S 2.0

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A Sonepar Company

Smart 2.0

Scalable | Monitoring | Archiving | Reporting | Tool

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About This Guide

Audience Profile

This is a comprehensive configuration guide intended for administrators and end-user who want to configure the system and use the system respectively.

Typographical Conventions

Convention	Description
Blue	Cross-reference links
Red	Note
*	Mandatory setting while configuring that component

Limitations Testing System

All the limitations are validated/checked on the system of –

RAM – 16GB

CPU – i7

Disk – SSD

Windows – 10

Number of tables – 10

Number of columns in each Table – 100

Note - Limitations might be different depending on the system environment.

System Requirements: Hardware and OS

Supported virtual systems:

Virtual Systems	SMART Editor/Runtime	SMART Web Server	SMART Web Client
Google VM	✓	✓	✓
AWS VM	✓	✓	✓
VMWare	✓	✓	✓
Oracle VM	✗	✗	✓

Supported operating systems and required service packs:

Operating system	SMART Editor/Runtime	SMART Web Server	SMART Web Client
Windows 7 (Professional, Enterprise and Ultimate version, x64 versions)	SP 1	SP 1	SP 1
Windows 8 and 8.1 (Standard, Professional, Enterprise version, x64 versions)	SP 0	SP 0	SP 0

Windows 10 (Home, Pro, Enterprise, Education, IoT Enterprise, version, x64 versions)	SP 0	SP 0	SP 0
Windows Server 2008 R2 (All editions except for Core, x64 versions)	SP 1	SP 1	SP 1
Windows Server 2012 and 2012 R2 and above (All editions except for Core, x64 versions)	SP 0	SP 0	SP 0

Hardware requirements:

Tags	Processor	Cores	Clock Speed	RAM	SSD Storage (approx.)
Up to 100 tags for 1 second data logging (Up to 2 years)	intel i5/i7 and above	4 cores	2.4 Ghz and above	16 GB	500 GB and above
Up to 1000 tags for 30 seconds data logging (Up to 2 years)	intel i5/i7 and above	4 cores	2.4 Ghz and above	32 GB	500 GB and above
Up to 10,000 tags for 30 seconds data logging (Up to 2 years)	intel i5/i7 and above	8 cores	2.4 Ghz and above	32 GB and above	750 GB
Up to 100,000 tags for 30 seconds data logging (Up to 2 years)	intel i5/i7 and above	32 cores	3.1 Ghz and above	64 GB and above	1TB and above
Up to 1,000,000 tags for 30 seconds data logging (Up to 2 years)	intel i5/i7 and above	64 cores	4.5 Ghz and above	128 GB and above	5TB

Installation
Pre-requisites
- Required RAM - 8GB (Minimum)
- Disk space - 1Gb for application. For data depending on the data logging frequency, in general it is recommended to keep 10GB of free space.
- Must have -
1. .Net versions (3.5, 4.5.2 and 4.6.1 are required)
2. Google Chrome
3. Mozilla Firefox (For version 3.46.00.00 and above)
4. Antivirus must be disabled.
5. Internet is not mandatory while installation.
6. Minimum resolution required is 1280*1024.
7. After any restart/shut down of PC, please wait approximately 5-miinutes to get start all the application automatically and start of datalogging.
- Check status for other dependencies installed by setup.
1. If Python 2.7 or Python 3.7.x are installed, then you can start installation.
2. If different version of NodeJS is installed, then so far, there have not been any issue till now. If lower version is installed (< 10.15.0), upgrade it to 10.15.0. If higher version is installed, then setup gives error while installation and setup fail to detect version 10.15.0. So, it gives the error message. Otherwise, our services work fine on higher version.
3. We support only MongoDB 4.0.4, if any other version is installed, then installation will not be done.
4. Erlang OTP and RabbitMQ, you should not start the installation if Erlang OTP with version other than 23.0.2 and RabbitMQ with version except 2.8.4 are installed on the system.
5. If Apache service is already installed with name apache2.4 or folder named C:\Apache24 is already present, then installation will not be done.

6. If Redis service is already installed with different version, then contact us.

If there are no conflicts with above pre deployment checks, you should be able to launch the installer.

Steps to Install SMART

SMART installer comes as setup.exe with all dependencies being wrapped in self-extracting archive file. The setup comes with name with below format -

SETUP_V<ReleaseVersion>_R<ReleaseDate>.exe

Release Version -

To start the installation, please double click on setup file. Windows will give UAC pop-up as the setup requires administrative privileges. Please click on Yes.

Installation screens

1. Welcome screen -
   - License key to be entered. License key contains the information of system's serial number, license expiry period, licensed features, product version and maximum concurrent login session count.
   - You need to read and accept terms and conditions. The license agreement page can be opened by clicking on the given link. You also need to click the checkbox.
   - If you don't have license key, then you need to send the license request form. License request form can be generated by using request form generator, the tool can be launched by clicking on the given link.
   - You can do basic configurations like, database location, install desktop shortcuts etc. Click on configure button to go on the configuration screen.
   - Click on continue to keep the default configurations.
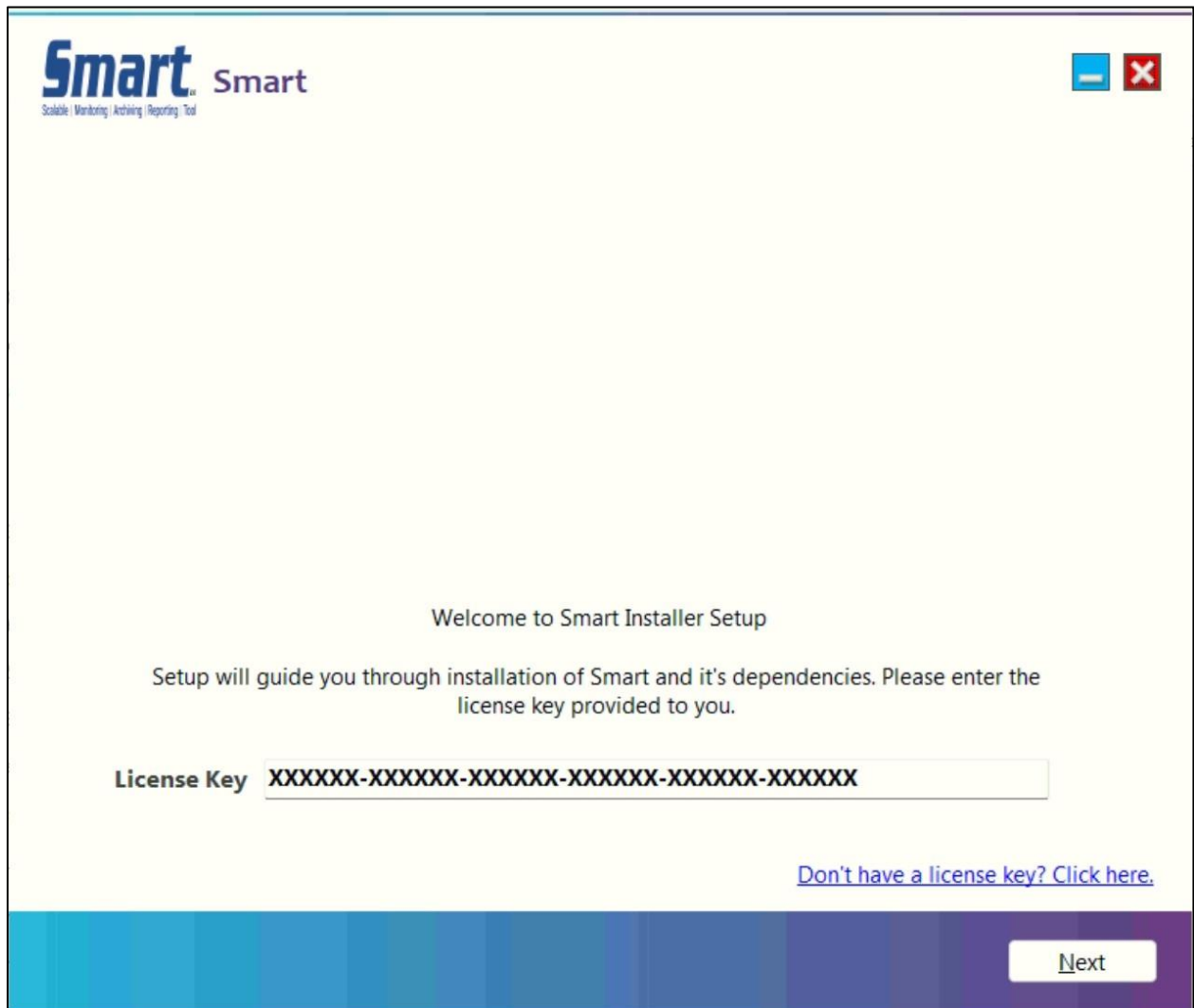
2. Request form screen -

   You need to fill the form and click on submit button. The request form will be created on your desktop. You need to send the same to SMART/MASIBUS support team.

3. License screen -

> Once you get the License, Copy and Paste it in the box. Click Next. You need to go through the license agreement mentioned by SMART. Once done, you can go to home screen and then proceed with installation.
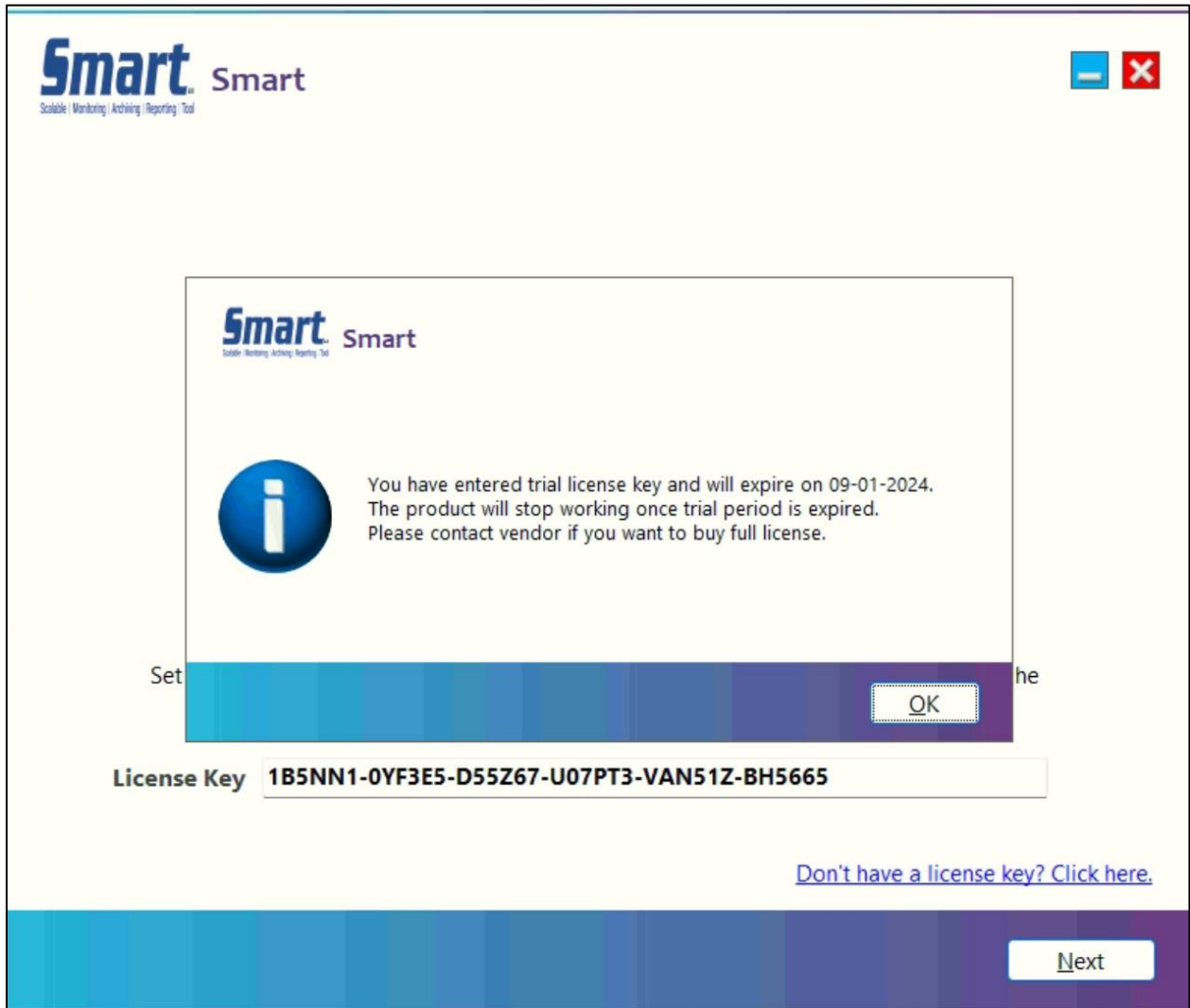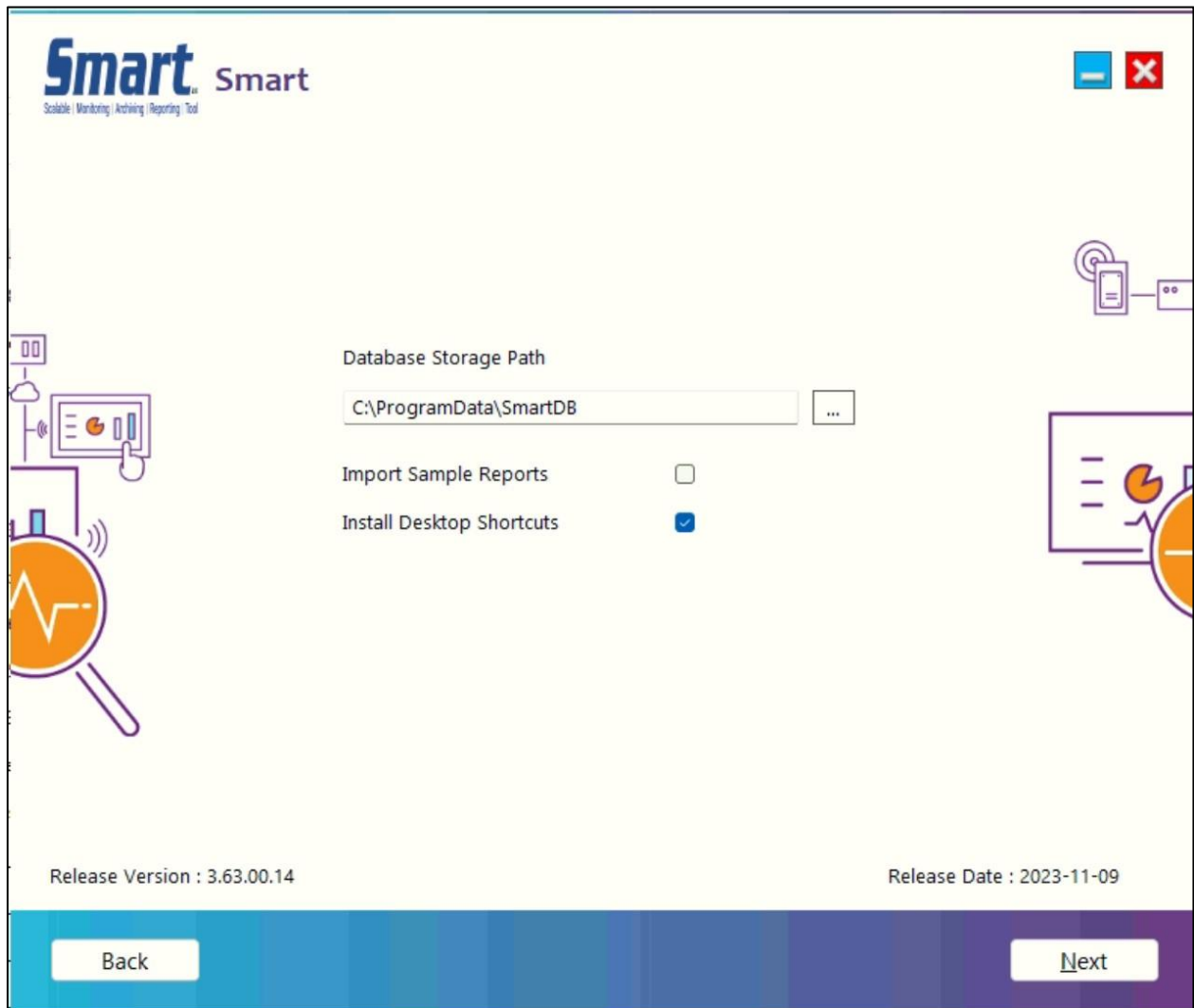
4. Configuration screen -

   On configurations screen, you can -

   - Select the database location.
   - Option to import sample dashboards.
   - Option to install desktop shortcuts.
   - Check setup release version and date.

   Once done, you can click on continue button to proceed with installation or go back to welcome screen to enter the license key or accept terms and conditions.

5. Dependency installation screen -

    Click on Install button to start with dependency installation. Dependency installation progress will be visible in status bar. Sit back and relax till the setup installs required dependencies.
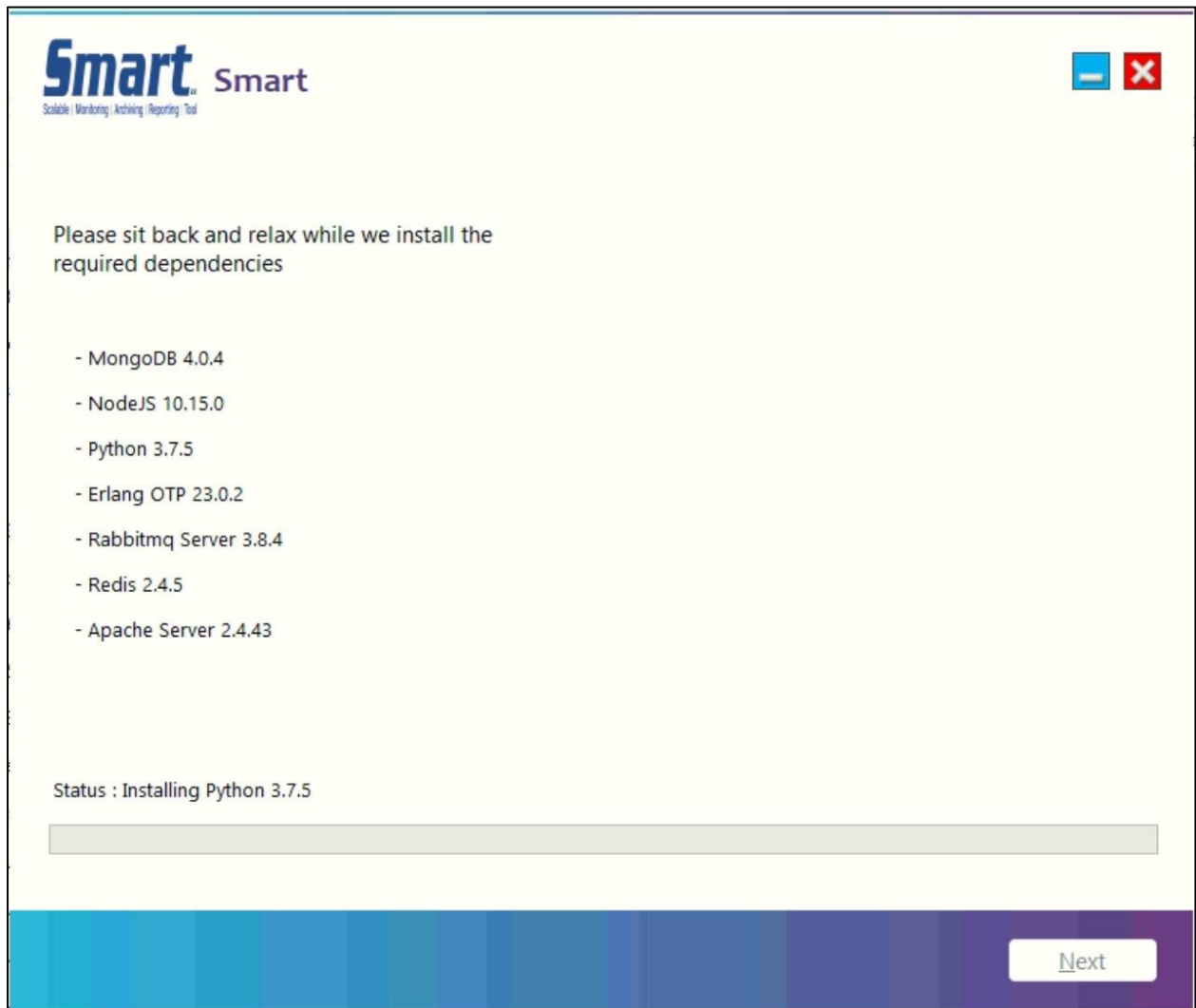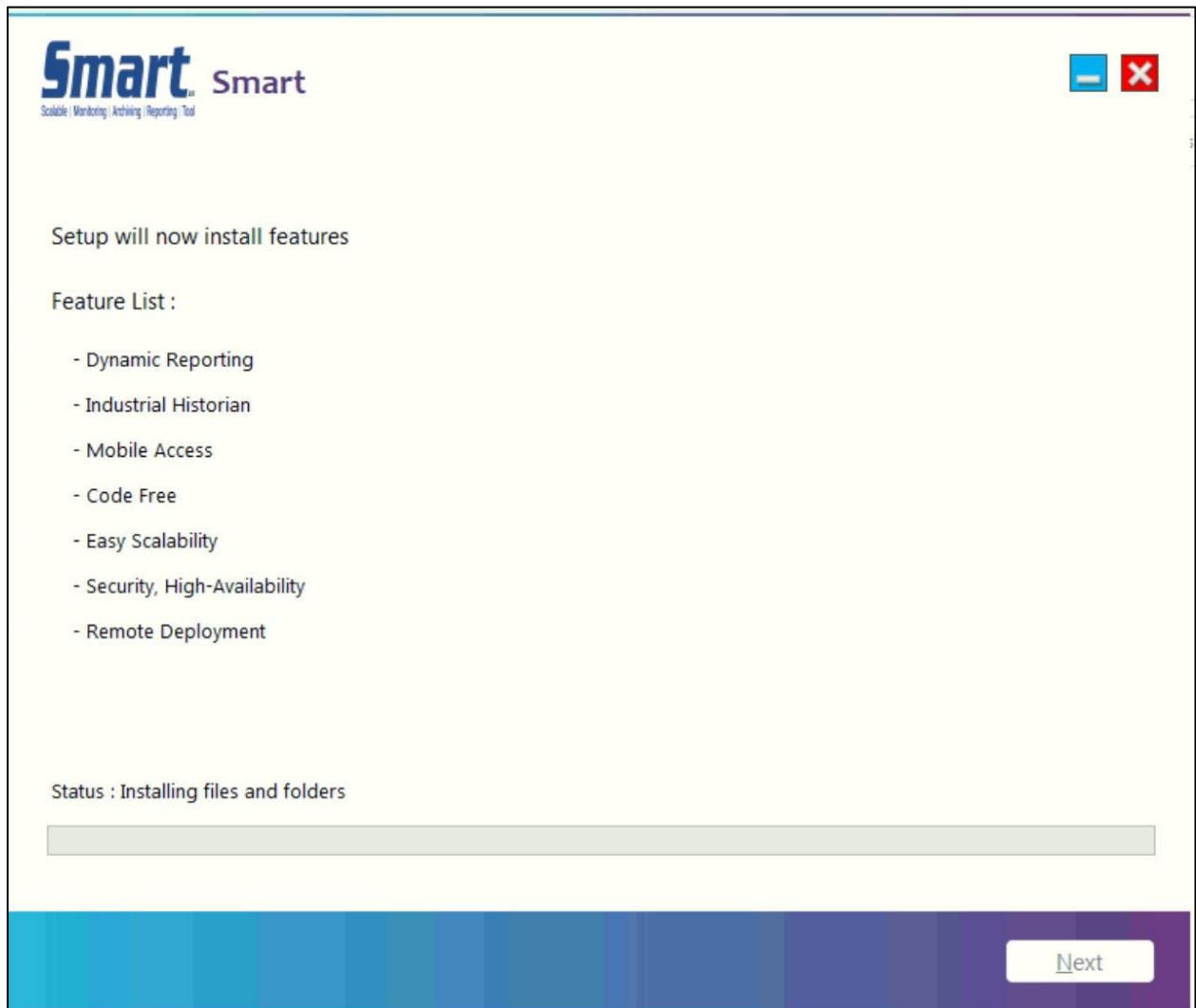
6. Once the installation is finished, you need to click on next button, to move on SMART installation screen.

7. SMART installation screen -

Click on install button to start with SMART installation. Installation progress will be visible in status bar. Sit back and relax till the setup installs required features.

Smart Smart

Setup will now install features

Feature List :

- Dynamic Reporting

- Industrial Historian

- Mobile Access

- Code Free

- Easy Scalability

- Security, High-Availability

- Remote Deployment

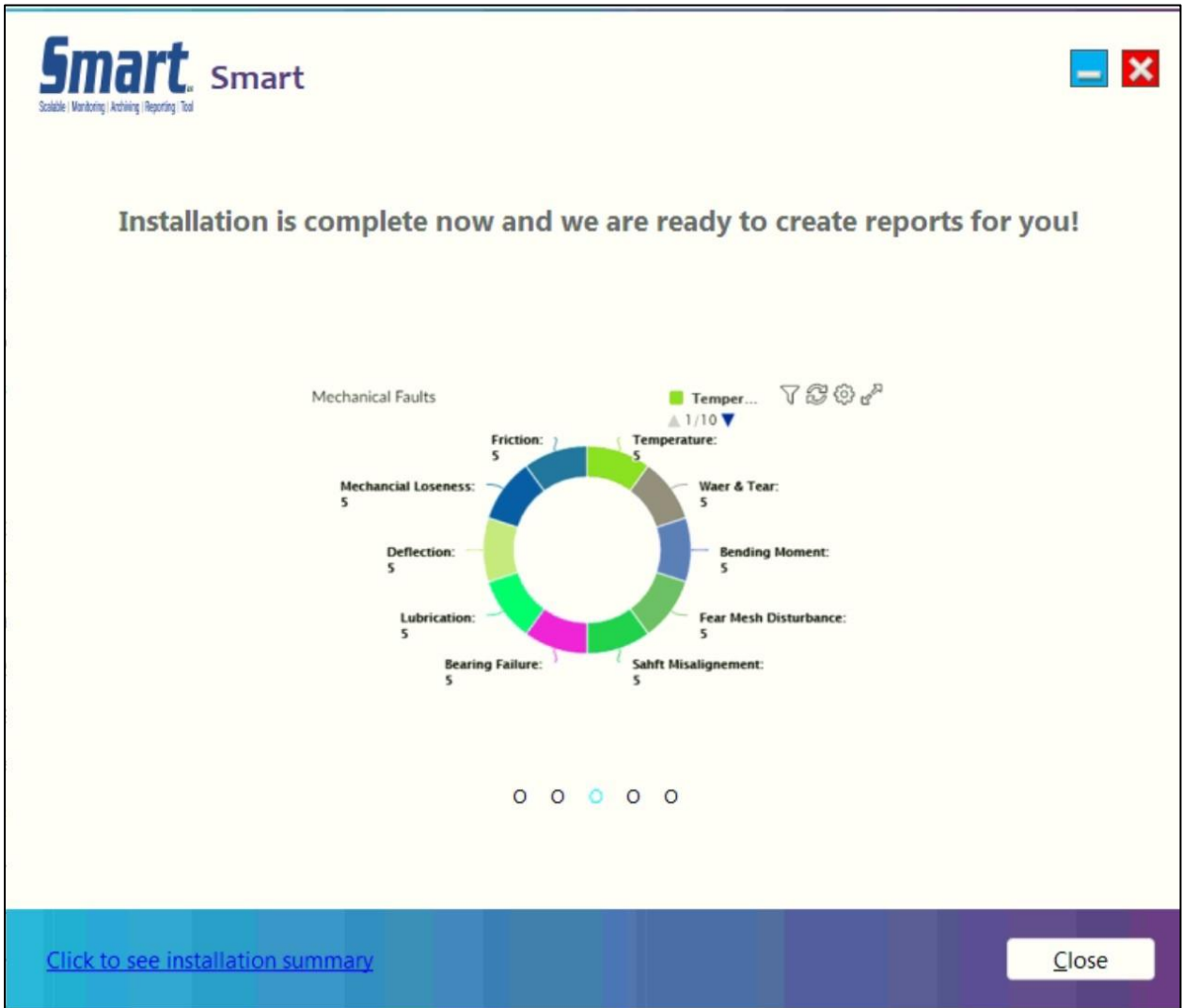Status : Installing files and folders

Next

8. Once the installation is finished, you need to click on next button, to move on SMART installation summary screen.
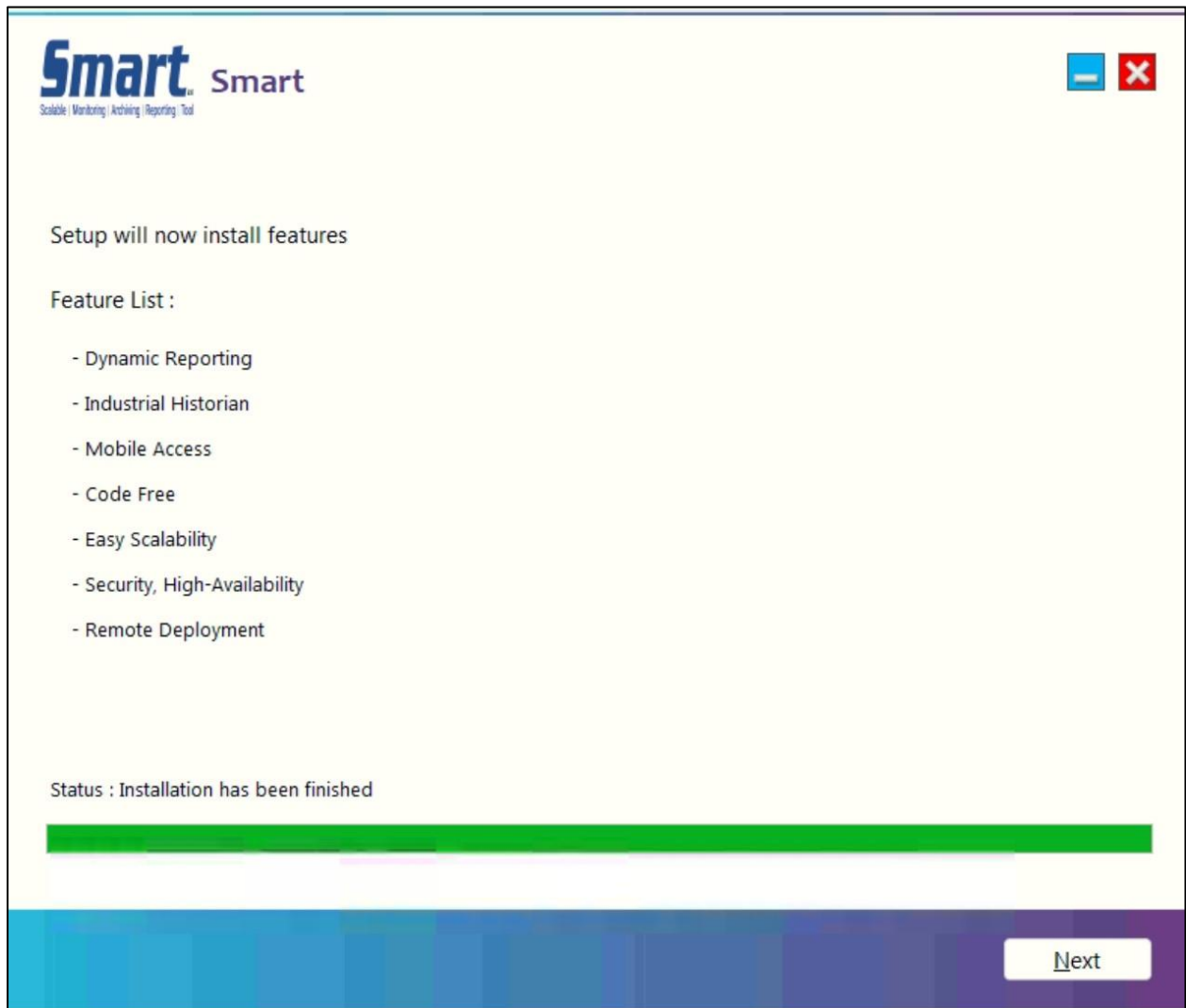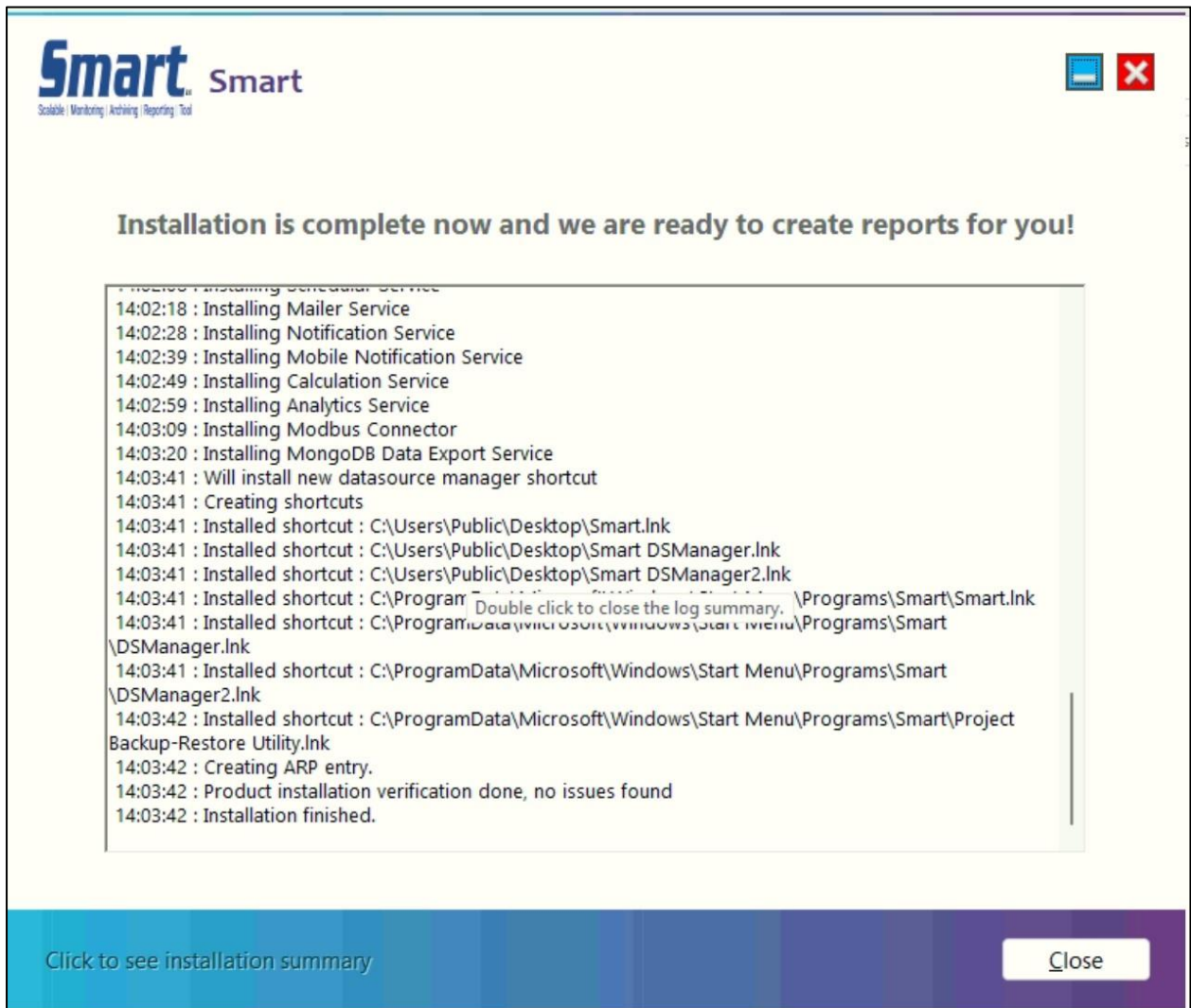
9. Installation finish screen -

    You can click on the link to open installation summary.

