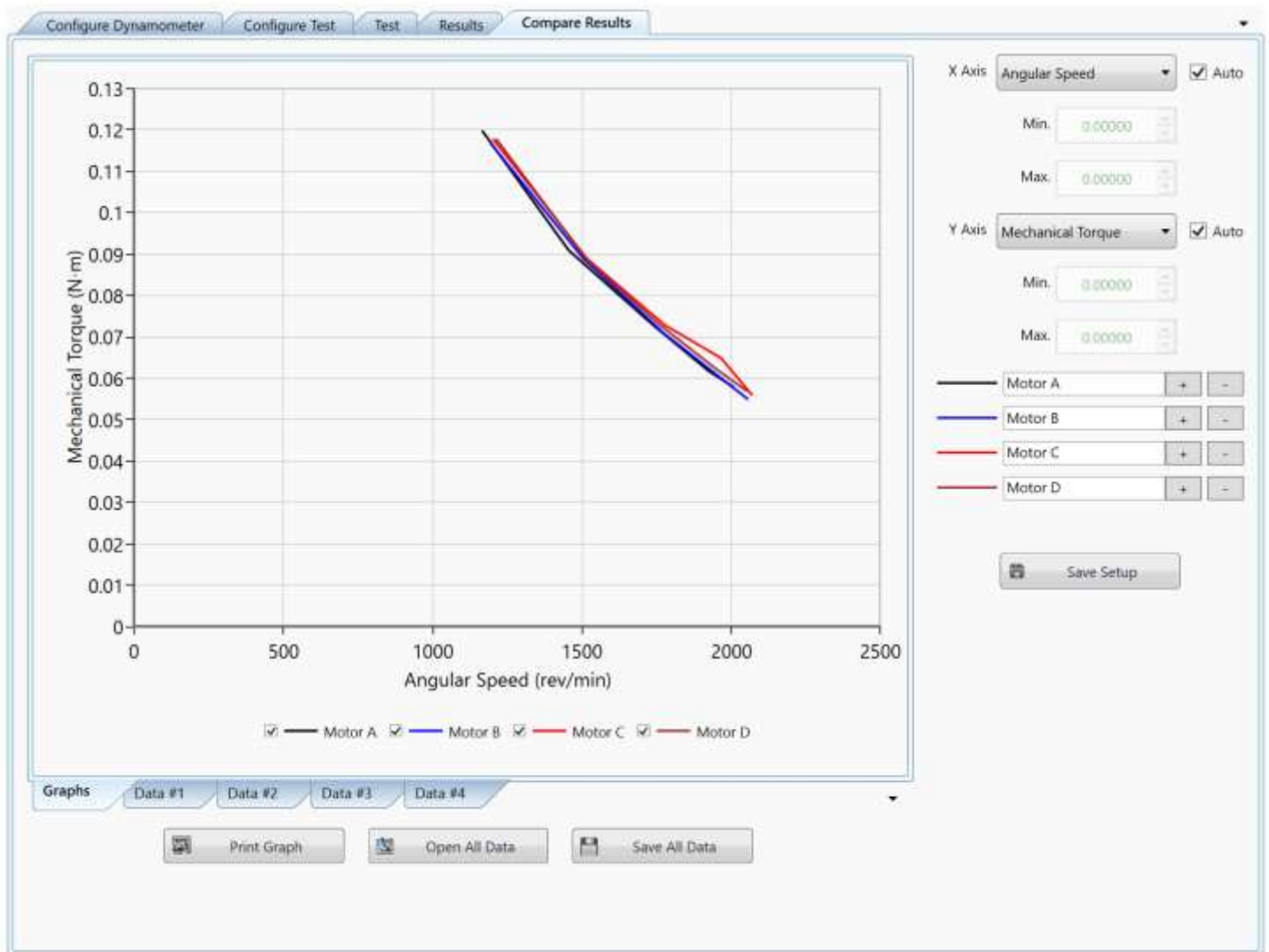


Figure 8-1 Compare Results Tab

8.1.1 OPEN LOOP PARAMETER CONTROLS

CONTROL	FUNCTION
Graphs Tab	Displays all imported test graphs.
Data #1	Display all parameters stored in your Test Graph (black line).
Data #2	Display all parameters stored in your Test Graph (blue line).
Data #3	Display all parameters stored in your Test Graph (red line).
Data #4	Display all parameters stored in your Test Graph (brown line).
X-Axis	Selects the parameter to be plotted during test.
Auto Scale X-Axis	Enables auto-scaling of the X-axis parameter.
X-Axis Min.	Indicates the minimum value to be displayed on the graph.
X-Axis Max.	Indicates the maximum value to be displayed on the graph.
Y1-Axis	Selects the parameter to be plotted during test.

Auto Scale Y1-Axis	Enables auto-scaling of the Y1-axis parameter.
Y1-Axis Min.	Indicates the minimum value to be displayed on the graph.
Y1-Axis Max.	Indicates the maximum value to be displayed on the graph.
Y2-Axis	Selects the parameter to be plotted during test.
Auto Scale Y2-Axis	Enables auto-scaling of the Y2-axis parameter.
Y2-Axis Min.	Indicates the minimum value to be displayed on the graph.
Y2-Axis Max.	Indicates the maximum value to be displayed on the graph.
Save Setup	Press to save to existing test file configuration.
Print Graph	Press to print preview graph.
Open All Data	Press to import all tests results.
Save All Data	Press to save all test results.

9. EXAMPLE TESTS

9.1 MANUAL TEST – OPEN LOOP

- Click on the Configure Test tab, and under Test Method select Manual.
- Select Open Loop under Control Parameter.

