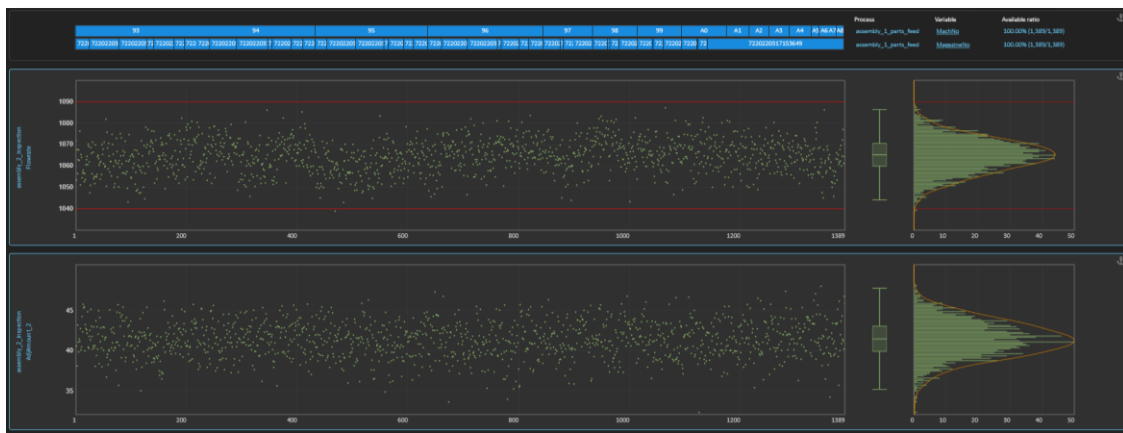# *Analysis Platform + DN7*
# *AP+DN7*

FPP: Full-points plot

This is "Full-points Plot" used as an alternative to the X-R plot in Big Data analysis.

It is used to see trends in data and to check outliers and outliers.

It can also be used as a data downloader that extract and/or integrates data from a database.

In addition, high-speed feature extraction algorithms support the visualization of data for up to several million products, making it possible to view and utilize large amounts of data on the order of several million units without waiting.
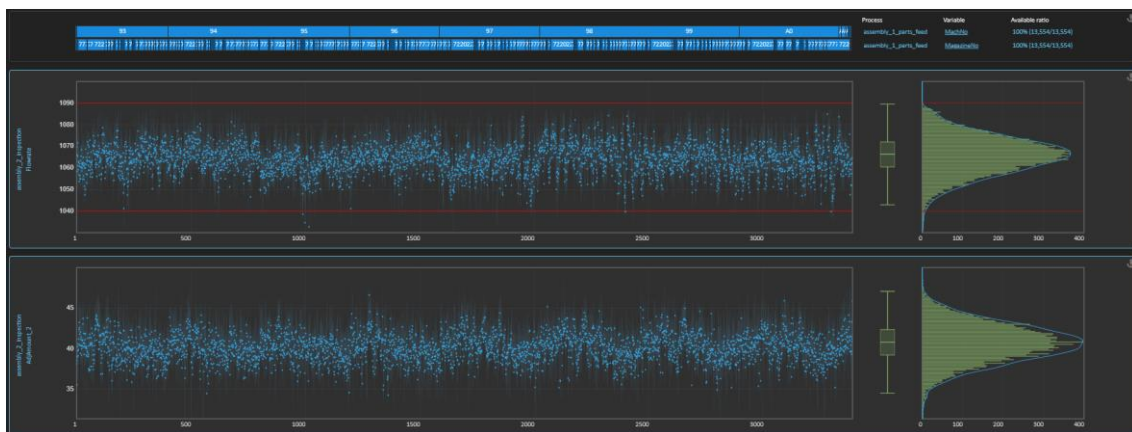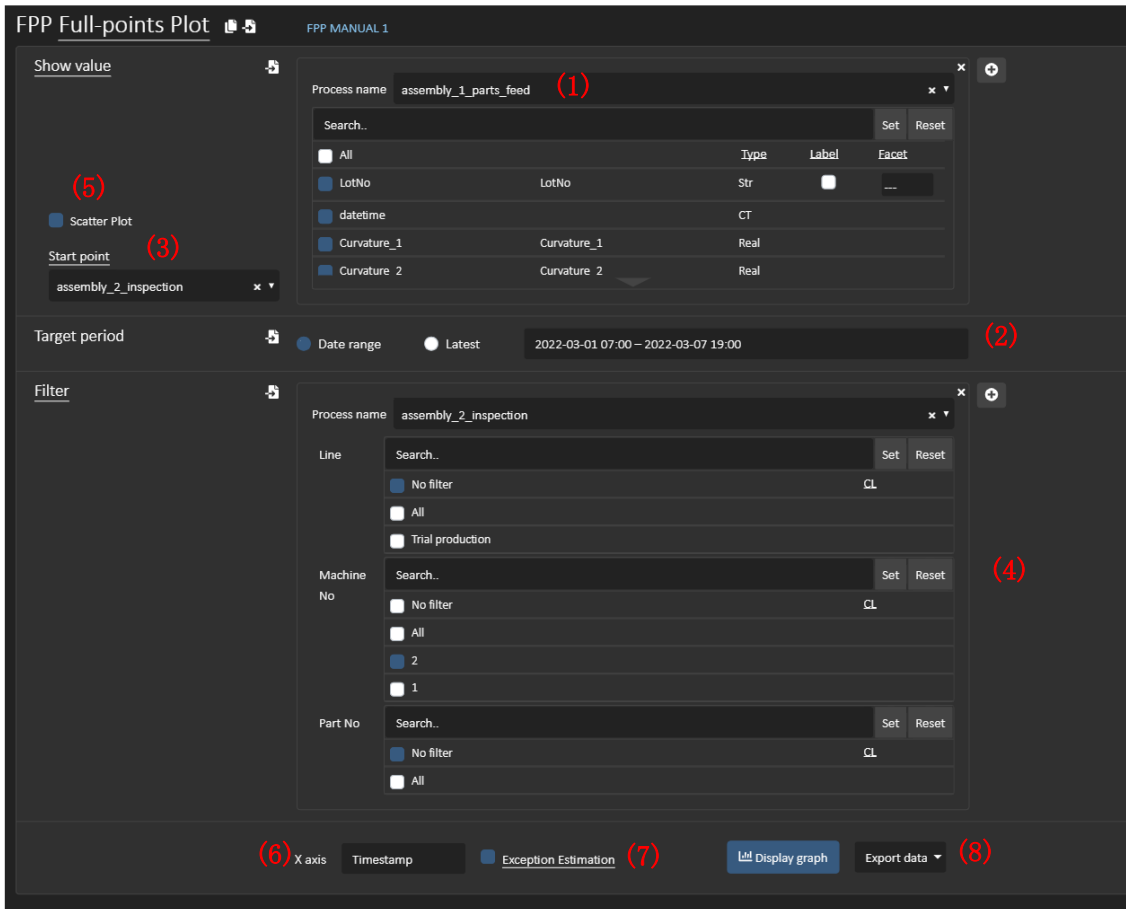

