POWERDAQ STUDIO

USER MANUAL

P/N: 82-0148-010

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ABOUT THIS MANUAL

This ‘Quick Reference Manual’ is designed for engineers and technicians, providing clear and detailed guidance on how to use the POWERDAQ STUDIO application effectively. It explains the key functions and features of the POWERDAQ STUDIO application to program configuration, calibration, data acquisition, and troubleshooting of the various measurement instruments. Whether you're setting up the system or resolving an issue, this manual offers practical instructions to support smooth and efficient operation.

REVISION HISTORY

Revision	ECO No.	Description	Date	By
01	-	Preliminary Release		
A	EC-104409	Rev A Release	14/11/2025	Jeevan V

OVERVIEW

PowerDAQ Studio Application Software is a powerful desktop application designed for configuration, data acquisition, control, real-time visualization, storage, playback, and analysis. It supports VTI Instruments' EMX digitizer, EX10xxA, EX1200 and EX1400 series and is optimized for high-performance and specialty testing applications. Future releases will include additional VTI and UEI products. PowerDAQ Studio is provided free of charge.

This PowerDAQ Studio application software is primarily for general purpose data acquisition and can be extended for specialty applications including:

- General Purpose Data Logging
- Engine Test Cell Acquisition
- Structural Testing
- Electronic test environment (High density switching/measurement)
- High Speed Data Acquisition
- Acoustic Intensity Testing
- Performance and Event Monitoring
- HALT / HASS Product Evaluation
- Battery Testing
- Power Quality Testing
- Process and Plant Monitoring

SYSTEM REQUIREMENTS

The following are the minimum system requirements for PowerDAQ Studio.

- Supported OS: Windows 10 and Windows 11, 64-bit. 32-bit versions of Windows operating systems are not supported.
- CPU: x86-64, i5 10th Generation or equivalent
- RAM: 8 GB minimum, 16 GB recommended
- GPU: Intel/NVIDIA/AMD dedicated GPU

SOFTWARE PREREQUISITES

For PowerDAQ Studio to successfully communicate with the supported hardware, the following software drivers and components are required to be installed:

- IVI Shared Components.
- Instrument Software Driver, e.g., VTEXDSA, VTEX10xxA

FEATURES AND DESCRIPTION

PowerDAQ Studio provides the following features for the supported hardware.

INSTRUMENT DISCOVERY

- Add instruments using the automatic search or by manually configuring the IP address.

SUPPORTED INSTRUMENTS

The following are the VTI products supported by PowerDAQ Studio. Future releases will include additional VTI and UEI products.

- EX14XX: EX1401, EX1402, EX1403
- EX10XXA: EX1044, EX1048, EX1000A, EX1016A, EX1032A, EX1048A-TC, EX1000A-TC
- EX1000A-51C, EX1044A, EX1000B, EX1016B, EX1032B, EX1048B, EX1000BTC, EX1000B-51C, EX1044B
- EMX: EMX-434/2632/2616/4XXX/7XXX/75XX

INSTRUMENT CONFIGURATION

- Configuration support for multiple instruments.
- Instruments can be configured for different sampling rates and recording settings.
- A down sampling option is available.
- Configured settings can be saved as a project for future use.
- Configurations can be exported and imported from Excel.
- The software can configure multiple sources and triggers.
- Various scaling options are available to integrate different transducers with the channels.

SPECIAL FUNCTIONS

- The software can perform self-tests and self-calibration for all configured instruments.
- Special operations are available for strain gauges:
    - reset
    - reboot
    - blink LED
- Supports a variety of transducers.

DATA STORAGE

- The Exporting to CSV file option is available for logged data, limits, and snapshot data.
- Data will be recorded in a binary file. It also supports primary and secondary recordings.

DATA REPRESENTATION

- Several math functions are available (RMS, average, max, min, cos, sin, etc.).
- Each channel can be configured with preferred math functions.
- Support for simple arithmetic operations.
- Support for up to four displays. Data can be viewed on multiple displays.
- Real-time time and frequency plots. Digital, gauge, and tank scale displays.
- Tables to view data.
- A manual snapshot option is provided.
- Configurable limits for data acquisition.
- Rules engines are available. Rules can be configured with various sources and sinks.
- The log history of the time series plot is configurable.

DATA MONITORING

- Limits monitor
- Value monitor
- Application state monitor
- Periodic timing source.

TRIGGERS

- Digital output (latched, non-latched).
- PXI trigger
- LAN trigger
- Trigger instrument actions (e.g., self-test, self-Cal, tare, lead wire measurement, etc.)
- Take snapshots, trigger applications (stop, start/stop recording), and sound output (latched, non-latched).

GENERAL

- Multiple instances of PowerDAQ Studio can be running at the same time.
- Tool tips provide additional information when hovering your mouse over user interface elements
- PowerDAQ Studio projects can be password protected for additional security.

GETTING STARTED

This section describes how to install PowerDAQ Studio.

INSTALLATION

Install the PowerDAQ Studio software as follows:

1. Download the latest software from the VTI website. (http://www.vtiinstruments.com)
   Extract the zip file into a folder.

2. Run the PowerDAQ Studio Setup Wizard, “PowerDAQ Studio”.exe” (Figure 1). Administrator rights are required.

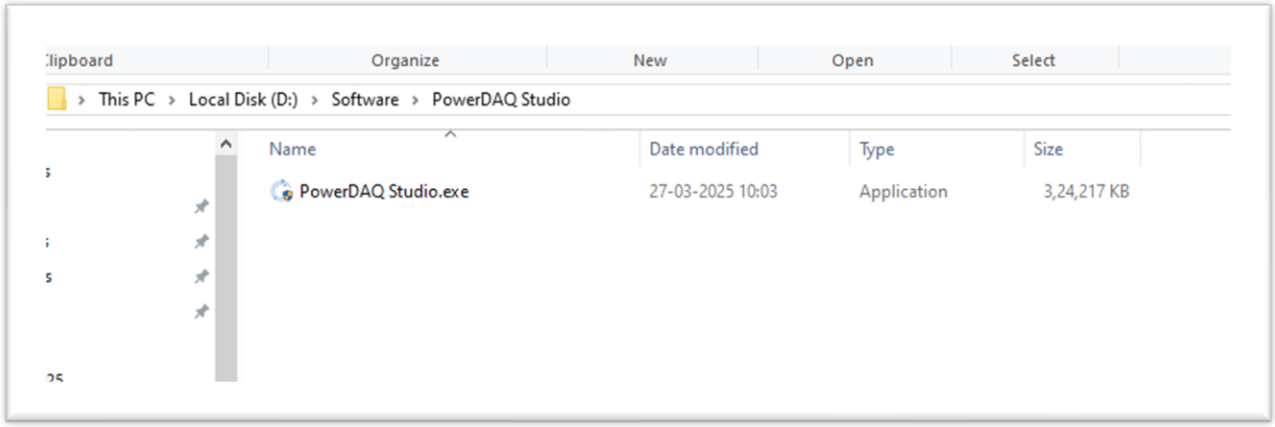


Figure 1. PowerDAQ Studio Setup Executable

3. Click through the installer prompts. Refer to Figure 2 through Figure 6.

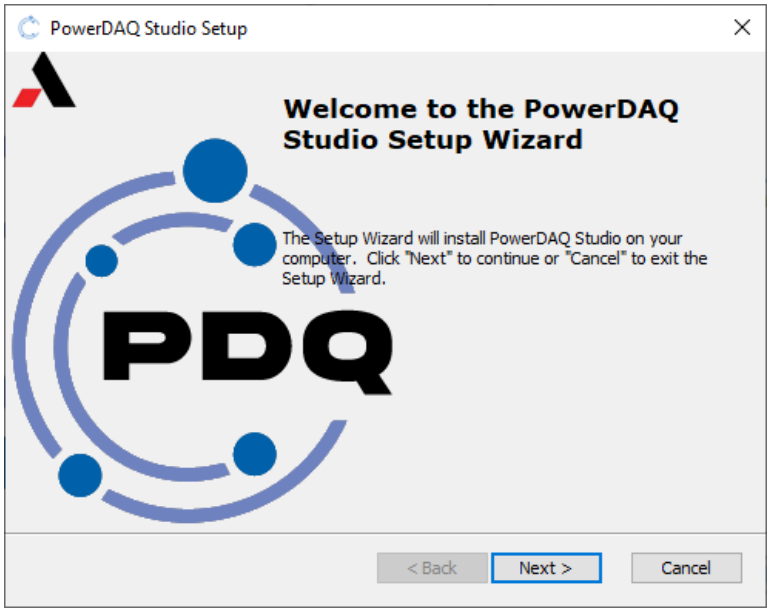


Figure 2. PowerDAQ Studio Setup Wizard

Figure 3. End-User License Agreement

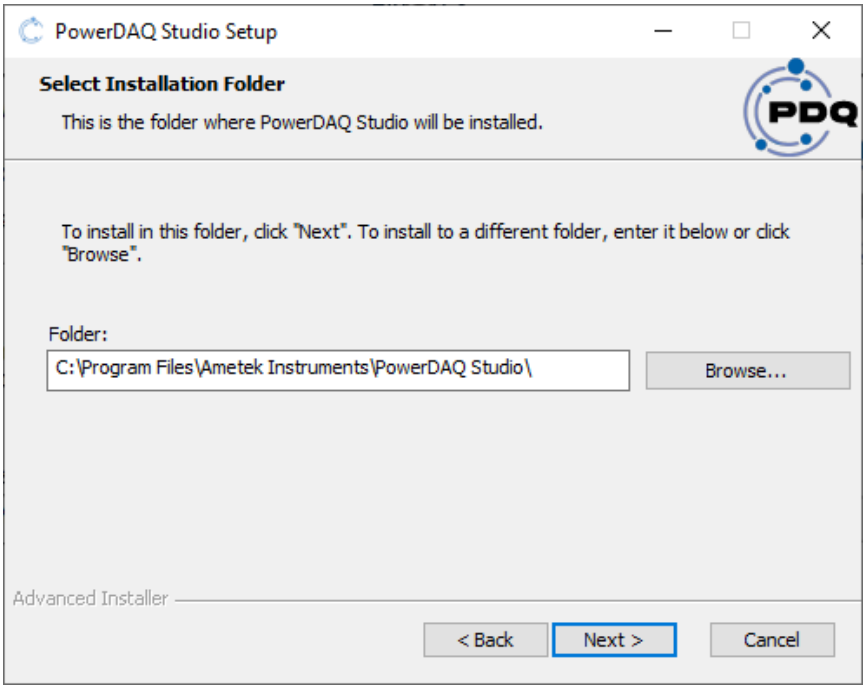


Figure 4. Select Installation Folder

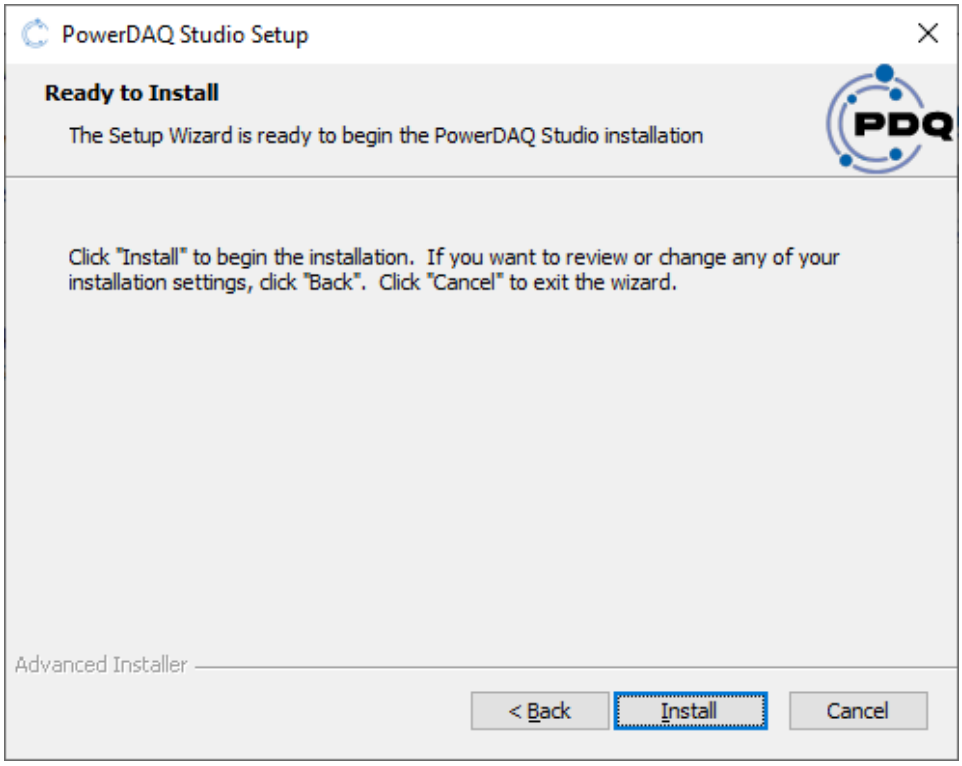


Figure 5. Ready to Install

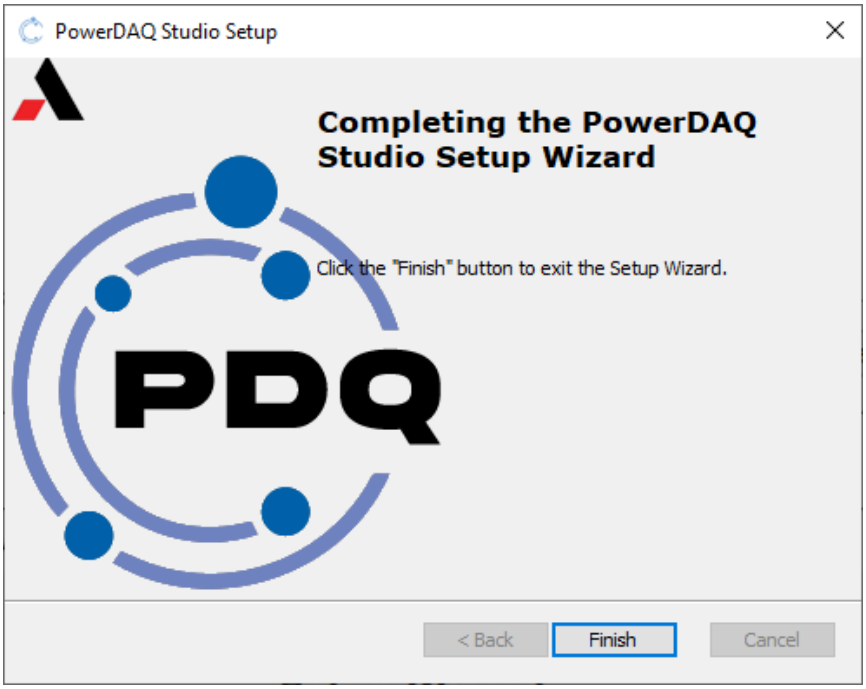


Figure 6. PowerDAQ Studio Setup Complete

USING POWERDAQ STUDIO

When PowerDAQ Studio is started, the main display appears as shown in Figure 7. This window includes a menu bar, a toolbar, and a status bar. The status bar displays warnings, errors, connection status, recording status, data acquisition status, and informational messages. Use this window to monitor and configure various parameters.

