PowerDAQ Studio Datasheet

PowerDAQ Studio

Full-Featured, Enterprise-Ready Data Acquisition Software

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. It is optimized for high-performance and specialty testing applications.

Specialty Applications

- 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

Overview

Why Build What PowerDAQ Already Delivers?

Modular Flexibility That Grows With You

This modular architecture is a key part of PowerDAQ Studio's flexibility, allowing users to tailor the software to their specific application needs without committing to a full enterprise license. Whether you're scaling up for complex testing or adding targeted functionality, PowerDAQ Studio adapts to your workflow—efficiently and cost-effectively.

Combined Dynamic and Static Measurements

PowerDAQ Studio supports multiple driver sessions and simultaneous configuration of diverse instruments, making it ideal for complex test environments. Whether you're acquiring high-speed vibration data or low-speed temperature and strain measurements, PowerDAQ Studio provides a unified platform for managing it all.

- Supports EMX digitizers, EX10xxA, EX1200, and EX1400 series
- Enables real-time acquisition and visualization across multiple instruments
- Allows independent sampling rates and custom configurations
- Ideal for applications like engine testing, Highly Accelerated Life Testing (HALT)/Highly Accelerated Stress Screening (HASS) battery testing, and structural monitoring

This flexibility makes PowerDAQ Studio a powerful, scalable solution for enterprise-wide deployment across a wide range of test and measurement applications.

Application-Specific Capabilities

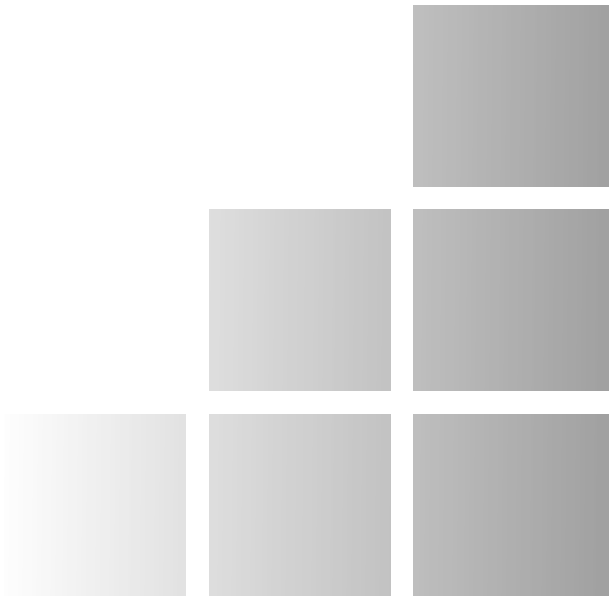
- Industrial Automation (OPC UA, modbus)
- Predictive Analysis
- Custom Transducer Libraries
- Multi-format Data Export (CSV, HDF5, MATLAB)
- Client Display for Distributed Visualization
- Shunt calibration & strain control
- CJC monitoring

Time is Valuable

PowerDAQ reduces the guesswork behind system startup, acquisition and analysis by delivering complete turn-key operation that eliminates time-consuming learning curves and software development delays, ensuring that tests are performed on time with accurate, repeatable results. If VTI data acquisition instruments are powered up and connected to your PC, PowerDAQ will automatically identify those resources for you.

- Eliminate costly application programming
- No need to qualify custom software
- No software debugging
- Simplify training
- Long-term software support

If your instruments are powered and network-connected, PowerDAQ Studio will automatically detect and configure them, saving hours of manual setup and reducing the risk of errors. With real-time visualization, predictive analysis, and flexible export options, PowerDAQ Studio helps ensure your tests are completed on time—with confidence.



PowerDAQ Studio: Features Overview

Setup & Configuration

Figure 1: Instrument Configuration

Quick setup via auto-search or manual IP ensures fast instruments detection and addition, with ease management of instrument settings such as sampling rate, clock rate, record length, digital filter and seamless monitoring, verification and control.