With the data linking function between processes, as long as there are common ID, it is possible to link various data such as materials, production management, logistics, MaaS, etc. between processes. It enables not only self-contained type improvement but also total optimization type improvement.
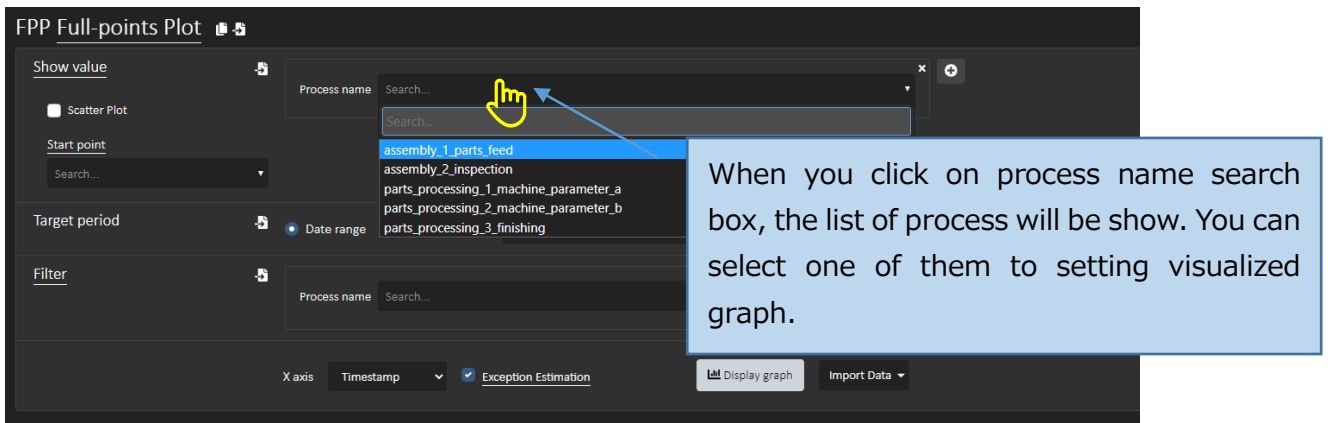
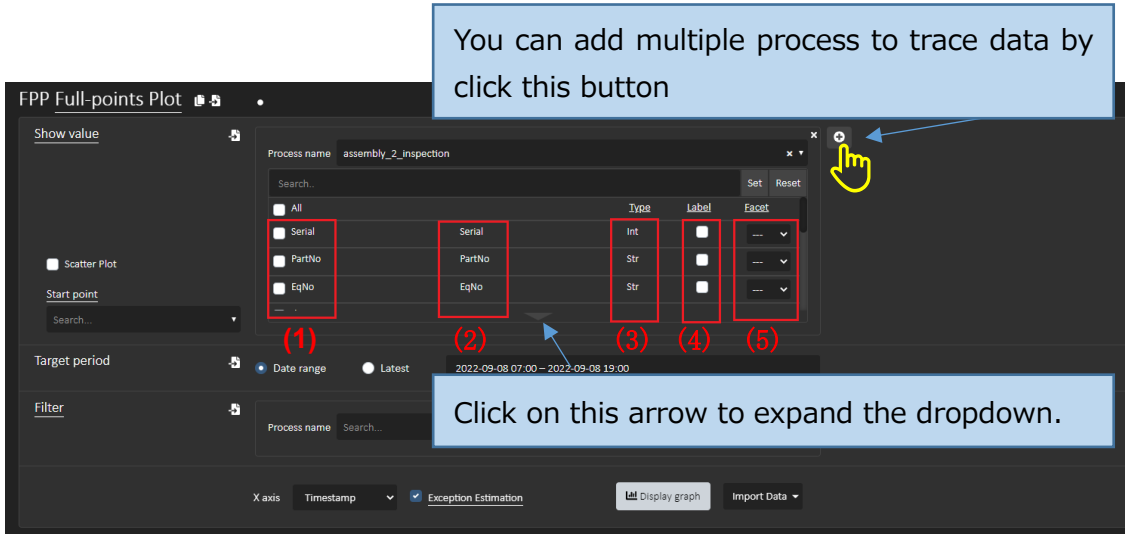# Table of contents

