

Analysis Platform + DN7

AP+DN7

Data importing & link setting

Analysis Platform supports any and all data sources, including existing equipment and systems within the factory. In addition, if there is a common ID, it is possible to link/link with various data such as materials, production management, logistics, MaaS, etc. Data linkage settings can also be set with intuitive and easy operations such as tracing a process flow diagram.

In addition to new IoT-compatible lines, we provide a one-stop integrated data analysis environment that "can do everything with just this" by aggregating and linking old legacy systems and collected data.

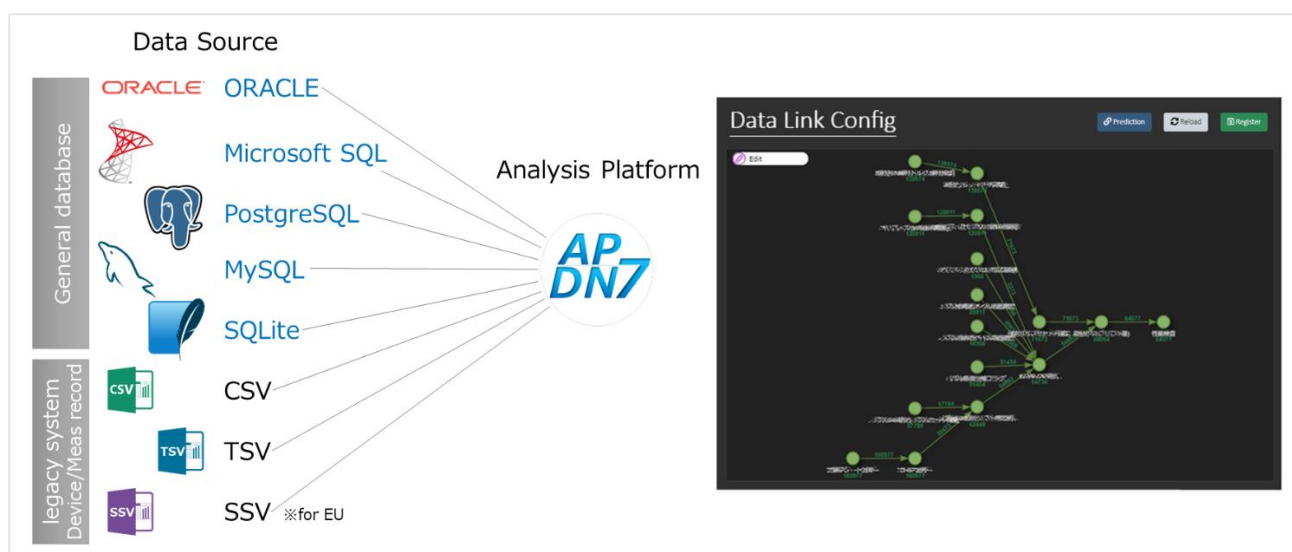


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1. Overview of each setting page

- **Data Source Config**

This app does not draw plots directly from the data stored in the factory data sources (various databases and CSV/TSV files), but by loading the data stored there into the app's database as a buffer. Enables high-speed plot drawing. Register the data source information for reading data in "Data Source Settings".

- **Process Config**

After "Data Source Config", set the target column (column) to read data into the application database in "process settings" and import the data. You can also set an arbitrary name for visualizing data.

- **Data Link Config**

In order to link data between different processes, set the column that stores the common ID.

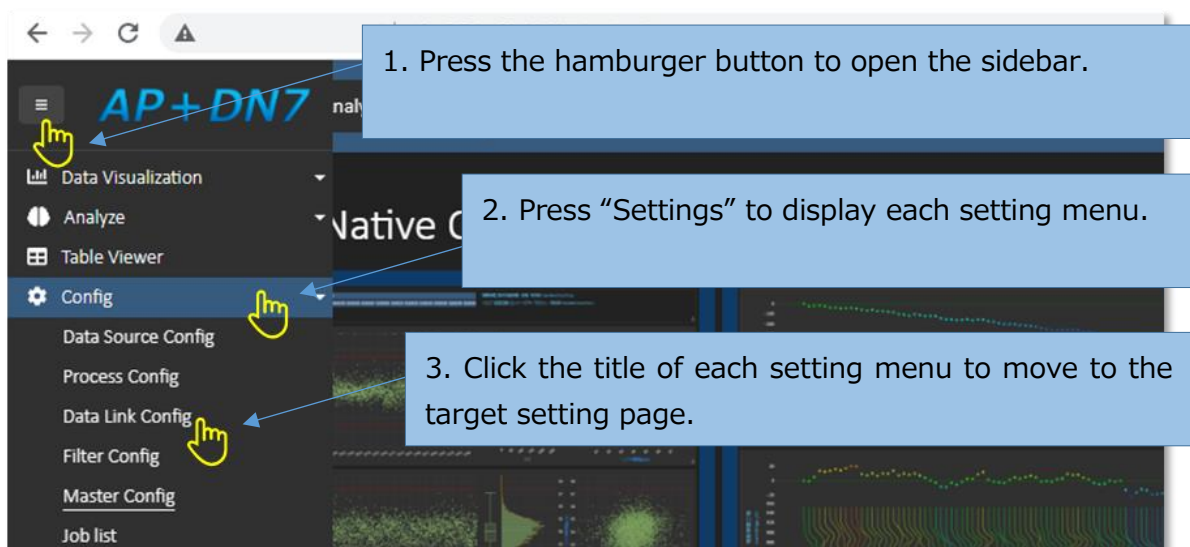
- **Filter Config**

Use the data such as equipment and product numbers included in the data loaded into the app's database to configure the settings to narrow down the data to be drawn in the plot. (explained in a separate manual)

- **Master Config**

Set the threshold to be displayed on the plot (upper threshold/lower threshold, upper threshold in process/lower threshold in process) and plot display range (y-axis maximum value/minimum value). (explained in another manual)