10. Installation summary screen -

The installation summary will be used to check if there are any issues occurred while installation.

Once done, click on close button.

Additional screens

- Addition to above screens setup can give few more pop-ups, which can be either information, warning, or error screens.
- Information will be displayed if trial license key is entered.
- Warning will be displayed if RAM or diskspace is not enough or if there are any dependency conflicts.
- Errors will be displayed if any error occurred in any dependency installation or feature installation. Please look for the log file, if the error message pop-ups, before clicking on ok or cancel button.

Accessing SMART Portal

You can log in directly to SMART's portal via URL or use a third-party single sign-on service, depending on the configuration.

You could be asked to change the user password. Kindly check mentioned details to access the SMART user interface using a user browser -

- Enter https://localhost:9197/login
- Default username - 'admin'
- Default Password - 'admin@123'

Licensing

SMART provides two types of licenses to our clients -

Trial - You can use the trial version to evaluate our product. The trial version has a 30-day trial period. You can extend the trial version depending on the requirements.
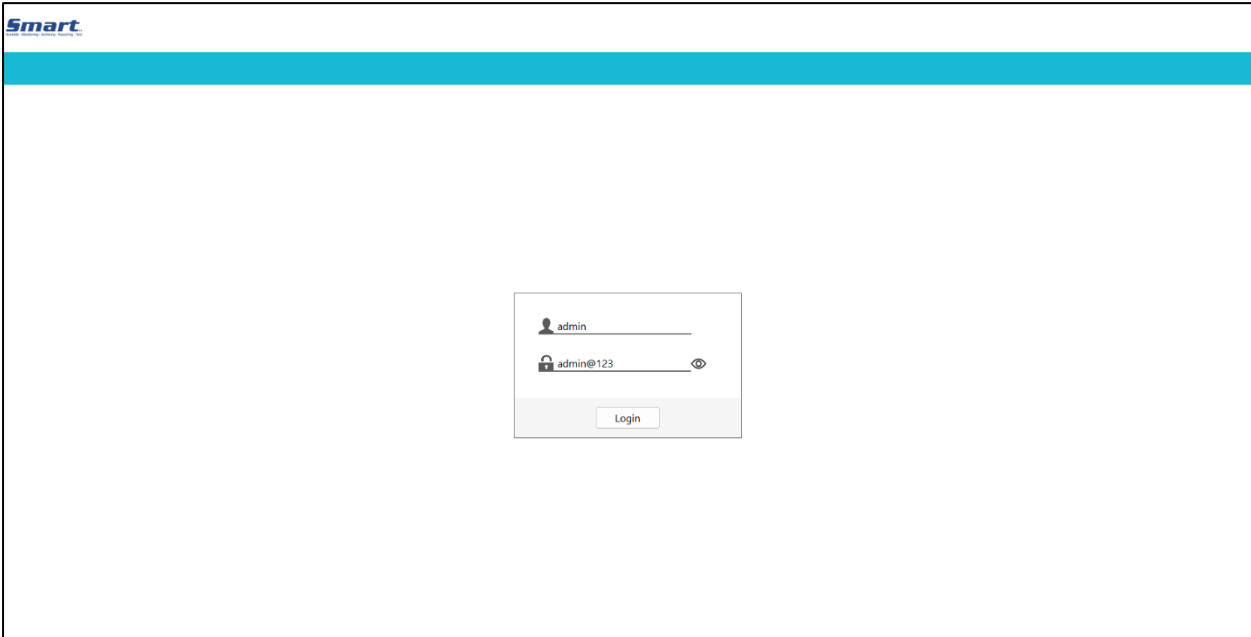
Premium - The premium version is a combination of the operation System and hardware. You can activate multiple connectors in the premium version.

The list of available connectors depends on the License bought by the client and is activated while configuring the system. For more information on connectors, refer to the installation and configuration guide.

DS Manager Configuration

Login

1. Enter "admin" as the username.
2. Enter "admin@123" as the password.
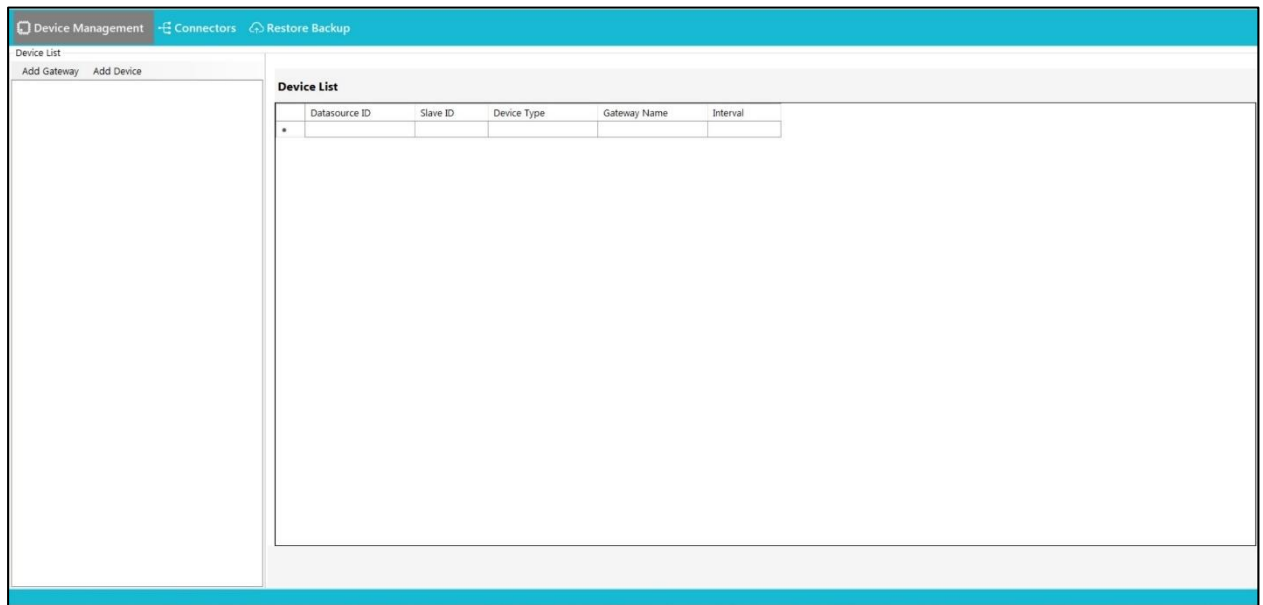3. Click on the "Login" button to access the system.

DS Manager is the Application which can be used for Modbus Devices Configuration. (Masibus device, 3rd party Modbus device).

Device Management

- Device Management is opened by default once you open the DS Manager.

- Click on Add Gateway.
  - Provide a name for the gateway.
  - Under Connections, choose from the dropdown menu which includes options like TCP and Serial. Select as per your requirement.
  - if you choose the "TCP" option, follow the steps below:
    1. Enter the device's port number.
    2. Input the device's IP address.
    3. Specify the connection timeout (in milliseconds) and retry count. [Default Connection Timeout (in milliseconds): 1000 and Default Retry Count: 3]
    4. For writeback options, choose between "Single Register" and "Multiple Register."
    5. Save the configuration by clicking on the "Save" button.
    6. A pop will appear once you save the configuration.

  - if you choose the "Serial" option, follow the steps below:
    1. From the dropdown menu, select the port.
    2. Specify the Baud rate.
    3. Set the word length.
    4. Specify the parity settings.

5. Define the number of stop bits.
6. Save the configuration by clicking on the "Save" button.
7. A pop will appear once you save the configuration.

Device and Tag Configuration

- Select the gateway under which you want to add device.
- Click on add device.
- Slave configuration window will be opened.
- Select the device from the dropdown menu.
- Enter the correct slave ID.
- You can check the customized tags checkbox.
- Once you check it, you will see tag names and display tag names which are already selected by default.
- Select the required tags from the list.
- If you want to change the display tag name, then you can directly edit it from the display tag column.
- Click on Save to save your configuration.
- Then your configuration will be saved under **device data.**
- Cancel button – If you want to close the configuration without saving your configuration then click on Cancel button.

Note – Display tag name is the combination of tag name and slave ID.

Note – If two tags have similar display tag name, then it will not work.

Note - Use connector option only if you want to add a new Masibus/third-party device. If you configure through connector, then, data logging will be stopped.

In the configuration details of connectors:

- Navigate to the "Connectors" section.
- Select any gateway and click on add device.
- In the select device, click the plus button to add new device.
- Device Configuration window will be displayed.

Follow the steps mentioned bellow to add a new device which will be displayed under the device management list:

- To create new tags, click on the plus button.
- Provide a name for your tag.
- Enter the register address.
- Select the data type and order.
- If we enable the derived from register option, then we can read the single bit address for the tag. For example, if int8 bit, the data type is selected in the data type and in order. We require value only of the single bit. Then we can enable this option and in the bit address, we enter the bit address.
- Specify the data size.
- Choose a function cell.
- Enter the multiplication factor.
- For "Details of Tag 1," "Tag 1 Operator," "Tag 2," and "Tag Operator 2," do not configure.
- Configure scaling by inputting the minimum and maximum value range for the PLC and adjusting the value linearly. For example, if the value from the device is receiving o to 100 but in data, we require the double i.e. 0 to 200. Then, in the value range PLC we enter the mean 0 and max 100. In the value adjustment linear, we setup the range 0 to 200

- Finally, select the mode. Read is only to view. Write is only to writeback tag values. Read + Write is for both options i.e. read as well as write.
- Click on "Add."
- You can create and add multiple tags to create and add a device to the DS Manager. Give a name to the configured device before saving.
- Click on "Apply" to save the changes.

1. To add a new device by importing from a CSV file, follow these steps.
    - Click on the "Import" button as indicated in the figure.
    - A CSV file will be downloaded to your system's desktop.
    - Input the details as per the columns in the CSV file.
    - Save the file.
    - Navigate to the DS Manager.
    - Click on the "Export" button and upload your file.
    - Click on "Apply" to save the changes.

These steps will guide you through the process of adding a new device and creating tags in DS Manager.

Close the window once you have saved all the details and go to device management to add data source.

Note – Don't use any other details apart from the one we have mentioned in the connectors option. Otherwise, data will not be logged or data logging will stop.

Dashboards

The dashboard helps you organize the data and visualize the same according to your needs. SMART provides the capability to create customized dashboards to help you monitor and analyze the performance of User data.

In dashboards, you can use different elements for visualizations. The following section contains details about all the elements and their configuration.

Create Dashboard

To create a dashboard -

- Click options - Add dashboard.
- Drag and drop the dashboard elements as required on the dashboard.
- Configure the dashboard elements as per your requirement to display the data.
- In the right-hand side panel, click dashboard properties.

- In the name field, enter a name for the dashboard.
- Under layout, select an option to display the dashboard in either portrait or landscape mode.

- In the date format dropdown list, select a date format.
- In the time format dropdown list, select a time format.
- Move the header slider to the right to display a header for the dashboard.
- Move the footer slider to the right to display a footer for the dashboard.
- Move the show pages as tabs slides to the right if you want to show the pages as tabs on the dashboard.

- Click dashboard style in the right-hand side panel to configure styles for the dashboard.
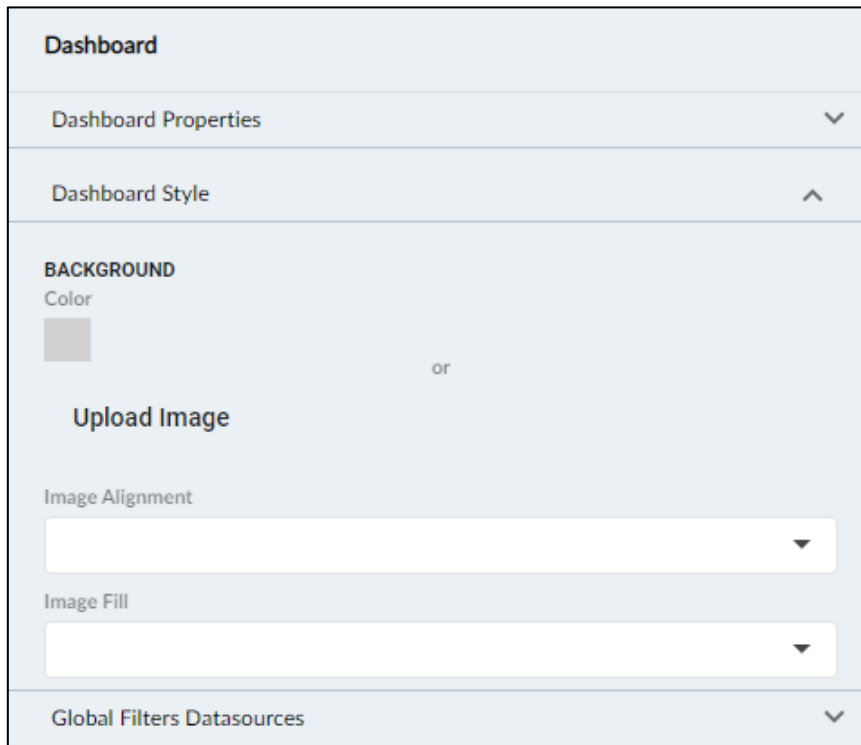
- Under background, click and select the color you want to be displayed as background color.
- To display an image as background instead of color, then click upload image to browse and select the image.
- In the image alignment dropdown list, select an option to align the uploaded image.
- In the image, fill the dropdown list, select an appropriate option.
- Click global filters data sources in the right-hand side panel to configure the data source for the dashboard.
- Click add data source to browse and select the appropriate data source.
- Click apply to save the dashboard.
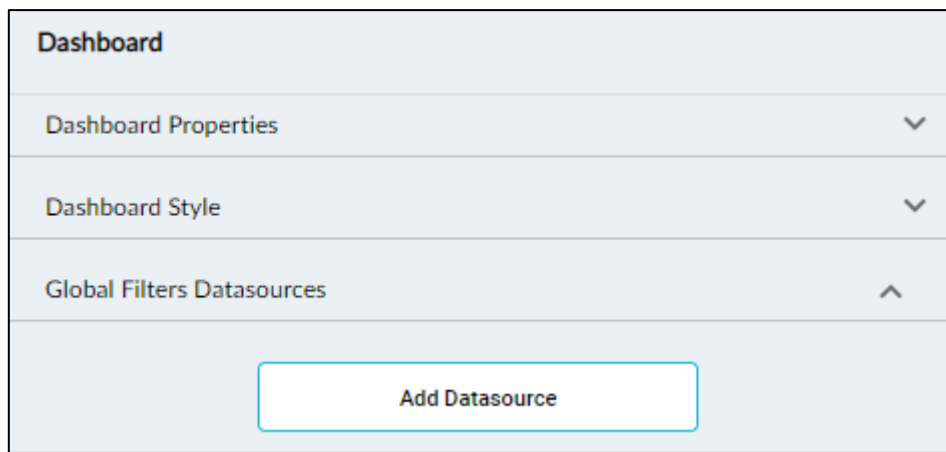
Example -

The following figure shows a sample dashboard.
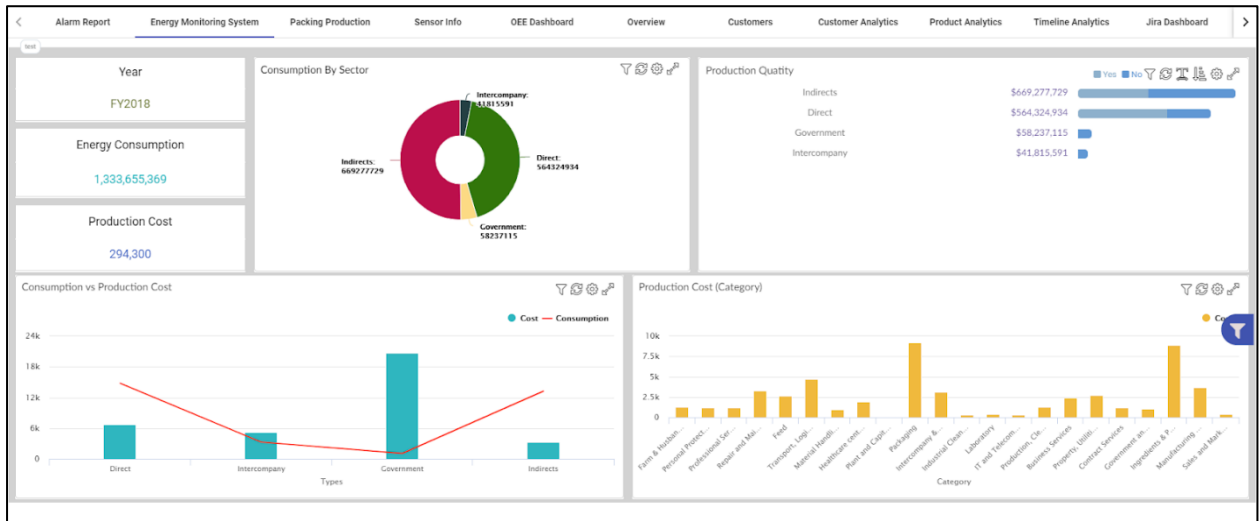
Add/Edit Elements in a Dashboard
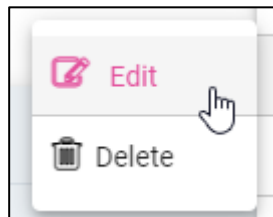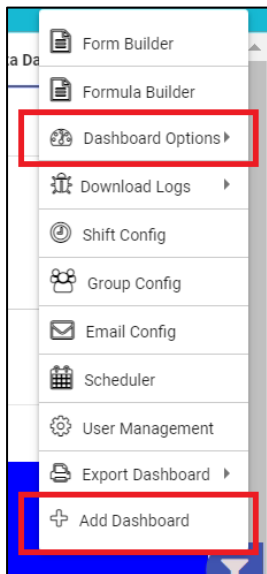
To make any changes to any dashboard, add/edit permissions are required. You need those permissions to make any changes to the dashboard.

- Navigate to the dashboard which you want to add/edit.

- Click on Options on the top-right of the user window.
- To add a dashboard, click on add dashboard.
- To edit the dashboard, navigate to dashboard options and click on edit.
- To add elements to a dashboard -
1. Scroll down to the page where you want to add elements.
2. Click and drag the element you want to add to the page.
- To edit any element in the dashboard, click on the pencil icon visible on the element.

You can check how individual elements can be modified/configured in this section.

Any configuration property can be expanded/minimized by clicking on the property header. Mandatory fields are marked Red in color.

Modify Dashboard

To modify a dashboard -

- Click on a dashboard which you want to modify.
- Click options - Dashboard options - Edit to edit the dashboard.
- Make the required changes to the dashboard, and then click apply to save the changes.

Delete Dashboard

To delete a dashboard -

- Click on a dashboard which you want to delete.
- Click options - Dashboard options - Delete, and then click yes to delete the dashboard.

Export Dashboard

You can export the dashboard data to a file for further analysis. You can export the dashboard data in either a spreadsheet or a PDF file.

To export dashboard -

- Click Options - Export dashboard.
- Click export dashboard - Excel to export dashboard in Microsoft Excel, and then select the appropriate option. You can directly print the dashboard data -
1. On separate files
2. On separate tabs
3. On a single file
- Click export dashboard - PDF to export dashboard in PDF, and then select the appropriate option. You can either -
1. Save the dashboard data in a PDF file
2. Directly send the dashboard for printing. You can print the dashboard as it is or print on the dashboard data.

Elements of Dashboard

Here is the list of elements available in our dashboards -

- **Graphs**
- **Tables**
- **Text box**
- **Images**
- **Pie/Donut charts**
- **Bar drill-down charts**
- **Map**
- **Cylinder**
- **Gauge**

Graphs

For the graph, you can configure -

- Properties
- X-Axis
- Y-Axis
- Style – Visual modifications like text size, alignment and color can be changed with this property.

To configure graph properties -

Graph Properties	
Graph Name	Graph name is displayed at the top of the component like a title.
Live Toggle	The live toggle is used to display live data in a graph. You need to refresh the dashboard if the toggle is off. If the live toggle is on, then the graph will auto-refresh every 30 seconds.
Value Toggle	If the value toggle is off, you need to check the particular graph series. The values are visible in the graph if you enable the toggle.
Data Source*	You can select the collection from the data source option. DS Manager configures collection. Multiple tags are present.

	After the configuration of the graph is complete, you cannot change the data source. If you try to change the data source and apply the settings, then an error will be displayed.
Distinct Toggle	If you have multiple text values on a tag, you need to display all text values for multiple values of the tag, for multiple dates and times. You also need to enable the distinct toggle and select the respective tag.
Time comparison	Time comparison is used to set the frequency for the distinct values. You need to set aggregators on custom and select the day/month/year off them from the drop-down list. Finally, in the value, need to select day/month/year from the calendar.
Date and Time Format*	In date format, you have multiple date format type options that are mostly used in the Y-Axis. (Example - DD-MM-YYYY, MM-YYYY-DD) In time format, you have multiple time format type options that are mostly used in the Y-Axis. (Example - HH-MM-SS, hh-mm-sss)

To configure X-Axis properties -

X-Axis	
X-Axis column*	To plot the X-Axis, select a tag in the X-Axis column. If you choose the date and time tag in the first column, the second column will disappear. Other than the date and time tag, if you choose the other tag in the first column, you can also choose time duration in the second column.
Time Series Frequency*	In time series frequency, there are multiple options like absolute, second, minute, hour, day, and month. These options are used to set the frequency on the X-Axis. The absolute option is used to plot X-Axis as per the default data interval. For other frequency options with choice, you need to enter the frequency in the frequency value column. If you miss entering the frequency, then an error will show in the graph.

X-Axis Duration*	In the X-Axis time duration, there are two options. The first option is the time duration in days, in which you can set the graph range in days. After selecting days, you need to enter the number of days. The second option is absolute, in which you can set the from and to date range.

To configure Y-Axis properties -

Y-Axis	
Series Name*	The series name is also known as the Y-Axis series name. It is used to find a particular Y-Axis; this name is displayed on the top of the right side of the graph.
Column Type*	By using column type, you can configure the Y-Axis series. • Data column - You can plot the graph as per the required aggregator by using Data Column. You can plot columns, lines, smooth line area, and area spline graphs by choosing from series type. Stack toggle works with only column type series type. In the select data column, the tags are present from the tag list. You can select the tag depending on the value you want to show in the graph. By using an aggregator, you can set the graph value as per your requirement. If you want to see the lowest entry graph, then you have the option min. Similarly, for a high value, you can set max, and for the average, the avg option is present in the list. There are a lot of aggregator options available on the list. Aggregator option, you have used with only data column, not with derived column. In the decimal precision point, you can set the decimal for the values. • Derived column - You can plot the mathematical calculation results by using the derived column option. In the formula, the difference is used to plot the difference between the time for the same tag. Also, by using custom formulas, you can write mathematical formulas.

	You can add the formulas by using the add/edit formula option. After that, the formula builder will open. In the formula builder, you need to create the formula, and finally, save it by pressing save.
Series color	By using series colors, you can choose a color as per the requirement. You can also modify the color of the series. You can directly copy and paste the hex color code in the series color as well. By default, the color of the graph series is dark Blue.
Configure Series*	Configure series option is used to configure the Y-Axis. The following features are given in that option. • Title - You can define the Y-Axis series name. • Show in right side - This toggle is used to view Y-Axis on the right side of the graph. • Value prefix and value suffix - By using this option, you can add any character/text/symbol before and after the Y-Axis value. • Minimum and maximum - They are used to define the Y-Axis range. • Axis point - It is used to set the number of axis points on Y-Axis. (For example - If you set the minimum value o and maximum value 100 and set 10 axis points then values on Y-Axis will display like 0,10,20, 30,100 i.e., it divides into 10 values on Y-Axis) (Axis Type - This option is not supported in the current version)
Add Filter	Add Filter - This feature is used to filter out the data and display the required graph. (Example - If you have got 10 machines' data and want to see only 2 machines' data, you need to select only those 2 machines' names from the add filter option) In the select data column, you need to select the tag and define the required condition in the option of operator equal to. Then in the value option, you need to select what you have to set. Finally, you can save this filter configuration by using the option of apply filter.
Add Split Point	The split point feature is used to split the graph into different conditions i.e., you can highlight the trend above or below the value in the graph based on the given configuration.
Apply Series*	The Apply series is used to save the configuration of the Y-Axis. If you directly use apply instead of apply series after the configuration of the Y-Axis, then the Y-Axis Configuration will not be saved. So, you need to use first apply series option after the Y-Axis configuration.

To configure style properties -

Style	
Text Size	By using text Size, you can increase or decrease the size of the graph name. The default size of the text is 12.
Text Style	In the text style, you can set the graph name to bold, and italic and can also add underlining to the graph name.
Text-Alignment	By using text alignment, you can set the position of the graph name at left, right, or center. The default alignment is left.
Text color	The text color option is used to modify the color of the graph name title. The default color of the name is Black.
Border	When the border toggle is switched on, the border is applied to the graph component. By using the color and size option, you can change the color and thickness of the border.
Border-Radius	By using the border radius, you can make the corner round also in radius size. You can also adjust the corner radius.

Table

For the table, you can configure -

- Table properties
- Table style
- Table filters and tool
- Cell Properties

To configure table properties -

- Click on the table you want to edit, and then click properties on the right.
- Under table type, select either fixed or dynamic table type.
- Fixed table - You must configure the rows and columns. Once configured, cell configuration needs to be done for the data to show. The cell configuration section can be found at the end of the table Section. Once the no. of rows and columns are decided in fixed table, it cannot be change further (in Fixed Table).

Properties	
Fixed Table	For fixed table you need to select the fixed option. You need to set this configuration first and then configure another part of the table. Once you set the table type, you cannot change the type. If you try to change, all the previous configurations will get erased.
Table Name*	Table name which is displayed at the top left of the component like the title. Space will be accepted in the name column but for the other, user table Component will not be visible if you do not enter the name. So, the name should assign to the component.
Number of Row and Column*	Then you need to set how many rows and Columns table required.
Data Source*	From data source option, you can select the collection which is configured by the DS Manager in that collection Multiple tags are Present. After the configuration of the table is completed, the user can't change the data source. If you try to change the data source and apply the setting, an error will be displayed.
Live toggle	Live toggle is used to display live data in the fixed table. If the toggle is off, then you need to refresh the dashboard.

	If live toggle is on, the table will auto refresh in every 30 seconds.
Display When No Data and Serial Number	This option is not for the fixed table, you can use this with the dynamic table.

- Dynamic Table - The table from the database is displayed as it is. You can select rows and columns from the database to be displayed in the dynamic table.

- In the table name field, enter a name for the table.
- Move the batch slider to the right to activate the table to show different batches.
- In the data source dropdown list, select a data source for the table values.
- Click on the batch slider to display the batch data on the graph.
- Click on the live slider to display live data on the table. The data gets updated every 30 seconds.
- Move the serial number slider to the right to display the serial numbers.

Properties	
Dynamic Table	For the dynamic table, you need to select the dynamic option. You need to set this configuration first and then you can configure other parts of the table. Once you set the table type, you cannot change the type. If you try to change, then all the previous configurations will be erased.
Table Name*	Table name is displayed at the top left of the component like the title. Space will be accepted in the name column but for the other user table, the component will not be visible if you do not enter the name. So, the name should assign to the component.
Static Row	If you enable the toggle, the fixed table will display over the dynamic table. You need to define the row in the number of static row columns and the number of columns depends on the number of dynamic table columns. You can configure the static row cell the same as fixed table cells. You can print this static row with a dynamic table on each page for excel and pdf print. You can also do it using print static table on all page's option. First finish the dynamic table configuration then enable the static row. If you merge the cell in the static row and add a new column in the dynamic table, it will affect this configuration.
Data Source*	From the data source option, you can select the collection which is configured by the DS Manager in that collection. After the configuration of the table is complete, you cannot change the data source. If you try to change the data source and apply settings, an error will be displayed.
Selected Column*	You can create the columns by selecting a tag from the selected column. Multiple tags are present in the selected column of the dynamic table and rows depend on the data. You can select single as well as all tags by selecting "select all columns". You can edit the column name by simply clicking on the name as well as do the mathematical calculation between tags or columns by using the derived column.
Distinct Aggregation	By using this option, you can show the distinct i.e., unique values in the table with respect to the table and use an aggregator. You need to select a tag accordingly to your needs to see the data.
Live Toggle	The live toggle is used to display live data in the dynamic table. If the toggle is off, you need to refresh the dashboard. If live toggle is on, table will auto refresh in every 30 Seconds.
Summary	You can show each column's total, maximum, minimum, and average in the last row by using this option.

Properties	
Column Properties	- Data column - Column name - You can modify the column by using this option. - Select data column - In the select data option, a tag is already visible. If you want to change the tag, then you can change from this option by simply selecting the required tags.