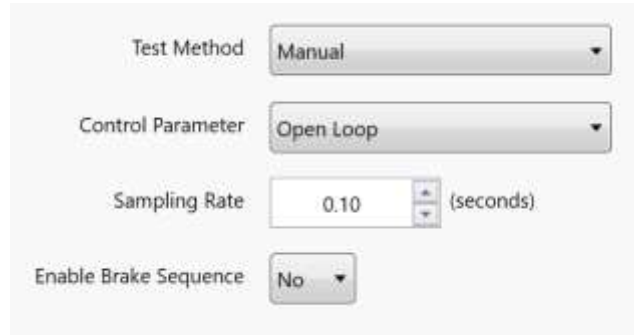


Figure 9-1 Test Method set to Manual with Open Loop Control Parameter

- Click on the Test Tab and select the parameters to show during the test.
- Press the Start Test button. The software will start logging data.
- Use the Brake Controller Knobs or Load Control slider to vary the amount of load applied to the motor.
- Press Stop Test button to end the test.
- Go to Results Tab to review your test

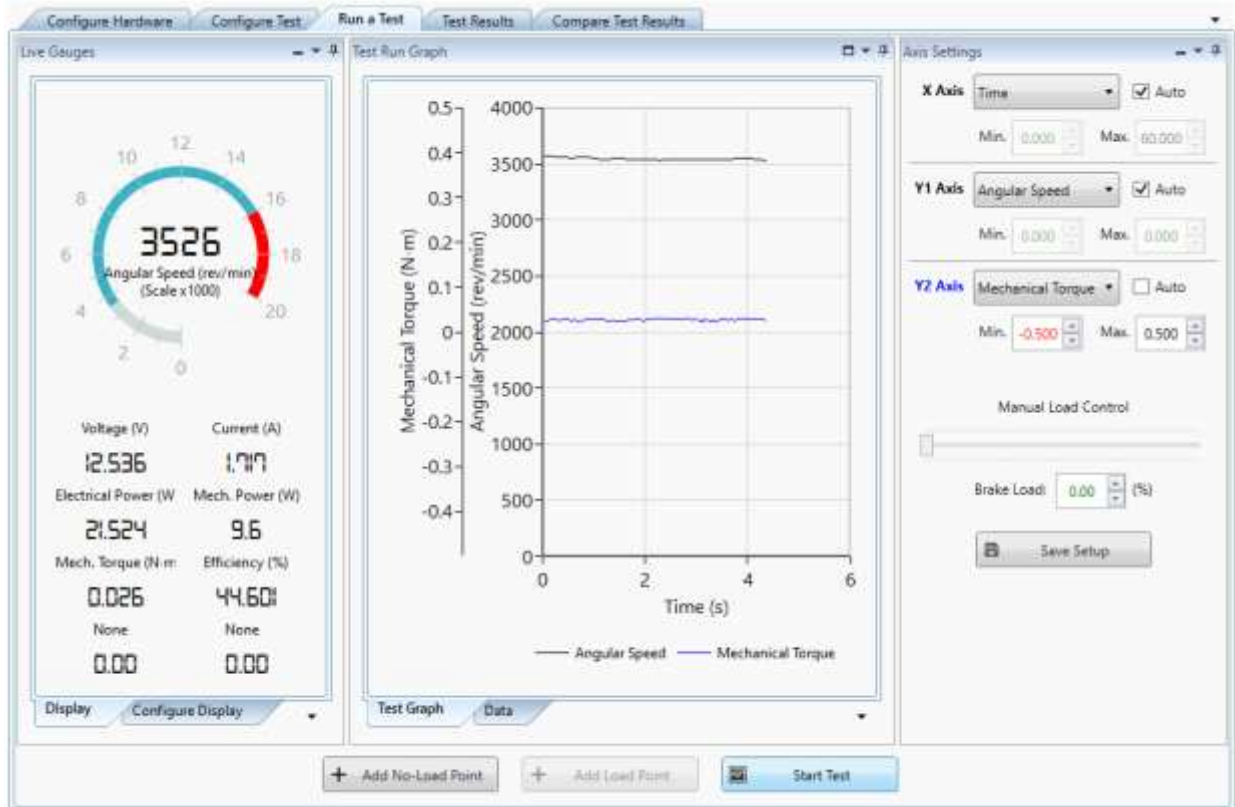


Figure 9-2 Manual Test – Open Loop Example

9.2 MANUAL TEST – OPEN LOOP WITH BRAKE SEQUENCE

- Click on the Configure Test tab, and under Test Method select Manual.
- Select Open Loop under Control Parameter.
- Set Enable Brake Sequence to Yes.

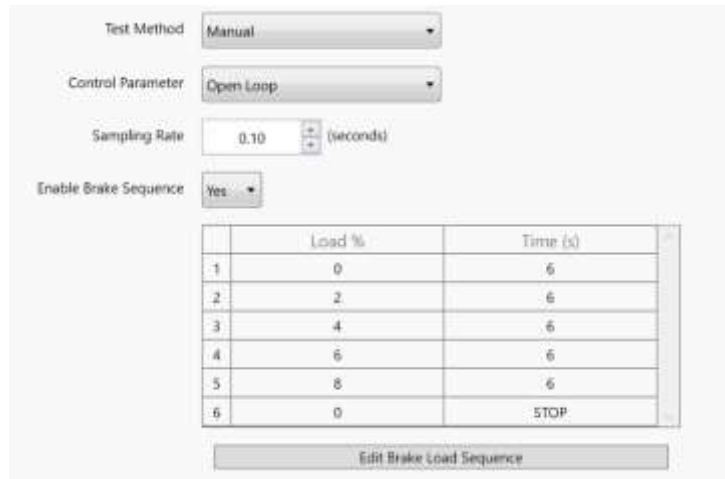


Figure 9-3 Test Method set to Manual with Open Loop and Brake Sequence Control Parameter

- Specify the Brake Sequence parameters.
- Click on the Test Tab and select the parameters to show during the test.
- Press the Start Test button. The software will start logging data.
- Press Stop Test button to end the test.
- Go to Results Tab to review your test.