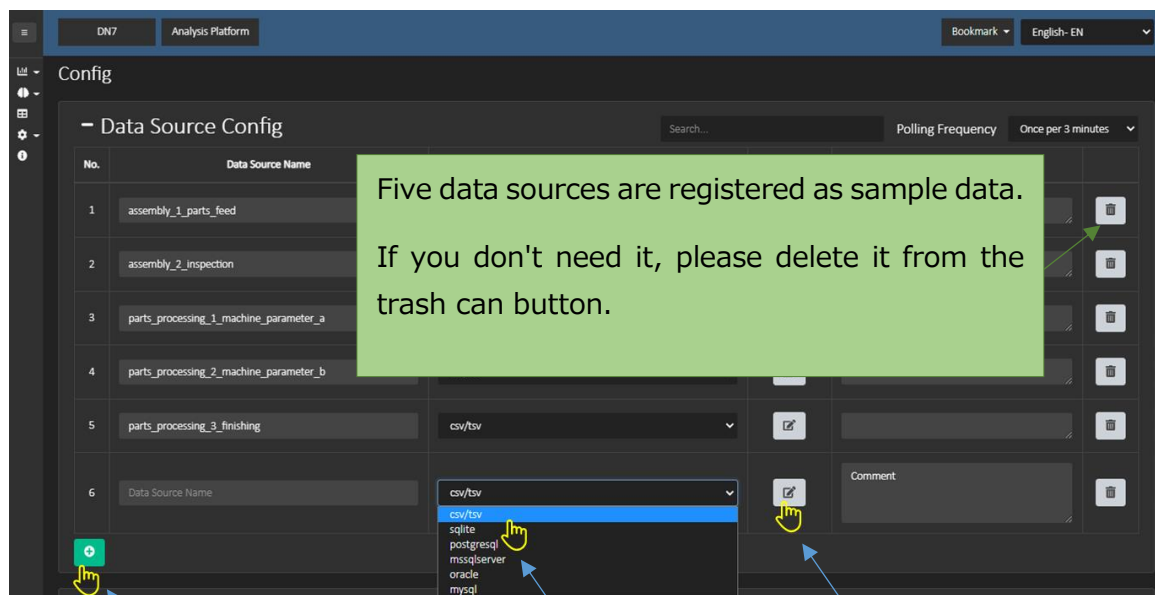
How to move to each setting page



2. Data Source Config

This app does not draw plots directly from the data stored in the factory data sources (various databases and CSV/TSV files), but by loading the data stored there into the app's database as a buffer. Enables high-speed plot drawing. Register the data source information for reading data in "Data Source Settings".

Use the buttons below to add/edit data source settings.



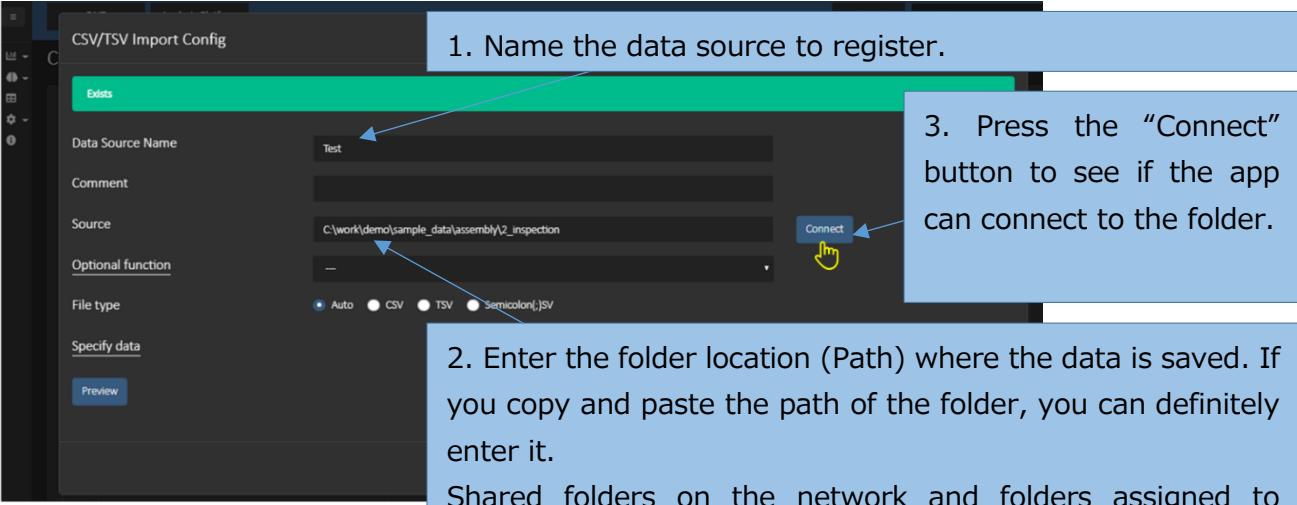
Since the setting method differs depending on the type of data source, the setting method for each data source is explained from the next page.

3. Importing from CSV/TSV file

Give the data source to be registered an arbitrary name, enter the location of the folder where CSV/TSV file are saved, and register it as the app data source.

Shared folders on the network or folders assigned to network drives can also be registered as target folders. In addition to absolute paths, it is also possible to set relative paths like below. (eg .¥sample_data¥assembly¥2_inspection)

Preview the data, and if there are no mistakes in the data to load, press the "OK" button to register the data source.



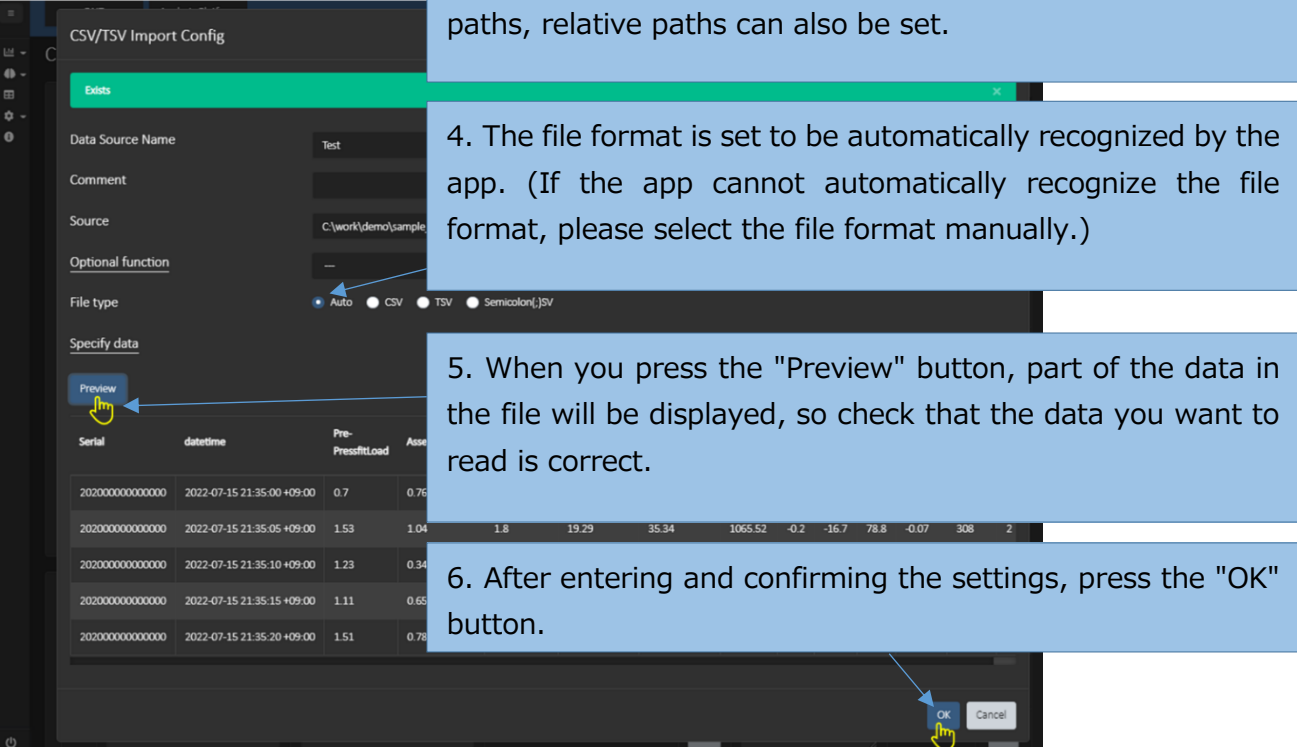
1. Name the data source to register.