	• There is no required selection or modification of the aggregator because it is on the absolute value by default. • Decimal precision point - By using the decimal option, you can adjust the decimal point for the number tags. • Date and time format - You can use the date and time tag for changing the format date and time by using this option, you need to select the format from the drop-down list. • Derived Column • Column Name - You can modify the column by using this option. • By using the formula option, you can create the formula as per our requirements. Also, the standard deviation formula can be created through this option. • Decimal Precision Point - By using the decimal option, you can adjust the decimal point for the number tags. • Date and Time Format - You can use the only date and time tag for changing the format date and time by using this option, you need to select the format from the drop-down list.
Summary	If you enable the toggle, then as per the selection of summary type in the Properties of the table, it will display the selected option as a row at the end of table. If selected "total" option, then total will be displayed for the column.
Hide Column	By using this option, you can hide the selected column.

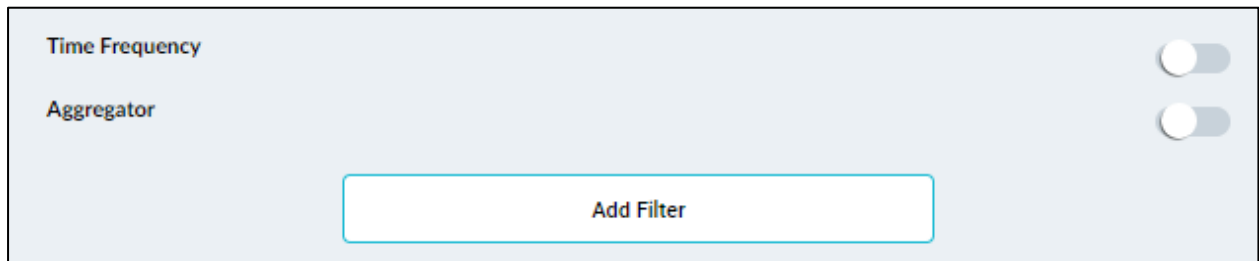| Style	
Column Formatting	By using this option, you can adjust the width size of the column. Also, you can modify the background and text color of the selected column.
Conditional Formatting	By using this option, you can define the condition and replace the values and text. You need to switch on the toggle condition first and then select the tag and, in the value column, select the value or text which you have to replace and replace it by setting the replacement value. Also, you can set the background color and text color modification for this by using the respective option.
Border	By using this option, you can modify the border of the column.

To configure table styles -

- Click on style on the right.
- Under the even row background color, click and select the required color for the even rows of the table.
- Under the odd row background color, click and select the required color for the odd rows of the table.
- Under header font size, select the required header size.
- Under body font size, select the required data font size.
- Move the border slider to the right to apply a border to the table.
- Under color, click and select the required border color.
- In the size field, enter the value for border size.
- Move the border radius slider to the right to apply the border-radius for the table.
- In radius size, enter a value for radius size.

Style	
Even and Odd Row Background color	By using this option, you can set the odd and even row background color for fixed as dynamic table.
Header and Body Font Size	• Copy style - You can copy another cell style by using this option. You have to select the cell from the drop-down. • Background color- You can modify the color of the cell by using this option. • Text - You can set the font and size of the text in a cell by using this option. • Color - You can change the color of the text in the cell by using this option. • Text style - You can set the text to bold and italics. You can also add an underline for the text name in the table cell. • Text-alignment - You can set the position of the Text Name at left, right, or center by using this option. The default alignment is left. • Border - You can change the border color of the cell by enabling the border toggle. The default color of the cell border is black. • Border radius - You can make the corner of the cell round by using this option. You can also adjust the corner radius. • Cell width - You can adjust the cell width by using this option.
Border and Border Radius	When the border toggle is switched on, the border is applied to the table component. You can change the color and thickness of the border by using the color and size option. By using the border radius, you can make the corner round. You can also adjust the corner radius by using the radius size.

To configure table filters and tools -

- Click on filters and tools on the right.
  - Click on the time frequency to apply time-frequency related filters to the table.

- Click on the aggregator slider to add data-column related filters to the table.

- Click on add filter to create a filter for the table.

Filters and Tools	
Sorting toggle	This option is used only with the dynamic tables to sort the table data in ascending or descending order. For this, you need to select the sort property tag in the select data column and in the direct select ASCE (ascending) and DESC (descending).
Time Frequency	This option is used only with dynamic tables. If you have defined interval data, then you can use this option. In the select time frequency column, you need to select the time base tag in the time series frequency to select the required frequency type i.e., month, day, minutes, and others, and enter the value in the frequency value. Finally, as per the aggregator, you can set the interval. Example - You have data that has a default 1-second interval, but you want to see per hour data average value. You can see this in the dynamic table by using time frequency. For this, you need to select a time tag in the time-frequency column, and in series frequency select hour and, in the value, set 1, and in the aggregator set on average.
Aggregator	By using this option, you can plot the table with distinct values. In the select data column of the aggregator, the option needs to select the tag.

Editing Option	
Editable	This option is used to enable the manual inputs option. In the select add form, you need to select the manual form while adding an entry in the table and in select update form, select the form which will be opened while editing the entry in the table. You need to first create the manual form and upload it from the forms option. It will be displayed in the list.

Cell configuration is needed when you have created a manual table. Each cell needs to be configured separately when you are using a fixed table.

- Click on the cell which you want to edit.
- Click on cell properties on the right.

- Select the cell type. Text, data, and derived options are available for selection.
    - Text - Only static text can be contained in the cell.
    - Data - For this type, the following fields need to be applied.
        - Under select data source, select the data source for the cell. All the active data sources are displayed.
- Under the aggregator, select the data source for the cell. All the single-cell aggregators are replaced.

- If the data column is a timestamp, date and time formats can be modified using the options available.
- Derived - This type gives options to use basic operations on 2 data columns and display the operated value.

- Formula - Operators that will be used on column 1 and column 2, need to be selected.
- Columns 1 & 2 - These are data columns used for the operation.
- Aggregators - Select appropriate aggregators for both columns 1 & 2.
- Value -
- Decimal point - Enter the decimal places you want to show in the cell.

Fixed Table Cell

Cell Properties*	There are three options given in the cell properties. • Text - This option is used to add text to the cell. You can write or copy-paste the text in the cell label column. • Data - By using this, you can show the tag value in the table cell. In the select data column, you need to select the tag, and then in the aggregator, select the aggregator. Also, you can set the decimal points by the decimal point option. Also, if you have set the date and time tag in the cell, you can use the date and time format. • Derived - By using this option, you can show the mathematical calculations in the cell of the table. You can also do the calculations for two different tags and values by using multiple option formulas. You can also write the formula by using the custom formula. If you select addition, subtraction, multiplication, or division in select column 1, you need to select a tag similar to column 1. If you select value option, then you need to enter the required number. .
Style	• Copy style - You can copy another cell style by using this option. You have to select the cell from the drop-down. • Background color - You can modify the color of the cell by using this option. • Text - You can set the font and size of the text in a cell in this option. • Color - You can change the color of the text in the cell. • Text style - In the text style, you can set the text to bold and italics. You can also add an underline for the text name in the table cell. • Text-alignment - By using text-alignment, you can set the position of the text name to the left, right, or center. The default alignment is left. • Border - By enabling the border toggle, you can change the border color of the cell. The default color of the cell border is Black. • Border radius - You can make the corner round of the cell by using the border radius. You can also adjust the corner radius. • Cell width - You can adjust the cell width by using this option.
Filter and Tools	By using this option, you can use the filter to the cell. Add filter - This feature is used to filter out the data and display only the required data.

<u>Text</u>

Using the text dashboard element, you can text on the dashboard. You can configure -

- Text properties
- Text style

To configure text properties -

- Click properties in the right-hand side panel.

Text

Properties	^
Text Content	
Test 123	
Dynamic Text	⬤
Style	v

- In the text content field, enter the text which you want to display on the dashboard.
- Move the dynamic text slider to the right to make the text dynamic. You can view dynamic text as per your choice.

Properties	
Text Content*	By using this option, you can add the plain text that is required to display. (Note: If you use space, then the text will not display)
Dynamic Text Toggle*	This feature is used to show tag value, date time, page details, and mathematical calculations. There are 3 options. • Data text - This option is used to show tag value as per the aggregator used. By using the data source, you can set the collection and from which tag is selected in the data column. Precision is used to add a decimal point for the value. You can add Prefix and suffix by using this option. You can add any character/text/symbol before and after the value. • Derived text - By using this option, you can show the mathematical calculation in the text. You can do calculations for two different tags and values by using multiple option formulas. You can also write the formula by using the custom formula. If you select addition, subtraction, multiplication, or division in select column 1, you need to select a tag similar to column 1. If you select value option, then you need to enter the required number. If it's user value, the option then you need to enter is "required number" in the value option. Prefix and suffix can be used by using this option. You can add any character/text/symbol before and after the value. • Print footer - In the select display option, there are three options. If You must display the current date for this, you need to select the current date option. You can also display the page numbers by using the page number option and if you need to display the used global filter in the text, then you can use the global filter option. Prefix and suffix by using this option. You can add any character/text/symbol before and after the value. Dynamic text - All the data filled mandatory except prefix, suffix, and decimal.
Link Text	By using this feature, you can go to other dashboards which are set in the link. This is not mandatory option.

To configure text style -

- Click style in the right-hand side panel to view the text style properties.

- In the text size field, enter a value for the text size.
- Under text style, select the type of style for the text. You can select bold, italics, or underline.
- In the text alignment dropdown list, select an option to align the text.
- Under text color, click and select a color for the text.
- Under background color, click and select a background color for the text.
- Move the conditional formatting slider to the right to apply conditional formatting. By using this option, the text changes as per the conditions.
- Move the border slider to the right to apply the border to the table.
- Under borders, select the appropriate option to apply the border to the text.
- Under color, click and select the required border color.
- In the size field, enter the value for border size.
- Move the border radius slider to the right to apply border radius for the table.
- In radius size, enter a value for radius size.
- Move the value or money slider to the right to display the $ sign for the values.

Style	
Date format	You have multiple date format type options given. You can set it as per our requirements. (Example - DD-MM-YYYY, MM-YYYY-DD, and so on)

Time format	You have multiple time format type options given. You can set it as per your requirements. (Example - HH-MM-SS, hh-mm-sss, and so on)
Text Size	You can increase or decrease the size of the text name. The default size of text is 12.
Text Style	You can set the graph name to bold, or italic and also add an underline for the text name.
Text-Alignment	You can set the position of the text name at the left, right, or center. The default alignment is left.
Text color	You can modify the color of the text color. The default color of the name is Black.
Conditional Formatting	You can define the condition and replace the values and text. You need to switch on the toggle condition first and then select the tag. In the value column, select the value or text you want to replace and replace it by putting a new value in the replace by setting. You can also set the background color and text color modification.
Background color	You can modify the color of the text background.
Border	When the border toggle is switched on, the border is applied to the component. You can also change the color and thickness of the border.
Border-Radius	You can make the corner round. You can also adjust the corner radius.

Gauge

A gauge is an important measuring device in the field of design engineering. It also refers to the measurement of an instrument, such as pressure, temperature, speed, size etc. This feature will serve as a meter to illustrate key performance indicator (KPI) parameters such as production rate per hour, alarm rate, etc, it enhances the visual display of the report.

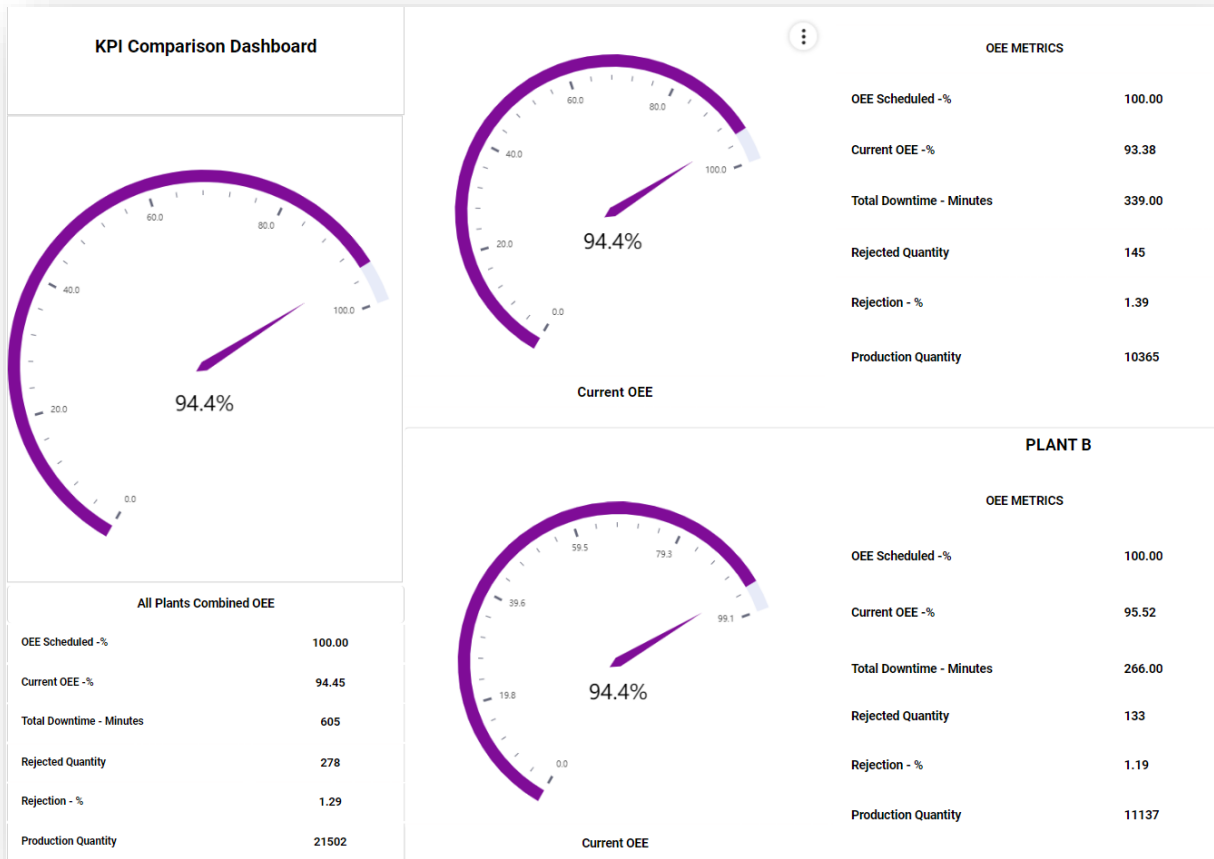Below are some of the samples of Gauge:

Production Rate Per Hour

41.11%

Current Rate	Target Rate
41.11	60.00

Alarm Rate (%)

4%

To configure the Gauge, please follow the below steps:

1. Select and drag the Gauge icon onto the dashboard page, and then we must edit to carry out any further activity. **As shown in the figure.1.**
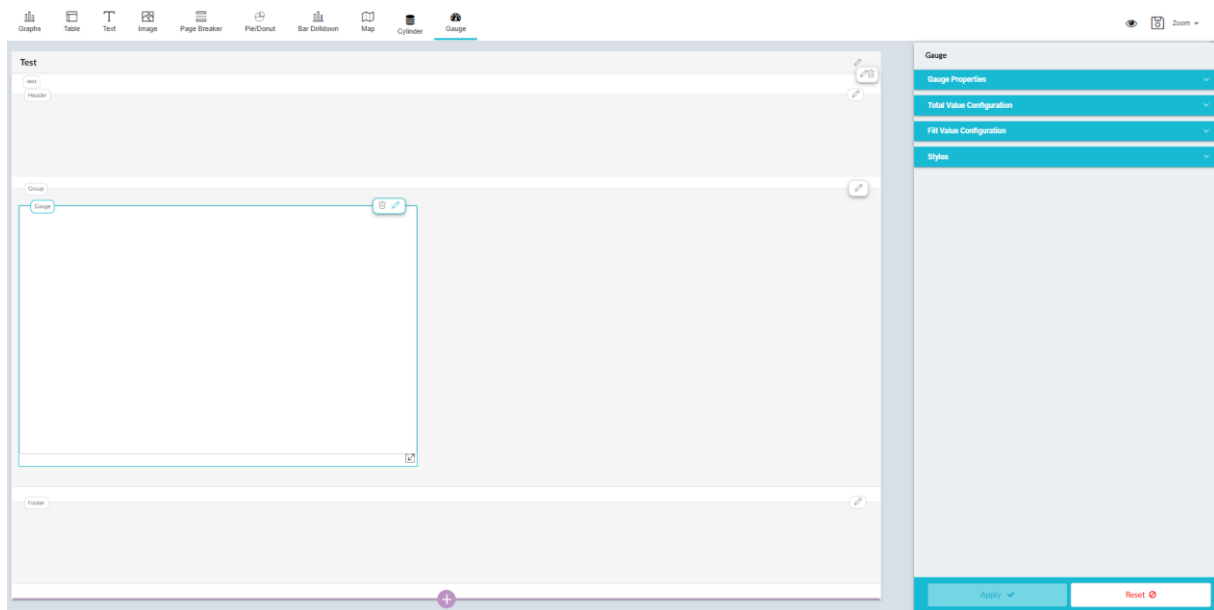2. Stretch the size of the page as per the requirement. **As shown in the figure.1.**

Figure.1.

3. Click on the "Edit" button reflected on the right-hand side corner of the cylinder page.
4. Cylinder properties, Total Value Configuration, Fill Value Configuration, Arrow Mark Configuration, and Styles will get reflected on the right-hand side of the page. **As shown in the figure.2.**

Gauge

Gauge Properties ⌄

Total Value Configuration ⌄

Fill Value Configuration ⌄

Styles ⌄

Apply ✔   Reset ⊘

Figure.2 – Gauge Properties.

A. Gauge Properties:

To configure Gauge properties:

Gauge Properties	As shown in figure.3.
Name*	To give a name to the gauge. Note - Space will accept in the name column but for the others, your gauge will not be visible if you do not enter the name. So, the name should be assigned to the gauge.
Data Source*	Choose the source file from the DS Manager-configured collection to plot the gauge. Note: Once the configuration of the gauge is complete, you cannot change the data source. If you wish to make changes, then you will need to reconfigure the entire component from the beginning.
Gauge type	Users can select the suitable type of gauge from available options.
Live	The toggle is set to OFF by default. When switched ON, it displays the live data for the gauge. Remember to refresh the dashboard if the toggle is off. Note: If the live toggle is on, then the data will auto-refresh every 30 seconds.

Gauge

Gauge Properties ^

Name *

Sample

Data Source *

alarms-alarms (Archive) ▾

Gauge Type*

Live ⬤

Add/Edit Filters ▼ 0

Total Value Configuration ⌄

Fill Value Configuration ⌄

Styles ⌄

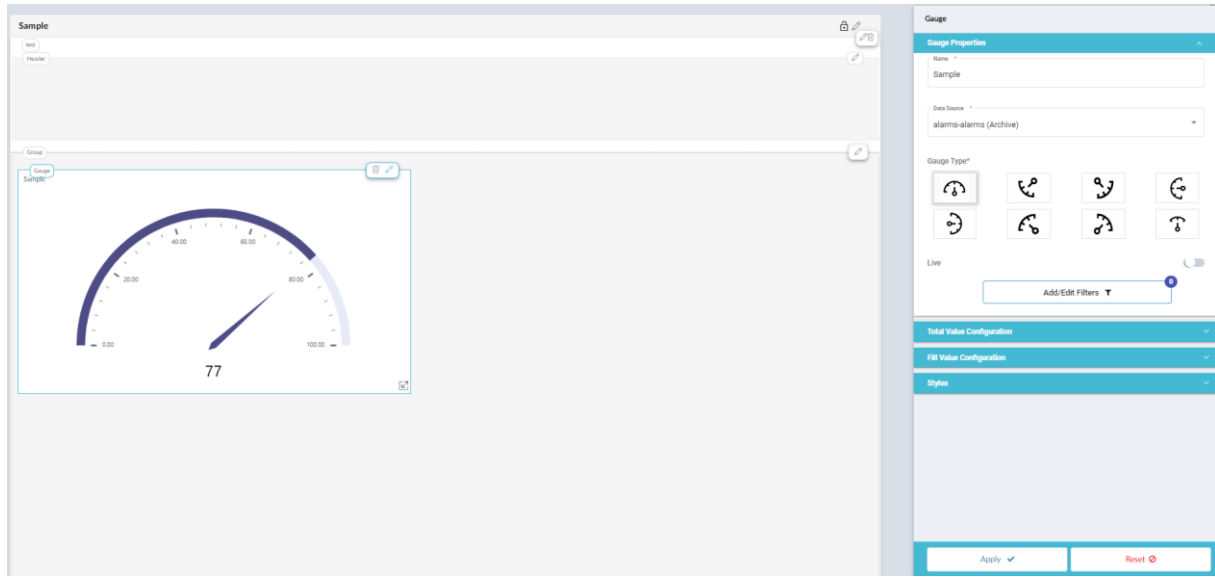Apply ✔   Reset ⊘

Figure.3 – Gauge Properties configuration.

Figure.4 – Gauge.

B. Total Value Configuration:

To configure Total Value configuration

Total Value Configuration	**As shown in figure.5.**
Input	This feature allows user to provide input from three different types of sources i.e. static, dynamic, and derived form.
Type: Static	Using static type, users can manually enter the maximum value of the meter, which will then be displayed accordingly within the gauge meter. **As shown in figure.5.**
Type: Dynamic	Using dynamic type, users can define the maximum value of the gauge by selecting a tag from the available options in the data column, followed by choosing the aggregator. Once both selections are made, the gauge will get displayed accordingly. **As shown in figure.6.** Data Column: Select the necessary tag from the available list, to plot the gauge. Aggregator: To choose the desired value type, select from the available options: Absolute, Sum, Count, Unique count, Max, Min, Average, First Value, Last Value.
Type: Derived	Using derived type, users have the option to display calculated values on the gauge by utilizing mathematical calculations, which can be executed through the Custom Formula feature. **As shown in figure.7.** Add/Edit Formula: You can create a formula by using basic mathematical operators (+, -, *, /), in the Formula Builder. You will start by selecting the necessary tag and adding an aggregator, then click on the "Add" tab to begin the formula. Next, choose an operator from the available options (+, -, *, /) and add it to the formula. Finally, enter the desired value in the value field and press "Add" tab to complete the formula and then save it for calculation.
Add/Edit Filters	This feature will allow the user to add or edit the necessary tag from the compiled report and view the outcome. (Example - If you have got 10 machines' data and want to see only 2 machines' data, you need to select only those 2 machines' names from the add filter option) In the data column, you need to select the tag and then an operator from the dropdown to define the required condition. Next, select or

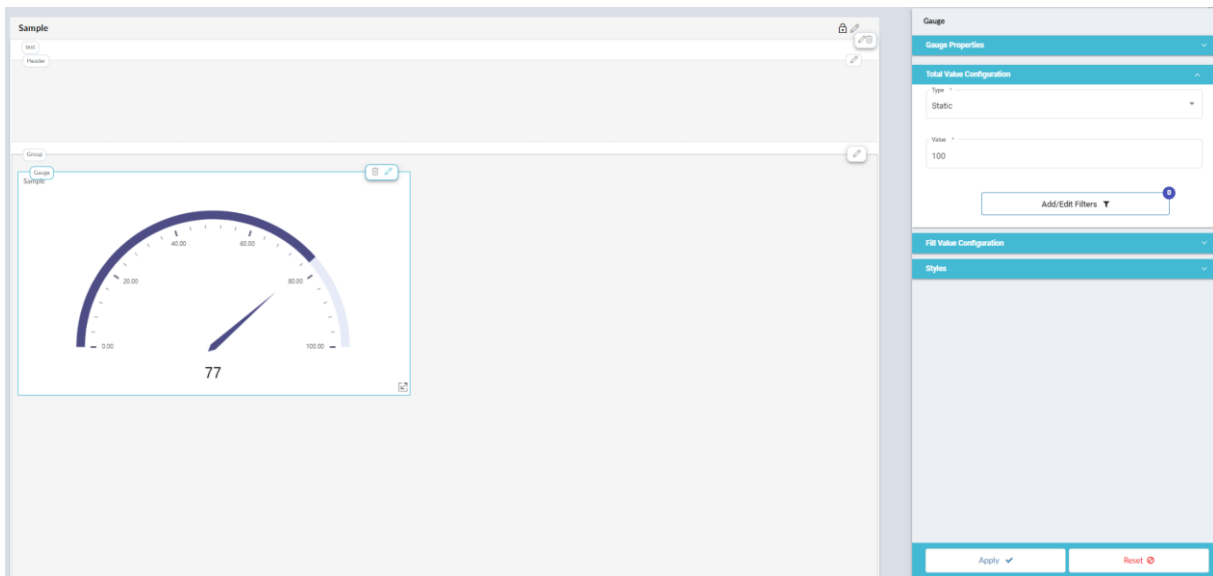|	input the value based on the condition chosen, and finally apply the configuration.
	Such one or many filters can be added.

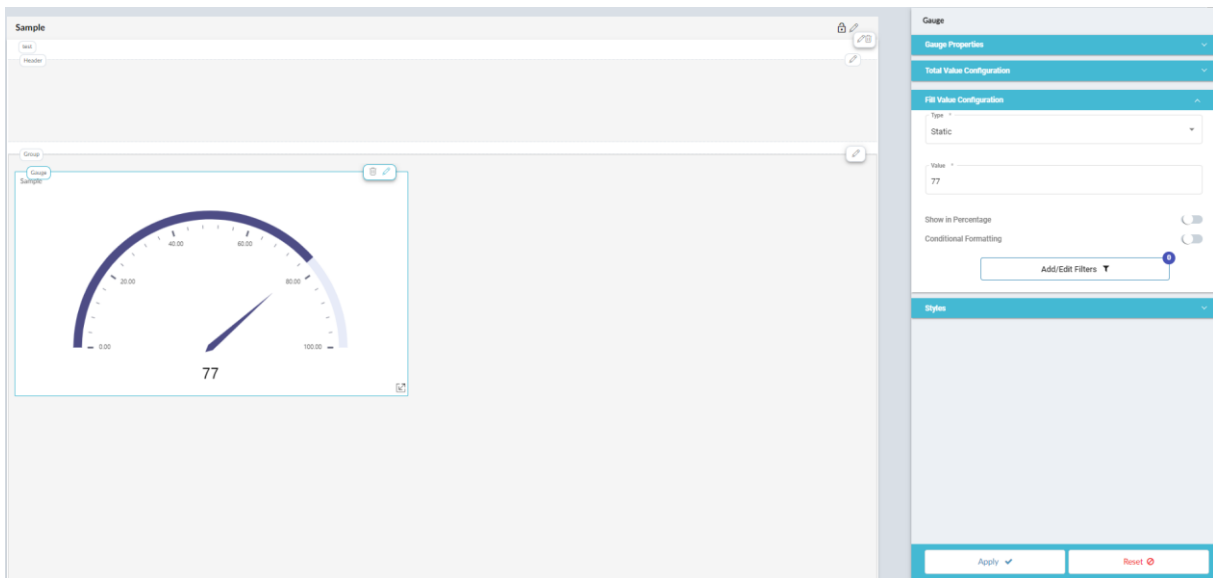Figure.5a – Total Value Configuration, Static type.

Figure.5b – Fill Value Configuration, Static type.

C. Fill Value Configuration:

To configure Fill Value Configuration

Fill Value Configuration	As shown in figure.5.
Input	This feature allows user to provide input from three different types of sources i.e. static, dynamic, and derived form.
Type: Static	Using static type, users can manually enter the actual value of the gauge, which will then be displayed accordingly within the gauge. **As shown in figure.5.**
Type: Dynamic	Using dynamic type, users can derive the actual value of the gauge by selecting a tag from the available options in the data column, followed by choosing the aggregator. Once both selections are made, the gauge will get displayed accordingly. **As shown in figure.6.** Data Column: Select the necessary tag from the available list, to plot the gauge. Aggregator: To choose the desired value type, select from the available options: Absolute, Sum, Count, Unique count, Max, Min, Average, First Value, Last Value. Precision: To specify the number of decimal values to be displayed for the filled value.
Type: Derived	Using derived type, users have the option to display calculated values on the gauge by utilizing mathematical calculations, which can be executed through the Custom Formula feature. **As shown in figure.7.** Add/Edit Formula: You can create a formula by using basic mathematical operators (+, -, *, /), in the Formula Builder. You will start by selecting the necessary tag and adding an aggregator, then click on the "Add" tab to begin the formula. Next, choose an operator from the available options (+, -, *, /) and add it to the formula. Finally, enter the desired value in the value field and press "Add" tab to complete the formula and then save it for calculation.
Round Off	This option will allow users to round up the value to the nearest ceiling value.
Show in Percentage	It enables the representation of actual gauge values in percentage format.
Conditional Formatting	This feature allows users to highlight the actual values when they meet specific criteria or conditions. By default, this toggle is OFF. When switched ON, users can set conditions that will trigger the changes in the report once all specified parameters are met. **As shown in figure.8.** Add/Edit Conditions: This option allows you to set the filled-up value and choose from multiple selection options when creating a specific condition, such as Is Equal to, Is Not Equal To, More Than, More Than Equal To, Less Than, Less Than Equal To, or Between.

|	
	Additionally, you can specify the required color through the "Fill color" option to reflect once the conditions are achieved.
Conditional Formatting	<u>Match with Other Values</u>: This feature will allow user to compare the condition value with some other tag value instead of actual value. <u>Data Column</u>: Select the necessary tag from the available list, to plot the gauge. <u>Aggregator</u>: To choose the desired value type, select from the available options: Absolute, Sum, Count, Unique count, Max, Min, Average, First Value, Last Value.
Conditional Formatting	<u>Match with Dynamic Value</u>: This feature will allow user to compare the actual value with some other tag value. <u>Data Column</u>: Select the necessary tag from the available list, to plot the gauge. <u>Aggregator</u>: To choose the desired value type, select from the available options: Absolute, Sum, Count, Unique count, Max, Min, Average, First Value, Last Value.
Add/Edit Filters	This feature will allow the user to add or edit the necessary tag from the compiled report and view the outcome. **As shown in figure.9.** (Example - If you have got 10 machines' data and want to see only 2 machines' data, you need to select only those 2 machines' names from the add filter option) In the data column, you need to select the tag and then an operator from the dropdown to define the required condition. Next, select or input the value based on the condition chosen, and finally apply the configuration. Such one or many filters can be added.
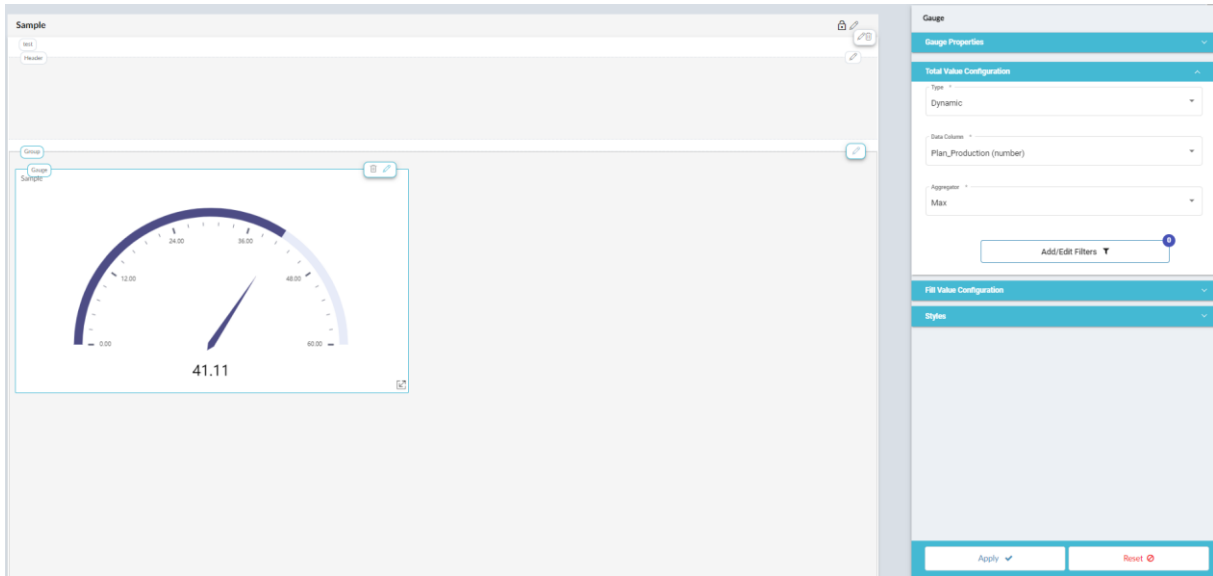
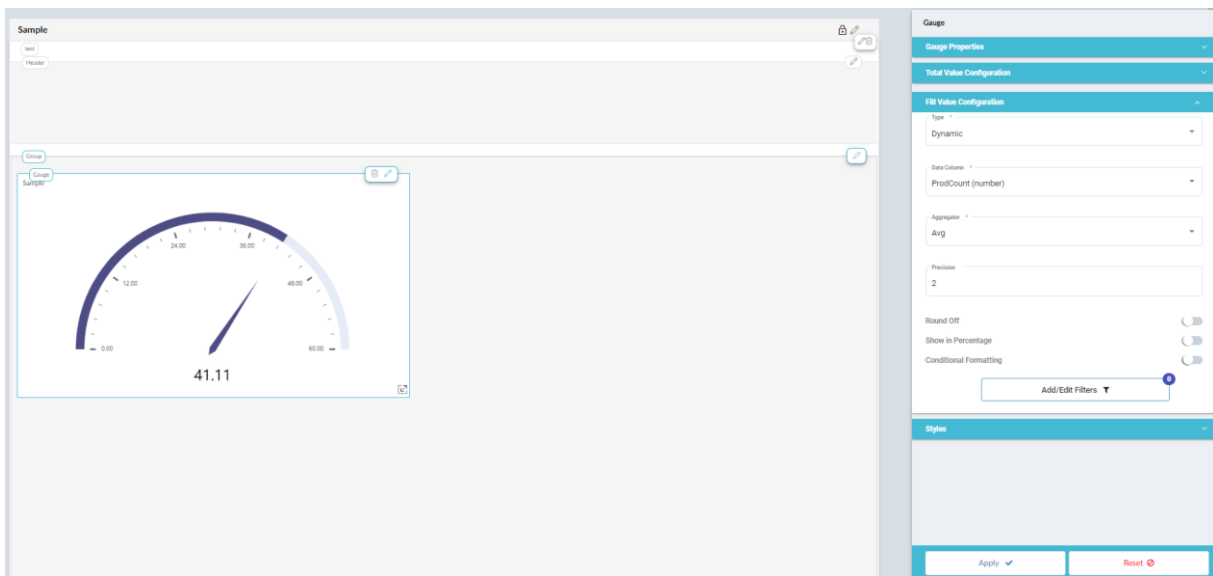Figure. 6a - Total Value Configuration, Dynamic type.