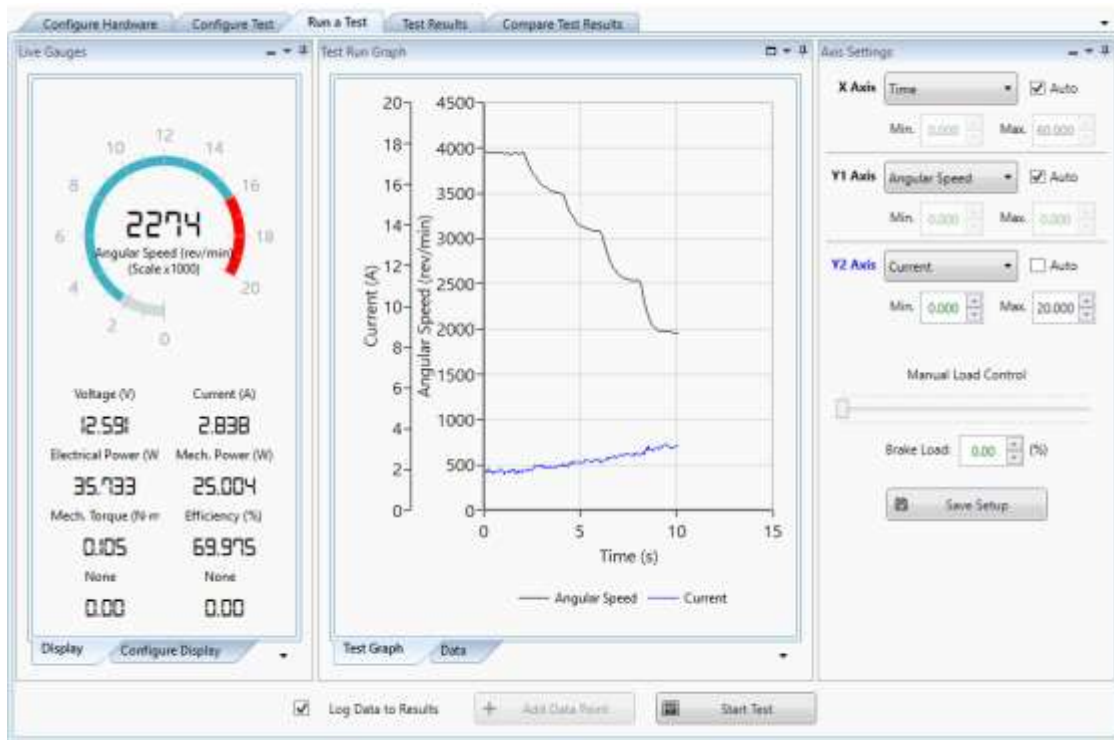


Figure 9-4 Manual Test – Open Loop with Brake Sequence Example

When using the Brake Sequence, the Brake Controller needs to be connected to the Dynamometer Controller (DC-1000).

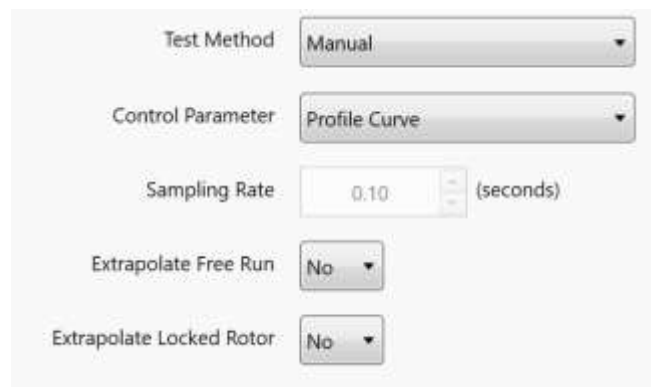
The Brake Controller load range **will affect the load percentage in the software. It's recommended to start at the LOW range.** The Brake Adjust knob will not work if the Brake Controller is connected to the dynamometer controller.

NOTE: Make sure the breaking does not exceed the specifications of your dynamometer. Exceeding the torque of your specifications will damage the dynamometer controller.

9.3 MANUAL TEST – PROFILE CURVE

-Click on the Configure Test tab, and under Test Method select Manual.

-Select Profile Curve under Control Parameter.



The screenshot shows a configuration window with the following settings:

- Test Method: Manual
- Control Parameter: Profile Curve
- Sampling Rate: 0.10 (seconds)
- Extrapolate Free Run: No
- Extrapolate Locked Rotor: No

Figure 9-5 Test Method set to Manual with Profile Curve Control Parameter

-Click on the Test Tab and select the parameters to show during the test.

-Press the Start Test button.

-Set your motor speed with no load applied from the brake

-Press Add No-Load point.

-Adjust the brake using your Brake Controller Load Adjust knob. Set the brake load close to stall. Make sure it does not exceed your custom dynamometer specifications or it would damage your dynamometer controller.

-Press Add Load point.

-Adjust the brake using your Brake Controller Load Adjust knob to no load.