2. Enter the folder location (Path) where the data is saved. If you copy and paste the path of the folder, you can definitely enter it.

3. Press the "Connect" button to see if the app can connect to the folder.

Shared folders on the network and folders assigned to network drives can also be registered. In addition to absolute paths, relative paths can also be set.

Setting



4. The file format is set to be automatically recognized by the app. (If the app cannot automatically recognize the file format, please select the file format manually.)

5. When you press the "Preview" button, part of the data in the file will be displayed, so check that the data you want to read is correct.

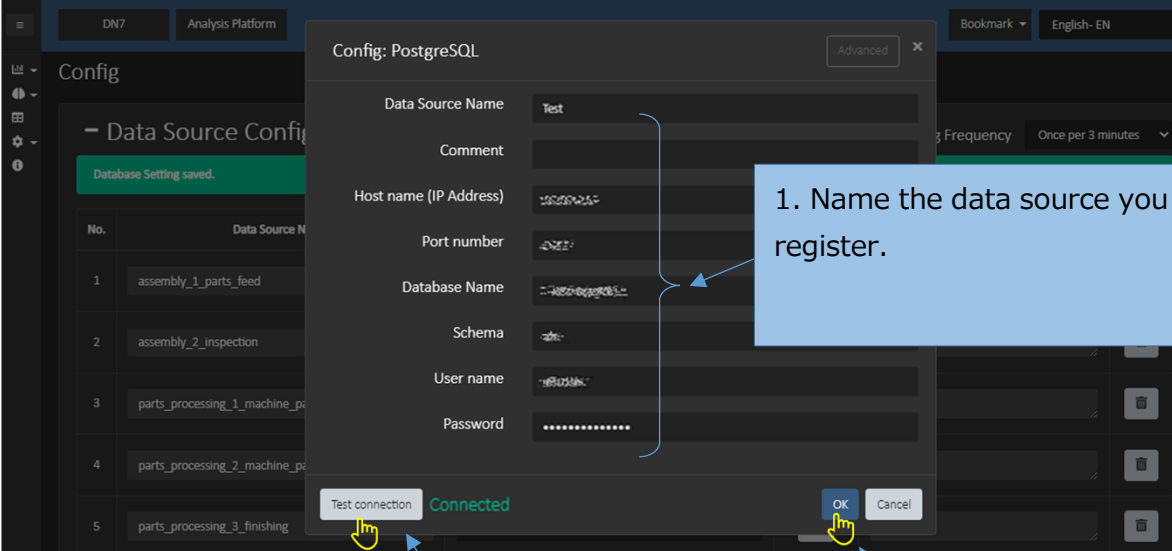
6. After entering and confirming the settings, press the "OK" button.

Serial	datetime	Pre-PressfitLoad	Asse
2020000000000000	2022-07-15 21:35:00 +09:00	0.7	0.76
2020000000000000	2022-07-15 21:35:05 +09:00	1.53	1.04
2020000000000000	2022-07-15 21:35:10 +09:00	1.23	0.34
2020000000000000	2022-07-15 21:35:15 +09:00	1.11	0.65
2020000000000000	2022-07-15 21:35:20 +09:00	1.51	0.78

4. Importing from Database

Give an arbitrary name to the data source to be registered, enter the connection information to the database (hereafter referred to as DB), confirm that the connection to the DB can be made without problems, and then press the "OK" button to register the data source.

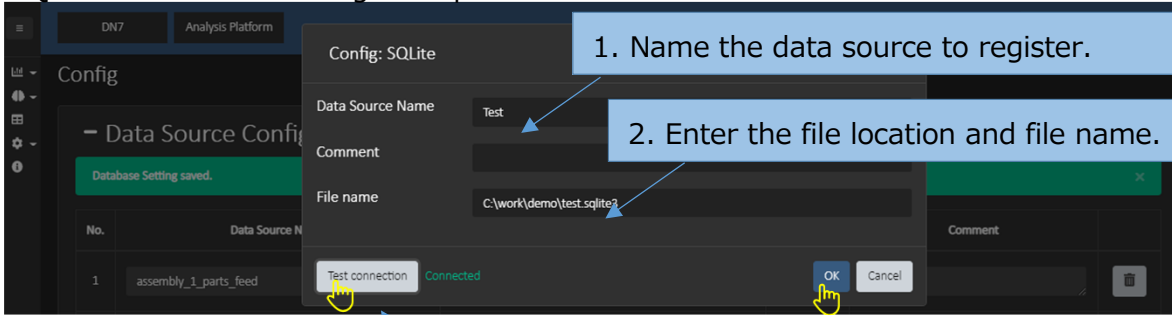
PostgreSQL data source setting example
(same setting for ORACLE/mssql etc.)



The screenshot shows the 'Config: PostgreSQL' dialog box. The 'Data Source Name' field is set to 'Test'. The 'Host name (IP Address)', 'Port number', 'Database Name', 'Schema', 'User name', and 'Password' fields are also filled. A 'Test connection' button is highlighted with a yellow arrow, and the status 'Connected' is shown. The 'OK' and 'Cancel' buttons are also visible.

1. Name the data source you want to register.
2. Press the "Test Connection" button and check if you can connect to the DB.
3. After connecting to the DB, complete the registration with the "OK" button.

SQLite data source setting example



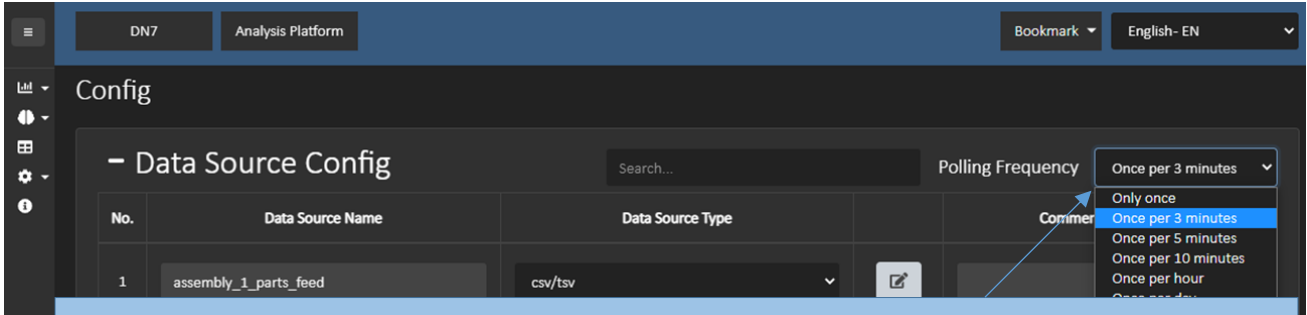
The screenshot shows the 'Config: SQLite' dialog box. The 'Data Source Name' field is set to 'Test'. The 'File name' field is set to 'C:\work\demo\test.sqlite'. A 'Test connection' button is highlighted with a yellow arrow, and the status 'Connected' is shown. The 'OK' and 'Cancel' buttons are also visible.