Figure. 6b – Filled Value Configuration, Dynamic type.

Figure.7a – Total Value Configuration, Derived type.

Formula Builder

Select Column	Select Aggregator	Precision		Add	Select Operator	Add	Enter Value	Add
Plan_Production (number) ▼	Max ▼		(toggle)		- ▼		1	

Use the toggle to turn Round ON and OFF

Formula:

Plan_Production{max} - 1   ←Delete

Save   Cancel   Clear Formula

Figure.7b – Formula creation.

Formula Builder

Select Column	Select Aggregator	Precision		Add	Select Operator	Add	Enter Value	Add
ProdCount (number) ▼	Avg ▼		(toggle)		- ▼		1	

Use the toggle to turn Round ON and OFF

Formula:

ProdCount{avg} - 1   ←Delete

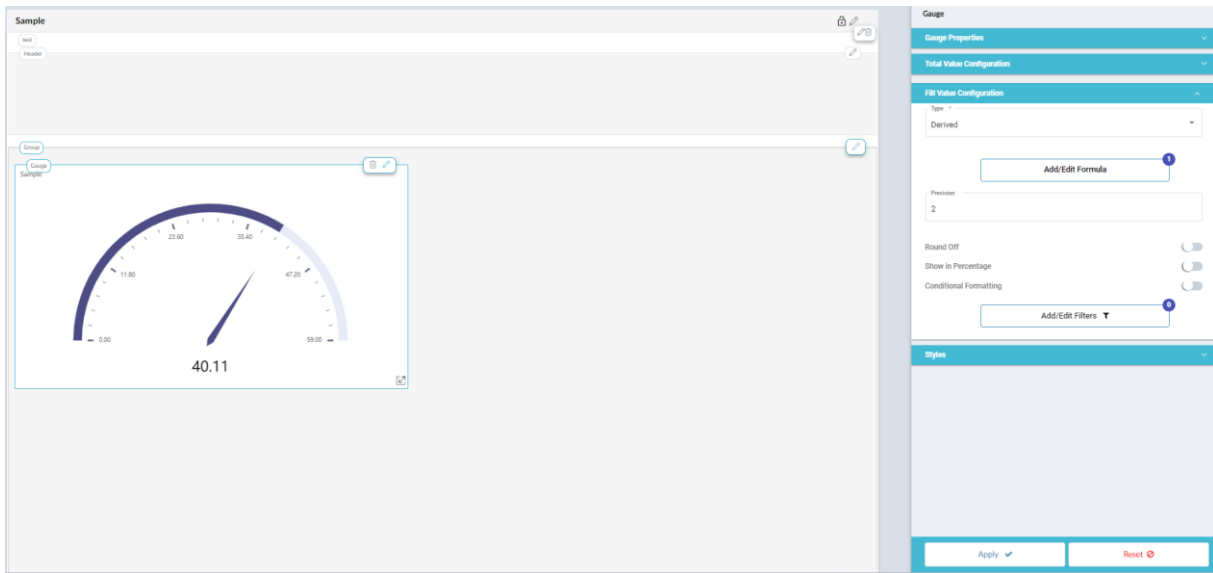Save   Cancel   Clear Formula

Figure.7c – Formula creation.

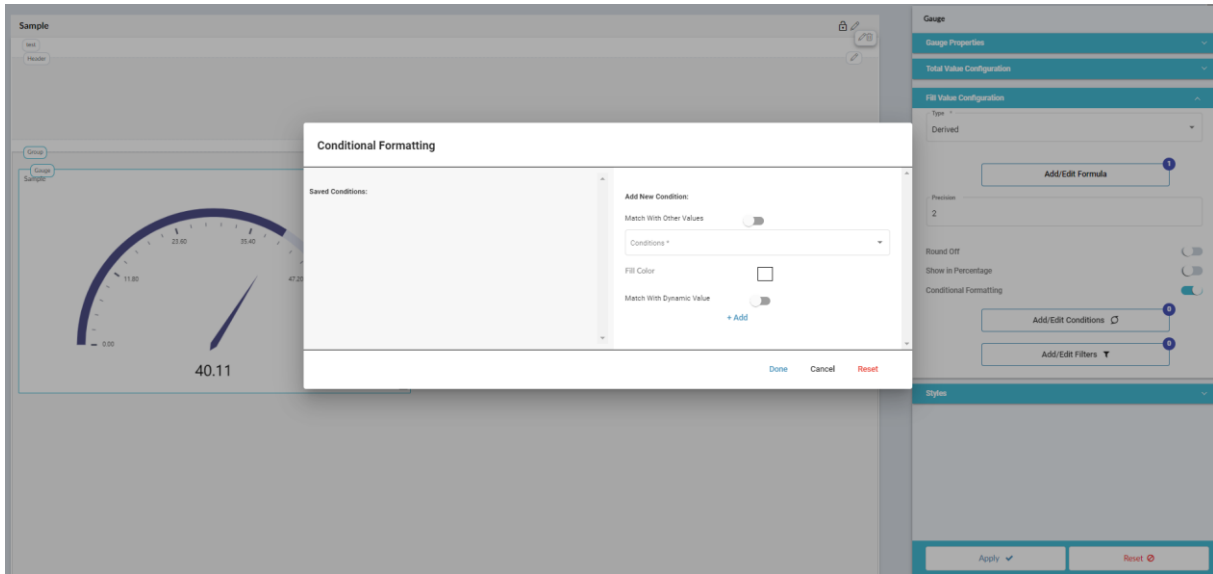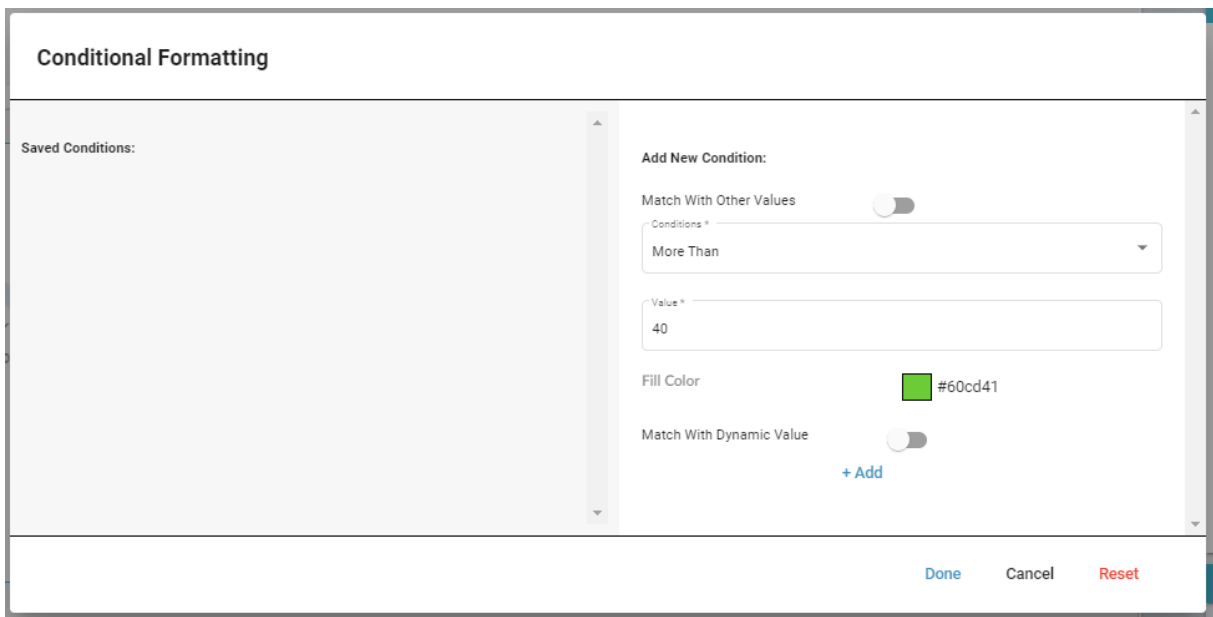Figure.7d – Gauge with derived type.

Figure.8a – Conditional Formatting.
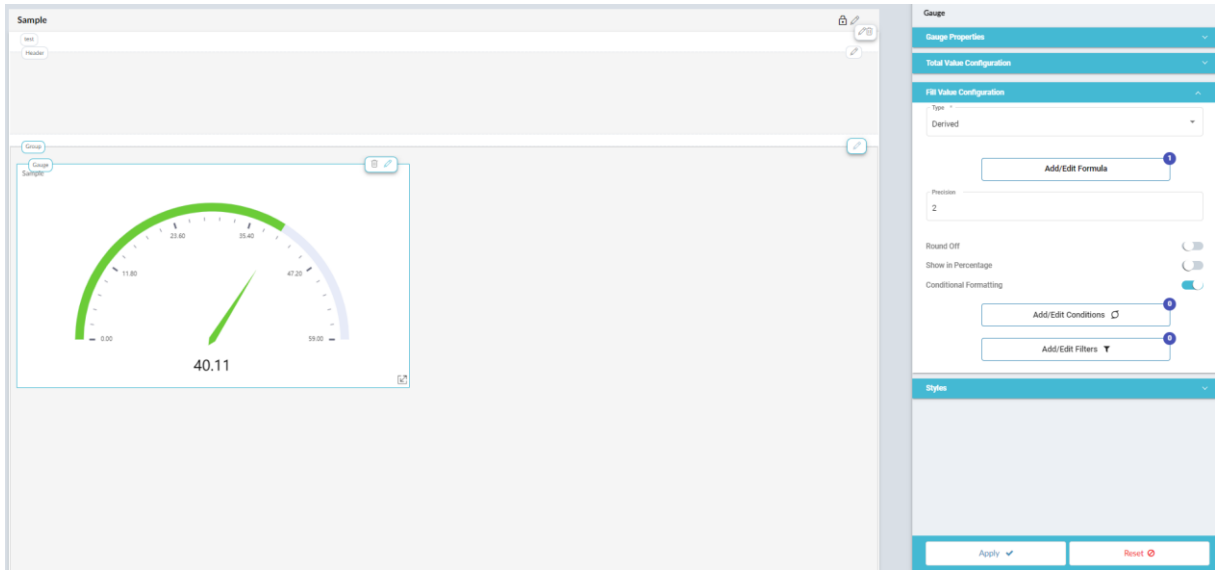

Figure.8b – Conditional Formatting configuration.

Figure.8c – Gauge plotted with conditional formatting.

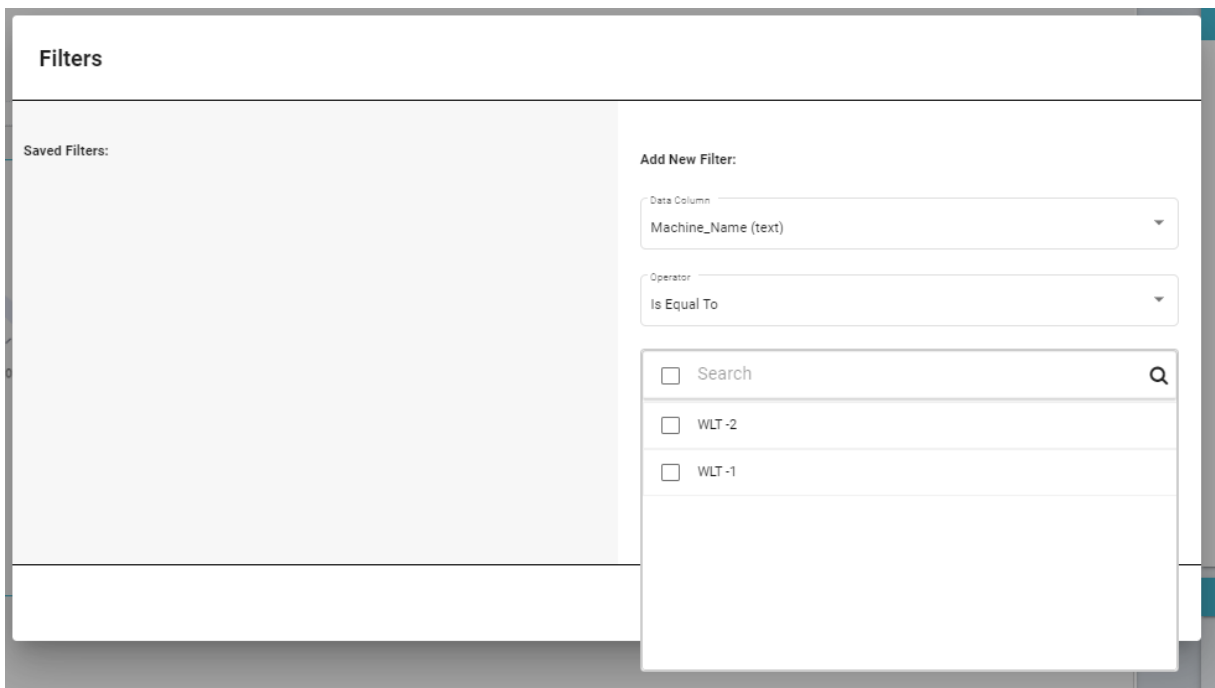
Figure.9a – Filter configuration.

Figure.9b – Filter configuration.

Figure.9c – Gauge after Filter configuration.

D. Styles:

To configure Style

Style	**As shown in the Figure.10.**
Chart Header	This will allow users to make changes to the text from the available options related to size, style, color, and alignment as per the requirement in the display of the gauge. **As shown in the Figure.10.** Text Size: You can select the required size of the text. Text Style: You can select the style from available formats of bold, italic and underline as per the requirement. Text Alignment: You can select the required alignment of the text from the available options of left, right, and centre. Text Color: You can select the required color for the text.
Background & Border	This will allow users to make changes in the background and border section from the available options related to color, size, border, and radius as per the requirement in the display of the gauge. **As shown in the Figure.11.** Background color: User can select the required color for the background. Border: By default, this toggle is OFF. When turned ON, user can select the required color of the border. Borders: Users can perform changes to the required section i.e. top, bottom, right and left side of the chart. Border Color: User can select the required color for the border. Border Size: This will allow user to set the value for thickness of the border. Border Radius: By default, this toggle is OFF. When switched ON, inserting a value will apply curve to the edges of the border. If no value is provided, then edges will remain squared.
Gauge Style	This will allow user to carry on some more precise changes in the display of the gauge. **As shown in the Figure.12.** Thickness: This value will allow users to select the thickness of the display of meter reading of the gauge. Show Pointer: The Pointer is visible only when this toggle is ON. When switched OFF, the pointer will not be visible. Show Scale: The scale is visible only when this toggle is ON. When switched OFF, the scale will not be visible.

Split Number: This feature allows users to display equal intervals on the meter by dividing the maximum range of the meter by the specified split number.

Scale Alignment: This feature allows users to choose whether the scale is displayed inside or outside the meter.

Fill Color: This will allow user to select the required color for the gauge.

Fill Value Font Size: This value will provide user to select the font size that need to be displayed for the actual value of gauge.

Fill Value Color: This will allow user to select the required color for the actual Value Font Size of the gauge.

Fill Value Font Style: This value will allow user to select the font style i.e. Bold/Italic that need to be displayed for the actual value of the gauge.

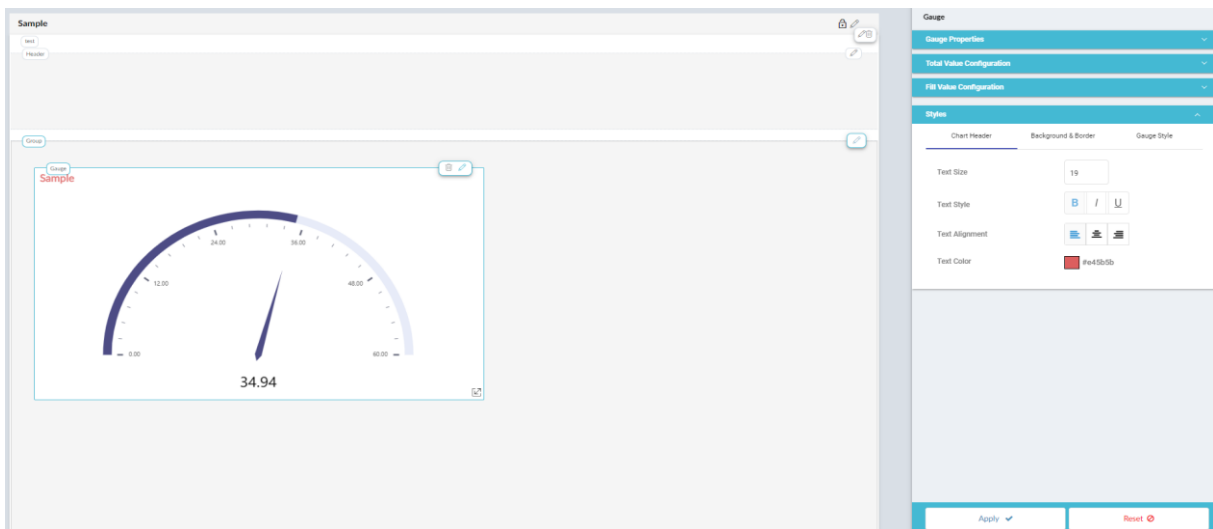**Scale Font Size**: This feature allows users to select the font size of the scale.

Figure.10 – Style configuration – Chart Header section.

Image

Using the image dashboard element, you can add images on the dashboard. For the image, you can configure -

- Image properties
- Image style

To configure image properties -

- Click properties in the right-hand side panel.

- In the image title field, enter a name for the image.
- Click choose file to browse and select an image.
- In the image alignment dropdown list, select an appropriate option to align the image as per the requirement.
- In the image fill dropdown list, select an appropriate option.

Image
Properties ^
Image Tittle
This field is required
Choose File
Image Alignment
▼
Image Fill
▼
Style ∨

To configure image style -

- Click style in the right-hand side panel to view the text style properties.
- In the text size field, enter a value for the text size.
- Under text style, select the type of style for the text. You can select bold, italics, or underline.
- In the text alignment dropdown list, select an option to align the text.
- Under text color, click and select a color for the text.
- Under background color, click and select a background color for the text.
- Move the border slider to the right to apply the border to the table.
- Under color, click and select the required border color.
- In the size field, enter the value for border size.
- Move the border radius slider to the right to apply the border radius for the table.
- In radius size, enter a value for radius size.
- Move the value or money slider to the right to display the $ sign for values.

Image	
Properties*	You can add an image to the dashboard. The title is used to set the title for the image. You can select the required image from choose file.
Image Alignment*	You can adjust the alignment of the image.
Image Fill*	You can set the image zoom.
Text Size	You can increase or decrease the size of the component name.
Text Style	You can set the component name to bold, or italic and also add an underline for the bar component name.
Text-Alignment	You can set the position of the component name at left, right, or center. The default Alignment is left.
Text color	The text color option is used to modify the color of the component title. The default color of the name is Black.
Background color	By using this option, you can modify the background color of the Component.
Border	When the border toggle is switched on, the border is applied to the bar chart component. You can also change the color and thickness of the border.
Border-Radius	You can make the corner round. You can also adjust the corner radius.

Pie/Donut

For the pie/donut, you can configure -

- Donut chart properties
- Donut chart series
- Donut chart style

To configure donut chart properties -

- Click on the donut chart, and then click donut chart properties in the right-hand side panel.

- In the chart name field, enter a name for the donut chart.
- Move the batch slider to the right to activate the batch.
- Move the live slider to the right to make the table live.
- Move the show slider to the right to show the donut chart on the dashboard when there is no data available in the table.
- In the data source dropdown list, select a data source for the donut chart.
- Move the donut slider to the right to display the donut.
- In the choose type dropdown list, select the type of donut chart.
- Under background color, click and select the background color for the chart.

Donut Chart Properties	
Chart Name*	The chart name is displayed at the top of the component like the title. (Note - Space will accept in the name column but for the others, your pie/donut will not be visible if you do not enter the name. So, the name should be assigned to the pie/donut.
Live Toggle	The Live toggle is used to display live data pie/donut. If the toggle is off, you need to refresh the dashboard. If live toggle is on, pie/donut will auto-refresh every 30 seconds.
Show Value Toggle	When the value toggle is off, you need to go on the particular pie/donut series. The value is displayed if you enable the toggle. The values are visible in the pie/donut.
Data Source*	From the data source option, you can select the collection which is configured by the DS Manager. Multiple tags are present in that collection. (Note - After the configuration of the pie/donut is completed, you cannot change the data source. If you try to change the data source and apply the settings, then an error will be displayed)
Donut*	You have the first option in the donut toggle. If you enable the toggle, the donut converts into the pie. The second option is choosing type. You can set drill-down and non-drill-down types. By using the drill-down type, you can set one layer of

|	pie/donut. Also, you can set multiple layers of the pie/donut by using the non-drill-down type. Resize and inner text options are only applicable to the pie. You can change the pie diameter using resize option. Inner text is used to add dynamic text at the center of the pie.

To configure series for donut chart -

- Click the series configuration in the right-hand side panel.
- Move the multi-series slider to the right to activate multiple series for the chart.
- In the aggregator for the series dropdown list, select the appropriate value.
- In the data column dropdown list, select the appropriate value.
- In the aggregator for the data column dropdown list, select the appropriate value.
- In the display name field, enter a name for the chart.
- In the precision field, enter an appropriate value.
- Move the group by the slider to the right to group the chart values.
- Click add a filter to add a filter for the chart.
- Click apply series to apply the series for the chart.

Series Configuration	
Series Name*	The series name is also known as the pie/donut. The series name is used to find a particular pie/donut area. It is displayed on the top of the right side of the pie/donut.
Column Type*	By using column type, you can configure the multiple pie/donut series. • Data column - You will plot the pie/donut as per the required aggregator by using the data column. In the data column, tags are present from the tag list. You can select the tag considering the value you need to show in the pie/donut. By using an aggregator, you can set the pie/donut value as per your requirement. If you want to see the lowest entry pie/donut, you have option min.

	Similarly, for high-value, you can set max. For the average, avg option is present in the list. There are a lot of aggregator options available on the list. Aggregator option - You have used only with data column, not with derived column. In the decimal precision point, you can set the decimal for the values. • Derived column - You can plot the mathematical calculation results by using the derived column option. By using custom formulas, you can write mathematical formulas. You can add the formulas by using add/edit formula option, then the formula builder will open. In the formula builder, you need to create the formula and finally, by pressing save it will save.
Group By Toggle	You can use this option only with the drill-down type pie/donut. You can set multiple-layer pie/donut. You need to set the sequence in the group by the data column option.
Add Filter	Add filter feature is used to filter out the data and display only the required pie/donut. (Example - if you have gotten machines' data and you want to see only 2 machines' data then you need to select only those 2 machines' names from add filter option) In the select data column, you need to select the tag and define the required condition in the option of operator equal to. Then in the value option, you need to select what you have to set. Finally, you can save this filter configuration by using the option of apply filter.
Apply Series*	Apply series is used to save the configuration of the pie/donut series. If you directly use the application instead of applying series, after the configuration of multiple series, then the multiple series configuration will not save. So, you need to use the first apply series option after the multiple series configuration.

To configure style for donut chart -

- Click Style on the right-hand side panel.
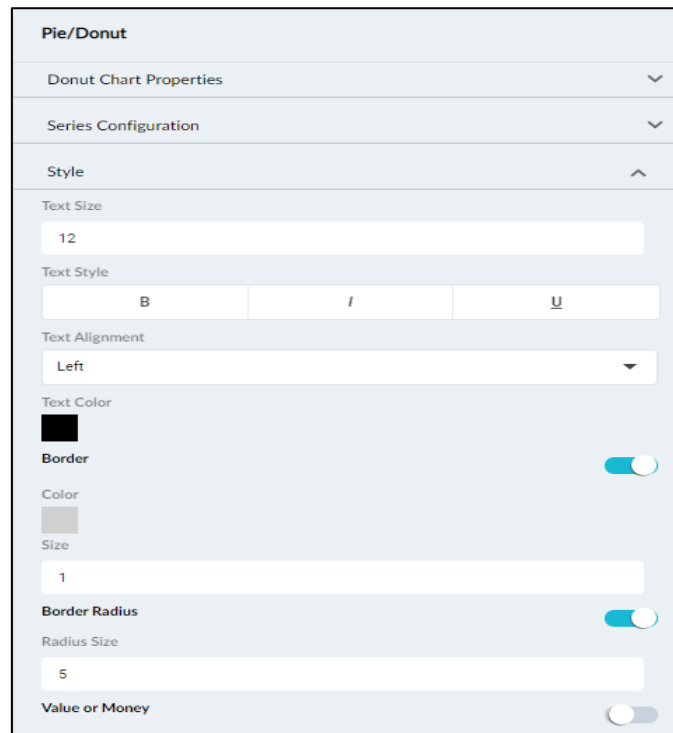
- In the text size field, enter a value for the text size.
- Under text style, select the type of style for the text. You can select bold, italics, or underline.
- In the text alignment dropdown list, select an option to align the text.
- Under text color, click and select a color for the text.
- Move the border slider to the right to apply the border to the table.
- Under color, click and select the required border color.
- In the size field, enter the value for border size.
- Move the border radius slider to the right to apply border radius for the table.
- In radius Size, enter a value for radius size.
- Move the value or money slider to the right to display $ sign for values.

Style	
Text Size	By using Text Size, you can Increase or decrease the size of the Graph Name. the default size of text is 12.
Text Style	In the Text Style, you can set the Graph Name into Bold, Italic also add Underline for the Graph Name.
Text-Alignment	By using Text-Alignment You can set the position of Graph Name at left, right or center. the default Alignment is left.
Text color	The text color option is used to modify the color of the Graph Name title, the default color of the name is black.
Border	When the Border toggle is switched to on the border is applied to the graph component. by using the color and Size option You change the color and Thickness of the Border.
Border-Radius	By using the Border radius, you can make corner round also in Radius size You can adjust corner radius also.

Bar Drilldown

For the bar drill-down, you can configure -

- Bar drill-down properties
- Bar drill-down series
- Bar drill-down style

To configure bar drill-down properties -

- Click on the drill-down bar, and then click drill-down Bar Properties.

- In the name field, enter a name for the drill-down bar.
- Move the batch slider to the right to activate the batch.
- Move the live slider to the right to display live data.
- In the data source dropdown list, select a data source for the drill-down bar.
- In the choose type dropdown list, select the type of drill-down bar.

Bar Chart Properties	
Name	Chart name which is displayed at the top of the component like the title. Space will be accepted in the name column but for the others, bar component will not be visible if you do not enter the name. So, the name should be assigned to the pie/donut.
Live Toggle	The live toggle is used to display live data bar component. If the toggle is off, you need to refresh the dashboard. If live toggle on bar component will auto refresh in every 30 seconds.
Data Source*	From data source option, you can select the collection which is configured by the DS Manager. In that collection, multiple tags are present. After the configuration of the Bar Component is completed, you cannot change the data source if you try to change the data source and apply the setting then an error will be displayed.
Choose Type*	In the option chose type, you can set drill-down and non-drill-down types. By using the drill-down type, you can set one layer bar component. Also, by using the non-drill-down type, you can set multiple layer bar component and set group by to display the group-wise layer data.

To configure series for drill-down bar -

- Click series configuration in the right-hand side panel.

- Move the multi-series slider to the right to activate multiple series for the drill-down bar.
- In the aggregator for series dropdown list, select the appropriate value.
- In the data column dropdown list, select the appropriate value.
- In the aggregator for data column dropdown list, select the appropriate value.
- In the display name field, enter a name for the drill-down chart series.
- In the precision field, enter an appropriate value.
- Move the group by slider to the right to group the series values.
- Click add filter to add a filter for the series.
- Click apply series to apply the series for the series.
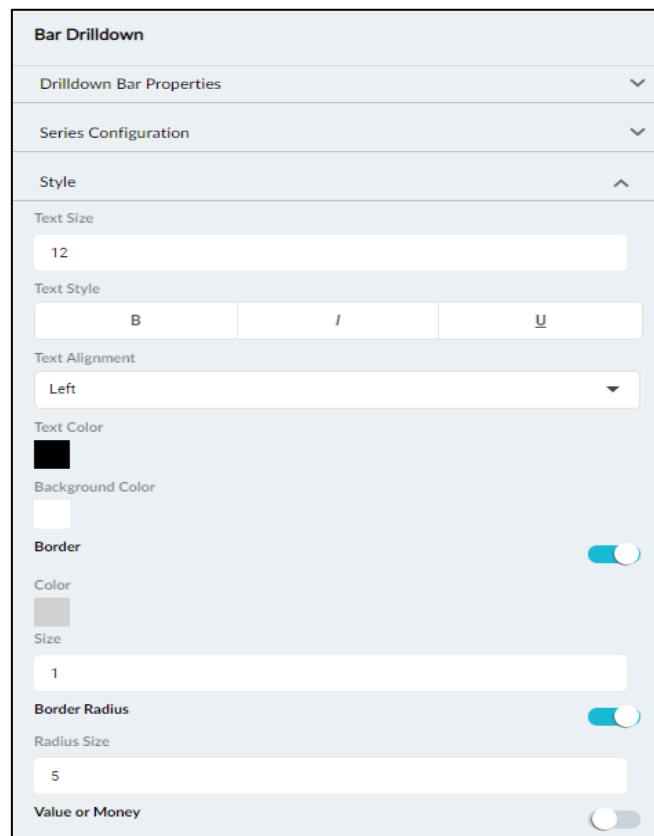
Series Configuration	
Column Type*	By using column type, you can configure the bar component series. • Data column - You can plot the bar component as per the required aggregator by using the data column. In the data column, tags are present from the tag list. You can select the tag as per your required value. So, by using an aggregator, you can set the value as per your requirement. If you want to see the layout entry pie/donut, you have option min similarly for high-value. You can set max, and for the average, avg option is present in the list. There are lots of aggregator options available in the list. Aggregator option you have used with only data column, not with derived column. In the decimal precision point, you can set the decimal for the values. • Derived column - You can plot the mathematical calculation results by using the derived column option. By using custom formulas, you can write mathematical formulas. You can add the formulas by using the add/edit formula option then the formula builder will open. In the formula builder, you need to create the formula and finally, by pressing save, it will save.