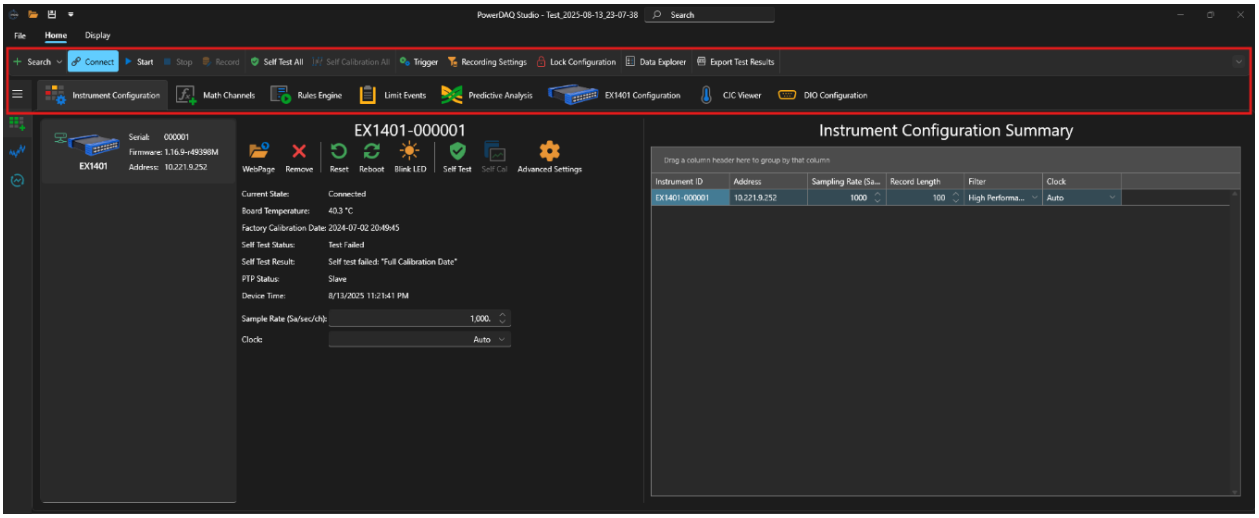


Figure 7. PowerDAQ Main Display

Note: When the application is started, it defaults to showing: "No devices added". Use search to add and configure devices in the display area. The display area shows all the functionality and various configurations of the application, including settings and device information, depending on the selected options.

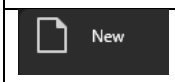
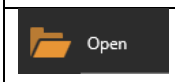
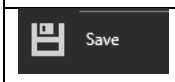
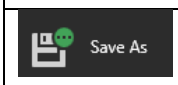
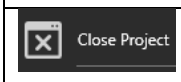
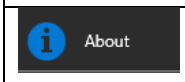
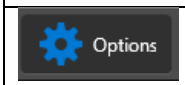
MAIN DISPLAY

This section describes components of the Power DAQ Studio main display, including the Menu Bar, Log Table, and Status Bar. The Menu Bar consists of the File, Home, and Display menus. When applicable, the Configuration, Dashboard, and Transducer Menus are displayed.

File Menu

The File Menu contains commands related to managing files and projects within an application. Common options are listed in Table 1.

Table 1. File Menu Commands

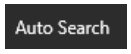
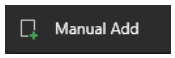
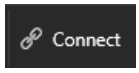
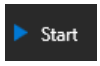
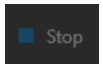
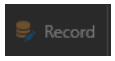
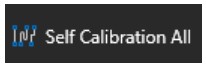
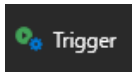
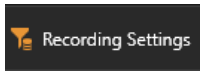
Icon	Command	Description
	New	Create a new project.
	Open	Load an existing project.
	Save	Store changes to the current project.
	Save As	Store changes to the current project under a new project name.
	Close Project	Exit the current project.
	About	Display application version and supported models.
	Options	Configure and reset application settings.
	Exit	Exit / Quit – Close the application.

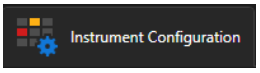
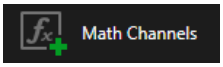
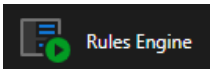
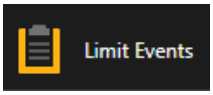
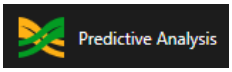
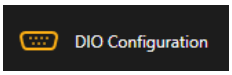
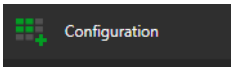
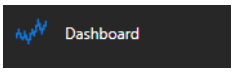
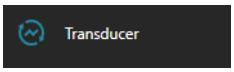
Home Menu

The Home Menu consists of the options listed in Table 2.

Note: Additional options appear on the menu bar when a device is connected. These options may vary, depending on the selected model type.

Table 2. Home Menu Commands

Icon	Command	Description
	Search	Search for the devices in the network.
	Auto Search	Search and add devices automatically.
	Manual Add	Add a device manually by providing IP address and slot number.
	Connect	Connect the application to all the selected devices.
	Start	Start acquiring data from the instrument
	Stop	Stop acquiring data from the instrument.
	Record	Record the data acquired from the instrument.
	Self Test All	Check the basic functionalities of all connected devices.
	Self Calibration All	Calibrate all the connected devices.
	Strain Control	Allow the user to apply strain specific operations such as Tare Offset, Auto Cal, measure excitation voltage, measure unstrained voltage, and measure lead wire resistance. The results are displayed on the instrument configuration tab. See Strain Control in the Special Features section for more information.
	Trigger	Trigger settings for the project.
	Recording Settings	Configure the recording settings including storage, enable file rotate, use record time, time per file, maximum number of files to create, resample rate,
	Lock Configuration	Secure project configurations with a password. Editing is restricted until the configuration is unlocked.

Icon	Command	Description
	Data Explorer	View and export limits, record, snapshot, and play back data from the project.
	Export Test Results	Export the self-test results in text format (.txt).
	Instrument Configuration	Display device information and allows configuration of device settings.
	Math Channels	Apply math equations to acquired data, it supports algebra and following math functions RMS(x), Median(x), Tan(x), Sqrt(x), Average(x), Abs(x), Asin(x), Pow(x, m), Max(x), Sin(x), Acos(x), P(π), Min(x), Cos(x), Atan(x), Sum(x).
	Rules Engine	The rules engine allows monitoring and triggering options to be combined.
	Limit Events	The Limit Events feature records events when enabled instrument channels or configured math channels exceed predefined alarm or warning thresholds.
	Predictive Analysis	Predictive Analysis allows users to predict, configure, and analyze measured data over time.
	DIO Configuration	Define the behavior of digital input and output channels on a device.
	Configuration	Selecting this menu allows configuration and display of the configuration summary for connected devices.
	Dashboard	Menu for displaying real time visualization of graph.
	Transducer	Menu for transducer configuration, limits, and specification.

Note that buttons on the Home Menu can be added to the Quick Access Toolbar using the same technique you would use with Microsoft Office applications, i.e., right-click on a Home Menu button and select “Add to Quick Access Toolbar” from the context menu. See Figure 8 for an example.

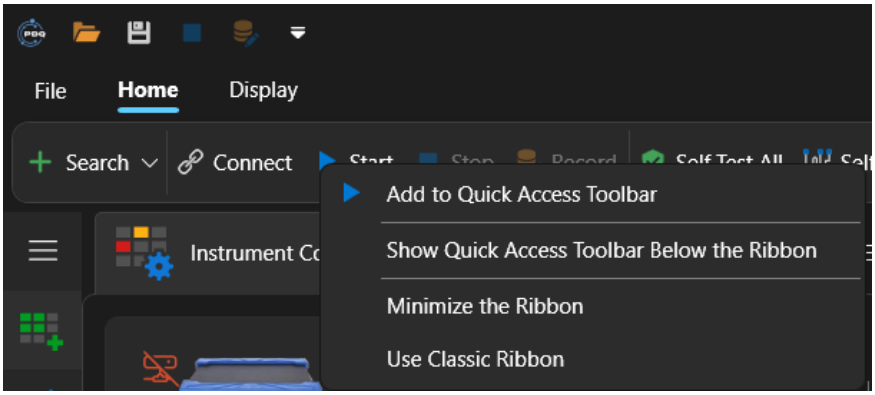


Figure 8. Add to Quick Access Toolbar

Display Menu

The Display Menu (Figure 9) allows you to monitor and analyze the recorded data in multiple displays. These displays project the data in Chart, FFT Chart, Table, Numeric, Gauge, and Slider.

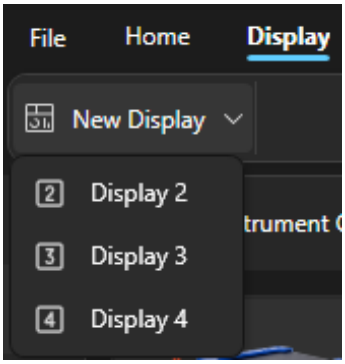


Figure 9. Display Menu

When any of the displays is selected, the following window shown in Figure 10 is displayed.

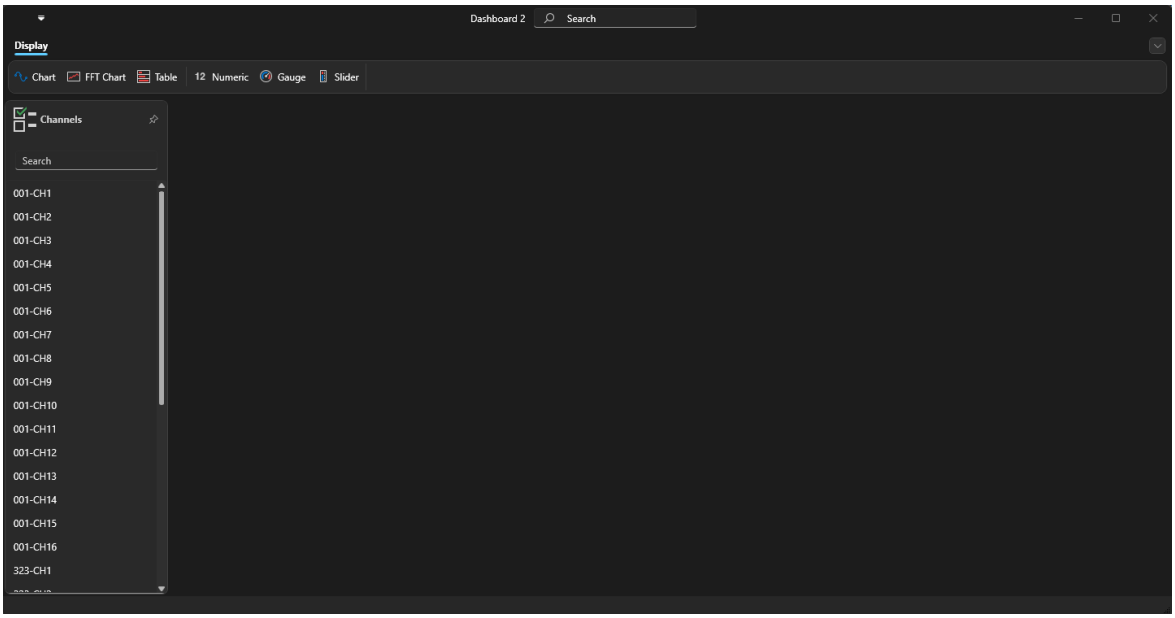
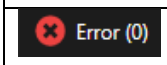
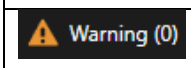
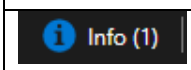
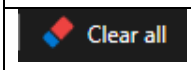


Figure 10. Display Window

Log Table

The commands listed in Table 3 are available from the Log Table window.

Table 3. Log Table Commands

Icon	Command	Description
	Error	Display only error-related logs.
	Warning	Display only warning-related logs.
	Info	Display only info-related logs.
	Clear all	Clear all the logs from the screen.

A device connection status notification also appears in the bottom-right corner of the Log Table as shown in Figure 11.

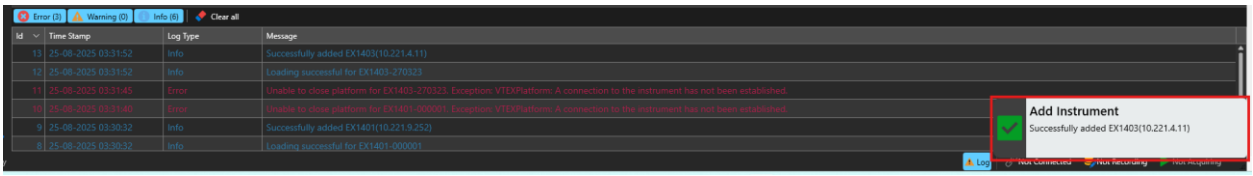


Figure 11. Log Table Display

Active state buttons are highlighted in blue. See Figure 12.

Figure 12. Log Table Active State Buttons

The Log button displays or hides the Log Table. See Figure 13.

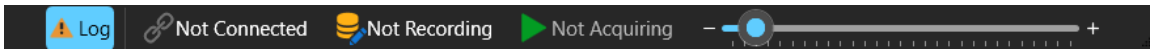
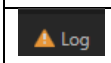
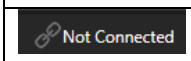
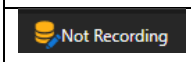
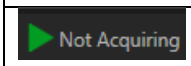


Figure 13. Log Button

Status Bar

The status bar consists of a button to enable or disable the Log Table and the status indicators listed in Table 4.

Table 4. Status Bar Options

Icon	Command	Description
	Log	Enable /disable the log table.
	Not Connected	It shows the status of the device connection.
	Not Recording	It shows the status of the data recording.
	Not Acquiring	It shows the status of data acquiring.

INSTRUMENT CONFIGURATION

Selecting an instrument on the Instrument Configuration tab, as shown in Figure 14, displays device information and allows configuration of the device settings.

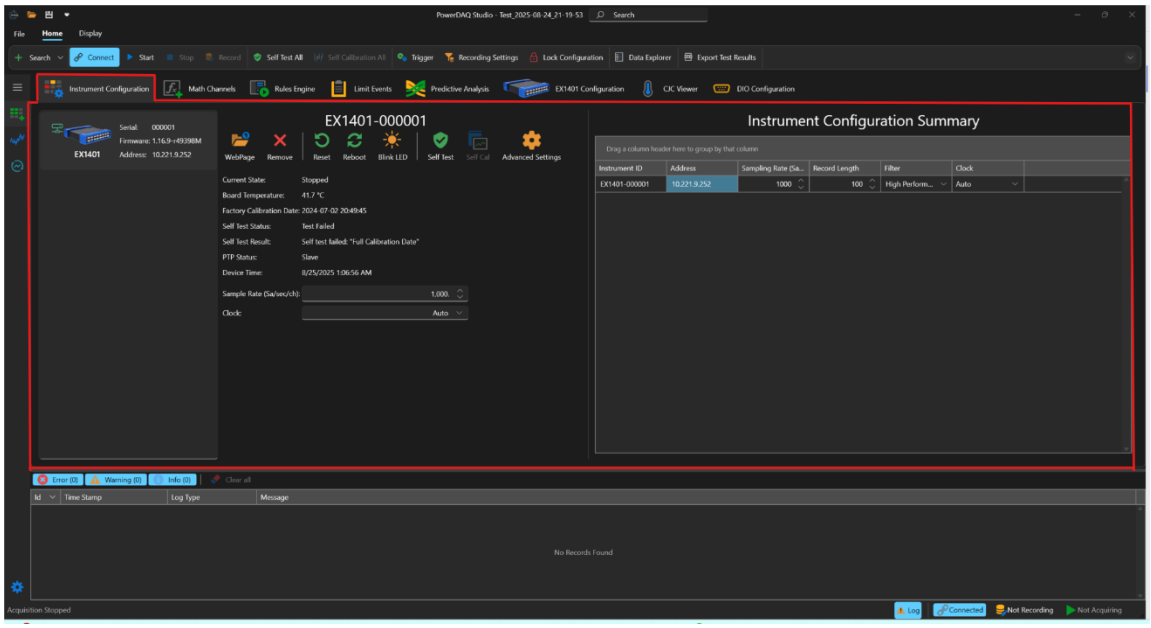
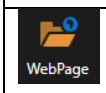
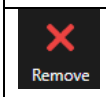
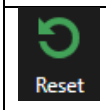
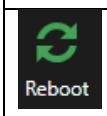
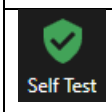
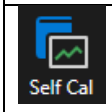
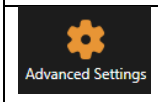


Figure 14. Instrument Configuration Tab

The Instrument Configuration tab contains the options listed in Table 5.