1. Name the data source to register.
2. Enter the file location and file name.
3. Press the "Test Connection" button and check if you can connect to the DB.
4. After connecting to the DB, complete the registration with the "OK" button.

Data periodic loading settings

You can set the app to periodically read updated data for the data that is saved in the factory DB at any time.

Also, depending on the factory equipment, CSV files may be saved sequentially in a specified folder. It can be loaded automatically at regular intervals.



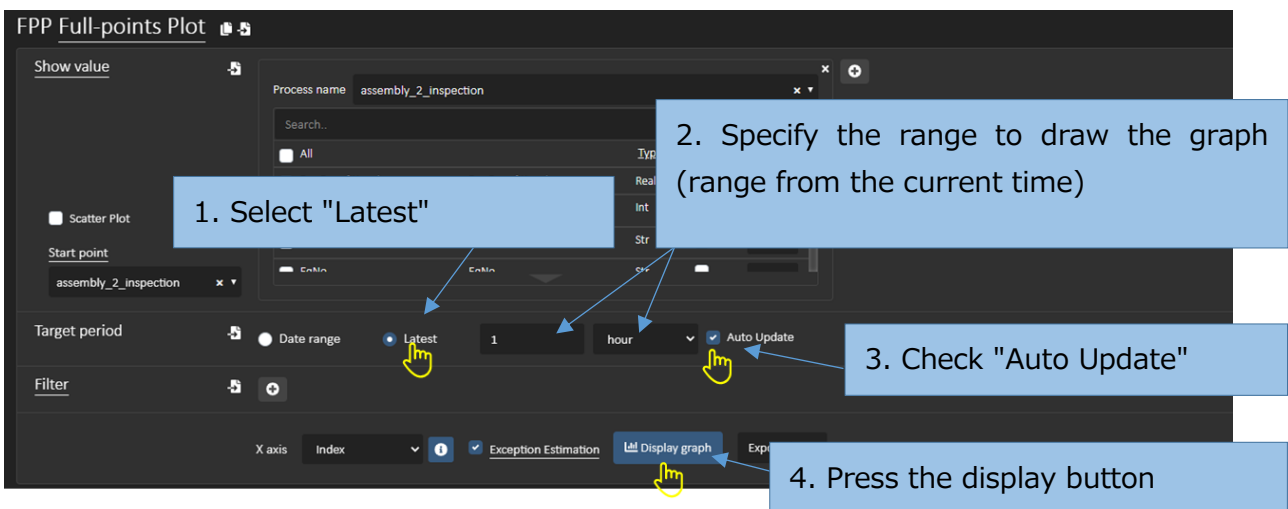
From the "Polling Frequency" pull-down menu, you can set the cycle for automatically reading the updated data of the registered data source.

At least once every 3 minutes, the data source registered by the application is searched for updated data, and if there is updated data, it is automatically loaded into the application's DB.

The updated data automatically read from the data source by the app can be automatically drawn on the plot screen.

For example, if you select "Latest" for the target period on the All Plot page, specify the range to draw the plot, and check "Auto Update", the plot will be updated at the update interval selected in the data source settings. Drawing is also updated automatically.

Auto-update settings for graph drawing (Example on FPP: Full Points Plot)