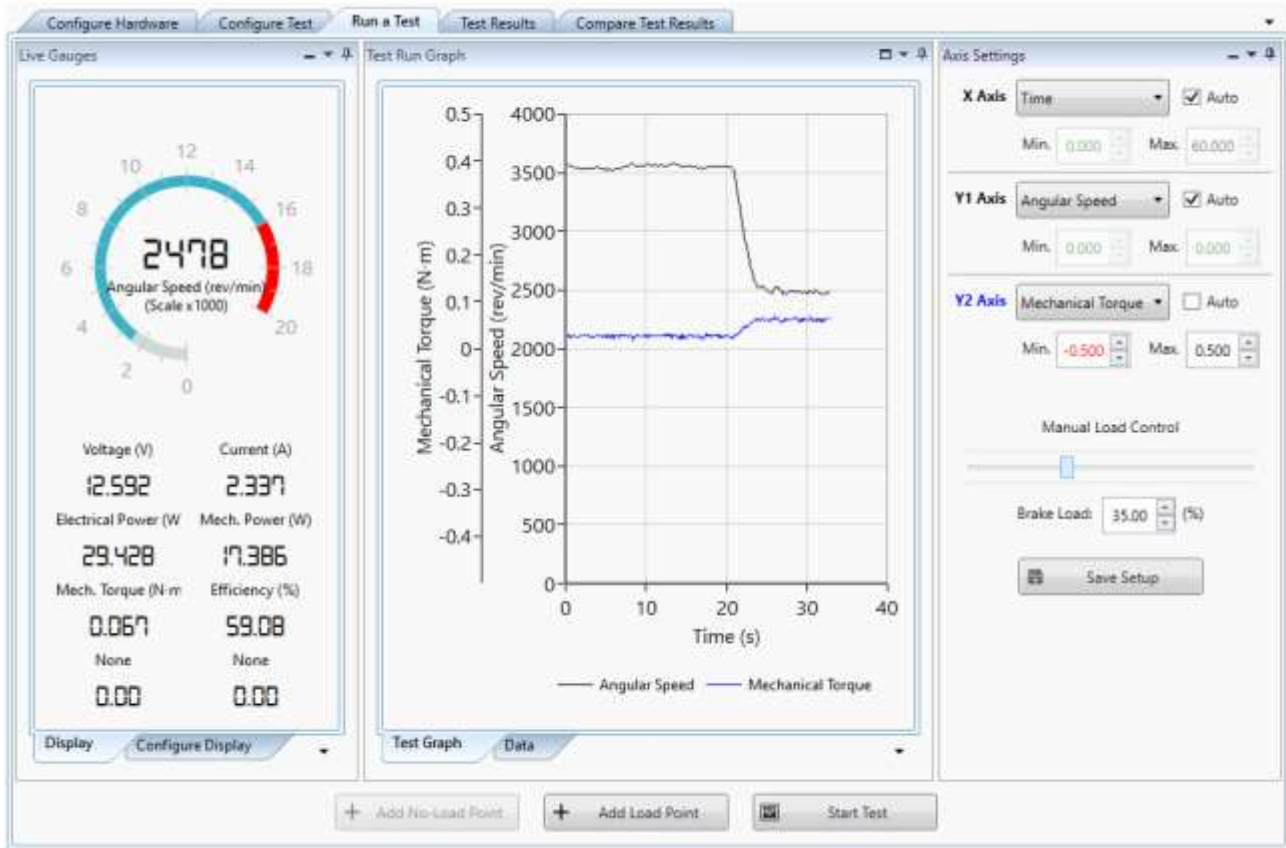


Figure 9-6 Manual Test – Profile Curve Example

The Profile Curve control parameter uses two points, no-load and load points to create the curves. This method uses extrapolated calculations to estimate the motor performance curves.

When using the Profile Curve control parameter, it is best to use the Manual Brake Controller adjust knobs.

The Brake Controller load range will affect the load percentage in the software. It's recommended to start at the LOW range. The Brake Adjust knob will not work if the Brake Controller is connected to the dynamometer controller.

NOTE: Make sure the braking does not exceed the specifications of your dynamometer. Exceeding the torque of your specifications will damage the dynamometer controller.

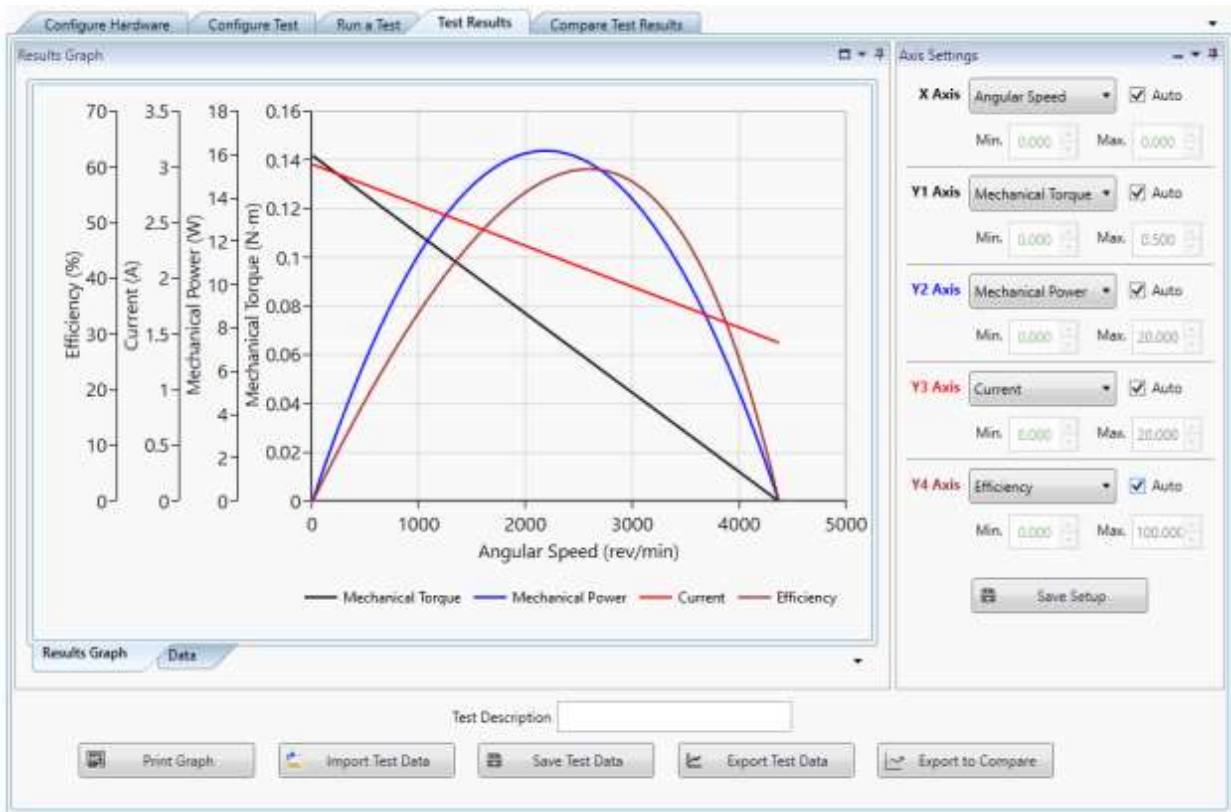


Figure 9-7 Test Results– Profile Curve Example

10. HOW TO

10.1 CHANGE UNITS

- Click on the Configure Dynamometer tab
- Click on the Units tab
- Select the units of preference.
- Press Apply Settings button.
- Press Save Setup button.

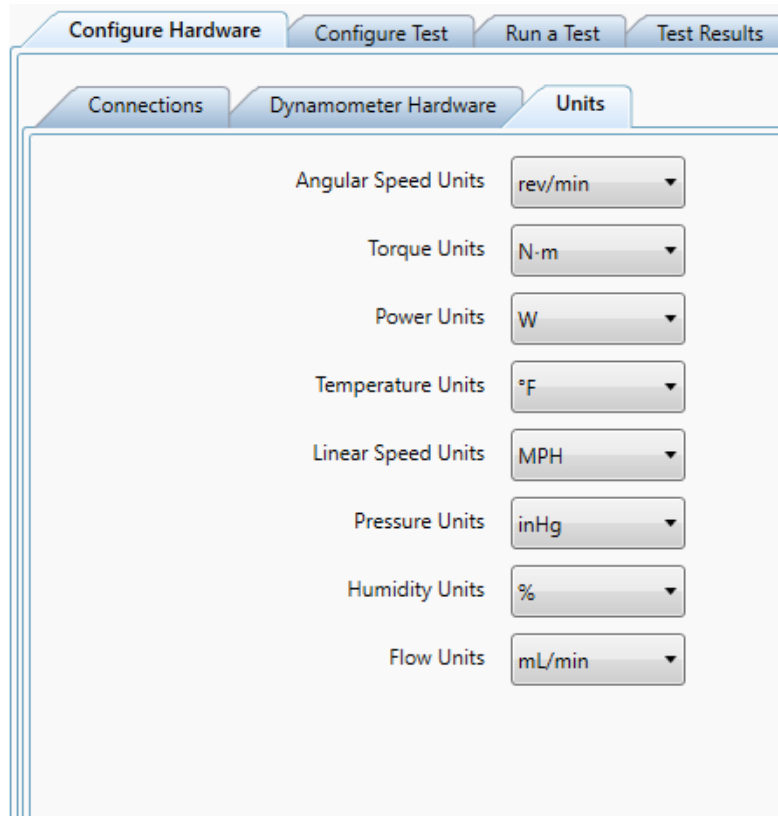


Figure 10-1 Changing Units

10.2 ZERO TORQUE / CALIBRATE

IMPORTANT: Make sure there is no torque applied to the sensor.