Table 5. Instrument Configuration Options

Icon	Function	Description
	Web Page	Redirects to the soft front panel. Refer to User's Manual EX1403A/EX1403, P/N: 82-0161-000 for more information.
	Remove	Remove the connected device.
	Reset	Reset the connected device.
	Reboot	Reboot the connected device.
	Blink LED	Identify a device by making its LAN LED blink. Useful when multiple instruments are present and you need to locate one by its IP address.
	Self Test	Check the basic functions of the device.
	Self Cal	Calibrate the specific device.
	Advanced Settings	Configure sampling and custom filter.

Steps To Add and Configure a Device

This section describes how to add and configure a device.

1. Before devices are added, the main screen will appear. as shown in Figure 15.

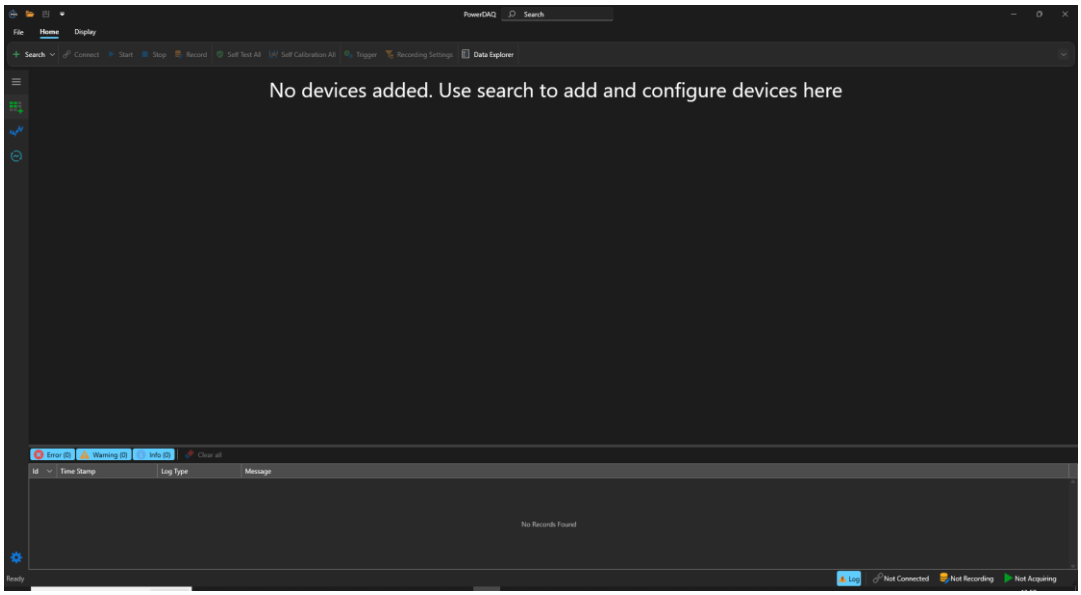


Figure 15. Main Screen with no Devices

2. Select **Search -> Auto Search** to search the available instruments in the network. See Figure 16.

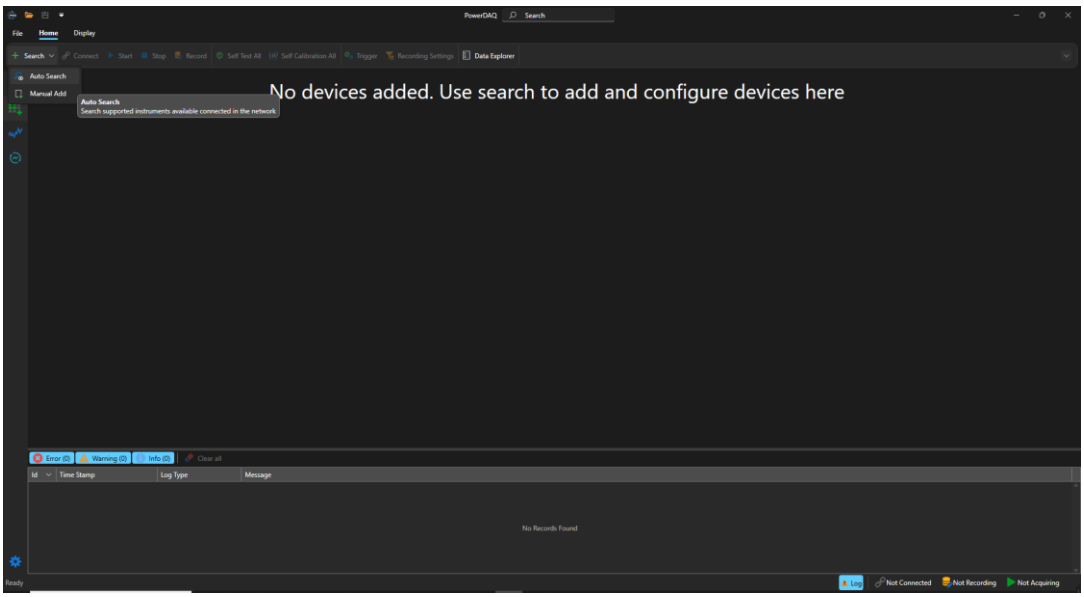


Figure 16. Auto Search Option

3. A list of devices found from running Auto Search will be displayed as shown in Figure 17.

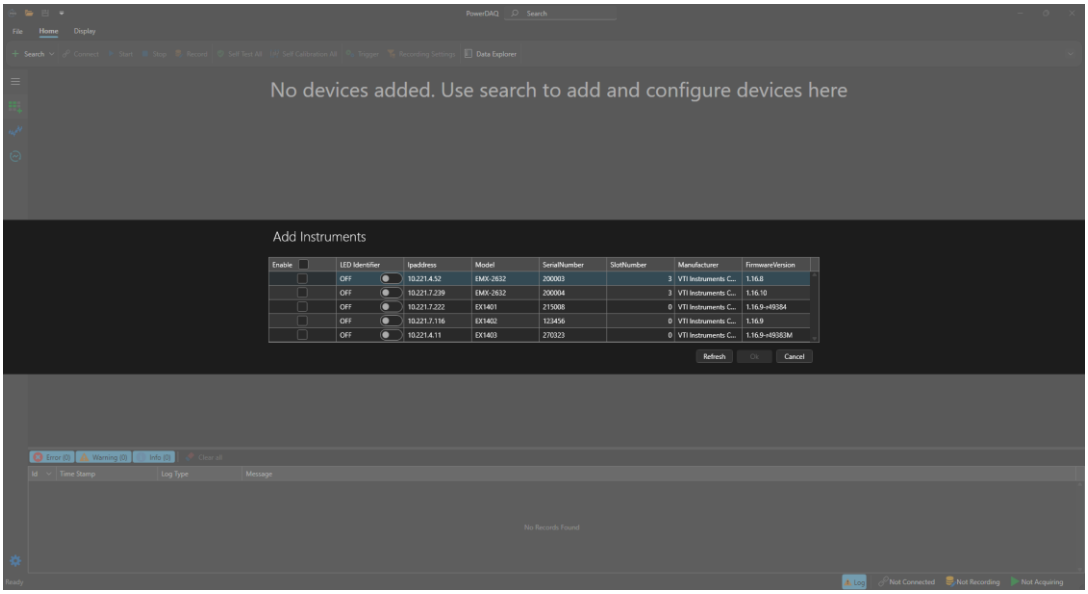


Figure 17. Auto Search Results

4. Select the instrument that you want to add and then select the “Ok” button.
5. The newly added instrument will appear in the Instrument Configuration Summary as shown in Figure 18.

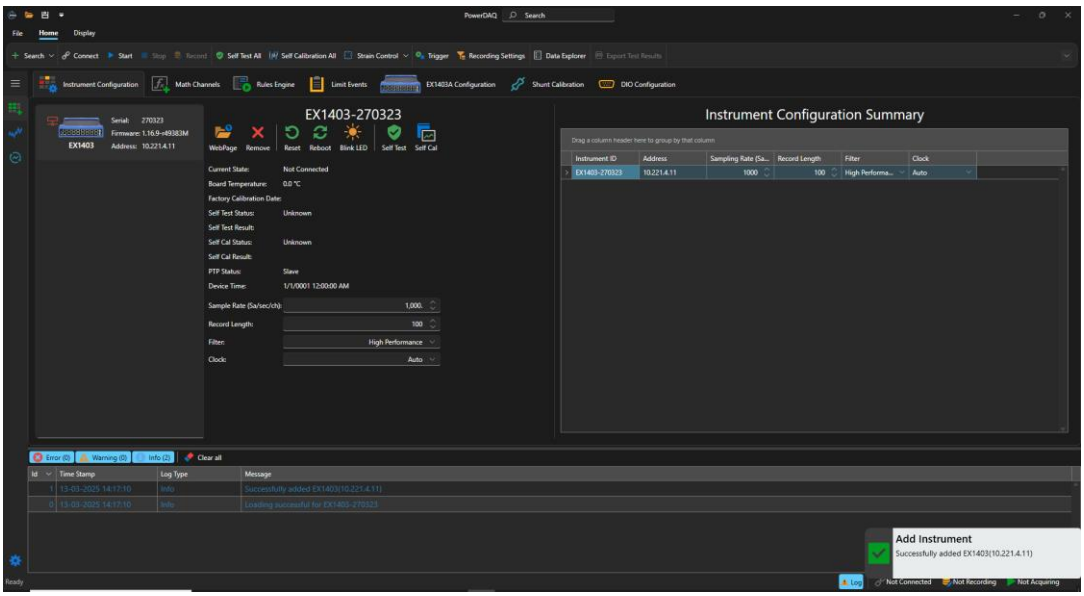


Figure 18. Instrument Added

6. Connect to the instrument by clicking the Connect button. Refer to Figure 19.

7. Double-click on an instrument in the Instrument Configuration Summary to display information for the instrument's channels.

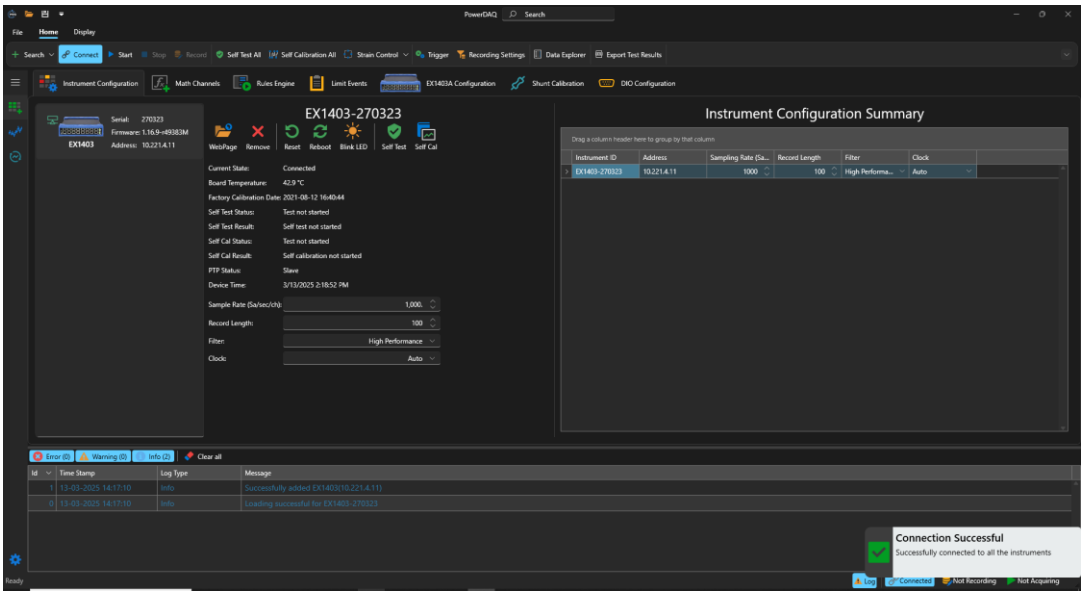


Figure 19. Instrument Connected

Additional Configuration Steps

The following steps provide an example for configuring a device for data acquisition.

1. Apply a 10 VPP sine wave with 1 kHz frequency to channel 2.
2. Configure the sampling rate, record length, filter, and clock source as shown in Figure 19.
    a. Sampling Rate: For a 10 Hz signal, the period of each sine wave is 100 ms. To represent the single sine pulse accurately, use 10 points. Enter 1,000 for the sampling rate per second.
    b. Record Length: The Record length is automatically set according to the sample rate but can be changed.
    c. Filter: Set Filter to High Performance.
    d. Clock: Set Clock to Auto.
3. Double-click an instrument in the Instrument Configuration Summary to display the Channel Configuration Parameters. See Figure 20.
4. Configure the channels for the measurement as follows:
    a. Enable Channel 2.
    b. Configure channel 2 for differential voltage mode.
    c. Set the range to 10 V.
    d. You can set Gain, Offset, and Tare offset for scaling the input signal.

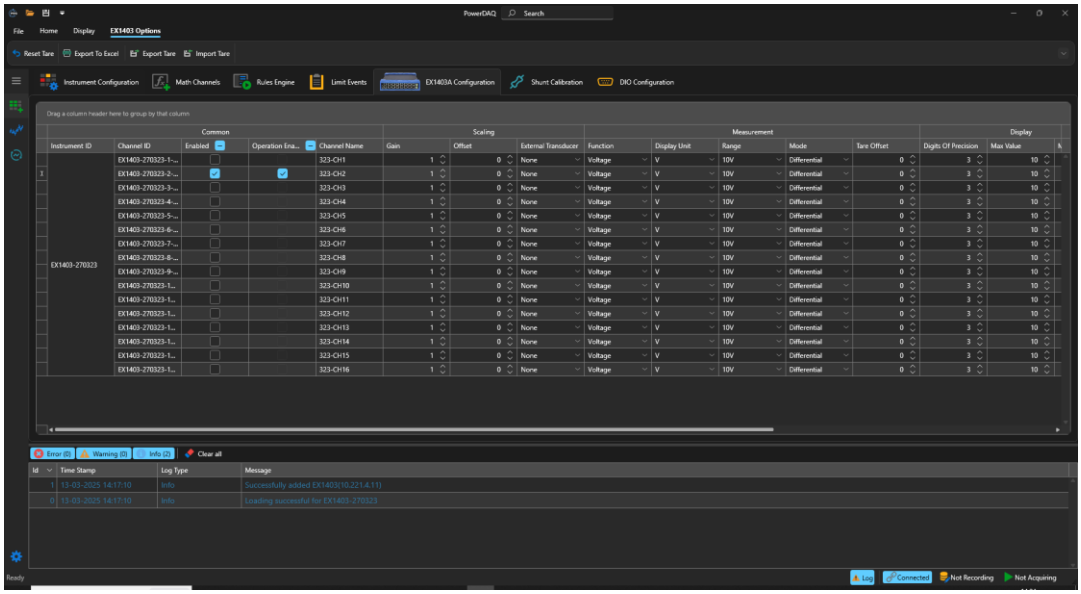


Figure 20. Channel Configuration Parameters

APPLICATION SETTINGS / OPTIONS

This section describes application settings that are available in PowerDAQ Studio. These settings are accessible by clicking the Options button on the File Menu. When the Options button is selected, the Application Settings window will be displayed as shown in Figure 21. The Application Settings window contains side tabs that allow access to various categories of settings.

Figure 21 shows the Search settings that can be used for instrument discovery using the VXI-11 and Multicast DNS protocols. Each protocol can be enabled in this window. Timeouts for each protocol can also be specified.