Group By Toggle	You can use this option with only drill-down type bar components. You can set multiple layers of the bar chart, for this, you need to set the sequence in the group by data column option.
Add Filter	This feature is used to filter out the data and display only the required bar. (Example - If you have got the 10 machines' data and you want to see only 2 machines' data then you need to select only those 2 machines' names from add filter option) In the select data column, you need to select the tag and define the required condition in the option of operator equal to. In the value option, you need to select the value which you want to set. Finally, you can save this filter configuration by using the option of apply filter.
Apply Series*	Apply series is used to save the configuration of the series. If you directly use apply instead of apply series after the configuration of multiple series, then the multiple series configuration will not save. So, you need to use the first apply series option after the multiple series configuration.

To configure style for drill-down bar -

- Click style on the right-hand side panel.

- In the text size field, enter a value for the text size.
- Under text style, select the type of style for the text. You can select bold, italics, or underline.
- In the text alignment dropdown list, select an option to align the text.
- Under text color, click and select a color for the text.
- Move the border slider to the right to apply the border to the table.
- Under color, click and select the required border color.
- In the size field, enter the value for border size.
- Move the border radius slider to the right to apply border radius for the table.

- In radius size, enter a value for radius size.
- Move the value or money slider to the right to display the $ sign for values.

Style	
Text Size	By using text size, you can Increase or decrease the size of the pie/donut name. The default size of text is 12.
Text Style	In the text style, you can set the graph name to bold and Italic also add underline for the bar component name.
Text-Alignment	By using text-alignment, you can set the position of the bar chart name at left, right or center. The default alignment is left.
Text color	The text color option is used to modify the color of the bar chart name title, the default color of the name is Black.
Background color	You can modify the background color of the component by using this option.
Border	When the border toggle is switched on, the border is applied to the bar chart component. By using the color and size option, you change the color and thickness of the border.
Border-Radius	By using the border radius, you can make the corner round. In Radius size, you can adjust corner radius also.

Filters

A filter is a criteria-based mechanism used to selectively extract or display specific subsets of data from a larger dataset. Filters enable users to focus on relevant information by setting conditions such as date ranges, numerical thresholds, or categorical criteria. Applying filters helps streamline data analysis, allowing users to tailor their view and extract insights to their specific requirements.

In SMART, there are two types of filters available.

1) Editor Filters
2) Runtime Filters

Editor Filters – Users can configure the filters in the dashboard edit mode. This mode allows users to adjust filter criteria, parameters, or settings to refine data views or analyses.

This feature is particularly valuable for users to remove the garbage values in the edit mode itself before analyzing data, adjusting filters to gain more insights or meet changing analysis needs.

To add these filters, go to properties of a desired component, go to filter section, and choose the required filter. For details about the available filter based on data column, refer to section 6.4.

Runtime Filters – are also known as Global filters. Users can configure these filters in the dashboard view mode otherwise known as runtime mode.

To apply the filter to any of the dashboards, the user needs to open the respective dashboard and find the Filter Funnel icons on the right side of the screen.

GLOBAL FILTER SYMBOL

Click on the funnel options and a drawer window will open on the right side of the screen.

It has 3 options –

a. Saved Filter
b. Add New Filter/Edit Existing Filters
c. Interval

Saved Filter –

- A saved filter refers to the ability to store and reuse specific combinations of filter settings in the SMART.
- Users can define multiple criteria within filters, such as date ranges, categories, or numerical thresholds, and save these configurations for future use.
- This feature streamlines the analytical process by allowing users to quickly apply and switch between different sets of filter conditions, enhancing efficiency in data exploration and analysis.

- To view previously saved filters, click on 'Saved Filter' option.

6.2.1) Add New Filter/Edit Existing Filters:
- Click on "Add New Filter" to expand the window.

- Default Filter - If this toggle is on, then the filter will get applied to the respective dashboard. In case you just want to create a group of filters and save those groups, then keep the toggle off.
  You can apply the saved filters from the saved filters section by simply enabling the toggle again.

1. Individual Filter:

An individual filter is applied separately to each page on the dashboard. If the dashboard has many pages, then user can apply filter to individual pages as per his requirements. This gives the flexibility to the user to define filters for individual pages.

2. Global Filter:

A global filter is applied uniformly to the entire dashboard, affecting data on all the pages. If the dashboard has many pages, then the user can apply only one global filter which would get apply across all the pages.
This is selected by default while adding the filter.

The above filters offer two distinct options:

a. Apply on Each (Cascading filter):

A cascading filter is a type of filtering mechanism in data visualization tools where the selection of a filter dynamically influences the options available in subsequent related filters. When a user makes a choice in the first filter, the available choices in the linked or cascading filters automatically adjust based on that selection. This hierarchical filtering structure allows for a more focused and refined exploration of data.

For example, consider a cascading filter scenario in a sales dashboard. The first filter might be "GA", and selecting a specific region could then dynamically update the options available in the next filter, such as "Location". This ensures that users only see relevant location options based on their chosen GA/region, facilitating a more intuitive and efficient data analysis process. Cascading filters are particularly useful in situations where data relationships are hierarchical or have dependencies, providing users with a streamlined and contextual filtering experience.

b. Apply on Save (Non-cascading Filter):

The opposite of cascading filter behavior is often referred to as "independent" or "non-cascading" filtering. In this approach, the selection in one filter does not impact the options available in other filters. Each filter operates independently, allowing users to make selections without any dynamic adjustments to the choices available in other filters.

Using the sales dashboard example, in a non-cascading filter setup, selecting a specific GA/region in one filter would not influence the available options in a second filter, such as "Location". Users have the flexibility to choose from the full range of options in each filter without restrictions based on previous selections. While this approach offers more freedom in selecting filter values, it may lead to less contextual filtering and might not be as suitable when there are hierarchical or dependent relationships among the filter criteria.

This is selected by default while adding the filter.

- Filter Label – Here, the user can give a unique name to the configured filter group.
- Add Filter – To add multiple filters by selecting the columns from the data sources.

- User can choose a required data column, and respective operators will be popped up in a drop-down menu.
- User can choose the required operator and value and then click on 'Apply filter' to confirm.
- Such multiple filters can be added to create a group of filters.
- Clicking on 'Save Filters' will save the group of filters and will get applied to the selected dashboard.

6.2.2) **Interval** –

- An interval represents a specific duration between two points. It is commonly used to organize and analyze time-based data by defining the period between data points. For instance, setting an interval to "day" would aggregate data into day wise and will display in the dashboard.
- Adjusting the interval allows users to control the granularity of time-related information, providing a flexible approach to time-based data exploration and visualization.
- To apply interval, user can select the Interval type such as Second, Minute, Hour, Day, Month etc.
- Set the interval value as desired and then choose Interval aggregator such as Absolute, Sum, Count, Max, Min, Avg, First Value, Last Value etc. The details are explained in the section 6.4.
- According to the selection, the Interval will be shown in dashboard.
- Please note that the, unlike to the individual filter which get applied to each page, the interval will always be applied for the entire dashboard.

6.3) **Filter Breadcrumb:**

A filter breadcrumb is a visual representation in a user interface that displays the active filters applied to a dashboard. It typically appears as a series of clickable links or elements, resembling a

breadcrumb trail, indicating the selected filter criteria. Users can interact with these filter breadcrumbs to review, modify, or change sequence in the runtime. This feature enhances flexibility and user control, providing a clear and accessible way to understand and manage the applied filters during data exploration and analysis.

The filter breadcrumb is visible on the dashboard's runtime screen as shown below -

INSERTTIMESTAMP	GA	LOCATION
Fri Jan 01 2021 00:00:00 to Sat Jan 01 2022 00:00:00 (+1 other)	Begusarai (+1 other)	New Star Petro Station (+5 others)
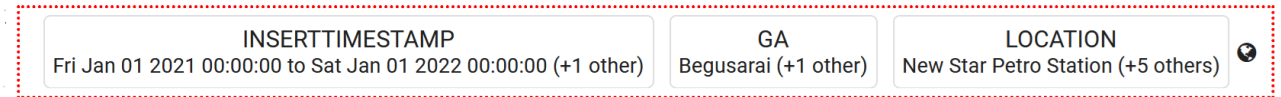
User can modify the values by clicking on applied filter and changing it with the desired values.

6.4) Filters based on data Columns:

1. **Time Filter:** In Time Filter, User can filter dashboards using time column. For time column we have multiple operators as follows:

   a. **Today:** The dashboard displays data for the current day only.
   b. **Yesterday:** The dashboard displays data for the previous day only.
   c. **Last 7 Days:** The dashboard displays data for the past 7 days.
   d. **Last 7 Days till yesterday:** The dashboard displays data for the past 7 days excluding Todays data.
   e. **Last 30 Days:** The dashboard displays data for the past 30 days.
   f. **Last 30 Days till yesterday:** The dashboard displays data for the past 30 days excluding Today's data.
   g. **Last 365 Days till yesterday:** The dashboard displays data for the past 365 days excluding Today's data.
   h. **This Week:** The dashboard displays data for the current week. The week start day can be configured in the project level configuration.
   i. **Last Week:** The dashboard displays data for the previous week.
   j. **This Month:** The dashboard displays data for the current month.
   k. **Last Month:** The dashboard displays data for the previous month.
   l. **This Year:** The dashboard displays data for the current year.
   m. **Last Year:** The dashboard displays data for the previous year.
   n. **Daily:** If the user selects the "Daily" operator, they can choose a specific time range according to their requirements. The dashboard then displays data within the selected daily time range across all days of data which is available.
   o. **Custom:** If the user selects the "Custom" operator, they can choose a specific time range according to their requirements. The dashboard then displays data within the selected custom time range.

2. **Batch Filter:**

   a. The Batch filter is a type of filter which is especially used in pharmaceutical industries where the process data, alarms and events are filtered according to the Batches.
   b. User can select the Batch Name to filter the data within a specific time range defined by the batch start time and batch stop time.

f. For example, if a user applies the Batch Column with a specific batch name and a time range defined by the batch start time and batch stop time, the system will filter and display relevant process data, alarm data, and audit data associated with that batch.

3. **Sub-Batch Filter:**
    a. In the pharmaceutical industry, they often run smaller sub-batches instead of one big batch. For example, if they want to produce 1000 kg of drug then they often run 10 sub-batches of 100 kg each.
    b. If an issue is identified in one sub-batch, it can be isolated and addressed without affecting the entire batch. This helps in mitigating risks related to potential defects, contamination, or other quality concerns.
    c. In SMART, users can apply data filtration based on Batch and Sub-batches.
    d. To do this, the user must select 'apply on each' option first.
    e. Then the user can select a batch and the available sub-batches from the data will be displayed to select.
    f. User can choose required sub-batch and data will be filtered as per that sub-batch.
    g. Such one or many sub-batch levels can be configured at the time of data logging (data source configuration).
    h. This way, the system will filter and display relevant process data, alarm data, and audit data associated with that batch and sub-batch.

4. **Shift Filter:**
    a. The Shift Filter enables users to filter data based on predefined or user-configured shifts. Users can apply this filter to focus on data relevant to specific work shifts.
    b. The shifts are configured in advance, defining their start and end times.
    c. These shifts could correspond to different work periods, such as day shifts, night shifts, or other custom shifts.
    d. For instance, if a manufacturing facility operates on a three-shift schedule (morning, afternoon, and night shifts), a user could use the Shift Filter to focus on production data during a specific shift.
    e. To create shifts in SMART refer section.

5. **Text Filter:** In Text Filter, User can filter dashboards using text column data. For text column we have multiple operators like Is Equal To, Is Not Equal To, begins with, does not Begins with, End With, does not End With, Contains, does not contain, Current User.
    a. **Is Equal To:** If the user selects "Is Equal To" operator, the data will be filtered to show only the data where the text column is exactly equal to the selected text.
    b. **Is Not Equal To:** If the user selects "Is Not Equal To" operator, the data will be filtered to exclude data where the text column is equal to the selected text.
    c. **Begins With:** If the user selects "Begins With" operator, the data will be filtered to show only the data where the text column starts with the specified text.
    d. **Does Not Begin With:** If the user selects "Does Not Begin With" operator, the data will be filtered to exclude data where the text column starts with the specified text.
    e. **Ends With:** If the user selects "Ends With" operator, the data will be filtered to show only the data where the text column ends with the specified text.

      f. **Does Not End With:** If the user selects "Does Not End With" operator, the data will be filtered to exclude data where the text column ends with the specified text.

      g. **Contains:** The "Contains" operator filters data to show rows where the text column contains any of the specified words or phrases.

      h. **Does Not Contain:** The "Does Not Contain" operator filters data to exclude data where the text column contains the specified words or phrases.

      i. **Current User:** If user selects 'Current User' as a filter option, then the logged in user's name will be applied as a filter and data will be displayed in the dashboard.

6. **Number Filter:** In Number Filter, User can filter dashboards using number column data. For number column we have multiple operators like Is Equal To, Is Not Equal To, Less Than, Less Than Equal To, More Than, More Than Equal To.

      a. **Is Equal To:** Filters data to show only the data where the number column is exactly equal to the specified value.

      b. **Is Not Equal To:** Filters data to show only the data where the number column is not equal to the specified value.

      c. **Less Than:** Filters data to show only the data where the number column is less than the specified value.

      d. **Less Than Equal To:** Filters data to show only the data where the number column is less than or equal to the specified value.

      e. **More Than:** Filters data to show only the data where the number column is greater than the specified value.

      f. **More Than Equal To:** Filters data to show only the data where the number column is greater than or equal to the specified value.

6.5) Click on filters:

A "click-on-filter" refers to a Runtime user interface feature that allows users to apply a filter simply by clicking on a data point, category, or value within the visualization. This action instantly filters the data to display only information related to the selected element.

For example, in a bar drilldown chart representing sales data by location, a click-on-filter would enable users to click on a specific bar (representing a location), and the SMARTwould automatically filter the dataset to show details only for that selected region. This interactive and intuitive feature streamlines the filtering process, making it easy for users to dynamically explore and analyze specific aspects of the data directly from the visualization.

This feature is available for Bar drilldown and Pie/donut of non-drilldown types.

Scheduler

The Scheduler automatically processes actions on time or on event triggers (by monitoring value changes) in data sources configured in the platform. Actions range from generating reports to saving files on a hard drive location, Emailing the generated files, or sending a notification on Mobile app or SMS.

When multiple schedules are triggered simultaneously, the Scheduler processes all actions as per the configuration. Since the execution of multiple schedules happens at the same time, users are advised not to create more than 5 schedules.

Click on the '*Options*' button & select '*scheduler*'.
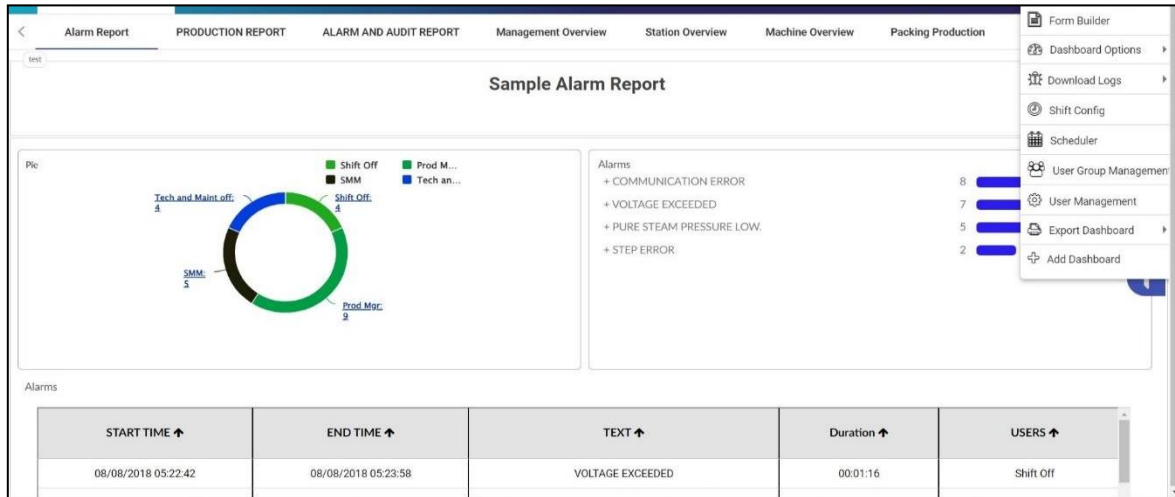
The following screen would appear -
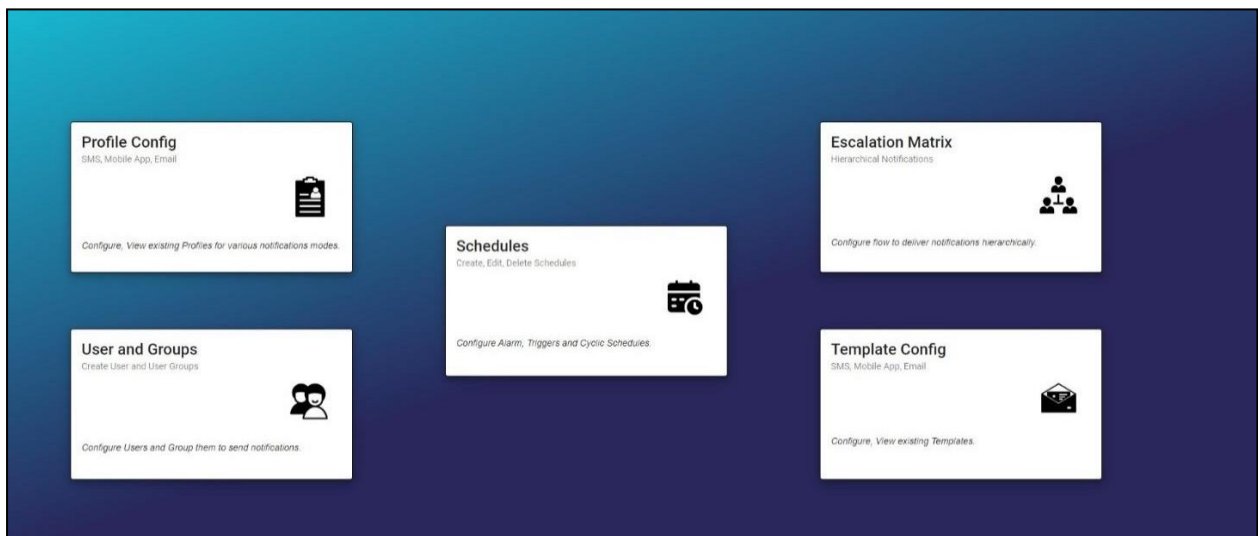
It consists of -

1) Profile config – All SMS/Email profile configuration would be done here.
2) User and Groups – All user and user groups configuration would be done here.
3) Template config – SMS/Email templates configuration would be done here.
4) Escalation Matrix – Configuration of the flow to deliver the notification hierarchically.
5) Schedules – Alarm, Trigger and cyclic schedules configuration would be done here.

Note: To configure only the scheduling of dashboards i.e., printing of the dashboards, users require to configure *Schedules* only. In case of Email/SMS/Mobile app use cases, user needs to configure them in the sequence mentioned above.

- **Profile Configuration**

1. **Click on the "Profile Configuration" option in the scheduler.**
2. To create a new profile, click on the '✚' button located at the top-right side of the window, while to go back to Scheduler screen, click on Back button on top-left side of the window.
3. A pop-up window will open with three configuration options: SMS, mail**,** and mobile app**.**

SMS Profile Configuration	- In the *Profile* Configuration, User must enter the profile name. It is mandatory to set a profile name. You can check if the name is already used or not by clicking '*check availability*'. - Select the *Profile Type* as *SMS*. - Enter the *API key* and the *Sender Name*. - We support https://www.textlocal.in/ as the third-party SMS gateway which needs to be purchased by the user. - The API key and the Sender name will be provided by textlocal. - Finally, click on 'Done' to save the configuration. - The saved configuration will be displayed in the list, along with its configuration type. - If you want to modify a previously created profile configuration, you can search for the profile or use scroll to find it. - Click on the pencil icon in *Action* to edit the previously created configuration.
Email Profile Configuration	- In the *Profile* Configuration, User must enter the profile name. It is mandatory to set a profile name. - Select the *Profile Type* as *Email*. - Enter the *Host Name* and *Port* of the mail server. E.g., For Gmail, the hostname is '*smtp.gmail.com*' and the port is '*587*'. - Provide the *Email ID* and the *Password*. Please note that for many email service providers, you will need to use a third-party app password. Refer the KB article here for Gmail: https://support.google.com/mail/answer/185833?hl=en - In the case of a proxy server, the user needs to configure *SSL* and *Proxy* settings. Enable the toggle in the configuration and provide the necessary details. - Click on 'Done' to save the configuration. - To modify a previously configured profile, you can search for the profile or use scroll to find it. - Click on the pencil icon in *Action* to edit the previously created configuration.
Mobile App Profile Configuration	- In the *Profile* Configuration, User must enter the profile name. It is mandatory to set a profile name. - Select the *Profile Type* as *Mobile App*. - Click on 'Done' to save the configuration. - To modify a previously configured profile, you can search for the profile or use scroll to find it.

	• Click on the pencil icon in *Action* to edit the previously created configuration.

User and Groups

- To configure users and groups, navigate to the scheduler and click on "User and Groups".
- To create a new user or group, click on the '✚' button located at the top-right corner of the screen. There will two options –
  1. Add new User
  2. Add User Group

  Select the appropriate option based on your requirements.
- To go back to Scheduler screen, click on Back button on top-left side of the window.
- Please note that the Users which are created here are considered as 'non-platform users' which won't have access to login into the platform although they can receive the configured notifications or Emails.

Add New User	To configure the new user,

	1. Enter the First and Last name of the user. You can check if the name is already used or not by clicking '*check availability*'. 2. Provide the email ID and Mobile number for the user. 3. Click on 'Done' to save the configuration.
Add New Group	To configure the new user group: 1. Enter the group name. You can check if the name is already used or not by clicking '*check availability*'. 2. From the user's drop-down menu, select the users that you have previously created. You could also use the platform users which are configured in User Management (Refer section 10, 10.2) Note: **Please ensure that you have created the users before creating the group**.
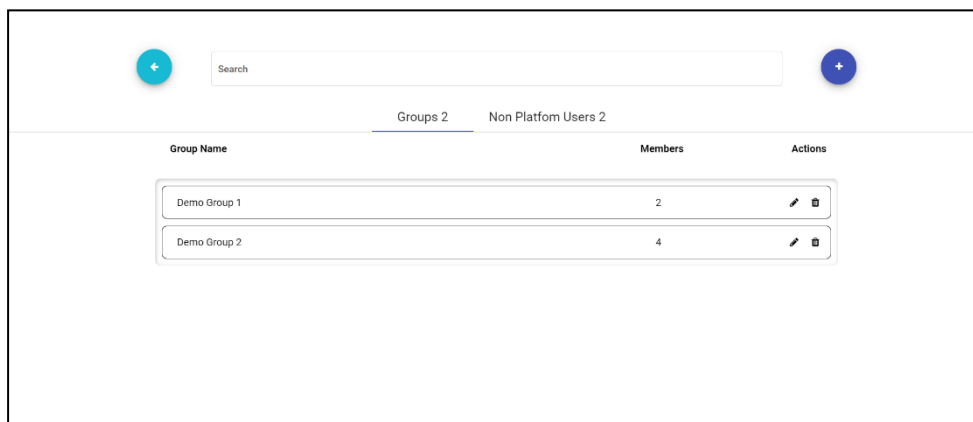
Template Config	
• To configure templates, navigate to the scheduler and click on "Template Configuration". • To create a new template, click on the '✚' button located at the top-right corner of the screen, while to go back to Scheduler screen, click on Back button on top-left side of the window.	
SMS Template	• For the SMS template, enter the template name, followed by the sender's name and the SMS content that you wish to include in the template text. You can check if the name is already used or not by clicking '*check availability*'.

	• Please note that the sender's name and template text are set according to the standards defined by TRAI (Telecom Regulatory Authority of India) rules. For info refer here: https://trai.gov.in/advice-to-senders • Users can also add the custom variable in Template Text box as per requirement. These custom variables could be taken from any of the configured data sources parameters. • To open custom variable popup, press ∧ key. Then select datasource, data column and required aggregator and Press Done. • This will add a custom variable placeholder in the input box.
Mail Template	• For the mail template, enter the template name, followed by the subject line. In the email body, you can type the necessary details related to the email. • Users can also add custom variables in Subject and/or email body as per requirement. These custom variables could be taken from any of the configured data sources parameters. • To open custom variable popup, press ∧ key. Then select datasource, data column and required aggregator and Press Done. • This will add a custom variable placeholder in respective input box.
Mobile App Template	• For the mobile app template, enter the template name first. Then, type the message you want to include in the message body. • Users can also add the custom variable in Template Text box as per requirement. These custom variables could be taken from any of the configured data sources parameters. • To open custom variable popup, press ∧ key. Then select datasource, data column and required aggregator and Press Done. • This will add a custom variable placeholder in the input box.

Search

Template Name	Type	Actions
test_app	mobileApp	✏ 🗑
epic_creation	mobileApp	✏ 🗑
time_spent	mobileApp	✏ 🗑
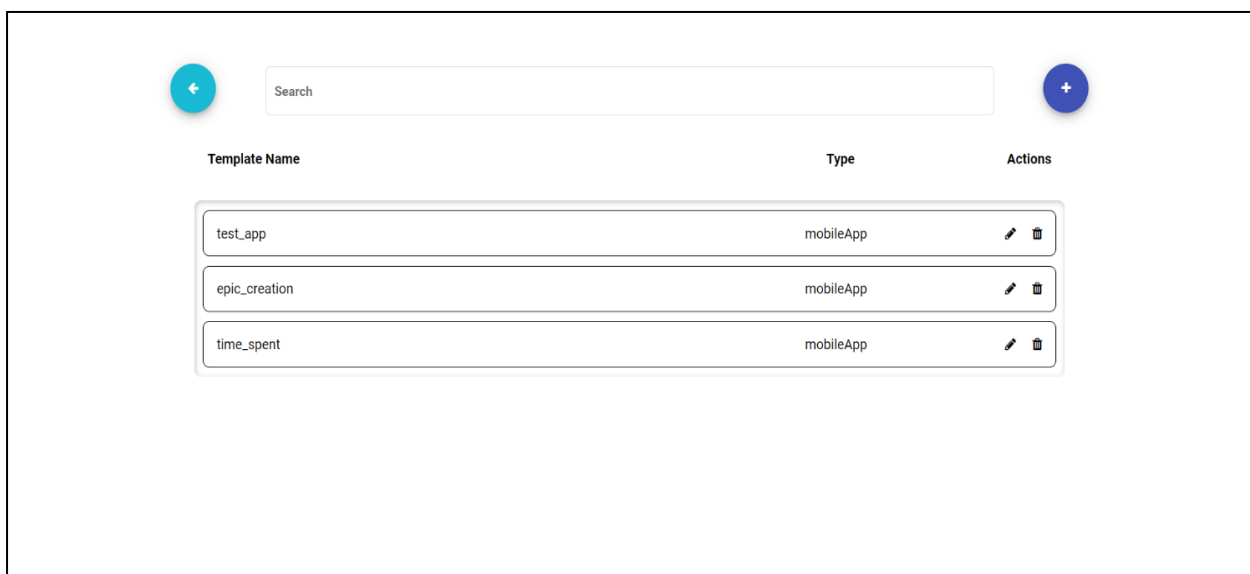
Configure Variable!

Variable Name: Line_Name   [Available] ✎

Data Source: vdfvf - vdfvf   ▾

Data Column: alarm_text (text)   ▾

Aggregator: Last Value   ▾

Cancel   Done

Escalation Matrix	
The escalation matrix feature in the SMART Platform allows a user to set up email notifications to designated individuals when a task becomes overdue. Please note that for sending a notification/email, creation of a Matrix Level 1 is mandatory. After that, depending on the escalation conditions, next levels can be configured.	
Matrix Name*	For easier identification and selection during the configuration of schedules, it is important to assign unique names to the matrices for SMS, mail, and mobile application. You can check if the name is already used or not by clicking '*check availability*'.
Matrix Level	Matrix level displays the Level of the escalation. The '1' is the default level for sending notification/emails. After that, depending on the escalation conditions, next levels can be configured.
Level Name*	A User must enter the unique Level name. It is mandatory to set a Level name.
Level Type*	• SMS: To send SMS notifications when a condition occurs, select the SMS type in the configuration. • Mail: To send email notifications based on specific values, select the level type as Mail. • Mobile App: To send mobile app notifications based on certain conditions, choose the level type as mobile app. • Please note that before configuring the escalation matrix, it is necessary to set up Templates, Profiles, Groups, and Users as explained above. These elements are selected from dropdown lists when configuring the escalation matrix. Without configuring them first, it will not be possible to configure the escalation matrix successfully.
Escalate	• Use this feature when you want to escalate the triggered situation to higher levels. • To configure it, enable the 'Escalate' toggle for configuring the next level in the escalation matrix. • Upon enabling the toggle, user would see the option to define conditions that trigger the escalation message. Using the condition builder, the user can create the combination of conditions to trigger the

	escalation. Here, you can use the logical operators to build the complex condition.
	• Once the conditions are built, click on 'Add Next Step' to set the second level of escalation details. In that user must configure Level name and Level Type.
	• Once level type is selected, the respective Templates, Profiles, Groups, and Users must be configured too.
	• This way, user can define as many levels as per requirements.

Matrix Name	Levels	Actions
test_matrix	1	✏ 🗑
time_spent_matrix	1	✏ 🗑

Configure Matrix

Matrix Name: [Matrix1]   [Available] ✎

Matrix Levels:

① Level 1

Level Name:	Level 1
Level Type:	○ SMS ○ E-mail ● Application
Template:	test_app ▼
Profile:	Test_mobileapp ▼
Group(s):	Demo Group 1, Demo Group 2 ▼
User(s):	▼
Escalate:	⬤

[Back] [Finish]

Escalate Conditions and Conditional Builder-

Conditions

Saved Conditions:

C2

PRIORITY [UNDEFINED-STATUS_UPDATE]
EQUAL TO   🗑

Edit Condition:

Condition Name
[C1]

DataSource
[localhost-itanta_logs ▼]

Data Column
[level (number) ▼]

Condition
[Is Equal To ▼]

[Condition Value ▼]

Match With Dynamic Value   ⬤

Save   Cancel

Done   Cancel   Reset

s

Condition Builder

Select Condition ▼   Add   Select Operator ▼   Add ←

Condition Formula:

C1 and C2

Save   Cancel   Clear Formula

Schedules*

For report generation or Email or notification, user must configure the schedules.
In the schedules, there are three types -
- Alarm
- Cyclic
- Trigger

All the types of schedules are explained below.

Alarm –

If a user want**s** to generate a report or send a notification based on each entry logging into the database, then they should use the type as *Alarm*.
For e.g., If SMART Alarm Management generates an alarm, the scheduler should send email or mobile notification of the same.
Or
If the SCADA is generating alarms in SQL database, SMART can read from it and send the notification of the same.
For both above cases, the user must use type as *Alarm*.

Schedule Name*	To ensure easy identification and management, it is recommended to assign unique names to schedules for alarms. You can check if the name is already used or not by clicking '*check availability*'. Please note that once the schedule configuration is saved, then Schedule name cannot be changed later.
Data Source*	From the data source option, select the source that has been configured using the DS Manager. After the selection, the available tags will be displayed for selection in Data Column.
Data Column*	In the data column, the user can select a tag. Whenever this tag value gets changed, a notification/email will be triggered.
Dashboard*	The dropdown list shows the list of all present dashboards from the project. User needs to select a dashboard which he wants to print. Please note that only one dashboard can be selected for each alarm configuration.

Filters*	By using the "Add Filter" option on the dashboard, any filter can be applied to the dashboard while scheduling it. If the user have already set the time in the filter, it is advisable to leave the next time filter option blank. If not left blank the values in Time Filter option below would overwrite the filters set in Filters option
Time Filter*	If the user wants to schedule a report back in time to a duration relative to the time of schedule, this option is required. E.g. if the user wants a schedule to run at midnight every day & wants the dashboard to show only data for previous day, he could set the from time as "1440" & to time as "0" as a day has 1440 mins.
Delay*	The delay option allows user to introduce a time delay before actual schedule kicks in. For example, if user sets a delay to 30 seconds and configures a condition that the value of a specific tag should be true, then the report will be generated after a 30-second delay from the satisfaction of condition.
Interval	Using the interval option, user can define the time interval for the dashboard which is selected earlier. For example, if a dashboard which is configured has 1 minute of data in it, and if a user sets interval as 1 hour, then the scheduled report will have 1 hour interval data in it.
Report Type and Print Type*	By using report print, user can set the print type to PDF, Excel, or both. PDF Option: If user selects the option *Print as it is*, then the print will be generated as per the dashboard data view. The dynamic table will have only the top 25 rows in the print. PDF Option: If user select the *print data*, then, as per the set filters and intervals, a print will be generated. Excel option: If the user selects *Print separate files*, it will print dashboard tabs into separate file Excel files. Excel option: Print separate tabs are used to print dashboard tabs in a single Excel file creating multiple sheets in it.
Conditions	In the condition section, you can set multiple conditions based on specific criteria for when the report should be printed. This allows for greater flexibility and customization. For instance, if you want to print a report when "Tag 1" has a value equal to true and "Tag 2" has a value equal to false, you can define this condition in the add/edit condition option and define 'And/OR' between them in condition builder.
Escalation Matrix:	If you desire to receive the generated report, message, or notification via mail, SMS, or mobile app, you can select the appropriate escalation matrix from the dropdown list. On the other hand, if you do not want to receive the report on a specific platform, simply refrain from selecting that option from the dropdown list.

