PRODUCT MANUAL

Field Analytics

Powered by SICK Analytics Engine

Sick Field Analytics
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Build Date :
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MySQL-Version : 8.0.33
Influx DB-Version : v2.7.1
Dynamic Dashboard Version : 1.8.0.0-SNAPSHOT

SICK
Sensor Intelligence.

DOCUMENT REVISION HISTORY

Date	Document Version	Description	Author	Verified
	V1.0	**First Release**		
	V1.1	**Added 'Dashboard Contexting' and Widget Contexting.**		
	V1.2	**Added Modbus TCP, Modbus RTU, OPC UA, OPC DA, MQTT Protocols. Updated Theme Customization. Added Notifications & Alerts feature, Certificate Management. Updated Historian, Data Source & Widget Improvements, Project Import options reset and overwrite.**		
	V1.3	**Added Safety Device, Dashboard Configuration, Updated Data sources protocols like Modbus TCP, Modbus RTU, OPC UA, OPC DA, MQTT, TCP/IP-Server. Historian with Influx DB, Aggregation filters, Data filtering functions, Backup and Restore. Updated Widgets.**		

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1 Field Analytics

1.1 Introduction

Field Analytics is an Industry (I4.0) manufacturing data Intelligence platform that empowers users to develop customizable and configurable data insights. Users have direct access to critical real-time Key Performance Indicators (KPIs) via dynamic dashboards throughout the facility.

Data visualization and analytics allow users to take a deep dive into historical process data and identify patterns and relationships to help optimize factors that may affect yield in the quest for manufacturing excellence. The dynamic database solution simplifies the processes of monitoring, analyzing, and creating reports.

Benefits of Field Analytics include:

- **Store, query, customize and visualize** Key Performance Indicators (KPIs).
- **Automated** and **accurate data** through dashboards provides insights into what's happening on the production floor. The data transparency provided by sourcing from multiple devices and displaying the information as concise visuals lead to faster decision making.
- Take the guesswork out by Reducing human-error-prone data collection /surveys and monitoring.

When system/machines/devices/sensors are coupled, the RESTful APIs plays a critical key role in extracting new data insights across the factory floor, especially in the context of web-enabled solutions such as Field Analytics.

The many advantages of RESTful API provide essential values to Field Analytics. The robustness of the RESTful API made it a trusted industry standard. The simple design and statelessness also allow Field Analytics to scale with the business. In the industrial sector RESTful API is a true IT/OT convergence way of sharing smart data across the factory.

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2 Installation

2.1 Pre- Requisites

2.1.1 Hardware Requirements

Operating System	Windows 10 (64bit), Windows 11(64bit), Server 2016 R2, Windows Server 2019, Windows Server 2022, Ubuntu22.04, Ubuntu 20.04
Supported Browsers	Google Chrome, Firefox, Microsoft Edge.
Processor	Intel Core i5, i7 Recommended (2.3 GHz).
RAM	8GB,16GB Recommended.
Disk Space	2GB SSD Installation, 3-4 GB SSD Recommended
Monitor Resolution	1980 X,1080, 16:9 aspect ratio for best result

2.1.2 Software Requirements

- Windows 11 or Windows 10
- Web browser (Google Chrome:105.0.5195.102, Mozilla Firefox: 105.0 (64-bit) and Microsoft Edge: 105.0.1343.53) or newer.
- Uninstall MySQL if installed on the machine.
- Supported Linux OS, Ubuntu 20, Ubuntu 22
- Availability of following ports for TCP communication
  - 8406, used by MySQL
  - 8080, used by Field Analytics web server
  - 1880, used by embedded Node-RED
  - 8084, used by Media Server(add-on)
  - 8086, used by Influx DB

2.2 Installation Procedure

Please find below the procedure to install the Field Analytics application.

1. Right-click on the installer **.exe** file and run as **Administrator**.
2. Click on the '**Next**' button on the '**Introduction**' Screen.

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3. Choose the folder location and click on the '**Next**' button on the '**Introduction**' Screen. Recommended not to change the default location.
4. Choose and select the license file.
5. Click on the '**Next**' button on the '**Pre-Installing Summary'** Screen.
6. Wait for Installation to get completed.
7. Click on the '**Done**' button.
8. Verify that Product services are up and running.
9. Now you can access the application by opening Field Analytics: https://localhost:8080

2.2.1 ActiveMQ Artemis

ActiveMQ (MQTT Broker) is installed along with FA application. It is a middleware messenger which helps in sending data from servers to FA application via MQTT broker.

Ensure ActiveMQ Artemis in **Services** is installed along with FA and is in **Running** status.

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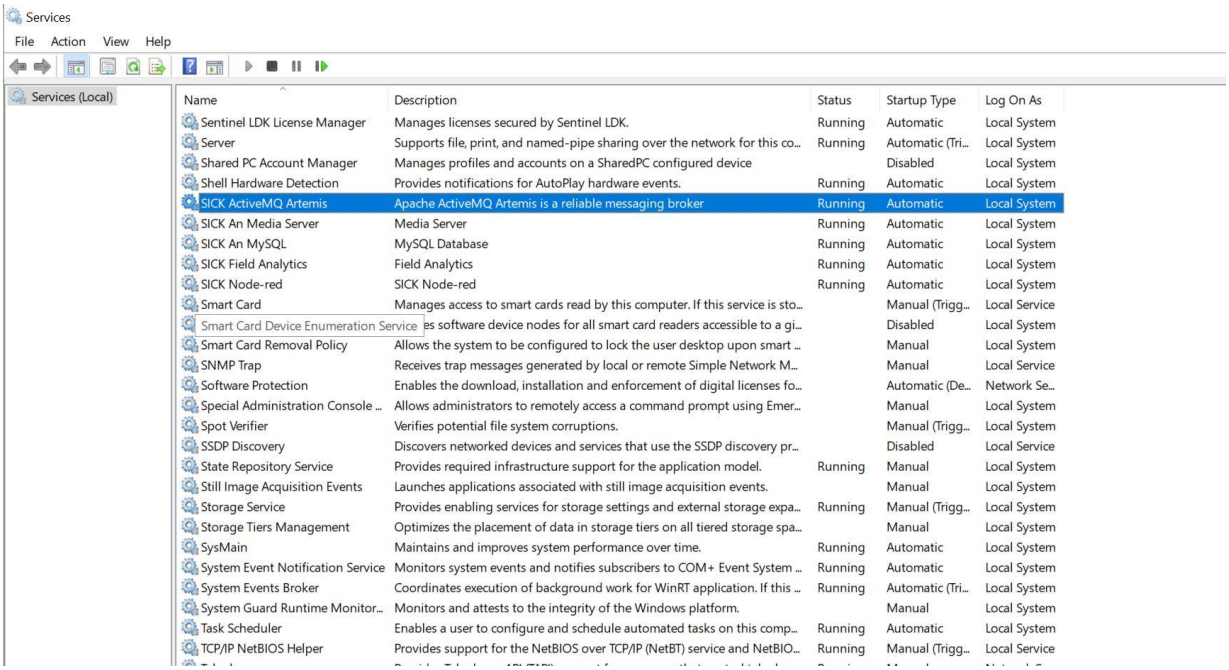

Figure 1: ActiveMQ Artemis in Running Status

There are two types of connections that are TCP and SSL. User can set-up any one connection at a time to send the data. To set-up the connection settings:

1. Navigate to below path:
   - C:/Program Files/SICK/Field Analytics/Dynamic Dashboard/Config
2. Open MQTTProperties file

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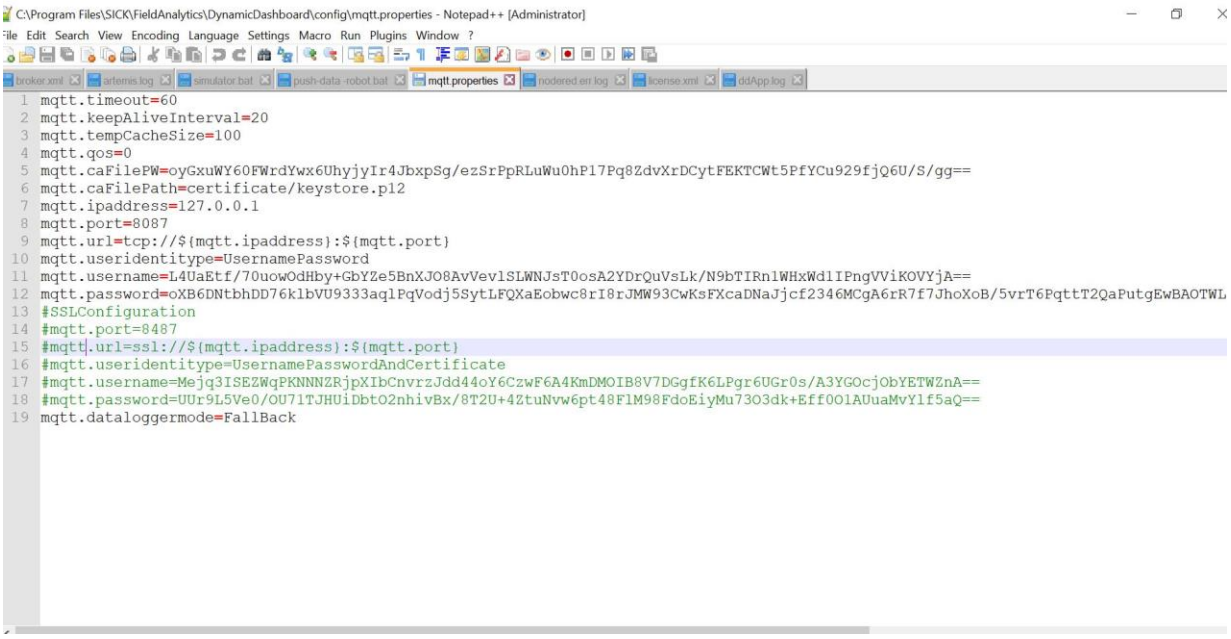

Figure 2: MQTT Properties File with TCP Configuration

3. To activate SSL configuration, remove # symbol before each setting in SSL configuration and add # symbol before each setting in TCP configuration.
4. Save the file to activate SSL configuration.
5. Similarly, to activate TCP configuration remove # symbol before each setting in TCP configuration and add # symbol before each setting in SSL configuration

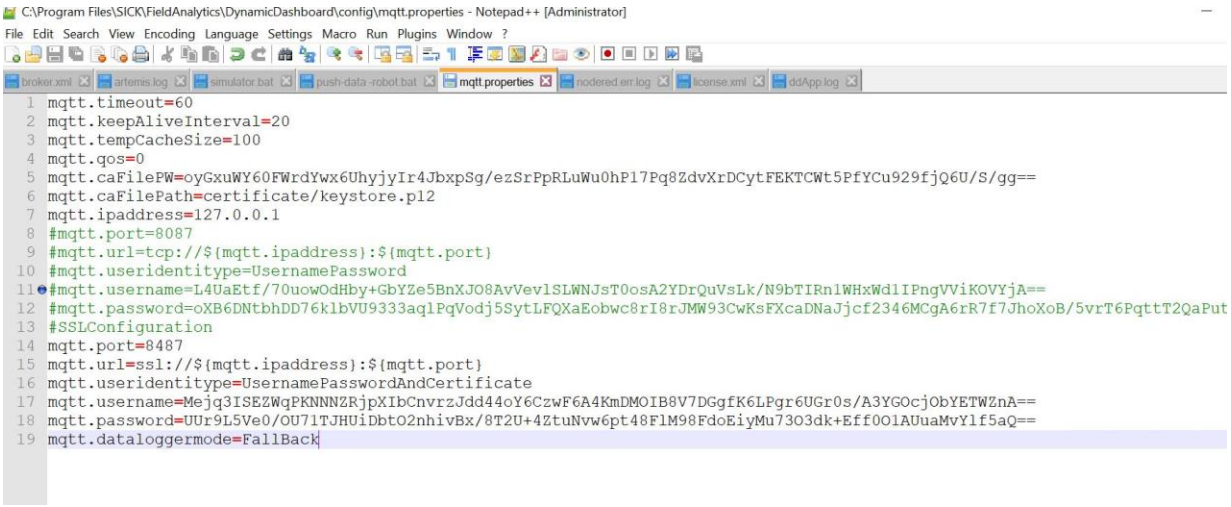

Figure 3: MQTT Properties File with SSL Configuration

6. Re-start the services after the saving the configuration in MQTT properties file.

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7. New configuration settings are activated.
8. User can view the health status of the data source connection in FA application.

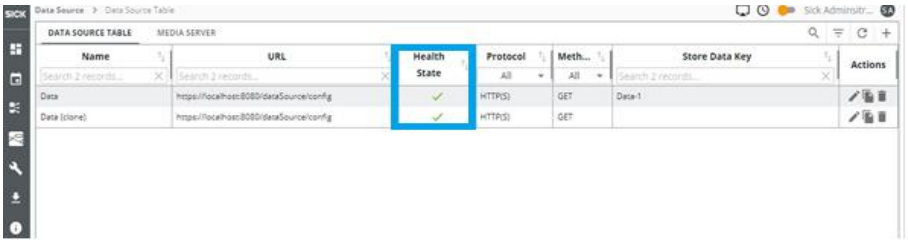

Figure 4: Health Status

2.2.2 ActiveMQ Artemis Management Console

Login ActiveMQ Artemis console through authorized credentials provided below:

- Username: **admin**
- Password: **c7EKV35Yto1gz5N**

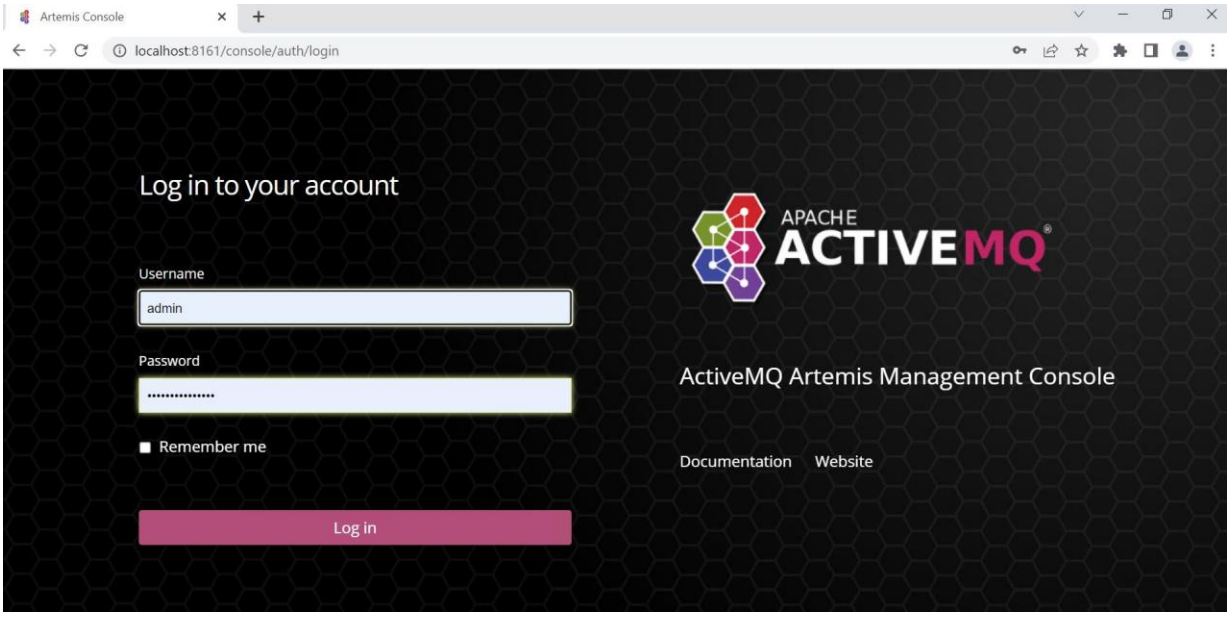

Figure 5: ActiveMQ Console Login Screen

ActiveMQ Artemis console helps users to view the subscriber details, publishing data and also displays connections.

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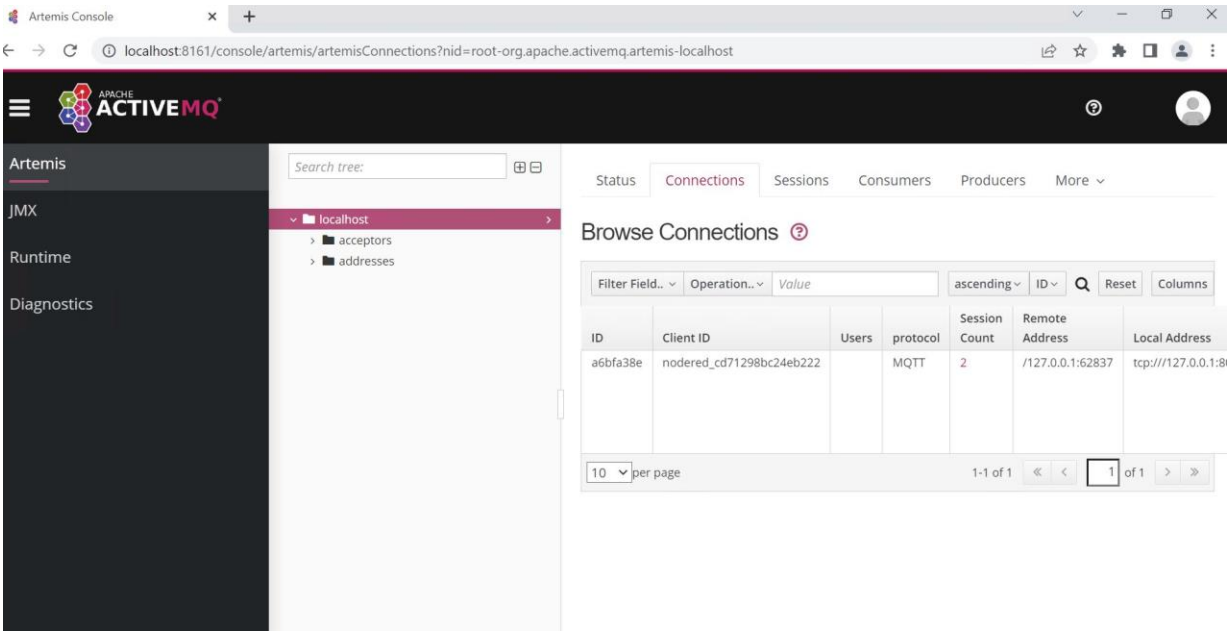

Figure 6: Connection Details

2.3 Uninstallation procedure

Please find below the procedure to uninstall Field Analytics applications.

1. Run Installer as **administrator** (Use SICK Privilege Elevation for SICK laptops).
2. Installer will find installed FA application and popup will display to uninstall the application.
3. Click on "**Uninstall**" to uninstall the application.
4. It will give the message for the successful removal of the application.

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3 Login

After launching the Field Analytics application, Users can access the application by providing the authorized credentials and then clicking on **'Login'**. This will help users to access all the features available in the Field Analytics. Refer to Figure 7: Login Screen.

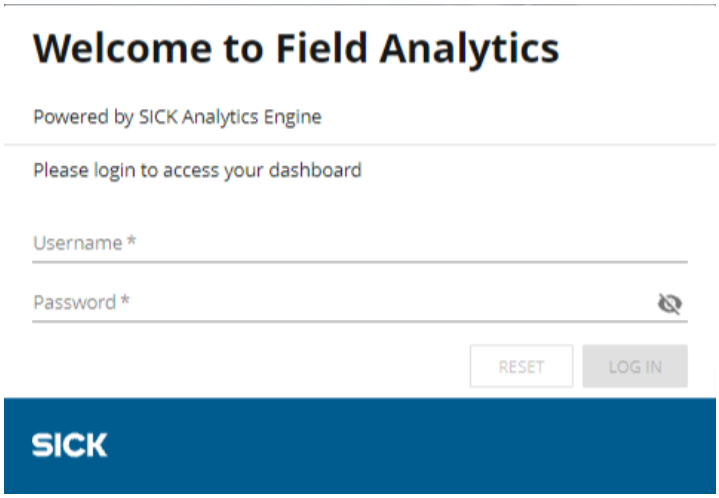

Figure 7: Login Screen

Field Analytics comes with pre-defined users for quick access to the application: Refer to Figure 9: User Privileges, Roles & Groups.

User	Credentials	Privilege	Additional Comment
Administrator	**Username: administrator** **Password: Welcome1**	The **administrator** user has access to the Licensed Dashboard as well as the Field Analytics Dashboard. The administrator users can also edit the Dashboard settings.	Log in with the **administrator** user to activate the application. It is recommended user to change password after logging in.
Operator1	**Username: operator1** **Password: Welcome1**	The **operator1** user can access the Licensed Dashboards but does not have the privilege to modify anything.	The **operator1** users can access the application only when it is activated. Once the administrator user activates the application by login, the **operator1** user can log in and access the application. When logged in for the first time, Field Analytics will require the user to change the default password.

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User can log in by providing authorized credentials and then click on Login. After successful login, the Field Analytics application will be accessible. When logging in for the very first time as the operator1 user, message will be displayed on the screen to change your password. Users can update the password by providing the current and the new password. The dashboard can be accessed once the password is updated.

Upon successful login, the **administrator** will be presented with a license screen which will guide users on how to obtain a license activate Field Analytics.

Field Analytics will display an error message, if the provided username or password is incorrect if you are still unable to login after verifying the username or password, please visit SICK Technical Support at https://supportportal.sick.com/. Refer to Figure 8: Invalid Login Message.

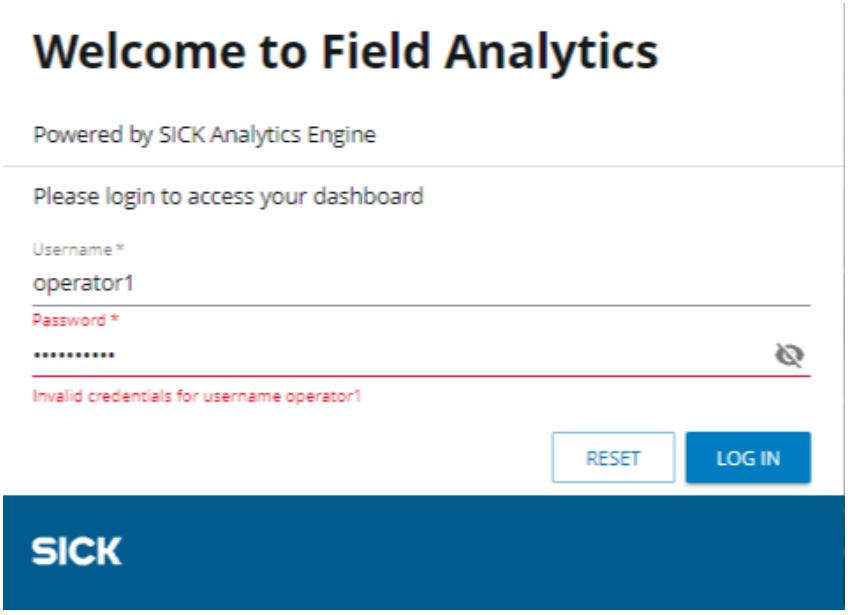

Figure 8: Invalid Login Message

3.1 Profile and User Management

Field Analytics provides a robust role-based user management module. The **administrato**r user can create a new role and select the privileges for that role. Once a role is created, it can be assigned to a user group. Refer to Figure 9: User Privileges, Roles & Groups.

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Note: All users in the user group will have the same privileges as selected while creating the role. Administrators can later add/edit/delete the users from the user groups.

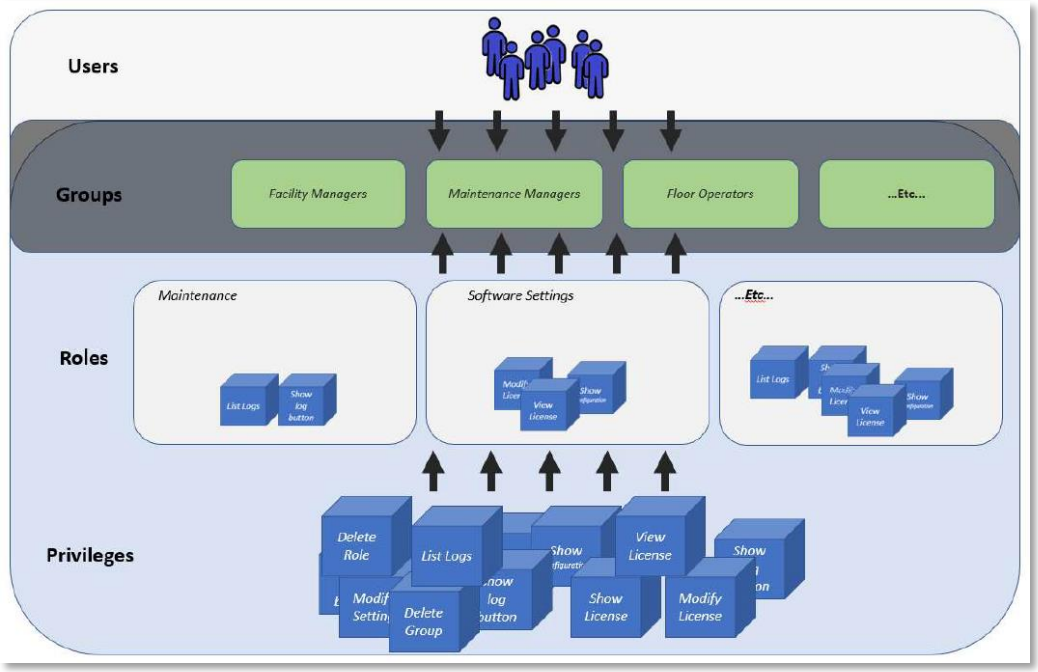

Figure 9: User Privileges, Roles & Groups

To access the user's profile, click on the profile icon at the top right corner. A drop-down will be displayed with the **My Profile** option along with a list of options based on your role and permissions. Refer to Figure 10: Profile Menu.

Note: Users can create and edit user profiles.

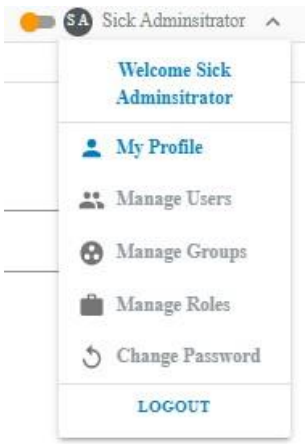

Figure 10: Profile Menu

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Click on the **My Profile** option. Refer to Figure 11: My Profile.

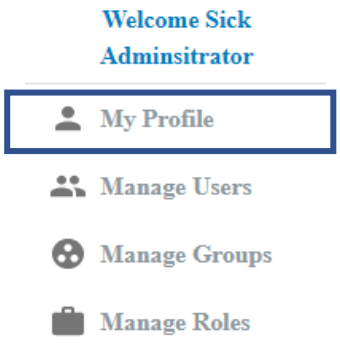

Figure 11: My Profile

The profile option displays the currently logged-in User Profile. This page will allow users to Add/Edit information about the user. Refer to Figure 12: My Profile Page.

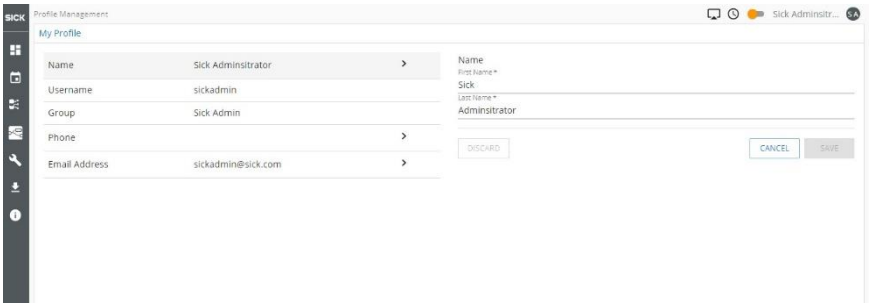

Figure 12: My Profile Page

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3.2 Manage Users

In the same drop-down displayed from the profile icon, click **Manage Users**. Refer to Figure 13: Manage Users.

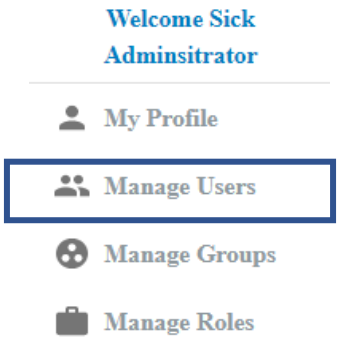

Figure 13: Manage Users

It displays the **Manage Users page** with the list of users. From this screen, you can add, edit, delete, or reset passwords for existing users. Refer to Figure 14: Manage Users Page.

Note: Add/Edit/Delete User and Reset Password permission is based on the privileges assigned to your role.

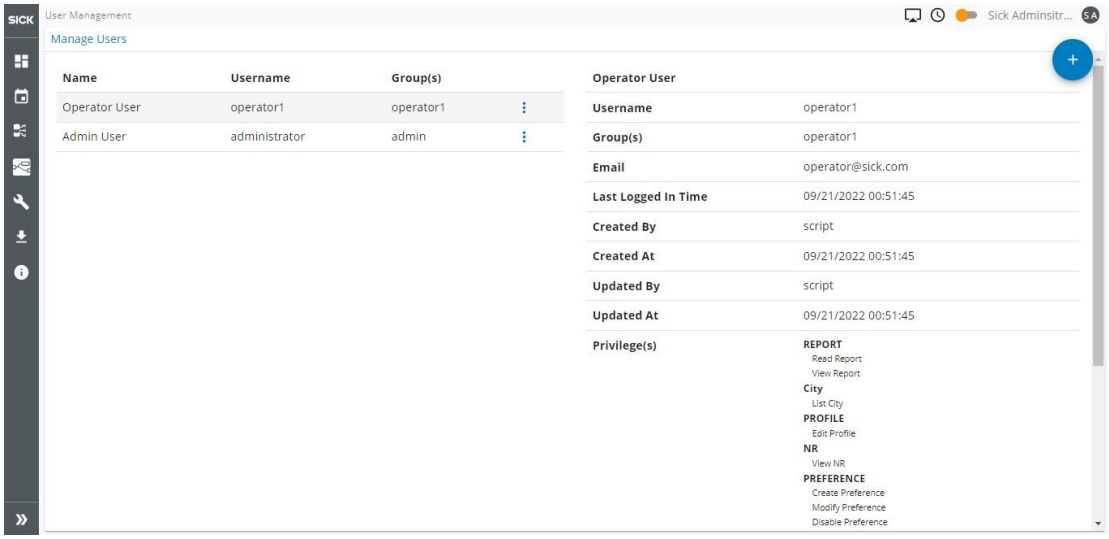

Figure 14: Manage Users Page

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3.2.1 Delete User

To delete a user:

1. Click the Delete options to delete users. Refer to Figure 15: Delete User.

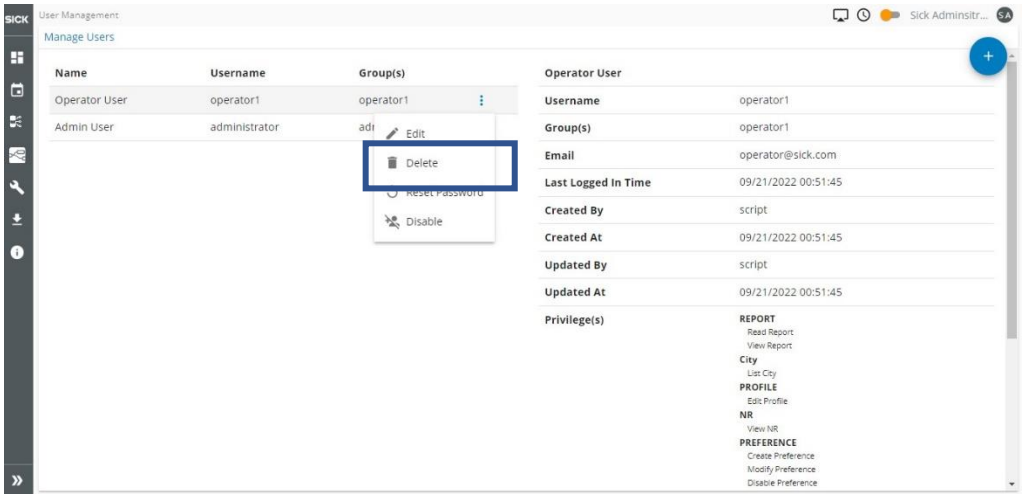

Figure 15: Delete User

2. Field Analytics will open the **DELETE USER** screen. Refer to Figure 16: Delete User Screen.

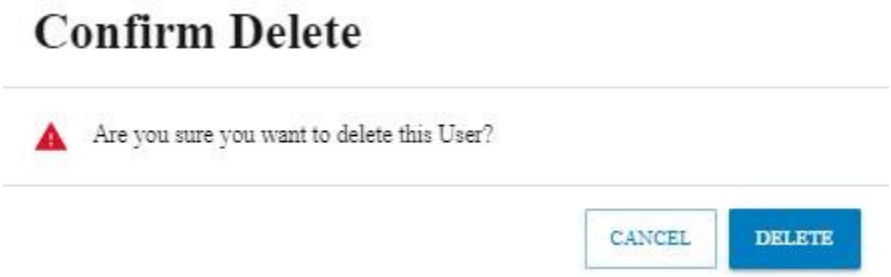

Figure 16: Delete User Screen

3. Click on the **DELETE** button to save or **CANCEL** to return to **Manage Users** home screen.

3.2.2 Add Users

To add a new User:

1. On the **Manage Users** screen, click the Add icon to display **CREATE USER** dialog box. Refer to Figure 17: Add User.

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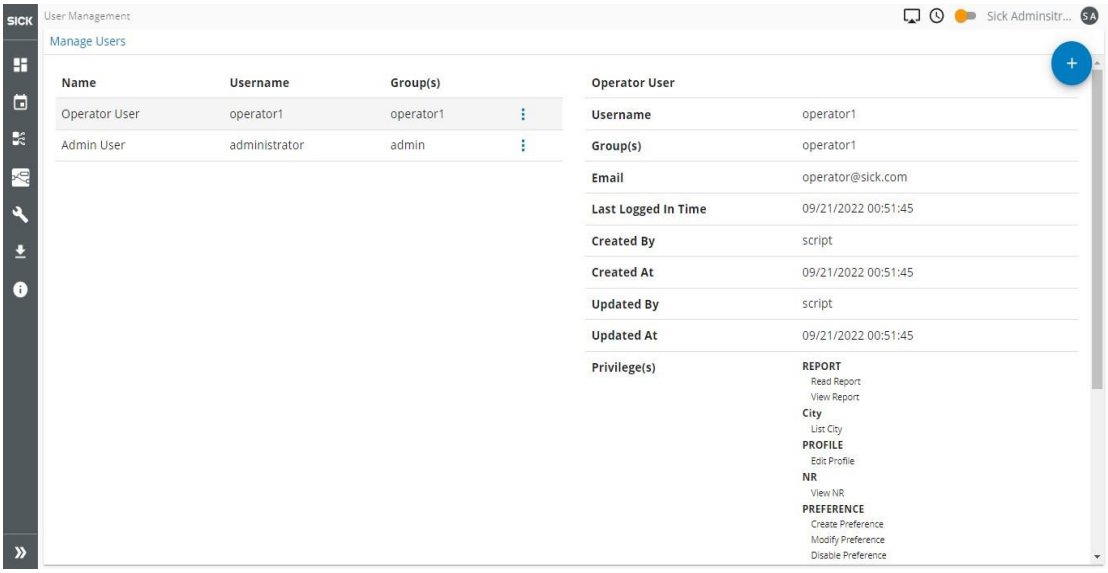

Figure 17: Add User

2. The **CREATE USER** dialog box allows for the creation of new users. Refer to Figure 18: Create User.

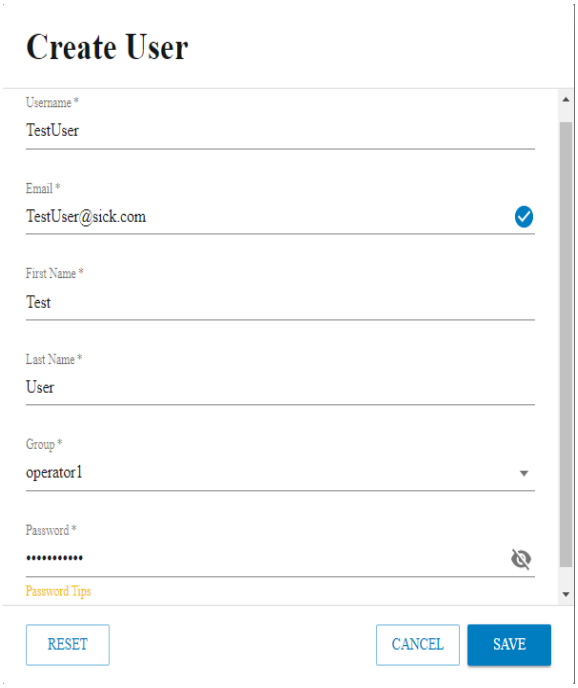

Figure 18: Create User

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3. Enter all mandatory fields and click on the ‘CREATE’ button to add a new user.
4. Click on the ‘**SAVE’** button to save or ‘**CANCEL’** to return to the ‘**Manage Users’** home screen.