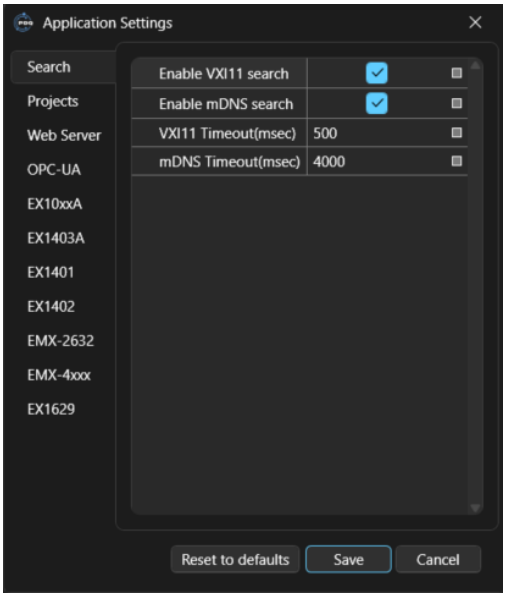


Figure 21. Search Settings

Global project settings can be managed from the Projects tab in the Application Settings window. These settings include Project Directory, Chart History, Software Trigger Timeout, and more. Project settings are shown in Figure 22.

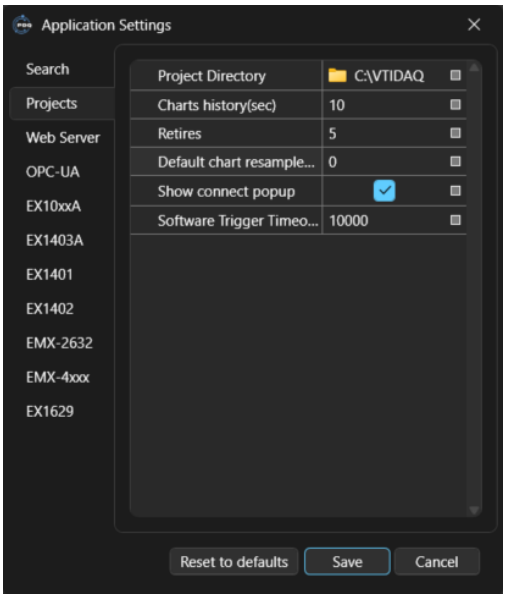


Figure 22. Projects Settings

The Web Server tab in Figure 23 shows the settings for enabling the integrated web server and configuring its port number. This allows remote access to the server application.

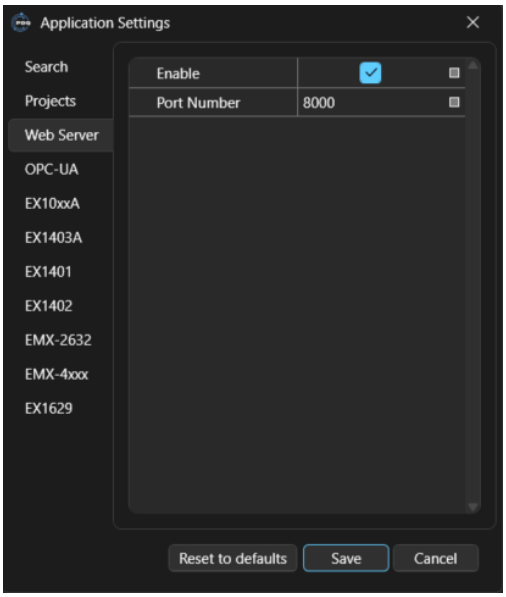


Figure 23. Web Server Settings

Figure 24 shows the settings on the OPC-UA tab for enabling OPC-UA support and configuring the port number. This allows transmission of measurement data through an OPC server for industrial automation and monitoring.

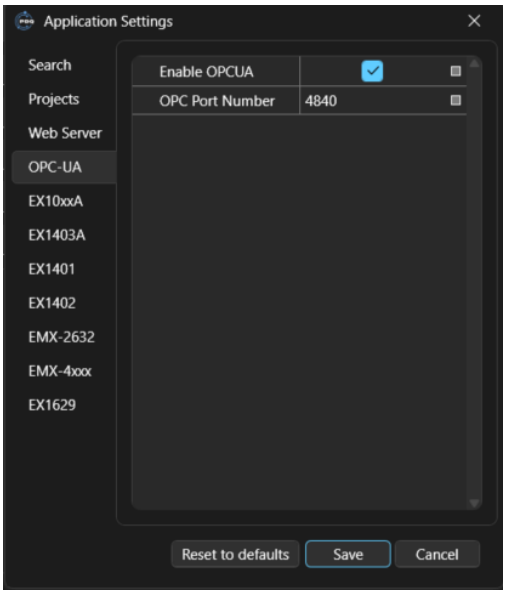


Figure 24. OPC-UA Settings

Additional side tabs are present for connected instruments. Selecting a side tab for an instrument allows you to enter default values for that instrument's settings. These settings include Sampling Rate, Record Length, Filter Type, Shunt ON Settling Timeout, and Sync Delay. Figure 25 shows the default settings for an EX1403A.

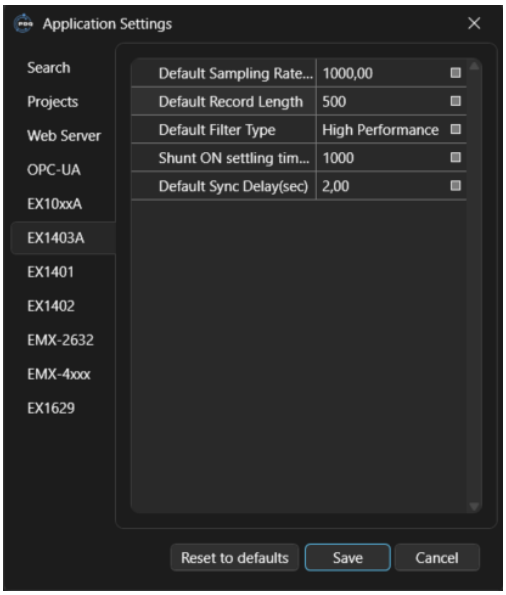


Figure 25. Instrument Settings

ACQUIRING DATA

This section describes how to start data acquisition and the various methods for viewing data acquisition results.

1. Ensure the device is added and configured.
2. On the **Home** menu, Click **Start** to start the data acquisition. The software will configure the unit based on the specified settings.
3. Navigate to the Dashboard for real time visualization. The default chart screen will be displayed as shown in Figure 26.

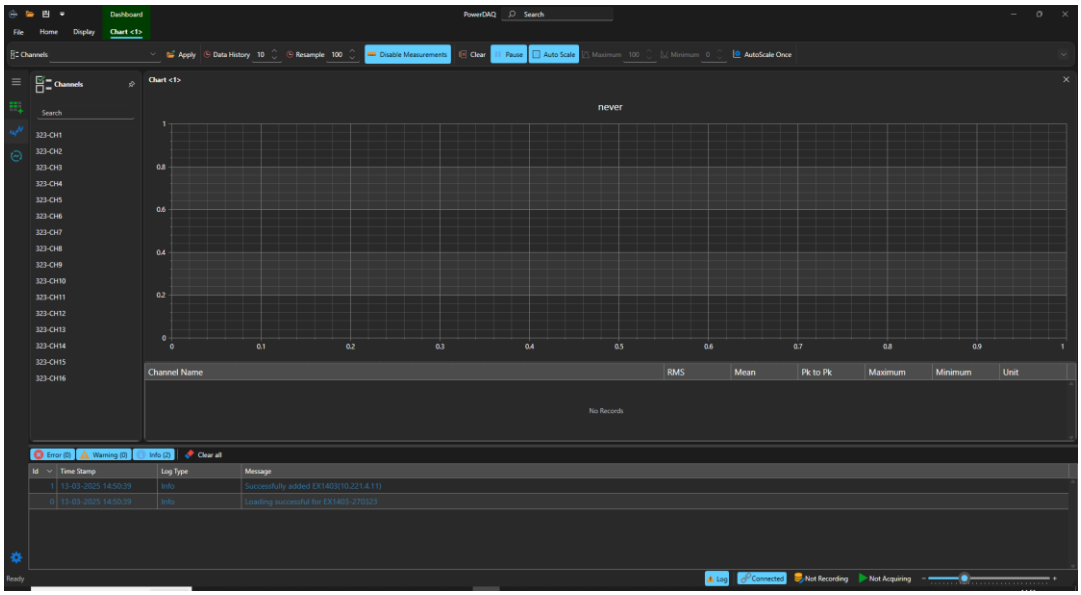


Figure 26. Default Chart

4. Select the preferred channel/s from the **Channels** drop-down available on the **Chart<1>** tab as shown in Figure 27. Click **OK** to apply.

Note: You can also apply visualization by dragging and dropping a channel from the Channels menu onto a chart.

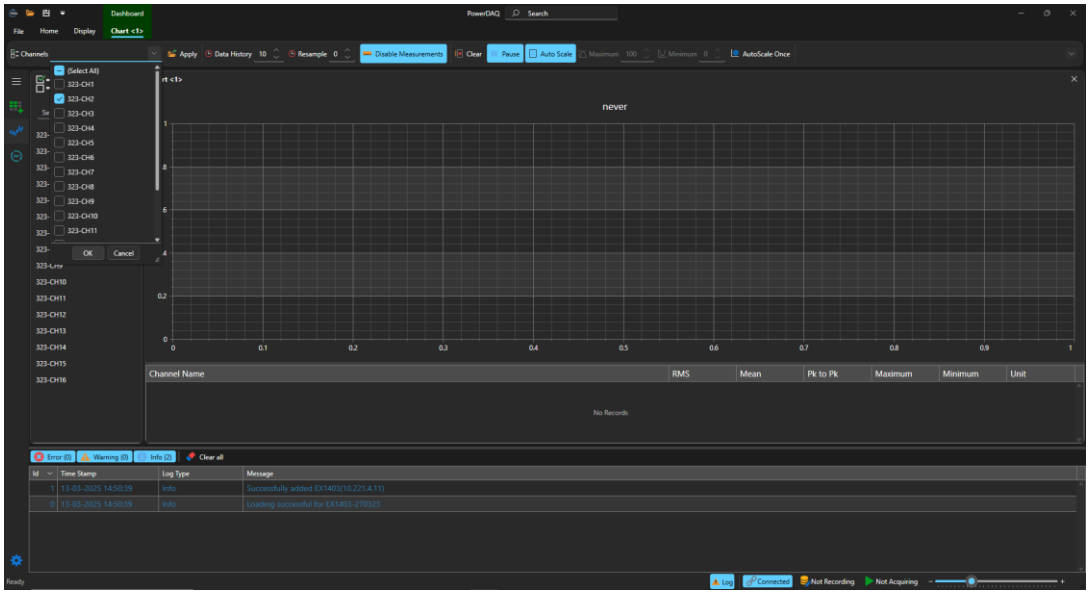


Figure 27. Channel Drop-down

5. A table below the chart displays the following real-time values. Refer to the Figure 28.
    - RMS, Mean, Median, Pk-Pk, Maximum, Minimum.
6. Click the "Disable Measurements" button to hide the measurements below the chart.

Figure 28. Table with Data Acquistion Values

7. Pausing the plotting by clicking the **Pause** button on the **Chart<1>** tab will allow you to analyze the graph. You can zoom in on the graph using the following methods:

8. Zoom in on the graph using the mouse wheel control.
9. Zoom in on the graph using the keyboard shift key and select a rectangular area with the mouse. Refer to Figure 29.

Figure 29. Zoom in on Data

RECORDING THE PLOT

This section describes how to record and save acquired data. You can also play back recorded data. See Playback Recording for more information.

1. Click the **Record** button on the **Chart<1>** to start recording the data. Refer to Figure 30.

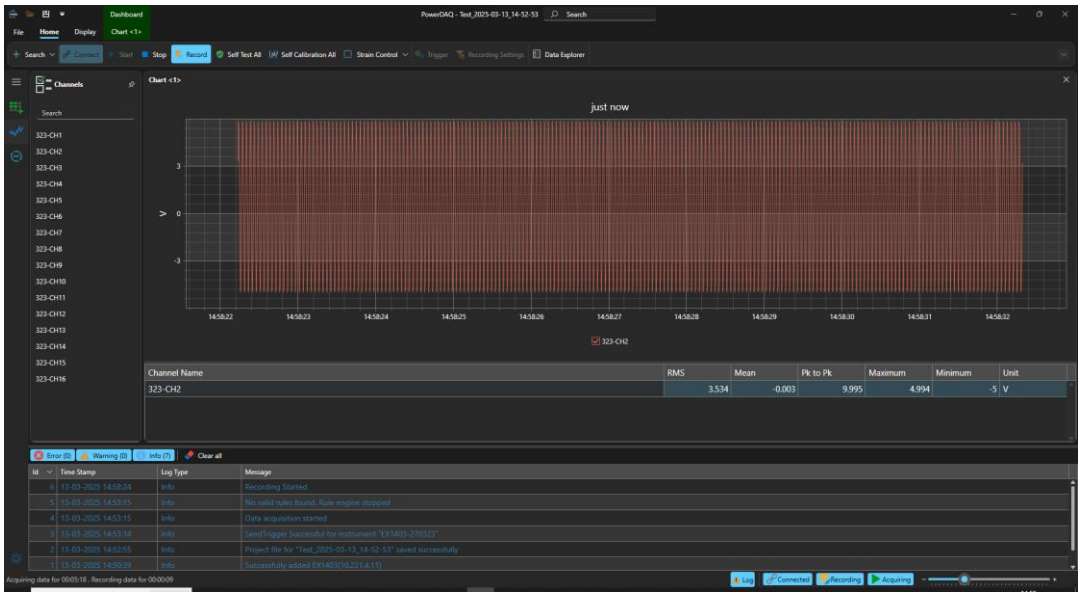


Figure 30. Record Data

2. To explore the recorded data, stop recording by clicking the **Record** button again or by clicking the **Stop** button.
3. View the recorded data by clicking the **Data Explorer** option on the Dashboard. Refer to Figure 31.

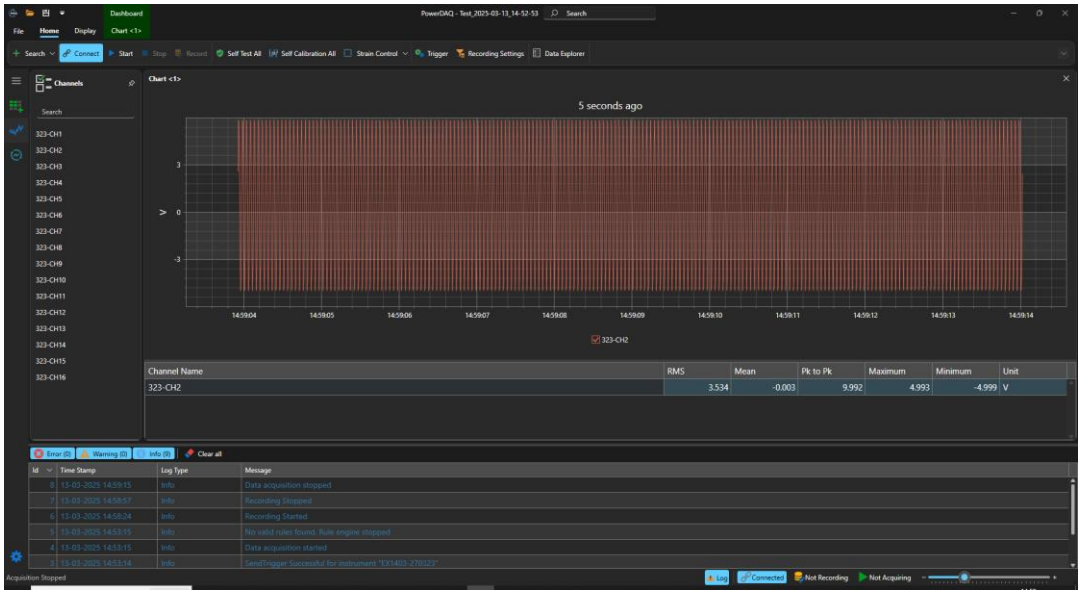


Figure 31. Data Explorer Button

4. On the **Data Explorer** screen (Figure 32), select the recording from the column that contains the project and its recording details.