1. GUI setting

1.1. GUI overview.

(1) Show value: Select process, column value, label, facet to show graph. At least one process and column is selected to show graph.

(2) Target period: Select date time range of data to show graph. It is required.

(3) Start point: The start process to link data when choose multiple processes. It is set default value of first process when not set.

(4) Filter: Filter conditions to limit the data to show on graph. It set in filter config page.

(5) Scatter plot: The option to show scatter plot on graph area. If it's not checked, scatter plot is not shown.

(6) X axis: Range value of X axis in time series chart. It includes "Timestamp" and "Index" options.

(7) Exception Estimation: If this option is selected, the app will remove all exception value like –inf, +inf in dataset.

(8) Export data: There are some features to export data: tsv, csv, png, clipboard png, clipboard value (tsv)…

1.2. Process setting

When you click on process name search box, the list of process will be show. You can select one of them to setting visualized graph.

After select a process, the list column (sensor) of this process will be show. The dropdown show column name, shown name, type of data, label, facet like below.


You can add multiple process to trace data by click this button

Click on this arrow to expand the dropdown.

(1) List columns of process, you can select the columns by check on checkbox to show value of these columns in graphs.

(2) Name that you setting shown name in process config page. This name will be show on title of graph instead of name ①.

(3) Data type of value (Int: Integer, Str: Text, Real: Float, CT: Cycle time).

(4) Category variables (part number, station number, etc.) that appears as a label at the head of graphs to visualize changing points (part numbers switching, etc.) of the qualitative variable. You can select items whose data types are Int(Integer) and Str(String).

(5) Category expansion is performed to divide the graph using the data of the selected item. You can select items whose data types are Int(Integer) and Str(String).
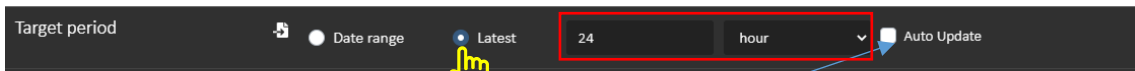
You can operate the GUI with the same operational feeling on other data visualization and analysis pages!

1.3. Target period

Specify a time period to limit the mount of data.
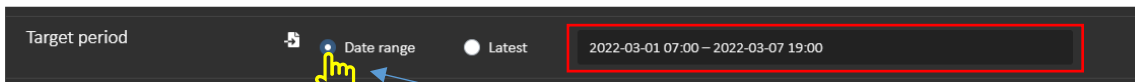
In case of Date range, input a value of time period by start date time and end date time.


Select auto update if you want to get newest data automatically.

In case of Latest, input a number and select unit of number (hour, minute, day, week). For example, 24 hour means that the time period will be set latest 24 hours from now.

1.4. X index

There are two options to set value of X-axis in time-series chart.