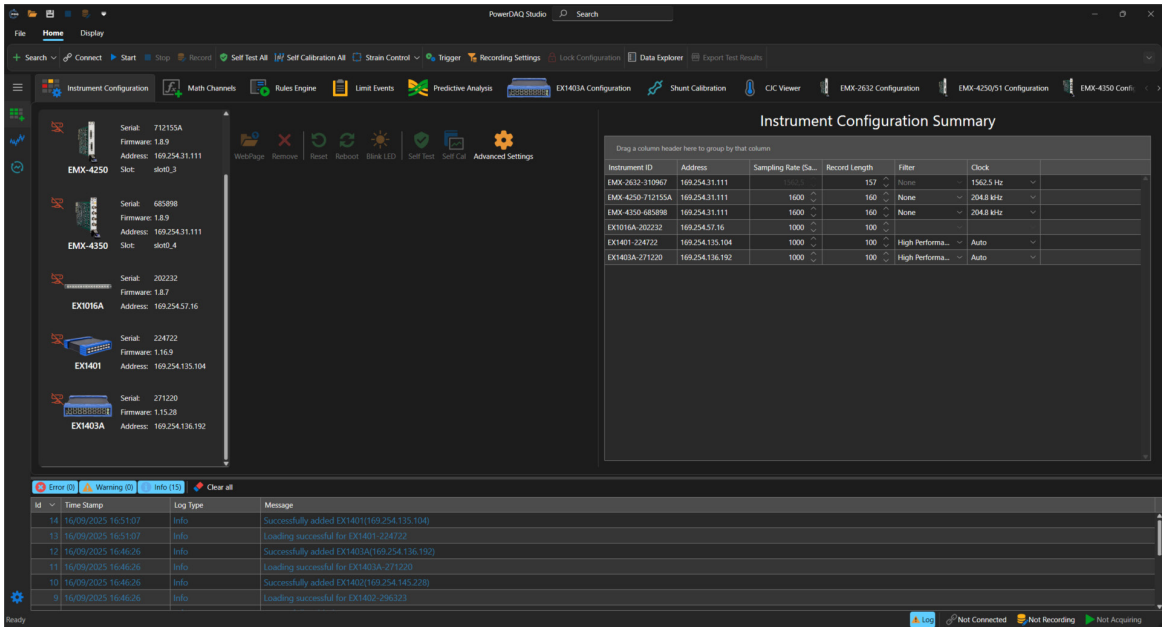


Figure 1: Instrument Configuration

Figure 2: Channel Configuration

Channel groupings to ease management of large channel counts, with the option to manage the channels' configuration, such as gain/offset, function and limits, through spreadsheet. Users can also save time by completing test setups offline without the instrument.

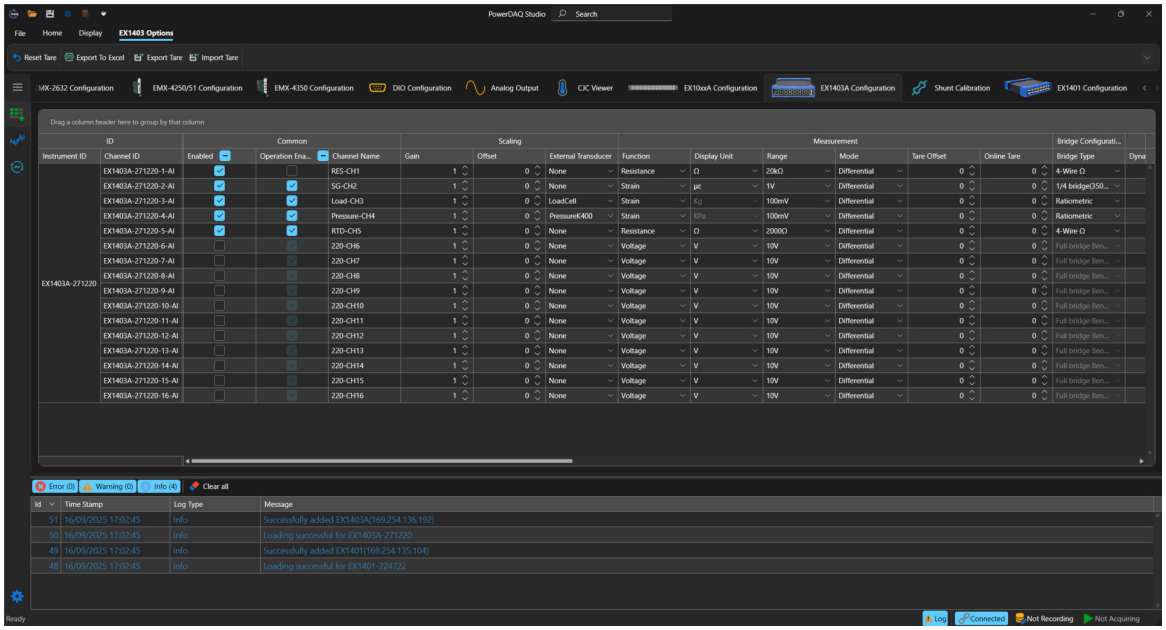


Figure 2: Channel Configuration

PowerDAQ Studio: Features Overview

Setup & Configuration (cont.)

Figure 3: DIO Configuration

The DIO Configuration tab allows users to define output types and logic states for each digital I/O channel. Channels can be used for arm/trigger sources, limit evaluation, or general-purpose I/O.