3.2.3 Edit User

To edit a user:

1. On the Manage Users page, click on the vertical ellipsis to edit, delete, reset password or disable of other users. Refer to Figure 19: Vertical Ellipsis.

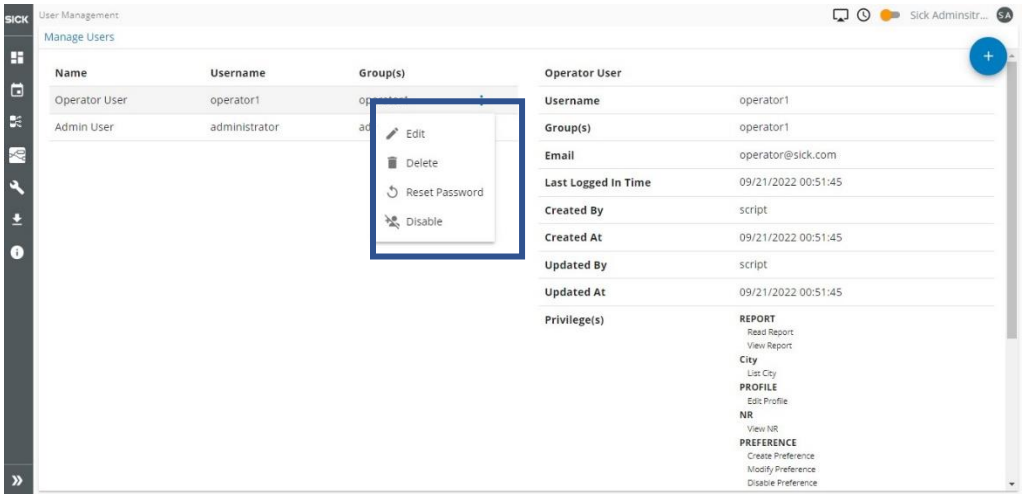

Figure 19: Vertical Ellipsis

2. The Edit option allows brings the user to the **EDIT USER** screen. Refer to Figure 20: Edit User.

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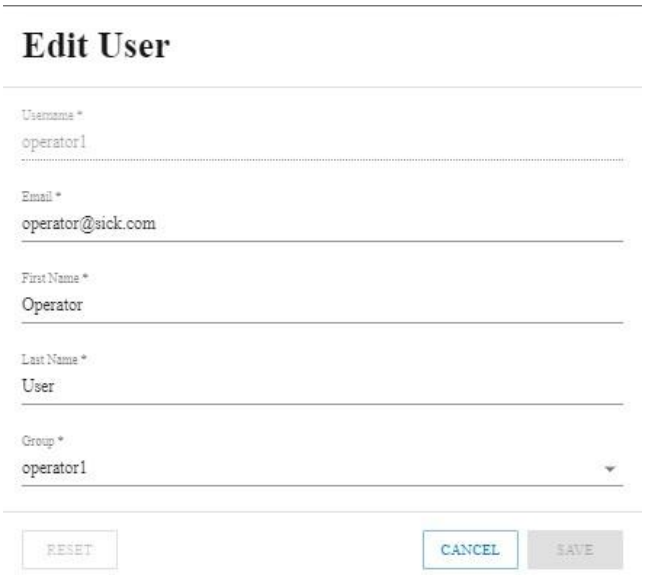

Figure 20: Edit User

3. From the **EDIT USER** screen, you can edit the e-mail address, first name, last name, and group the user.

Note: The username is not editable.

4. Click on the '**SAVE'** button to save or '**CANCEL'** to return to Manage User home screen.

3.2.4 Reset Password

To reset password:

1. Click the Reset Password option. Refer to Figure 21: Reset Password.

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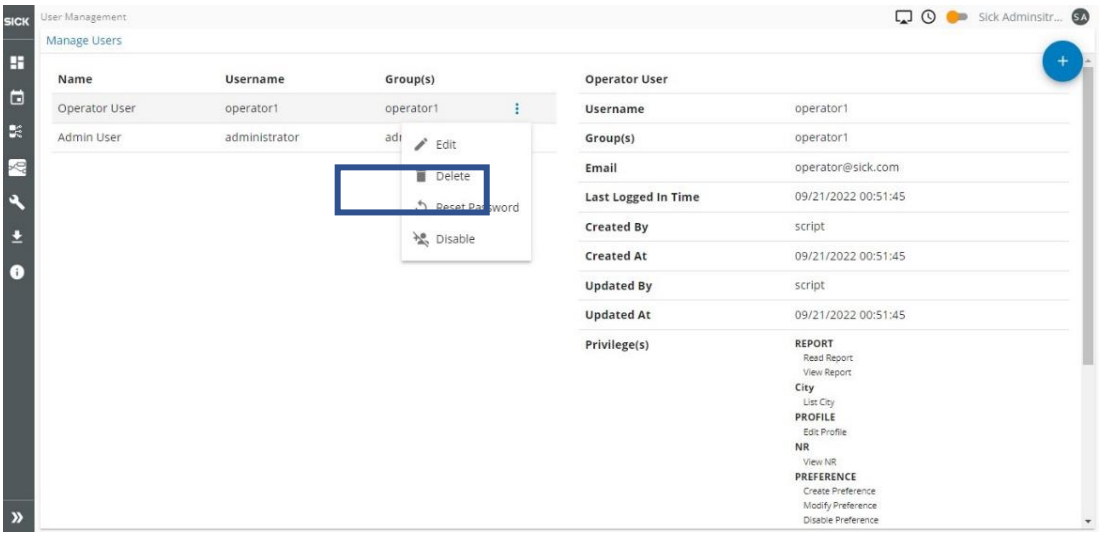

Figure 21: Reset Password

2. Field Analytics will open Reset Password with two options **Reset Password Manually** or **Generate Random Password.**
3. **Reset Password Manually** will allow you to reset the password manually by entering the **New Password** and **Confirm password**. Refer to Figure 22: Manual Password.

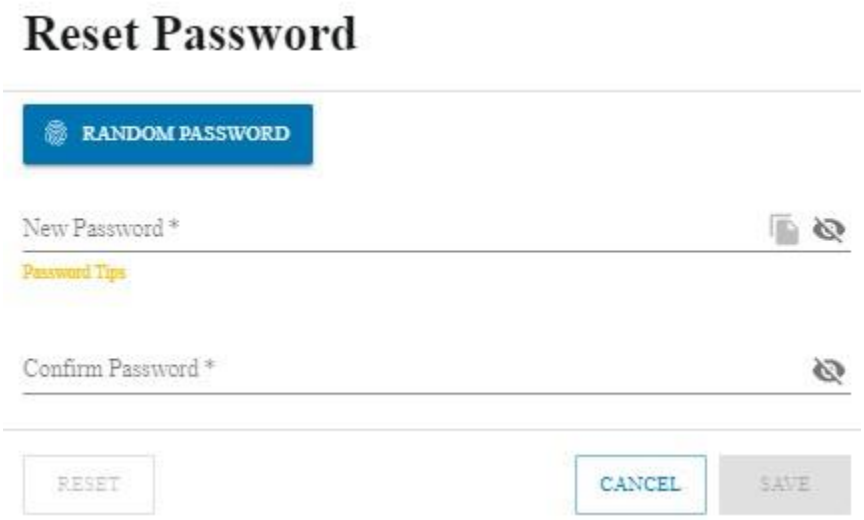

Figure 22: Manual Password

4. **Generate Random Password** will generate a random password Refer to Figure 23: Random Password.

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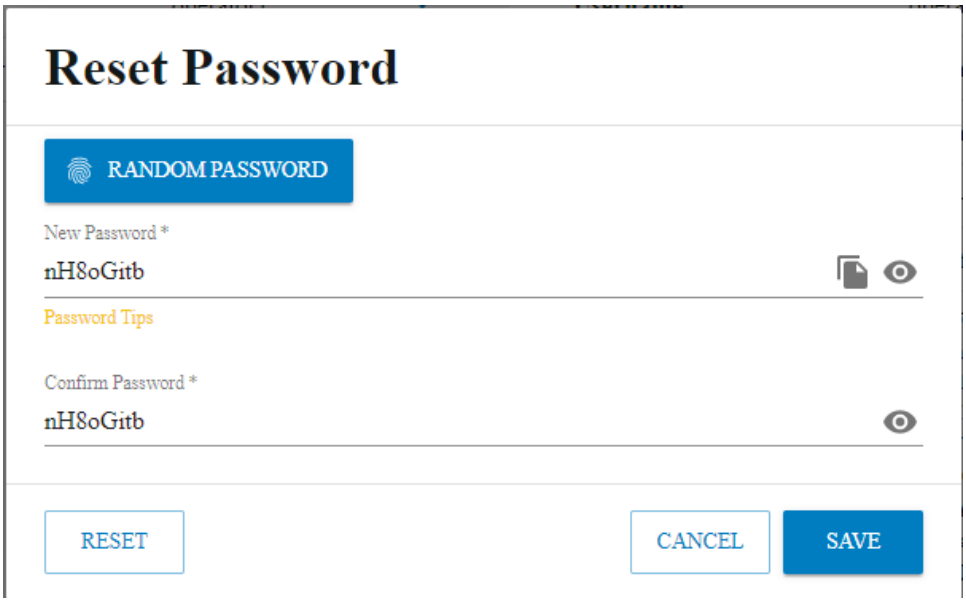

Figure 23: Random Password

5. Administrators must share the password with the user manually.
6. Once the user, who's password was reset logs-in, Field Analytics will require user to change password to maintaining confidentiality.
7. Click on '**SAVE'** button to save the new password or '**CANCEL'** to return to the **Manage Users** home screen.

3.3 Manage Groups

Users can click on the Profile icon at the top right corner and then click on the Manage Groups option. Refer to Figure 24: Manage Groups.

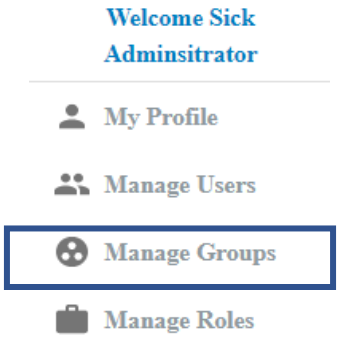

Figure 24: Manage Groups

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The option navigates to **Manage Groups page** with the list of users. From this screen, you can add, edit and delete the groups. Refer to Figure 25: Manage Groups Page.

Note: Add/Edit/Delete Group permission is based on the privileges assigned to your role.

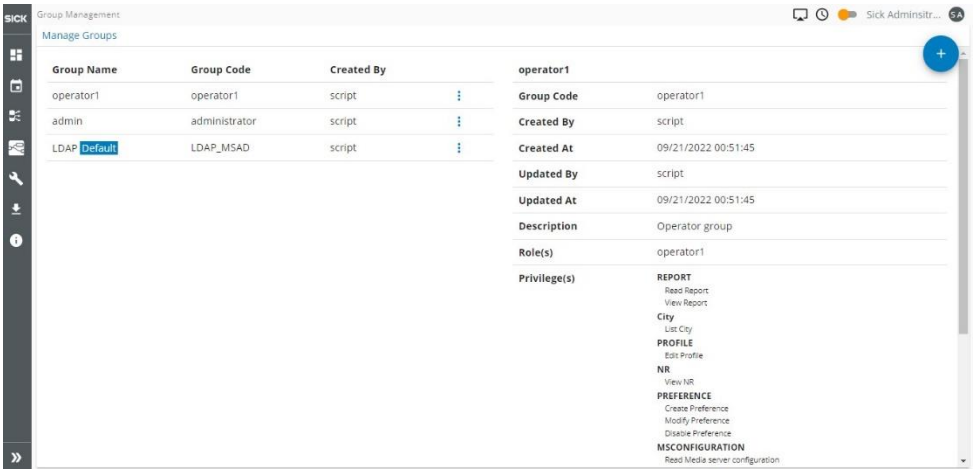

Figure 25: Manage Groups Page

Manage Group screen will display three existing groups, by default: administrator and operator1, administrator and LDAP.

3.3.1 Add Groups

To add a new group:

1. On the **Manage Groups** screen, click the Add icon to display **Create Groups** dialog box. Refer to Figure 26: Add Group.

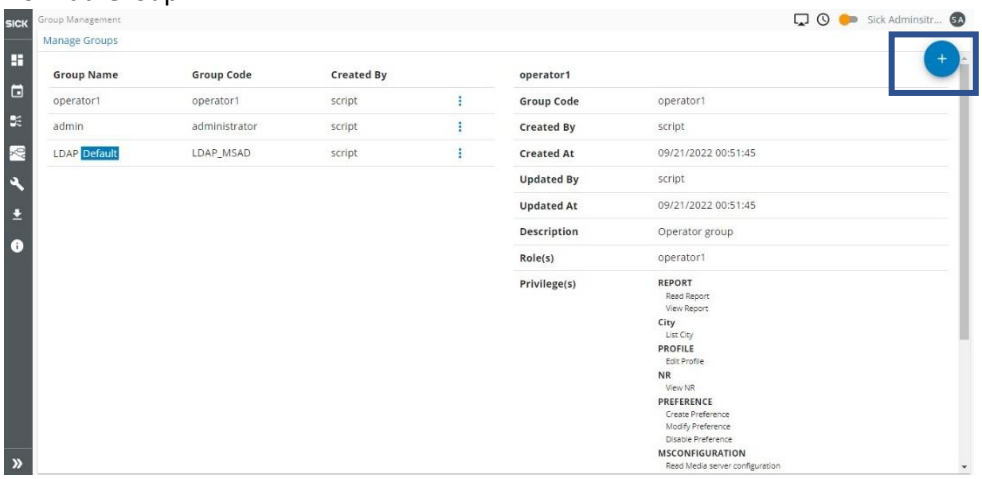

Figure 26: Add Group

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2. It displays create groups dialog box. Refer to Figure 27: Create Group.

Figure 27: Create Group

3. The Role drop-down on **CREATE GROUP** dialog box should list all the existing roles including the **DEFAULT** Role.
   Note: The DEFAULT role has Read-only privileges.
4. Enter all mandatory fields and click on the **'SAVE'** button to create and add a new group.
5. Click **'CANCEL'** to return to the Manage Group home screen.
6. Click on **'RESET'** to clear out the previously entered values.

3.3.2 Edit Groups

To edit a group:

1 On the **Manage Groups** page, click on the vertical ellipsis. Refer to Figure 28: Vertical Ellipsis.

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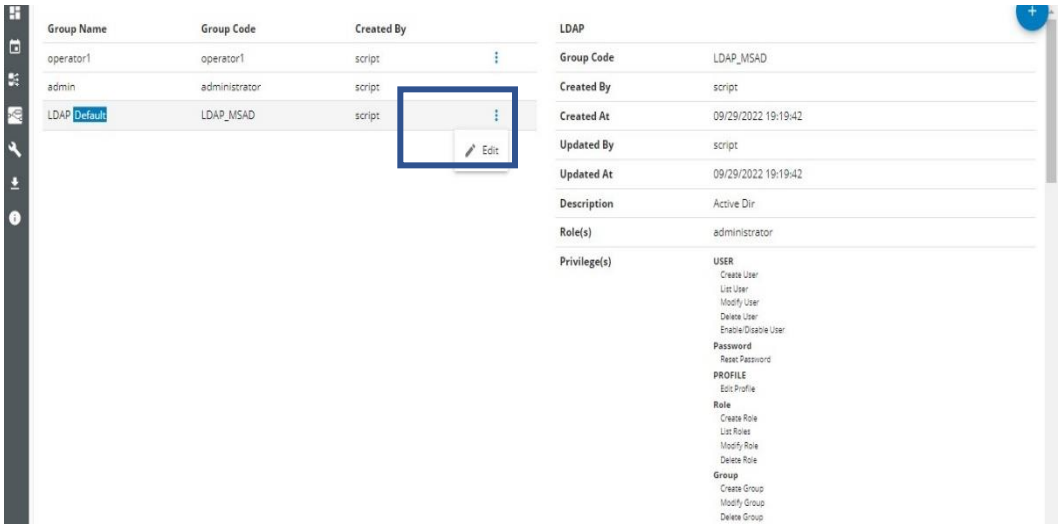

Figure 28: Vertical Ellipsis

2 From the dropdown, click Edit. Refer to Figure 29: Edit Group.

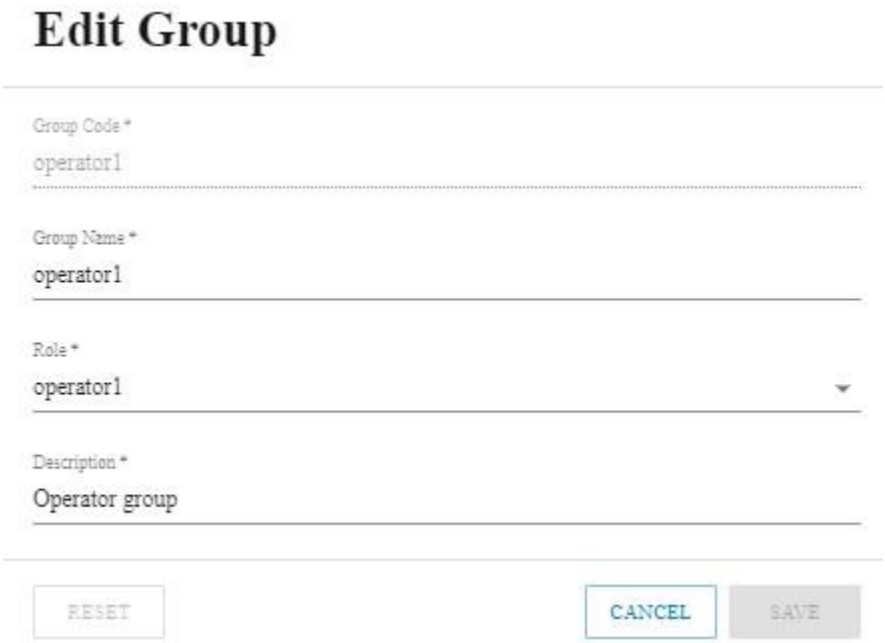

Figure 29: Edit Group

3 User can edit the **Group Name**, **Role** and **Description**.

Note: Group Code is not editable.

4 Click on '**SAVE'** button to save the changes or click '**CANCEL'** to return to Manage Group home.

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3.3.3 Delete Groups

To delete a user:

1. Click Delete option. Refer to Figure 30: Delete Group.

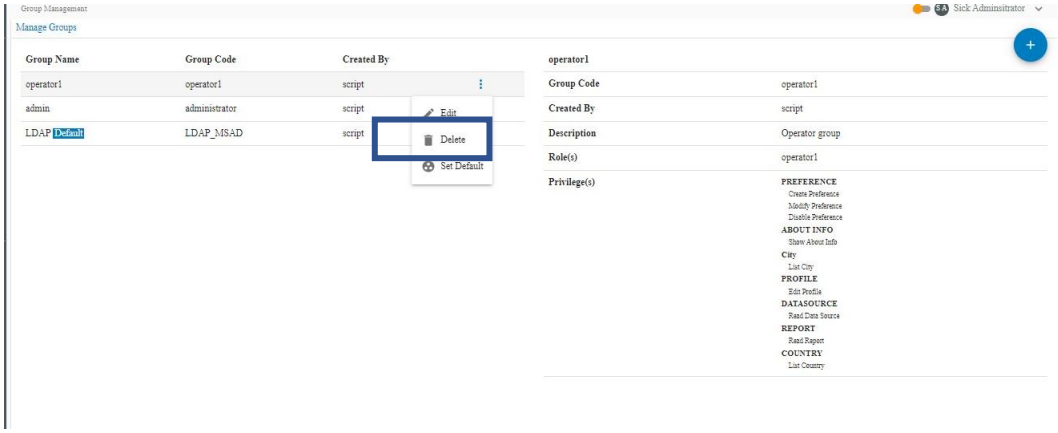

Figure 30: Delete Group

2. Field Analytics will open a confirmation pop-up with a '**CANCEL'** and '**DELETE'** button. Refer to Figure 31: Confirm Delete.

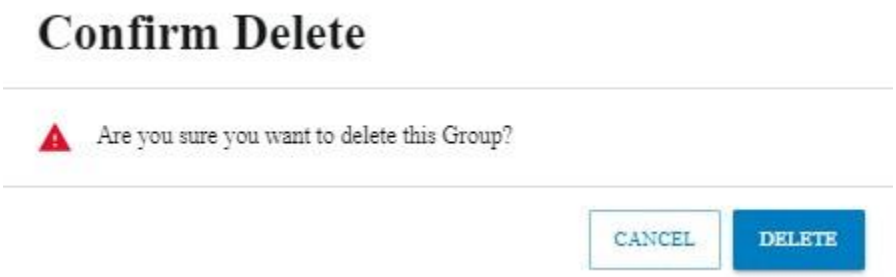

Figure 31: Confirm Delete

3. Click on the '**DELETE'** button to delete the group or '**CANCEL'** to return to **Manage Group** home page.

3.3.4 Default Groups

This feature is used when customer links Field Analytics authentication to customer LDAP server such as Microsoft Active Directory.

To set a group as Default Group:

1 User can click on vertical ellipsis in front of the Group which you want to set as Default Group. Refer to Figure 32: Default Group.

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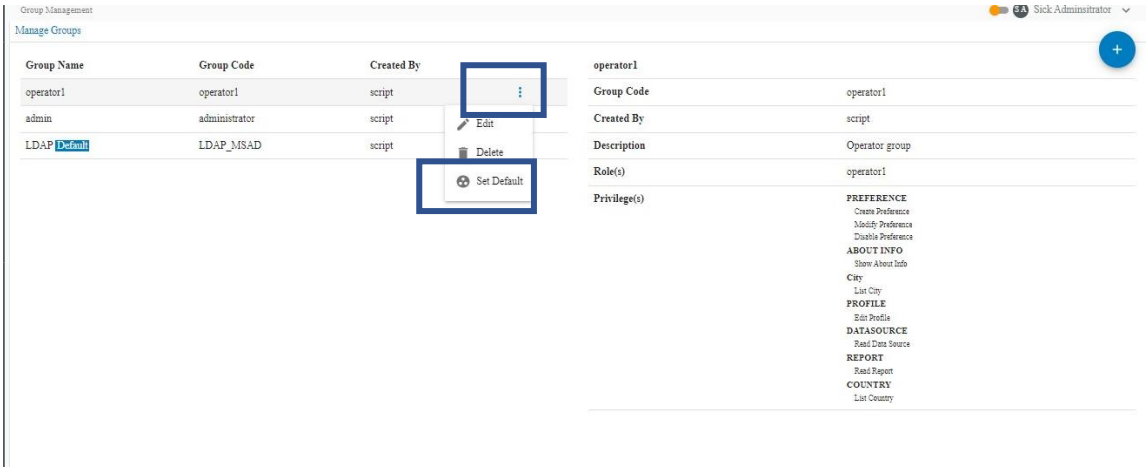

Figure 32: Default Group

2 Click on **Set Default** option Set Default .

3 Application will set the selected group as '**Default'** group and will display a success message. Refer to Figure 33: Default Group Success.

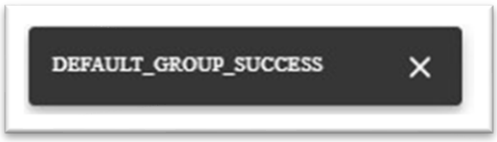

Figure 33: Default Group Success

3.4 Manage Roles

Users can click on the Profile icon at the top right corner and then click on the Manage Role option. Refer to Figure 34: Manage Roles.

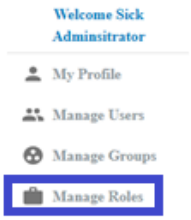

Figure 34: Manage Roles

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It displays the **Manage Role page** with the list of roles. From this screen, you can add, edit, delete. Refer to Figure 35: Manage Role Page.

Note: Add/Edit/Delete role permission is based on the privileges assigned to your role.

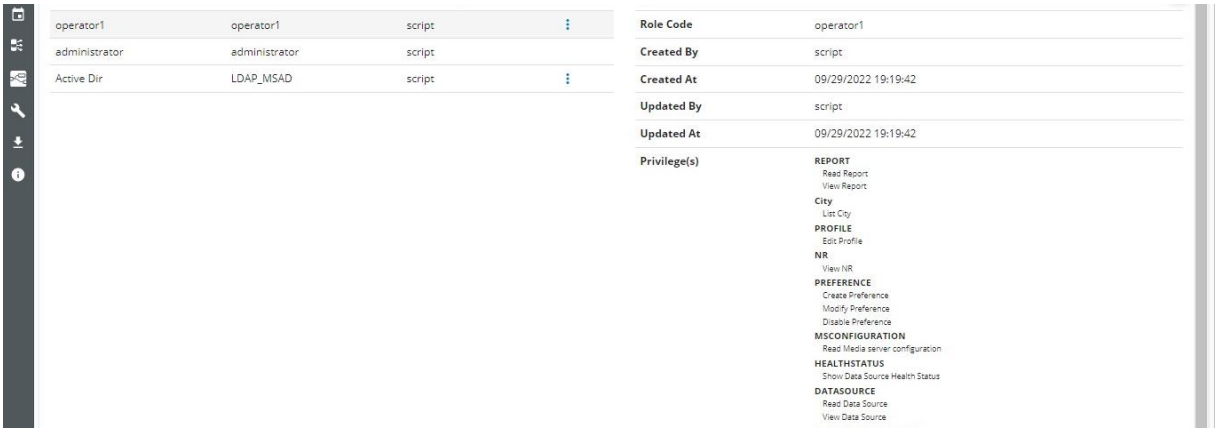

Figure 35: Manage Role Page

Manage Role screen will display three existing groups, operator1, administrator and LDAP by default.

3.4.1 Add Role

To add a new role:

1 On the **Manage Role** screen, click the Add icon to display **Create Role** dialog box. Refer to Figure 36: Create Role.

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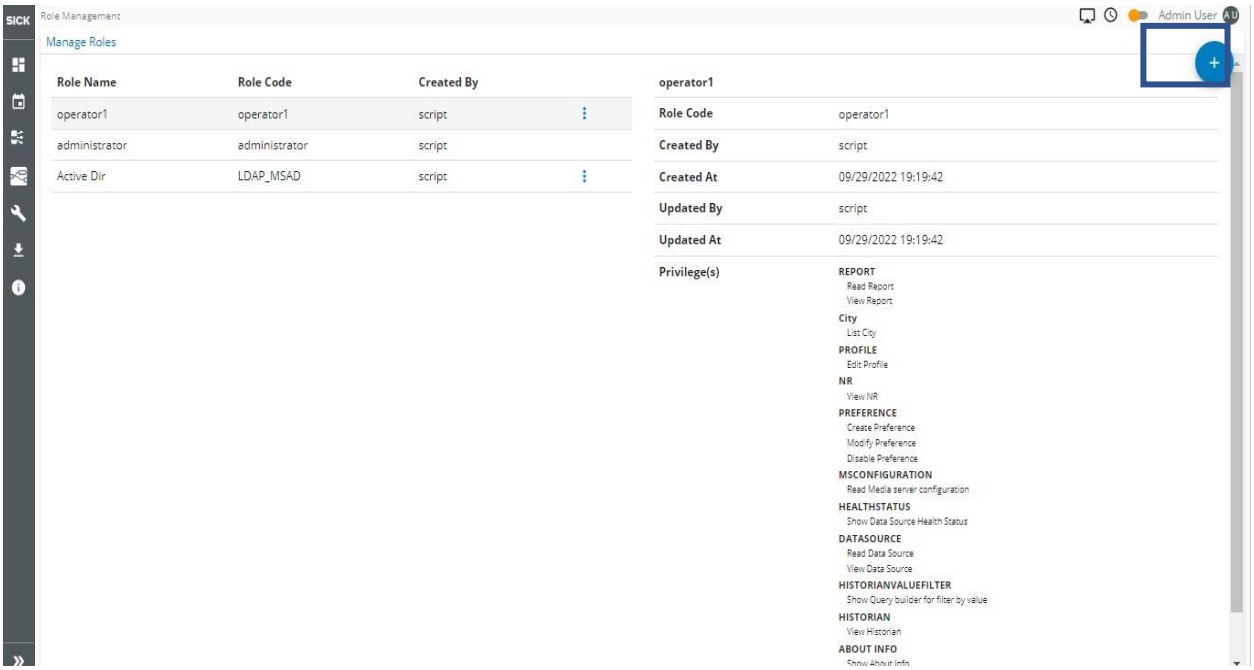

Figure 36: Create Role

2 It displays create group dialog box. Refer to Figure 37: Create Role.

Figure 37: Create Role

3 Enter all mandatory fields and click on '**CREATE'** button. Clicking on '**CREATE'** button will create a new role.

4 Click on '**RESET'** to clear out the previously entered values.

5 Click '**CANCEL'** to return to Manage Role screen without role creation.

3.4.2 Edit Roles

To edit a group:

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1 On the Manage Role page, there are three vertical ellipsis icons in front of the screen. It has following tabs. Refer to Figure 38: Vertical ellipsis.

- Edit
- Delete

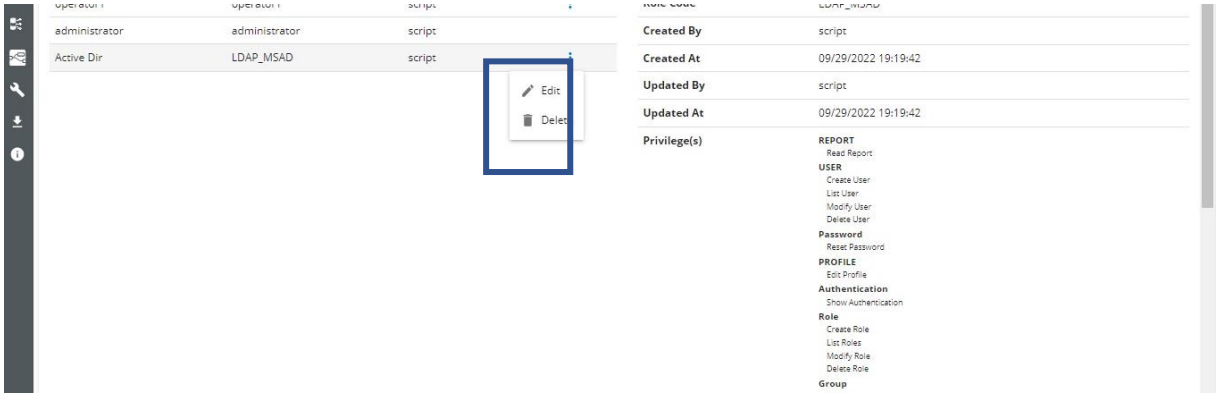

Figure 38: Vertical ellipsis

2 User can click Edit options. Refer to Figure 39: Edit Role.

Figure 39: Edit Role

3 User can edit the '**Role Name'** and '**Privileges'**.

Note: Role Code is not editable.

4 Click on '**SAVE'** button to save the changes or click '**CANCEL'** to return to Manage Role screen.

3.4.3 Delete Roles

To delete a user:

1 User can click the Delete option. Refer to Figure 40: Delete Role.

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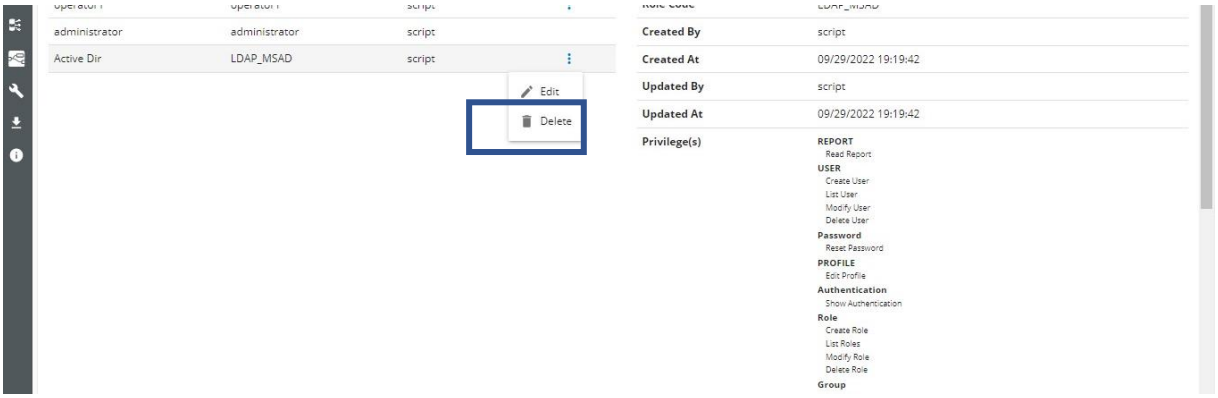

Figure 40: Delete Role

5. Field Analytics will open a confirmation pop-up with a '**CANCEL'** and '**DELETE'** button. Refer to Figure 41: Confirm Delete Role.

Figure 41: Confirm Delete Role

6. Click on '**DELETE'** button to delete the role or click '**CANCEL'** to return to Manage Role screen.

3.5 Change Password

All users have the option to change their passwords.

To change password:

1. Users can click on the Profile icon at the top right corner and then click '**Change password'** option. Refer to Figure 42: Change Password.

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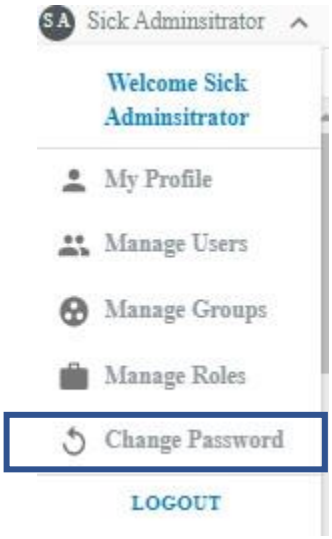

Figure 42: Change Password

2. It displays Change password dialog box. Refer to Figure 43: Change Password Dialog Box.

Figure 43: Change Password Dialog Box

3. Enter '**Current Password'**, '**New Password'** and '**Confirm Password'.**
4. Click on '**SAVE'** button to save changes or '**CANCEL'** to return to the previous screen.

3.6 Logout

To logout:

1. Users can click on the Profile icon at the top right corner and then click '**LOGOUT'** option. Refer to Figure 44: Logout.

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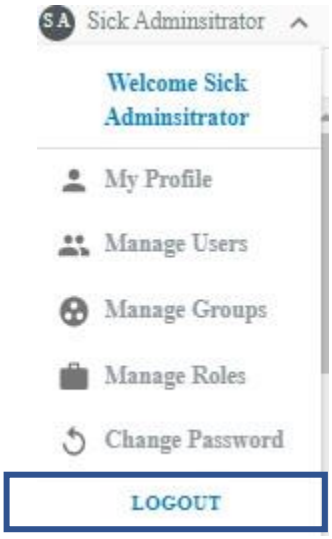

Figure 44: Logout

2 It displays Logout dialog box. Refer to Figure 45: Logout Dialog box.

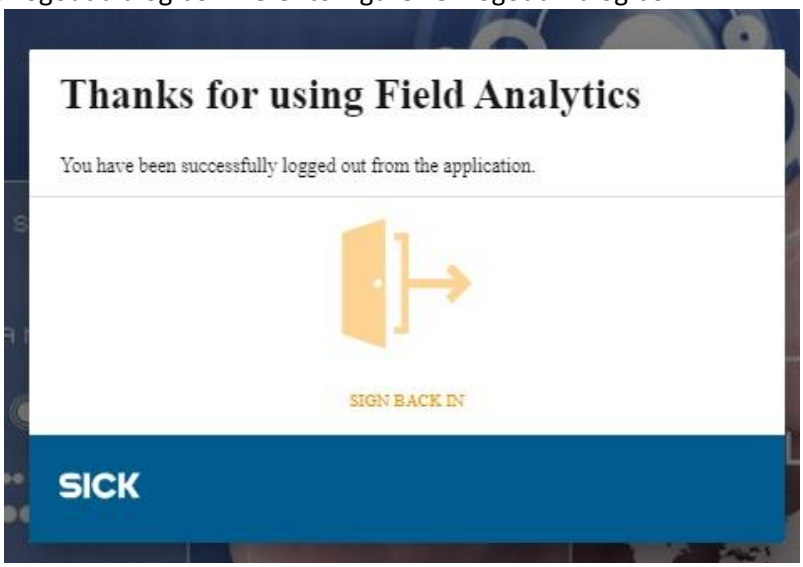

Figure 45: Logout Dialog box.