- Timestamp: value of X-axis will be date time of selected target period.
- Index: value of X-axis will be ordinal number of each data point. When X-axis is index, the app will have a feature to order the dataset base on user setting in order modal as following image.
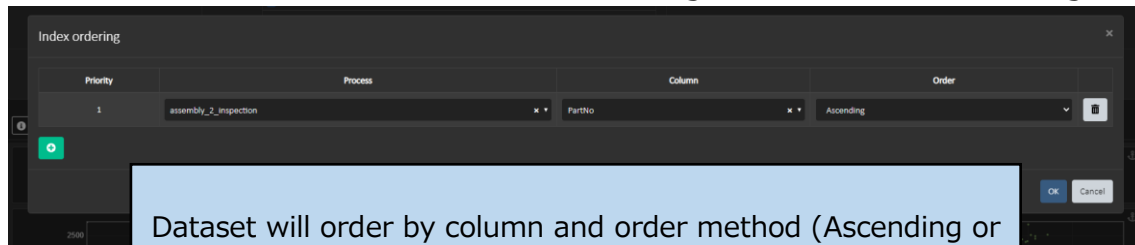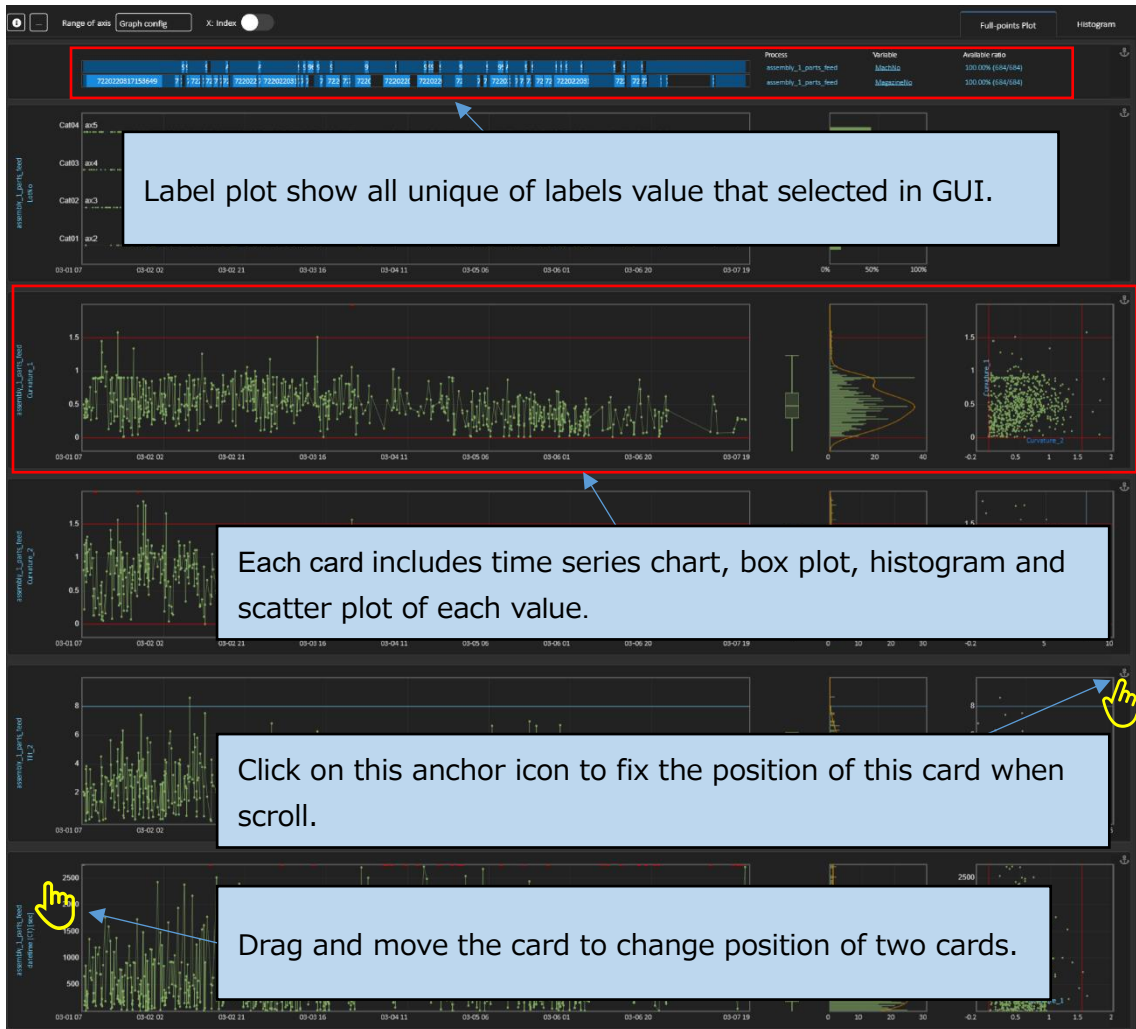

