

xSight – Spheryx

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 xSight system is a total holographic characterization technology that non-invasively yields a wealth of information with precise, reliable, and accurate quantitative measurements of suspended particles in complex samples. This technology has the unique ability to distinguish different distributions in multi-component suspensions – even when they are the same size.

DETAILS

LINK requires a CSV import for xSight data. The data files are generated automatically by the xSight software.

The following raw curve data may be imported, in addition to all available instrument/analysis settings and parameters calculated by the instrument software:

- Count/Concentration/Count per Container vs. Particle Diameter
- Count/Concentration/Count per Container vs. Refractive Index
- Count/Concentration vs. Time
- Velocity vs. Z

Particle count/concentration for each supported morphological parameter occurs at a pre-defined bin spacing and measurement range as per the table in the Users Manual.

The xSight CSV data file example is as follows:

	A	B	C	D	E	F	G	H	I	J	K	L
1	Name	s2022_05_04run002_test										
2	Time	5/4/2022 10:31										
3	Notes											
4	User	Lumetics										
5	Sample	beads										
6	Sample notes											
7	Medium refractive index	1.34										
8	Measured volume	0.11 mL										
9	Viscosity	1-2 cP										
10	Laser	0.445 mm (Blue)										
11	Temperature	30.0 °C										
12	Channel	1										
13	Software version	v2.6.0										
14												
15												
16		d [um]	d uncertain	n uncertain	z [um]	z uncertain	v [um / s]	timestamp	symmetry	morphology		
17	1	5.1402	0.2113	1.3425	0.0002	65.6605	1.6192	1223.881	0	Non-sphe	Undetermined	
18	2	2.1025	0.2519	1.343	0.0006	63.5858	5.2544	2512.529	0.1379	Non-sphe	Undetermined	
19	3	1.9144	0.1197	1.3435	0.0005	42.2589	0.1869	717.3777	0.1626	Non-sphe	Rod-like	

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 xSight specific import method settings are:

- Default Sub-Populations: **None**
- Number of Thumbnails to Crop: **250**



- Ignore Thumbnails less than: **5 μm**
- Import Images in order of Largest-to-Smallest: **Yes**
- Automated Metadata Extraction: **None**
- Dilution Factor: **1 (no dilution)**

Notes:

- Sub-population parameters for ECD, Refractive Index, Height, and Time Stamp are available upon import method creation for the xSight instrument.
- New subpopulation category support for “morphology” & “symmetry”. If there is no morphology data within the xSight measurements, the data will not import with a subpopulation dependant on morphology.
- CPP currently not available for custom formulas on a per particle basis

Sub-Populations

In addition to the total particle population data set, sub-populations based morphological parameter filters may be generated at the point of measurement import. An unlimited number of sub-populations may be specified for each measurement. For each sub-population, the particle count/concentration vs. morphological parameter will be available, as well as representative particle thumbnail images. The sub-populations do not count towards the measurement limit per project. Additional Sub-Populations will affect import speeds.

When creating as sub-population, select a **Morphological Parameter** from the pre-defined list and specify the filter criteria. Select the + to add the filter term to the **Live Expression View**. The **Live Expression View** can be edited directly. Brackets, mathematical operators/values, logical ANDs or ORs are valid operators. Syntax must be exact, for successful application.

Thumbnail Images

Specify the maximum number of particle thumbnail images to be imported to the LINKdb for each measurement population. Apply a size threshold (the default is 5 microns). Choose whether particles should be first sorted from largest to smallest (based on ECD) or imported in their order of appearance during the analysis. These selections apply to the total particle population and all defined sub-populations.

Automated Metadata Extraction

Specify criteria for automated metadata extraction from measurement file fields (e.g. Comments, File Name, Import Path etc...) utilizing specified delimiters. Both metadata name and value may be extracted or only the value only.