3 User will be logged out of the application with a link to Sign back.

3.7 Privileges

Field Analytics provides two default user groups, **administrator** and **operator1.** Refer to Table 1: Privileges.

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FA Privileges			
S. No.	**Module**	**Privilege**	**Privilege Description**
1	About Info	Show About Info	Gives ability to view version information about the application
2	Configuration	Create Configuration	Gives ability to create the widgets.
3		Show configuration	Displays configuration button in menu
4	Global Preference	Create Global Preference	Gives ability to create/publish Global preferences
5		Modify Global Preference	Ability to modify global preference
6		Delete Global Preference	Gives ability to delete global preference, like default language selection.
7	My Preference	Read my preferences	Gives ability to view preferences
8		Modify my preferences	Gives ability to modify preferences, like logged in user's language preference.
9	Global Setting	List Global Setting	Gives ability to show global application setting
10		Modify Global Setting	Gives ability to modify global setting
11	Global Settings	Read global settings	Gives ability to read global settings
12	Application Setting	List Application Setting	Gives ability to show application setting
13		Modify Application Setting	Gives ability to modify application setting
14	Logs	List logs	Gives ability to show logs
15		Download log files	Gives ability to download log files
16	Historian	View Historian	Gives ability to access historian page
17	Report	Create a Report	Gives ability to create report
18		Read Report	Gives ability to read data from data sources
19		View Report	Gives ability to see the list of saved historian report
20		Modify Report	Gives ability to update a historian report
21		Delete Report	Gives ability to delete a historian report
22	Profile	Edit Profile	Gives ability to edit profile
23	User	Create User	Gives ability to create user profile
24		List User	Gives ability to list all users (Except Super Admin)
25		Modify User	Gives ability to modify other user profile
26		Delete User	Gives ability to remove a user profile
27	Password	Reset Password	Gives ability to reset password for another user (Except Super Admin)
28	Group	Create Group	Gives ability to create new group(s)

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29		Modify Group	Gives ability to modify group(s)
30		Delete Group	Gives ability to permanently remove group(s) from database
31		List Group	Gives ability to get list of groups
32	Role	Create Role	Gives ability to create new role(s)
33		List Roles	Gives ability to list roles (Except Super User role)
34		Modify Role	Gives ability to modify an existing role(s)
35		Delete Role	Gives ability to permanently remove role(s) from database
36	Dashboard	Create Dashboard	Gives ability to create dashboard
37		Rename Dashboard	Gives ability to rename dashboard
38		Delete Dashboard	Gives ability to delete dashboard
39		Share Dashboard with Users	Gives ability to share dashboard with specific users
40		Share Dashboard with All	Gives ability to share dashboard with all users
41		Un-Share Dashboard with Users	Gives ability to un-share dashboard with specific users
42		Un-Share Dashboard with All	Gives ability to un-share dashboard with all users
43		Copy/Clone a Dashboard	Gives ability to copy/clone dashboard
44		Import Dashboard	Gives ability to import dashboard
45		Export Dashboard	Gives ability export dashboard
46	Widget	Create a Widget	Gives ability to create a widget
47		Delete Widget	Gives ability to delete widget
48		Edit Widget	Gives ability to edit widget
49		Move Widget	Gives ability to move widget
50		Resize Widget	Gives ability to resize widget
51	Data source	Create Data Source	Gives ability to create data source
52		Read Data Source	Gives ability to read data from data sources
53		View Data Source	Gives ability to see the list of data sources
54		Update Data Source	Gives ability to update data sources
55		Delete Data Source	Gives ability to delete data sources
56	Authentication	Show Authentication	Displayed Authentication setting on the Configuration page
57	Node RED		Gives ability to view or edit Node RED. View will give read-only abilities

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			whereas edit will allow users to create, modify and delete nodes of Node RED.

Table 1: Privileges

4 Full Screen Icon

To view the application in full screen mode, click the full screen icon on the home page.

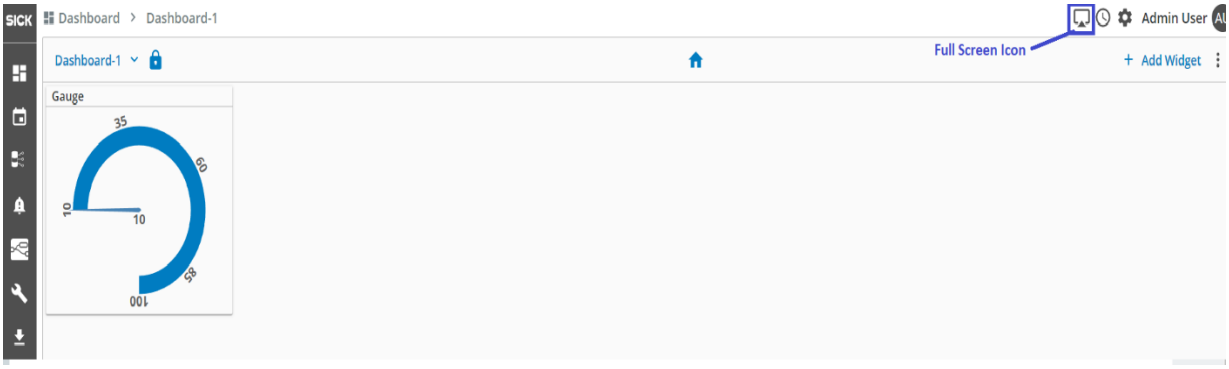

Figure 46: Full Screen Icon

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5 Server Date and Time

To view the information related to server date and time, click the server date and time icon on the home page.

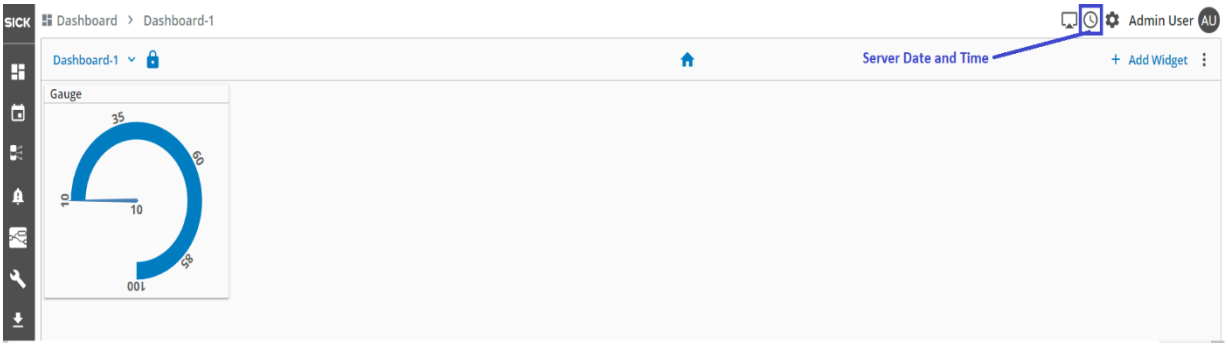

Figure 47: Server Time and Date Icon

Server Date and Time Information box appears.

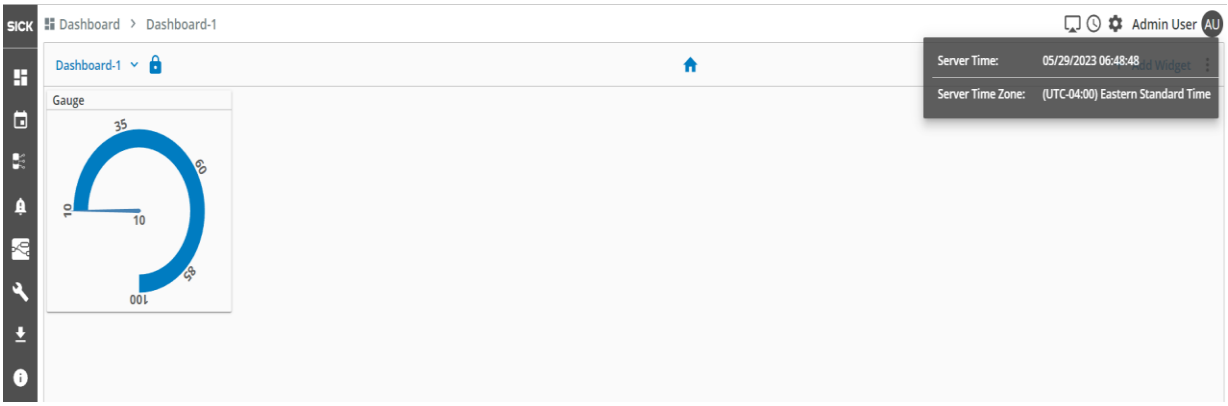

Figure 48: Server Date and Time Information Box

6 Theme Customization

User can customize the theme of the application by clicking on theme customization icon on the home page.

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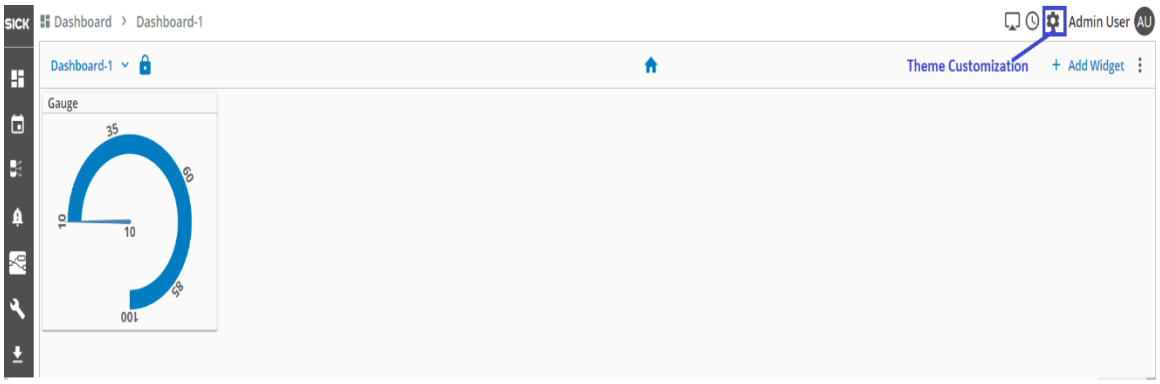

Figure 49: Theme Customization Icon

Theme customization window appears with theme mode, color scheme and font family options. User can select the desired options to customize the theme of the application.

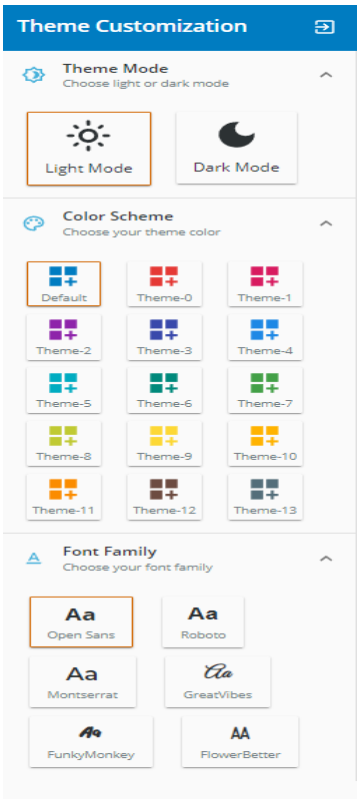

Figure 50: Theme Customization Options

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7 Configuration

Users can configure Language, Region, License, and Registration from the Configuration page.

Please follow the steps below to navigate to the **Configuration** page:

1. On the home page, click on the configuration icon in the left-hand navigation bar. Refer to Figure 51: Configuration icon.

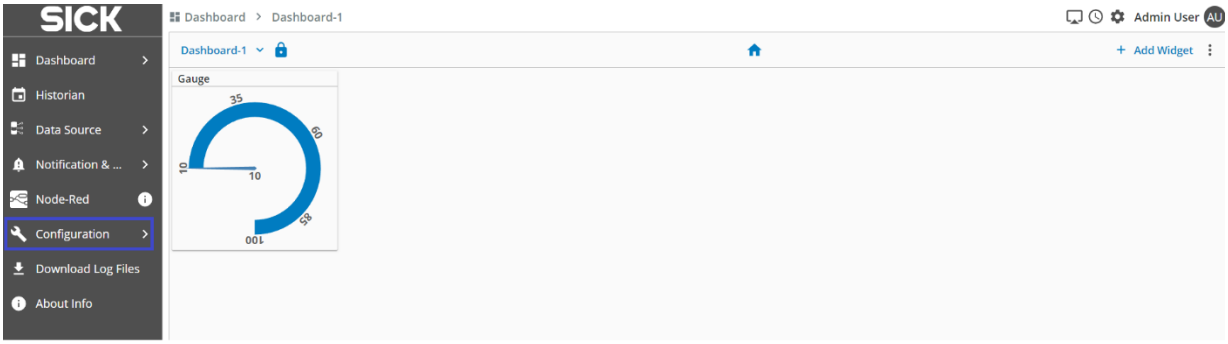

Figure 51: Configuration icon

2. It will navigate to the **Configuration** page and display the following sections on the page. Refer to Figure 52: Configuration Page.

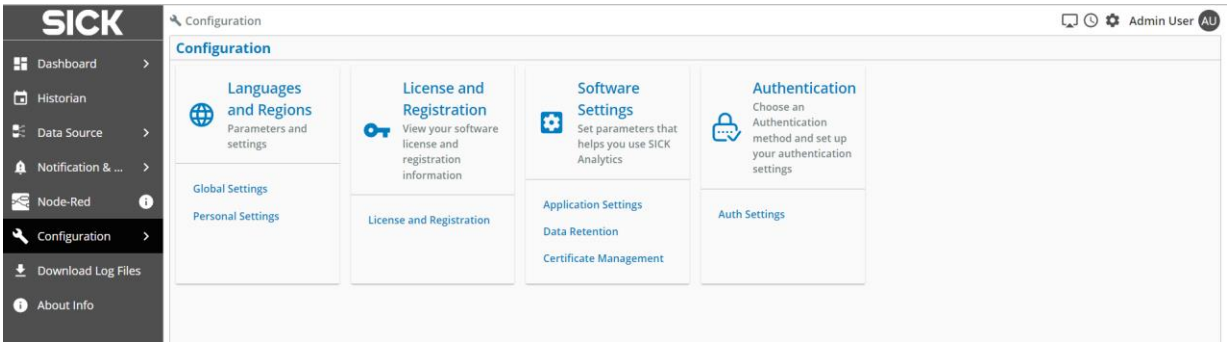

Figure 52: Configuration Page

a. Language and Regions
b. License and Registration
c. Software Settings
d. Authentication

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7.1 License & Registration

7.1.1 Field Analytics License

1. When logged into Field Analytics select, "**Apply License**" on the license configuration page. Refer to Figure 53: License Configuration Page.

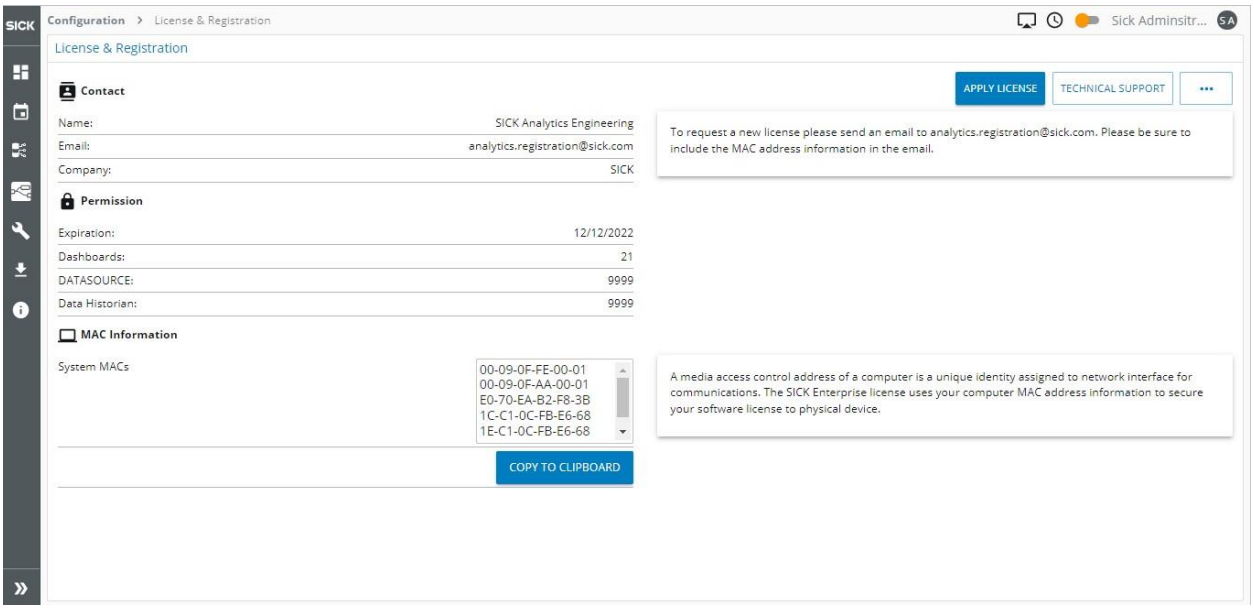

Figure 53: License Configuration Page

Field Analytics allows users to personalize their experience with a few parameters and settings according to their geographical location and personal needs.

7.2 Languages and Registration

7.2.1 Global Language Settings

This option allows the Administrator to configure settings, related to Locale, Date format, and Time format:

1. On the Configuration page, click on the '**Global Settings'** link under the '**Languages and Regions'** section. Refer to Figure 54: Languages and Regions Settings.

Figure 54: Languages and Regions Settings

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2. It will navigate user to **Global Settings** page. Refer to Figure 55: Global Settings.

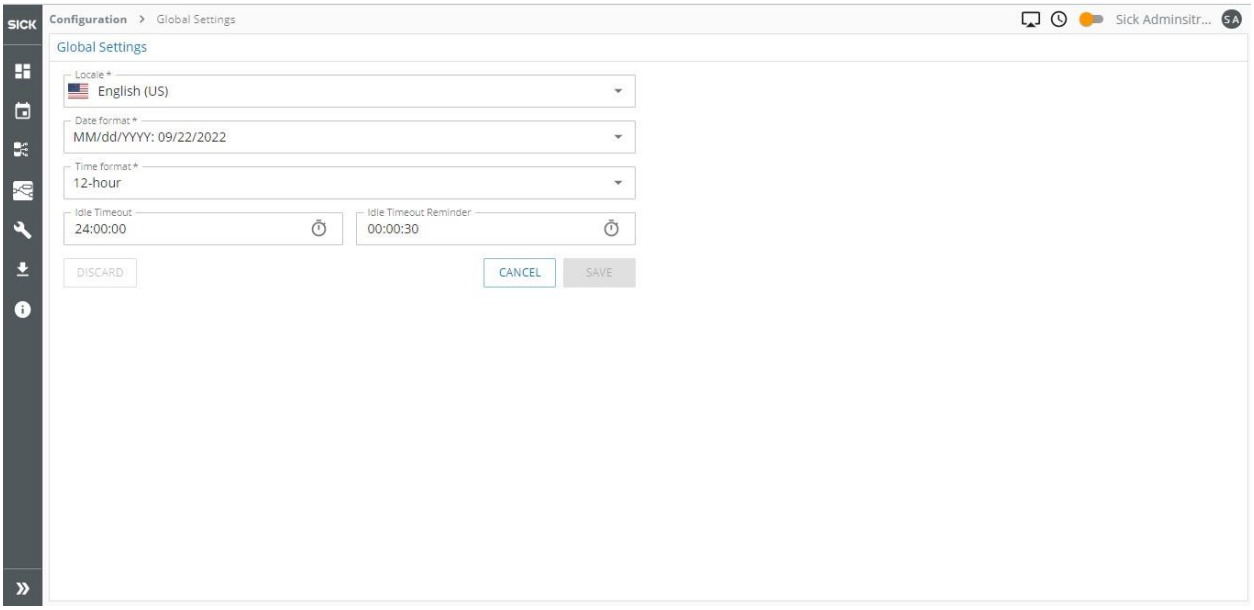

Figure 55: Global Settings

3. Update the **Language Preference** as desired, using the drop-down, as per your language. Refer to Figure 56: Languages.

Supported Languages	Chinese, Chinese, Czech, Danish, Dutch, English (US), Finnish, French, German, Italian, Japanese, Korean, Polish, Portuguese, Russian, Spanish, Swedish, Turkish

Figure 56: Languages

4. Update the '**Date format'** if required, using the drop-down, as per your preference.
5. Update the '**Time format'** if required, using the drop-down, as per your preference.
6. Users can set **Idle Timeout** for logging out and can set Reminder.
7. In case the changes need to be reset to the previous state, please click on '**RESET'** button.
8. Click on the '**SAVE'** button to save the changes.
9. Field Analytics will display the following message at the bottom of the screen to confirm that the changes have been saved: Refer to Figure 57: Confirmation Message.

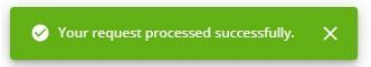

Figure 57: Confirmation Message

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7.2.2 Personal Settings

This option allows users to personalize changes related to Locale, Date format, and Time format for their profiles only and not for the complete group:

1. On the Configuration page, click on **Personal Settings**. Refer to Figure 58: Personal Settings.

Figure 58: Personal Settings

2. It will navigate the user to the **Personal Settings** page. Refer to Figure 59: Personal Settings.

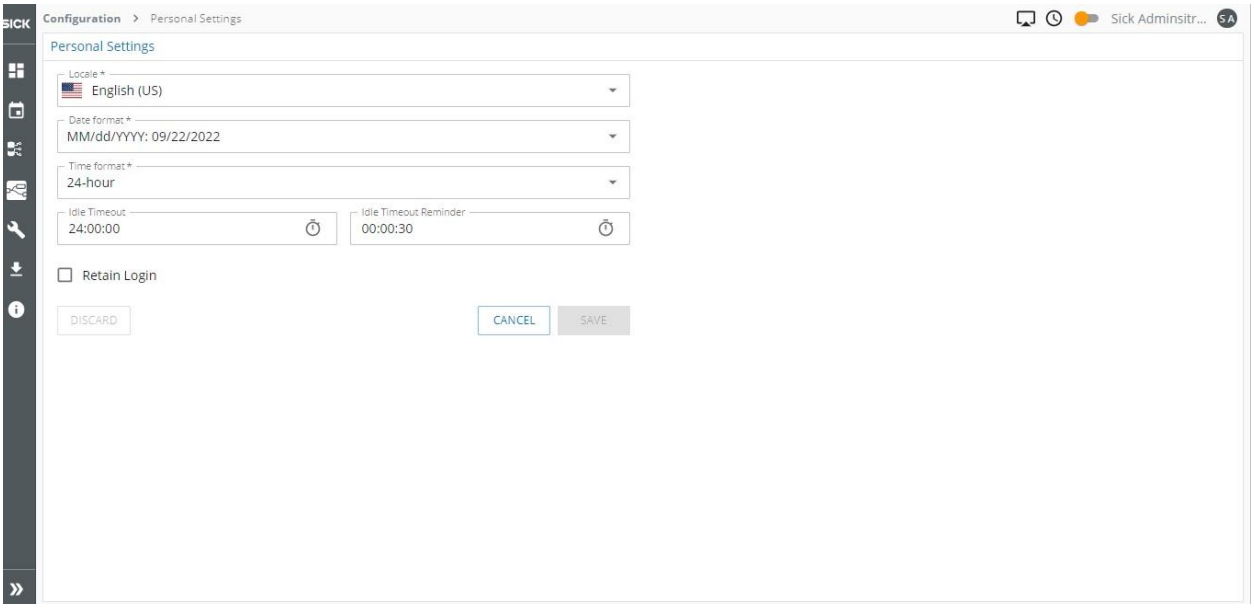

Figure 59: Personal Settings

3. Update the **Language, Date and Time format Preference** and set **Idle Timeout** to the user preferences.
4. By clicking on '**Retain Login'** you will allow field Analytics to keep the application dashboard running on the browser without logging out. This is particularly useful when dashboards are projected on a TV or monitors.

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5. In case the changes need to be reset to the previous state, please click on '**RESET'** button.
6. Click on '**SAVE'** button to save any changes.
7. Field Analytics will display following message at the bottom of the screen to confirm that the changes have been saved: Refer to Figure 60: Confirmation Message.

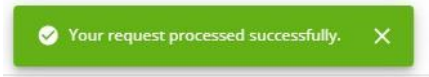

Figure 60: Confirmation Message

Note: Global settings will set the settings at the Field Analytics level, but personal level settings are user-specific and always overrides the global settings.

7.3 Software Settings

This feature allows users to configure a few settings related to the application, data retention and Certificate Management.

Refer to Figure 61: Software Settings.

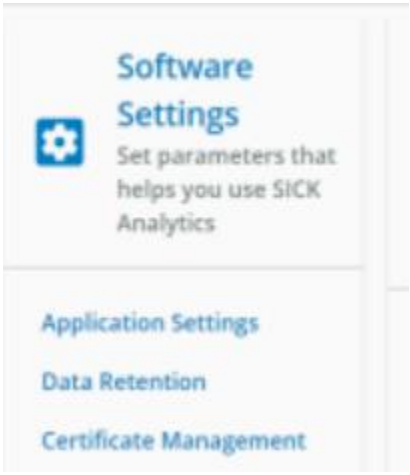

Figure 61: Software Settings

7.3.1 Application Settings

This feature enables users to change settings related to different parameters. For example, Field Analytics timeout, username max/min length, etc. Refer to Figure 62: Application Settings.

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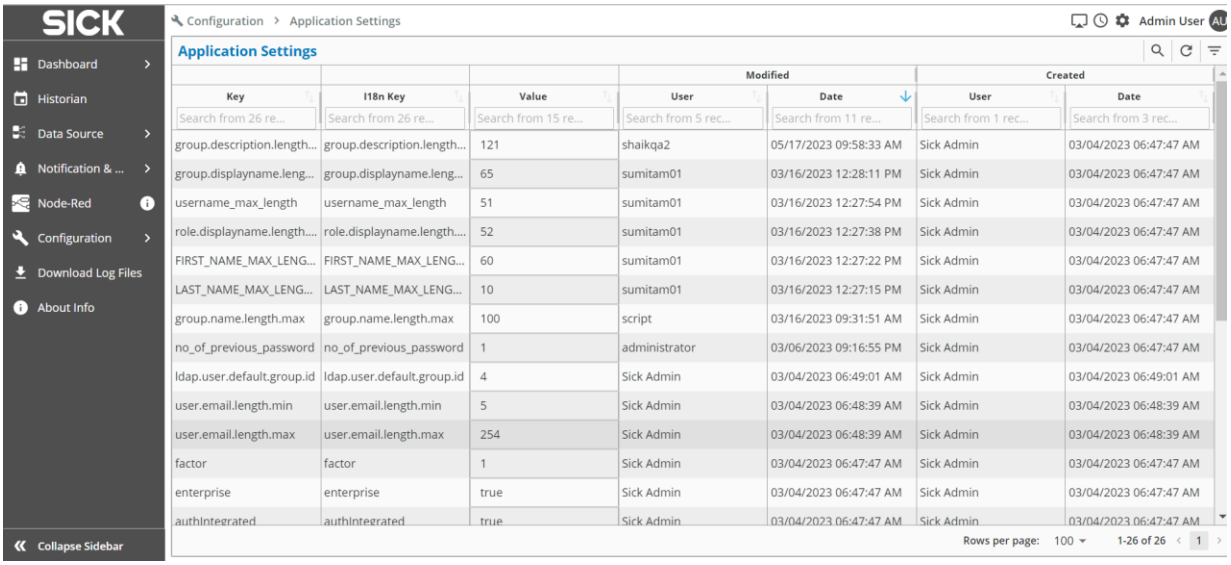

Figure 62: Application Settings

7.3.2 Data Retention

The data retention option allows the Administrator or other user-defined roles with appropriate privileges to configure the number of days Historian data parameters shall be retained within Field Analytics. If the frequency is set to 60 days, then on the 61st day the data of the 1st day will be deleted, and Field Analytics will start storing data of the 61st day. The data retention policy is based on FIFO (First in First out). Refer to Figure 63: Data Retention.

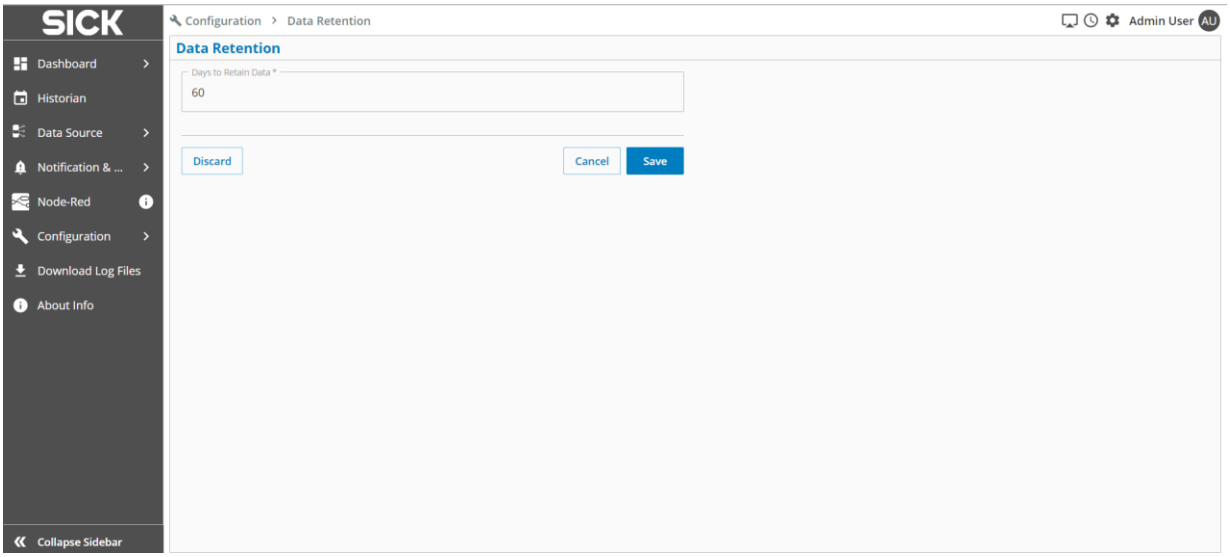

Figure 63: Data Retention

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7.3.3 Certificate Management

Certificate management helps the communication between client and server operating encrypted and secure.

From **Configuration** Screen, select **Certificate Management** under **Software Settings**. Click Add icon in the Certification Management screen.

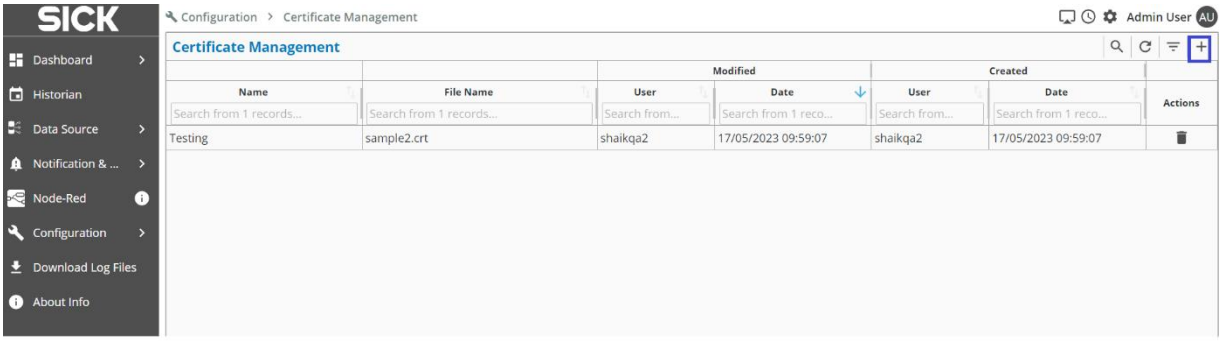

Figure 64: Add Icon

Upload Certificate window appears.

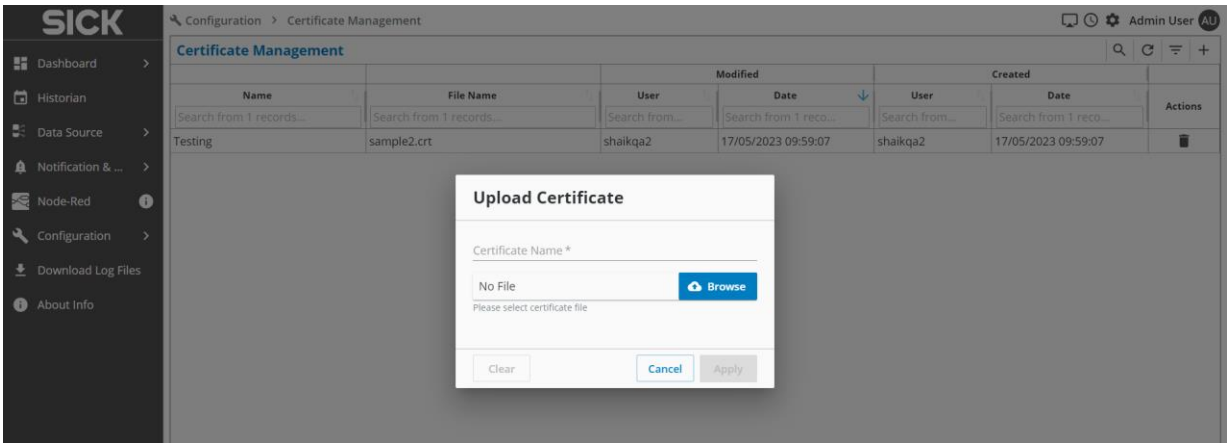

Figure 65: Upload Certificate

In Upload Certificate window, Enter **Certificate Name,** click the **Browse** button and select the certificate to be uploaded. Click the **Apply** button to upload the certificate. The uploaded certificate information is displayed in the certificate management table.

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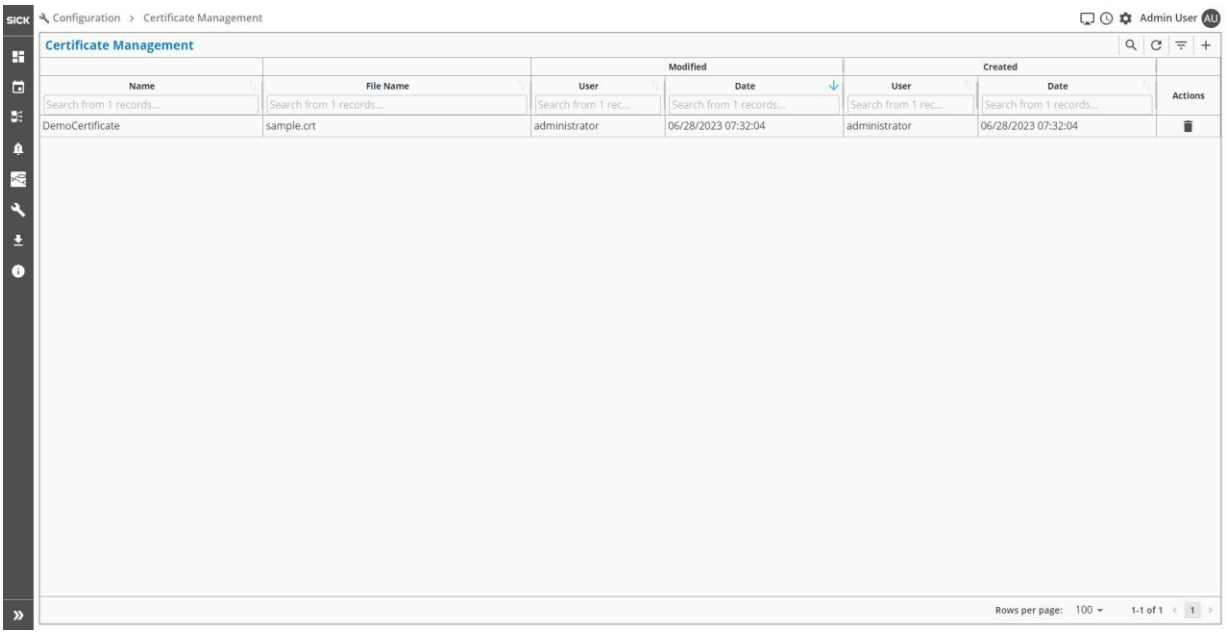

Figure 66: Certificate Management Table

7.4 Authentication

"**Auth settings**" allow you to choose authentication and authorization settings. Field Analytics allows customers the flexibility to either use the onboard/native authorization and authentication credentials or more seamless integration into the hosted IT environment by selecting the Open LDAP or Active Directory Login mechanism.