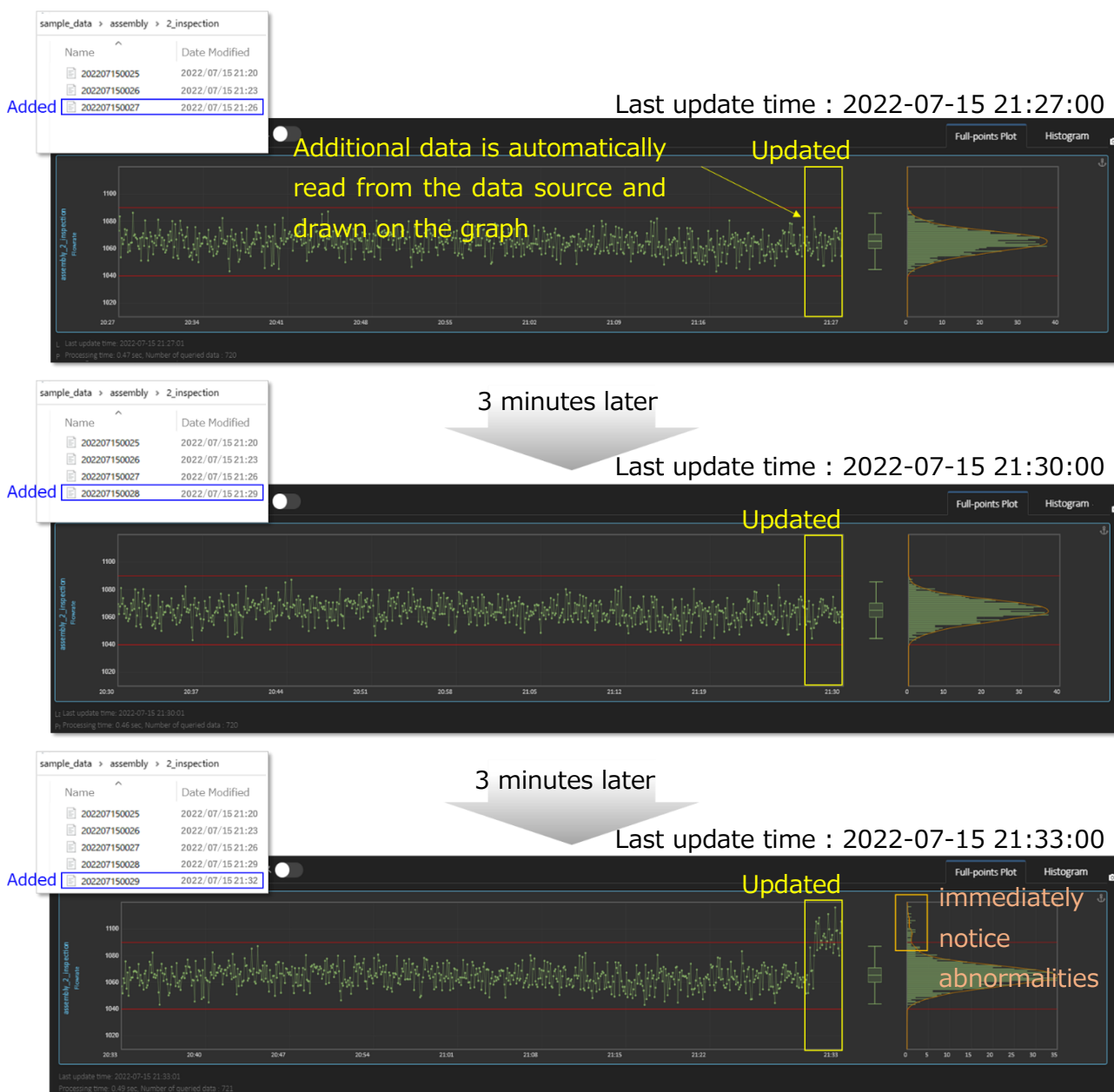


The application automatically reads the updated data of the data source, and the updated data can be automatically drawn in plots, so it can be used to monitor the process as a process Andon.

When updating data, for example, even if new data is added to the CSV file and the file is overwritten, the application can read the added data as updated data and automatically draw the plot.

The figure below is an example of automatic updating of all plots when the periodical update of the data source is set to "Once every 3 minutes". (In the example below, only one plot is drawn, but even if you set to draw multiple plots, the plot can be automatically updated in the same way, so it is the most suitable function for process Andon.)

Example of auto-update FPP when auto-update of data source is set to "Once every 3 minutes"
Update data source CSV file



5. Process Config

After registering the data source of the factory that is the target of data utilization in "Data source settings", set the columns to be read into the database of the application in "Process settings" and read the data.

First, register the process as follows.

The image shows two screenshots of a software interface for configuring processes. The top screenshot displays a table with columns: No., Process Name, Data Source Name, Table Name, Comment, and Status. Five rows of sample data are listed. A green callout box explains that these are sample data and can be deleted. A blue callout box 1 points to a plus icon for adding a new process. A blue callout box 2 points to a dropdown menu for selecting a data source. A blue callout box 3 points to a dropdown menu for selecting a table. A blue callout box 4 points to an edit icon. A grey arrow labeled 'After pressing edit button' points to the bottom screenshot. The bottom screenshot shows the 'Process Config: Detail' form with fields for Process Name, Comment, Data Source Name, and Table Name. A blue callout box 5 points to the Process Name field. A blue callout box 6 points to the Data Source Name and Table Name fields. A blue callout box 7 points to a 'Preview' button. At the bottom right, there are buttons for 'Import Data', 'Cancel', 'Edit Mode', 'Operator', and 'Coef'.

No.	Process Name	Data Source Name	Table Name	Comment	Status
1	assembly_1_parts_feed				
2	assembly_2_inspection				
3	parts_processing_1_machine_par				
4	parts_processing_2_machine_par				
6	Process Name				

Five data sources are registered as sample data. If you don't need it, please delete it from the trash can button.

1. Press the new registration button.
2. Select the target data source.
3. If the target data source is DB, select the target table.
4. Press the Edit button to make advanced settings. (The setting method is explained on the next page)