Configure Schedule

Status 🔵

Schedule Name: `Alarm1`   Available ✏️

Schedule Type: 🔘 Alarm ⚪ Cyclic ⚪ Trigger

Data Source: - status_update ▼

Data Column: Status (text) ▼

Conditions:
Add/Edit Conditions ↻ [0]   Condition Builder ☰ [0]

Dashboard: Jira Daily Status Report ▼

Filters:
Add/Edit Filters ▼ [0]

Time Filter:
From Time (mi...)   To Time (mins)

Delay:
Delay (secs)

Interval:
Add/Edit Interval [0]

Report Type: 🔘 PDF ⚪ Excel ⚪ Both

Print Type: 🔘 Print as it is ⚪ Print Data

Escalation Matrix: test_matrix ▼

Cancel   Save

Cyclic –

If a user wants to generate a report or send a notification at a specific interval (time based), then they should use the type *Cyclic*.
For e.g., a dashboard or notification to be sent at 7:00 am on weekdays**.**
Or
For the condition to occur every 20 minutes between 8:00am and 5:00pm on a weekday.
For such cases, the user must use type *Cyclic*.

Schedule Name*	To ensure easy identification and management, it is recommended to assign unique names to schedules for cyclic. You can check if the name is already used or not by clicking '*check availability*'.
Select Interval*	By utilizing this option, you can schedule the report to be generated at a defined time. By default, the scheduling is set to "every", indicating that the report will be generated periodically.
Dashboard*	The dropdown list shows the list of all present dashboards from the project. User needs to select a dashboard which he wants to print. Please note that only one dashboard can be selected for each alarm configuration.
Filters*	By using the "Add Filter" option on the dashboard, any filter can be applied to the dashboard while scheduling it. If the user have already set the time in the filter, it is advisable to leave the next time filter option blank. If not left blank the values in Time Filter option below would overwrite the filters set in Filters option
Time Filter*	If the user wants to schedule a report back in time to a duration relative to the time of schedule, this option is required. E.g. if the user wants a schedule to run at midnight every day & wants the dashboard to show only data for previous day, he could set the from time as "1440" & to time as "0" as a day has 1440 mins.
Delay*	The delay option allows you to introduce a time delay in the printing process. By specifying a delay time in seconds, user can control when the when the schedule must be triggered. For example, if user sets a delay to 30 seconds and configures a condition that the value of a specific tag should be true, then the report will be generated after a 30-second delay from the satisfaction of condition.
Interval	Using the interval option, user can define the time interval for the dashboard which is selected earlier. For example, if a dashboard which is configured earlier has every 1 minute of data in it, and if a user set interval as 1 hour, then the scheduled report will have 1 hour interval data in it.
Report Type*	By using report print, user can set the print type to PDF, Excel, or both. PDF Option: If user selects the option *Print as it is*, then the print will be generated as per the dashboard data view. The dynamic table will have only the top 25 rows in the print. PDF Option: If user select the *print data*, then, as per the set filters and intervals, a print will be generated. Excel option: If the user selects *Print separate files*, it will print dashboard tabs into separate file Excel files. Excel option: Print separate tabs are used to print dashboard tabs in a single Excel file creating multiple sheets in it.

Conditions	In the condition section, you can set multiple conditions based on specific criteria for when the report should be printed. This allows for greater flexibility and customization.
	For instance, if you want to print a report when "Tag 1" has a value equal to true and "Tag 2" has a value equal to false, you can define this condition in the add/edit condition option and define 'And/OR' between them in condition builder.
Escalation Matrix	If you desire to receive the generated report, message, or notification via mail, SMS, or mobile app, you can select the appropriate escalation matrix from the dropdown list.
	On the other hand, if you do not want to receive the report on a specific platform, simply refrain from selecting that option from the dropdown list.

Configure Schedule

Status ⬤

Schedule Name: Cyclic1   Available ✎

Schedule Type: ◯ Alarm   ⦿ Cyclic   ◯ Trigger

Select Interval:

| Minute | Hour | Day of Month | Day of Week | Month |

Every: ⬤

Start
7

Step
0

Conditions:

Add/Edit Conditions ↻ ⓿   Condition Builder ≡ ⓿

Dashboard:

Management Overview ▾

Filters:

Add/Edit Filters ▼ ⓿

Time Filter:

From Time (mins)   To Time (mins)

Delay:

Delay (secs)

Interval:

Add/Edit Interval ⓿

Report Type: ⦿ PDF   ◯ Excel   ◯ Both

Print Type: ⦿ Print as it is   ◯ Print Data

Escalation Matrix: test_matrix ▾

Cancel   Save

Trigger

If a user want**s** to generate a report or send a notification when a predefined trigger is satisfied, then they should use the type as *Trigger*.

For e.g., a dashboard or notification to be sent at when a tag value is true.

Or

A notification is to be sent if the temperature tag value exceeds 35 °C.

For such cases, the user must use type as *Trigger*.

Schedule Name*	To ensure easy identification and management, it is recommended to assign unique names to schedules for triggers in the SMART Platform. You can check if the name is already used or not by clicking '*check availability*'.
Data Source*	From the data source option, select the source that has been configured using the DS Manager. After the selection, the available tags will be displayed for selection in Data Column.
Data Column*	In the data column, the user can select a tag. User can define a condition on this tag to trigger a notification/email.
Operator*	In this option, you can select the condition i.e., selected tag value is equal to, not equal to, less than and greater than etc.
Values*	Based on the requirement, the user can specify a value in the "Value" field. Please note that user can specify only one value.
Time Column*	In the time column, you need to select the time column name. All columns with property as time will be displayed in the drop-down. If the sort of property is applied to a time column in DS Manager, then select the same one here.
Dashboard*	The dropdown list shows the list of all present dashboards from the project. User needs to select a dashboard which he wants to print. Please note that only one dashboard can be selected for each alarm configuration.
Filters*	By using the "Add Filter" option on the dashboard, any filter can be applied to the dashboard while scheduling it. If user have already set the time in the filter, it is advisable to leave the next time filter option blank. If not left blank the values in Time Filter option below would overwrite the filters set in Filters option
Time Filter*	If the user wants to schedule a report back in time to a duration relative to the time of schedule, this option is required. E.g., if the user wants a schedule to run at midnight every day & wants the dashboard to show only data for previous day, he could set the from time as "1440" & to time as "0" as a day has 1440 mins.
Delay*	The delay option allows you to introduce a time delay in the printing process. By specifying a delay time in seconds, you can control when the print is generated based on certain conditions. For example, if user sets a delay to 30 seconds and configures a condition that the value of a specific tag should be true, then the report will be generated after a 30-second delay from the satisfaction of condition.
Interval	Using the interval option, user can define the time interval for the dashboard which is selected earlier.

	For example, if a dashboard which is configured earlier has every 1 minute of data in it, and if a user set interval as 1 hour, then the scheduled report will have 1 hour interval data in it.
Report Type*	By using report print, user can set the print type to PDF, Excel, or both. PDF Option: If user selects the option *Print as it is*, then the print will be generated as per the dashboard data view. The dynamic table will have only the top 25 rows in the print. PDF Option: If user select the *print data*, then, as per the set filters and intervals, a print will be generated. Excel option: If the user selects *Print separate files*, it will print dashboard tabs into separate file Excel files. Excel option: Print separate tabs are used to print dashboard tabs in a single Excel file creating multiple sheets in it.
Conditions	In the condition section, you can set multiple conditions based on specific criteria for when the report should be printed. This allows for greater flexibility and customization. For instance, if you want to print a report when "Tag 1" has a value equal to true and "Tag 2" has a value equal to false, you can define this condition in the add/edit condition option and define 'And/OR' between them in condition builder.
Escalation Matrix	If you desire to receive the generated report, message, or notification via mail, SMS, or mobile app, you can select the appropriate escalation matrix from the dropdown list. On the other hand, if you do not want to receive the report on a specific platform, simply refrain from selecting that option from the dropdown list.

Configure Schedule

Status 🔵

Schedule Name: | Trigger1 | | Available | 📝

Schedule Type: ⚪ Alarm   ⚪ Cyclic   🔘 Trigger

Data Source: localhost - itanta_logs ▾

Data Column: new_value (text) ▾

Conditions: Add/Edit Conditions ↻ **0**   Condition Builder ☰ **0**

Operator: Greater Than ▾

Value: 2

Time Column: time (time) ▾

Batch: ⚪

Dashboard: Management Overview ▾

Filters: Add/Edit Filters ▼ **0**

Time Filter: From Time (mi| To Time (mins)

Delay: Delay (secs)

Interval: Add/Edit Interval **0**

Report Type: ⚪ PDF   🔘 Excel   ⚪ Both

Print Type: 🔘 Print Separate Files   ⚪ Print Separate Tabs

Escalation Matrix: test_matrix ▾

Cancel   Save

Formula Builder

A formula builder is a tool that facilitates the creation of mathematical or logical expressions through a user-friendly interface. It typically allows users to construct complex formulas by selecting predefined aggregators, operators, and variables/tags. This simplifies the process of creating equations without requiring users to manually write code. Formula builder generates results on the live/historical data and stores it into the assigned table.

Note: - The custom Tag which is created using Formula Builder and it is to be saved in system will also be considered in Tag licensing.

- In the basic configuration, the user must give a unique formula name to the formula.

FORMULA BUILDER

Unique Formula Name *
Formula1

Unique Result Collection Name *
Archive-FormulaResultTable

Start Interval Configuration *
01 / 11 / 2023 , 12 : 00 am

Formula Type *
Aggregate Logging

Logging Interval *
Hours   1

Calculation Interval(Sleep in sec) *
60

Recalculation Period *
Days   1

Cancel   Continue

- Result collection is a table in which the calculated result of the formula would be stored. User must give unique name to the table. In case you want to update the result in the existing collection, then give the same table name here. This result table will be available as a data source in the SMART dashboard designer.
Ensure accurate configuration of the formula when updating an existing collection or table to prevent unintended changes to historical values. Updating the collection can impact past data, so careful formula setup is crucial to maintain the integrity of historical records.

- Start interval configuration is the time from which calculations should start. In the start interval configuration, you need to mention the date in DD/MM/YYYY format and select

time in hours and minutes. Ideally it should be time from which formula needs to be calculated.

- In the formula type, you will have 4 options to choose from. Such as
  - Aggregate logging – When formula to be calculated on a significant period.
  - Absolute logging - When formula to be calculated on each row of the table.
  - On change logging - When formula to be calculated when a value of tag changes
  - Copy document – Copying a row again based on configured period.

  These points are explained in detail in their individual section. You must select one of the types as per requirements to continue.

- Logging Interval is applicable only if you select 'Aggregate Logging' option. You need to select the period from drop down (Days/Hours/Minutes/Seconds) and put the value in the input field.

- Calculation Interval or Sleep Interval is the option in which you need to specify the sleep time of the formula calculation engine in seconds. This allows formula builder to wait for specified time before calculating the result on the next cycle. The default calculation interval is 25 seconds.
  Please note that the smaller the sleep time, higher the resource requirement thus higher CPU/memory uses. So, if your formula doesn't need to be calculated often then set the higher sleep time.

- A recalculation period refers to the frequency at which formula builder updates and recalculates its formulas. E.g., If you set frequency as 1 Day, then formula builder is going to recalculate the last 24 hours of historical data on every calculation cycle. The default re-calculation interval is 1 day.
  Please note that the higher the recalculation period, the higher the resource requirement thus higher the CPU/memory uses. So, if your formula doesn't need to be re-calculated for longer duration, then set the lower recalculation period.

- Once the above settings are done, the continue button will enable you to create formula in formula builder.

As per the selected formula type, the configuration of the formula in formula builder screen will be different.

1. Aggregate Logging –

The "aggregate formula" type implies a calculation method that considers data over a significant period, typically aggregating values over time. This approach is valuable when analyzing trends, patterns, or cumulative effects. For instance, in efficiency of machine contexts, it might involve calculating daily or shift-wise availability, performance and quality to provide a more comprehensive understanding of efficiency. This formula type is beneficial for applications where insights derived from aggregated data over substantial periods offer a more insightful and strategic perspective, as opposed to focusing solely on individual data points or short-term fluctuations.

After configuration of Basic settings, the following screen will appear.

1. Tag – Tag is under which formula result will be stored. Click on it and a popup window will appear, where user must enter a unique tag name and click on save.

2. Placeholder – There might be a requirement where the user wants to create the same formula with different operands. For example.
   Machine 1 Average Temperature in Kelvin = (Machine1_Temperature) (Avg) + 273.15
   Machine 2 Average Temperature in Kelvin = (Machine2_Temperature) (Avg) + 273.15
   Machine 3 Average Temperature in Kelvin = (Machine3_Temperature) (Avg) + 273.15
   And so on.

In this case, you can set a placeholder say temperature and create only one formula. While saving the formula, a popup will be shown where you can replace placeholder with tags from the Data source as shown below-

Placeholders Configuration

Formula = [Temperature_in_dC] + 273.15

No.	[Temperature_in_dC]	Result Tag Name	Action
1	Select Tag PV_TE201_1	Result Tag Name TE201_1_kelvin	🗑
2	Select Tag PV_TE201a_1	Result Tag Name TE201a_1_kelvin	🗑
3	Select Tag PV_TE201_2	Result Tag Name TE201_2_kelvin	🗑
4	Select Tag PV_TE340_1	Result Tag Name TE340_1_kelvin	🗑

Add New Row   Save and Proceed   Back

This will help to create as many formulas as possible based on user input.

3. Select Data source – Here, all available data sources from the connectors will be visible including the data source from SMART's Formula Builder and SMART Alarm Manager. You can use these data sources to create formulas from them.

4. Search tag – The list of tags will be displayed once a data source is selected. You can search through the tags using the search tags option.

5. Operators and aggregators – In the bottom section of page, you can see all available operators such as +, -, *, /, and brackets too. There are several out of the box aggregators available which would be helpful for formula creation.
    a) Sum – Get total value of the tag.
    b) Avg – Get the average value of the tag.
    c) Min – Get the minimum value of the tag.
    d) Max - Get the maximum value of the tag.
    e) Count – Get the number of counts of the tag.
    f) First – Get the First value of the tag.
    g) Last – Get the Last value of the tag.
    h) Totalizer – Last variable minus first variable and rollover aware of the tag.

Constant is the numeric field where you can enter any numeric value and use it in the formula.

Please note that in the case of aggregate formula type, it is mandatory to use the aggregator while creating formula. For example.,
Avg Machine 1 Temperature in Kelvin = (Machine1_Temperature) (Avg) + 273.15

6. Formula Creation Panel – It's an empty panel in which you can drag and drop the tags, operators, and aggregators to create a formula.
Please note that the correct way of configuring aggregator is to keep it after a tag.
e.g.,   (Last) Tag1 – Incorrect
         Tag1 (Last) – correct

If you wish to delete any added tag/operator/aggregator, then simply double click on it and it will get removed.

7. Sort column – Select a sort column on which data is to be sorted. This is always a time column which needs to be selected by the user.

8. Distinct tags – The term "Distinct" refers to a method or operation that identifies unique or different values within a set of data.
E.g., If your data source has '*Location*' tag in which data from multiple locations are getting logged, then by selecting distinct option in the dropdown, the configured formula will calculate the result for each of the distinct locations.

Furthermore, the concept of "Distinct" can be extended beyond just locations to other columns or attributes in a dataset. Users may be able to select one or more distinct columns, and the system will then calculate results based on the unique values found in those selected columns. This functionality is useful for analyzing data at a granular level, allowing users to focus on specific subsets of information within the dataset.

9. Add/Edit Filters – In this section, user can apply filters on the source data before formula gets calculated. To see the option to apply filters, click on '^' arrow to expand the properties panel.
For example, A formula to be calculated when *Tag1* value is greater than 25. (OR)
A formula to be calculated when *Location* is equal to 'Location1' etc.

10. Save tag – You can save the configured tag by clicking on the 'save tag' button. Upon clicking, it will verify if the created formula is correct as per syntax. In case of incorrect syntax, an error popup will appear while saving the tag.
Using the formula builder, such many tags can be configured by the user.

11. Save Formula – There is a save icon on the top right of the page to save the entire formula group. This group can contain one or many tags in it.

12. Exit – The exit icon is available next to the save button. Clicking on exit will exit the formula and will redirect you to the main formula builder screen.
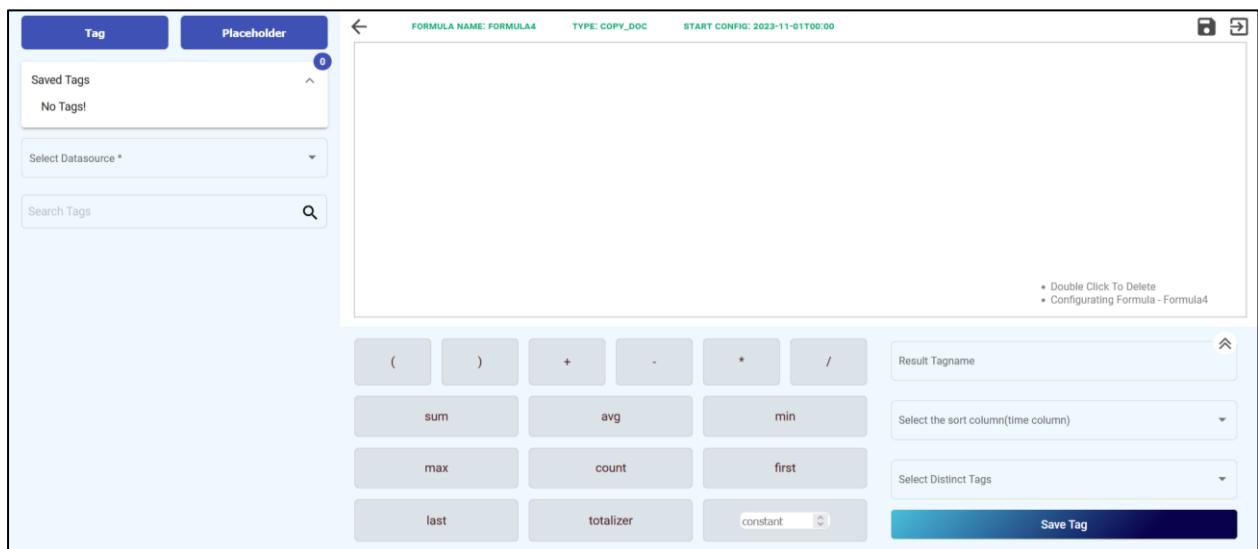
Sample formula:

2. Absolute Logging –

Absolute logging involves the recording or logging of data based on individual rows within a table. When a formula is calculated using absolute logging, it means that the calculation is applied independently to each row of the dataset. This approach is useful when you want to capture and document specific values or outcomes for each entry in the dataset, allowing for a detailed analysis of individual data points. Absolute logging is often used in various fields such as data analytics, where understanding the nuances of each data row is essential for uncovering patterns, trends, or anomalies within the dataset.

After configuration of Basic settings, the following screen will appear.
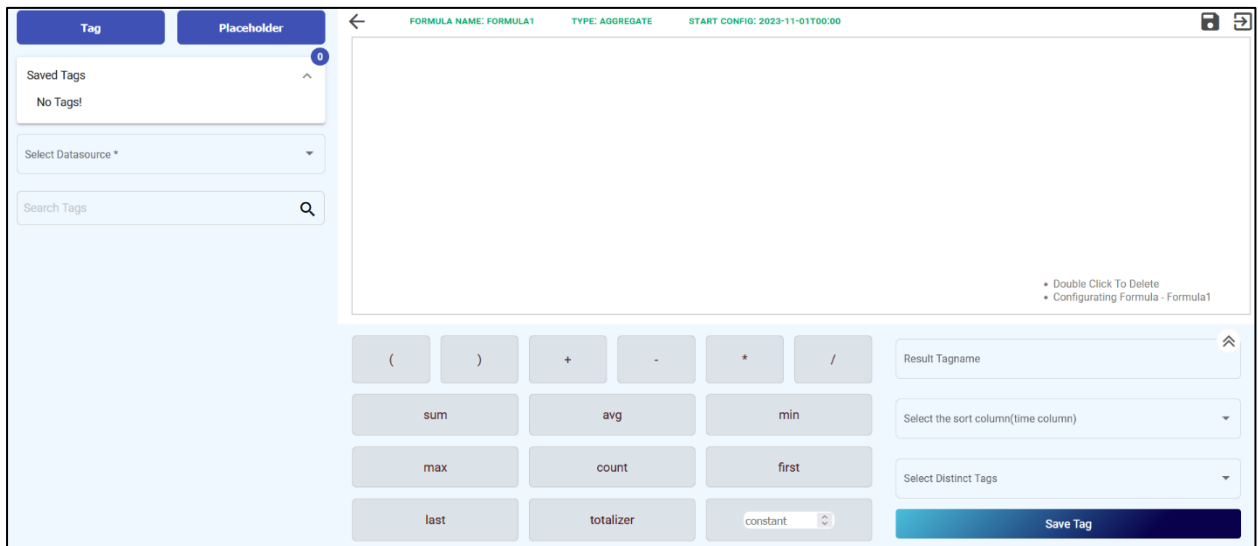
1. Tag – Tag is under which formula result will be stored. Click on it and a popup window will appear, where user must enter a unique tag name and click on save.

2. Placeholder – There might be a requirement where the user wants to create the same formula with different operands. For example.
   Machine 1 Temperature in Kelvin = Machine1_Temperature + 273.15
   Machine 2 Temperature in Kelvin = Machine2_Temperature + 273.15
   Machine 3 Temperature in Kelvin = Machine3_Temperature + 273.15
   And so on.

In this case, you can set a placeholder say temperature and create only one formula. While saving the formula, a popup will be shown where you can replace placeholder with tags from the Data source. This will help to create as many formulas as possible based on user input.

3. Select Data source – Here, all available data sources from the connectors will be visible including the data source from SMART's Formula Builder and SMART Alarm Manager. You can use these data sources to create formulas from them.

4. Search tag – The list of tags will be displayed once a data source is selected. You can search through the tags using the search tags option.

5. Operators and aggregators – In the bottom section of page, you can see all available operators such as +, -, *, /, and brackets too. There are several out of the box aggregators available which would be helpful for formula creation.
   a) Sum – Get total value of the tag.
   b) Avg – Get the average value of the tag.
   c) Min – Get the minimum value of the tag.
   d) Max - Get the maximum value of the tag.
   e) Count – Get the number of counts of the tag.
   f) First – Get the First value of the tag.
   g) Last – Get the Last value of the tag.
   h) Totalizer – Last variable minus first variable and rollover aware of the tag.

Constant is the numeric field where you can enter any numeric value and use it in the formula.

Please note that in the case of absolute formula type, the aggregators are used only when distinct tags are selected. If your formula does not require distinct tags, then you can create formula without any aggregators. For example.,

   Machine 1 Temperature in Kelvin = Machine1_Temperature + 273.15

6. Formula Creation Panel – It's an empty panel in which you can drag and drop the tags, operators, and aggregators to create a formula.
   Please note that the correct way of configuring aggregator is to keep it after a tag.
   e.g.,   (Last) Tag1 – Incorrect
            Tag1(Last) – correct

   If you wish to delete any added tag/operator/aggregator, then simply double click on it and it will get removed.

7. Sort column – Select a sort column on which data is to be sorted. This is always a time column which needs to be selected by the user.

8. Distinct tags – The term "Distinct" refers to a method or operation that identifies unique or different values within a set of data.
   E.g., If your data source has 'Location' tag in which data from multiple locations are getting logged, then by selecting distinct option in the dropdown, the configured formula will calculate the result for each of the distinct locations.

   Furthermore, the concept of "Distinct" can be extended beyond just locations to other columns or attributes in a dataset. Users may be able to select one or more distinct columns, and the system will then calculate results based on the unique values found in those selected columns. This functionality is useful for analyzing data at a granular level, allowing users to focus on specific subsets of information within the dataset.

9. Add/Edit Filters – In this section, user can apply filters on the source data before formula gets calculated. To see the option to apply filters, click on '^' arrow to expand the properties panel.
    For example, A formula to be calculated when *Tag1* value is greater than 25. (OR)
    A formula to be calculated when *Location* is equal to 'Location1' etc.

10. Save tag – You can save the configured tag by clicking on the 'save tag' button. Upon clicking, it will verify if the created formula is correct as per syntax. In case of incorrect syntax, an error popup will appear while saving the tag.
    Using the formula builder, such many tags can be configured by the user.

11. Save Formula – There is a save icon on the top right of the page to save the entire formula group. This group can contain one or many tags in it.

12. Exit – The exit icon is available next to the save button. Clicking on exit will exit the formula and will redirect you to the main formula builder screen.

Sample formula:

3. On Change Logging –

On-change logging involves calculating a formula only when there is a change in the value of a specified tag or variable. This approach is particularly useful for monitoring and recording events or conditions that occur intermittently or when specific triggers are met. In the context of formulas, this means that the calculation is performed and logged only when there is a detectable alteration in the associated tag's value. On-change logging is often applied in systems where tracking discrete events or significant shifts in data is critical, such as in process control, monitoring equipment performance, or capturing specific occurrences in a dataset.

After configuration of Basic settings, the following screen will appear.

1. Tag – Tag is under which formula result will be stored. Click on it and a popup window will appear, where user must enter a unique tag name and click on save.

2. Placeholder – There might be a requirement where the user wants to create the same formula with different operands. For example.
   Machine 1 Average Temperature in Kelvin = (Machine1_Temperature) (Avg) + 273.15
   Machine 2 Average Temperature in Kelvin = (Machine2_Temperature) (Avg) + 273.15
   Machine 3 Average Temperature in Kelvin = (Machine3_Temperature) (Avg) + 273.15
   And so on.

   In this case, you can set a placeholder say temperature and create only one formula. While saving the formula, a popup will be shown where you can replace placeholder with tags from the Datasource. This will help to create as many formulas as possible based on user input.

3. Select Datasource – Here, all available data sources from the connectors will be visible including the data source from SMART's Formula Builder and SMART Alarm Manager. You can use these data sources to create formulas from them.

4. Search tag – The list of tags will be displayed once a data source is selected. You can search through the tags using the search tags option.

5. Operators and aggregators – In the bottom section of page, you can see all available operators such as +, -, *, /, and brackets too. There are several out of the box aggregators available which would be helpful for formula creation.
   a) Sum – Get total value of the tag.
   b) Avg – Get the average value of the tag.
   c) Min – Get the minimum value of the tag.
   d) Max - Get the maximum value of the tag.
   e) Count – Get the number of counts of the tag.
   f) First – Get the First value of the tag.
   g) Last – Get the Last value of the tag.
   h) Totalizer – Last variable minus first variable and rollover aware of the tag.

   Constant is the numeric field where you can enter any numeric value and use it in the formula.

   Please note that in the case of on change formula type, the aggregators must be used while creating formula. For example.,

       Machine 1 Average Temperature in Kelvin = (Machine1_Temperature) (Avg) + 273.15

6. Formula Creation Panel – It's an empty panel in which you can drag and drop the tags, operators, and aggregators to create a formula.
Please note that the correct way of configuring aggregator is to keep it after a tag.
e.g.,   (Last) Tag1 – Incorrect
        Tag1(Last) – correct

If you wish to delete any added tag/operator/aggregator, then simply double click on it and it will get removed.

7. Sort column – Select a sort column on which data is to be sorted. This is always a time column which needs to be selected by the user.

8. Distinct tags – The term "Distinct" refers to a method or operation that identifies unique or different values within a set of data.
E.g., If your data source has '*Location*' tag in which data from multiple locations are getting logged, then by selecting distinct option in the dropdown, the configured formula will calculate the result for each of the distinct locations.

Furthermore, the concept of "Distinct" can be extended beyond just locations to other columns or attributes in a dataset. Users may be able to select one or more distinct columns, and the system will then calculate results based on the unique values found in those selected columns. This functionality is useful for analyzing data at a granular level, allowing users to focus on specific subsets of information within the dataset.

9. On change Tag – In this section, user can select tags/variables calculating a formula only when there is a change in the value in them. For example,
Let's say there's a pump in a plant, and you want to calculate and log the pump on and off duration whenever the machine starts/stop. Instead of continuously monitoring and logging the time, which might be unnecessary if the machine is running continuously, you can implement an on-change formula. You can create formula of subtracting last timestamp and first timestamp and set 'Machine Run status' tag as on change tag. This will give result of machine on duration and off duration.

10. Add/Edit Filters – In this section, user can apply filters on the source data before formula gets calculated. To see the option to apply filters, click on '^' arrow to expand the properties panel.
For example, A formula to be calculated when *Tag1* value is greater than 25. (OR)
A formula to be calculated when *Location* is equal to 'Location1' etc.

11. Save tag – You can save the configured tag by clicking on the 'save tag' button. Upon clicking, it will verify if the created formula is correct as per syntax. In case of incorrect syntax, an error popup will appear while saving the tag.
Using the formula builder, such many tags can be configured by the user.

12. Save Formula – There is a save icon on the top right of the page to save the entire formula group. This group can contain one or many tags in it.

13. Exit – The exit icon is available next to the save button. Clicking on exit will exit the formula and will redirect you to the main formula builder screen.

Sample formula:
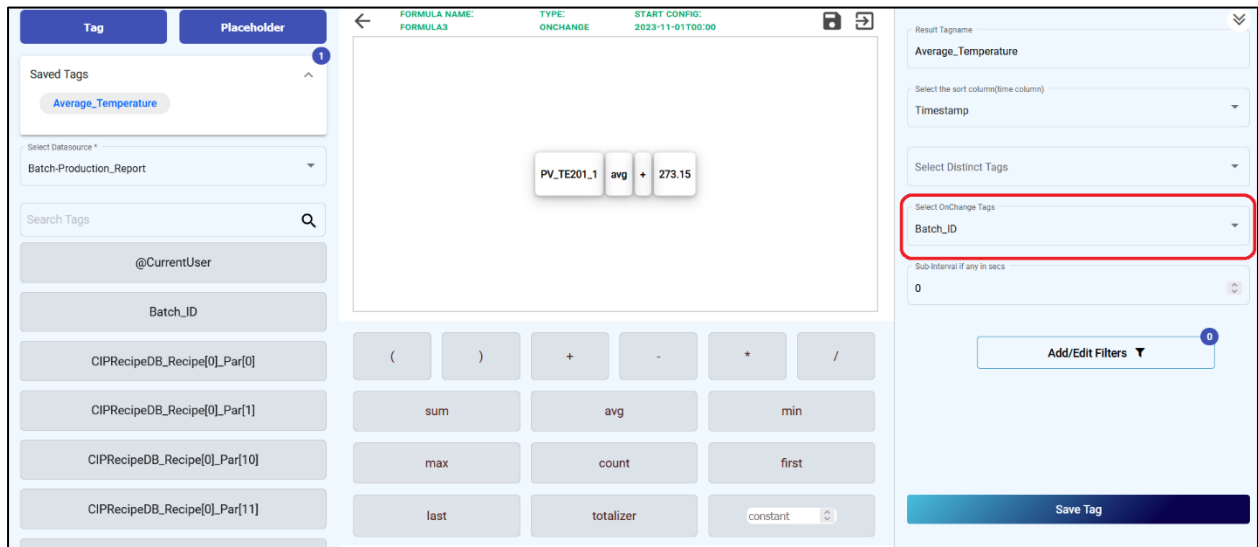
4. Copy document –

"Copying a document" involves duplicating a row of data at regular intervals, typically to create recurring snapshots. For instance, in tracking daily energy meter readings, a copy document process set to a one-day period would automatically duplicate the row, capturing the closing value for one day as the opening value for the next day. This ensures a systematic record of data points over time, facilitating analysis and historical tracking in applications like energy consumption monitoring.

After configuration of Basic settings, the following screen will appear.

1. Tag – Tag is under which formula result will be stored. Click on it and a popup window will appear, where user must enter a unique tag name and click on save.
2. Placeholder – There might be a requirement where the user wants to create the same formula with different operands. For example.