Dataset will order by column and order method (Ascending or Descending) you select in this setting modal.
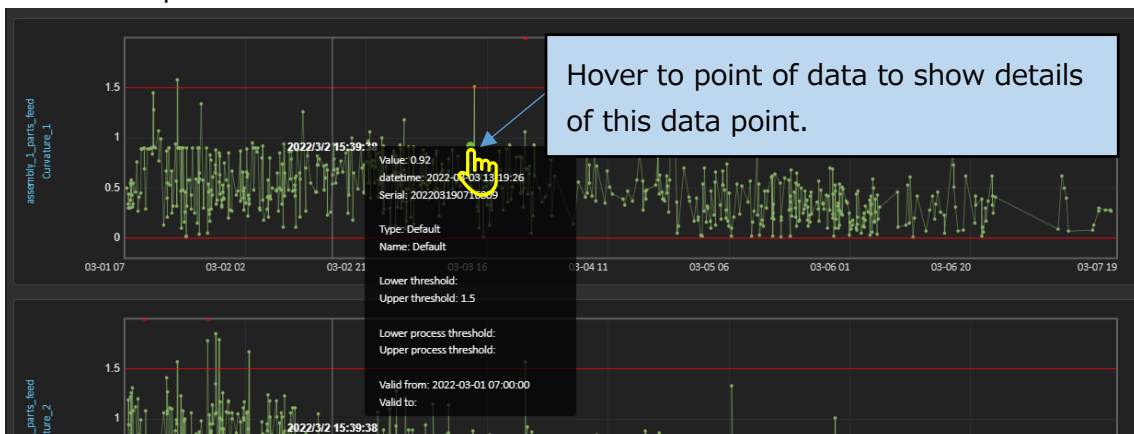
2. Graph area

After press [Show graph] button, graphs will be plot with two tabs are "Full-points plot" and "Histogram".

2.1. Full-points plot

Label plot show all unique of labels value that selected in GUI.

Each card includes time series chart, box plot, histogram and scatter plot of each value.

Click on this anchor icon to fix the position of this card when scroll.

Drag and move the card to change position of two cards.

Show details of data point in time series chart.

Hover to point of data to show details of this data point.

Right click on time series chart to have some options to setting and see more details of data point.
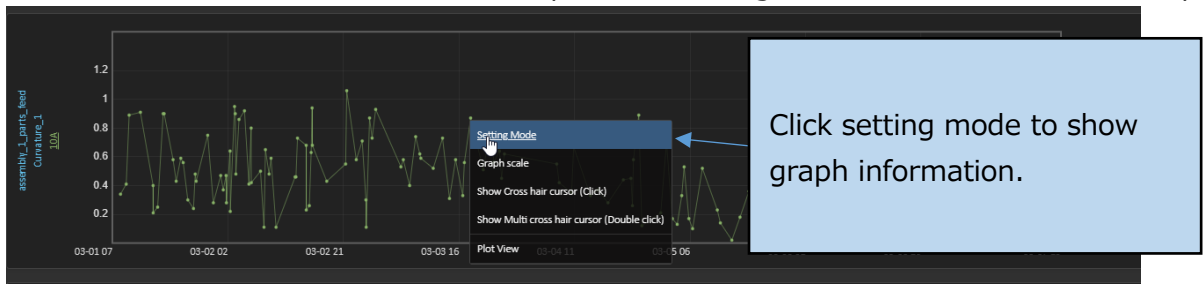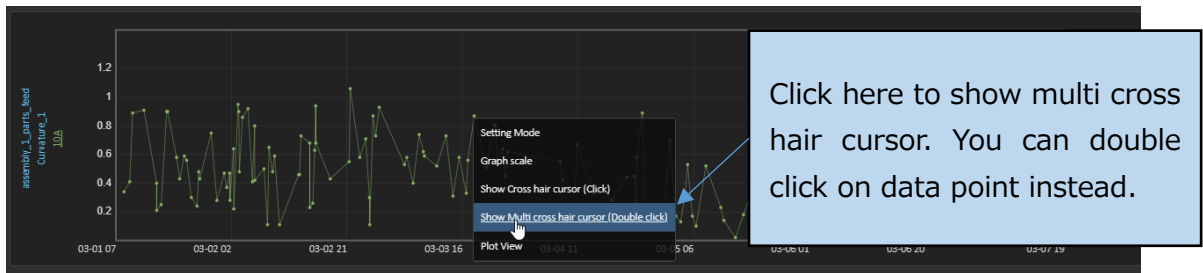