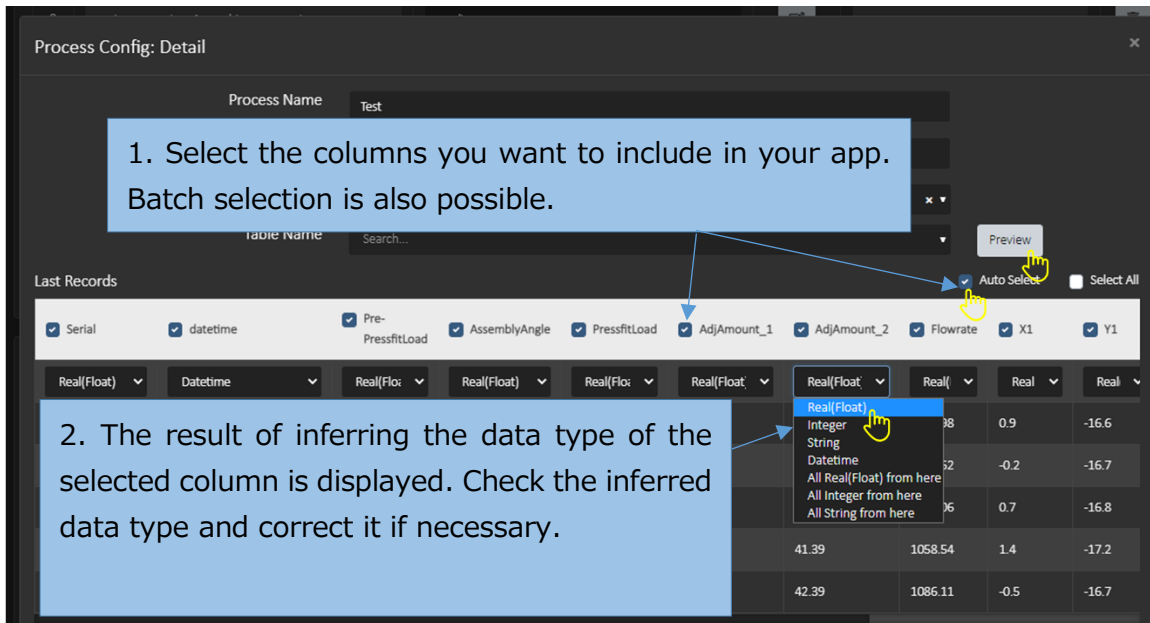
After pressing edit button

Page displayed when you press the edit button

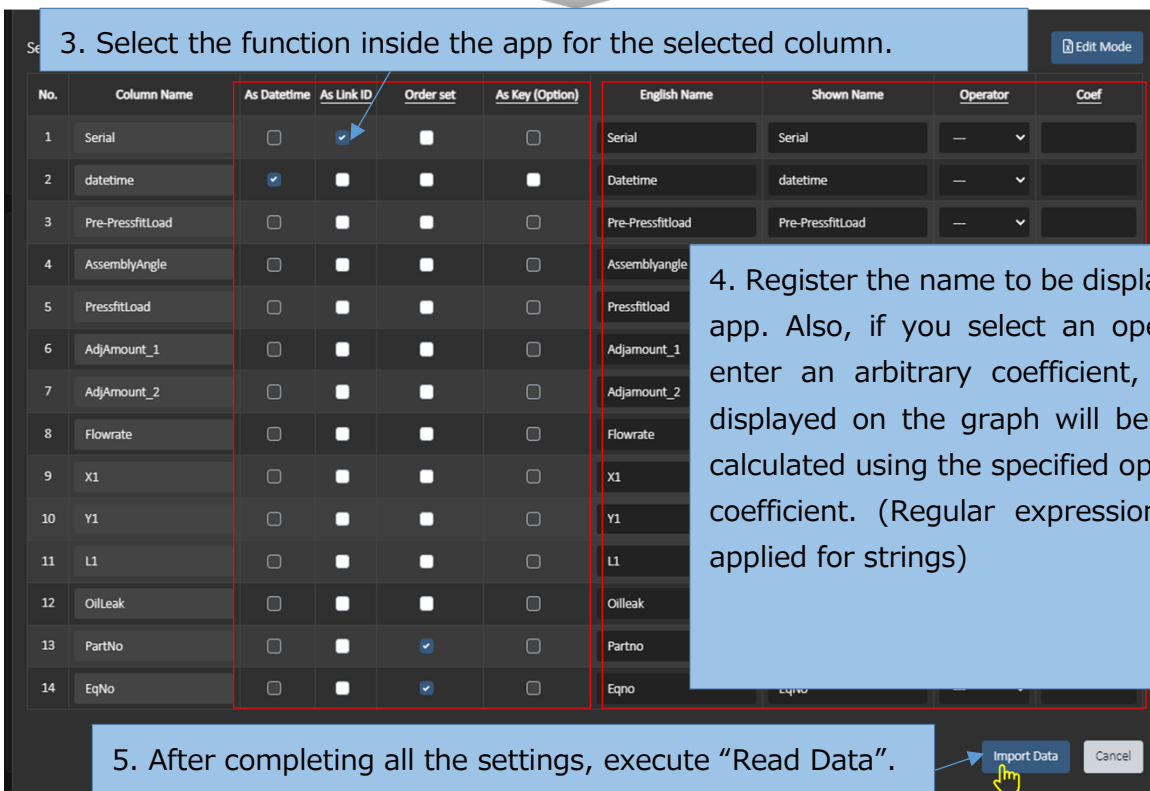
5. Give any name to the process to be registered. (default is the same name as the data source name)
6. You can select and change the target data source. If the target data source is DB, you can select and change the table.
7. Press the "Preview" button

After registering any process name and selecting the name of the data source to import data from, click the preview button to display part of the data in the data source. Select the target column (column) to read data from, confirm the data type, and set the properties of the target column (column), then start reading the data.

After pressing the preview button, select the column (column) to read data

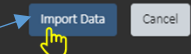


After selecting the target column



4. Register the name to be displayed in the app. Also, if you select an operator and enter an arbitrary coefficient, the value displayed on the graph will be the value calculated using the specified operator and coefficient. (Regular expressions can be applied for strings)

5. After completing all the settings, execute "Read Data".



Note:

About function selection inside the app for selected columns

* Date & time (required) : Be sure to select one column to be used as date and time on the app. (Multiple selection not allowed)

* Data Link ID (Optional) : Select the column to be used for pegging data between processes. (multiple selection possible)

* Order by (Optional): Select the column to use for sorting the data in the full count plot. (multiple selection possible)

* As key (optional): Select a column of date and time data that will be preferentially used as the key that the app will use to remember the date and time when recurring data imports. (Multiple selection not allowed)

After completing the settings, press the "Read data" button to start reading data.

If you have set the data to be read periodically (select the update cycle) in "Data source settings", once you press the "Read data" button, the app will automatically read the data periodically after that. will load.

Note:

If a folder in which CSV/TSV files are saved is registered as a data source, all files saved in the target folder will be read.

If the selected column does not exist in the target file, or if data other than the set data type exists, that file or data will not be read.

Unloaded data is exported to the app's error folder (./error/trace) so you can check its contents.

Also, if duplicate data exists in all files in the target folder, the app automatically detects the duplicate data and exports the duplicate data to the error folder without reading it.

Tips:

If the list of display names in "Process Settings" is managed in an Excel file, you can transfer (copy and paste) data to and from the Excel file in "Edit Mode".

Setting Content Edit Mode

No.	Column Name	As Datetime	As Link ID	Order set	As Key (Option)	English Name	Shown Name	Operator	Coef
1	Serial	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Serial	Serial	---	▼
2	datetime	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Datetime	datetime	---	▼
3	Pre-PressfitLoad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pre-PressfitLoad	Pre-PressfitLoad	---	▼

Edit Mode

Setting Content Setting Mode

	Column Name	As Datetime	As Link ID	Order set	As Key (Option)	English Name	Shown Name	Operator	Coef
1	Serial	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Serial	Serial		
2	datetime	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Datetime	datetime		
3	Pre-PressfitLoad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pre-Pressfitload	Pre-PressfitLoad		
4	AssemblyAngle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Assemblyangle	AssemblyAngle		
5	PressfitLoad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pressfitload	PressfitLoad		
6	AdjAmount_1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Adjamount_1	AdjAmount_1		
7	AdjAmount_2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Adjamount_2	AdjAmount_2		
8	Flowrate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Flowrate	Flowrate		
9	X1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X1	X1		
10	Y1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Y1	Y1		
11	L1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L1	L1		
12	OilLeak	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Oilleak	OilLeak		
13	PartNo	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Partno	PartNo		

Context menu: Insert a new row before, Insert a new row after, Delete selected rows, Copy... (Ctrl + C), Paste... (Ctrl + V), Save as... (Ctrl + S), About.

Data transfer (copy & paste) with Excel is possible



	A	B	C
1		Pre-Pressfitload	Pre-PressfitLoad
2		Assemblyangle	AssemblyAngle
3		Pressfitload	PressfitLoad
4		Adjamount_1	AdjAmount_1
5		Adjamount_2	AdjAmount_2

6. Data Link Config

When the data loading from the registered data source is completed in "Process Settings", the data can be visualized. If there is a common ID in , it is possible to link data between processes.

The explanation of each button etc. displayed on the "Link setting" screen is as follows.

The screenshot shows the "Data Link Config" interface. At the top right, there are three buttons: "Prediction", "Reload", and "Register". A callout points to the "Register" button, stating: "Start button for linking ID generation". Another callout points to the "Reload" button, stating: "Reset button of setting". A third callout points to the "Prediction" button, stating: "A button that predicts how much pegging is possible with the set pegging conditions". In the center, there are two nodes: "Test" and "Test_2", both with the value "0/13,633". A callout points to the "0" in "0/13,633" for the "Test" node, stating: "Number of data that can be linked". Another callout points to the "13,633" in "0/13,633" for the "Test_2" node, stating: "Number of imported data".

In pegging settings, first select the pre-process and post-process to be pegged.

After pressing the linking addition button that is displayed by pressing the edit button, by connecting the node (○ mark) of the previous process to the node (○ mark) of the following process with a line using the mouse drag and drop, the string Set the pre-process and post-process to be attached.