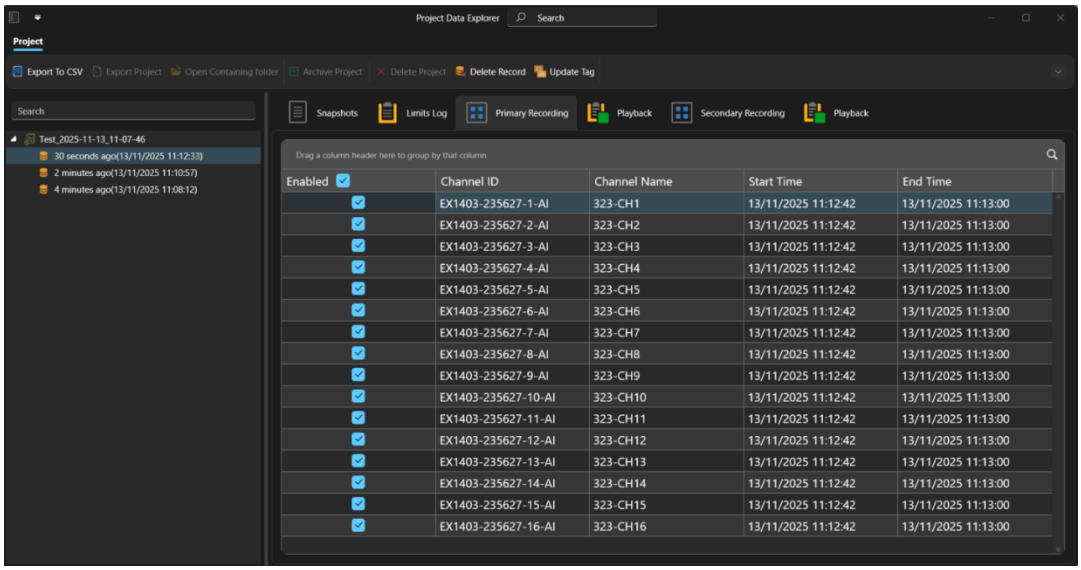


Figure 32. Data Explorer Screen

5. The data acquisition should be stopped prior to exporting the data. Select the preferred channels and click on the **Export to CSV** button. Refer to Figure 33.
6. The file save dialog will ask for a location and file name.
7. The export dialog will save a CSV file in the selected location.

8. You can review the data using a text editor or Excel.

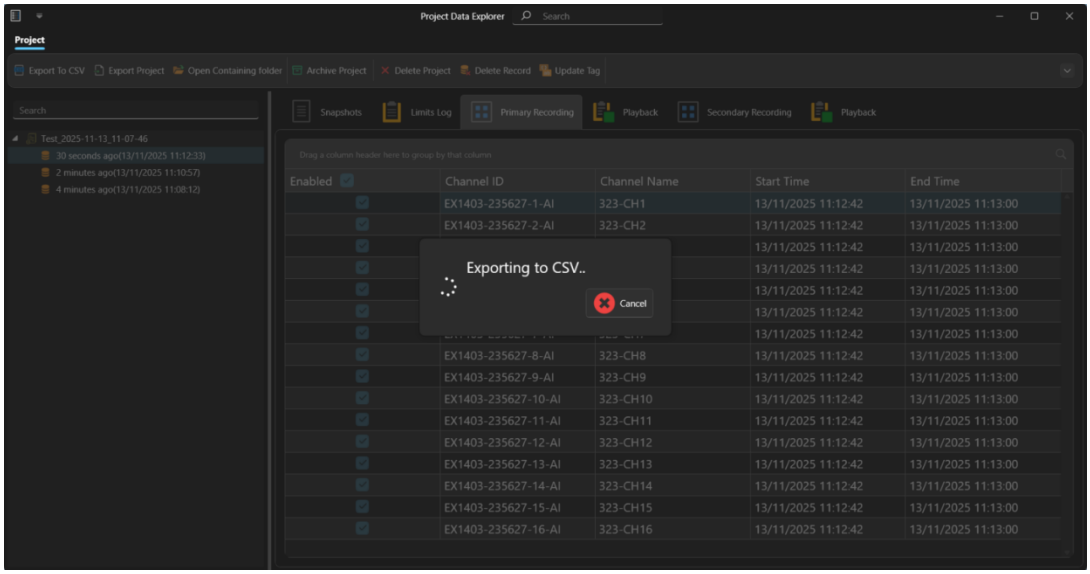


Figure 33. Exporting Data

SPECIAL FEATURES

SELF TEST ALL

The Self Test All function verifies that all internal critical voltages are within specified limits such as power source (POE vs. AUX), power supply voltages, calibration reference voltages, excitation voltages, calibration date, internal PCB temperature, and fan speed of all connected devices. Clicking the Self Test All button on the Home menu will display the window shown in Figure 34. The self-test result is displayed on the **Instrument Configuration Summary** screen.

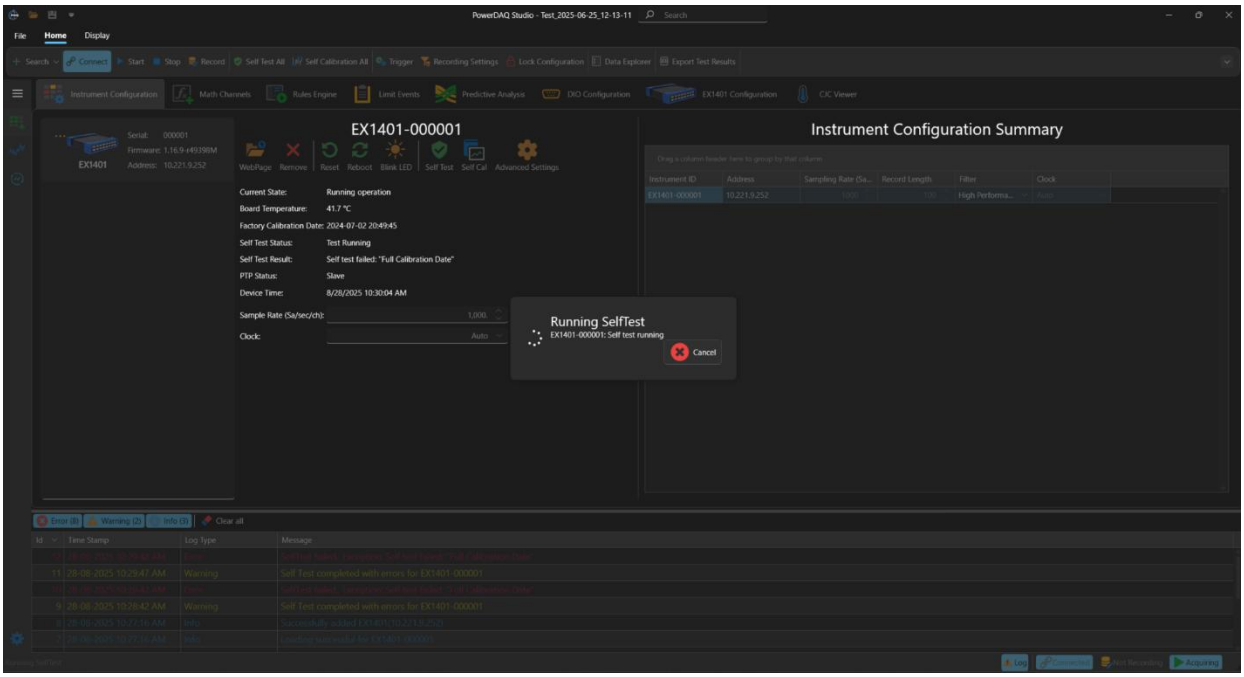


Figure 34. Self Test All Window

SELF CALIBRATION ALL

The Self Calibration All function calibrates all the connected devices. Clicking on the Self Calibration All button on the Home menu, will display the window shown in Figure 35. The calibration result is displayed in **Instrument Configuration Summary** screen.

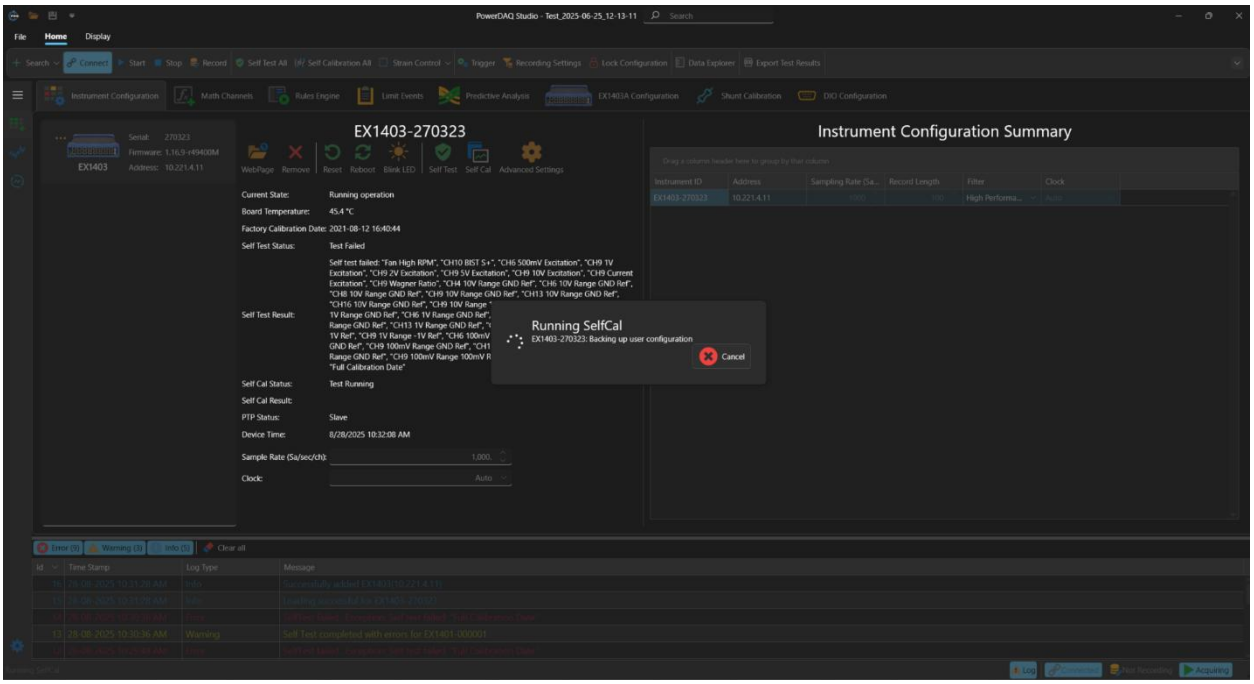


Figure 35. Self Calibration All Window

LOCK CONFIGURATION

The Lock Configuration function allows you to secure project configurations with a password. Editing is restricted until the configuration is unlocked. Clicking on the Lock Configuration button on the Home menu, will display the window shown in Figure 36.

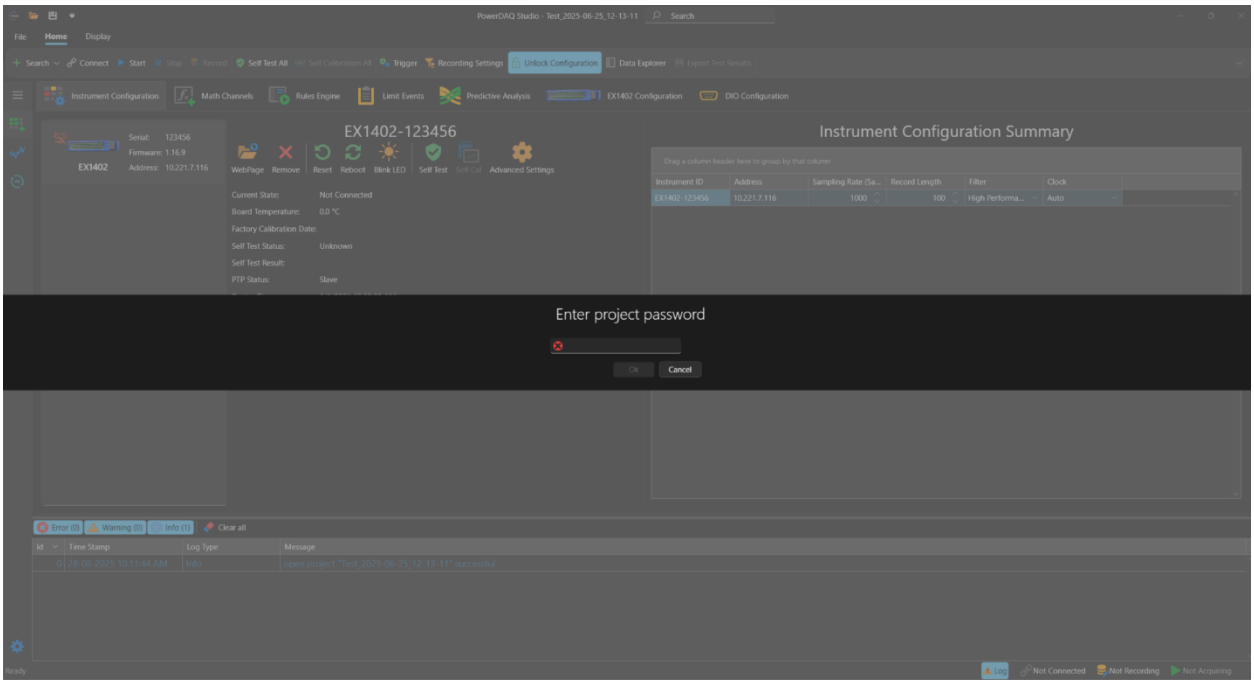


Figure 36. Lock Configuration

STRAIN CONTROL

The Strain Control function allows control of various strain gauge functions. Clicking on the Strain Control button on the Home Menu will display the functions shown in Figure 37. Note that these functions are only applied when "Operation Enabled" is checked on the EX1403 Configuration Menu.

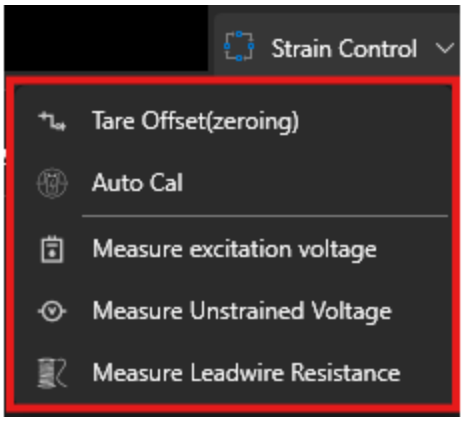


Figure 37. Strain Control

TRIGGER

The Trigger function allows configuration of trigger settings for the project. To access the Trigger function, click on the Trigger button on the Home menu. See Figure 38. You must select the master instrument and apply a trigger source from the drop-down list. Use the mouse scroll button to view the complete list.