Click setting mode to show graph information.
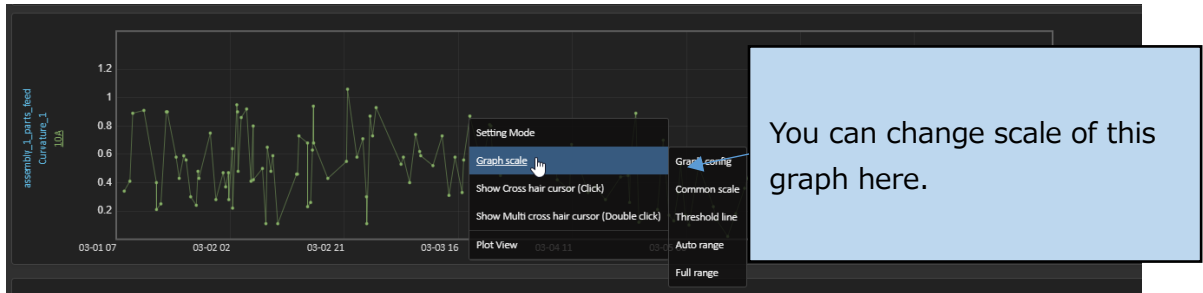
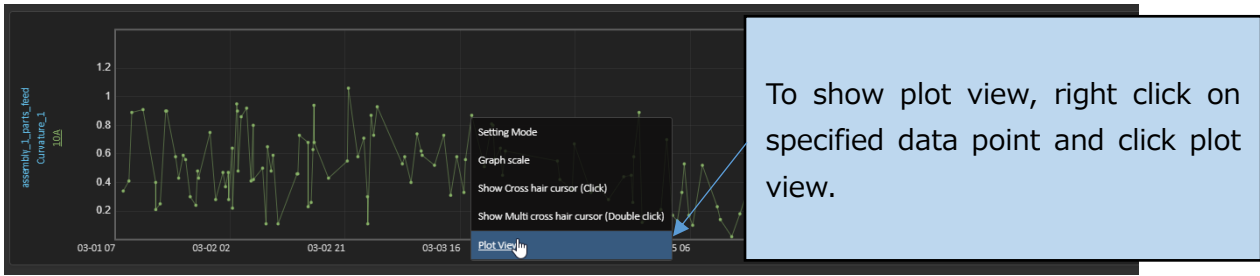You can change scale of this graph here.
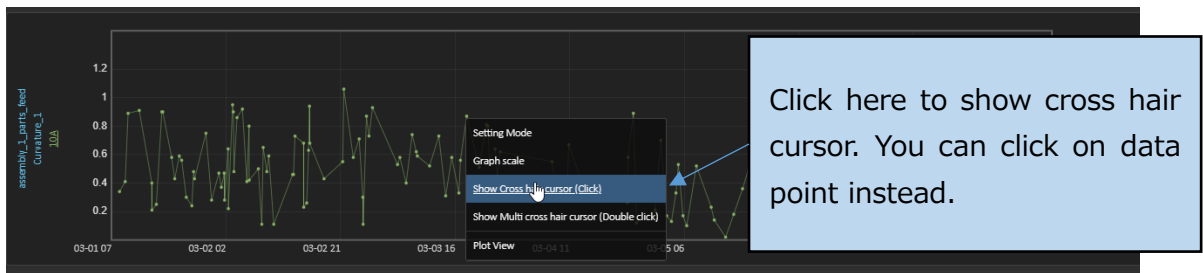
Click here to show cross hair cursor. You can click on data point instead.

Click here to show multi cross hair cursor. You can double click on data point instead.

Show Plot view

To show plot view, right click on specified data point and click plot view.

Plot view shows you detailed information for that data point.

In Full Linked Data, in addition to displaying the data of all other variables included in the table, if data is linked, variables that share the same ID as the linked table are also displayed.

It can also be used as traceability information.

Summaries of value will be shown if you hover on box plot.

Show graph information.

Click on this button to show information of graph like right image.

Show summaries information of variable.

Count

Basic statistics

None parametric

Change range of Y-axis scale. There are five type of scale option to change range of-Y axis scale.