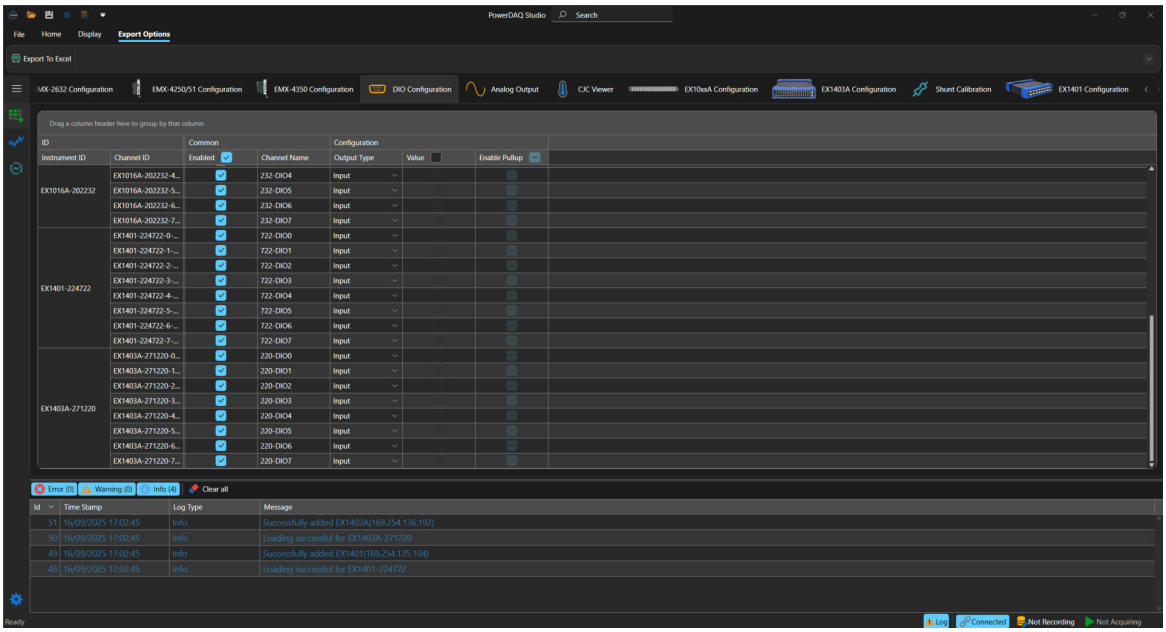


Figure 3: DIO Configuration

Data Processing & Analysis

Figure 4: Math Channel Configuration

Math channels can be created by performing operations on individual channels or combinations of channels. This feature is a powerful tool for data analysis and for configuring control mechanisms. PowerDAQ includes standard algorithms, such as those required to set up Rosettes.

Math channels can be configured with resample rate, resolution, and warning/alarm limits. They are displayed alongside physical channels during data acquisition.

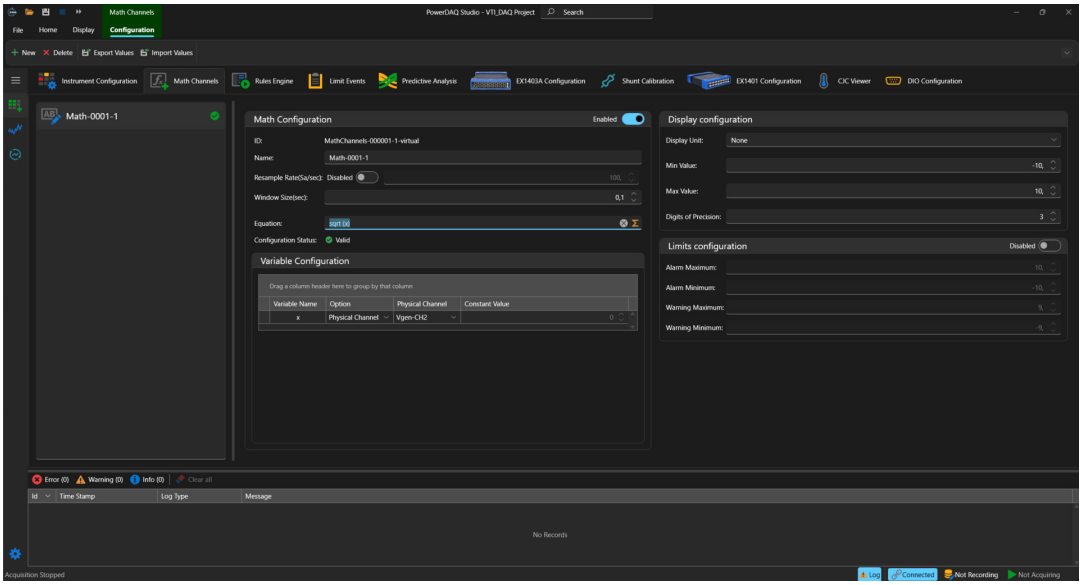


Figure 4: Math Channel Configuration

PowerDAQ Studio: Features Overview
Data Processing & Analysis (cont.)