FOR SENSOR WITHOUT LCD DISPLAY:

- Click on the Configure Dynamometer tab and click Configure Hardware.
- Push Zero next to Torque Sensor SF (Scale Factor).
- Press Apply Settings button.
- Press Save Setup button.

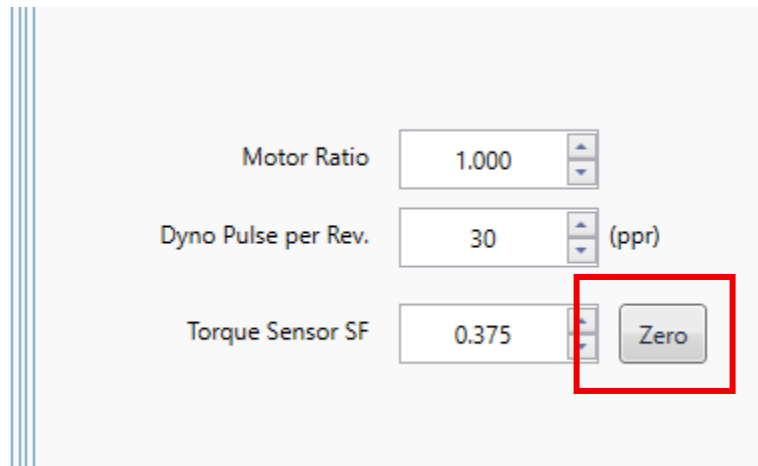


Figure 10-2 Zero Torque

FOR SENSOR EQUIPPED WITH LCD DISPLAY:

- Click on the Configure Dynamometer tab and click Configure Hardware.
- Move the torque sensor to read 0.000 (or close too zero) figure 10-3.
- Push Zero next to Torque Sensor SF (Scale Factor).
- Press Apply Settings button.

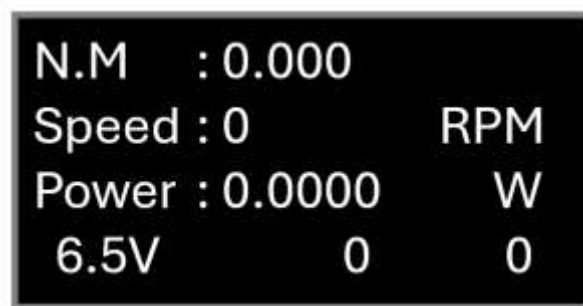


Figure 10-3 Torque Sensor with LCD display

10.3 ZERO VOLTAGE / CALIBRATE

- Click on the Configure Dynamometer tab and click Configure Hardware.
- Make sure there is no voltage on the sensor (PSU disconnected)
- Push Zero next to Voltage SF (Scale Factor).
- Press Apply Settings button.
- Press Save Setup button.

NOTE: The Voltage SF value is used to calibrate the sensor.

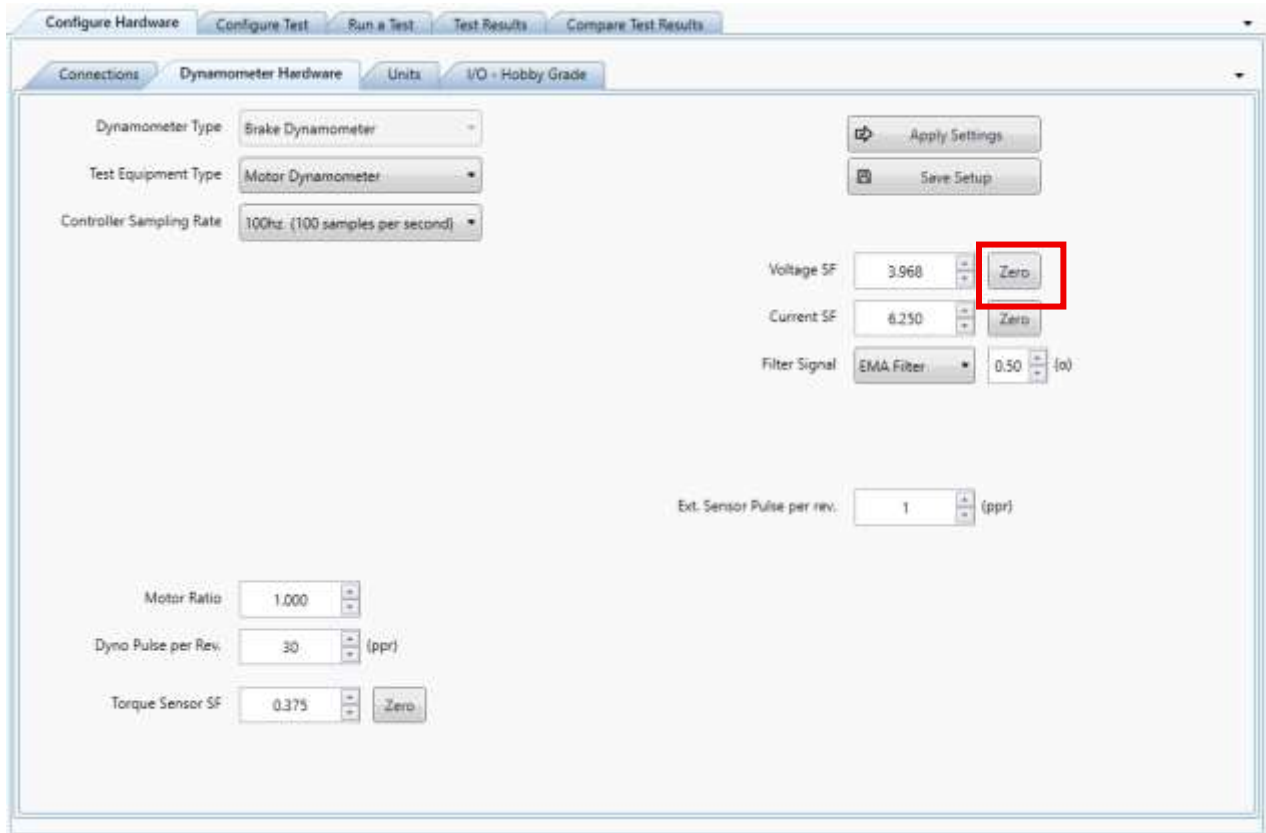


Figure 10-4 Zero Voltage

10.4 ZERO CURRENT / CALIBRATE

- Click on the Configure Dynamometer tab and click Configure Hardware.
- Make sure there is no voltage on the sensor (PSU disconnected)
- Push Zero next to Current SF (Scale Factor).
- Press Apply Settings button.
- Press Save Setup button.