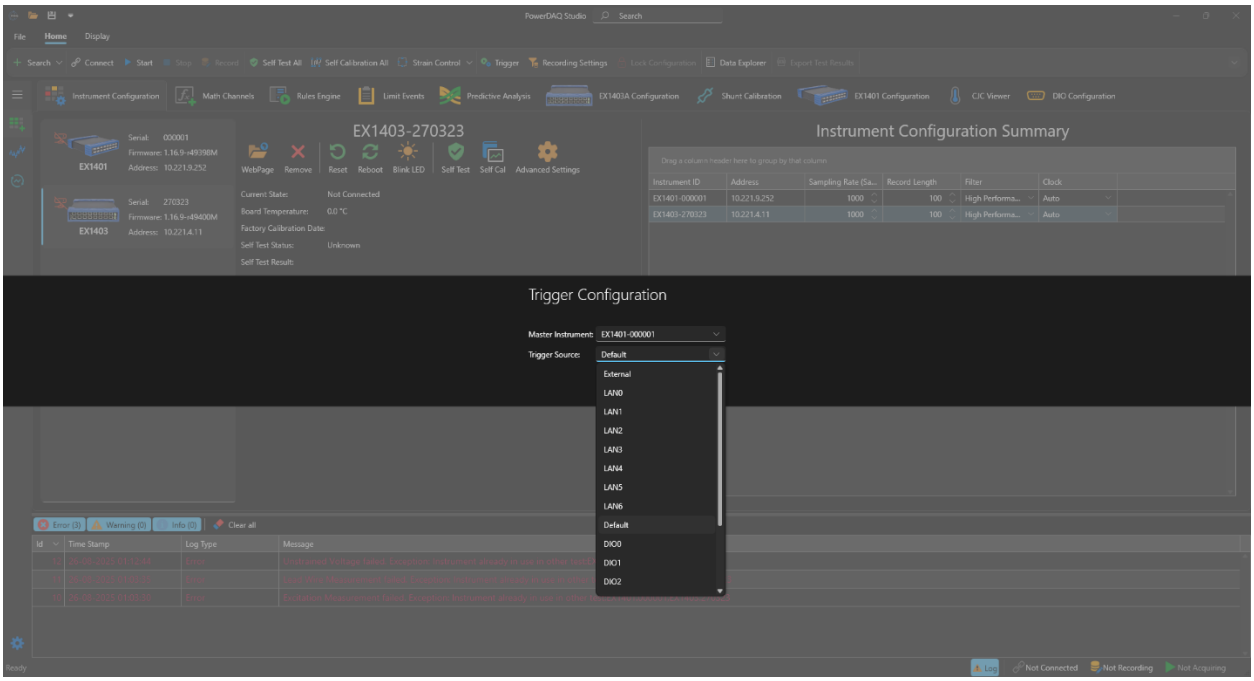


Figure 38. Trigger Configuraton

RECORDING SETTINGS

This function allows configuration of the recording settings for primary (Figure 39) and secondary (Figure 40) storage. This includes Enable File Rotate, Use Record Time, Time per File, Maximum Number of files to Create, and Resample Rate. Storage locations can include internal storage or external storage such as a USB drive.

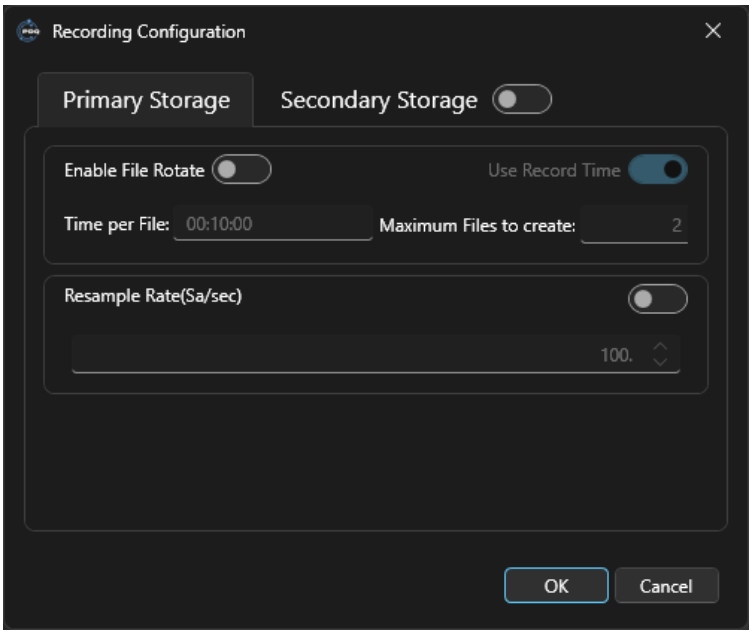


Figure 39. Recording Configuraton (Primary Storage)

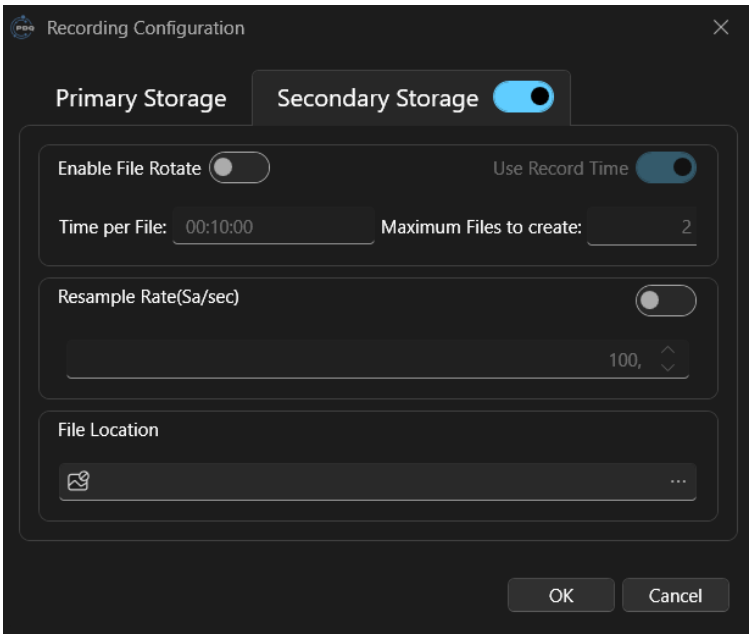


Figure 40. Recording Configuraton (Secondary Storage)

EXPORT TEST RESULTS

The Export Test Results button allows the exporting of the self-test results in text format (.txt). When the Export Test Results button is selected, the Export Test Results window will be displayed.

DATA EXPLORER

The Data Explorer function allows you to view and export records, the limits log, snapshots, and play back recordings from the project. When the Data Explorer button is selected on the Home menu, the window in Figure 41 is displayed.

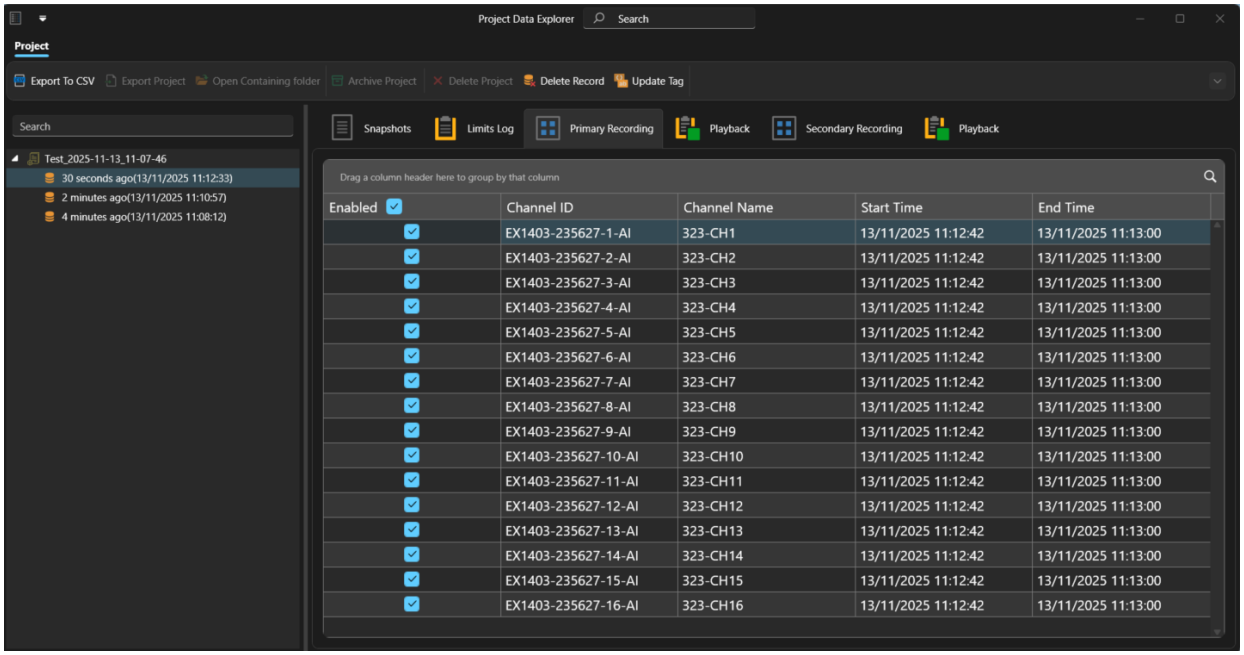


Figure 41. Data Explorer

PLAYBACK RECORDING

The Playback feature in the Data Explorer menu allows users to review recorded data files interactively by selecting a recording file from a project. Selecting the Playback tab allows the recording to be played back for analysis and visualize the data over time. Figure 42 provides an example of the Playback Recording feature. During playback users can:

- redefine the dashboard view to customize how data is displayed
- adjust the playback speed to review data faster or slower
- pause the chart and zoom in to look at specific data points
- set markers to highlight important values.

Figure 42. Playback Recording

MATH FUNCTIONS

PowerDAQ Studio supports the algebra and math functions listed in Table 6.

Table 6. PowerDAQ Studio Math Functions

RMS(x)	Median(x)	Tan(x)	Sqrt(x)
Average(x)	Abs(x)	Asin(x)	Pow(x, m)
Max(x)	Sin(x)	Acos(x)	PI(TT)
Min(x)	Cos(x)	Atan(x)	

Configuring Math Functions

The following steps can be used to configure PowerDAQ Studio math functions.

1. Select the Math Channels tab on the Configuration page.
2. Click the New button to configure the math function for the preferred channels.
3. Fill in the fields with appropriate values.
4. You can configure the Resample value to resample the acquired samples.
5. To perform the math operation for the preferred channels, select the math function in the Equation field.
6. Select the physical channel in the variable configuration section.
7. You can change the default name of the variable and the default name of the configuration.
8. The configuration status should be valid.
9. You can configure the min value, max value, digits of precision, warning limits, and alarming limits for the math function. Refer to Figure 43.

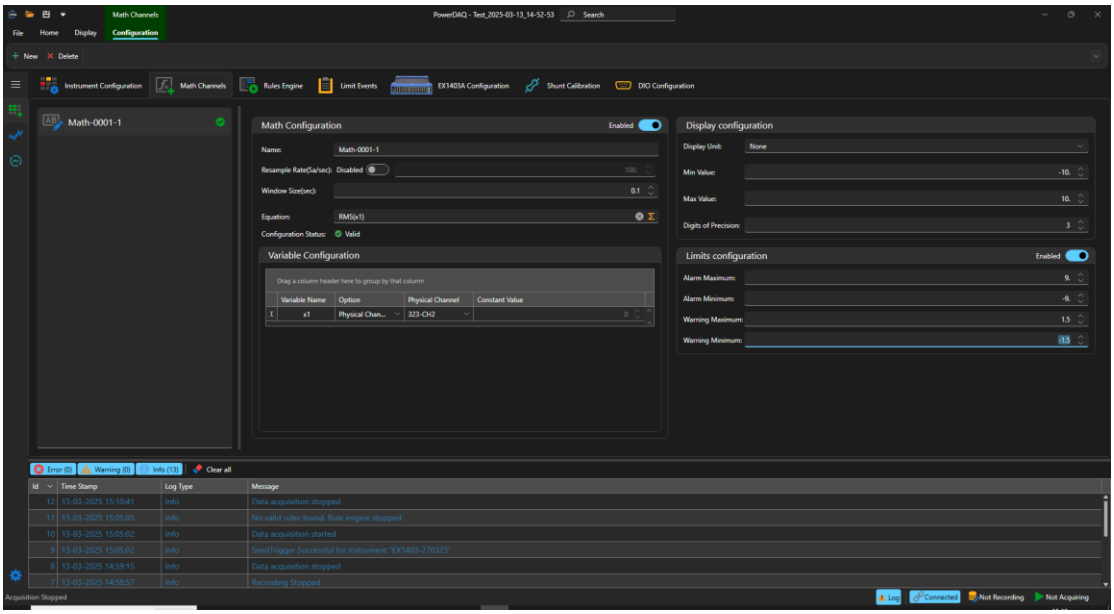


Figure 43. Math Channel Configuration

Executing Math Functions

The following steps describe how to execute the configured math functions.

1. Start the data acquisition by clicking the **Start** button on the Home Menu.
2. Go to the Dashboard and add a chart.
3. Add the configured physical channel and math function listed in the channels drop-down. Set Data History to a sufficient value. Click the **Apply** button. Refer to Figure 44.

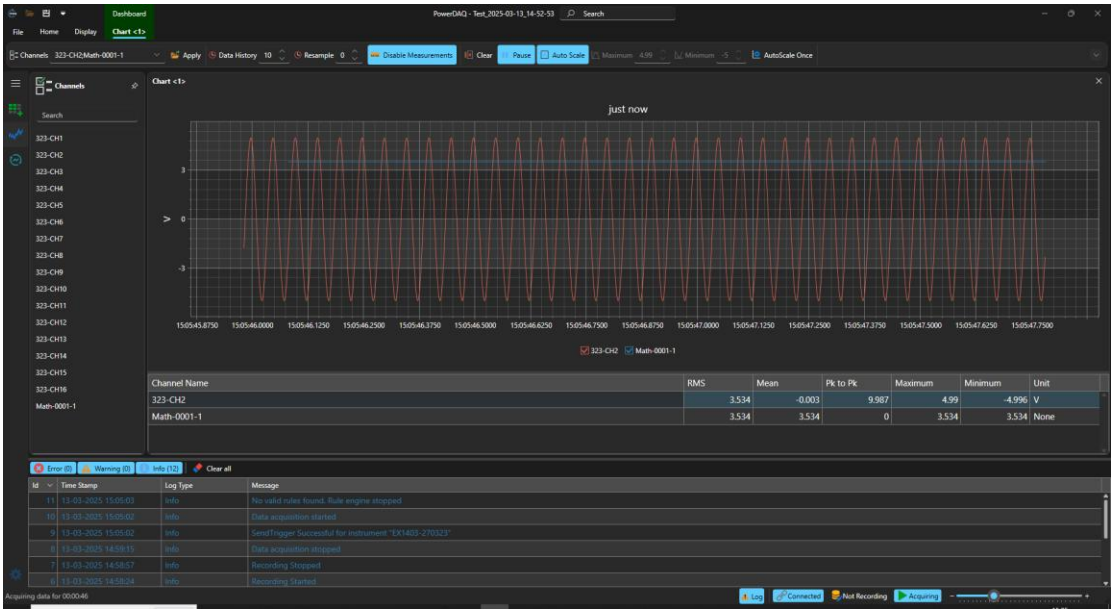


Figure 44. Acquiring Data with Math Channel

4. The chart will start plotting the actual data as well as the configured math channel.
5. The red represents actual data, whereas the blue represents the configured math function.

LIMIT EVENTS

The Limit Events function allows you to monitor predefined thresholds for each measurement channel. When a measured value reaches or exceeds the configured maximum or minimum limit, the system automatically triggers an alarm and emits a warning sound to alert the user. To apply limits, the user must ensure that “Limit Events” is enabled in Instrument Configuration. This feature helps ensure that critical parameters remain within safe operating ranges. All active limit events are displayed in the Limit Events section, where users can review the triggered conditions. Refer to Figure 45.