Figure 5: Rules Engine Configuration

Event-driven signals can be generated on digital output channels to trigger external devices based on acquired data values, predefined system events, or time intervals.

Digital input channels can also be configured to read event-driven signals, allowing conditional actions to be initiated based on externally generated triggers—such as starting or stopping a recording, or capturing a snapshot of data. PowerDAQ supports logical operations like AND and OR to combine multiple events, enabling the creation of complex triggering mechanisms.

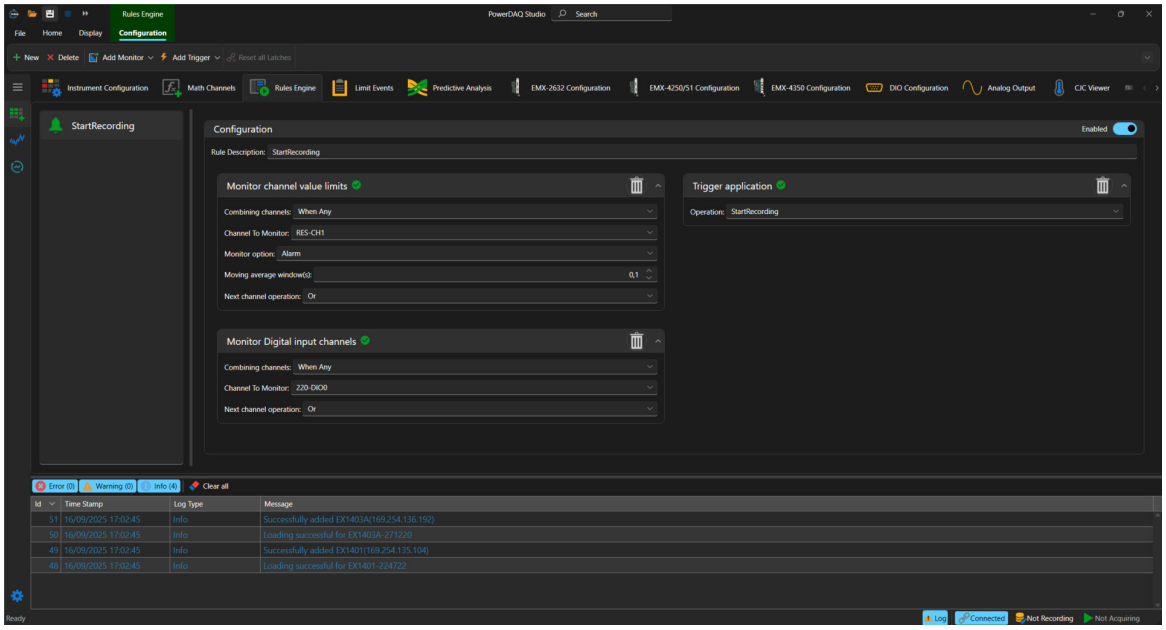


Figure 5: Rules Engine Configuration

Figure 6: Shunt Calibration for Structural Strain Operations

PowerDAQ Studio provides reliable strain calibration verification for both offset and gain, along with strain control operations such as tare offset (available offline or live during acquisition), auto-calibration, measurement of excitation/unstrained voltage, and lead resistance.