NOTE: The Current SF value is used to calibrate the sensor.

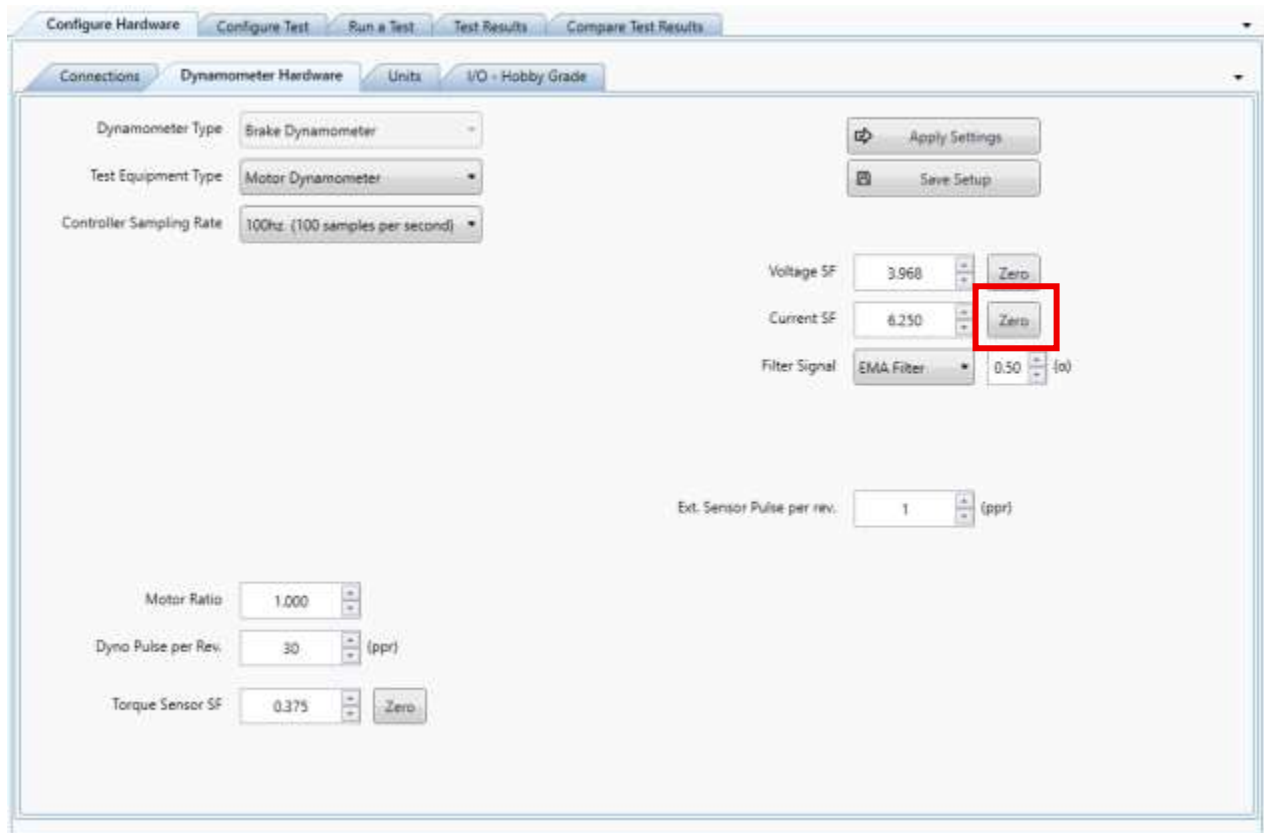
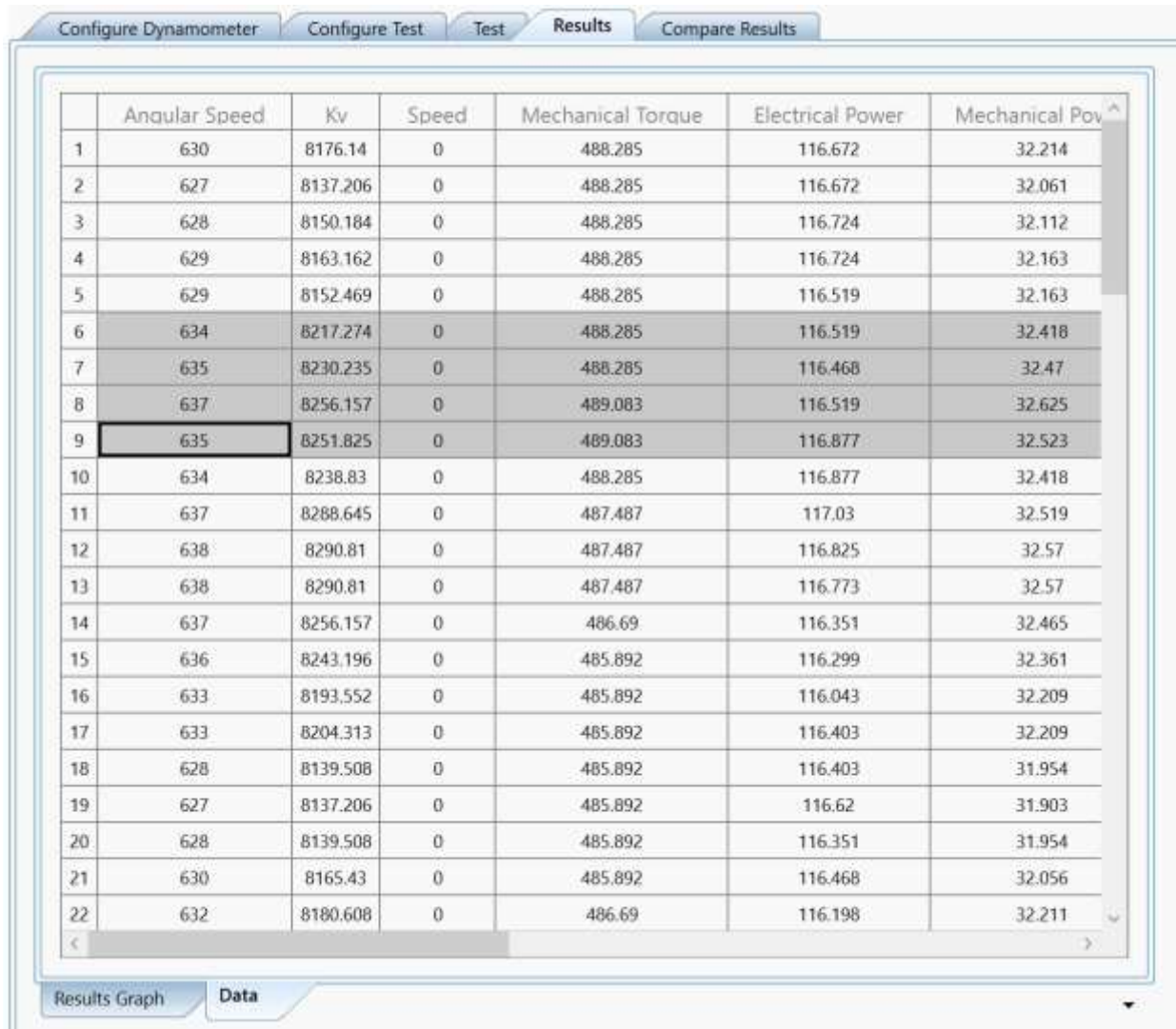