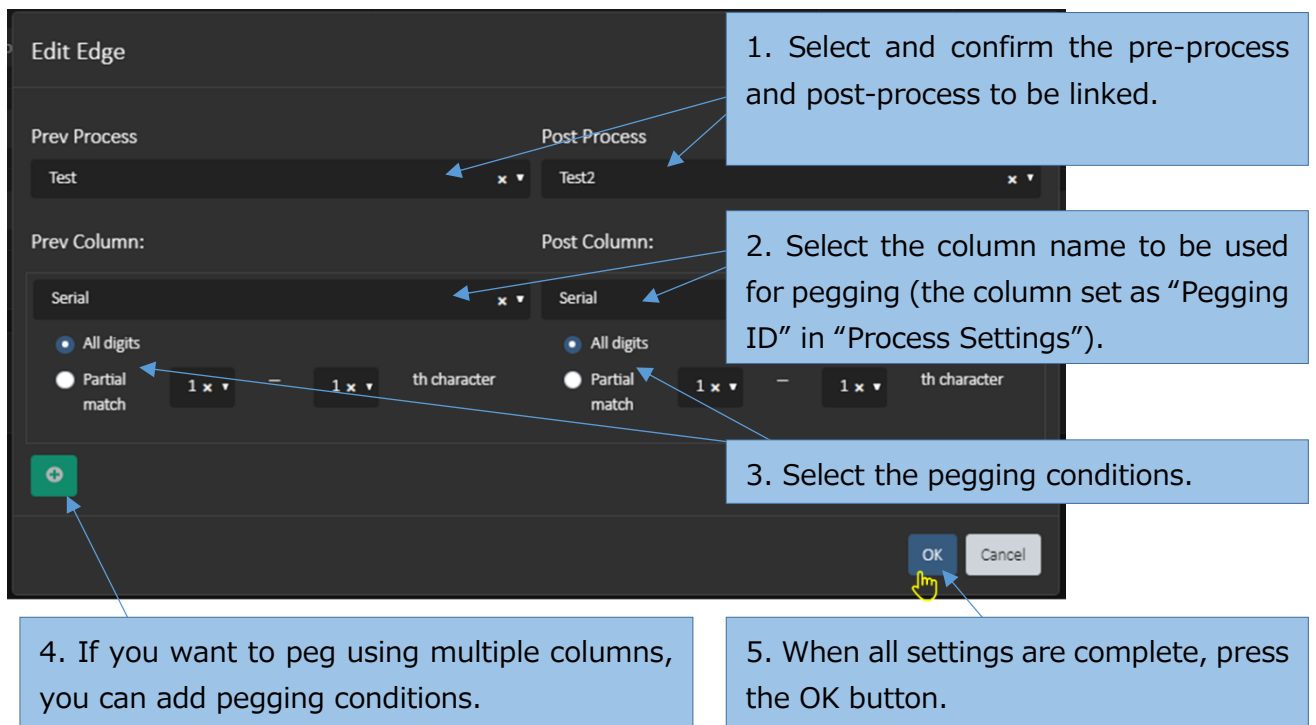
It is also possible to select the process to be linked by selecting "Add link" displayed by right-clicking the mouse on the node (○ mark) of the previous process.

The screenshot shows the "Data Link Config" interface. At the top left, there are two buttons: "Edit" and "Add Edge". A callout points to the "Add Edge" button, stating: "When you press the 'Edit' button, the 'Add link' button will appear, so press it". In the center, there are two nodes: "Test" and "Test_2", both with the value "0/13,633". A line connects the node "Test" to the node "Test_2". A callout points to the line, stating: "When you drag the mouse over the node that represents the process, a line will appear. Drop the mouse over the node of the process you want to link." Another callout points to the node "Test_2", stating: "You can also set to add a link by right-clicking on the node." At the top right, there are two buttons: "Reload" and "Register".

When you select the process to be pegged, a window to enter the pegging conditions will be displayed.

Enter the linking conditions in the following procedure.

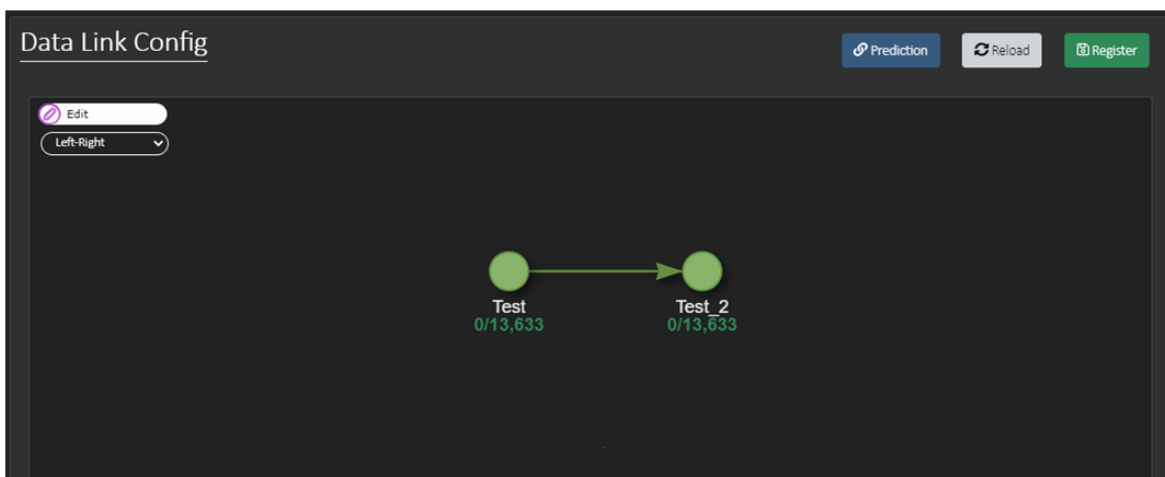
1. Selection and confirmation of processes to be linked
2. Select column name used for pegging (the column set as "Pegging ID" in "Process settings")
3. Select the linking condition (all rows match or partial match can be used)
4. Add a linking condition if you want to link using multiple columns
5. After setting the conditions, press the OK button.



The screenshot shows the 'Edit Edge' dialog box with the following settings and callouts:

- 1. Select and confirm the pre-process and post-process to be linked.** Callout pointing to 'Prev Process: Test' and 'Post-Process: Test2'.
- 2. Select the column name to be used for pegging (the column set as "Pegging ID" in "Process Settings").** Callout pointing to 'Prev Column: Serial' and 'Post Column: Serial'.
- 3. Select the pegging conditions.** Callout pointing to the 'All digits' radio button under both 'Prev Column' and 'Post Column'.
- 4. If you want to peg using multiple columns, you can add pegging conditions.** Callout pointing to the green '+' button.
- 5. When all settings are complete, press the OK button.** Callout pointing to the 'OK' button.

