

Freeze Dryer – Millrock Technology

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.

The Millrock freeze dryers, specifically Lyophilizer are custom designed and fit for GMP environments.

DETAILS

LINK requires a CSV export file for importing Millrock Lyophilization data.

Helpful Notes:

- Temperature data outside 0-100°C is ignored.
- Pressure data values of zeros are ignored.
- Temperature and Pressure readings will be assigned a Measurement Type value, to allow for easy overlay/comparison across multiple sensors.
- Pressure is assumed to be in mTorr, unless otherwise specified in the LyoStar import method.
- Due to high data point density, data point averaging is applied by default upon importation. Averaging specifications may be adjusted in the Millrock Import Method.

The Millrock CSV data file example is as follows:

| | A | B | C | D | E | F | G | H | I | J | K | L | M | P | Q | R | S | T | U | AC | AD | AE | AF | AG |
|---|----------|-----------|------------|-------|-------|------|-----------|---------|------------|-------------|---------|--------|--------|-----|------|-----|-----|-----|------|--------------|-------------|---------------|------------|------|
| 1 | BatchID | PointTime | Cycle Time | Cycle | Phase | Step | Vac SetPt | Vac CPM | Vac Pirani | Shelf SetPt | T Shelf | T Cond | TP Avg | TP3 | TP4 | TP5 | TP6 | TP7 | TP8 | Percent Heat | Flu T Shelf | Sur T Product | Kv Shelf 1 | |
| 2 | Sample A | 1/14/2020 | 0 | 9 | 0 | 0 | 750 | 0 | 758760 | 5 | 18.72 | 18.5 | 18.19 | 18 | 18.4 | 19 | 19 | 19 | 19 | 0 | 4.57 | 18.77 | 18.17 | 8.72 |
| 3 | Sample A | 1/14/2020 | 0 | 9 | 1 | 0 | 750 | 0 | 760330 | 5 | 18.7 | 18.47 | 18 | 18 | 18.1 | 19 | 19 | 19 | 19.1 | 0 | 4.6 | 18.75 | 18.01 | 6.67 |

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 following is the default Millrock-specific import method settings:

- Data Reduction Options: **Averaged Timepoints**
- Pressure Units: **Assumed to be mTorr**
- Automated Metadata Extraction: **None**

Data Reduction

To reduce the number of data points per curve and improve dashboard rendering times, LINK offers various options for reducing the data residing in the LINK database. Any options applied will in no way impact the original data files.

Pressure Units

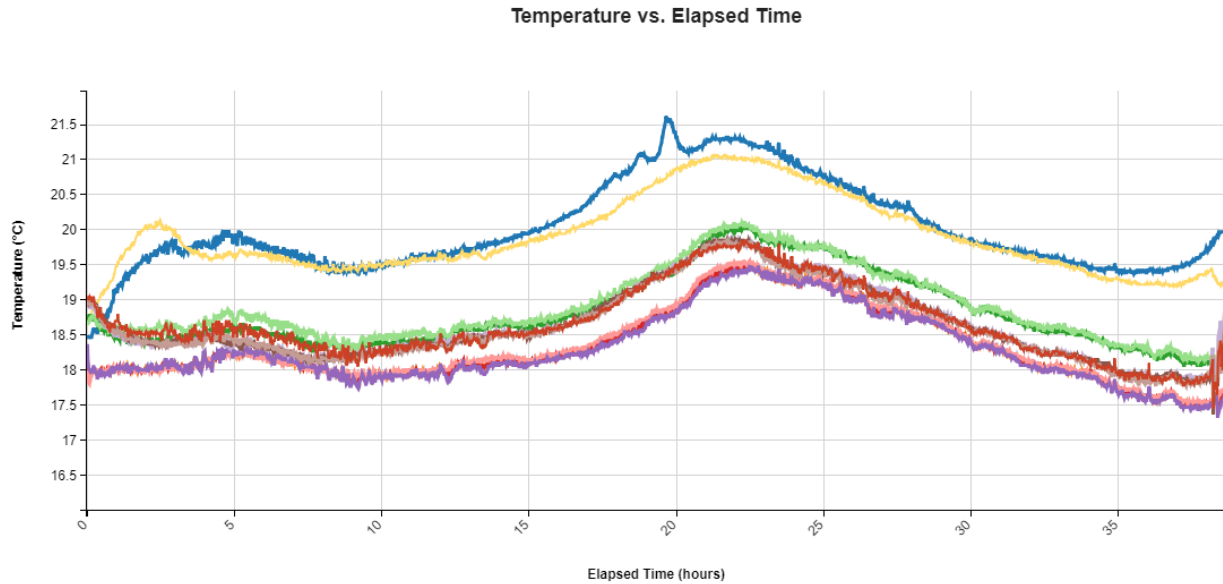
Specify the units for the pressure data. The default is mTorr for all pressure data imported.



EXAMPLES

Included below are sample dashboards from Millrock measurement files:

1. Line Chart plotting raw data curves for Temperature vs. Elapsed Time



2. Tabular Summary examples:

Measurement Summary Table – Measurement Results

| LINK Record ID # | Instrument Name | Sample Name | Temperature (°C) | Pressure (mTorr) | Measurement Type Number | Measurement Type |
|------------------|-----------------|-------------|-------------------------------------|-------------------------------------|-------------------------|------------------|
| | | | (Elapsed Time (hours) >=1) - AVG | (Elapsed Time (hours) >=1) - AVG | - AVG | |
| 1 | Millrock | Sample A | 0.00 | 0 | 3 | Cycle |
| 2 | Millrock | Sample A | 0.00 | 0 | 4 | Phase |
| 3 | Millrock | Sample A | 0.00 | 1450500 | 6 | Vac setpt |
| 4 | Millrock | Sample A | 0.00 | 1462415460 | 8 | Vac pirani |
| 5 | Millrock | Sample A | 0.00 | 0 | 9 | Shelf setpt |
| 6 | Millrock | Sample A | 38526.99 | 0 | 10 | T shelf |
| 7 | Millrock | Sample A | 38770.78 | 0 | 11 | T cond |
| 8 | Millrock | Sample A | 35457.41 | 0 | 12 | Tp avg |

MILLROCK DASHBOARDS

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

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