Note:

Authentication Provider Settings page is only available for the logged-in Users having appropriate permissions.

If you are not logged in or do not have permission, you won't be able to access this page.

If there is a Microsoft Active Directory group created and the same group is created in Field Analytics then upon using LDAP, those users will be assigned to the default groups on Field Analytics and from there, privileges are already assigned or can be modified.

If Active directory authentication is enabled, the Manage User fields will be disabled.

7.4.1 Overview

To change the authentication provider:

1. Click on '**Auth Settings'** option present under the '**Authentication'** section. Refer to Figure 67: Authentication Settings.

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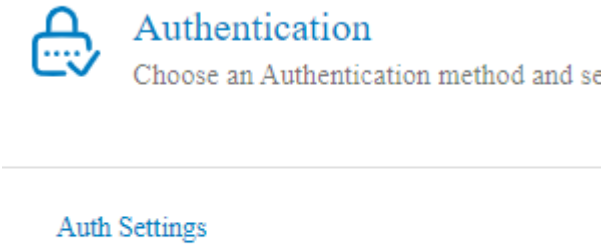

Figure 67: Authentication Settings

2. Field Analytics will navigate the user to the '**Authentication'** page. Refer to Figure 68: Authentication Provider.

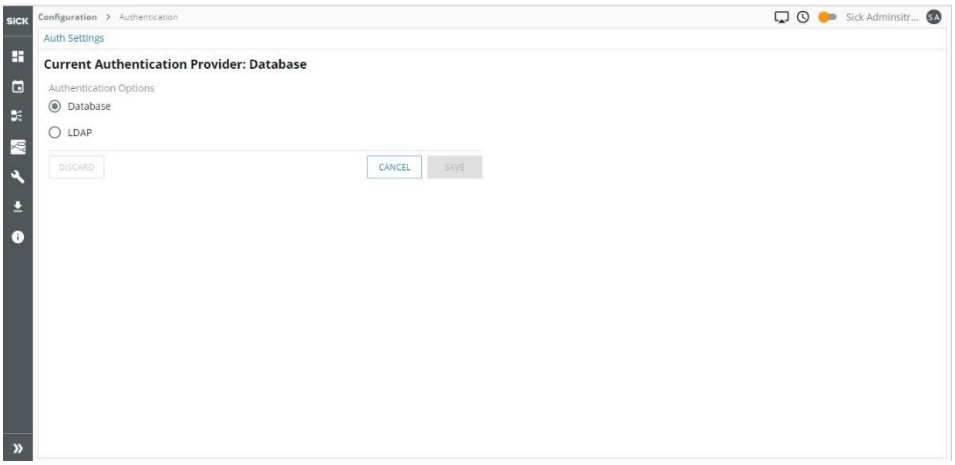

Figure 68: Authentication Provider

3. The authentication options LDAP and Database (Field Analytics managed users) are displayed on the left-hand side of the page.
4. The Field Analytics authorization and authentication method is selected by default.

7.4.2 Switch to Active Directory Authentication

1. Select the LDAP radio button from the left-hand side. Refer to Figure 69: Active Directory.

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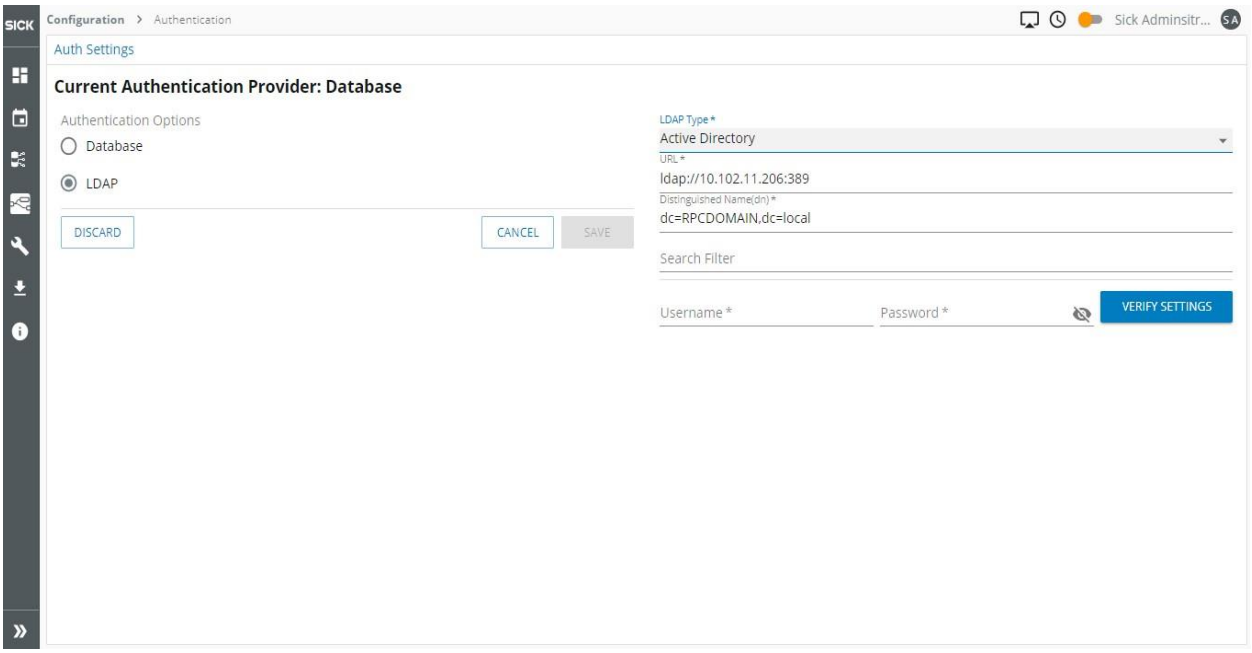

2. Select the Active Directory option from the '**LDAP**' Type drop-down. Refer to Figure 69: Active Directory.

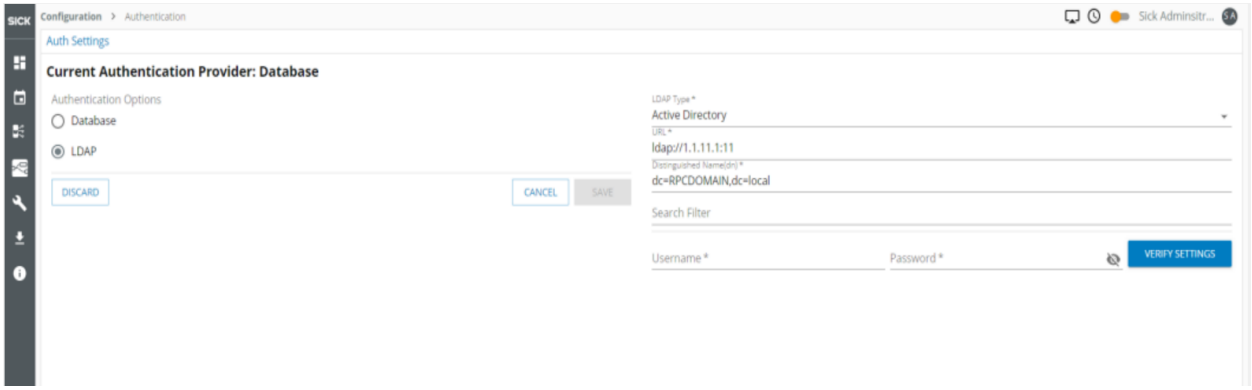

Figure 69: Active Directory

3. Enter the URL of the Active Directory server.
4. Enter Distinguished Name, Username, and Password.
5. Enter '**Search Filter'** if you want to select users which are within the requested scope of DN i.e., Distinguished Name.
6. Click on the '**Verify Settings'** button

.

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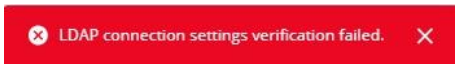
7. If all the values entered are valid, clicking on the **'Verify Settings'** button will display a snack bar message **'LDAP Connection is successful'** and the '**SAVE**' button will be enabled.

8. If any of the fields is incorrect, the connection will be failed, and a proper snack bar message will be displayed.



9. Click on '**SAVE'** button.

10. These settings will take effect only when the SICK Field Analytics windows services are restarted, or the computer is restarted. A message in red will be displayed at the top of the page unless you restart the application services. Refer to Figure 70: Service Restart Required.

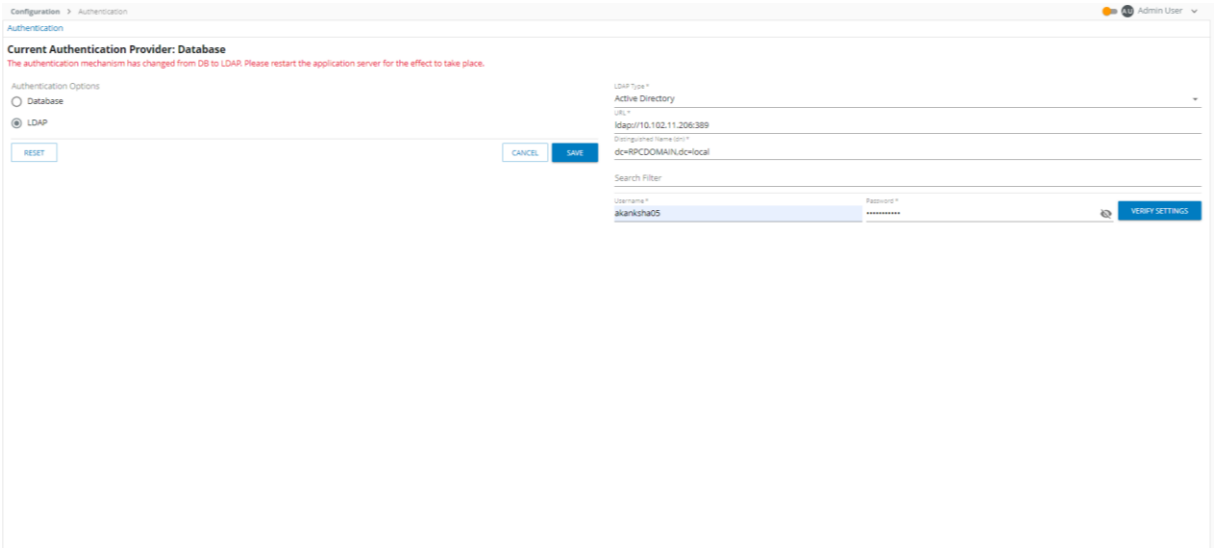


Figure 70: Service Restart Required

11. Once you restart the SICK Field Analytics windows services, you will be able to log in an application using your Active Directory Credentials. Also, the message in red will disappear. Refer to Troubleshooting Section.

12. If the AD group already exists in Field Analytics, the newly logged-in user will be added to that AD group. If the AD group does not exist user will be added to the default group.

    Note: When creating groups within Field Analytics to link customer AD, if the AD group already has been created or exists within Field Analytics, the newly logged-in AD user will be added to

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this same group name within Field Analytics. If that group does not exist, the user will be assigned to the pre-defined default group within Field Analytics.

7.4.3 Switch to Open LDAP Authentication

1. Select the LDAP radio button from the left-hand side.
2. Select OpenLDAP option from the 'LDAP Type' dropdown. Refer to Figure 71: Open LDAP.

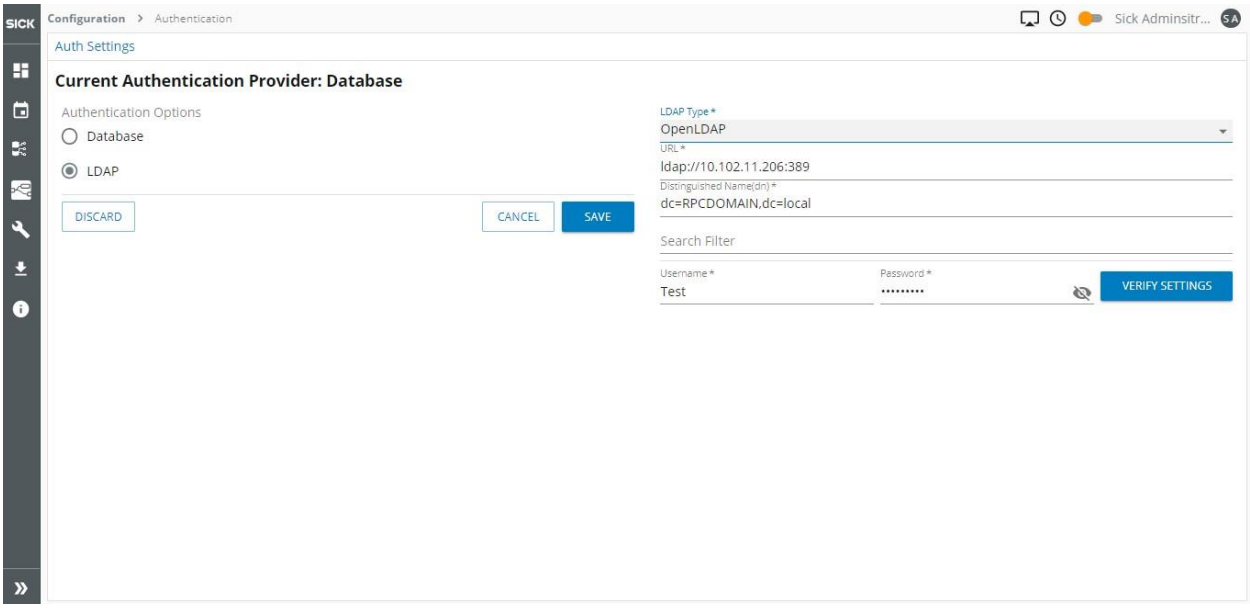
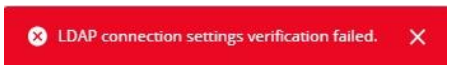


Figure 71: Open LDAP

3. Enter the URL of the OpenLDAP Server.
4. Enter Distinguished Name, Username, and Password.
5. Enter '**Search Filter'** if you want to select users which are within the requested scope of Distinguished Name.
6. Click on the '**Verify Settings'** button

.
7. If all the values entered are valid, clicking on the '**Verify Settings'** button will display a snack bar message '**LDAP Connection is successful'** and the '**SAVE**' button will be enabled.
8. If any of the fields is incorrect, the connection will be failed, and a proper snack bar message will be displayed.



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9. Click on **'SAVE'** button.
10. These settings will take effect only when the services are restarted. A message in red will be displayed at the top of the page unless you restart the services. Refer to Troubleshooting section for more details.
11. Once you restart the services, you will be able to log in to the application using '**OpenLDAP'** Credentials. Also, the message in red will disappear.

7.4.4 Switch back to Database Authentication

1. Select the Database radio button from the right-hand side. Refer to Figure 72: Database.
2. Field Analytics will display the current Database Settings by default filled in. Editing is disabled and you cannot modify the DB settings.

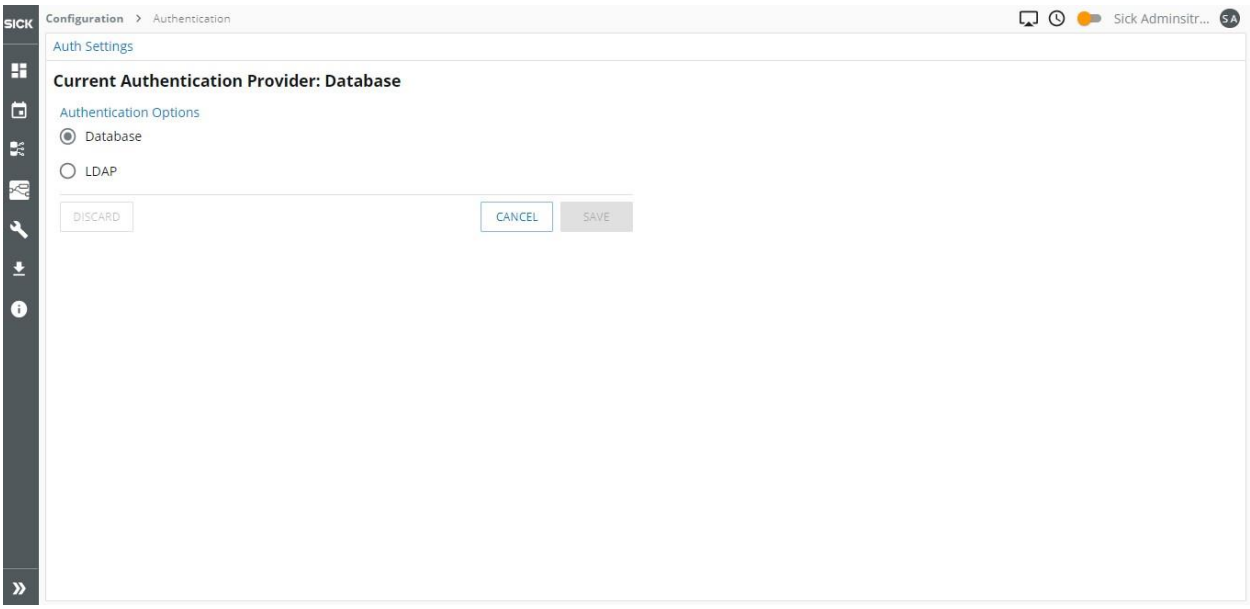

Figure 72: Database

3. Click on the '**SAVE**' button.
4. Clicking on the **'CANCEL'** button will close the **Auth Setting** page.
5. Click on the '**OK**' button. The changes will be saved.
6. These settings will take effect only when the services are restarted. A message in red will be displayed at the top of the page unless you restart the SICK Field Analytics windows services. Please refer Troubleshooting section for steps to restart windows services. Refer to Figure 73: Changes saved and Service Restart Required.

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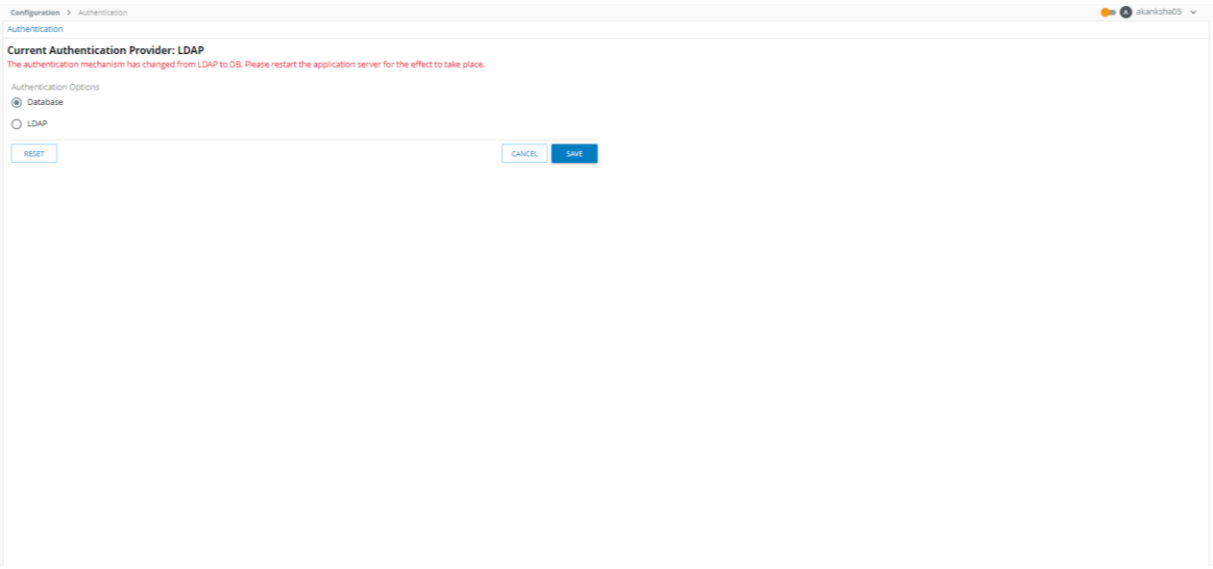

Figure 73: Changes saved and Service Restart Required

1. Once you restart the services, you will be able to log in to the application using your Database Credentials. Also, the message in red will disappear.

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8 Dashboard

Dashboards are a visual representation of all information (to keep track of production, quality, system health etc.) that can be represented by customizable widgets to track, process, and display relevant data as per user needs. Dashboards are designed to provide data visualizing.

User can View, Create, Rename, Delete, Clone, Share, Import and Export dashboards project based on user privileges. Many dashboards can be setup on a single instance of Field Analytics to view different types of information (Key Performance Indicators KPI's).

Note: Dashboards can be customized per user or group of users within Field Analytics to reduce complex data collection into simple, accessible information to improve efficiency.

8.1 Create Dashboard

Note: Only users with associated privileges can create dashboard.

To create a new Dashboard:

1. Add dashboard tab is used to create a new dashboard Refer to Figure 74: Dashboard.

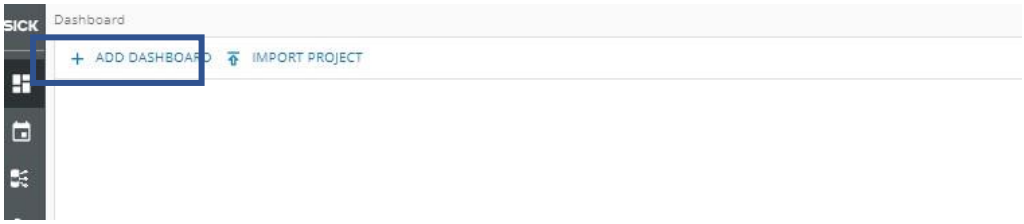

Figure 74: Dashboard

2. A dialog box appears with the following fields Refer to Figure 5.2: Add New Dashboard.
   - **Dashboard Name:** User can change default name and provide a new name.
   - **Set Linked URL:** Enable and link external URL web pages/application within dashboard.
   - **Reset:** Used to reset the dashboard name and URL.
   - **Cancel:** To cancel the created dashboard.
   - **Save:** To save a new dashboard.

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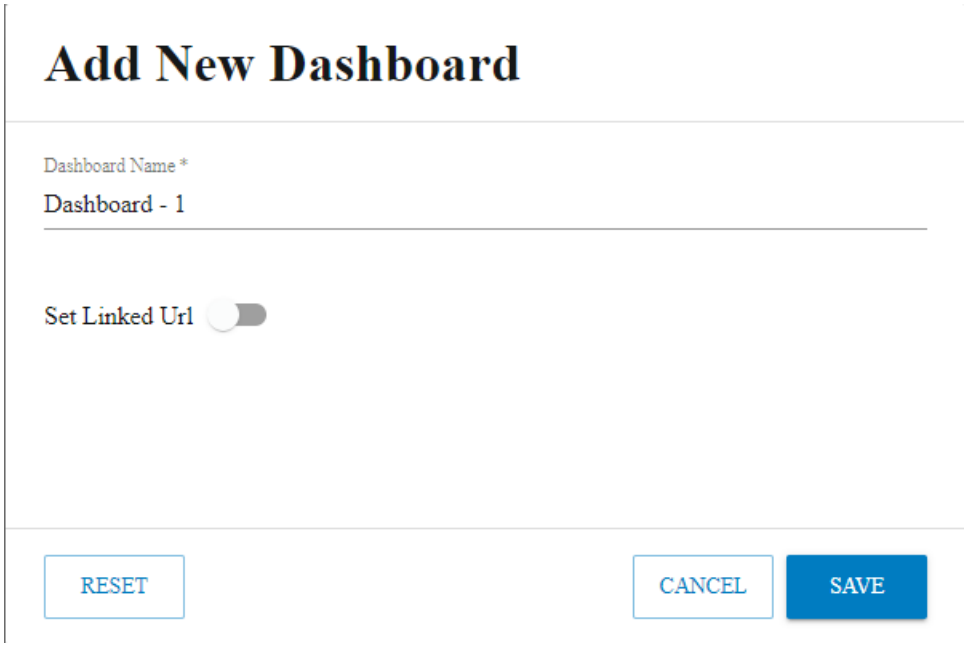

Figure 75: Add New Dashboard

3. It will navigate to the new dashboard page. Refer to Figure 76: New Dashboard.

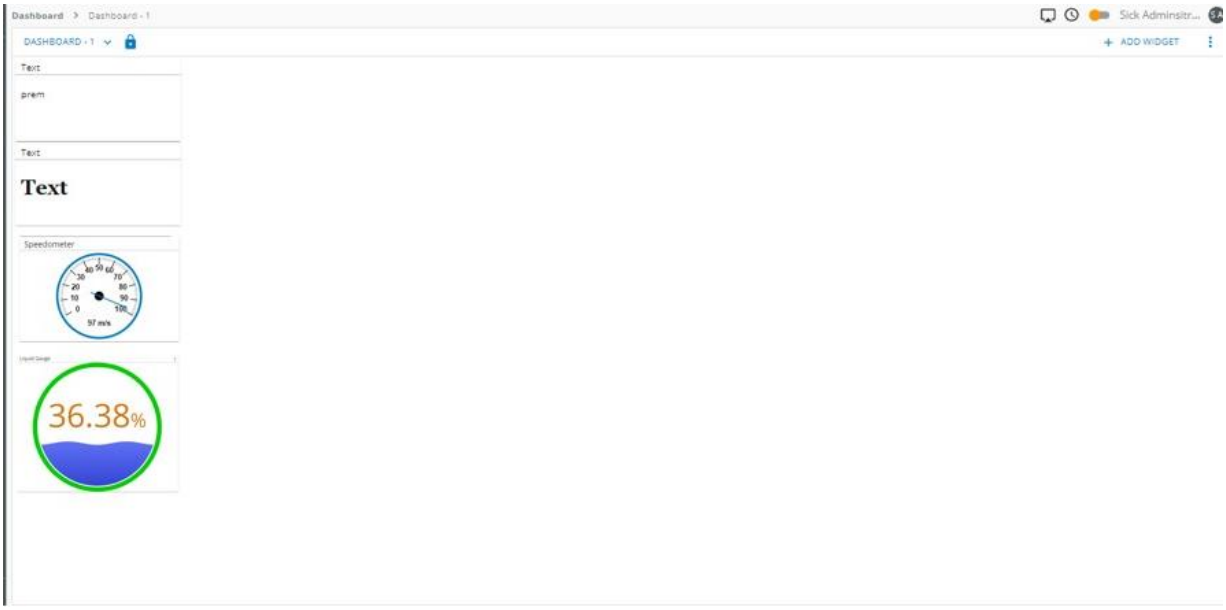

Figure 76: New Dashboard

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4. Once new Dashboard is created, click on Add Background image where we can see it in top right-hand side.

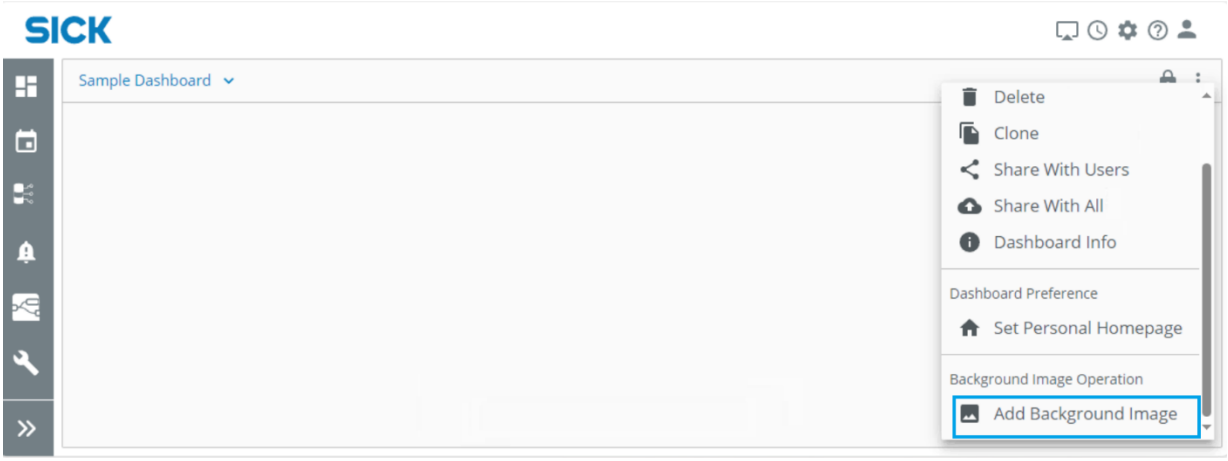

Figure 81: Background Image

5. Upon clicking "Add Background Image," the user is able to browse and drop any image from their PC or laptop into the window below.

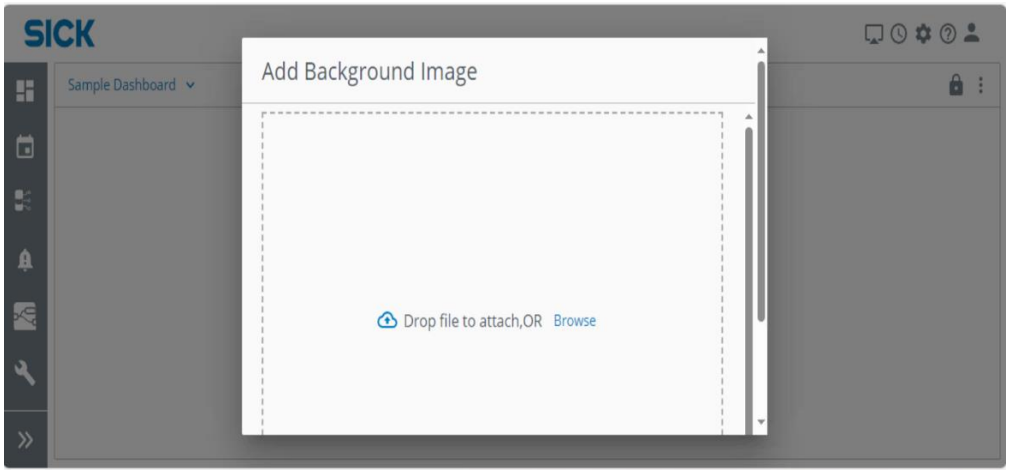

Figure 82: Add Background Image

6. User can add another Dashboard, click on the dashboard name at top-left corner and click on **+ Add Dashboard** option. Refer to Figure 83: Add Dashboards.

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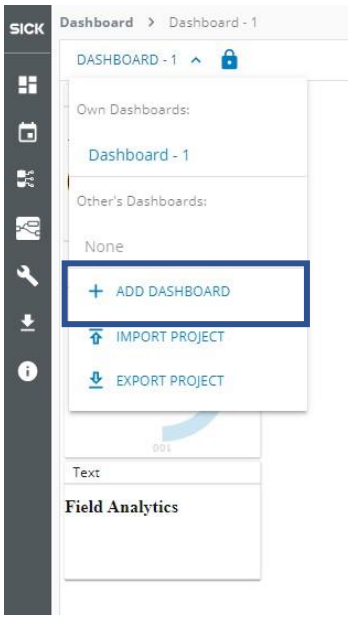

Figure 83: Add Dashboards

8.2 Renaming Dashboard

Note: Only users with associated privileges can rename already created dashboards.

To rename a Dashboard:

1. User can click on vertical ellipsis icon at top-right corner. Refer to Figure 84: Rename Dashboard.

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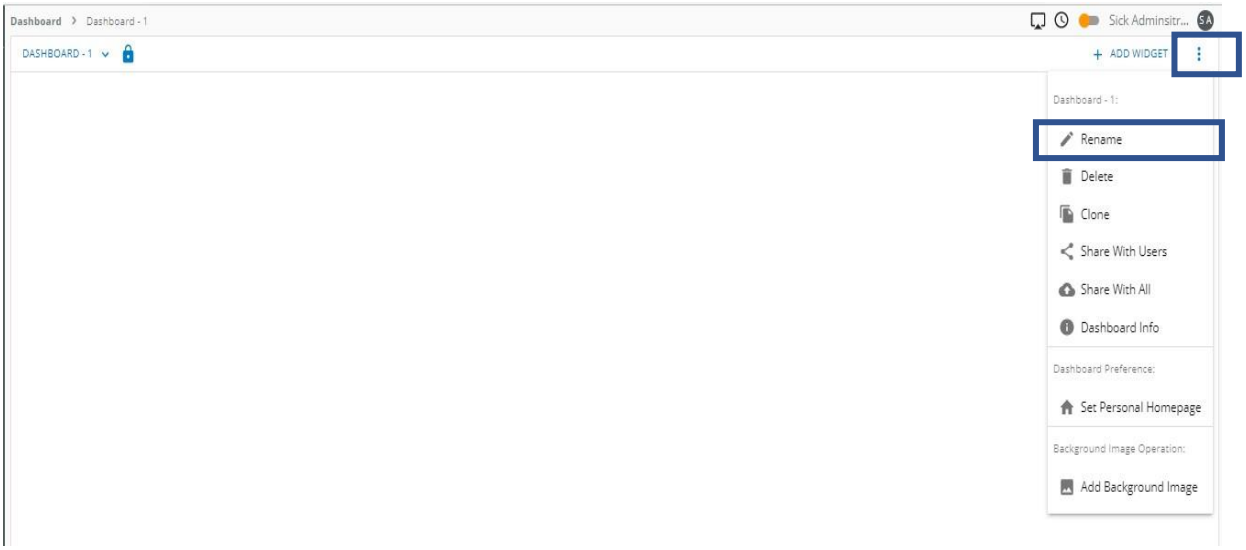

Figure 84: Rename Dashboard

2. Click on '**Rename'** option.
3. Field Analytics will open '**Rename Dashboard'** dialog box.
4. Enter any custom name in '**Dashboard Name'** textbox. Refer to Figure 85: New Dashboard Name.

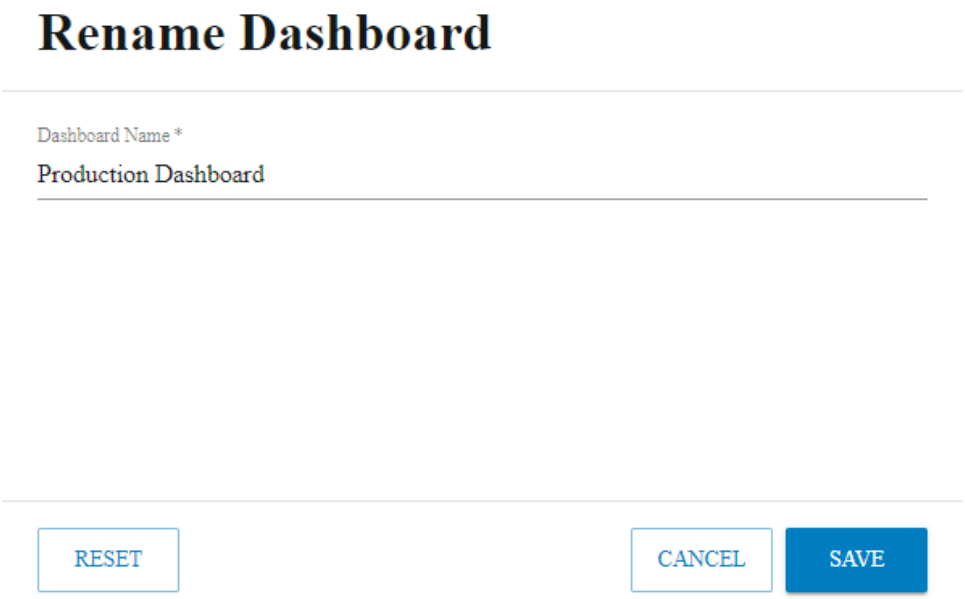

Figure 85: New Dashboard Name

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5. Click on '**SAVE'** button to save changes.
6. Updated name of the dashboard will display at top-left corner. Refer to Figure 86: Dashboard Name.