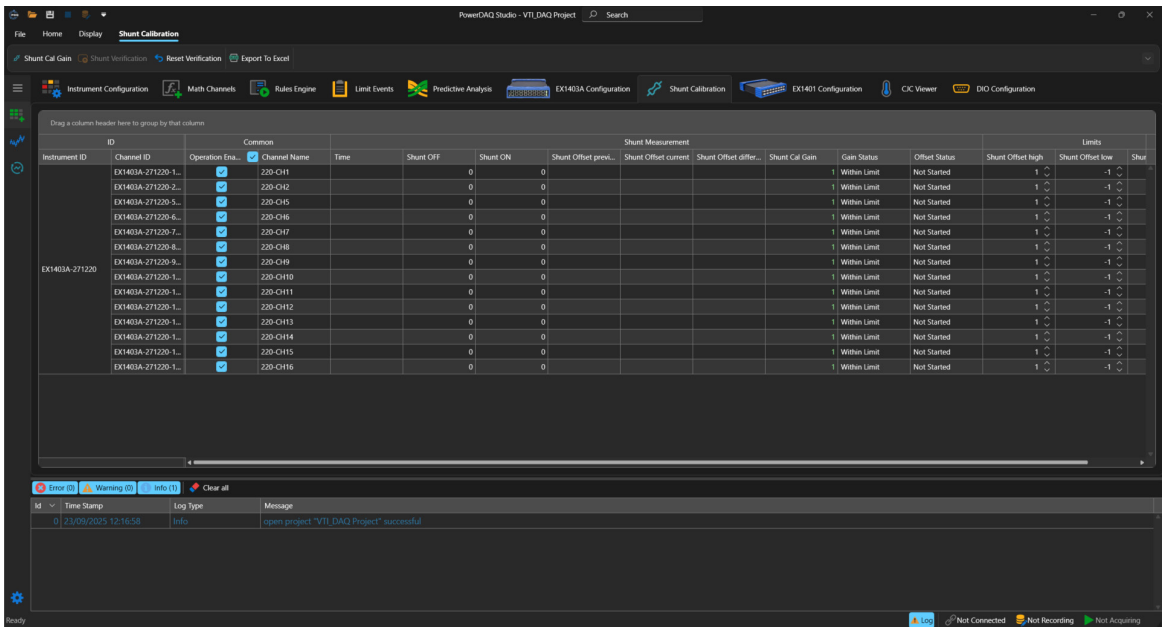


Figure 6: Strain Operations

PowerDAQ Studio: Features Overview
Visualization & Monitoring

Figure 7: CJC Reporting for High-Precision Thermocouple Applications

PowerDAQ Studio ensures accurate thermocouple applications with real-time CJC reporting and monitoring, delivering reliable temperature measurements and enhanced process confidence.

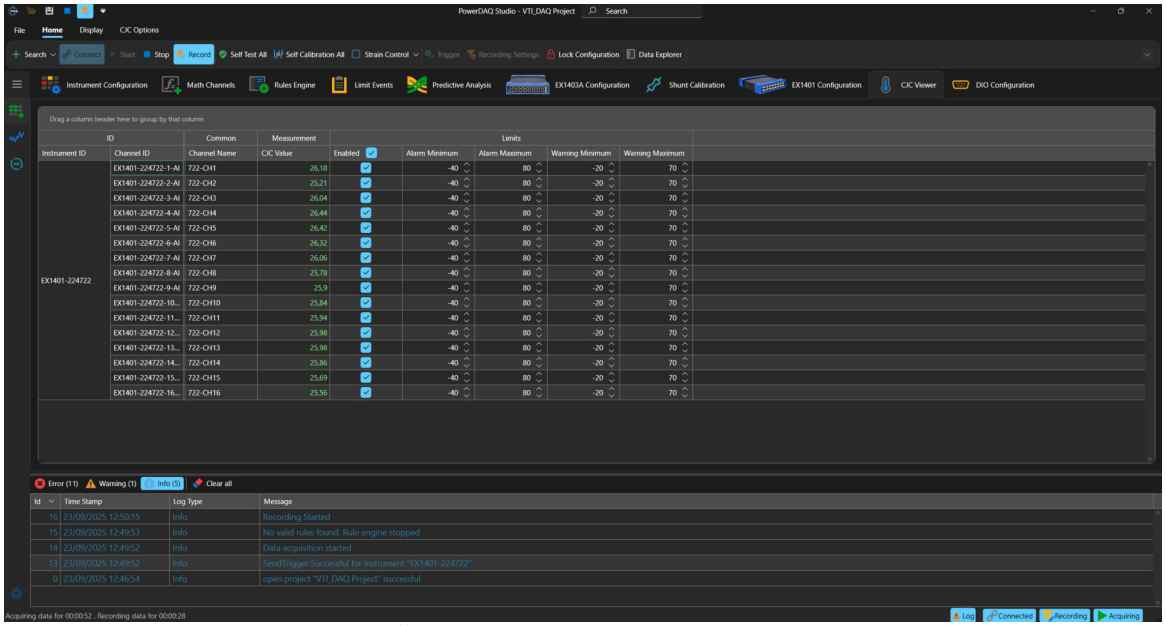


Figure 7: Data Explorer – Snapshots Tab

Figure 8: Dashboard Display

Real-time visualization includes charts, FFT charts, tables, numeric displays, gauges, and sliders. Users can zoom, pause, and overlay measurements such as RMS, Mean, Median, Max, Min, and Pk-Pk. Up to four widgets can be displayed simultaneously.