- Graph config: The y-axis range will be used from Master Config page for each variable. This scale option is set by default.
- Common scale: To set the same y-axis range (min-max of all variables) for all graphs.
- Threshold line: The y-axis range is set based on threshold value set in the Master Config page.
- Auto range: The y-axis range is set based on the min-max value of dataset, but the outlier will be displayed as a red marker.
- Full range: The y-axis range is set based on the min-max value of dataset (including outliers)
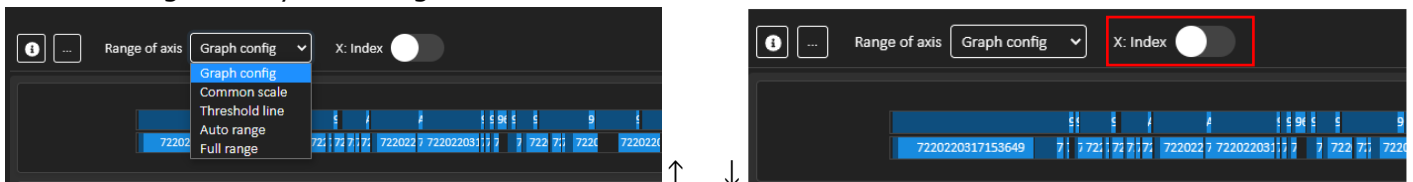

Change index of x-axis from index to timestamp and vice versa (This feature available when the X-axis was set to "index" on the previous GUI).

2.2. Histogram plot


Show histogram of each variable.
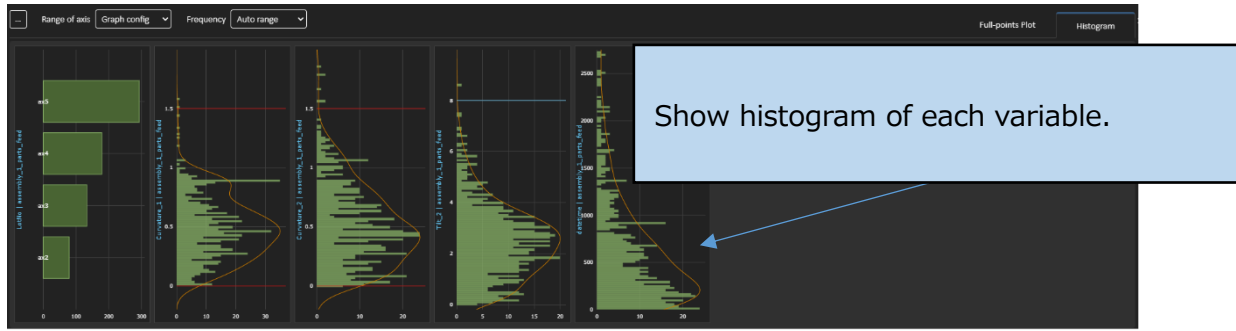
The data distribution will be shown in histogram tab, with statistics summary information, graph's scale by range of y-axis and data frequency.

There are two options supported to change scale of frequency (X-axis): Common scale and auto range.
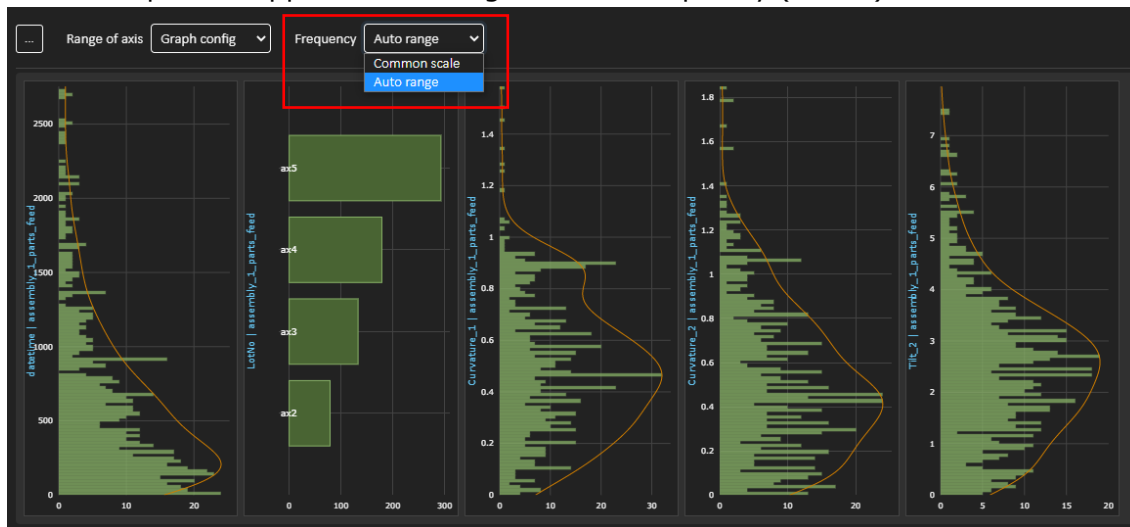
3. On-demand Filter