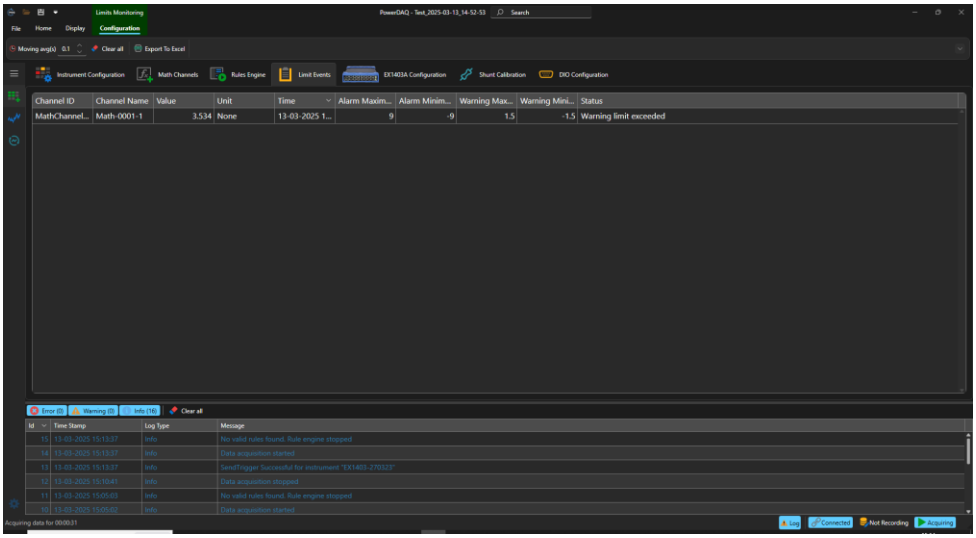


Figure 45. Limit Events Tab

DISPLAYS

PowerDAQ Studio provides a variety of data viewing widgets including charts, FFT charts, tables, numeric displays, gauges, and sliders that help users visualize and analyze acquired data effectively. You can add up to four widgets. The widgets can be resized using the Zoom Control Bar, located in the lower-right corner of the display. Refer to Figure 46.

Figure 46. Power DAQ Studio Widgets

RULES ENGINE

The PowerDAQ Studio Rules Engine allows you to combine monitoring and trigger options. You can monitor channel limits, channel values, application state changes, and periodic timing sources. Available trigger options include digital output, instrument operation, snapshot, application, and sound output.

An example of how to configure the rules engine is provided in the following steps:

1. Navigate to the **Configuration** menu.
2. Select the **Rule Engine** tab to display the default rules engine page (Figure 47).

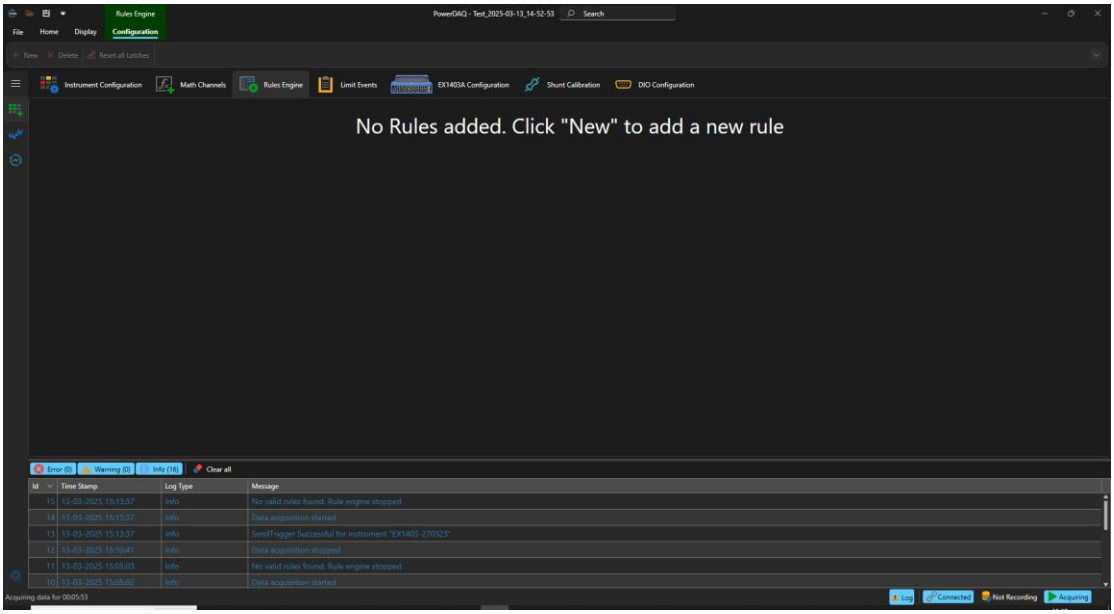


Figure 47. Default Rules Engine Page

3. Click on the **New** button to create a new rule.
4. Add a **monitor and trigger options** for a rule. Refer to Figure 48, Figure 49, and Figure 50. Monitoring and trigger options can be combined.

   Available monitor options are:

   - Monitor channel value
   - Monitor channel value limits
   - Monitor Digital input channels
   - Monitor application state change
   - Periodic Timing source (based on relative time from the PC time)

   Available trigger options are:

   - Trigger Digital Output
   - Trigger Instrument Operation
   - Take snapshot

- Trigger application
- Trigger Sound Output

5. Figure 48 and Figure 49 show an example of the **Monitor channel value** option with the **Take snapshot** trigger option**.**

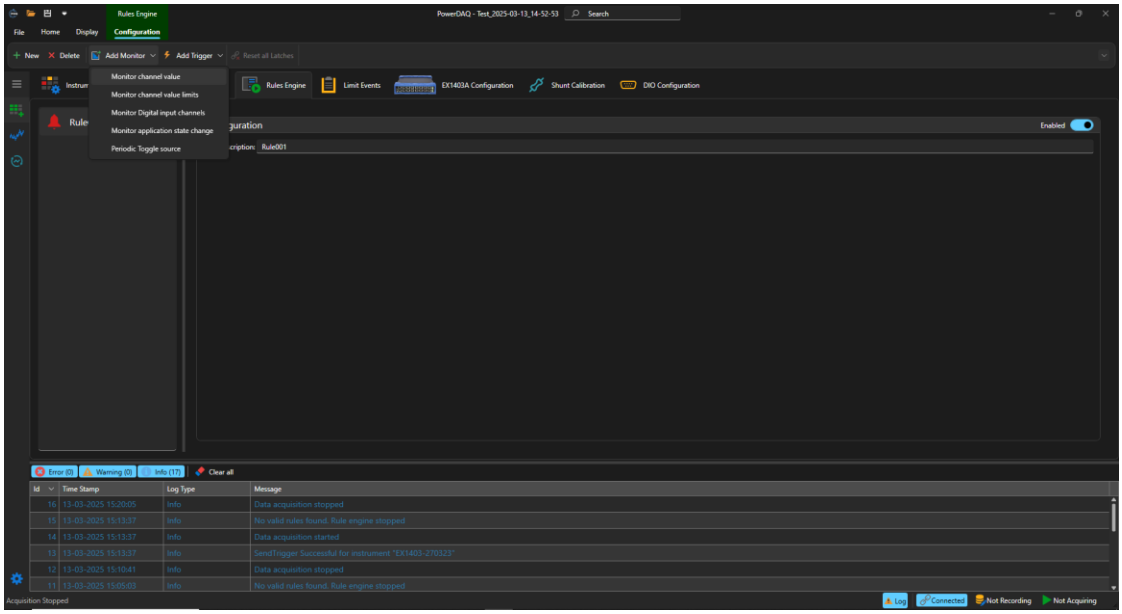


Figure 48. Add Monitor

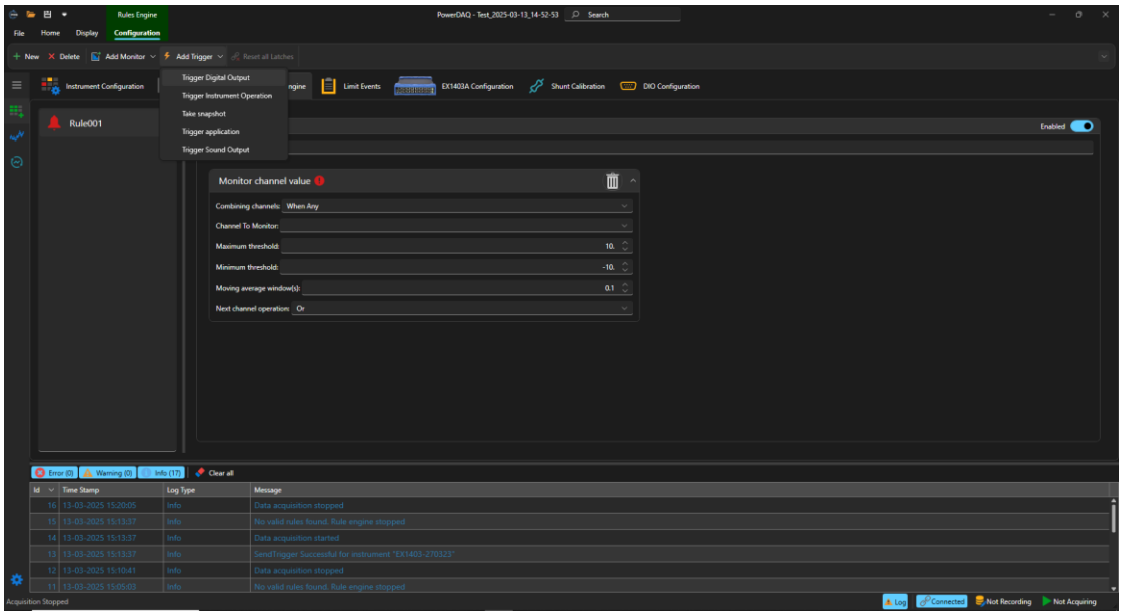


Figure 49. Add Trigger

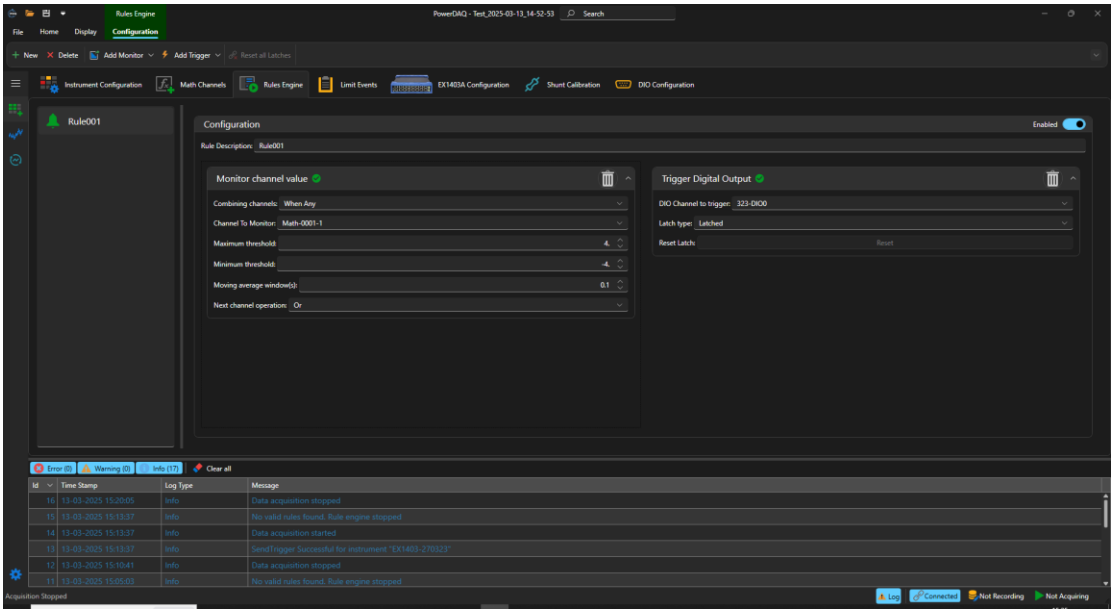


Figure 50. Configured Rules Engine

6. Here the DIO0 is configured as output, and it will be triggered if the value of the measurement is not following the rules created in the rule engine.

PREDICTIVE ANALYSIS

The Predictive Analysis section allows users to predict, configure, and analyze measured data over time. The Configuration tab includes options such as predictive name, display unit, trigger type (immediate /rule based), start delay, samples rate, and sample count. You can create, delete, export, and import a table. Refer to Figure 51.

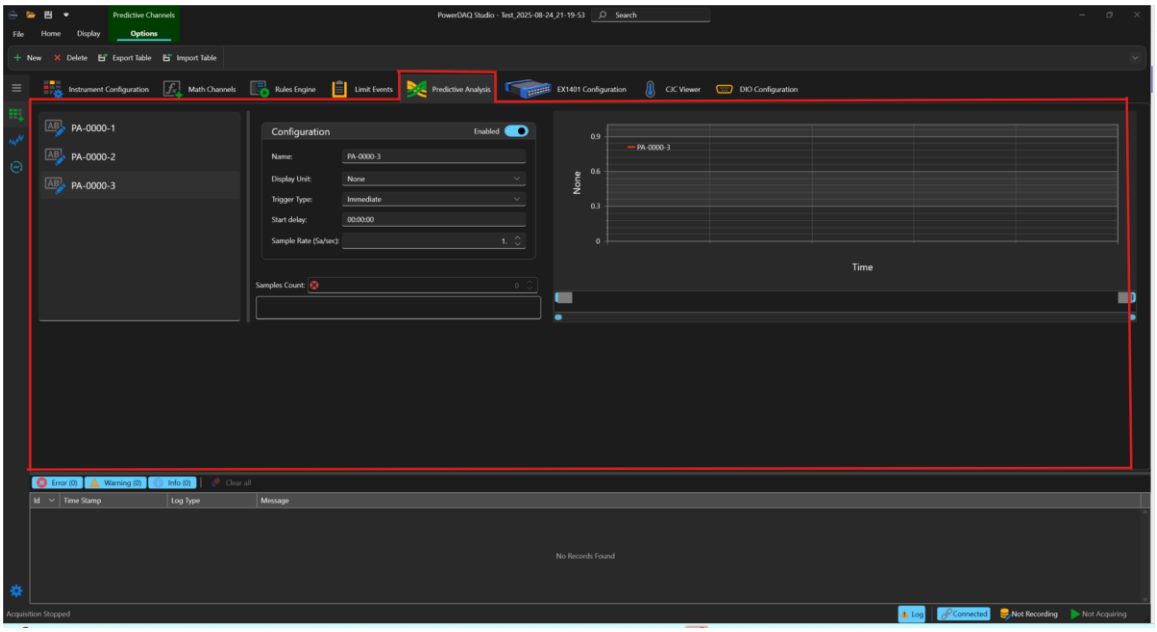


Figure 51. Predictive Analysis Tab

DIO CONFIGURATION

The DIO Configuration tab displays the instrument ID and channel ID of the connected devices and allows the user to configure output types for each channel. Refer to Figure 52. The number of channels may vary depending upon the measured instrument. The digital I/O port on the rear panel of the instrument can be used for various functions, such as arm/trigger source, for presentation of limit evaluation information, and as a general-purpose input/output device.

As a general-purpose output device, each DIO channel can be independently programmed with regards to its output functionality and its logic state, when enabled as an output. When not enabled as an output, a channel becomes tri-stated, preventing conflict with other potential voltage drivers. Refer to the port's electrical specifications for voltage tolerance limits and output drive capabilities. Regardless of output functionality, each channel provides constant input functionality. That is, the input level on each channel can be accessed without a specific enabling function call.

It is also possible for the DIO data to be acquired and reported along with the analog channel data. Unless linked to a limit condition, as discussed below, the DIO port's operation is completely autonomous.