Dilution Factor

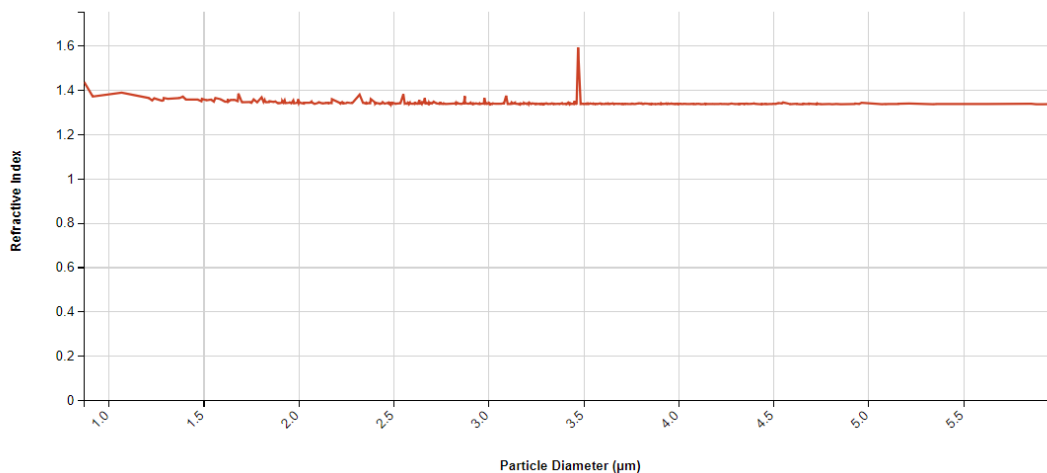
Specify a dilution factor for automated particle count/concentration data adjustment. This selection applies to the total particle population and all defined sub-populations. A **LNK_Dilution_Factor** may also be applied after import, utilizing the **Add/Edit LINKdb Fields** feature.

EXAMPLES

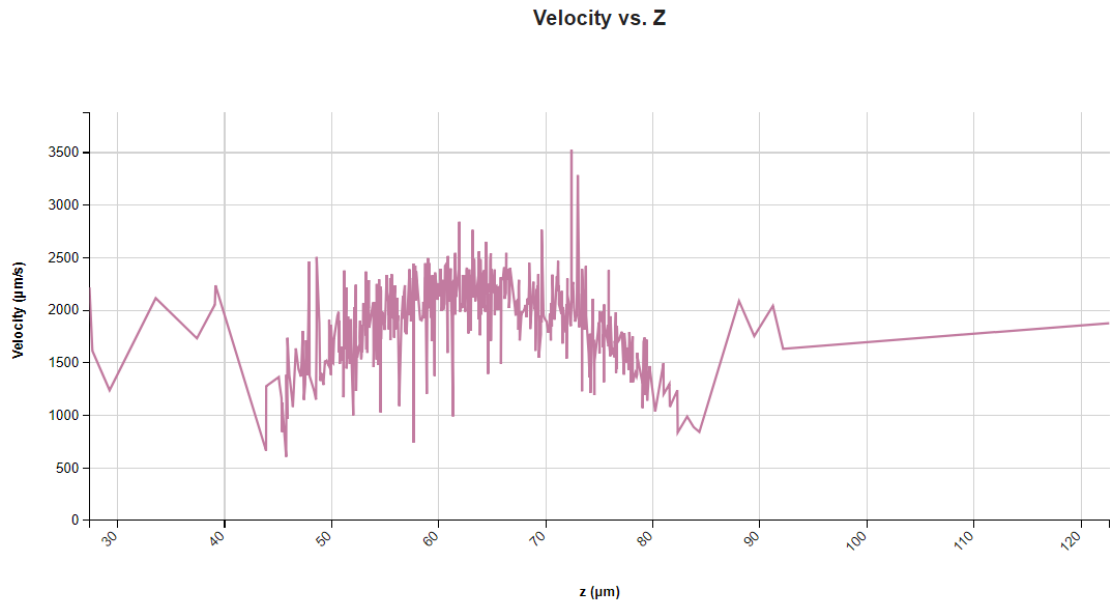
Included below are example dashboards from xSight measurement files:

1. Line Chart plotting raw data curves for Refractive Index vs. Particle Diameter

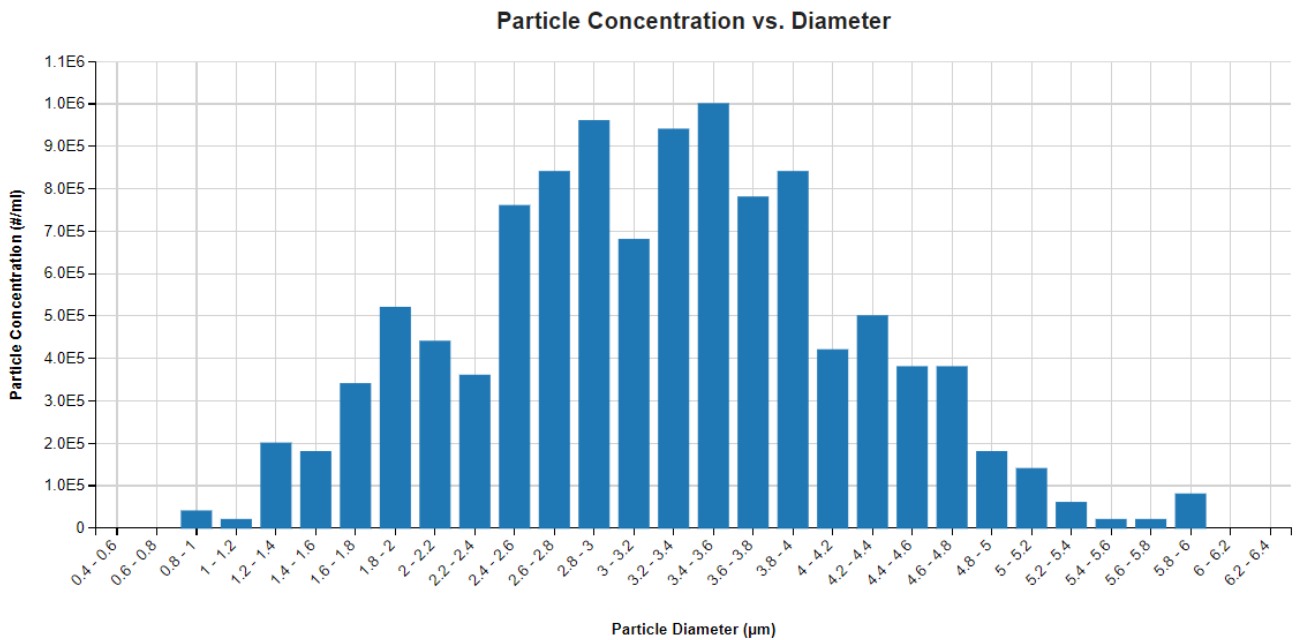
Refractive Index vs. Particle Diameter



2. Line Chart plotting raw data curves for Velocity vs. Z



3. Histogram plotting binned raw data for Particle Concentration vs. Diameter



4. Tabular Summary examples

Measurement Summary Table – Measurement Results

Sample Name	Sub-Population	Particle Count (#) (Particle Diam. (µm) >=0) - AVG	Particle Conc. (#/ml) (Particle Diam. (µm) >=0) - AVG	Particle Conc. (#/ml) (Particle Diam. (µm) 0-0.5) - AVG	Particle Conc. (#/ml) (Particle Diam. (µm) 0.5-1) - AVG	Particle Conc. (#/ml) (Particle Diam. (µm) 1-2) - AVG	Particle Conc. (#/ml) (Particle Diam. (µm) 2-10) - AVG	Particle Conc. (#/ml) (Particle Diam. (µm) >=10) - AVG	Particle Conc. (#/ml) (Particle Diam. (µm) >=25) - AVG	Total Particle Count (#) - AVG	Total Particle Concentration (#/ml) - AVG
1.0mg/mL IgG in...	Total Population	554	11080000	0	40000	1260000	9780000	0	0	554	11080000



Measurement Summary Table – Instrument Settings

LINK Record ID #	Sample Name	File Name	Sample refractive index - AVG	Volume Analyzed (ml) - AVG	Channel
1	1.0mg/mL IgG in filtered DI water	spheryxExportData.csv	1.34	0.00	unknown

XSIGHT DASHBOARD DOWNLOAD

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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