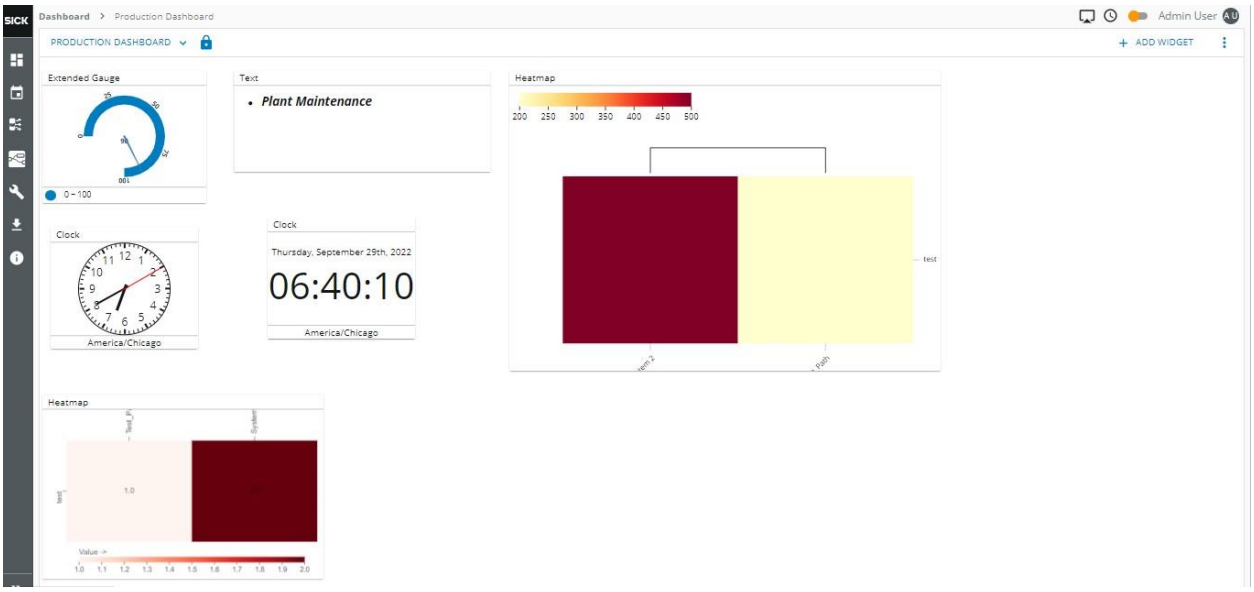

Figure 86: Dashboard Name

8.3 Clone a Dashboard

Cloning a custom dashboard is useful if the user wants to create a new dashboard that is based on the details of an existing dashboard. The cloned dashboard will have all the rules and data bindings of existing dashboard.

Note: Only users with associated privileges can clone dashboard.

To clone an existing Dashboard:

1. User can click on vertical ellipsis icon at top-right corner and select clone option. Refer to Figure 87: Cloning Dashboard.

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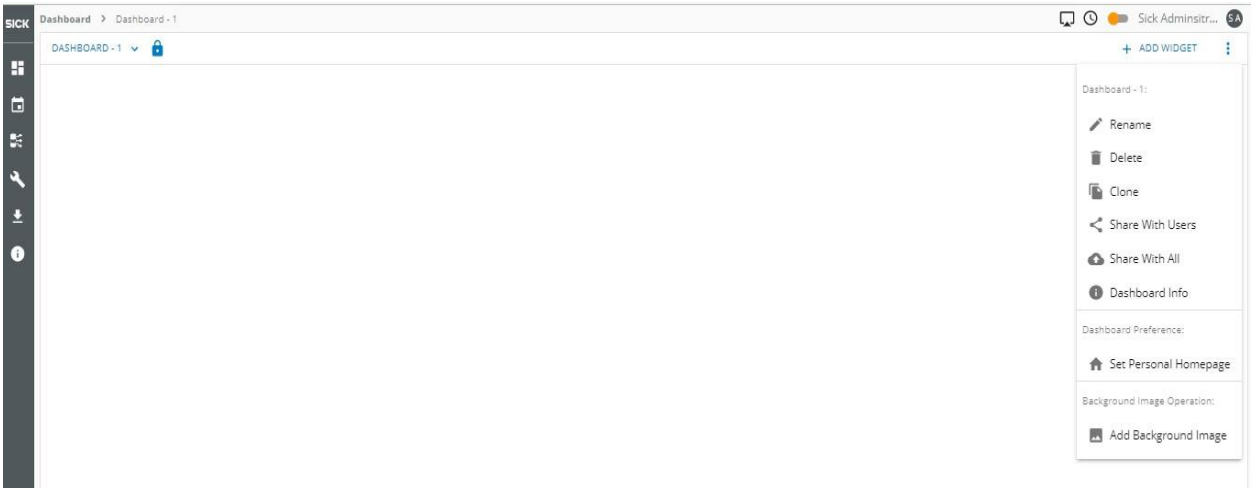

Figure 87: Cloning Dashboard

2. Field Analytics will open **Clone Dashboard** dialog box. Refer to Figure 88: Confirm Cloning.

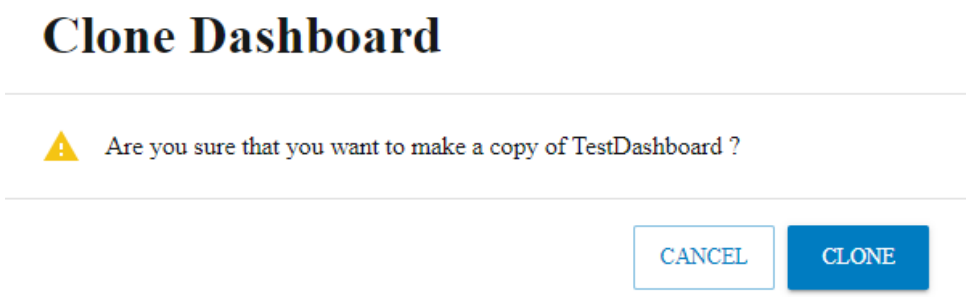

Figure 88: Confirm Cloning

3. Click on '**CLONE'** button.
4. Field Analytics will create a new dashboard.
5. The name of the new dashboard will be the same as dashboard that it is cloned from, having **(Clone)** appended at the end it. Refer to Figure 77: Cloned Dashboard.

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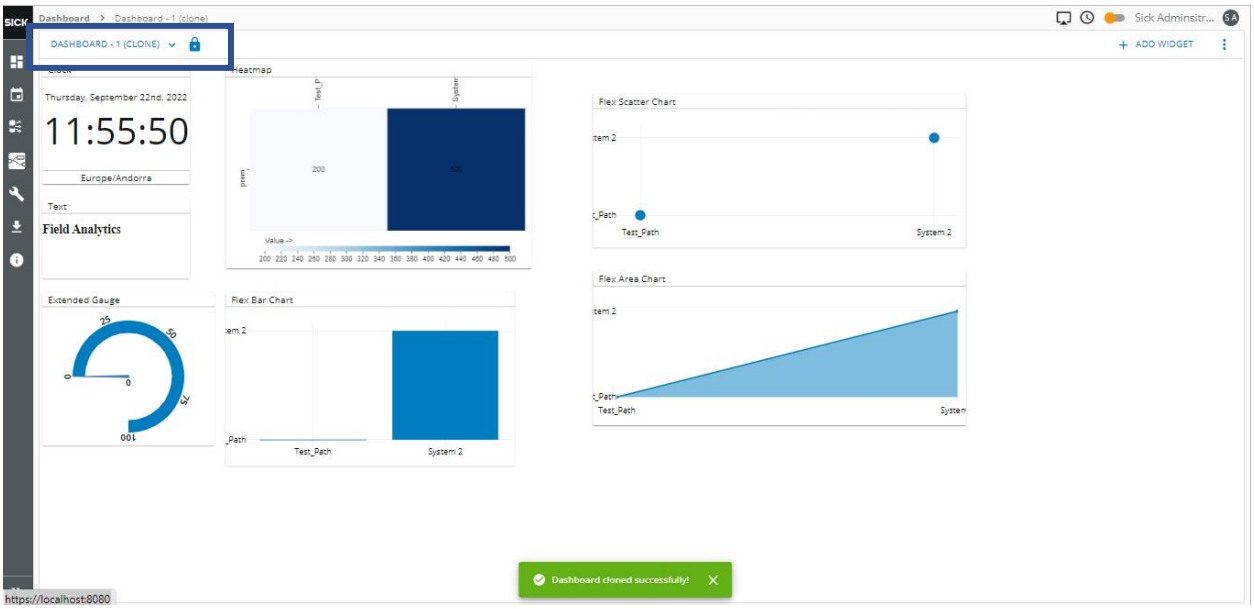

Figure 77: Cloned Dashboard

8.4 Delete a Dashboard

Note: Only users with associated privileges can delete dashboards.

To delete an existing Dashboard:

1. User can click on vertical ellipsis icon at top-right corner. Refer to Figure 90: Deleting Dashboard.

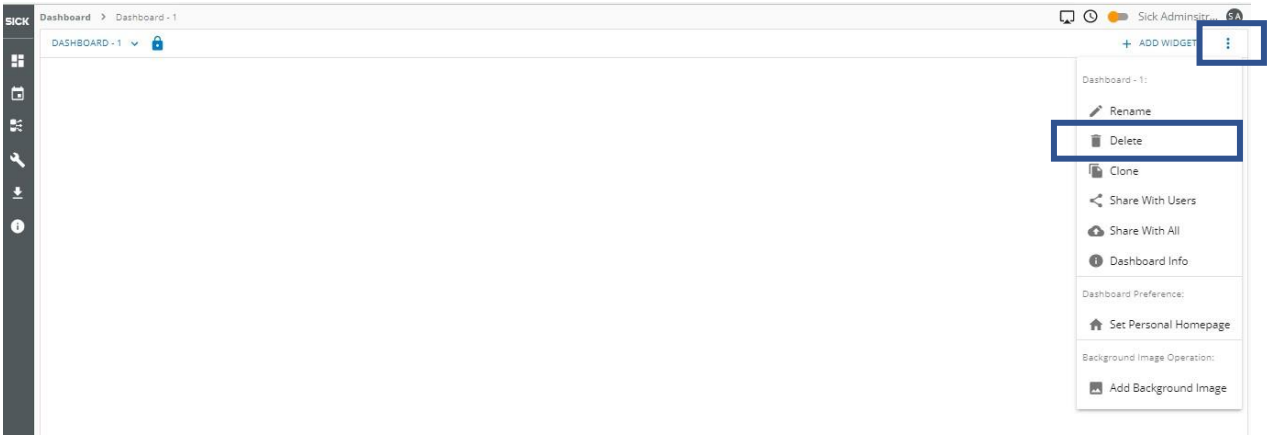

Figure 90: Deleting Dashboard

2. Click on **Delete** option.

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3. Field Analytics will open **Delete Dashboard** dialog box. Refer to Figure 781: Confirm Delete.

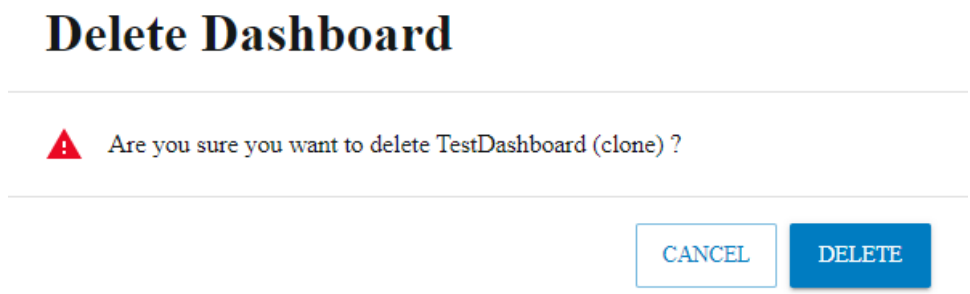

Figure 781: Confirm Delete

4. User can click on '**DELETE'** button to delete the dashboard.

8.5 Share Dashboard with Users

Dashboards can be shared with different user accounts that have been previously setup in the application. Any user who is not the creator but has access to the shared dashboard, can view but cannot configure.

Note: Only users with associated privileges can share dashboards.

To share Dashboard with user groups:

1. User can click on vertical ellipsis icon at top-right corner. Refer to Figure 92: Sharing Dashboard.

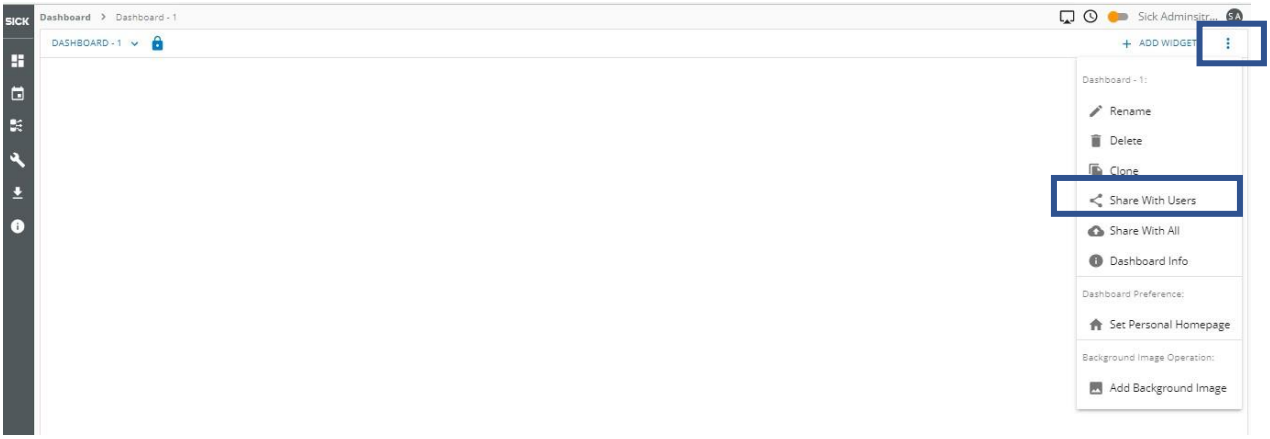

Figure 92: Sharing Dashboard

2. User can click on **Share with Users** option. Refer to Figure 79: Select User List.

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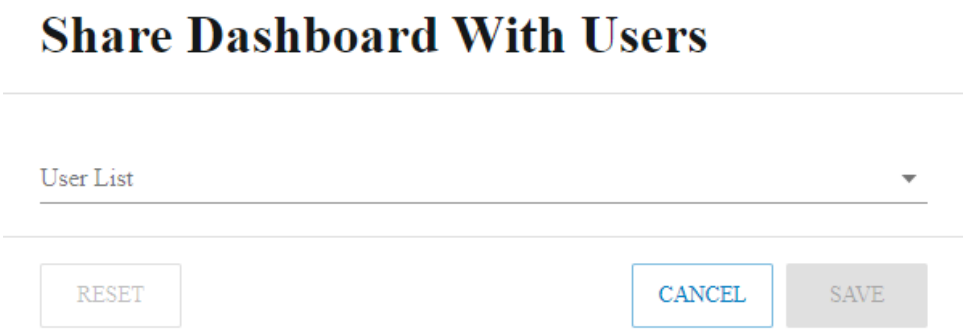

Figure 79: Select User List

3. Select from the list of users(s).
4. Click on '**SAVE'** button.
5. Field Analytics will save the sharing preferences.

8.6 Update Dashboard Sharing Preferences

Note: Only users with associated privileges can update sharing preferences of dashboards.

To update the Dashboard sharing permissions:

1. User can click on vertical ellipsis icon at top-right corner.
2. User can click on '**Edit Share'** option to select the desired user group.
3. Click on '**SAVE'** button.
4. Field Analytics will save the updated sharing preferences.

8.7 Unshare With All

Note: Only users with associated privileges can unshare dashboards with other user groups.

To unshare the Dashboard with all user groups:

1. User can click on vertical ellipsis icon at top-right corner.
2. User can click on **Unshare With All** option.
3. Field Analytics will open **Unshare With All** dialog box. Refer to Figure 80: Confirm Unshare.

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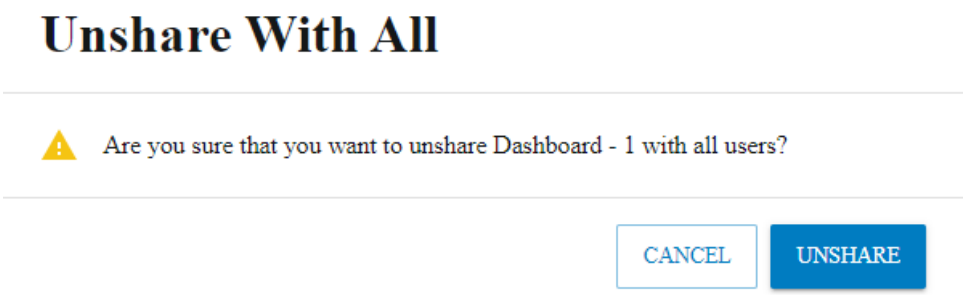

Figure 80: Confirm Unshare

4. User can click on **UNSHARE** button to remove all sharing permissions.

8.8 Setting default Dashboard (Set Personal Homepage)

Users can set their personal homepage upon login.

Note: In the case there is a single dashboard created by the user, this will automatically be the default.

1. User can click on Dashboard dropdown at top-left corner.
2. Click on the dashboard of interest.
3. Click on vertical ellipsis icon at top-right corner.
4. Click on **Set Personal Homepage** option.
5. Field Analytics will open **Set Personal Homepage** dialog box. Refer to Figure 81: Confirm Personal Homepage Selection.

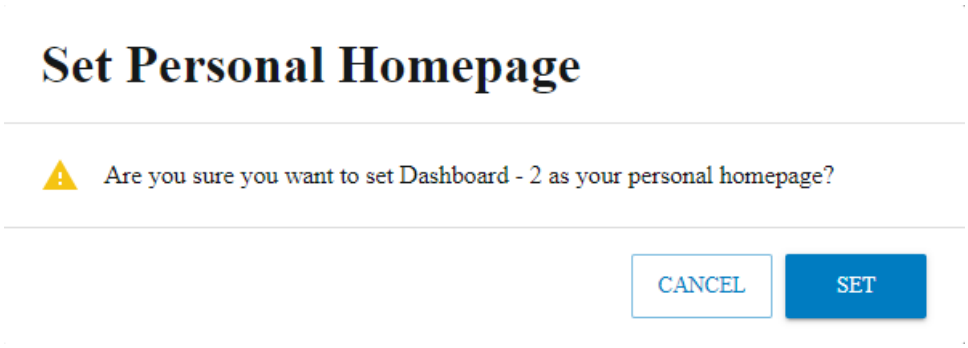

Figure 81: Confirm Personal Homepage Selection

6. User can click on **'SET'** button.
7. Field Analytics will set the default dashboard every time user logs-in.

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8.9 Export Project

Dashboard projects can be exported for periodic backups or shared with other users to quickly replicate and/or customize per application needs. The exported projects(s) will contain all the rules for data binding (Used Data Sources, Historian, Reports and Media Server Configuration) and associated reports for faster commissioning.

Note: Only users with associated privileges can export dashboards.

To export a dashboard:

1. User can click on Dashboard dropdown at top-left corner. Refer to Figure 82: Export Dashboard.

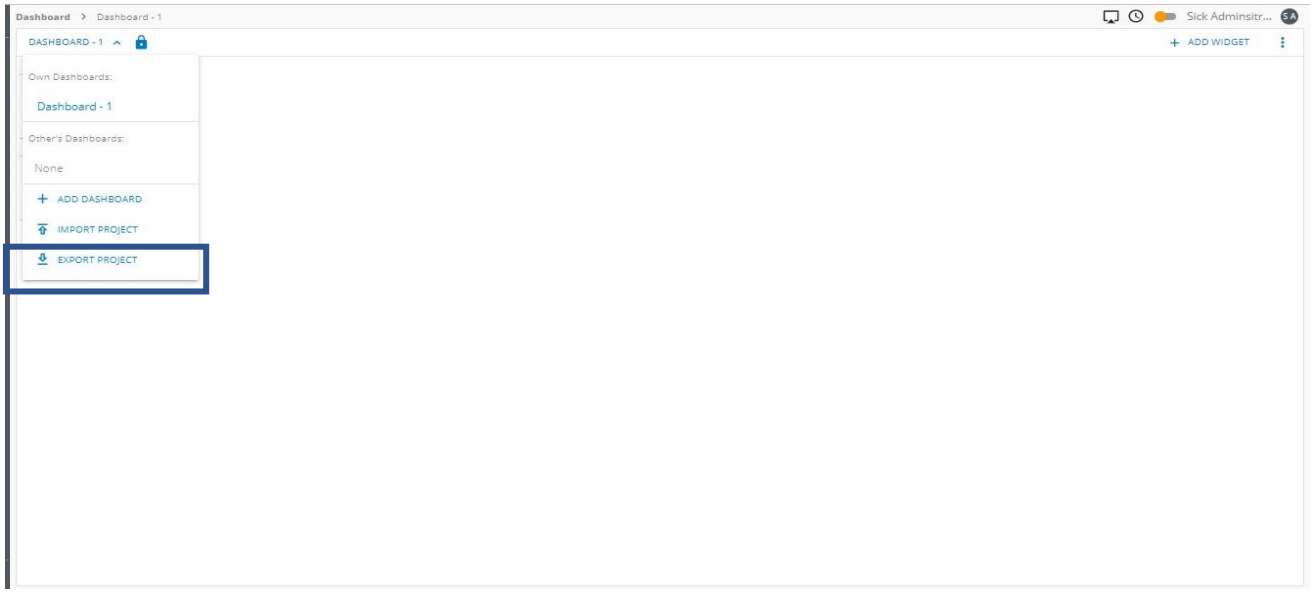

Figure 82: Export Dashboard

2. Click on **EXPORT Project** option.
3. It will open **Export Project** dialog box. Refer to Figure 83: Confirm Dashboard Export.

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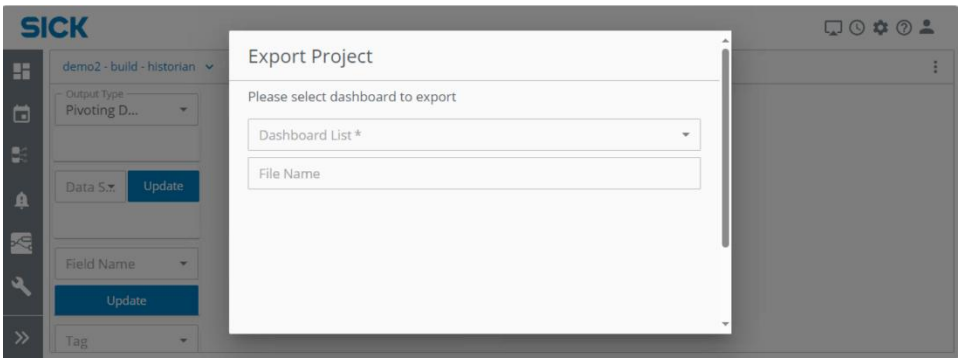

Figure 83: Confirm Dashboard Export

4. User can click on **Dashboard List** drop-down.
5. Select the dashboard to export (Select **All** to export all dashboards). Refer to Figure 84: Export All Dashboard.

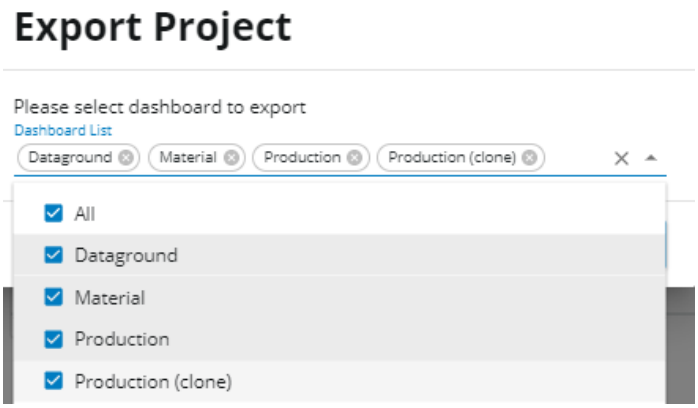

Figure 84: Export All Dashboard

6. Click on **EXPORT** button.
7. Field Analytics will export selected dashboards.

8.10 Import Project

This option enables customers to import projects from other installation instances of Field Analytics, thus empowering users across a factory or factories to share their work. The import (.JSON file format) automatically creates and configures the dashboard for the user. The newly imported dashboard inherently contains the configured data bindings (data sources, business rules, alerts, and reports).

Note: Only users with associated privileges can import the dashboard.

To import a dashboard:

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1. User can click on Dashboard dropdown at top-left corner. Refer to Figure 85: Import Dashboard.

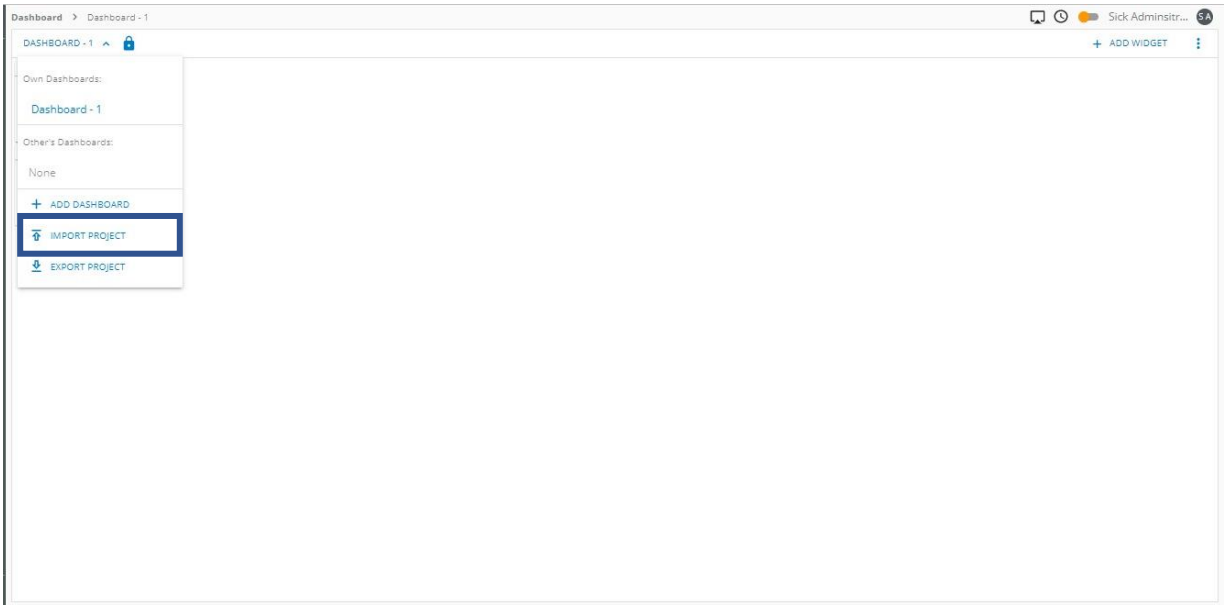

Figure 85: Import Dashboard

2. Click on **IMPORT Project** option.
3. Field Analytics will open **Import Dashboard** dialog box. Refer to Figure 86: Import Dashboard .

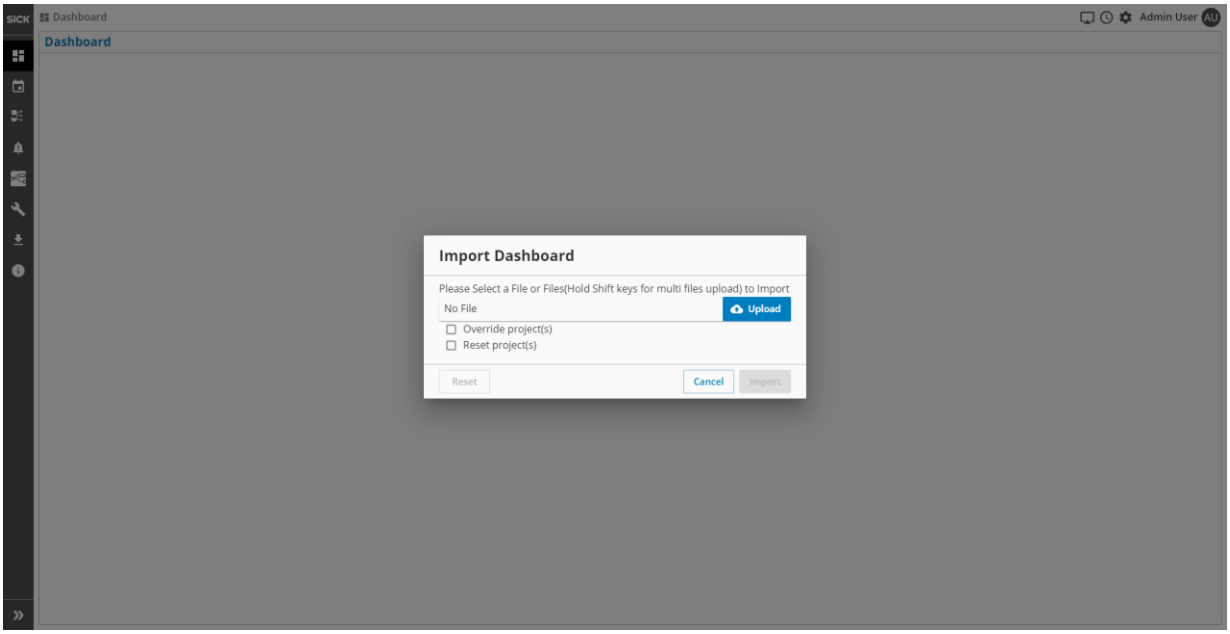

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Figure 86: Import Dashboard

4. User can click on **UPLOAD** button to select the project to import.
5. Select the file to upload.
6. Check the **Override Project(s)** checkbox if the user wants to replace the existing file with the updated file.
7. Check the **Reset Project(s)** checkbox if the user wants to reset other dashboards with latest project.
8. Click on **IMPORT** button to import the project.
9. It will navigate to the newly imported dashboard.

Note: Users might need to configure the Data sources (HTTP(s) URL endpoints) associated with the imported dashboard project based on destination Data Source connections (HTTP(s) URL endpoints).

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9 Data Source

Data sources are used to store data generated by the APIs. For example, let's assume there is an API that tracks the speed of a conveyor belt. The speed of the belt changes every time data is received from the API. So, we receive different belt speeds in the API response.

By defining data sources, the user can store the speed of the conveyor belt in the form of a table. Field Analytics supports tracking and storing different types of data using multiple data sources.

9.1 HTTP(s) Protocol

Https protocol is a secure way to send data between web server and web browser.

Users need to add HTTPs protocol data source to retrieve information through this communication protocol.

9.1.1 Add Data Source

Field Analytics allows user to add a Data Source to store information as required. To add a Data Source:

1. On the home page, click on Data source icon in the left-hand navigation bar. Refer to Figure 87: Dashboard

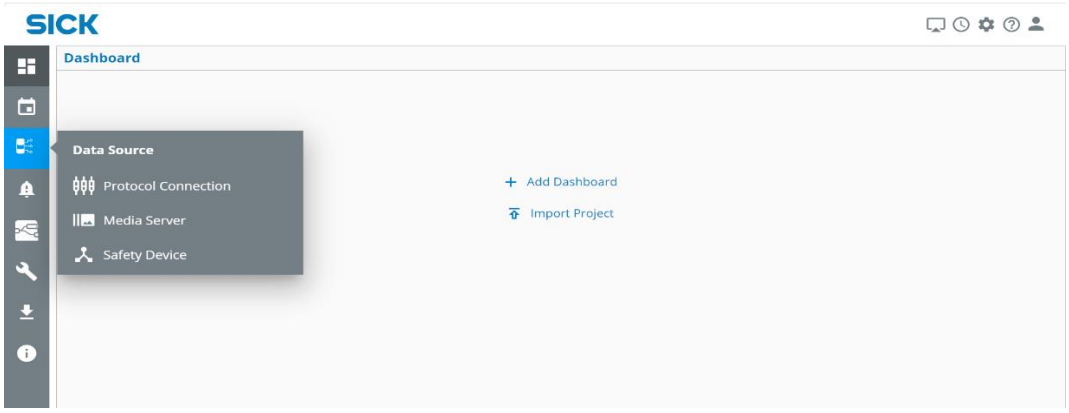

Figure 87: Dashboard

2. It displays Data Source page. Refer to Figure 88: Data Source page

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Figure 88: Data Source page

3. To add new data, user can click on the add icon at top-right corner to **Add New Data** Source. Refer to **Figure 89: Add Data**.

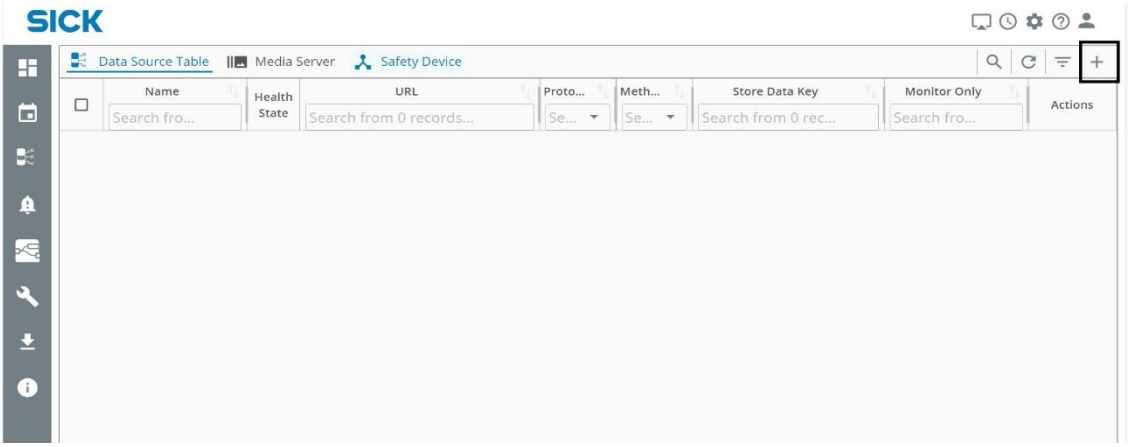

Figure 89: Add Data

4. It displays **Add New Data source** page. Refer to Figure 90: Add New Data Source

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Figure 90: Add New Data Source

The following fields will need to be configured as required:

- **Name**: Provide unique user defined name of the Data Source.
- **Communication Protocol**: set to Http(s) by default.
- **HTTP(s) Method**: **GET** or **POST** will be used to retrieve or create data.
- **URL**: The URL of the API that will be used to get the information or create information.
- **TEST**: Use to verify if the entered URL is hitting the targeted server and getting a valid response code.
- **Header**: Add Key and Value in case header information is required to access the API URL.
- **Parameter**: Add Key and Value in case additional parameters are required to access the API URL.

5. Click the **Next** button.

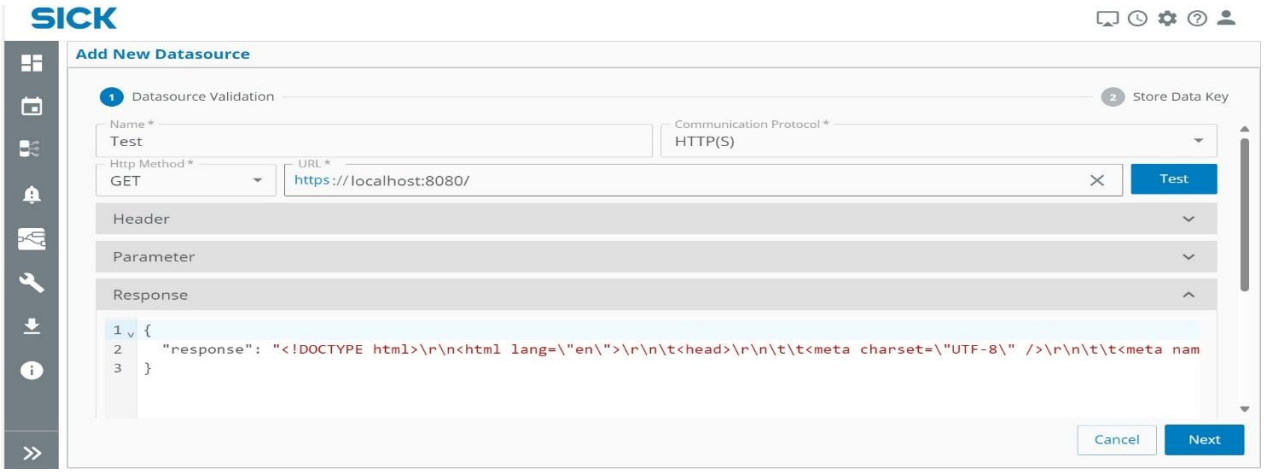

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Figure 91: Http(s) Protocol Fields

6. It will navigate to the **Store Data Key** section.

   Field Analytics provides users the ability to define data sources with unique identifiers for fast and easy dashboard creation. Users can also select to store these values in the time series historian by selecting **Store Data Key.** Refer to Figure 92: Store Data Key.