The default selections for each DIO channel are:

- Output enable is off
- Output level is 0

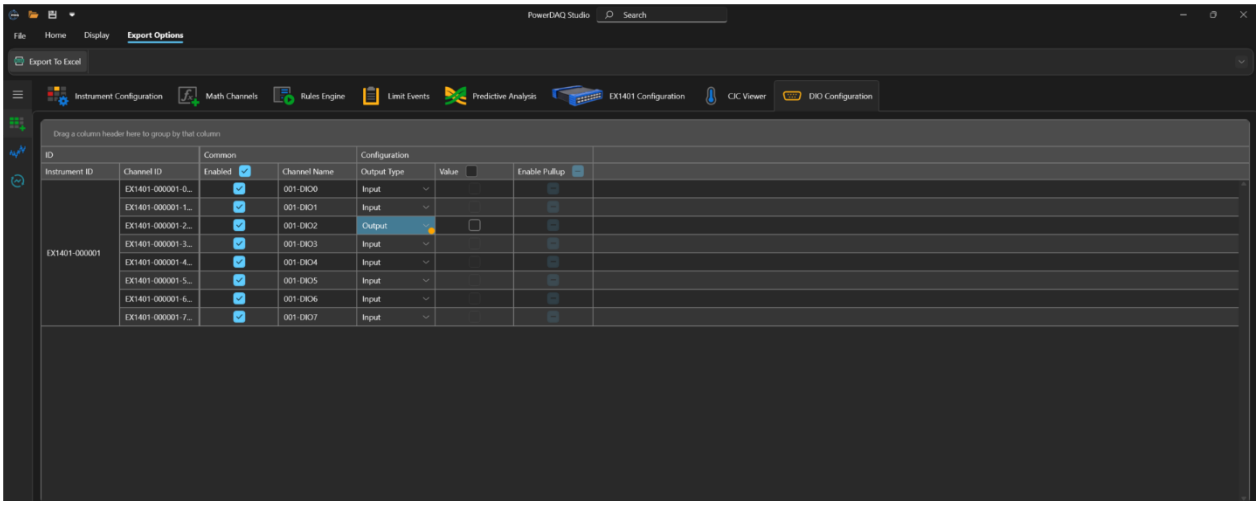


Figure 52. DIO Configuration Tab

TRANSDUCERS PAGE

The Transducers function provides the ability to create, configure, delete, and save transducer configurations, limits, and specifications. In the transducer configuration section, you can set the input unit, output unit, and transducer type (Linear, Polynomial, Lookup, Load Cell, Ratiometric). The transducer limits section defines the maximum and minimum input and output values. In the transducer specification section, the user can set gain and offset values or enable/disable the auto-calculation toggle option. Based on these settings, a graph is generated in the graph preview section located on the right side of the display. See Figure 53.

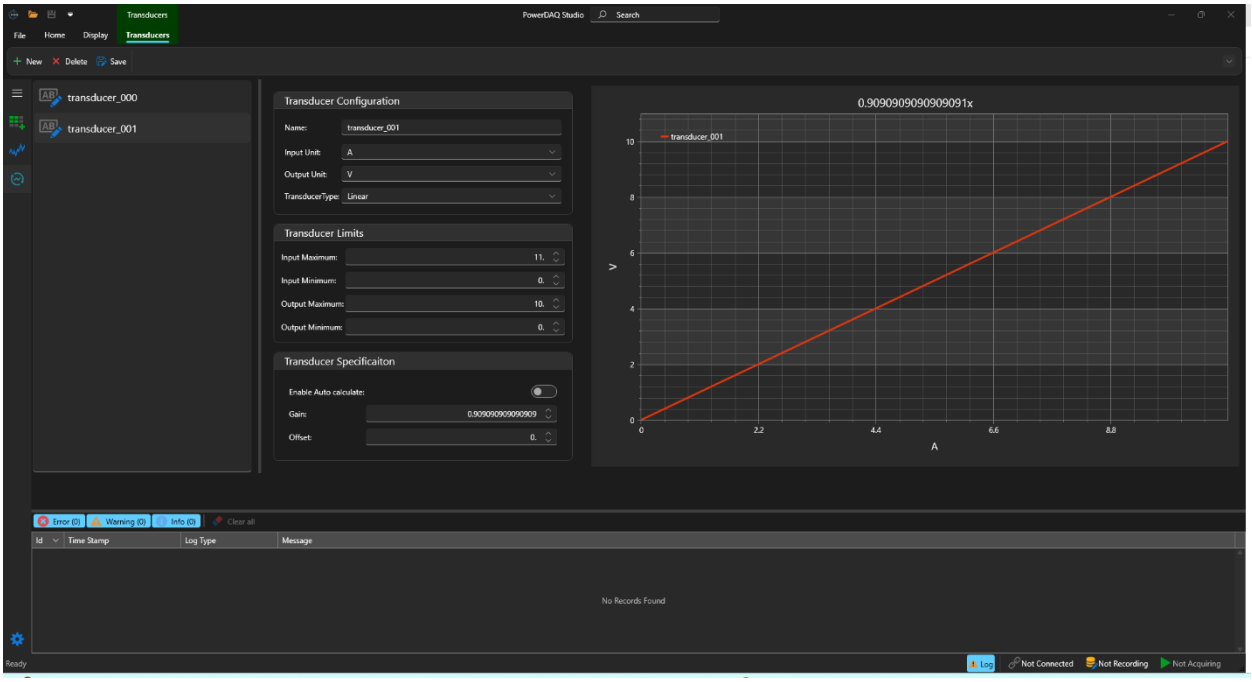


Figure 53. Transducers Tab

CJC VIEWER

CJC configuration allows monitoring of predefined thresholds for each measurement channel. When a measured value reaches the configured maximum or minimum limit, the system automatically triggers an alarm and emits a warning sound to alert the user. All CJC value events are displayed on the CJC Viewer tab shown in Figure 54. Note that CJC reporting must be enabled on the channel configuration tab for the instrument.

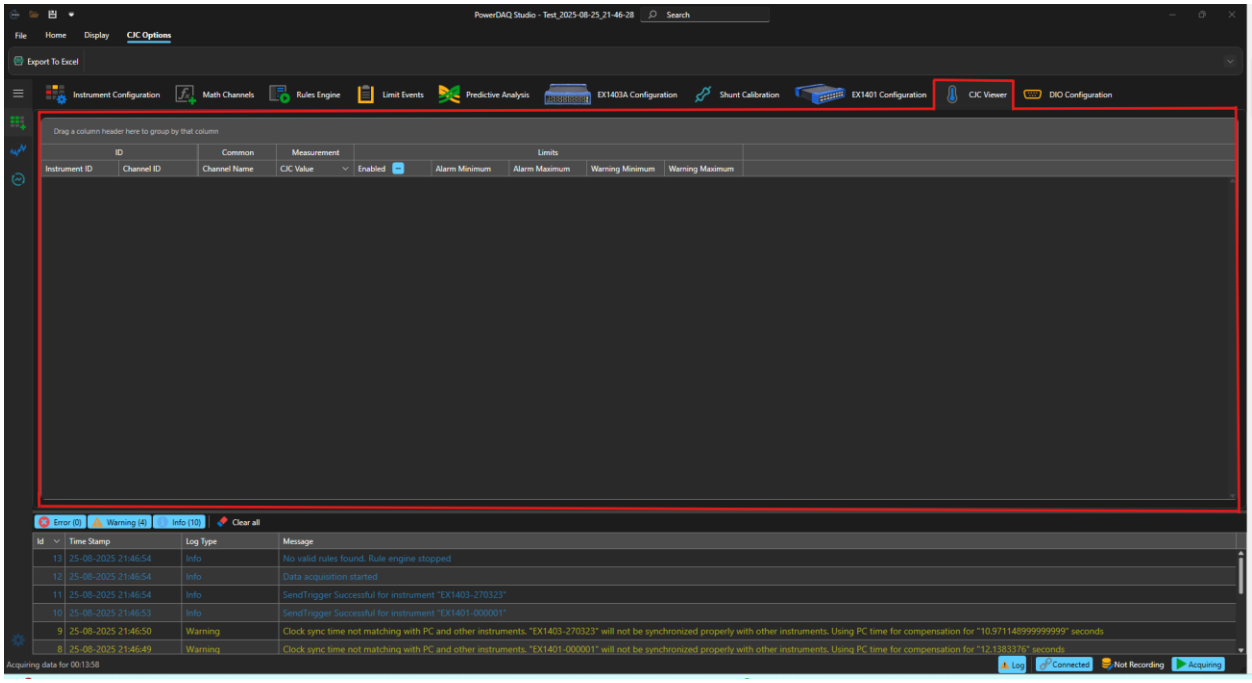


Figure 54. CJC Viewer Tab

SHUNT CALIBRATION

Shunt calibration allows the monitoring of shunt measurement parameters such as Time, Shunt OFF, Shunt ON, Shunt Offset Previous, Shunt Offset Difference, Shunt Calibration Gain, Gain Status, and Offset Status. It also supports predefined limits for each measurement channel, including Shunt Offset High, Shunt Offset Low, and Shunt Calibration Gain Limit (%). You can also apply filters to the displayed values. The Shunt Calibration tab is shown in Figure 55.

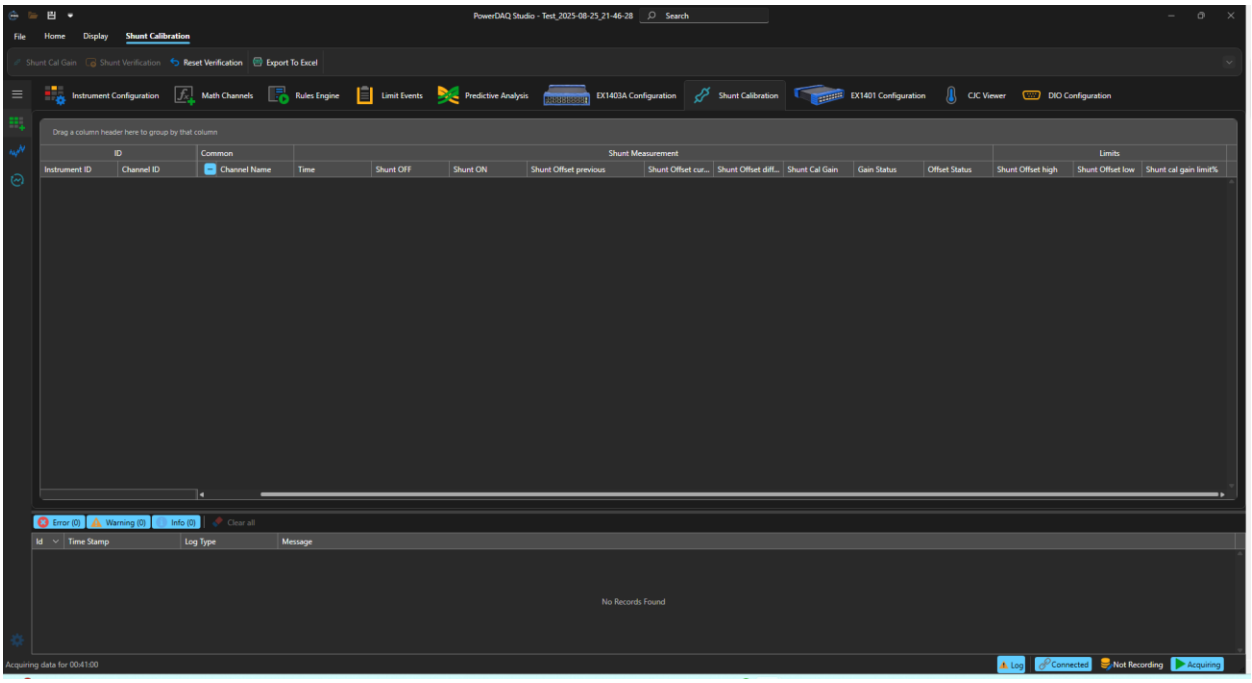


Figure 55. Shunt Calibration Tab

Note: When instruments are added to the project, the corresponding instrument configuration tab appears on the menu bar, allowing configuration of the device. Figure 56 shows the location of the configuration tabs for the EX1403 and EX1401. Figure 57 shows the full configuration screen for the EX1403.

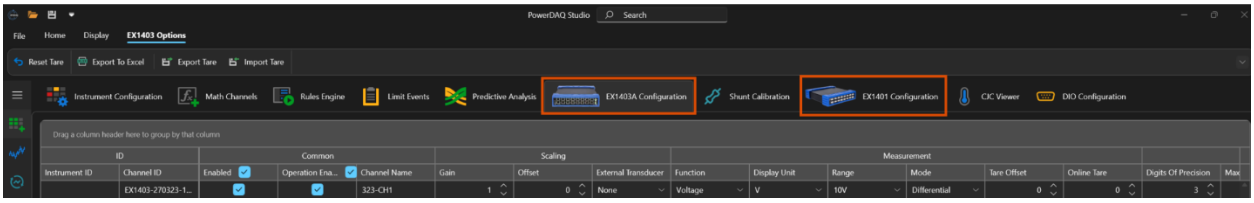


Figure 56. Location of Instrument Configuration Tabs

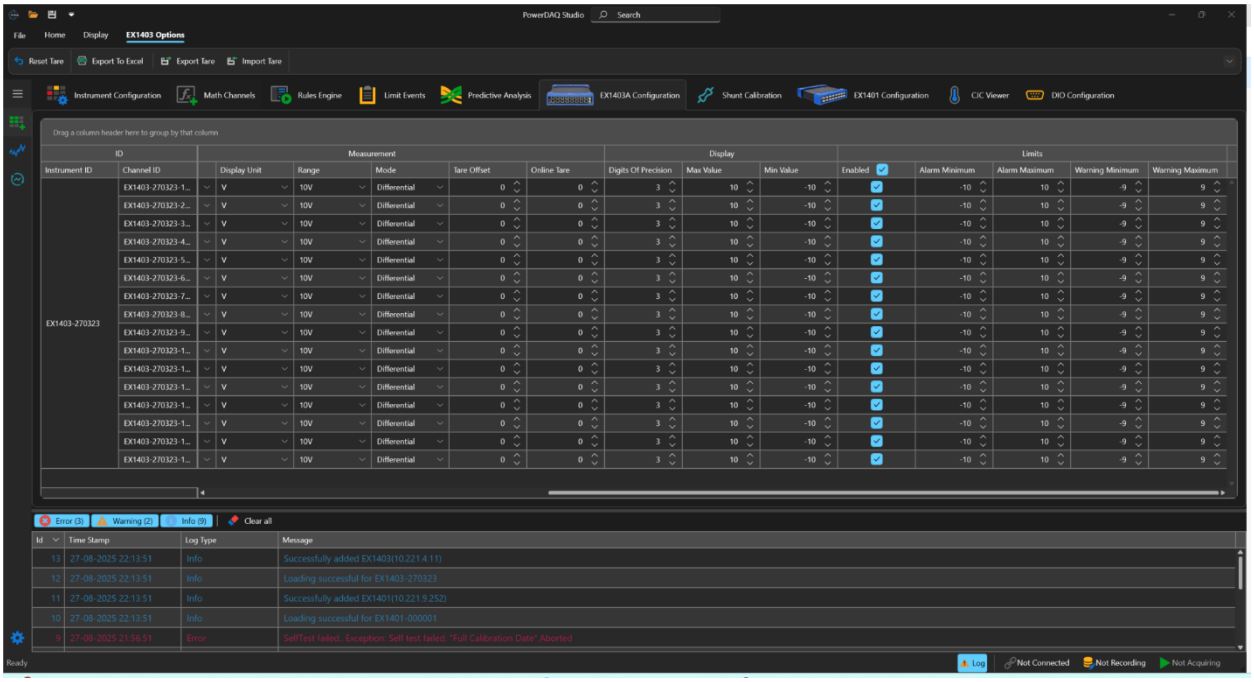


Figure 57. EX1403 Configuration Screen

VTI INSTRUMENTS SUPPORT

PowerDAQ Studio (part number 72-5169-000) is free of charge. Please contact VTI Instruments Support at vti.support@ametek.com for more information on PowerDAQ Studio.