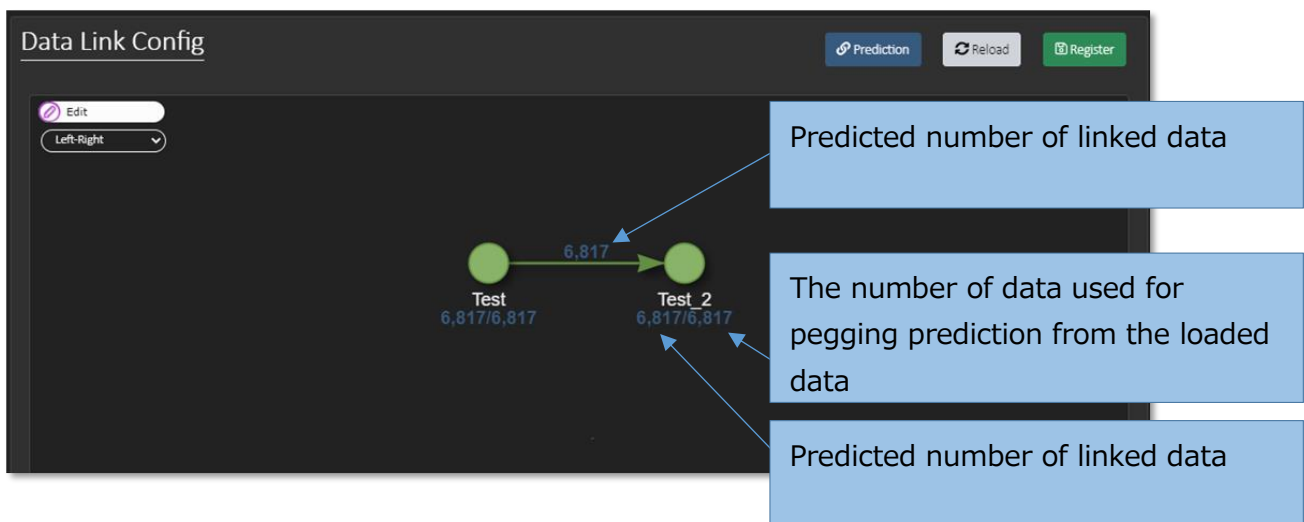
When the pegging setting is completed, the nodes (○ mark) of the previous process and the next process will be connected with arrows as shown below.



If you press the "Pegging prediction" button on the right side of the "Pegging settings" screen after setting the data pegging between processes in the pegging settings, you can see how much data will be pegged according to the set pegging conditions. You can predict how long it will take.

In the figure below, the number of data used for prediction is displayed in dark blue under the node (o), and it is linked above the edge (arrow representing the connection between processes). The prediction result of the number of data is also displayed in dark blue numbers.

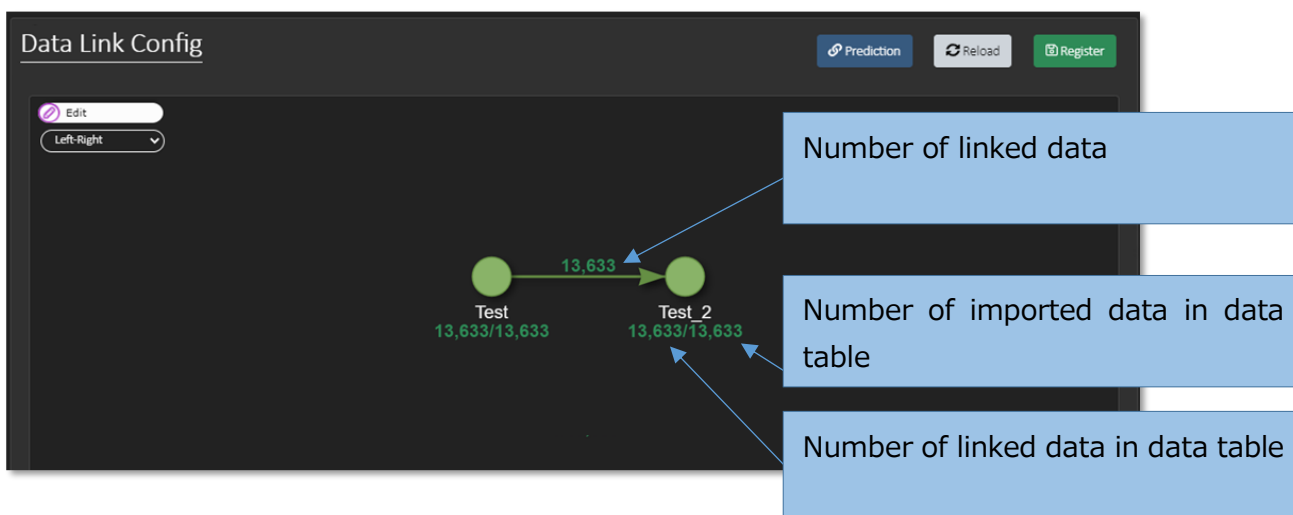
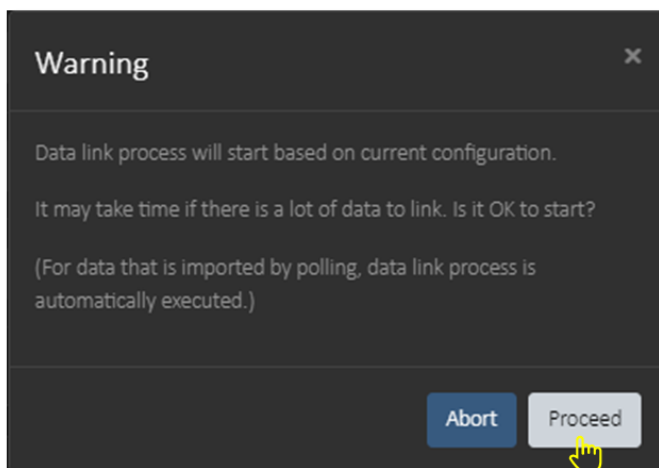
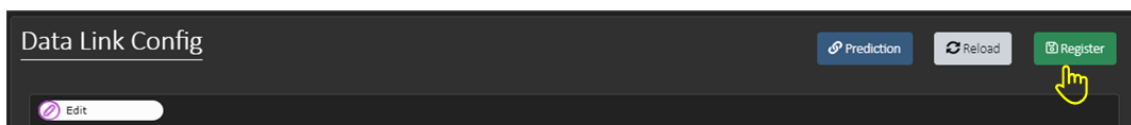
If the predicted result of the number of data to be linked is zero or is significantly different from the forecast, please review the linking conditions at this point.



After completing the setting of the linking conditions, execute the linking.

After confirming that there are no problems with the linking conditions, press the "Register" button on the right side of the screen to display a confirmation screen to start generating a linking ID.

When you press the OK button on the confirmation screen, the generation of the ID for linking starts. When the generation of the ID for linking is completed, the number of data read in each process and the number of data linked between processes is displayed as a green number.



Once you have completed the settings up to this point, you can start using the data visualization/analysis tools on each page.