

PendoTECH Bioprocessing

INTRODUCTION

The Lumetics LINK™ software platform scans network locations for new measurement data files, copies data directly to a centralized database, and provides a powerful user interface for rapid multi-measurement multi-technique data aggregation, visualization, analysis, and reporting. LINK employs a client/server-based architecture where the LINK server hardware is provided by the end user and resides on the end user's network. The LINK client is a portable web-based application that may be placed on any computer with network connectivity to the LINK server. For successful import, the LINK webserver requires read access to the folders where user data resides.

PendoTECH delivers a line of pressure sensors, control systems and software for measuring, monitoring and data collection in bioprocess applications and other areas where the products provide a unique process solution.

DETAILS

LINK requires the CSV data file to import PendoTECH data. LINK requires the first line in the CSV file to start with "Experiment Name:" and pressure units "psi" must be in the file header. There must be data after the header row and the data row length must match the header length. LINK expects the file format to have 4 experiments. Each experiment has filters and is specifically looking for the following columns:

- 1-FilterA_Name, 1-FilterB_Name, 1-FilterC_Name, 2-FilterA_Name, 2-FilterB_Name..... 4-FilterC_Name
- 1-PressureA, 1-PressureB, 1-PressureA, 2-PressureA, 2-PressureB..... 4-PressureC
- 1-Mode, 2-Mode, 3-Mode, 4-Mode
- 1-CumVol, 2-CumVol, 3-CumVol, 4-CumVol
- 1-Notes, 2-Notes, 3-Notes, 4-Notes
- 1-Train Name, 2-Train Name, 3-Train Name, 4-Train Name
- 1-Error, 2-Mode, 3-Mode, 4-Mode
- Four distinct columns named "Date/Time"

Helpful Notes:

- A valid measurement is determined two ways:
 - If the filter name is NOT named a "default" name (e.g., 3-FilterB_Name is NOT named "3B")
 - AND if there is at least one value in the "Mode" column that is of type RUN. If they are all of type "STOP" then we don't bring in the data.
- We do NOT bring in any rows that have a "Mode" value of "ALARM" currently, as it looks like it is a stop-type condition and not part of the experiment. Customer can provide feedback on this.

The PendoTECH CSV data file example is as follows:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Experiment Name:	Lumetics													
2	Details:														
3	Pressure units	psi													
4															
5															
6	Date/Time	1-Notes	1-Train Name	1-FilterA_N	1-FilterB_N	1-FilterC_N	1-Mode	1-PressureA	1-PressureB	1-PressureC	1-DeltaA	1-DeltaB	1-DeltaC	1-Flow	1-FluxA
7	09/22/2022 13:00:00		Train 1	Lumetics	123 1C		STOP	0.13	-0.12	0	0.15	-0.1	0	0	0
8	09/22/2022 13:00:01		Train 1	Lumetics	123 1C		STOP	0.14	-0.12	0	0.16	-0.1	0	0	0
9	09/22/2022 13:00:02		Train 1	Lumetics	123 1C		RUN	0.54	-0.12	0.01	0.46	-0.11	0.01	6	800
10	09/22/2022 13:00:03		Train 1	Lumetics	123 1C		RUN	0.13	-0.13	0	0.16	-0.12	0	6	800
11	09/22/2022 13:00:04		Train 1	Lumetics	123 1C		RUN	0.13	-0.11	0	0.14	-0.11	0	6	800



Import Method options can be defined and calculated each measurement during import if it is first created/defined and then requested within an Import Method. The default PendoTECH-specific import method settings are:

1. Filter Sizes: Specify the sizes (in m²) of the filter(s) used for up to 4 experiments for the PendoTECH instrument. This will be used to calculate the filter throughput, by dividing the cumulative volume measured in the CSV file, with the filter size(s) defined below.

Filter Sizes

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Experiment 1	Experiment 2	Experiment 3	Experiment 4
Filter A: <input type="text"/> m ²	Filter A: <input type="text"/> m ²	Filter A: <input type="text"/> m ²	Filter A: <input type="text"/> m ²
Filter B: <input type="text"/> m ²	Filter B: <input type="text"/> m ²	Filter B: <input type="text"/> m ²	Filter B: <input type="text"/> m ²
Filter C: <input type="text"/> m ²	Filter C: <input type="text"/> m ²	Filter C: <input type="text"/> m ²	Filter C: <input type="text"/> m ²

2. X-Axis Aggregation Type: This instrument will import the Differential Pressure (psi) data in the file and allow it to be plotted on the x-axis, and the y-axis. When selected as an x-axis option, duplicate values for x-axis points are not allowed, and therefore if there is more than one identical x-axis value found, a decision must be made on what corresponding y-axis value to choose as the correct one.