    Machine 1 Average Temperature in Kelvin = (Machine1_Temperature) (Avg) + 273.15
    Machine 2 Average Temperature in Kelvin = (Machine2_Temperature) (Avg) + 273.15
    Machine 3 Average Temperature in Kelvin = (Machine3_Temperature) (Avg) + 273.15
    And so on.

    In this case, you can set a placeholder say temperature and create only one formula. While saving the formula, a popup will be shown where you can replace placeholder with tags

from the Datasource. This will help to create as many formulas as possible based on user input.

3. Select Datasource – Here, all available data sources from the connectors will be visible including the data source from SMART's Formula Builder and SMART
4. Alarm Manager.
You can use these data sources to create formulas from them.

5. Search tag – The list of tags will be displayed once a data source is selected. You can search through the tags using the search tags option.

6. Operators and aggregators – In the bottom section of page, you can see all available operators such as +, -, *, /, and brackets too. There are several out of the box aggregators available which would be helpful for formula creation.
   a) Sum – Get total value of the tag.
   b) Avg – Get the average value of the tag.
   c) Min – Get the minimum value of the tag.
   d) Max - Get the maximum value of the tag.
   e) Count – Get the number of counts of the tag.
   f) First – Get the First value of the tag.
   g) Last – Get the Last value of the tag.
   h) Totalizer – Get the difference value of the tag.

   Constant is the numeric field where you can enter any numeric value and use it in the formula.

   Please note that in the case of a copy document formula type, you can create any formula as a placeholder.

7. Formula Creation Panel – It's an empty panel in which you can drag and drop the tags, operators, and aggregators to create a formula.
   Please note that the correct way of configuring aggregator is to keep it after a tag.
   e.g., (Last) Tag1 – Incorrect
         Tag1(Last) – correct

   If you wish to delete any added tag/operator/aggregator, then simply double click on it and it will get removed.

8. Sort column – Select a sort column on which data is to be sorted. This is always a time column which needs to be selected by the user.

9. Distinct tags – The term "Distinct" refers to a method or operation that identifies unique or different values within a set of data.
   E.g., If your data source has 'Location' tag in which data from multiple locations are getting logged, then by selecting distinct option in the dropdown, the configured formula will calculate the result for each of the distinct locations.

   Furthermore, the concept of "Distinct" can be extended beyond just locations to other columns or attributes in a dataset. Users may be able to select one or more distinct columns, and the system will then calculate results based on the unique values found in those selected columns. This functionality is useful for analyzing data at a granular level, allowing users to focus on specific subsets of information within the dataset.

10. Select tags to copy – In this section, the user can select tags/variables which he wants to propagate as a next row. All the selected tags will be copied from the previous row and will insert against new timestamp as per configuration in timings.

11. Select timings – "Select timings" involves entering a timestamp to determine which data to copy for the next row. If the user opts for the 'less than' operator, the previous row's data from the entered timestamp is copied. Alternatively, if the user chooses the 'greater than' operator, the data from the next row after the entered timestamp is duplicated as a new row.

    Such one or many timings can be set for copying a data from previous row for the next row.
    For example,
    in tracking daily energy meter readings, a copy document process set to a one-day period would automatically duplicate the row, capturing the closing value for one day as the opening value for the next day. To do this, set the timings as '12:00 am' and operator as 'less than' and click on 'save time'. This will copy a row which is logged in source database before 12:00 am, as a new row with timestamp as 12:00 am.

12. Add/Edit Filters – In this section, user can apply filters on the source data before formula gets calculated. To see the option to apply filters, click on '^' arrow to expand the properties panel.
    For example, A formula to be calculated when *Tag1* value is greater than 25. (OR)
    A formula to be calculated when *Location* is equal to 'Location1' etc.

13. Save tag – You can save the configured tag by clicking on the 'save tag' button. Upon clicking, it will verify if the created formula is correct as per syntax. In case of incorrect syntax, an error popup will appear while saving the tag.
    Using the formula builder, such many tags can be configured by the user.

14. Save Formula – There is a save icon on the top right of the page to save the entire formula group. This group can contain one or many tags in it.

15. Exit – The exit icon is available next to the save button. Clicking on exit will exit the formula and will redirect you to the main formula builder screen.

All the created formulas will be available in Formula builder window. Here you can edit/delete the existing formulas. There's also a toggle of formula running status available to make formula enable/disable.

Logs

You can download logs for a selected number of days. For example, you can download and view logs of the past 7 days. You can download logs for a maximum of 30 days.

To download logs -

- Click options - Download logs.
- In the dropdown list, select an option for the number of days for which you want to download the logs.

User Management

The user management feature enables you to define users and to map users to specific roles. For each role, specific permissions for accessing dashboards are defined. you can choose a predefined role for each user.

Each time you define a user, you must map the user to a role.

Roles

A role is a collection of permissions granted to you to access the dashboard. For example, you can create a role named Agent007 and grant permission to view the dashboard but not to modify the dashboard.

Edit Roles
- Click options - User management, and then click add user.
- In the roles drop down list, select a role which you want to edit.
- Click edit role.
- Update the role name, and then click save to save the changes.

Delete Roles
- Click options - User management, and then click add user.
- In the roles drop down list, select a role which You want to delete.
- Click delete role to delete the selected role.

Create Global Grant
- Click options - User management, and then click add you.
- Click the new grant.
- In the grant name field, enter a name, and then click save to save the changes.

Edit Global Grant
- Click options - User management, and then click add user.
- In the global grant drop down list, select a global grant which you want to edit.
- Click edit grant.
- Update the grant name, and then click save to save the changes.

Delete Global Grant
- Click options - User management, and then click add you.
- In the global grant drop down list, select a grant which the you want to delete.
- Click delete grant to delete the selected global grant.

User

You can create a user in SMART from the user management screen. Authorized user can create or modify users.

On the user management screen, you can -

- Create a user - Only authorized users can create a user.
- Modify a user - Only authorized users can modify a user.
- Delete user by clicking the delete button. Only authorized users can delete a user.

View User
- Click options - User management to view the existing users.

Create User
- Click options - User management, and then click add you.
- Enter values in the first name, last name, email, username, and password fields.

- Select the "Is AD" user check box if you want to create a user with administrator privileges.
- In the role drop down list, select the type of role for the user.
- You can also create a new role. For more information, see 8.1 | Roles
- In the global grant field, select the permissions you want to give to the user. Global grant gives selected permissions to all the dashboards. For example, you can give permission to view all dashboards to the user.
- You can also create a new set of permissions. For more information, see 8.1.3 | Create global grant.
- Under grants, click [down arrow] associated with each dashboard to select the permissions for each dashboard. You can select, view, add, edit, delete, and filter permissions for each dashboard.
- In the default dashboard dropdown list, select a dashboard which you want to display as the default dashboard for the user.
- Click add user to add a user.

Modify User

- Click options - User management to view all the users.
- Click anywhere on the user to edit the user.
- Edit the user details as per your needs, and then click update user to save the changes.
- [OPTIONAL] Click clear, to clear all the user permissions and then apply fresh permissions to the user. Click update user to save the changes.

Delete User

- Click options - User management to view all the users.
- Click anywhere on the user to edit the user.
- Click delete user to delete the user.

Troubleshooting Guide

Dependency Installation

The setup installs all the dependencies with silent switches. Hence, you won't be seeing any window for dependency installation, though you can see couple of command prompts flashed on screen.

If any dependency is failed while installation, then setup will give you error message and will ask for the confirmation. Please follow below steps in this case -

- Do not click ok/cancel and check for the log in C:\ProgramData\ialogs folder.
- Check the dependency, which is failed, make a note of it.
- Go to event viewer and look for the errors in windows logs > application. If you find the error, then take a copy/screenshot of it.
- Now try installing the dependency manually with administrator rights without silent switches. Proceed the installation with default options, except for Python. We install python for all users; by default, it gets installed for current user.
- If there is any error with dependency installation, you will get the same error while installing manually. Try to troubleshoot the error and resolve it. Because the errors related to dependency installation are always caused by system configuration and those have nothing to do with our application. Hence, those errors don't need any coding changes from our side.
- If dependency gets installed successfully in manual mode, then go back to our installer and click on ok button to proceed further.

Most common reasons why the dependencies fail to install, or services do not start -

- If there was different version installed on the system and was not uninstalled successfully, then new dependency may give an error. In this case look for the left-over resources by previous installation. Check the installation directory, registries.
- For RabbitMQ, the setup will fail to install if ErlangOTP is not installed successfully.
- RabbitMQ service will not be created if there is stale registry key present HKEY_LOCAL_MACHINE\SOFTWARE\Ericsson\Erlang\ErlSrv\1.1\RabbitMQ, if this registry is present then delete key RabbitMQ.
- If MongoDB service is not starting after installation, then check the errors in log file in C:\Programdata\SMART\mongodb.log

Alarm Management

1. Go to "Options" and click on "Alarm Management."

2. Click on "Add Data Source."
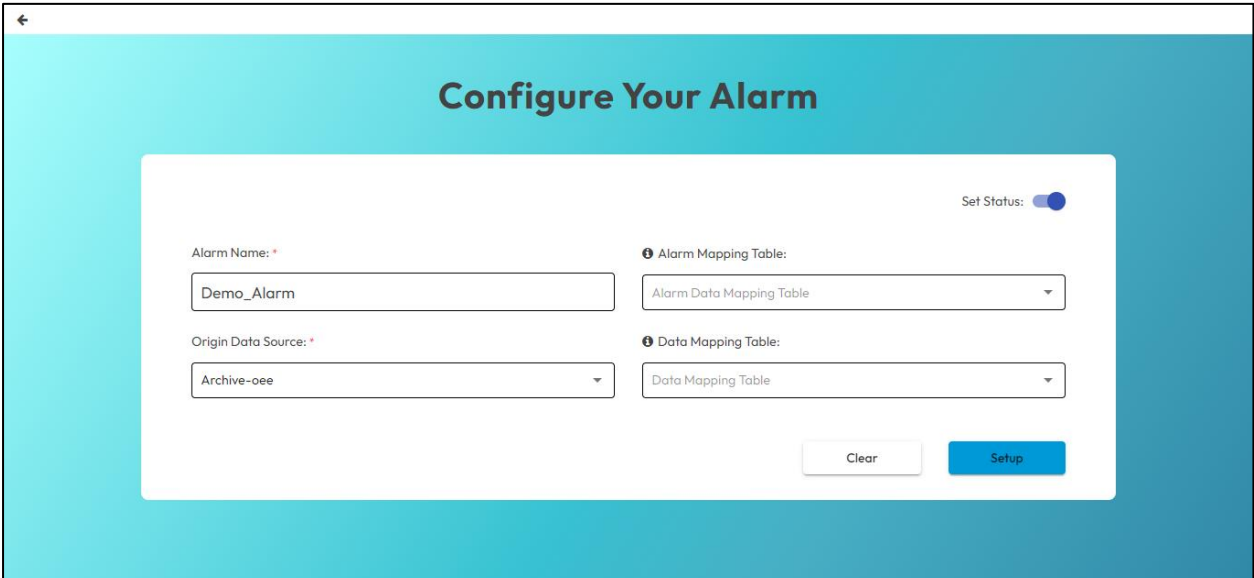
3. Provide a name in the "Table Name" section.
4. Click on the "Configure" button.
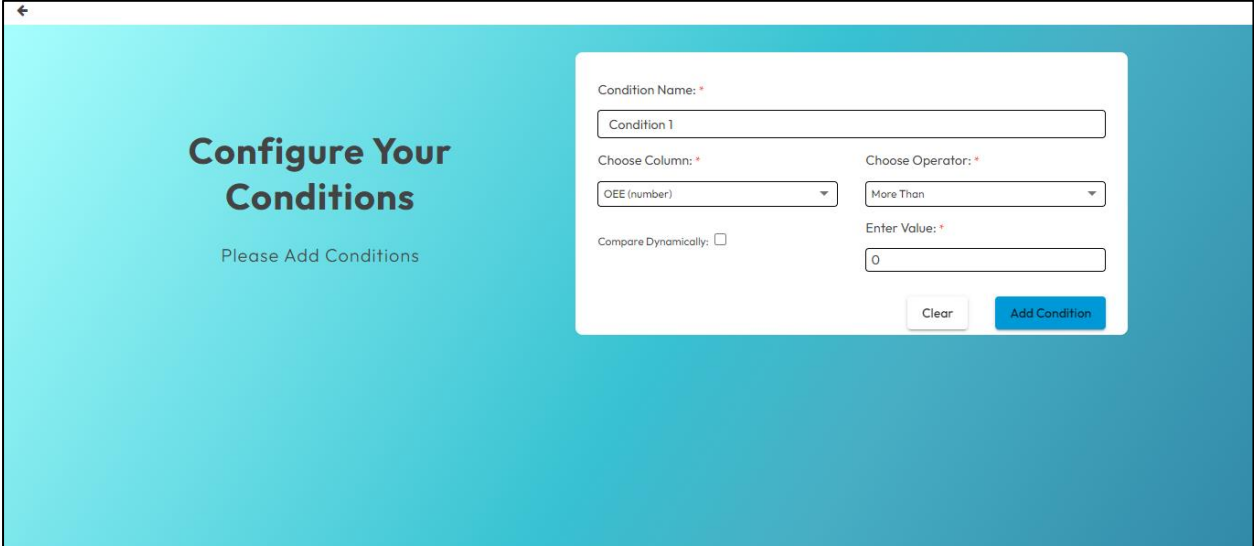
5. Begin creating alarms:
- Give your alarm a name.
- Select a data source from the dropdown menu of the "Original Data Source" option.
- The "Set Status" function determines the operational state. By default, it is set to 'on,' meaning alarms are active. If you want to deactivate alarms, change the status to 'off.' This provides control over the alert system based on intentional configurations.
- Click on the 'Setup' option to proceed further.
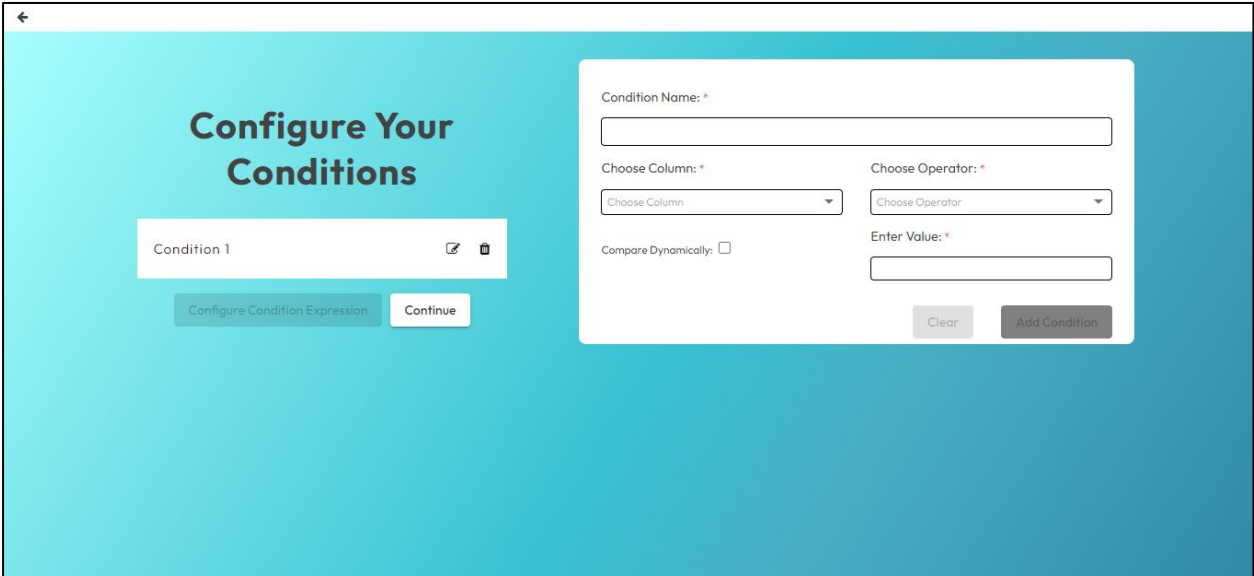
6. Configure the conditions:
- You can set up multiple conditions.
- Assign a name to your condition.

- For each condition, assign a different name.
- Choose a column.
- Select from multiple operators such as 'Less than,' 'More than,' 'Equal to,' etc.
- Enter a value to define your condition.

- Click on "Add Condition".
- You have the option to click on "Continue" if you want to proceed with just one condition.

- If you want to configure multiple conditions, create multiple conditions.
- Click on "Configure Condition Expression."
- You can set up multiple conditions.

Comparing Dynamically

- Assign a name to your condition.
- For each condition, assign a different name.
- Choose a column.

- Select from multiple operators such as 'Less than,' 'More than,' 'Equal to,' etc. The aggregator option is utilized to compare the original data source with the one you want it to be compared to.
- Check the tick box for "Compare Dynamically."
- Choose the column with which you want to compare the original column.
- Choose the aggregator, which will perform a mathematical action on the column that you want to compare to the original column.
- Enter a value to define your condition.
- Click on "Add Condition".

- You have the option to click on "Continue" if you want to proceed with just one condition.
- If you want to configure multiple conditions, create multiple conditions.
- Click on "Configure Condition Expression."

- You can create a condition expression using logical operators like 'and' and 'or.'
- Once you have configured your condition expression, click on "Confirm Formula" to proceed further.
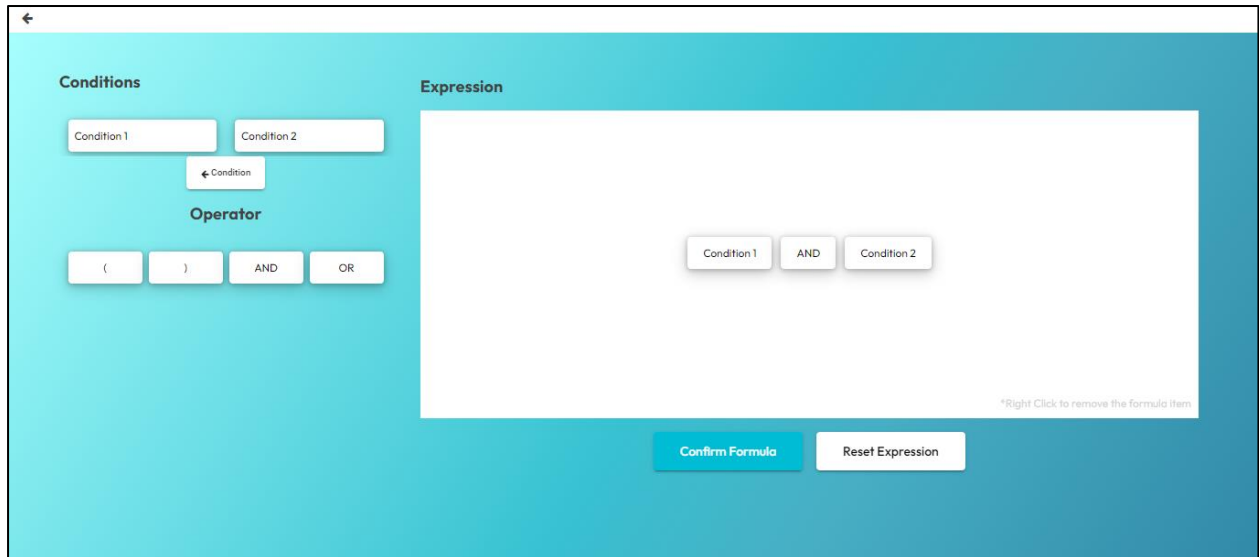
6. Add alarm text:

- In this section, you can provide your alarm text.
- You have the option to include dynamic values.
- Click 'Next' to proceed further.
- If you have selected for "Add Dynamic Value" then Color coding in condition formatting shall not be available.

7. Configure the standby time:

- You can choose between time and occurrence.
- If you opt for time, please read the following information, and proceed with the configuration.
- Standby time refers to the duration during which the system monitors variables without actively alarming. For instance, a standby time of 5 minutes might be configured in a system where, if a critical parameter such as pressure remains outside the normal range for this period, an alarm is triggered.
- Select the operator and value based on your specific requirements.

- If you opt for occurrence, please read the following information, and proceed with the configuration.
- Alarm activation based on occurrence involves triggering an alarm when specific events or conditions repeat a predetermined number of times. For example, in a power distribution system, if the voltage exceeds 100 volts for 10 occurrences within a set timeframe, an alarm is initiated.
- Put the occurrence.

Configure Standby Time

Choose Column: *
Occurence

Enter Value: *
10

Skip   Next

8. Set up the alarm time:

- Configure the time of day or a span of days.
- For the "Time of Day" configuration, choose the start time and end time as needed.
- "Time of day" refers to specific moments or periods within a 24-hour cycle in which alarms would be generated.

Alarm Time Configuration

Skip

Select Duration Type: *
Time Of Day

Start Time: *
10:00:00 AM

End Time: *
06:00:00 PM

Submit   Clear

- When setting a "Span of Days," you have the flexibility to include durations beyond a single day, such as weeks or months, for generating alarms.
- If you are configuring a "Span of Days," select both the start date and month as well as the end date and month according to your requirements.

- You have the option to configure multiple durations.
- Click 'Submit' when you are done with the configuration.

9. You will see an overview of the configuration you've completed.

10. Click 'Confirm' to finalize the configuration.

These steps will guide you through the process of adding a data source and configuring alarms in the alarm management system.
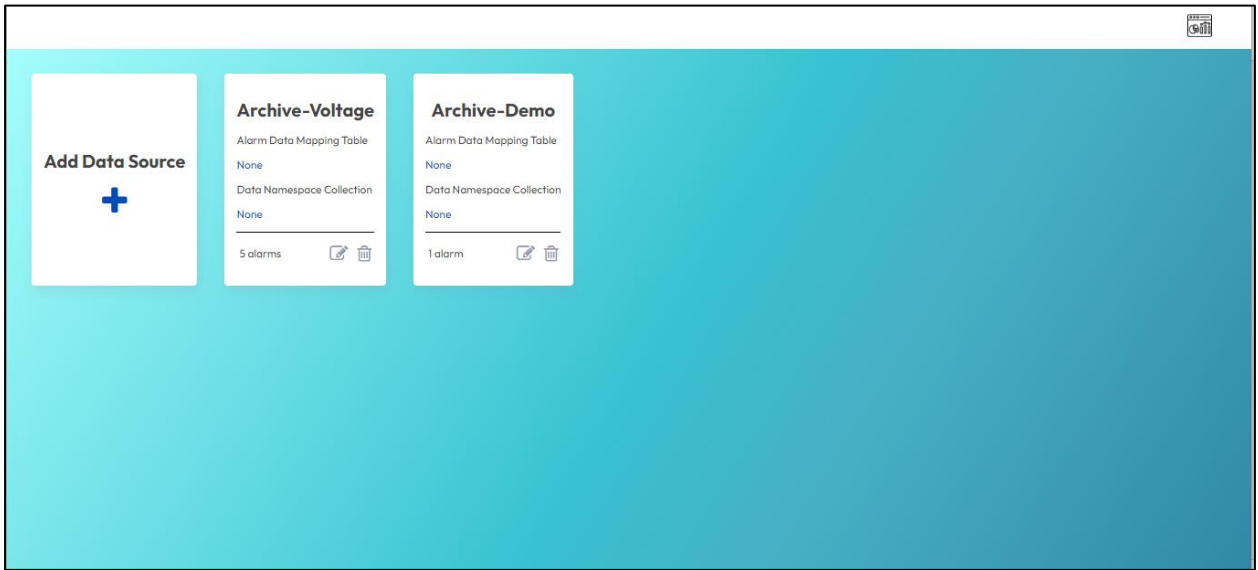
If you want to configure multiple alarms, click on the data source that you have configured. From there, you can proceed to add more alarms.
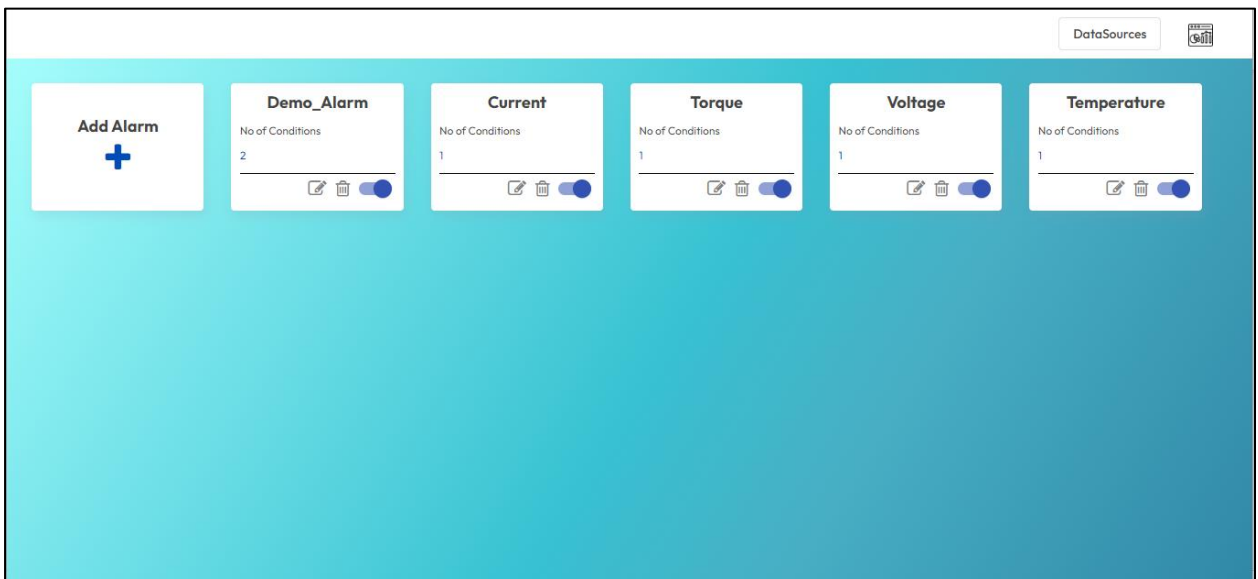
21 CFR User Management

Introducing the User Management feature at SMART. With this functionality, you can easily create, edit, and delete user and admin profiles. What sets it apart is its seamless compliance with 21 CFR regulations, ensuring your organization's adherence to robust data integrity and security standards. Streamline user administration effortlessly with SMART's User Management feature, designed to meet the needs of your organization.

To utilize this feature, navigate to "Options" and choose "User Management."

User/Admin List

- On this screen, you can observe the list of users.
- To add a new user, click on "Add User." For editing an existing user, select "Edit User" to make necessary changes.
- By clicking on the login status logo, you can either lock or unlock a user. If the logo is red, the user is locked, while green indicates an active user. By default, users are active.
- To permanently remove a user, click on "Delete User.

	USER MANAGEMENT							ADD USER
ID	**Firstname**	**Lastname**	**Email**	**Username**	**Role**	**Login Status**	**Edit User**	**Delete User**
1	John	Doe	johndoe@company.com	John	user	🔓	✎	🗑
2	Suyog	Shingote	suyog@support.com	Suyog	user	🔓	✎	🗑

Add/Edit User

Upon selecting "Add User" or "Edit User," you will be redirected to this screen.

To create a user or admin, carefully read the descriptions of all the options and toggles as mentioned in the table. Configure the settings accordingly based on the provided information.

Title	Description
Username*	Input your username. The username will be used for logging in, and it must be unique.
E-mail*	Input your email ID. This will be utilized in the scheduler functionality.
First Name*	Input your first name.
Last Name*	Input your last name.
Password*	Input your password. The password must meet the following criteria: • At least one lowercase character • At least one uppercase character • At least one digit character • At least one special character • Minimum length of 8 characters
Generate	By clicking on "generate," you can create a random password that adheres to the specified password rules.
Confirm Password*	Confirm your password. The password should match the one you've configured above.
Country Code	Select your country code.
Mobile Number	Input your mobile number. This will be utilized in the scheduler functionality.
Roles	You can select between Admin and User as per your requirements. • If you choose "admin," the created admin can be assigned user and group level permissions and given global grants. • If you select "user," the created user cannot be assigned user and group level permissions but can be given global grants.
Reset Password On The First Login	You have the option to make the user reset their password after the first login. If you enable this option, the user needs to change the password after the first login.

Allow To Edit Project Configuration	You have the option to allow the user to edit project configuration. If you enable this option, the user can edit project configuration.

Title	Description
User And Group Level Permissions	You will see the following options that you can enable or disable: • Allow to create another group. • Allow to delete another group. • Allow to edit another group. • Allow to create another user. • Allow to delete another user. Allow to edit another user.
Disable Password Expiry	If you enable this option, you can disable password expiry. The default time for password expiry is set to 90 days. If you wish to modify this duration, you can make the necessary changes in the project configuration utility.
User Type	You have four types to choose from: Non-AD User, AD-LDS User, Azure-AD User, and Windows User. By default, Non-AD User is the selected type.
Add Group*	To create the user/admin, you must select a group under which they will be categorized. It is mandatory to choose at least one group, and you can opt for an unlimited number of groups if needed.
Upload Photo	You have the option to upload your profile photo.
Upload Signature	You have the option to upload your signature.
Global Grants	Grant access to view and edit the dashboard by checking the respective boxes.

- Once you have configured all the details, you can click on "Next" to proceed further and assign specific dashboards to yourself or the administrator.
- If you need to reconfigure the details, simply click on "Reset."
- In case you decide to cancel the creation of a new user/admin, click on "Cancel."

Example -

User Details

User Name * John	**E-Mail *** johndoe@gmail.com	
First Name * John	**Last Name *** Doe	
Password * Wpu0%140 👁 Generate	**Country** (+49)... ▾ **Mobile No** 2232423421	
Confirm Password * Wpu0%140 👁	**User Type** Non-AD User ▾	⬆ Upload Photo ✖

Reset Password On First Login 🔘   Allow To Edit Project Configurations 🔘   ⬆ Upload Signature *Signature*

Disable Password Expiry 🔘

User and Group Level Permissions
Allow to create another group, Allow to delete another ... ▾   **Global Grants** ▾

Roles
admin ▾   Add Group ⦸

Cancel   **Next**   Reset

Dashboard Access List

- When you access the list of dashboards, you'll find boxes next to each dashboard.

Dashboard & Grants

Sr No.	Is Default	Dashboard Name		View ☐	Add ☐	Edit ☐	Delete ☐
1	☐	Alarm Report	✎	☐	☐	☐	☐
2	☐	PRODUCTION REPORT	✎	☐	☐	☐	☐
3	☐	Overview	✎	☐	☐	☐	☐
4	☐	Operation	✎	☐	☐	☐	☐
5	☐	Sales	✎	☐	☐	☐	☐
6	☐	IOT	✎	☐	☐	☐	☐
7	☐	OEE	✎	☐	☐	☐	☐
8	☐	OEE (F&B)	✎	☐	☐	☐	☐
9	☐	OEE METRICS	✎	☐	☐	☐	☐
10	☐	Energy Dashboard	✎	☐	☐	☐	☐
11	☐	Alarm Report Copy	✎	☐	☐	☐	☐
12	☐	Alarm Report Copy	✎	☐	☐	☐	☐
13	☐	Operation Copy	✎	☐	☐	☐	☐
14	☐	Itanta Dashboard	✎	☐	☐	☐	☐
15	☐	Manual Entry Log	✎	☐	☐	☐	☐

Back   **Save**   Reset

- To grant access, simply check the box next to the desired dashboard for viewing, editing, or deleting.
- In the "View Dashboard" permission, you are limited to viewing the dashboard.
- With "Edit Dashboard" permission, you gain the capability to add, edit, or remove dashboard components.
- Meanwhile, the "Delete Dashboard" permission grants you the authority to delete the entire dashboard.
- If you have selected edit or delete permission, the view permission will be automatically assigned.
- The "Add" option is specifically applicable to table components for manual data entry.

Dashboard & Grants

Sr No.	Is Default	Dashboard Name		View ☐	Add ☐	Edit ☐	Delete ☐
1	☐	Alarm Report	☑	☐	☐	☐	☐
2	☐	PRODUCTION REPORT	☑	☑	☐	☑	☐
3	☐	Overview	☑	☑	☑	☑	☑
4	☐	Operation	☑	☐	☐	☐	☐
5	☐	Sales	☑	☐	☐	☐	☐
6	☐	IOT	☑	☑	☑	☑	☑
7	☐	OEE	☑	☑	☑	☑	☑
8	☐	OEE (F&B)	☑	☑	☑	☑	☑
9	☐	OEE METRICS	☑	☑	☑	☑	☑
10	☐	Energy Dashboard	☑	☐	☐	☐	☐
11	☐	Alarm Report Copy	☑	☐	☐	☐	☐
12	☐	Alarm Report Copy	☑	☐	☐	☐	☐
13	☐	Operation Copy	☑	☐	☐	☐	☐
14	☐	Itanta Dashboard	☑	☐	☐	☐	☐
15	☐	Manual Entry Log	☑	☐	☐	☐	☐

Back   Save   Reset

- Click on the "Edit" option, as shown in the image, to explore all components and manage permissions for each.