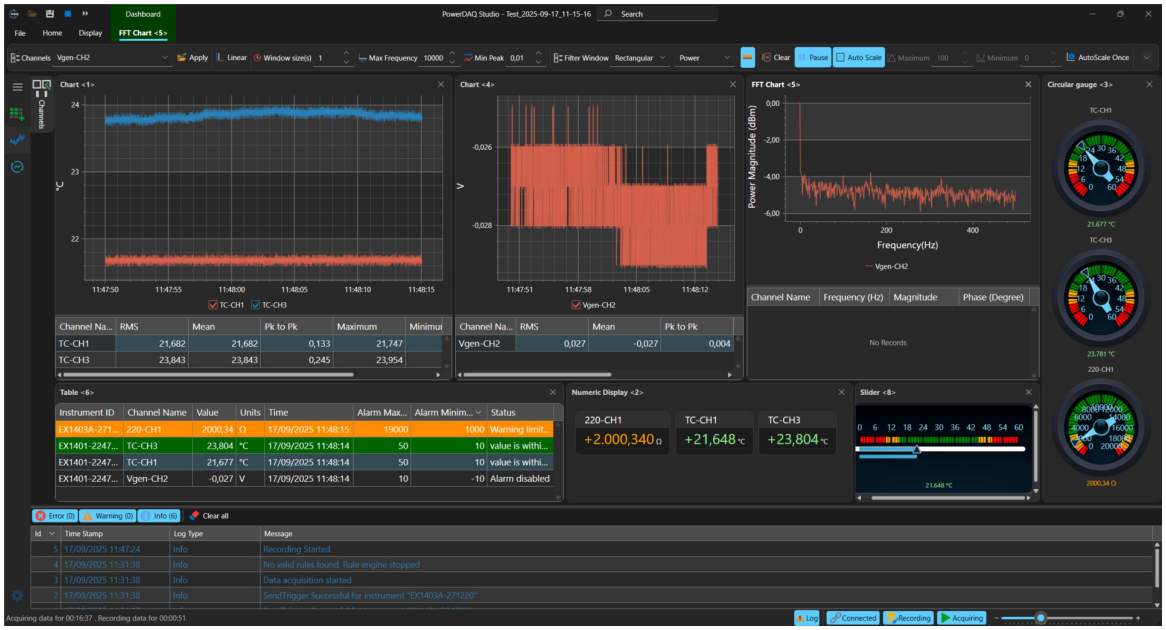


Figure 8: Dashboard Display

PowerDAQ Studio: Features Overview

Data Management & Export

Figure 9: Data Explorer Menu

The Data Explorer menu centralizes project, logs, snapshots, recording management, playback, and post-processing into a single window—enabling faster access and a streamlined workflow.

Figure 9: Data Explorer – Snapshots Tab

Customization & Integration

Figure 10: External Transducer Configuration

The Transducer page streamlines the creation and management of a transducer database library by storing information such as transducer type (Linear, Polynomial, Lookup, Load Cell, Radiometric), manufacturer name, measured units, and EU conversion formulas. Once created, the transducer is immediately available to be added to the configuration.