For example, Differential Pressure is measured in the file as a function of Elapsed Time but will also be imported so that Elapsed Time can be selected on the y-axis and plotted as a function of Differential Pressure (x-axis). As there can be the same pressure measured for different Elapsed Time points, a choice must be made as to which Elapsed Time value to choose for a given x-axis Pressure value. The default for PendoTECH is to choose the Minimum time point when a given pressure value was reached.

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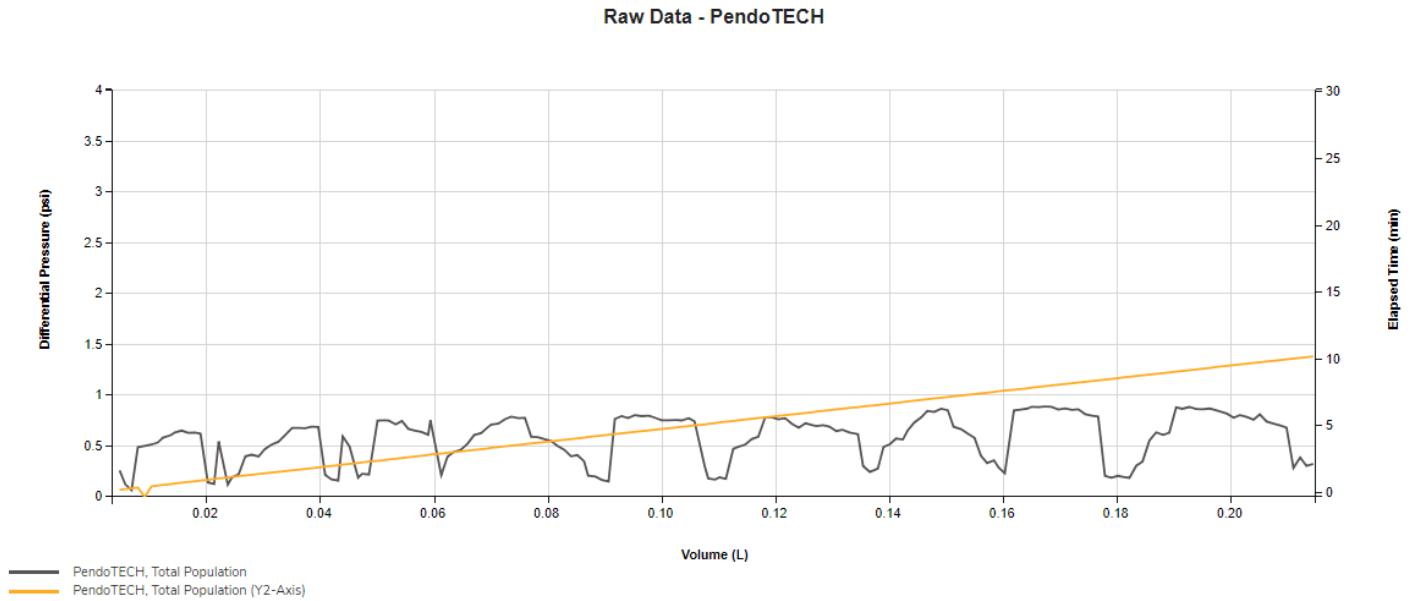
Use the of y-axis values when duplicate x-axis values are found



EXAMPLES

Below are some example data visualizations:

A) Line Chart raw data curves Differential Pressure and Elapsed Time vs. Volume



B) Tabular Summary examples

Measurement Summary Table – Measurement Results

Instrument Name	Sample Name	Train Name	File Name	Differential Pressure (psi) (Time Stamp >=1) - AVG	Differential Pressure (psi) (Elapsed Time (min) >=1) - AVG	Elapsed Time (min) (Differential Pressure (psi) >=1) - AVG	X-Axis Aggregation Type for Duplicate Values
PendoTECH	Lumetics	Train 1	LINK_Test_File.csv	4023.82	4021.69	41728.73	MIN

DASHBOARD DOWNLOADS

LINK contains an extensive built-in dashboard library from LINK version 2.4.0.210401 and later. This function contains specific pre-created dashboards for all instruments and application groups.

CONTACT LUMETICS

For direct assistance, please contact Lumetics LINK™ Support:

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