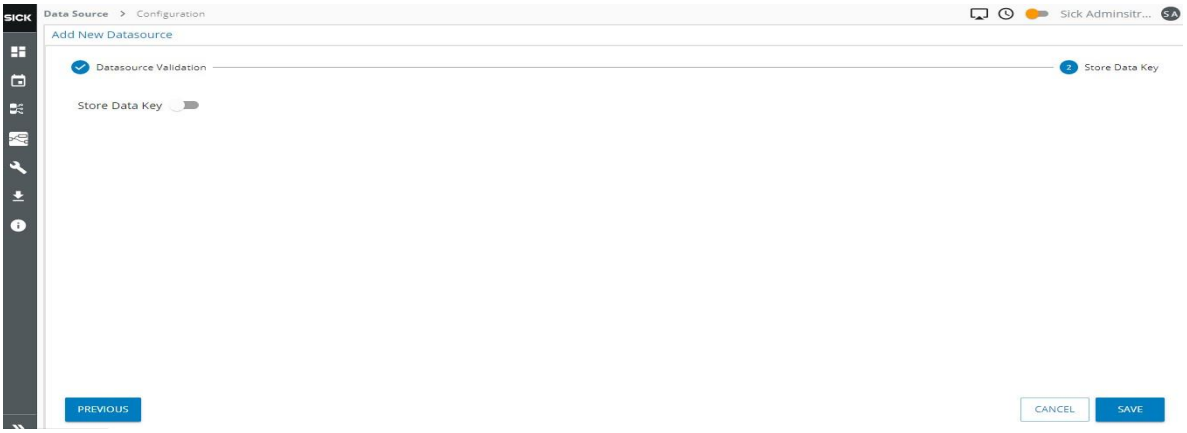

Figure 92: Store Data Key

7. On selecting **Store Data Key** will start displaying the required configured fields. Refer to Figure 93: Store Data Key Variables

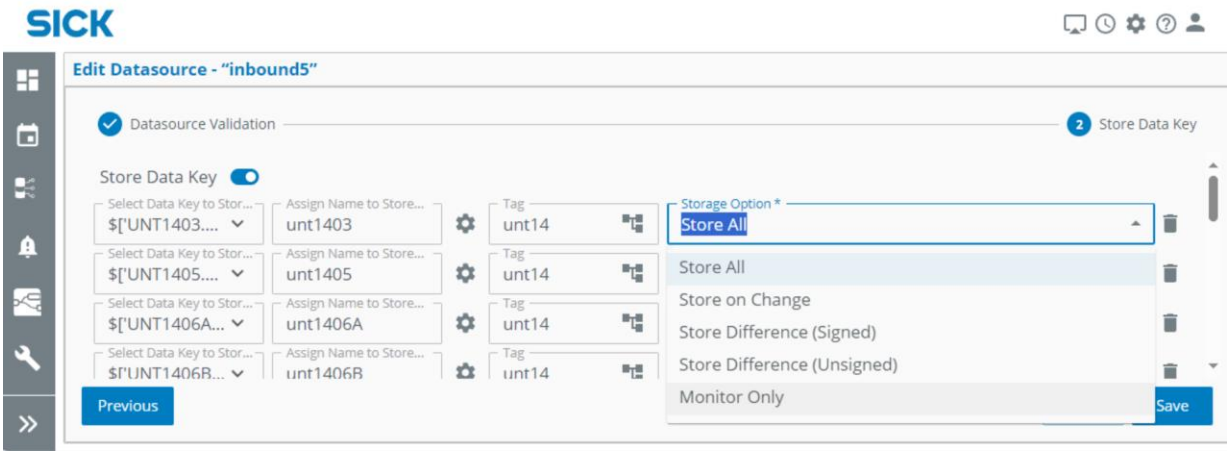

Figure 93: Store Data Key Variables

The following fields will need to be configured as required:

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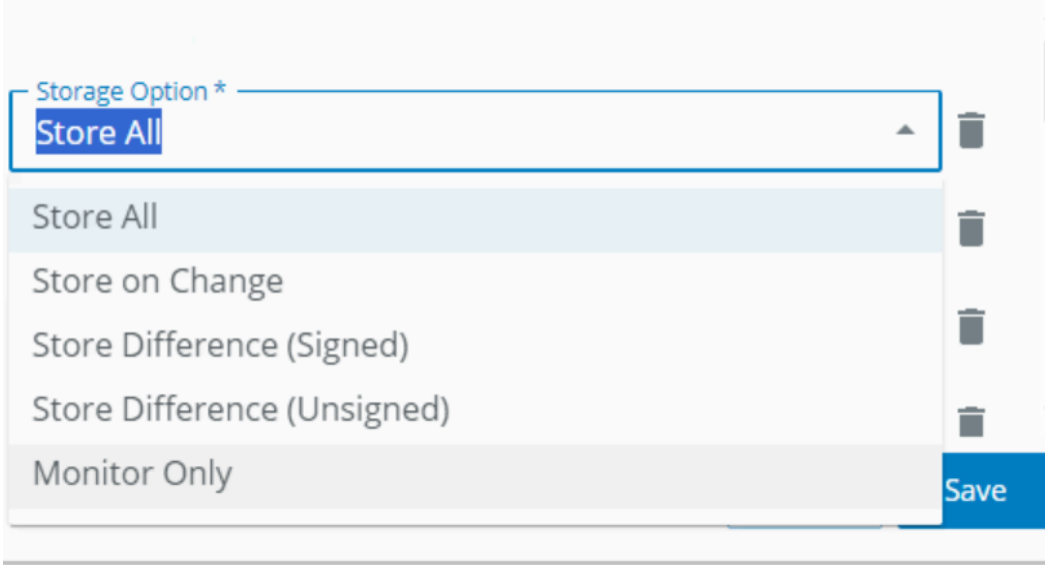
a. **Refresh/Polling Frequency**: This will set the frequency at which the data will be polled from the endpoint Data Source (server) (HH:MM: SS: SSS) format.
b. **Data Key to Store**: This will define the data parameter to be stored from the API response.
c. **Assign Name to Stored Data Key**: Assign a unique user defined name to the data parameter being stored in Field Analytics time series historian.
d. **Tag**: This will set a unique label/tag for the Stored Data Key. Always use Tags as something common to all the variables stored. Example, id of the event (this will help in historian reporting and data pivoting functionality).
e. **Storage Options**: Collects and stores a value whenever the value changes. It has following options:
    i. **Store All:** Stores all the values.
    ii. **Store on Change:** Changes the store value upon change in data source.
    iii. **Store Difference (Signed)**: Stores the difference value calculated with base value with mathematical minus sign.
    iv. **Store Difference (Unsigned)**: Stores the difference value calculated with base value without any mathematical sign.
    v. **Monitor Only**: This option does not store any value; it is used to monitor the values and notify when condition is met on configured alert



Note: If this is not enabled, Field Analytics will store all values based on the polling frequency.

f. **Deadband Plus/Minus**: When a latest received value or set of values surpasses the specified (deadband threshold) +/- boundaries, only then will the values be stored in the historian.

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Note: For example, let's store a pressure value that is frequently changing. Given the current pressure value is 100 psi from the API response, if we set a Plus/Minus (+/-) deadband of 3 psi, Field Analytics will only store the next pressure value in the historian that exceeds deadband, that is more than 103 or less than 97. Any new value is only stored when it exceeds the threshold of the previous value. For instance, if the value from the API response is 104 psi, this value will be stored in the historian as it exceeds the rules of the deadband. The next value that would be stored is based on this previous value, and only when the next response is more than 107 psi, or less than 101 psi will another value be stored in the historian.

8. User can click add data key to add additional parameters from the API response.
9. After providing all parameters, user can click on **SAVE** button.
10. It will create the new Data Source. Refer to Figure 94: New Data Source.

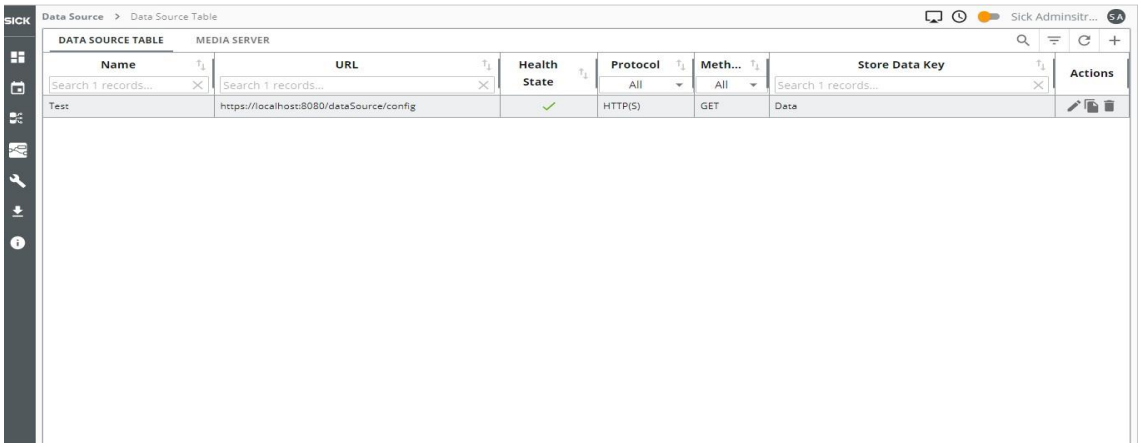

Figure 94: New Data Source

9.1.2 Edit Data Source

1. User can click on the edit icon in **Actions** column of table for the Data Source to navigate to the edit page.

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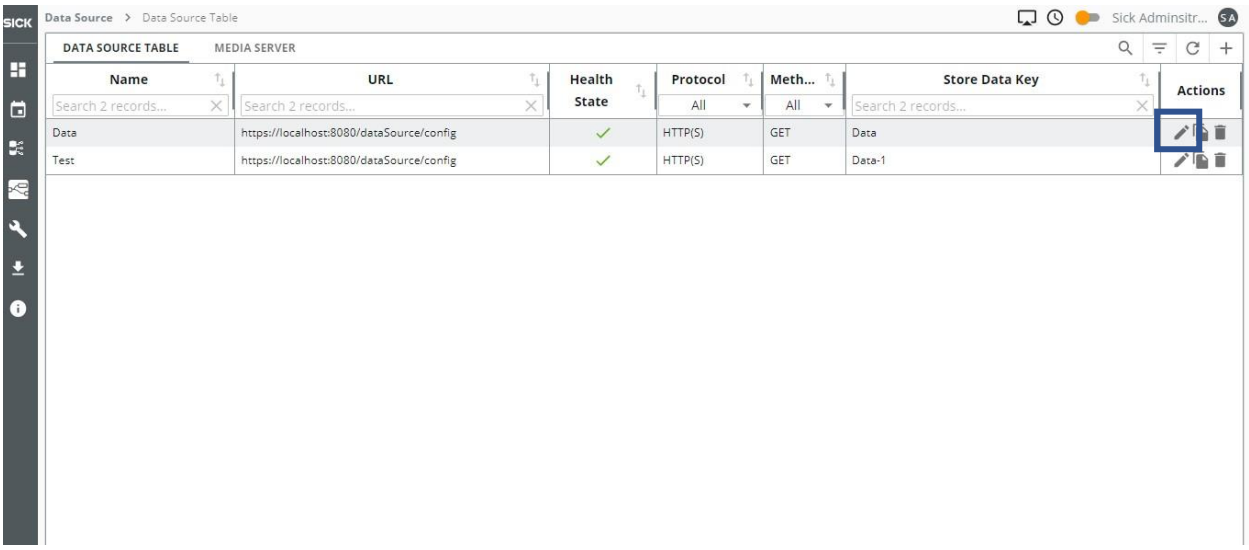

Figure 95: Edit Data Source Icon

2. **Edit Data source** page appears. Refer to Figure 96: Edit Data Source Page

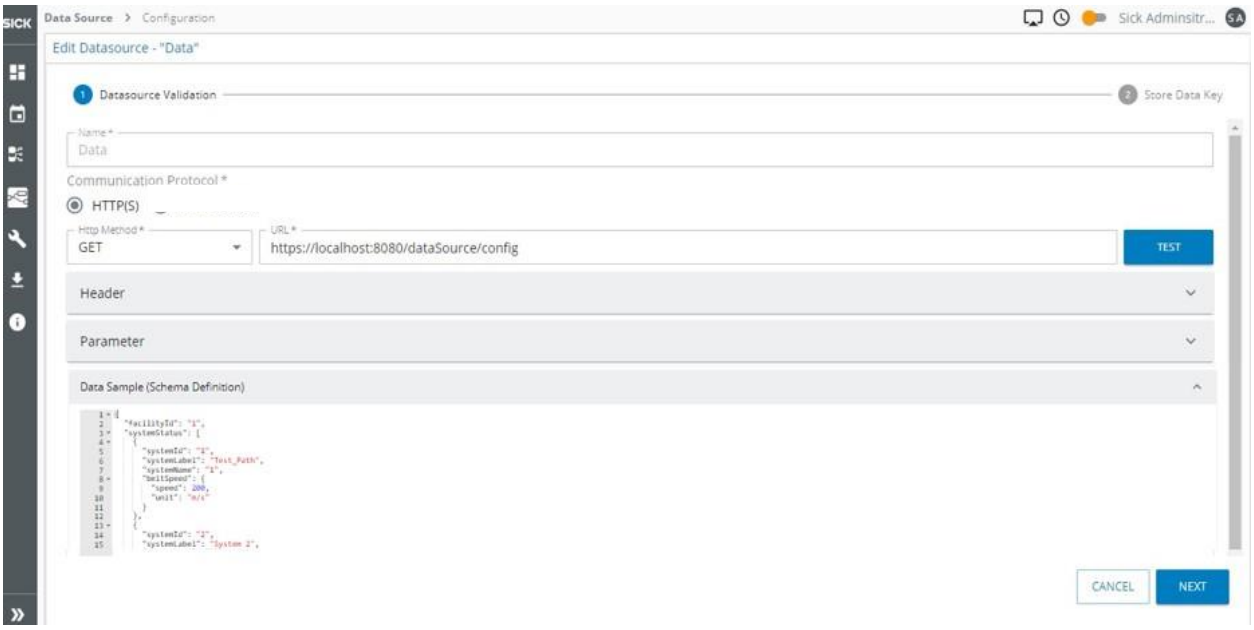

Figure 96: Edit Data Source Page

3. **Name of the Data source** field is non-editable.
4. Click the **NEXT** button**.** It will navigate to the **Store Data Key** section where users can modify the parameters. Refer to Figure 97: Store Data Key

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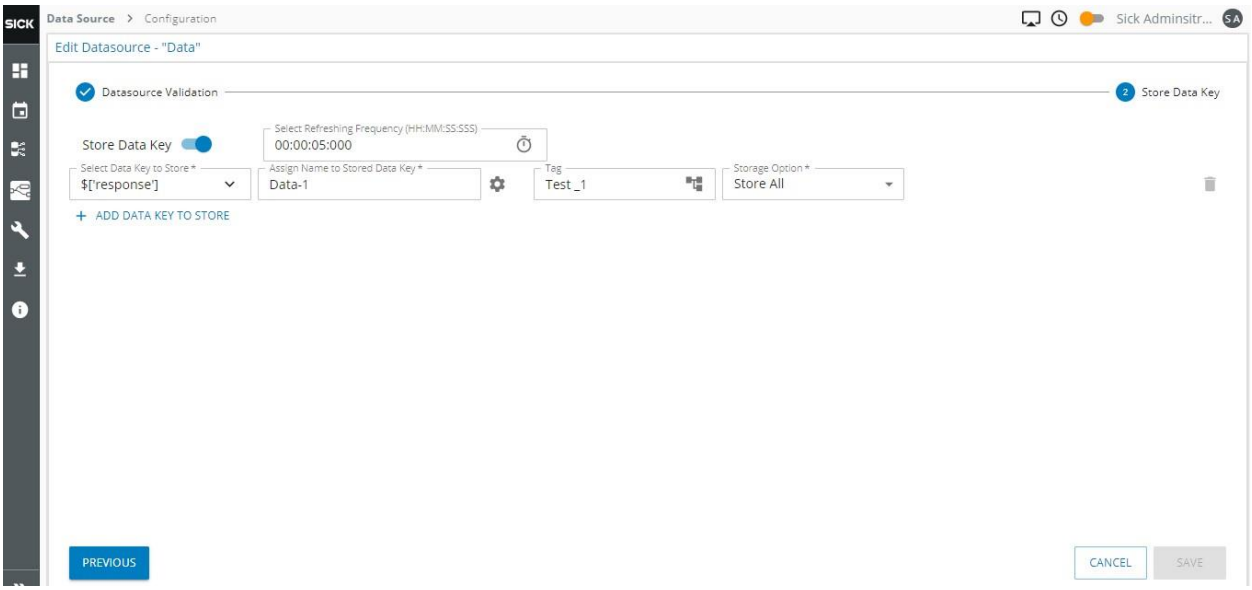

Figure 97: Store Data Key

5. After modifying the changes users can click the **Save** button to confirm changes. Refer to Figure 98: Update Confirmation.

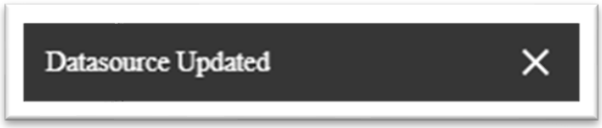

Figure 98: Update Confirmation

6. It will display edited Data source. Refer to Figure 99: New Edited Data Source.

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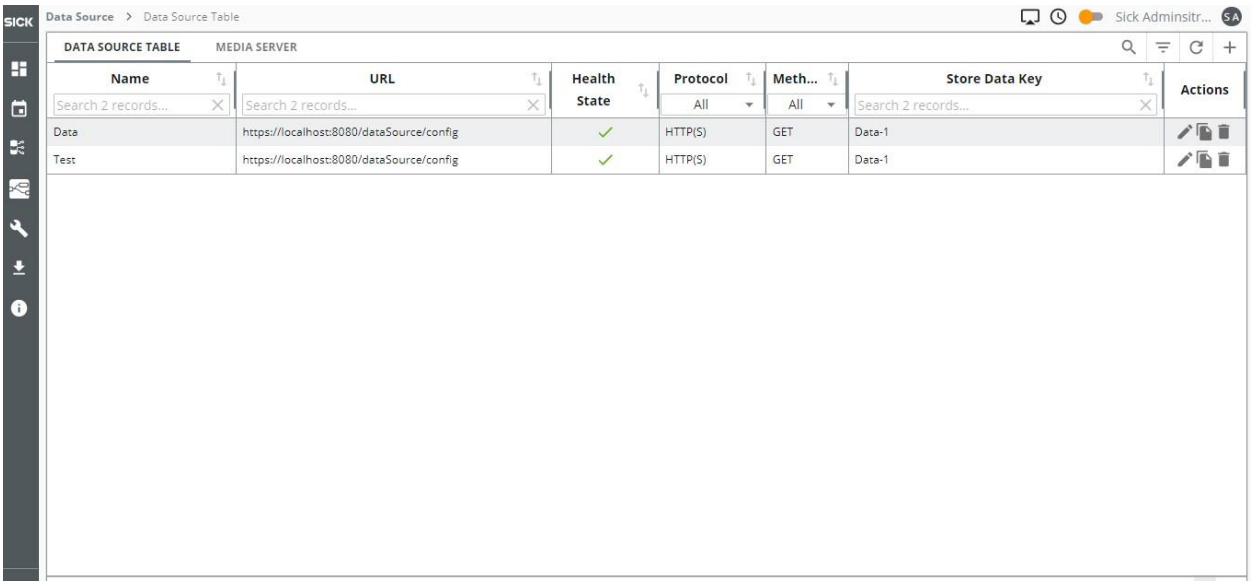

Figure 99: New Edited Data Source

9.1.3 Delete Data Source

To delete a Data Source:

1. User can delete the specified Data Source by clicking on the delete icon. Refer to Figure 100: Delete Data Source

Figure 100: Delete Data Source

2. "**Confirm Deletion- Data**" dialog box.

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Figure 101: Confirm Delete

3. Users can click the **Delete** button to confirm.

Note: When Data source is deleted, the saved data will remain in database. However, user will lose filter of it in Historian Filter Field.

9.1.4 Copy Data Source

Users can copy a created data source from the Data source page. Copying any of these data sources produces a file that has the same field and data as the original.

To Copy a Data Source

1. User can copy the specified Data Source by clicking on the copy icon in the Data Source Table. Refer to Figure 102: Copy Data Source

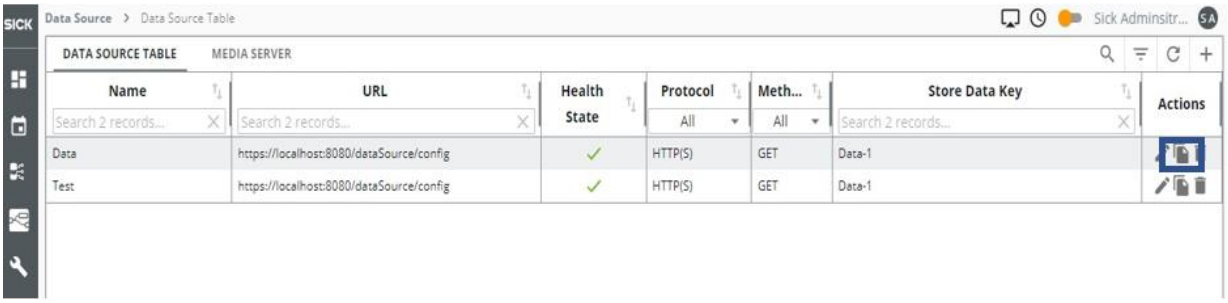

Figure 102: Copy Data Source

2. **Clone Data source – "Data"** dialog box appears**.** Refer to Figure 103: Clone Data Source
3. Provide new name to cloned data source by default it will appear as data source name along with clone as new data sources name and click the **Copy** button.

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Figure 103: Clone Data Source

4. Cloned Data source will appear in Data Source table. Refer to Figure 104: Copy Data Source in Table
5. Store data key will be disabled by default. Users are required to edit the cloned Data Source and enable store data key.

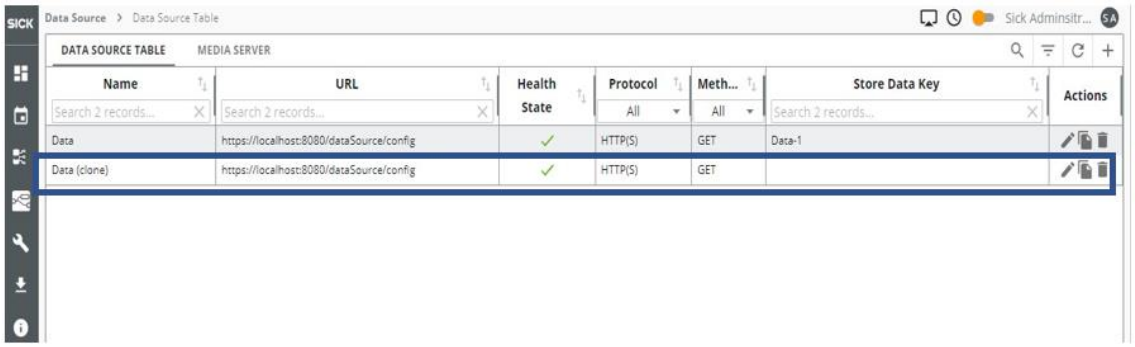

Figure 104: Copy Data Source in Table

9.2 HTTP Server Protocol

HTTP Protocol is used for distributed, collaborative, hypermedia information systems that allows users to communicate data on the World Wide Web.

Users need to add HTTP protocol data source to retrieve information through this communication protocol

9.2.1 Add Data Source

Field Analytics allows user to add a Data Source to store information as required. To add a Data Source:

1. On the home page, click on Data source icon in the left-hand navigation bar. Refer to Figure 87: Dashboard

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2. It displays Data Source page. Refer to Figure 88: Data Source page
3. To add new data, user can click on the add icon at top-right corner to **Add New Data** Source. Refer to **Figure 89: Add Data**.
4. It displays **Add New Data source** page. Refer to Figure 90: Add New Data Source

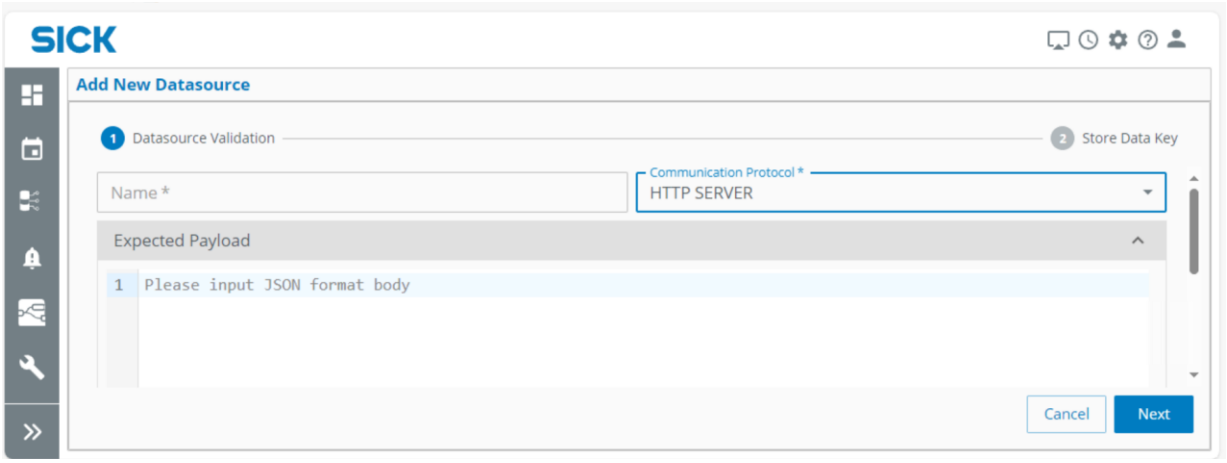

Figure 105: HTTP Server Protocol

The following fields will need to be configured as required:

- **Name**: Provide unique user defined name of the Data Source.
- **Communication Protocol**: set to Http(s) by default.
- **Expected Payload**: Input JSON format body.

5. Click the **Next** button.

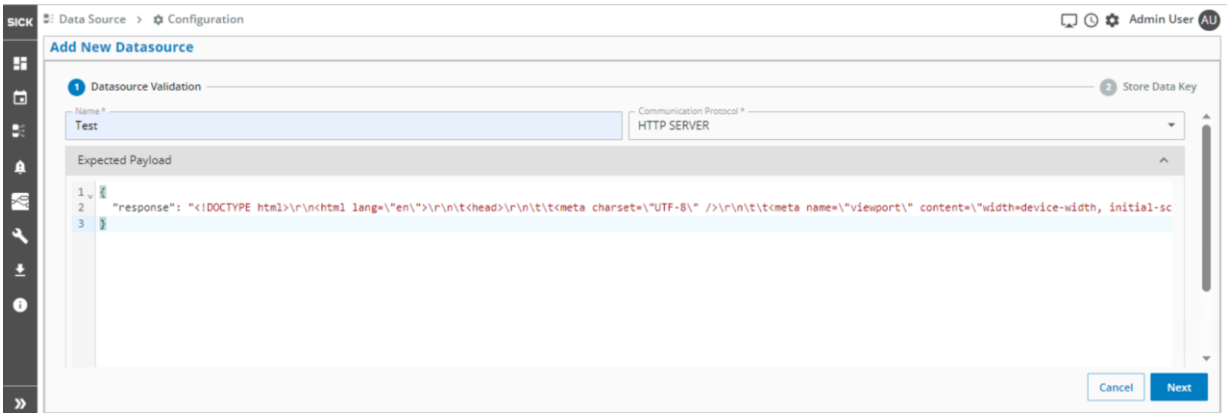

Figure 106: Http Protocol Fields

6. It will navigate to the **Store Data Key** page.

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Field Analytics provides users the ability to define data sources with unique identifiers for fast and easy dashboard creation. Users can also select to store these values in the time series historian by selecting **Store Data Key.** Refer to Figure 92: Store Data Key.

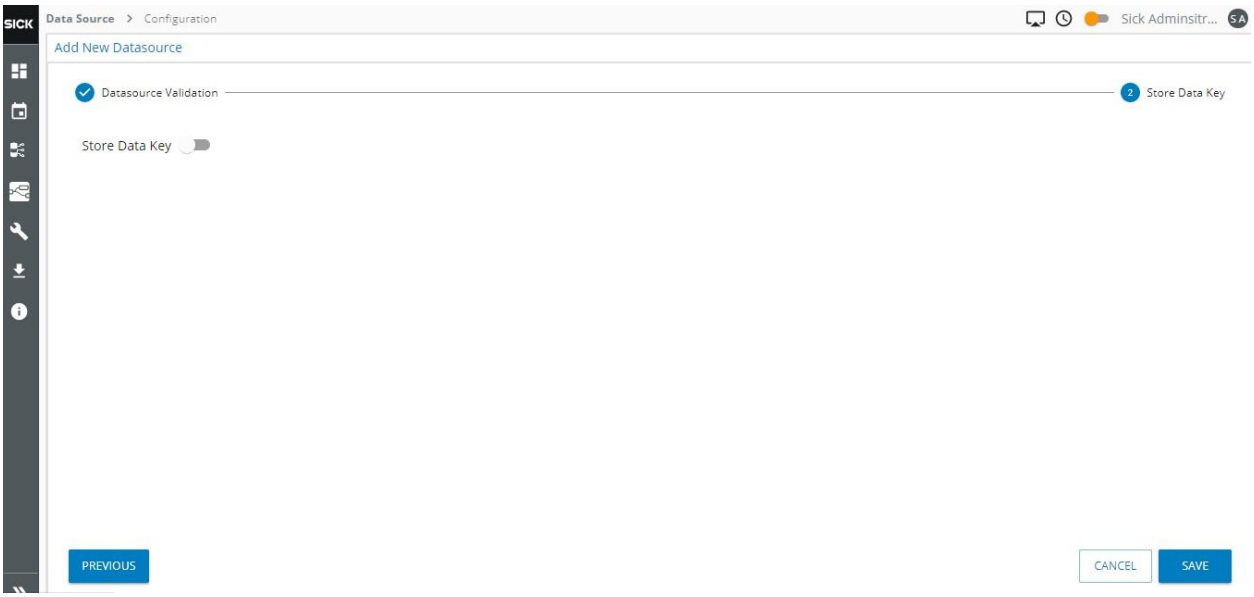

Figure 107: Store Data Key

7. On selecting **Store Data Key** will start displaying the required configured fields. Refer to Figure 93: Store Data Key Variables

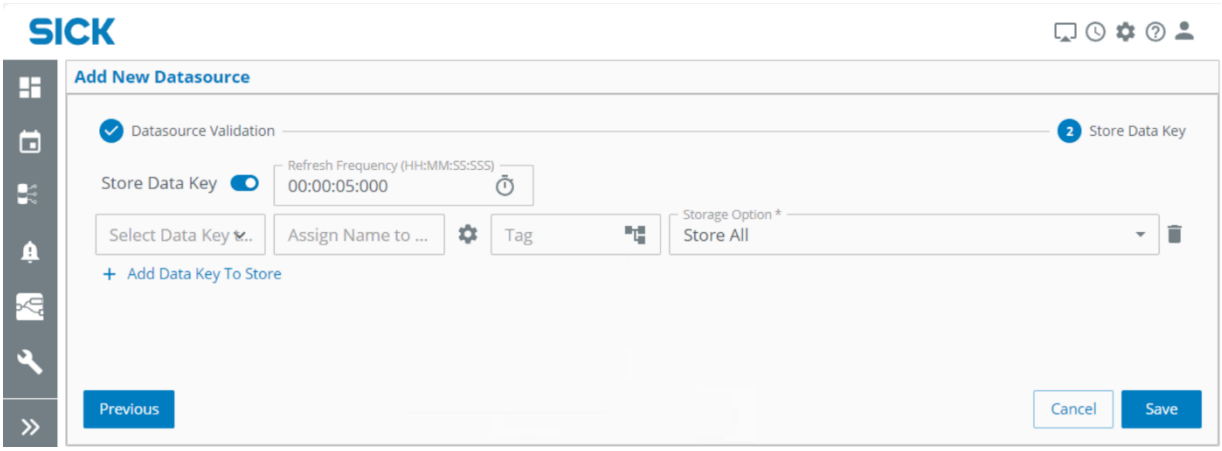

Figure 108: Store Data Key Variables

The following fields will need to be configured as required:

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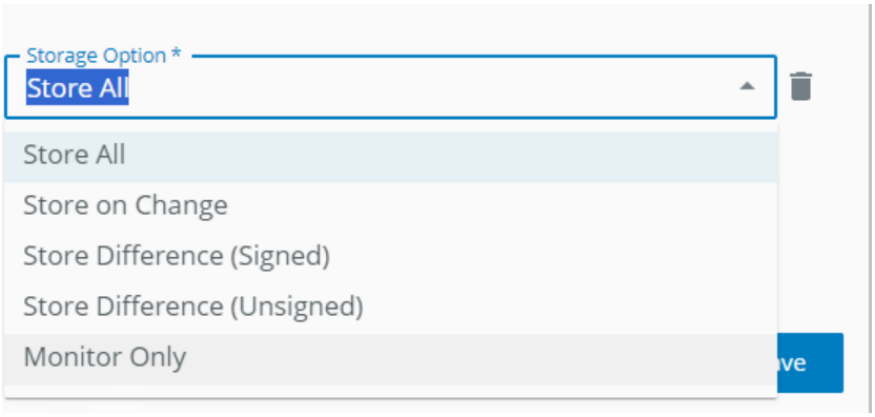
g. **Refresh/Polling Frequency**: This will set the frequency at which the data will be polled from the endpoint Data Source (server) (HH:MM: SS: SSS) format.
h. **Select Data Key to Store**: This will define the data parameter to be stored from the API response.
i. **Assign Name to Stored Data Key**: Assign a unique user defined name to the data parameter being stored in Field Analytics time series historian.
j. **Tag**: This will set a unique label/tag for the Stored Data Key. Always use Tags as something common to all the variables stored. Example, id of the event (this will help in historian reporting and data pivoting functionality).
k. **Storage Option**: Collects and stores a value whenever the value changes. It has following options:
    i. **Store All:** Stores all the values.
    ii. **Store on Change:** Changes the store value upon change in data source.
    iii. **Store Difference (Signed)**: Stores the difference value calculated with base value with mathematical minus sign.
    iv. **Store Difference (Unsigned)**: Stores the difference value calculated with base value without any mathematical sign.
    v. **Monitor only**: This option does not store any value; it is used to monitor the values and notify when condition is met on configured alert



Note: If this is not enabled, Field Analytics will store all values based on the polling frequency.

l. **Deadband Plus/Minus**: When a latest received value or set of values surpasses the specified (deadband threshold) +/- boundaries, only then will the values be stored in the historian.

Note: For example, let's store a pressure value that is frequently changing. Given the current pressure value is 100 psi from the API response, if we set a Plus/Minus (+/-) deadband of 3 psi, Field Analytics will only store the next pressure value in the historian that exceeds deadband, that is more than 103 or less than 97. Any new value is only stored when it exceeds the threshold of the previous value. For instance, if the value from the API response is 104 psi, this value will

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be stored in the historian as it exceeds the rules of the deadband. The next value that would be stored is based on this previous value, and only when the next response is more than 107 psi, or less than 101 psi will another value be stored in the historian.