You can filter value of label or facet when you selected label or facet in GUI.
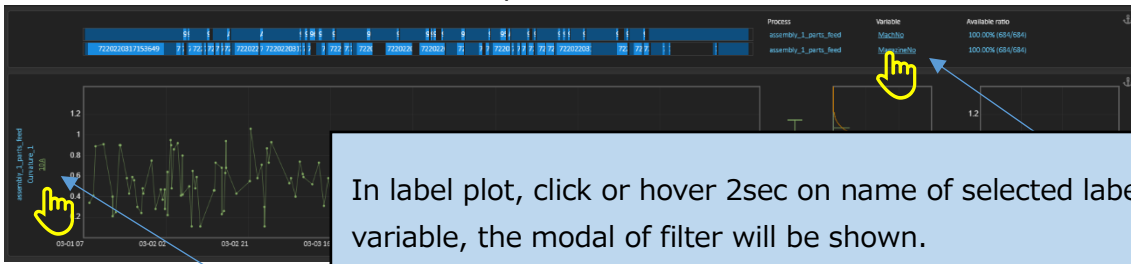
In label plot, click or hover 2sec on name of selected label variable, the modal of filter will be shown.

If facet is selected, value of each facet show at title of card. Click or hover (2sec) on this value to show filter modal.
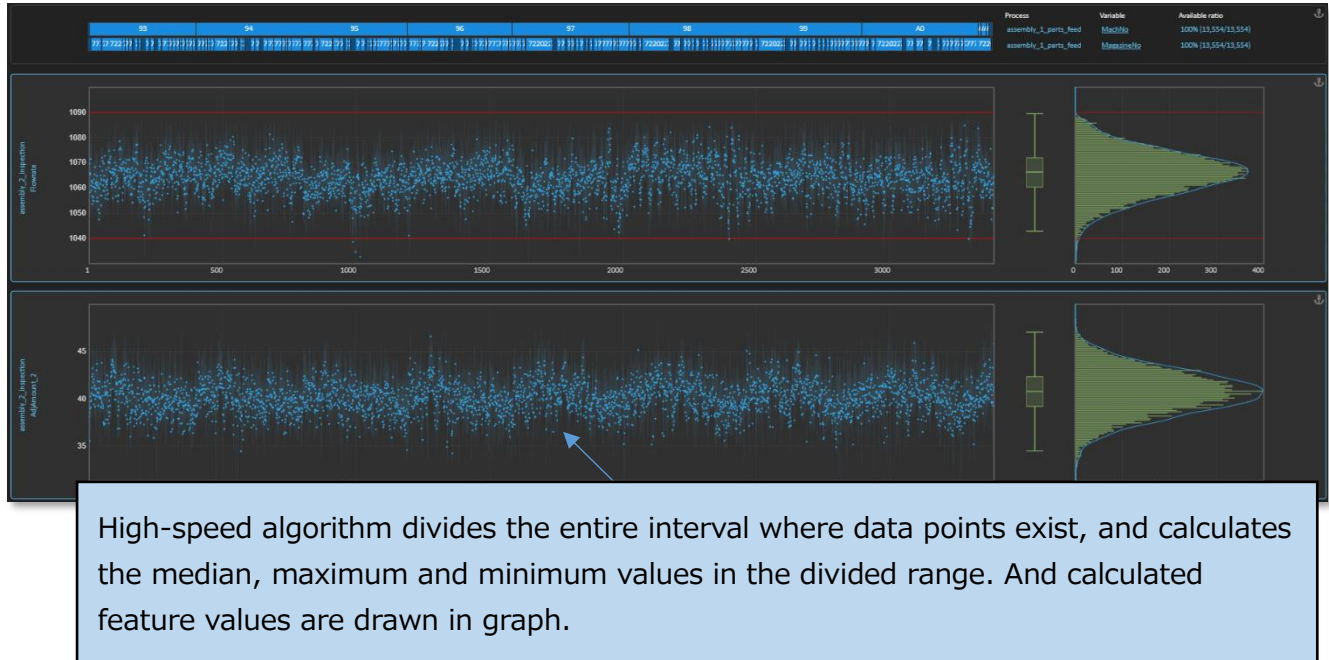
Filter modal

You can search all value shown on this modal by search box. Input to highlight and push [Enter] to limit selection. When click Set button, all matched value will be selected automatically.

There are Facet and Label, it shows all unique value of selected Facet and Label in dataset.
Select value that you want to see in graph and press button OK to see the results.

4. High speed mode

When the number of data points displayed in one graph reaches 12,000 or more, it automatically switches to high-speed mode with high-speed feature extraction algorithms.

The drawn light blue data points show the results of high-speed processing.

High-speed algorithm divides the entire interval where data points exist, and calculates the median, maximum and minimum values in the divided range. And calculated feature values are drawn in graph.

High-speed feature extraction algorithms support the visualization of data for up to several million products, making it possible to view and utilize large amounts of data on the order of several million units without waiting.