Dashboard & Grants

Sr No.	Is Default	Dashboard Name		View ☐	Add ☐	Edit ☐	Delete ☐
1	☐	Alarm Report	☑	☐	☐	☐	☐
2	☐	PRODUCTION REPORT	☑	☐	☐	☐	☐
3	☐	Overview	☑	☐	☐	☐	☐
4	☐	Operation	☑	☐	☐	☐	☐
5	☐	Sales	☑	☐	☐	☐	☐
6	☐	IOT	☑	☐	☐	☐	☐
7	☐	OEE	☑	☐	☐	☐	☐
8	☐	OEE (F&B)	☑	☐	☐	☐	☐
9	☐	OEE METRICS	☑	☐	☐	☐	☐
10	☐	Energy Dashboard	☑	☐	☐	☐	☐
11	☐	Alarm Report Copy	☑	☐	☐	☐	☐
12	☐	Alarm Report Copy	☑	☐	☐	☐	☐
13	☐	Operation Copy	☑	☐	☐	☐	☐
14	☐	Itanta Dashboard	☑	☐	☐	☐	☐
15	☐	Manual Entry Log	☑	☐	☐	☐	☐

Back   Save   Reset

Dashboard & Grants

Sr No.	Is Default	Dashboard Name		View ☐	Add ☐	Edit ☐	Delete ☐
1	☐	Alarm Report	✎	☐	☐	☐	☐
2	☐	PRODUCTION REPORT	✖	☑	☐	☑	☐
		BATCH INFORMATION (table)		☐	☐	☐	☐
		RECIPE PARAMETERS (table)		☐	☐	☐	☐
		PROCESS VALUE (table)		☑	☑	☑	☑
		TEMPERATURE TRENDS (graph)		☑	☐	☑	☑
		FLOW TRENDS (graph)		☑	☐	☑	☑
		PRESSURE TRENDS (graph)		☐	☐	☐	☐
		VIBRATION TREND (graph)		☐	☐	☐	☐
		LEVEL TRENDS (graph)		☐	☐	☐	☐
		Alarms (table)		☑	☑	☑	☑
		AUDIT (table)		☑	☑	☑	☑
		REMARKS (table)		☐	☐	☐	☐
3	☐	Overview	✎	☐	☐	☐	☐

Back   Save   Reset

- If you select the box in the index row, it will automatically include all associated columns for that particular option.

Dashboard & Grants

Sr No.	Is Default	Dashboard Name		View ☑	Add ☑	Edit ☑	Delete ☑
1	☐	Alarm Report	✎	☑	☑	☑	☑
2	☐	PRODUCTION REPORT	✎	☑	☑	☑	☑
3	☐	Overview	✎	☑	☑	☑	☑
4	☐	Operation	✎	☑	☑	☑	☑
5	☐	Sales	✎	☑	☑	☑	☑
6	☐	IOT	✎	☑	☑	☑	☑
7	☐	OEE	✎	☑	☑	☑	☑
8	☐	OEE (F&B)	✎	☑	☑	☑	☑
9	☐	OEE METRICS	✎	☑	☑	☑	☑
10	☐	Energy Dashboard	✎	☑	☑	☑	☑
11	☐	Alarm Report Copy	✎	☑	☑	☑	☑
12	☐	Alarm Report Copy	✎	☑	☑	☑	☑
13	☐	Operation Copy	✎	☑	☑	☑	☑
14	☐	Itanta Dashboard	✎	☑	☑	☑	☑
15	☐	Manual Entry Log	✎	☑	☑	☑	☑

Back   Save   Reset

- To save the configuration, simply click on the "Save" button.
- When editing a user/admin, you will observe the option to "Update" instead of "Save."
- If you need to reconfigure the details, simply click on "Reset."
- In case you decide to cancel the creation of a new user/admin, click on "Cancel."

Your user/admin is now created. You can log in to the SMART platform using your unique username and password.

Project Configuration Utility:

This functionality enables users to set up the SMART tool with customized configurations. Here, one can configure settings related to logs, alarms, reports, printouts, passwords, and more. This setup is based on a unique license system and is restricted to users with admin rights.

You may search for "Project Configuration Utility" on Windows

To configure the Project Configuration Utility, please follow the below steps:

5. Click the "Start" Menu, go to folder 'SMART' and then select the "Project Configuration Utility" option to open it. **As shown in the figure.1.**
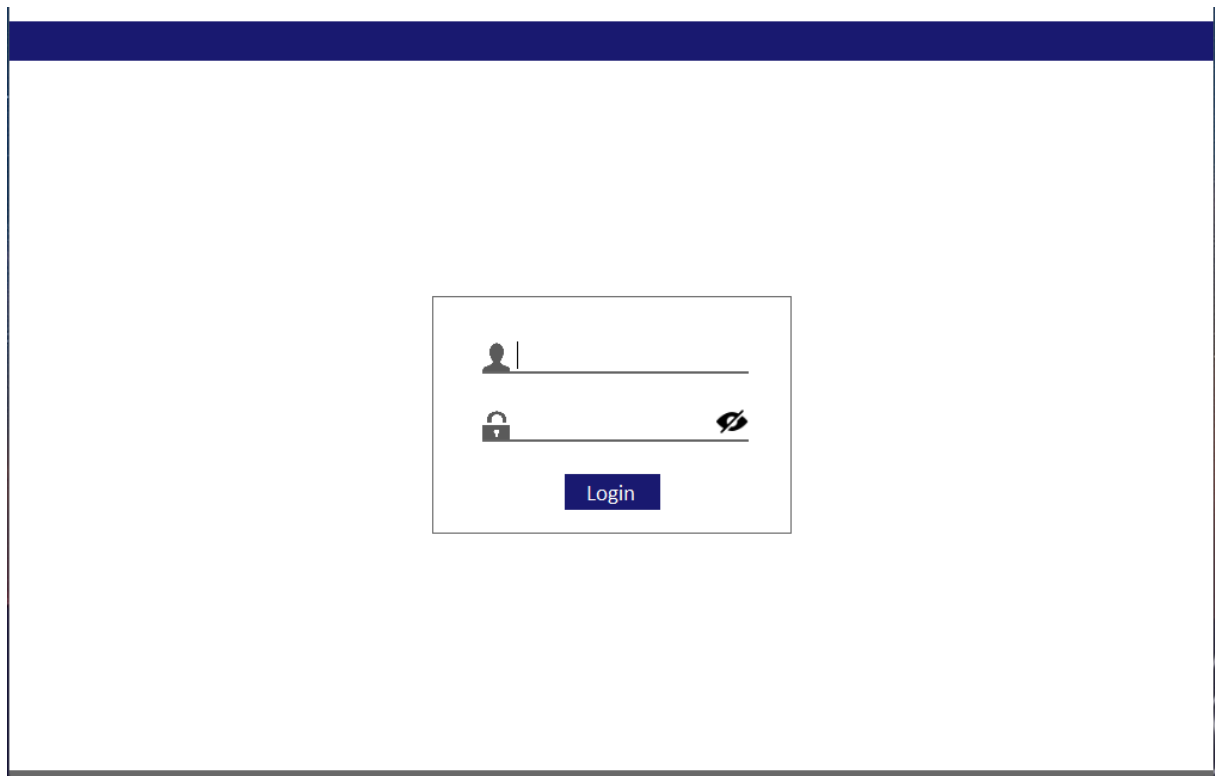
Figure.1 – Login page.

6. Login with admin details. This utility can be accessed by the user with admin rights only. After Logging in, by default system configuration page will be displayed. **As shown in the figure.2.**

Figure.2 – System Configuration page.

System Configurations	As shown in the Figure.3 & 4.
Select Configuration	The user must select the required configuration from the logging level and scheduler options.
Logging Level	The log messages which have higher severity than the 'set level' will be logged in DB, others will be discarded. e.g. if the 'set level' is 'warning', then 'debug' and 'info' logs will be discarded and only warning, error and critical logs will be logged. By default, log level will always reflect "Error". Debug: This will store all detailed information related to program executions. It is used for identifying, analyzing and resolving issues or bugs in the system. Information: This contains messages which describe certain events which are initiated by user and are harmless (e.g. creation of a schedule). Warning: This will store all information related to any alert which may indicate a potential issue or danger, prompting caution or preventive action. Error: This will store all the errors generated in the system.
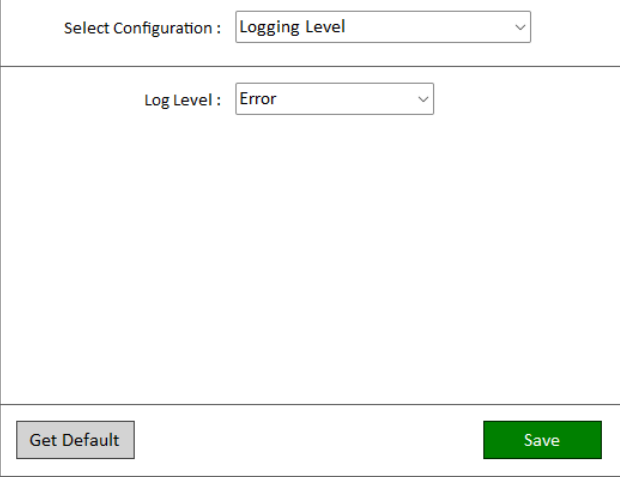
	<u>Critical</u>: This will contain all the details of critical activities executed by users or generated in the system. If this is automatically generated in the system, then it usually means some critical component of the software isn't functioning well and requires immediate action.
Scheduler options	By default, it will show the saved file location of scheduled reports: *C:\Program Files\SMART\Core\app-server\print\output* User can change it as per need.

Configuration Utility

System

Reports

User Management

System Configurations

Select Configuration : Logging Level

Log Level : Error

Get Default   Save

Figure.3 – Logging level - Error page.
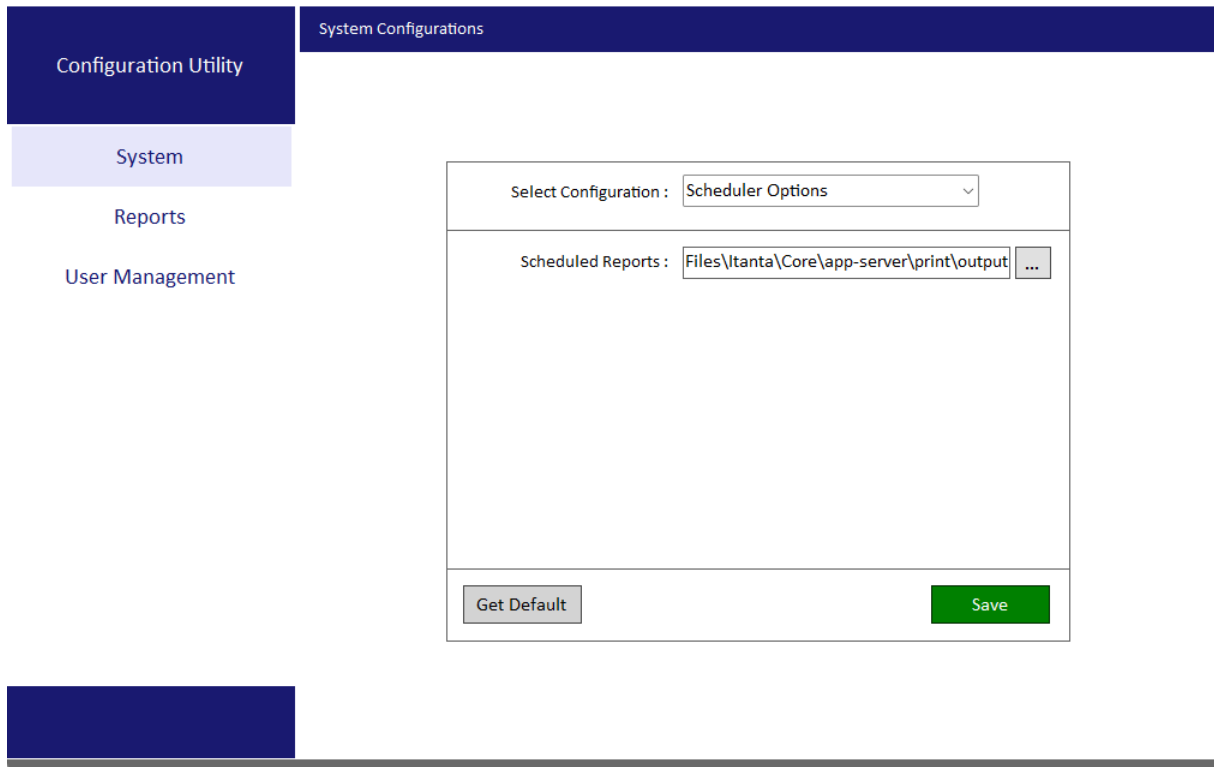
Figure.4 – Scheduler Options page.

Report Configurations	As shown in the Figure.5.
Select Configuration	The user must select the required configuration from the dropdown list: None value, Live refresh interval, Start time, Excel print options, Table/graph interval type.
Select Report Configuration	By default, none value will always be shown "-" in SMART Analytics interface. None Value: User can manually change the representation of none value from default "-" value to other. Live Refresh Interval: Here, we can manually enter the required value in seconds to set the refresh interval for fetching the live data on SMART Analytics platform. Start Time: Here, we can manually set the report time in terms of year, month, week, hour, minutes and seconds. This feature allows users to filter and view the data according to specific requirements from the organization in SMART Analytics platform. Excel Print Options: This provides users with options to print reports as either single file with single sheets or single file with multiple sheets. In single file, the entire dashboard will be printed in a single excel sheet, while in the second option, each page/component will be printed into different sheet of the same excel.

| | Table/Graph Interval Type: Here, we can select the interval as either absolute or first entry in data to display the data accordingly.

In absolute type, the data will be displayed as per the absolute time period (starts from 00:00:00) while in the second case, the data will be shown based on the first entry of the applied time/batch/shift filter. |

Report Configurations

Configuration Utility

- System
- Reports
- User Management

Select Configuration : None Value

None Value : -

Get Default   Save

Figure.5a – Report configuration page, None Value.

Report Configurations

Configuration Utility

- System
- Reports
- User Management

Select Configuration : Live Refresh Interval

Live Refresh Interval : 60 (in Seconds)

Get Default   Save

Figure.5b – Report configuration page, Live Refresh Interval.

Figure.5c – Report configuration page, Start Time.

Figure.5d – Report configuration page, Excel Print Options.

Figure.5e – Report configuration page, Excel Print Options.

Figure.5f – Report configuration page, Table/Graph Interval Type.
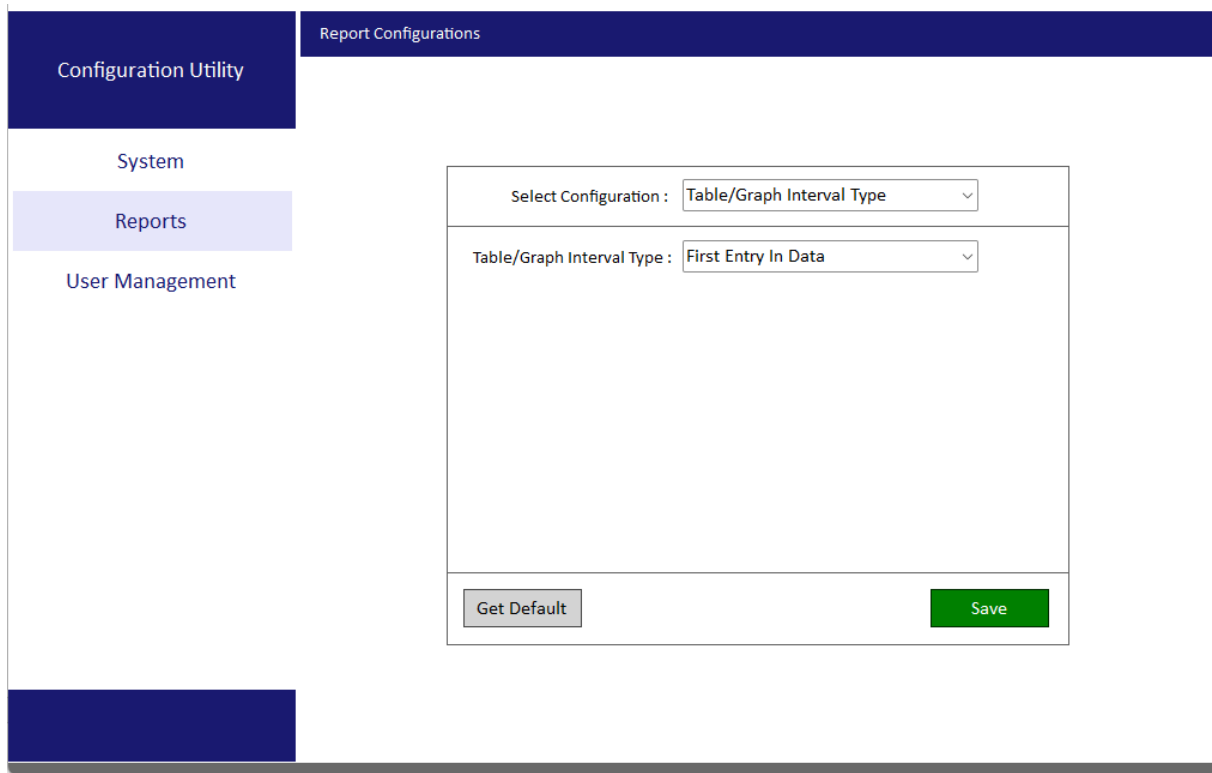
Figure.5g – Report configuration page, Table/Graph Interval Type.

User Management	As shown in the Figure.6.
Select Configuration	The user must select the required configuration from the dropdown list: Password Expiry, User Logout Time, Password Attempts, Delete Disable Config.
Select User Management Configuration	By default, password expiry will always be reflected in the configuration section. Password Expiry: We can manually set the number of days after which the password will expire and must be renewed. User Logout Time: Here, we can manually set the time in minutes after which the user will be automatically logged out when kept idle. Additionally, if "Never logout User" is checked, the user will never be logged out from the system. Password Attempts: Here, one can restrict password usage by setting the number of attempts, password lock duration, and enabling the lock user permanently feature. By manually entering the values, we can limit the number of attempts and specify the password lock duration. Additionally, if "Lock User Permanently" is checked, the users account will be permanently locked from the system. In such scenarios, user can be unlocked by the admin user. Delete Disable Config: This will allow user to choose between delete and disable option from the user management. For 21CFR

	compliance in Pharma, disable user option is recommended which will never allow admin to delete any of the user.

Figure.6a – User Management page, Password Expiry.

Figure.6b – User Management page, User Logout Time.
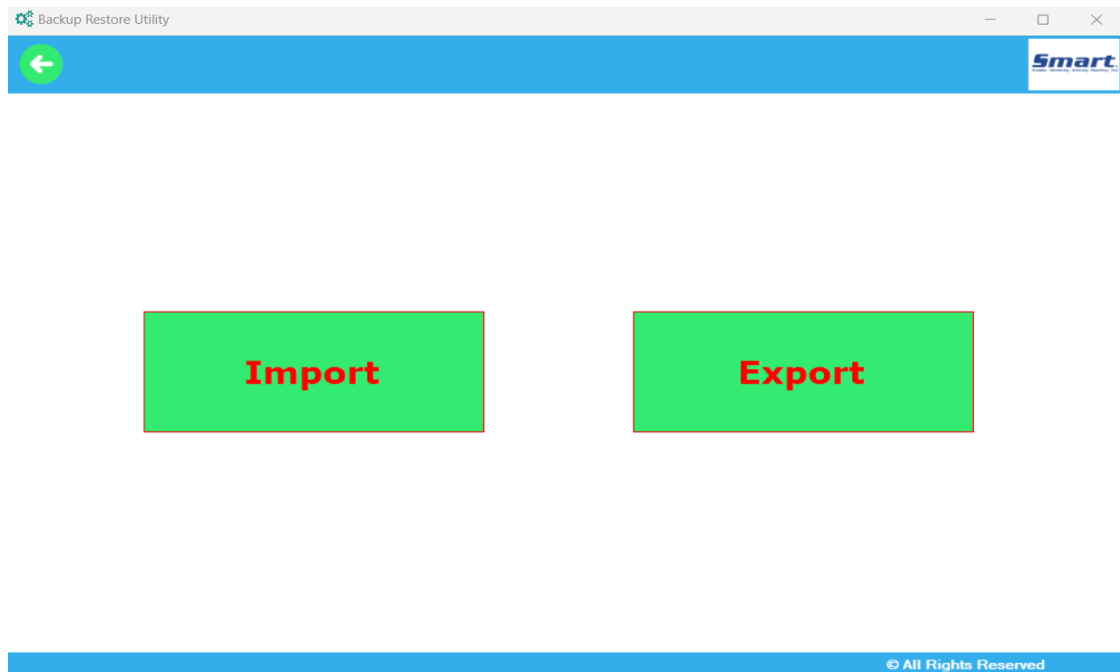
Figure.6c – User Management page, Password Attempts.

Figure.6d – User Management page, Delete Disable Config.

Project Backup Utility:

EXPORT

You may search for "Project Backup Utility" on Windows
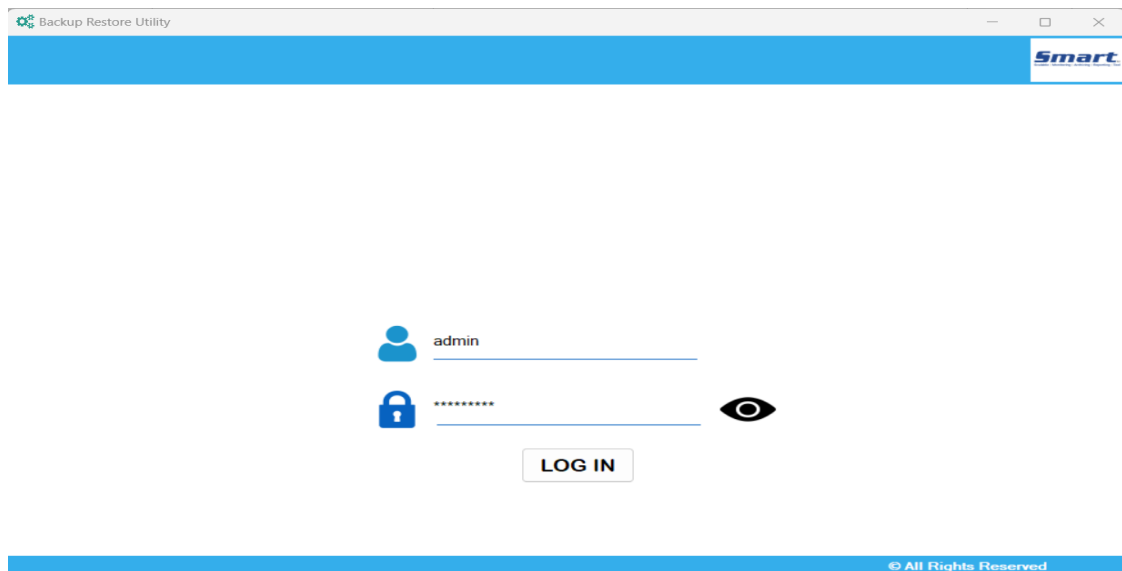
Click on "Export" to take the project/data backup.

Steps to follow:

1. Click on "Select all" or you may choose as required to take in backup.
2. Then click on Get Details and Then Enter the backup project name (PL do not use special characters)
3. Either choose backup based on number of Days or number of Documents (data samples).
4. Then click on Export.
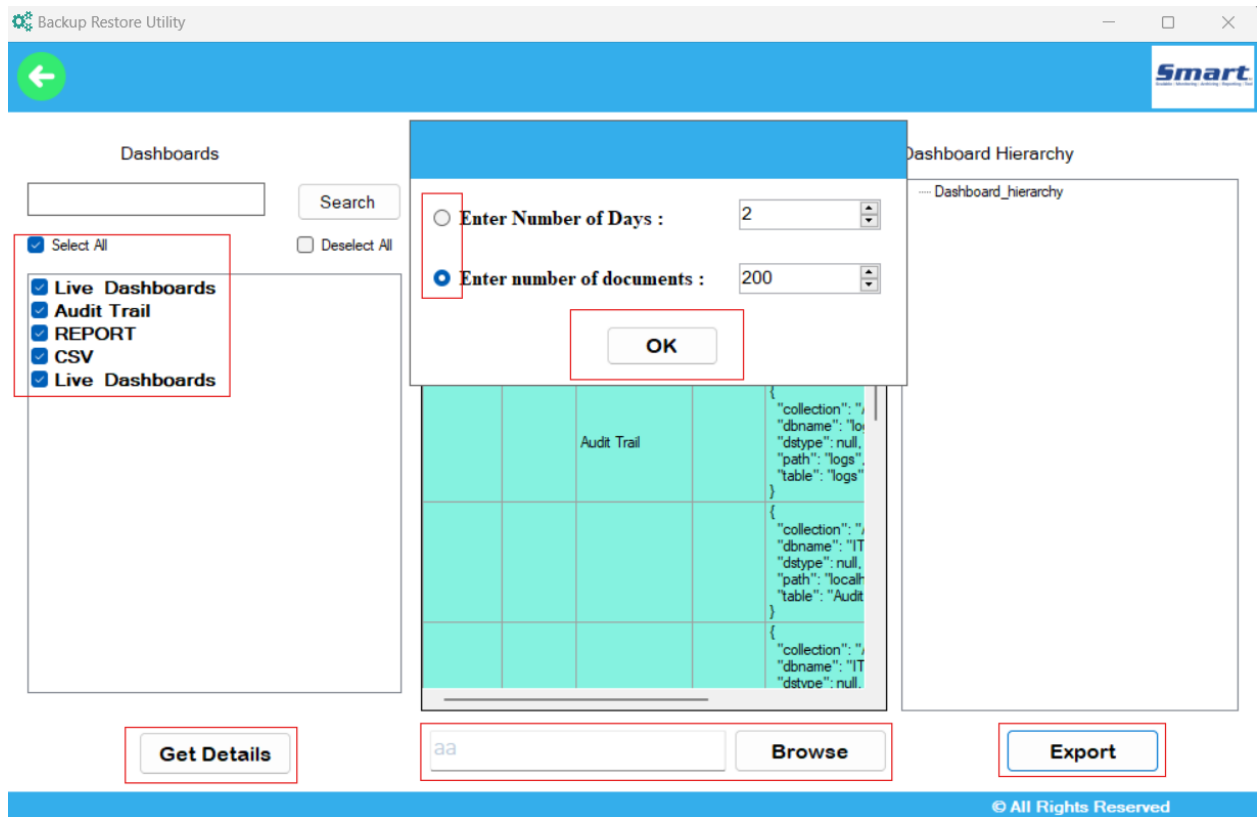
It may take some time to generate the backup and will save on your system in "ZIP"/"RAW" file format.

IMPORT
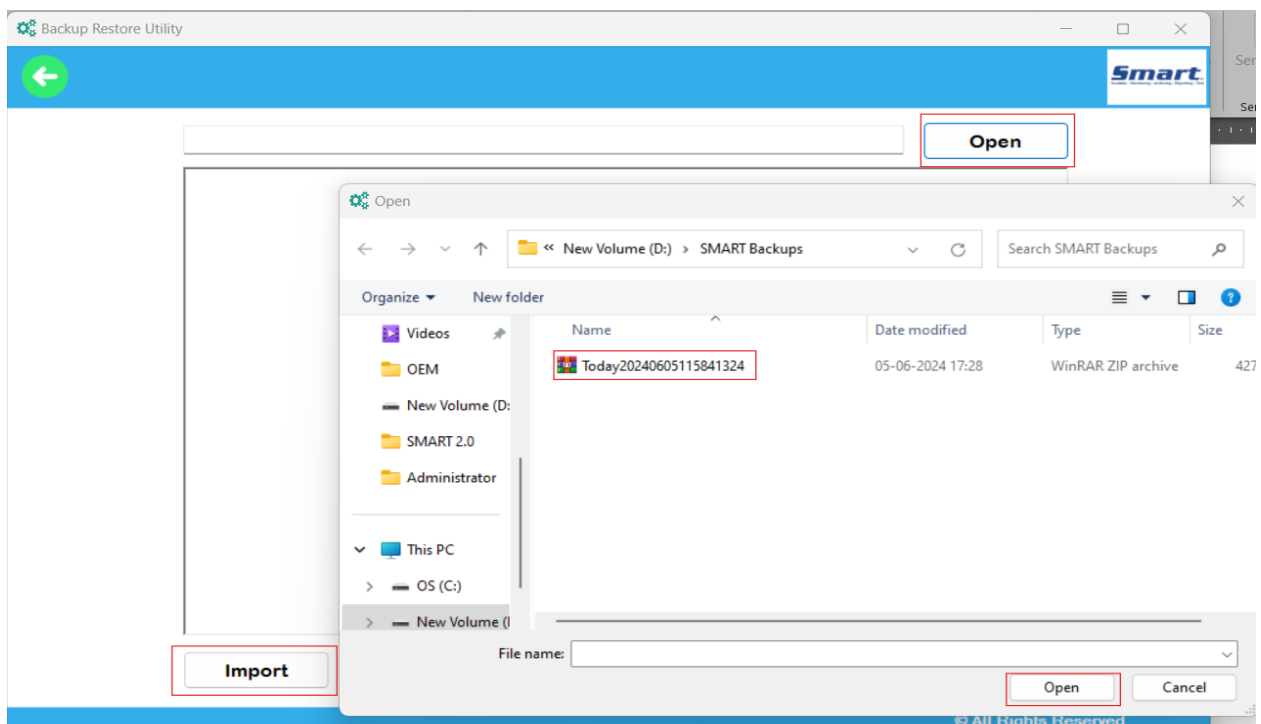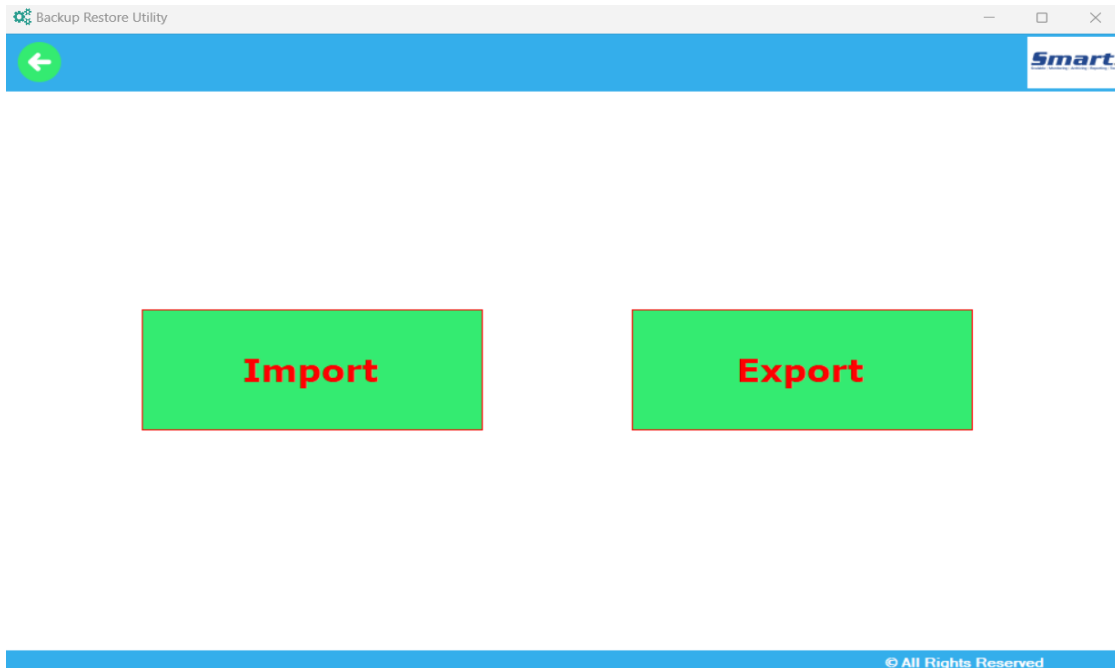
Import the existing "ZIP"/ "RAW" file to import the back up of any previous project.