8. User can click add data key to add additional parameters from the API response.
9. After providing all parameters, user can click on **SAVE** button.
10. It will create the new Data Source. Refer to Figure 94: New Data Source.

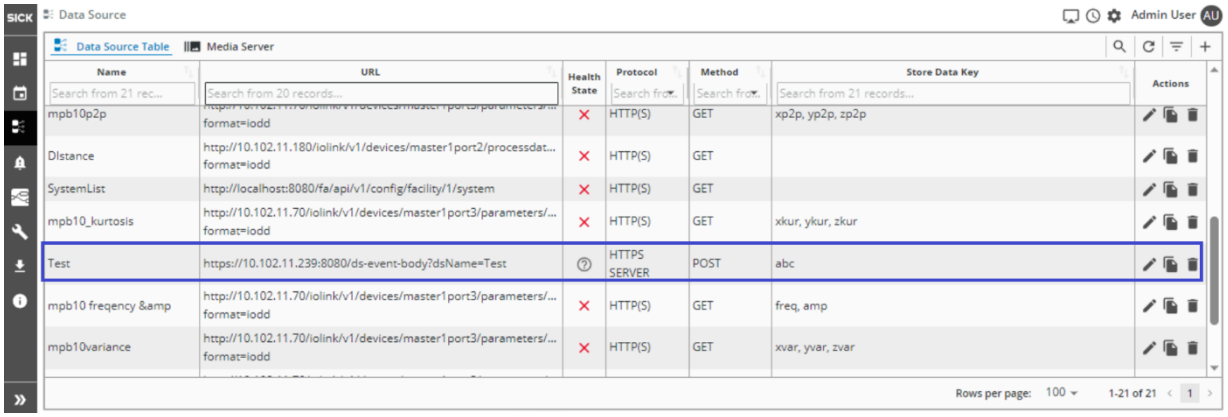

Figure 109: New Data Source

9.2.2 Edit Data Source

7. User can click on the edit icon in **Actions** column of table for the Data Source to navigate to the edit page.

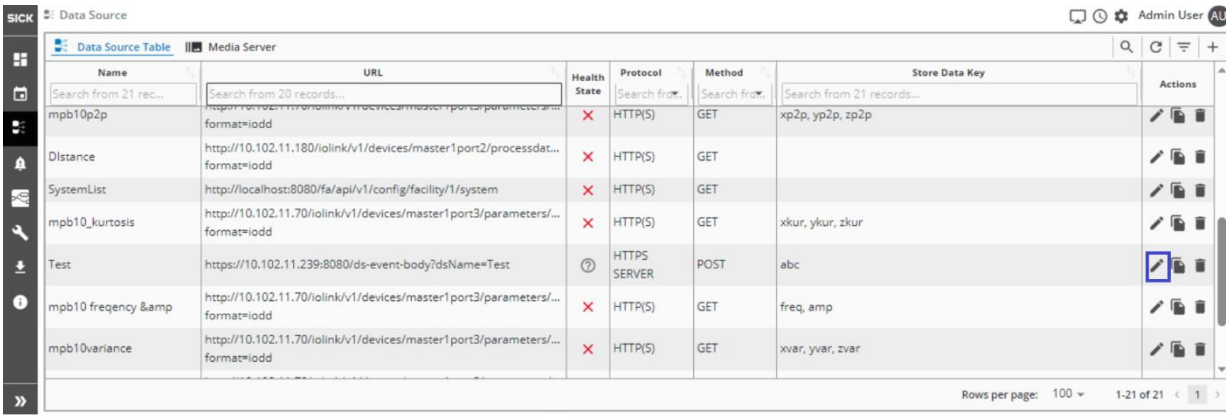

Figure 110: Edit Data Source Icon

8. **Edit Data source** page appears. Refer to Figure 96: Edit Data Source Page

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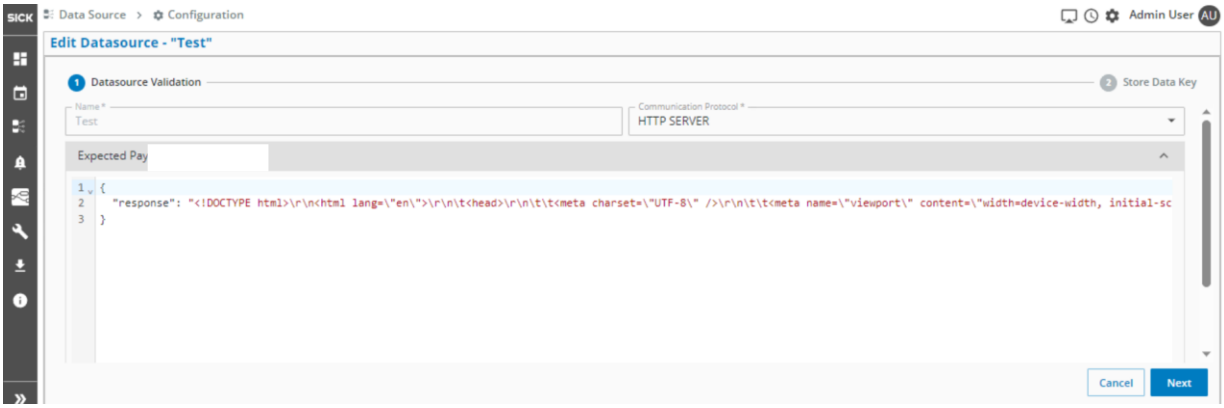

Figure 111: Edit Data Source Page

9. **Name of the Data source** field is non-editable.
10. Click the **NEXT** button**.** It will navigate to the **Store Data Key** section where users can modify the parameters. Refer to Figure 97: Store Data Key

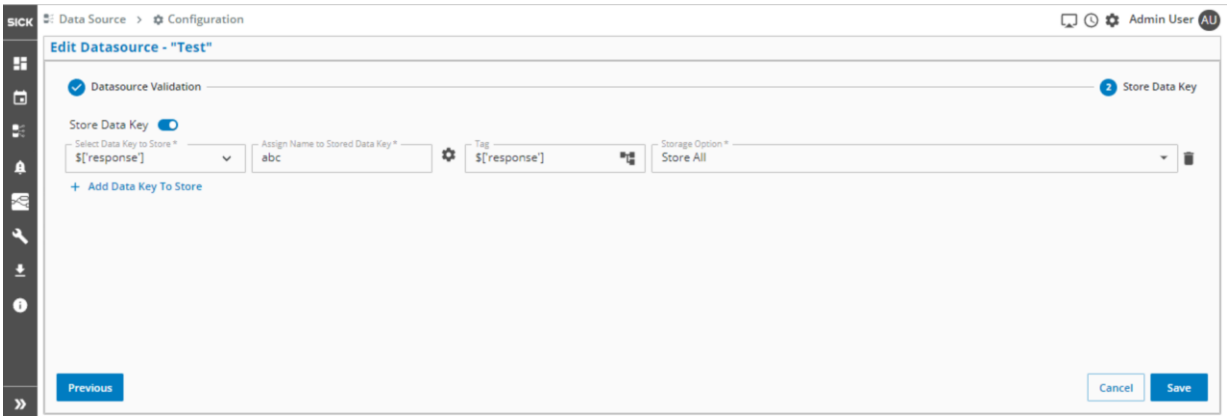

Figure 112: Store Data Key

11. After modifying the changes users can click the **Save** button to confirm changes. Refer to Figure 98: Update Confirmation.

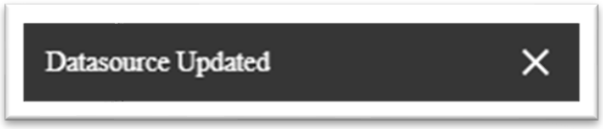

Figure 113: Update Confirmation

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9.2.3 Delete Data Source

To delete a Data Source:

4. User can delete the specified Data Source by clicking on the delete icon. Refer to Figure 100: Delete Data Source

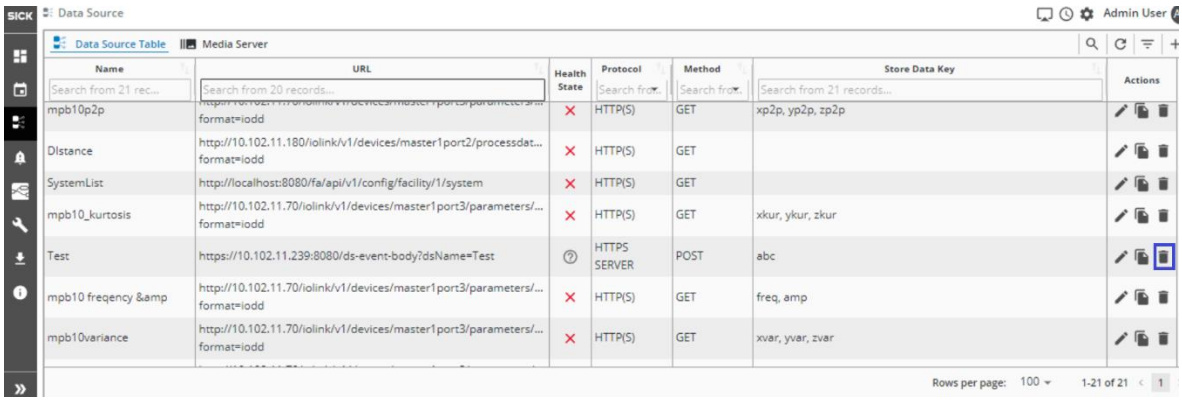

Figure 114: Delete Data Source

5. "**Confirm Deletion- Data**" dialog box.

Figure 115: Confirm Delete

6. Users can click the **Delete** button to confirm.

Note: When Data source is deleted, the saved data will remain in database. However, user will lose filter of it in Historian Filter Field.

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9.2.4 Copy Data Source

Users can copy a created data source from the Data source page. Copying any of these data sources produces a file that has the same field and data as the original.

To Copy a Data Source

6. User can copy the specified Data Source by clicking on the copy icon in the Data Source Table. Refer to Figure 102: Copy Data Source

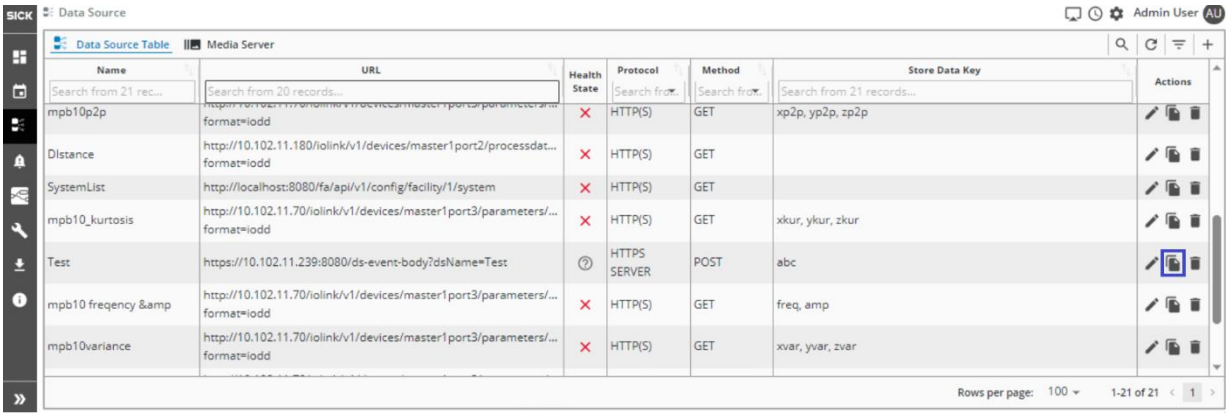

Figure 116: Copy Data Source

7. **Clone Data source – "Data"** dialog box appears**.** Refer to Figure 103: Clone Data Source
8. Provide new name to cloned data source by default it will appear as data source name along with clone as new data sources name and click the **Copy** button.

Figure 117: Clone Data Source

9. Cloned Data source will appear in Data Source table. Refer to Figure 104: Copy Data Source in Table

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10. Store data key will be disabled by default. Users are required to edit the cloned Data Source and enable store data key.

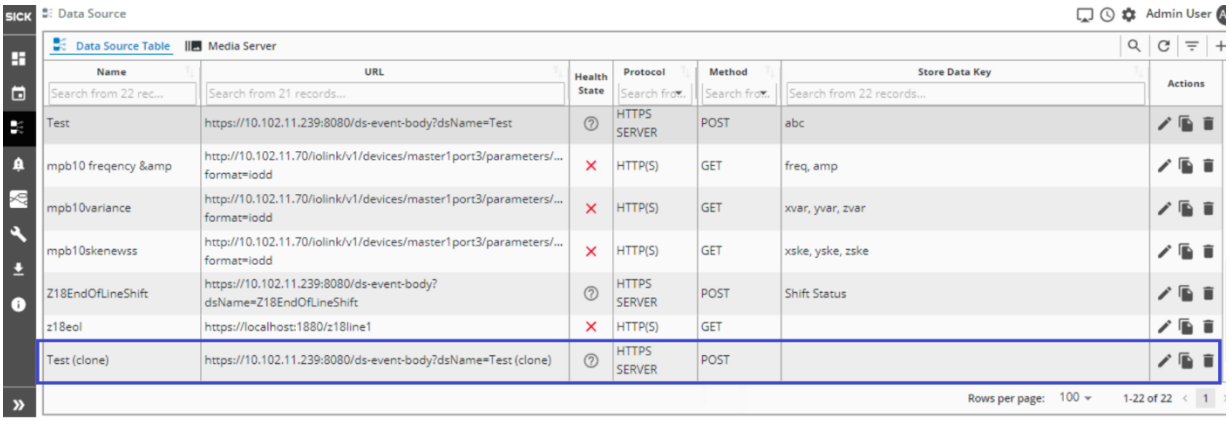

Figure 118: Copy Data Source in Table

9.3 Modbus TCP Protocol

Modbus TCP allows Modbus devices to communicate over Ethernet, making it easier to connect devices over long distances.

Users need to add Modbus TCP protocol data source to retrieve information through this communication protocol.

9.3.1 Add Data Source

Follow below steps to add data source for Modbus TCP protocol:

1. Navigate to **Data Source** page and click on add icon at top-right corner to Add New Data Source. Refer to Figure 87: Add Data
2. On **New Data Source** page, select **Modbus TCP** from **Communication Protocol** drop-down

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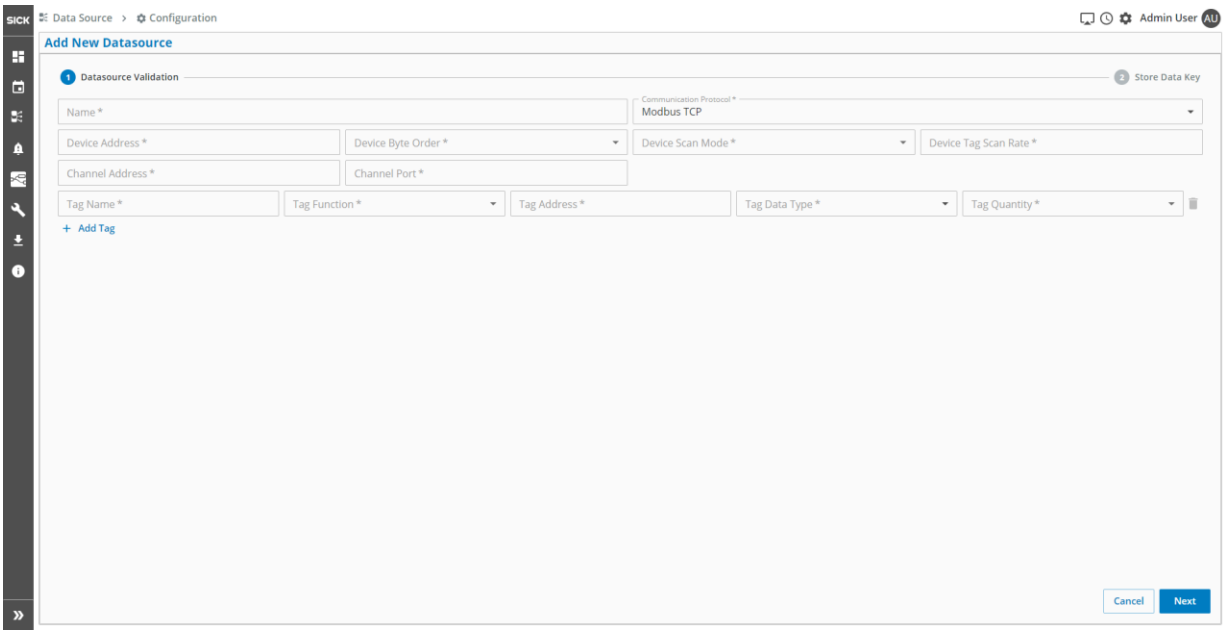

Figure 119: Modbus TCP Protocol

3. Once the Modbus TCP protocol is selected, it displays following fields:
    - **Name**: Provide unique user defined name of the Data Source
    - **Device Address**: Provide Device Address
    - **Device Byte Order**: It displays **Little Endian** & **Big Endian** options in the drop-down. Select the preferred option.

      Note: A Byte Order is an enumeration that describes a possible value byte order for Type Descriptions that allow different byte orders to be used.
    - **Device Scan Mode**: It displays **Client Specific Scan Rate** & **Tag Specific Scan Rate** options in the drop-down. Select the preferred option.

      Note: Scan Mode allows users to specify both how the server scans the device for data and how to override the application's update rate when necessary
    - **Device Tag Scan Rate**: Provide Device Tag Scan Rate

      Note: The scan class determines the frequency at which input tags are scanned for new values
    - **Channel Address**: Provide IP address for the channel.
    - **Channel Port**: Provide Port number for the channel.
    - **Tag Name**: Provide the tag name.
    - **Tag Function**: It displays four functions that are **Coil, Holding Register, Input, and Input Register**. Select the preferred option.

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- **Tag Address**: Provide the tag address.
- **Tag Data Type**: Based on the Tag function selection, data types are displayed in the drop-down. Select the preferred option.
- **Tag Quantity**: Select tag quantity from drop-down.

4. User can add more tags by clicking on **Add Tag** link or click the **Next** button.

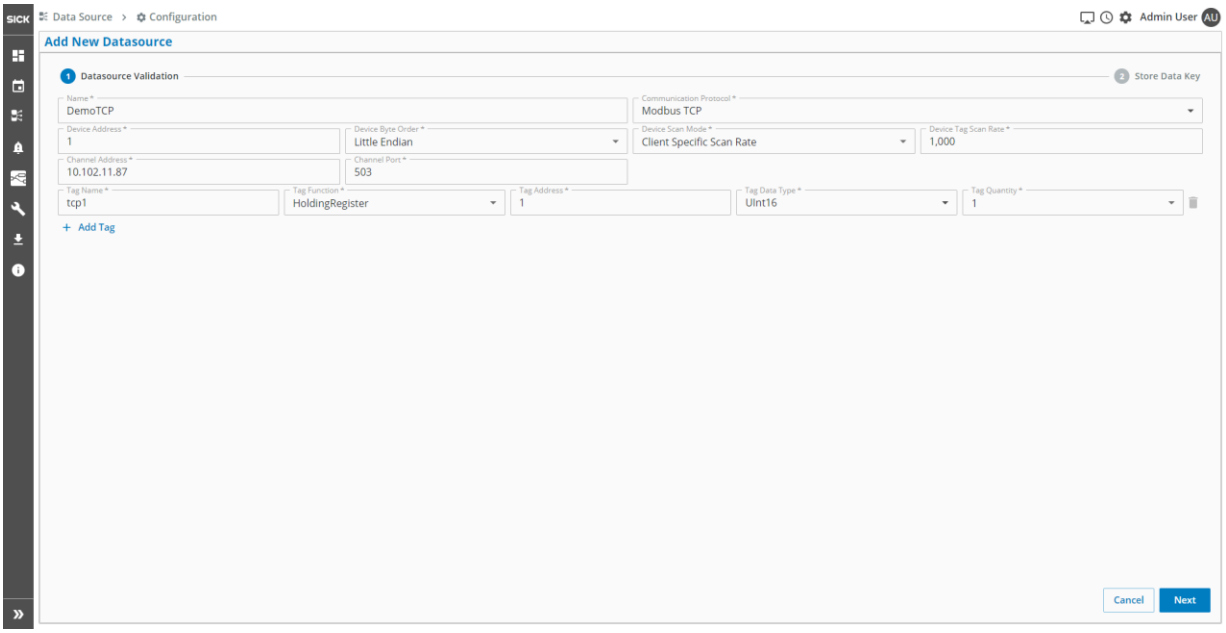

Figure 120: Modbus TCP Data Source Fields

5. Click the **Next** button**,** to navigate to the **Store Data Key** page.
6. Enable **Store Data Key** toggle button. It displays the required configured fields:
   - **Data Key to Store**: This will define the data parameter to be stored from the API response.
   - **Assign Name to Stored Data Key**: Assign a unique user defined name to the data parameter being stored in Field Analytics time series historian.
   - **Tag:** This will set a unique label/tag for the Stored Data Key. Always use Tags as something common to all the variables stored. Example, id of the event (this will help in historian reporting and data pivoting functionality)
   - **Storage Option**: Collects and stores a value whenever the value changes. It has following options:
     i. **Store All:** Stores all the values.
     ii. **Store on Change:** Changes the store value upon change in data source.

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iii. **Store Difference (Signed)**: Stores the difference value calculated with base value with mathematical minus sign.
iv. **Store Difference (Unsigned)**: Stores the difference value calculated with base value without any mathematical sign.
v. **Monitor only**: This option does not store any value; it is used to monitor the values and notify when condition is met on configured alert

7. Click **Add data key** to add additional parameters from the API response.
8. Click the **Save** button.

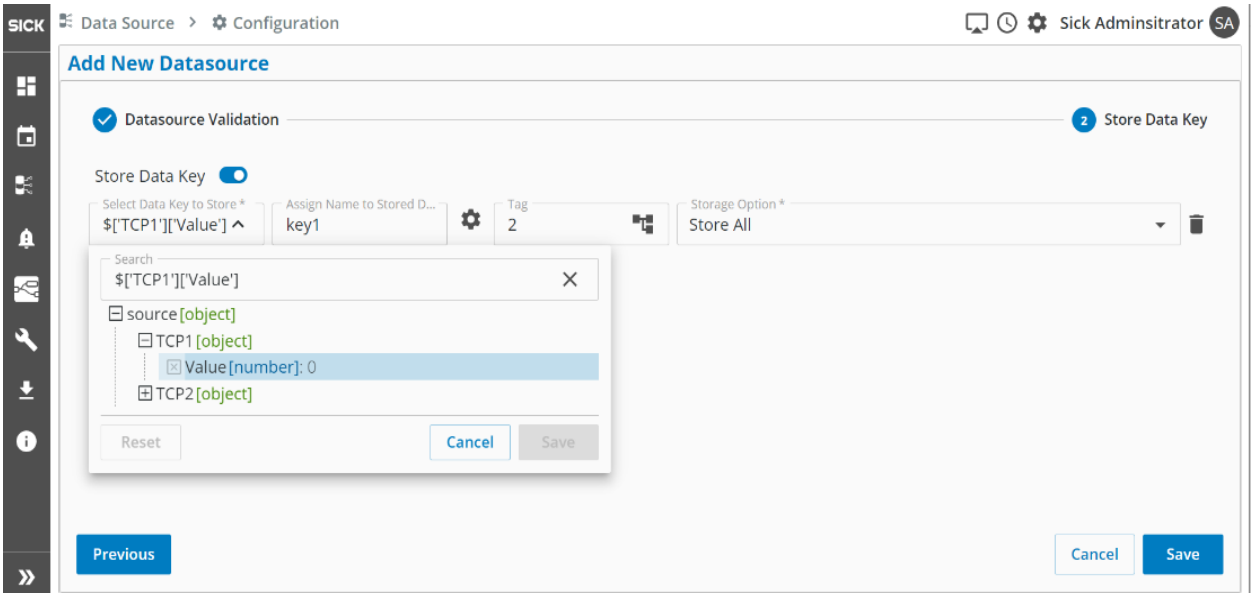

Figure 121: Store Data Key

9. It creates the Modbus TCP data source in the Data Source Table

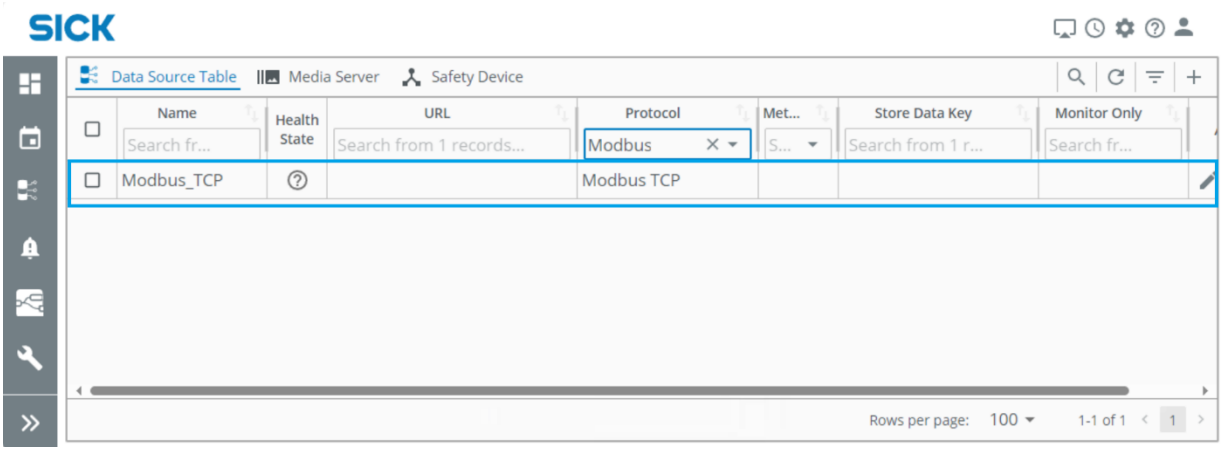

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Figure 122: New Data Source

9.3.2 Edit Data Source

1. User can click on the edit icon in **Actions** column of table for the Data Source to navigate to the edit page.

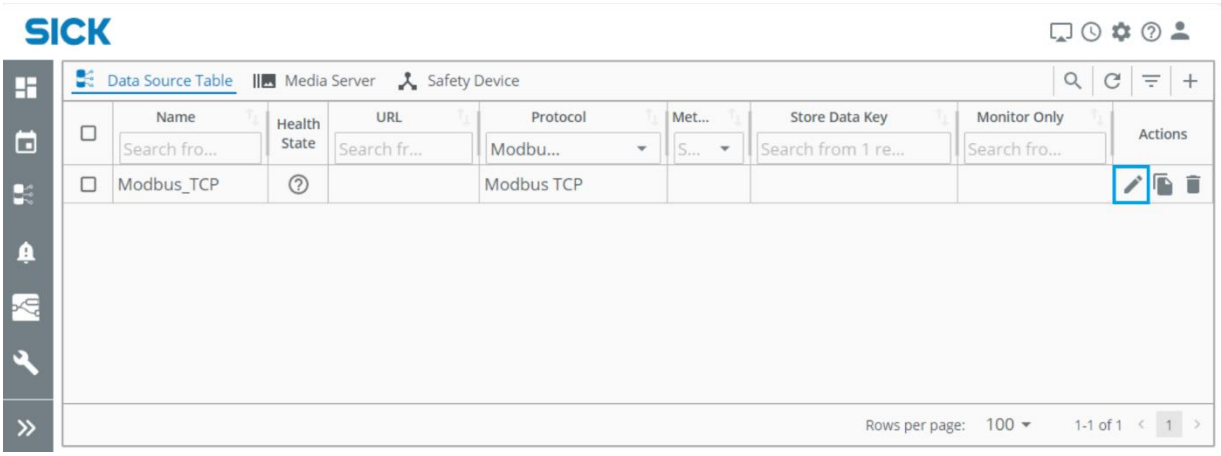

Figure 123: Edit Data Source Icon

2. Edit Data Source page appears.

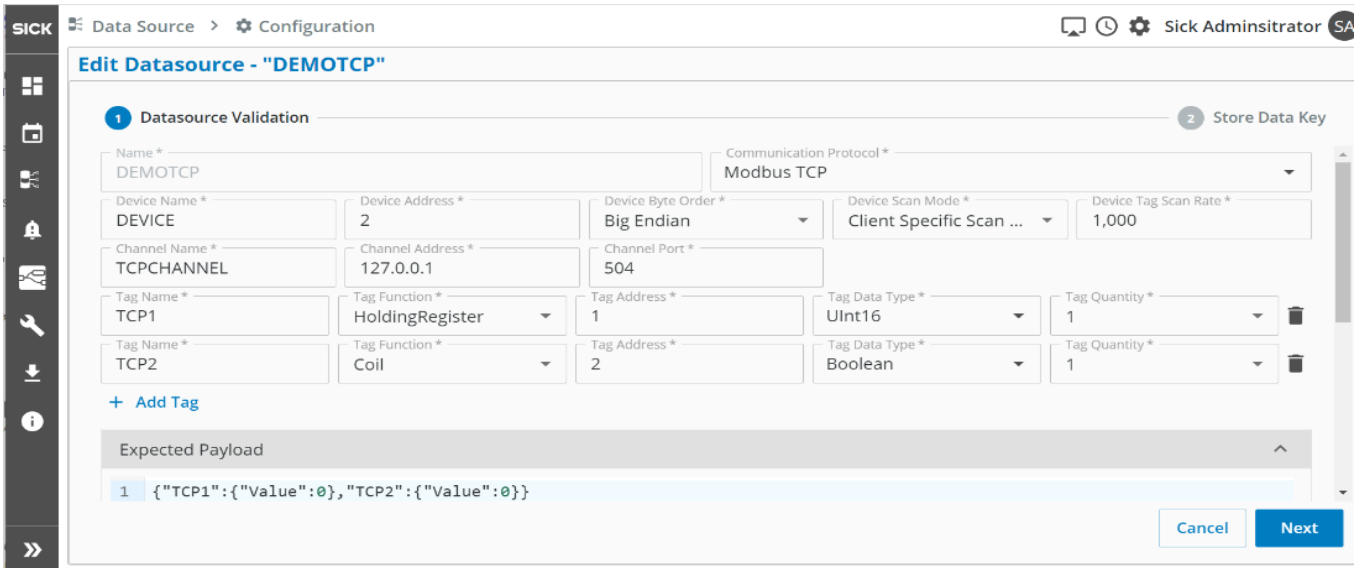

Figure 124: Edit Data Source

3. **Name of the Data source** field is non-editable.
4. Modify the fields and click the **NEXT** button.

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5. Navigates to the **Store Data Key** section where users can modify the parameters and click the **Save** button to save the changes.

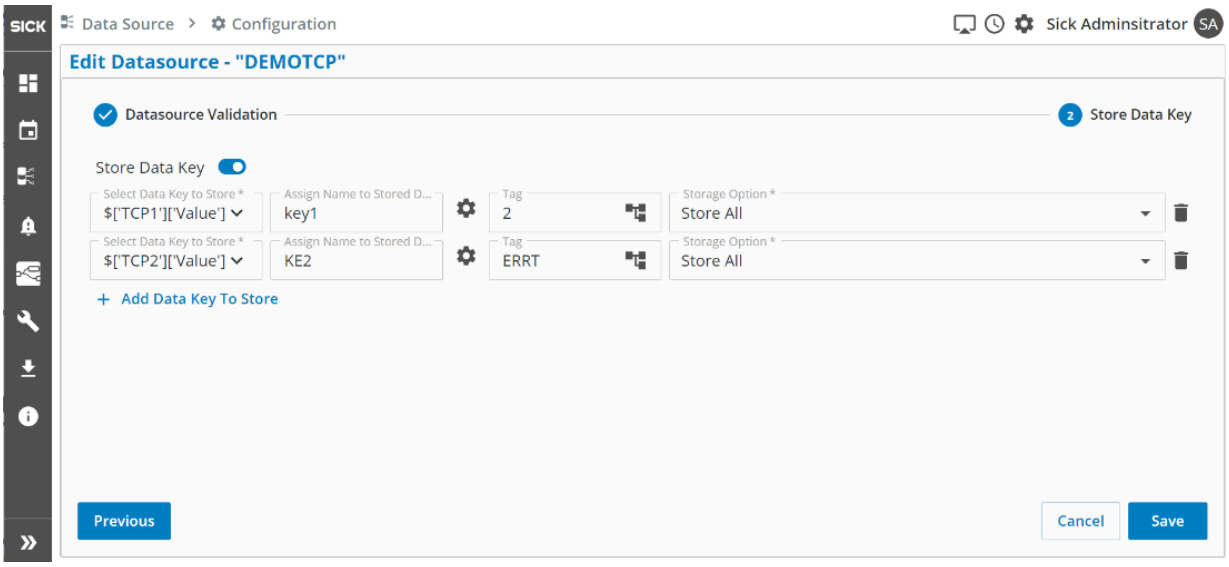

Figure 125: Store Data Key

9.3.3 Delete Data Source

To delete a Data Source:

1. User can delete the specified Data Source by clicking on the delete icon.

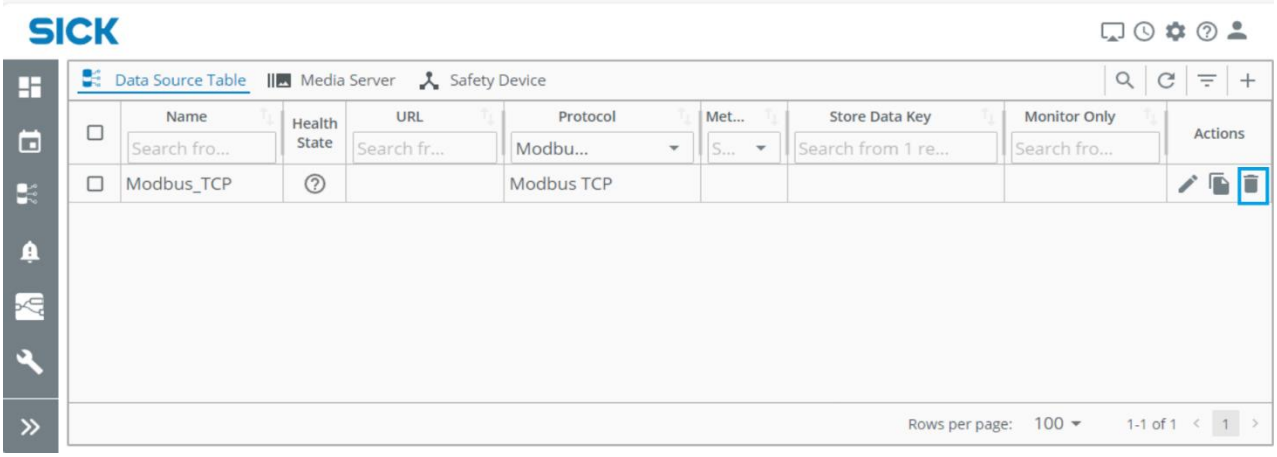

Figure 126: Delete Icon

2. It will display "**Confirm Deletion- Data**" dialog box.

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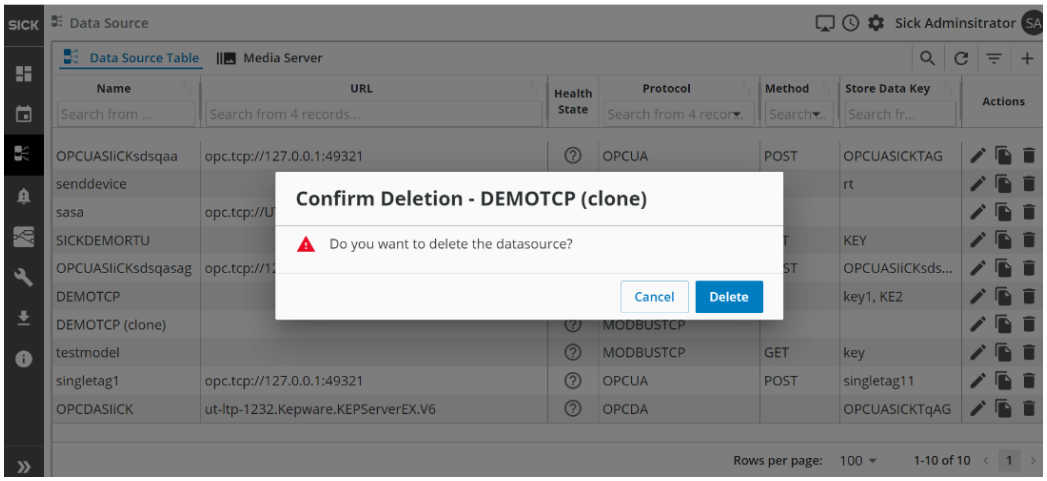

Figure 127: Confirm Deletion

3. Click the **Delete** button to confirm the deletion.

Note: When Data source is deleted, the saved data will remain in database. However, user will lose filter of it in Historian Filter Field.