Figure 10-5 Zero Current

10.5 DELETING DATA POINTS FROM GRAPHS

- Select the Graph you want to delete data.
- Go-to the Data tab.
- Find the row you would like to delete.
- Press the Delete key from your keyboard.



	Angular Speed	Kv	Speed	Mechanical Torque	Electrical Power	Mechanical Pow
1	630	8176.14	0	488.285	116.672	32.214
2	627	8137.206	0	488.285	116.672	32.061
3	628	8150.184	0	488.285	116.724	32.112
4	629	8163.162	0	488.285	116.724	32.163
5	629	8152.469	0	488.285	116.519	32.163
6	634	8217.274	0	488.285	116.519	32.418
7	635	8230.235	0	488.285	116.468	32.47
8	637	8256.157	0	489.083	116.519	32.625
9	635	8251.825	0	489.083	116.877	32.523
10	634	8238.83	0	488.285	116.877	32.418
11	637	8288.645	0	487.487	117.03	32.519
12	638	8290.81	0	487.487	116.825	32.57
13	638	8290.81	0	487.487	116.773	32.57
14	637	8256.157	0	486.69	116.351	32.465
15	636	8243.196	0	485.892	116.299	32.361
16	633	8193.552	0	485.892	116.043	32.209
17	633	8204.313	0	485.892	116.403	32.209
18	628	8139.508	0	485.892	116.403	31.954
19	627	8137.206	0	485.892	116.62	31.903
20	628	8139.508	0	485.892	116.351	31.954
21	630	8165.43	0	485.892	116.468	32.056
22	632	8180.608	0	486.69	116.198	32.211

Figure 10-6 Deleting Data Points from Graph

10.6 EXPORTING A TEST TO EXCEL (.CSV)

- Go-to Results Tab.
- Select the Export Data.
- Save the data to your preferred location.

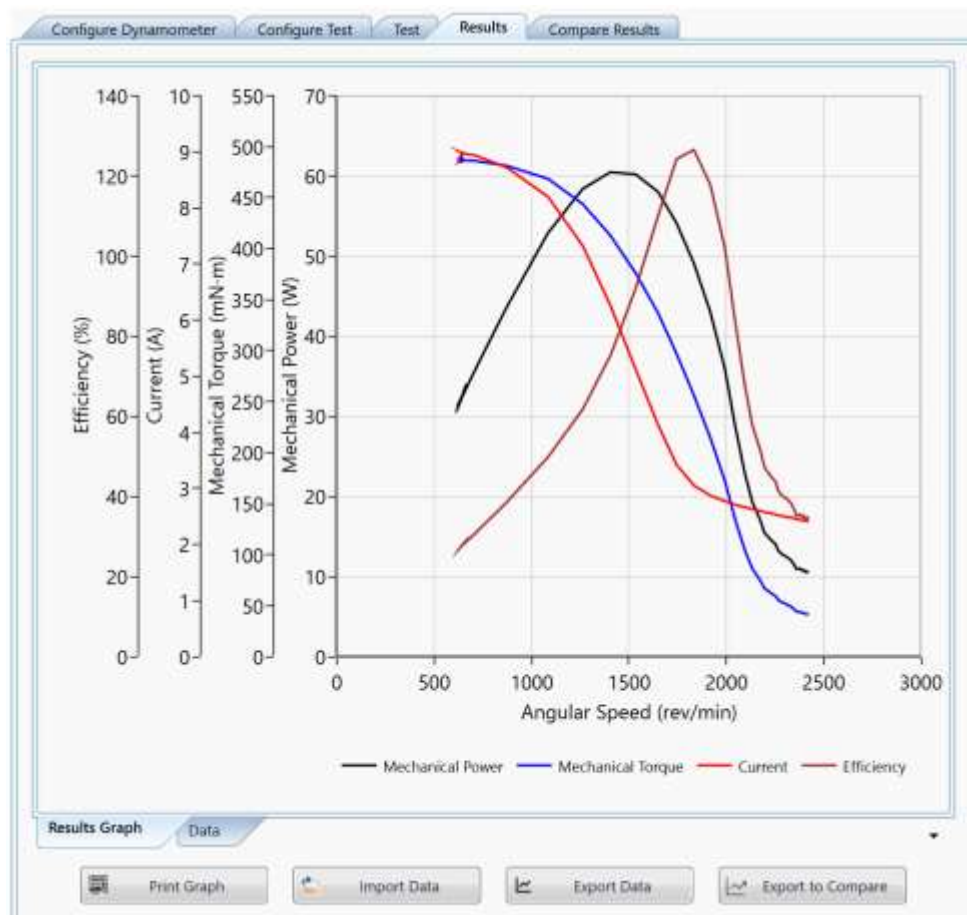


Figure 10-7 Export Data to Excel

10.7 PRINT A TEST GRAPH

- Go to Results Tab or Compare Tab.
- Select Print Graph.