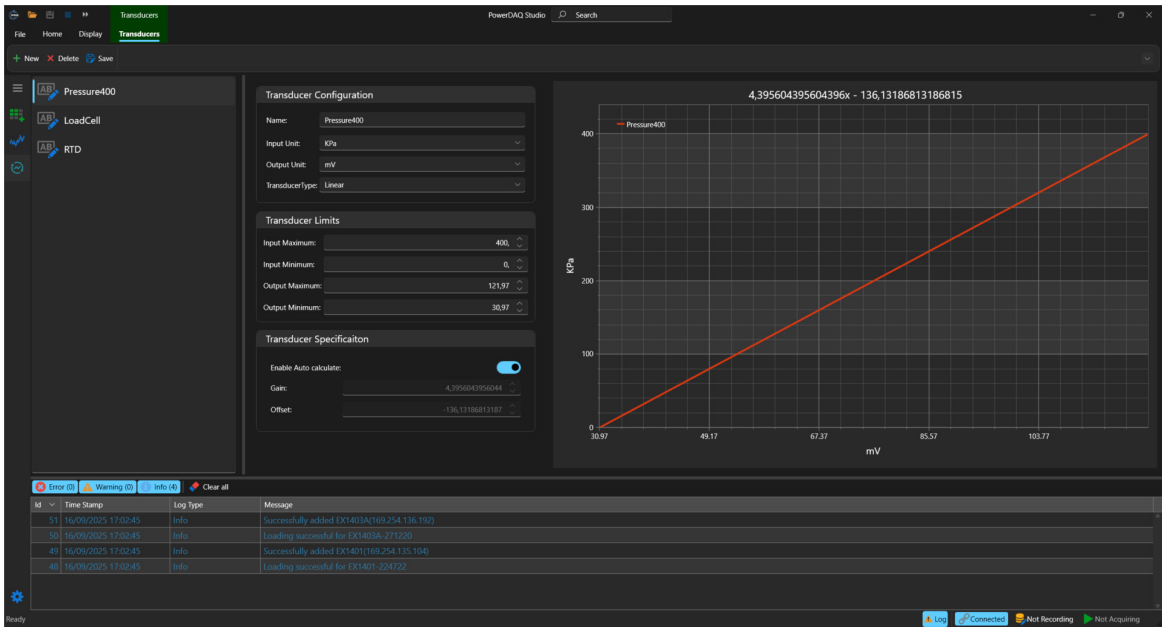


Figure 10: External Transducer Configuration

Detailed Feature List

Hardware Support	
EMX Series	X
EX1400 Series	X
EX1200 Series (future development)	X
EX1000 Series	X
EX1629	X
UEI AI & AO cards*	X

**In development*

Basic Feature Support	
Open and save project configurations	X
List recent projects	X
Instrument detection	X
Instrument configuration	X
Acquisition configuration	X
Instrument control	X
Limit events	X
Import / export instrument configuration to JSON	X
Max instrument support	Unlimited

Trigger Features / Event Management (Rules)	
DIO	X
LXI	X
Ethernet	X
Trigger linking	X
Trigger on event	X
Trigger on timer	X
PXIe triggers	X
Take snapshot on event	X
Trigger instrument operation	X
Trigger application	X
Trigger sound output	
Sent trigger on snapshot completion	X
Record high speed data on event	X
User configured pre-trigger data	X

Detailed Feature List (cont.)

Live Data Storage and Export	
Save to CSV	X
Save to TDBIN*	X
Save to HDF5	X
Save to Matlab*	X
OPC UA / DA*	X
Modbus*	X
iDDS*	X
Max file size control	X
Save to multi file control (file rotate)	X
Circular recording control	X
Dual speed acquisition saving control	X
Save to multiple locations	X
Record high speed data on event	X
Log preset alarm and warning violations	X
Export alarm and limit violations	X
Post-processing*	X

*In development

Live Data Display	
Drag and drop graphical interface	X
XY Chart	X
FFT chart	
Table	X
Numeric	X
Gauge	X
Slider	X
Configurable full scale, alarm, and warning limits	X
Live RMS, Mean, Pk to PK, Max and Min data	X
Multi page data display	X
Multi-screen data display	X
Live graph history duration control	X
Live graph resample rate control	X
Chart live data zoom	X
Chart pause	X
Marker and laber	X
Chart image capture	X

Detailed Feature List (cont.)

Strain Measurement	
Tare offset (zeroing)	X
Auto cal	X
Measure excitation voltage	X
Measure unstrained voltage	X
Measure lead wire resistance	X
Live shunt calibration	X
Rossett math channels*	X
Status export	X
TEDS support*	X

*In development

Temperature Measurement	
CJC Viewer	X
Live CJC reporting	X
OTD	X
EU conversion to °C, °F, °K	X
All standard thermocouples supported	X

*In development

Math Functions	
Math channels	X
Custom math channel sample rates	X
Custom equations	X
Math channel display limits control	X
Math channel warning and alarm control	X
Math channel precision control	X

Custom Transducer Library	
Math channels	X
Custom math channel sample rates	X
Custom equations	X
Math channel display limits control	X
Math channel warning and alarm control	X
Math channel precision control	X

Predictive Analysis	
Predictive analysis creation	X
Trigger via rules engine	X
Predictive / shadow plot import for charts	X

Detailed Feature List (cont.)