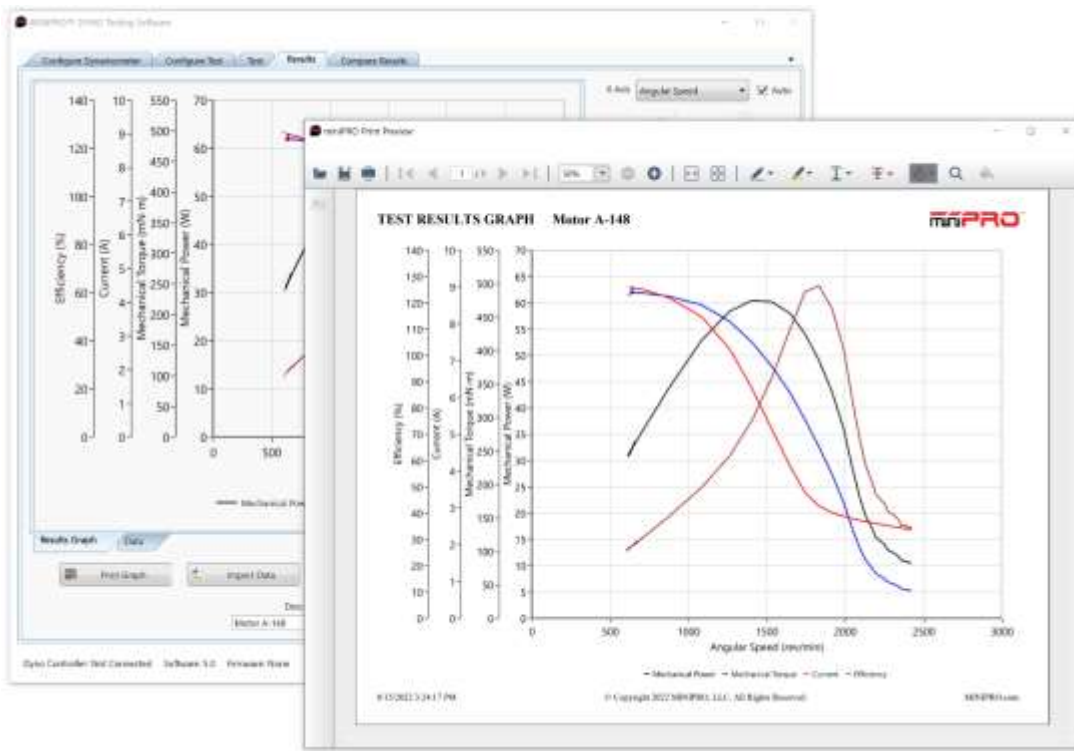


Figure 10-8 Print a Test Graph

10.8 FILTERING DATA - EXPONENTIAL MOVING AVERAGE (EMA)

One of the filters currently available is the Exponential Moving Average (EMA) low-pass filter. It's ideal for signals that you want to stabilize without introducing too much lag—like sensor readings, speed estimates, or torque measurements. It uses a single smoothing factor (α). It gives you intuitive control over the tradeoff between noise reduction and responsiveness: smaller α = smoother but slower, larger α = faster but noisier.

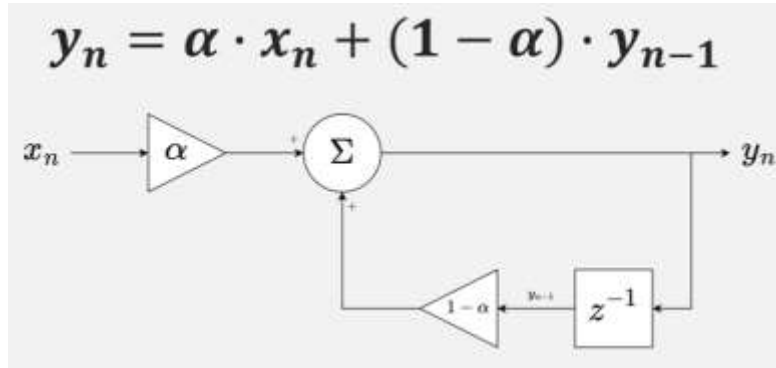


Figure 10-9 Formula used on EMA Filter

- Click on the Configure Dynamometer tab and click Configure Hardware.
- Under Filter select EMA.
- Specify your smoothing factor (α).
- Press Apply Settings button.
- Press Save Setup button.

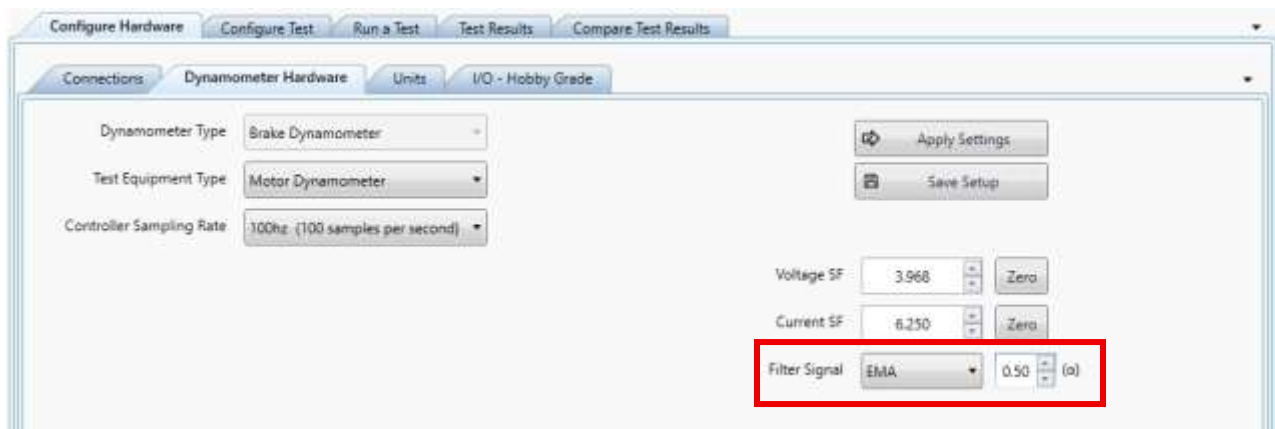


Figure 10-10 EMA Smoothing factor

RECOMMENDED SMOOTHING FACTOR

Frequency (Hz)	Smoothing Factor (α)
10	0.1
100	0.02