Security Feature	
Lock project with password	X

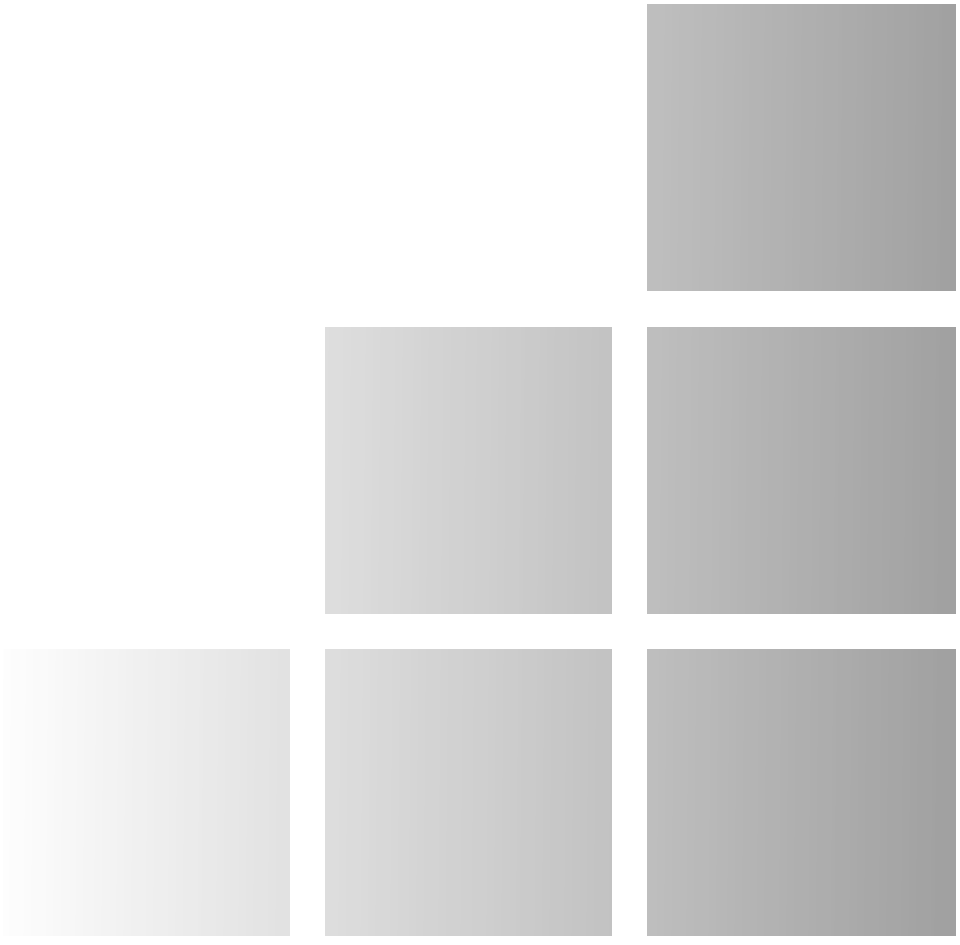
Report Generation (In development)	
Report generation*	X

*In development

Native Client Display	
Display access via remote display	5

*In development

Playback Feature	
Recording playback	X



Key Features

POWER DAQ STUDIO

Comprehensive Features for Complex Test Environments

Measurement Setup

- Import/export setup parameters into/from a spreadsheet
- Channel groupings to ease in large channel count management
- Support to read and write TEDS (Transducer Electronic Data Sheets) data on instruments that support it (EX1629, EX1403A)
- Easy configuration of large channel counts through automatic data population
- **Math channels:**
    - Arithmetic
    - Exponential
    - Creation / combination of RPN based formulas
    - Operators including (cos, sin, sqrt, rsm, mean..)
- Able to calculate/display rosettes
- Able to do averages of channels and differences (basic math functions)
- **Rules engine:**
    - Trigger based on channel limits, channel value, DIO line, application events, timers and combination
    - Trigger can be routed to DIO, snapshot, alarm sound, instrument operations etc

Triggering & Data Sampling

- Supported various sample rates for different instruments (i.e. EX1403A different than EX1401)
- Supported multiple trigger sources (Software, LAN, DIO, PXI) per instrument
- Supported to set a high speed and low speed recording mode
- Supported to select synchronization methods, i.e. trigger bus or IEEE1588

Data Display Options

- Data zoom & marker on specific time range
- Advanced measurements with peak, peak to peak, diff values, RMS, etc
- Data history
- Data resample in real time
- Auto and manual scale
- Easy management of large numbers of channels with search option
- Supported for several standard display formats such as:
    - Tabular
    - X/Y display type
    - Multiple Y axis support
    - Tachometer or meter style
    - Slider
    - Numeric
    - FFT Chart

Security Features

- Locking project with password protection

System Requirements

- **Operating System:** Windows 10/11 (64-bit only)
- **Processor:** Intel i5 10th Gen or equivalent (x86-64)
- **Memory:** Minimum 6 GB, recommended 8 GB or 16 GB
- **Graphics:** Dedicated GPU (Intel/NVIDIA/AMD)

POWER DAQ STUDIO

Full-Featured, Enterprise-Ready Data Acquisition Software

VTI Instruments / AMETEK PROGRAMMABLE POWER

VTI Instruments
9250 Brown Deer Road
San Diego, CA 92121
+1 858-450-0085
vti.sales@ametek.com
www.VTIInstruments.com