9.3.4 Copy Data Source

Users can copy a created data source from the Data source page. Copying any of these data sources produces a file that has the same field and data as the original.

To Copy a Data Source

1. User can copy the specified Data Source by clicking on the copy icon in the Data Source Table

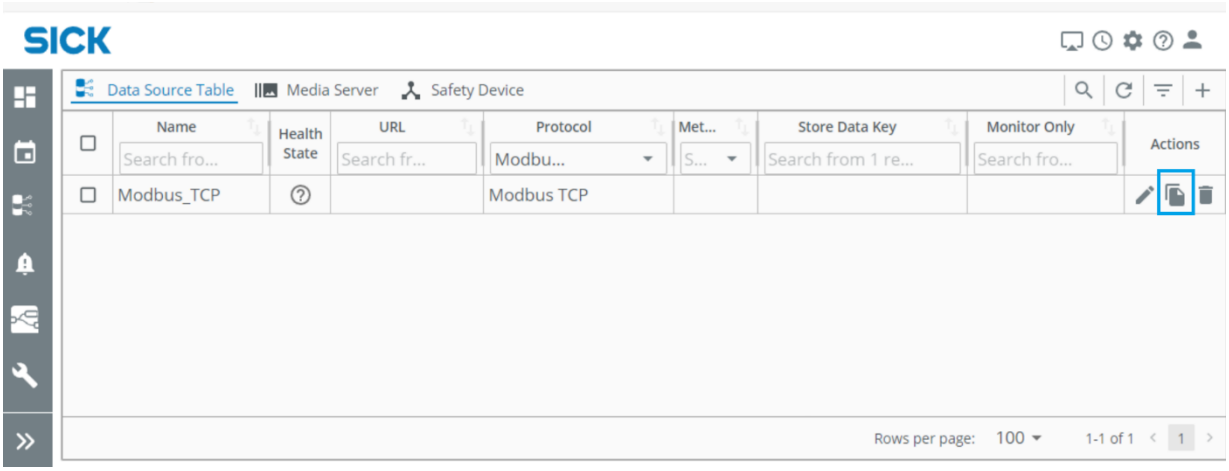

Figure 128: Copy Icon

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2. **Clone Data source – "Data"** dialog box appears.
3. Provide new name to cloned data source by default it will appear as data source name along with clone as new data sources name and click the **Copy** button.

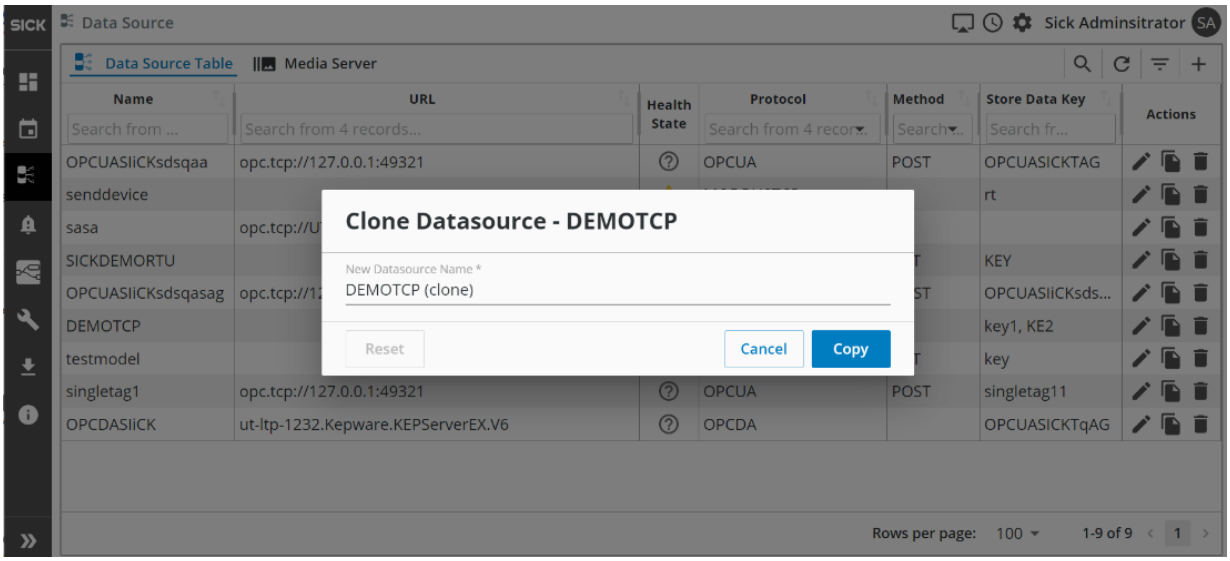

Figure 129: Clone Data Source Dialog box

4. Cloned Data source will appear in Data Source table.
5. Store data key will be disabled by default. Users are required to edit the cloned Data Source and enable store data key.

9.4 Modbus RTU

Modbus RTU is an open serial protocol derived from master/slave architecture (Client/server). It helps in communication between the controllers and also controllers & other devices.

Users need to add Modbus TCP protocol data source to retrieve information through this communication protocol.

9.4.1 Add Data Source for Modbus RTU

Follow below steps to add data source for Modbus TCP protocol:

1. Navigate to **Data Source** page and click on add icon at top-right corner to Add New Data Source. Refer to Figure 87: Add Data
2. On **New Data Source** page, select **Modbus RTU** from **Communication Protocol** drop-down

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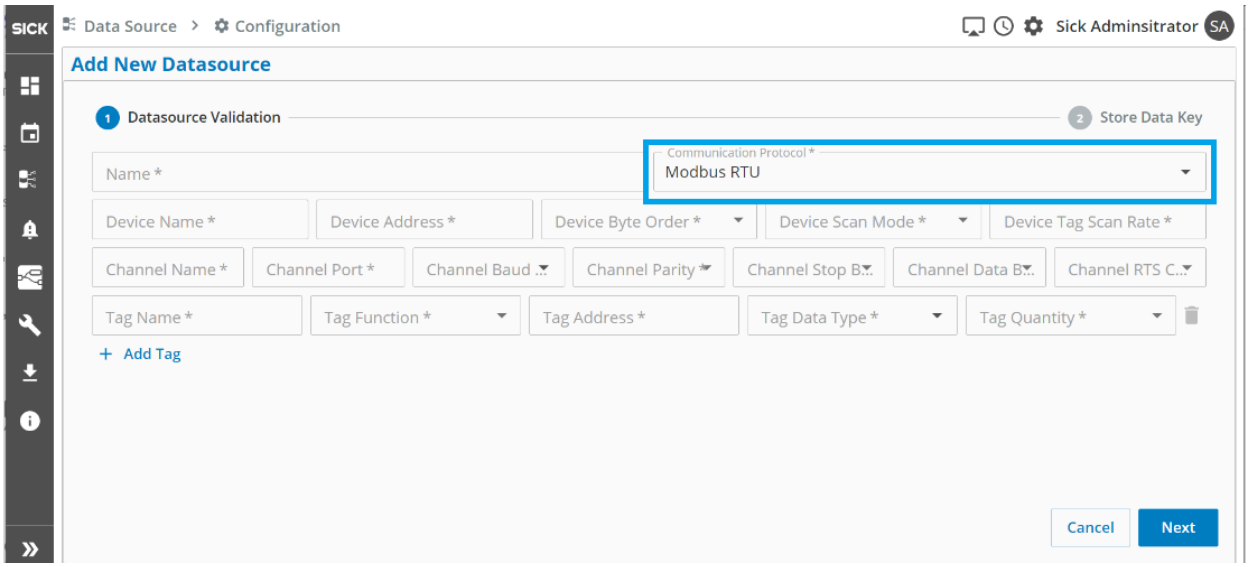

Figure 130: Modbus RTU Protocol

3. Once the **Modbus RTU** protocol is selected, it displays following fields:
    - **Name**: Provide unique user defined name of the Data Source
    - **Device Name**: Provide Device Name
    - **Device Address**: Provide Device Address
    - **Device Byte Order**: It displays **Little Endian** & **Big Endian** options in the drop-down. Select the preferred option.
    - **Device Scan Mode**: It displays **Client Specific Scan Rate** & **Tag Specific Scan Rate** options in the drop-down. Select the preferred option.
    - **Device Tag Scan Rate**: Provide Device Tag Scan Rate
    - **Channel Name**: Provide the channel name.
    - **Channel Port**: Provide Port number for the channel.
    - **Channel Baud Rate**: Select the preferred option from drop-down.

      Note: The baud rate is the rate at which information is transferred in a Communication channel
    - **Channel Parity**: Select the preferred option from drop-down.

      Note: It is an optional parameter, used in serial communications to determine if the data character being transmitted is correctly received by the remote device.
    - **Channel Stop bits**: Select the preferred option from drop-down.

      Note: Stop bits allow time for the reception and processing of the current byte and preparation for the next byte
    - **Channel Data bits**: Select the preferred option from drop-down.

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Note: The number of bits used to represent one character of data. When Transmitting ASCII text via modem, either seven or eight bits may be used.

- **Channel RTS Control**: Select the preferred option from drop-down.

Note: Controls the RTS flow

- **Tag Name**: Provide the tag name.
- **Tag Function**: It displays four functions that are **Coil, Holding Register, Input, and Input Register**. Select the preferred option.
- **Tag Address**: Provide the tag address.
- **Tag Data Type**: Based on the Tag function selection, data types are displayed in the drop-down. Select the preferred option.
- **Tag Quantity**: Select tag quantity from drop-down.

4. User can add more tags by clicking on **Add Tag** link or click the **Next** button.

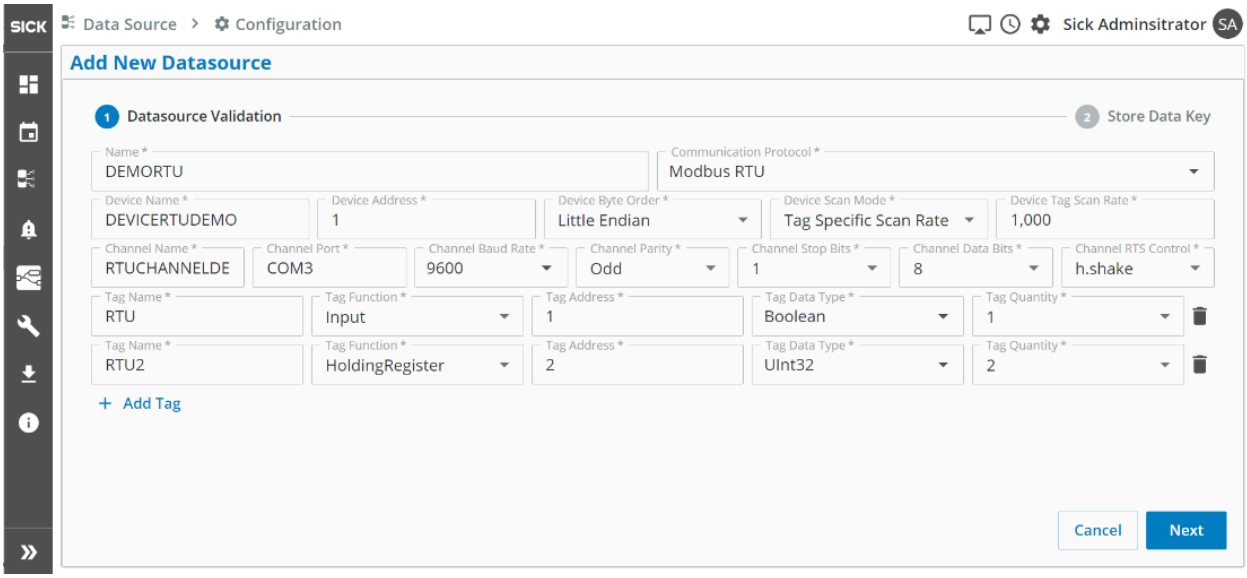

Figure 131: Modbus RTU Data Source Fields

5. Click the **Next** button**, i**t will navigate to the **Store Data Key** page.
6. Enable **Store Data Key** toggle button. It displays the required configured fields:
   - **Data Key to Store**: This will define the data parameter to be stored from the API response.
   - **Assign Name to Stored Data Key**: Assign a unique user defined name to the data parameter being stored in Field Analytics time series historian.
   - **Tag:** This will set a unique label/tag for the Stored Data Key. Always use Tags as something common to all the variables stored. Example, id of the event (this will help in historian reporting and data pivoting functionality)

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- **Storage Option**: Collects and stores a value whenever the value changes. It has following options:
    i. **Store All:** Stores all the values.
    ii. **Store on Change:** Changes the store value upon change in data source.
    iii. **Store Difference (Signed)**: Stores the difference value calculated with base value with mathematical minus sign.
    iv. **Store Difference (Unsigned)**: Stores the difference value calculated with base value without any mathematical sign.
    v. **Monitor only**: This option does not store any value; it is used to monitor the values and notify when condition is met on configured alert

7. Click **Add data key** to add additional parameters from the API response.
8. Click the **Save** button.

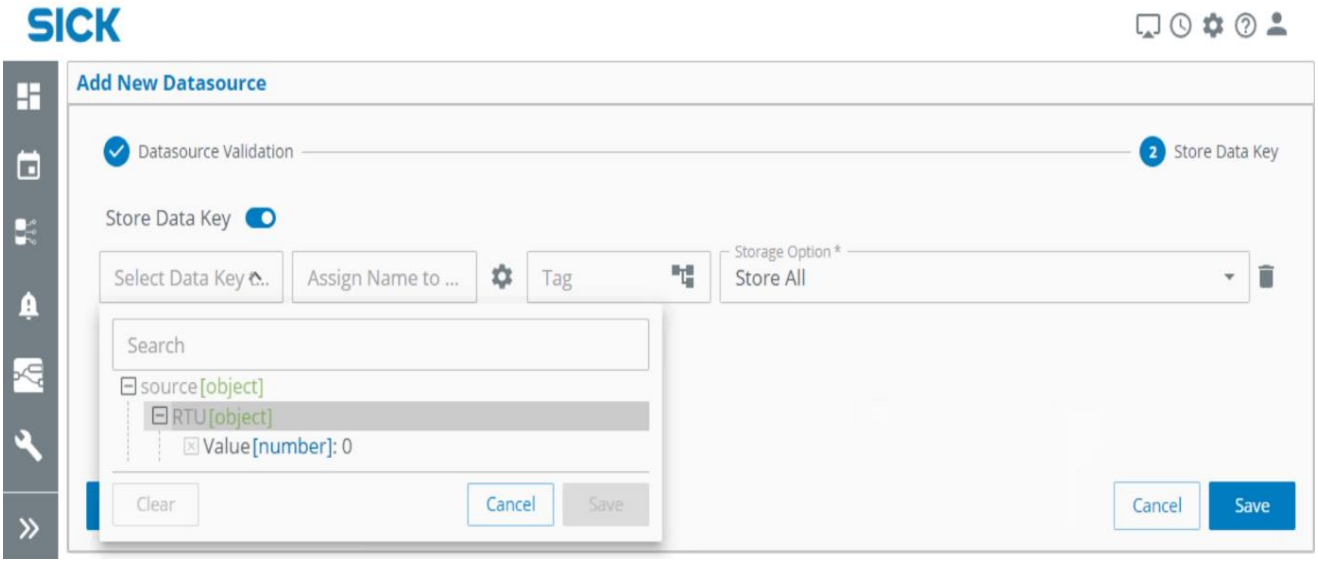

Figure 132: Add New Data Source

9. It creates the Modbus RTU data source in the Data Source Table

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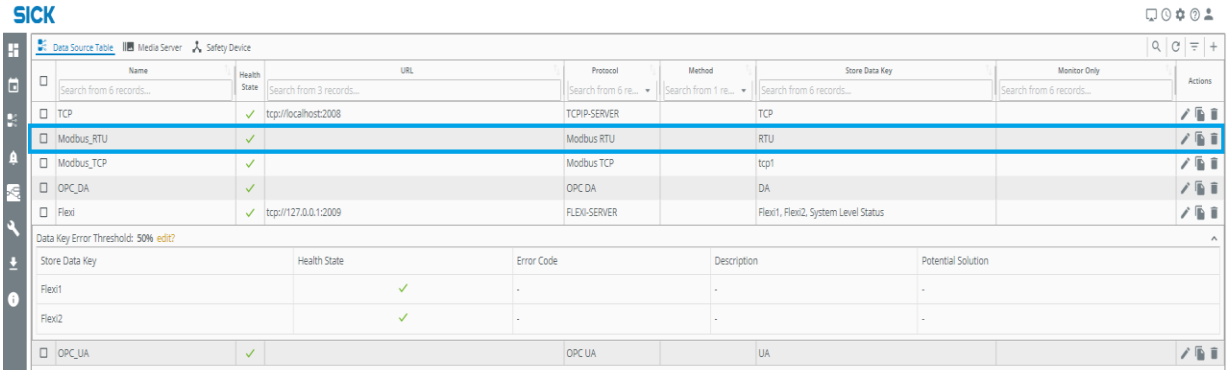

Figure 133: Modbus RTU in Data Source Table

9.4.2 Edit Data Source

1. User can click on the edit icon in **Actions** column of table for the Data Source to navigate to the edit page.

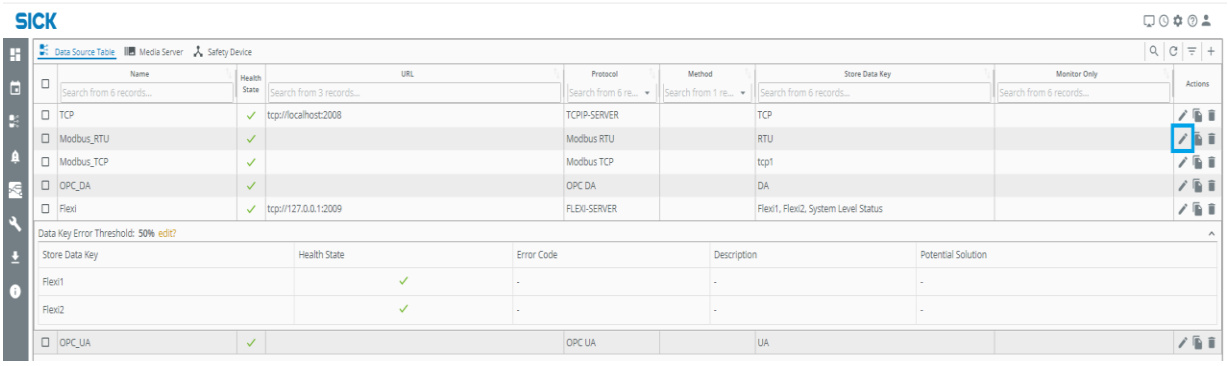

Figure 134: Edit Icon

2. Edit Data Source Page appears.
3. **Name of the Data source** field is non-editable.
4. Modify the fields and click the **NEXT** button.

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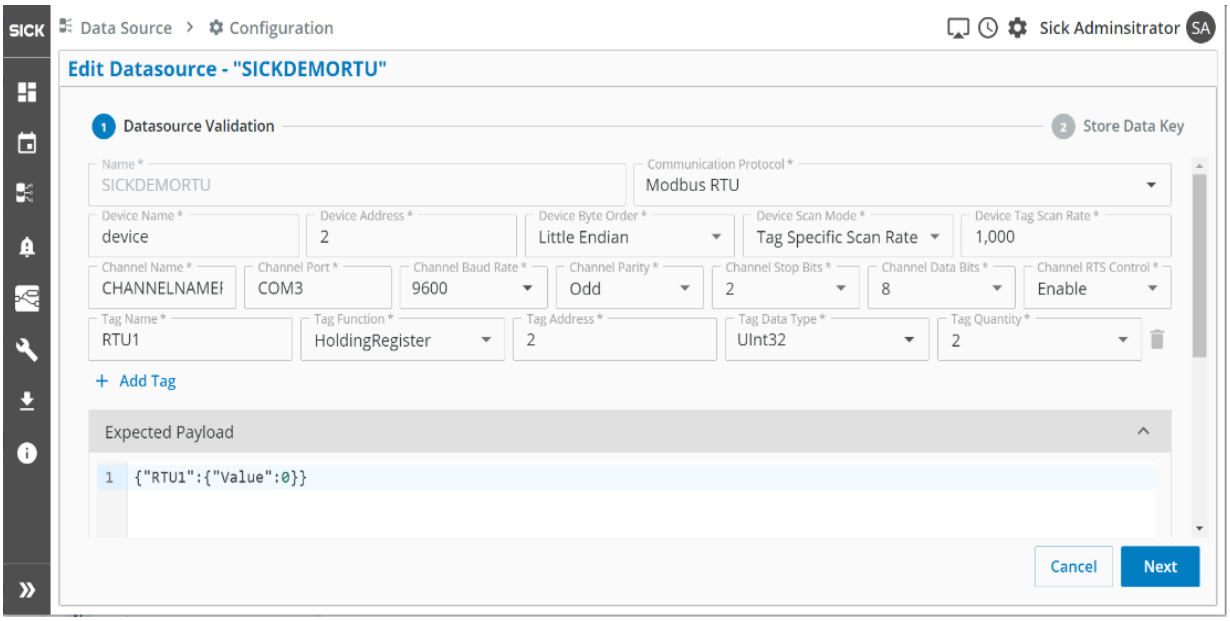

Figure 135: Edit Source Page

5. Navigates to the **Store Data Key** section where users can modify the parameters and click the **Save** button to save the changes.

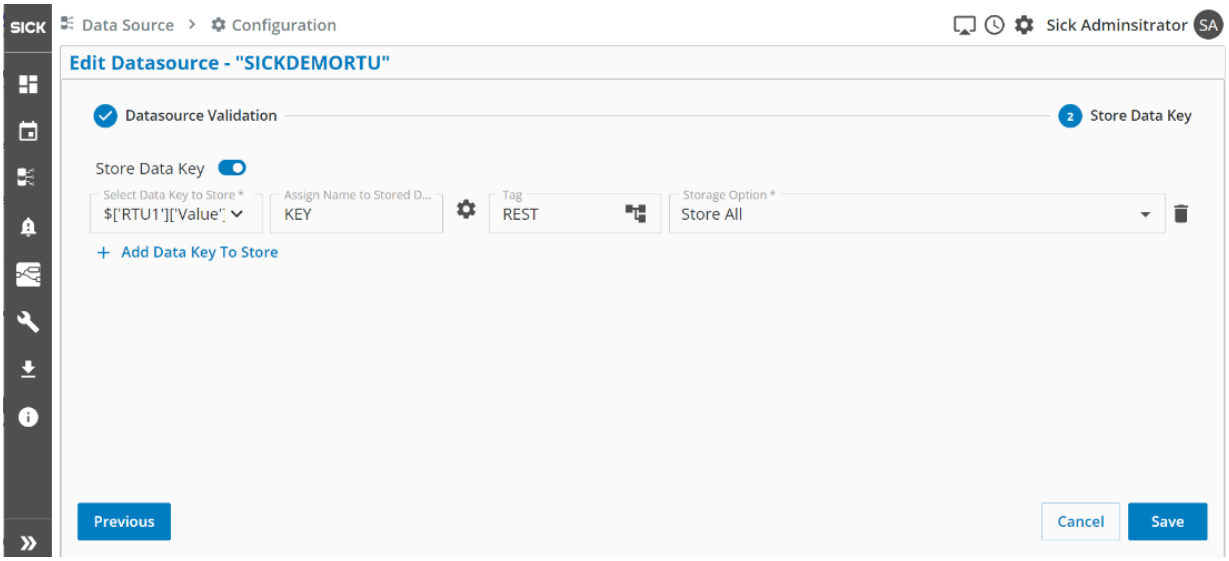

Figure 136: Store Data Key

9.4.3 Delete Data Source

To delete a Data Source:

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1. User can delete the specified Data Source by clicking on the delete icon.

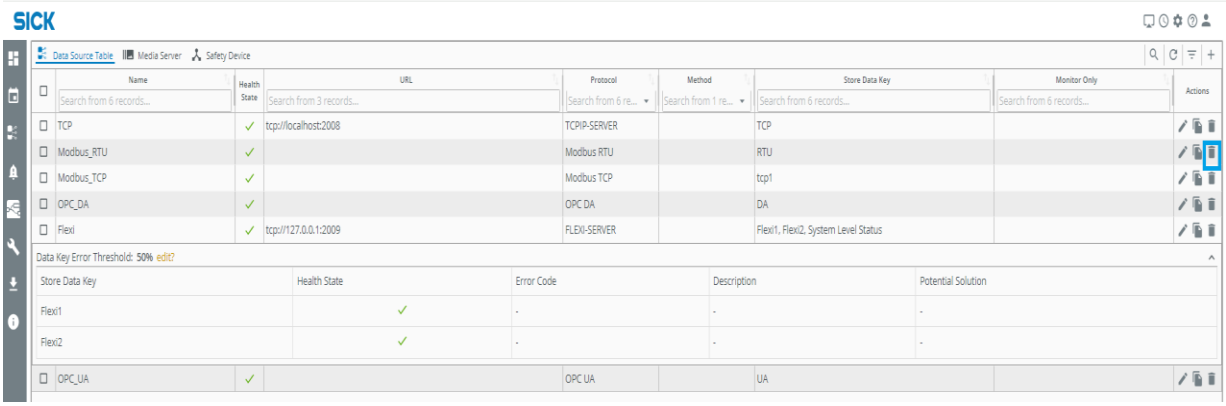

Figure 137: Delete Icon

2. It will display "**Confirm Deletion- Data"** dialog box.

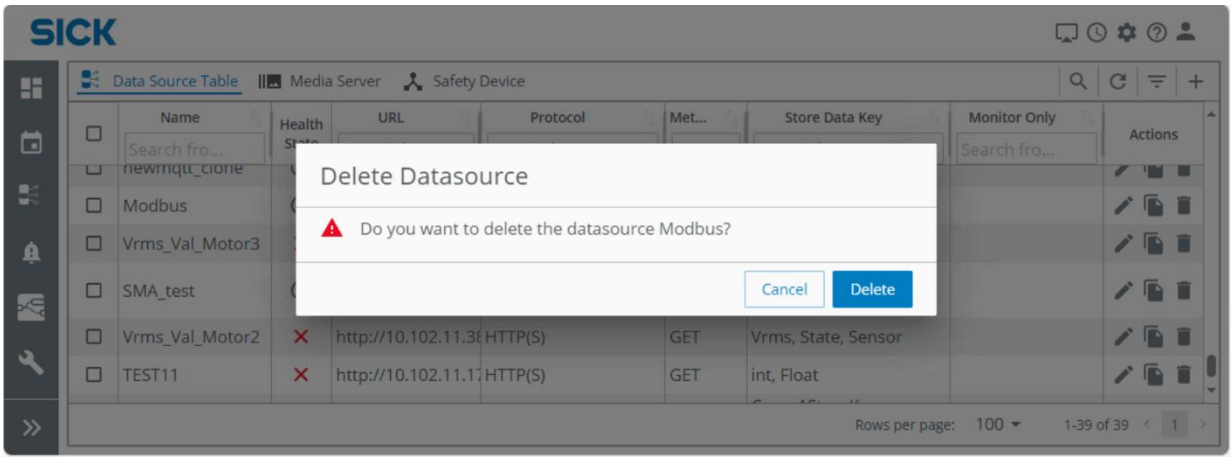

Figure 138: Confirm Deletion

3. Click the **Delete** button to confirm the deletion.

   Note: When Data source is deleted, the saved data will remain in database. However, user will lose filter of it in Historian Filter Field.

9.4.4 Copy Data Source

Users can copy a created data source from the Data source page. Copying any of these data sources produces a file that has the same field and data as the original.

To Copy a Data Source

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1. User can copy the specified Data Source by clicking on the copy icon in the Data Source Table

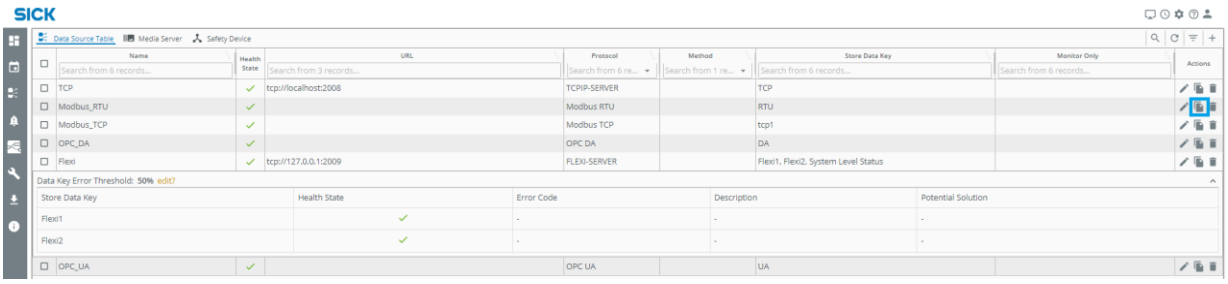

Figure 139: Copy Icon

2. **Clone Data source – "Data"** dialog box appears.
3. Provide new name to cloned data source by default it will appear as data source name along with clone as new data sources name and click the **Copy** button.

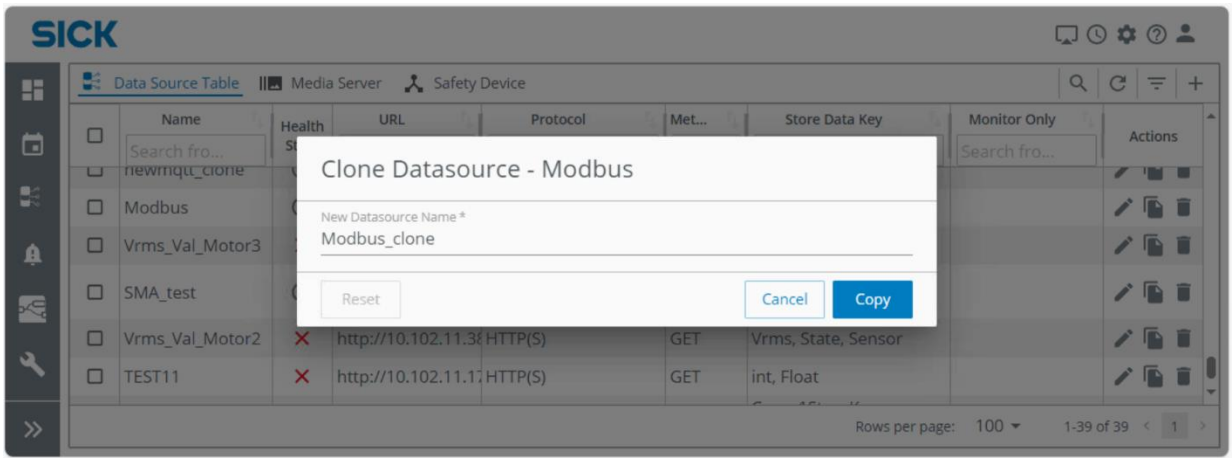

Figure 140: Clone Data Source Dialog box

4. Cloned Data source will appear in Data Source table.
5. Store data key will be disabled by default. Users are required to edit the cloned Data Source and enable store data key.

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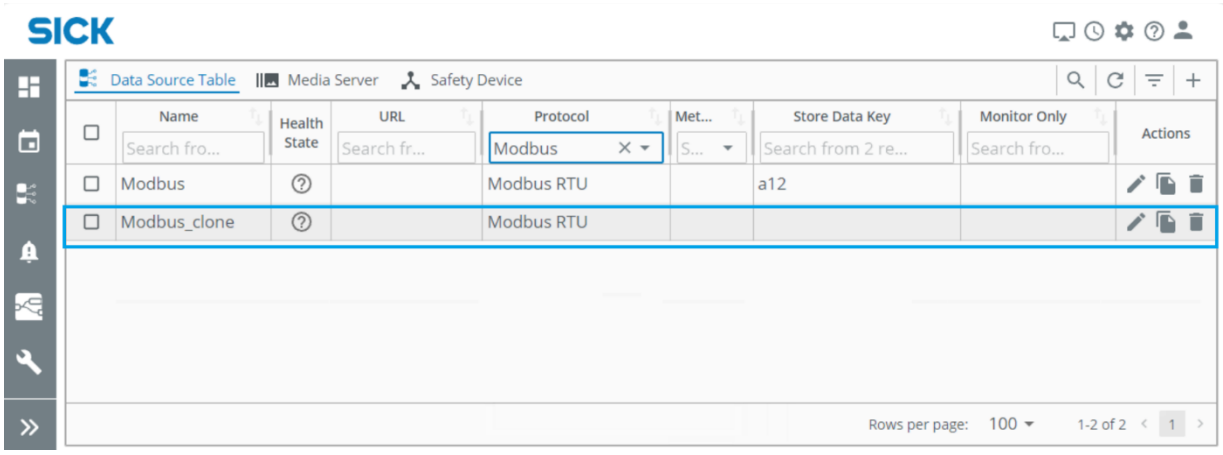

Figure 141: Cloned Data Source

9.5 OPC UA

OPC-UA (Open Platform Communications United Architecture) is a data exchange standard for industrial communication. It communicates by PC-Machine communication or Machine-Machine communication.

9.5.1 Add Data Source

Follow below steps to add data source for OPC UA protocol:

1. Navigate to **Data Source** page and click on add icon at top-right corner to Add New Data Source. Refer to Figure 87: Add Data
2. On **New Data Source** page, select **OPC UA** from **Communication Protocol** drop-down.

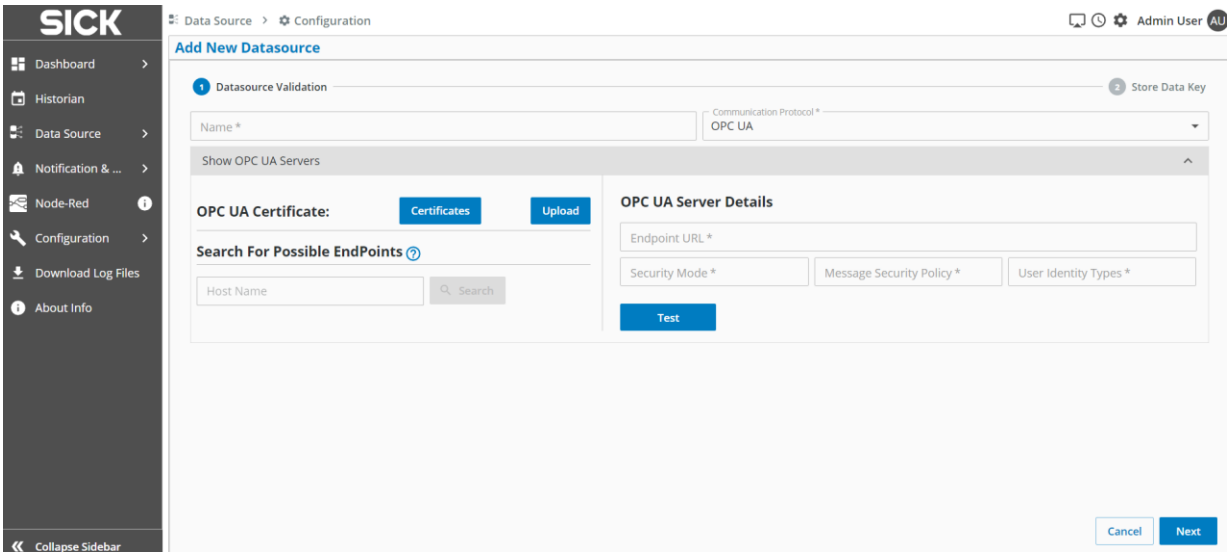

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Figure 142: OPC UA Protocol

3. Once the OPC UA protocol is selected, following fields are displayed:
    - **OPC UA Certificate**: Certificate is mandatory as it provides secure communication between server and client. Upload the OPC UA certificate by clicking the **Upload** button. To view all the uploaded certificates, click the **Certificates** button.

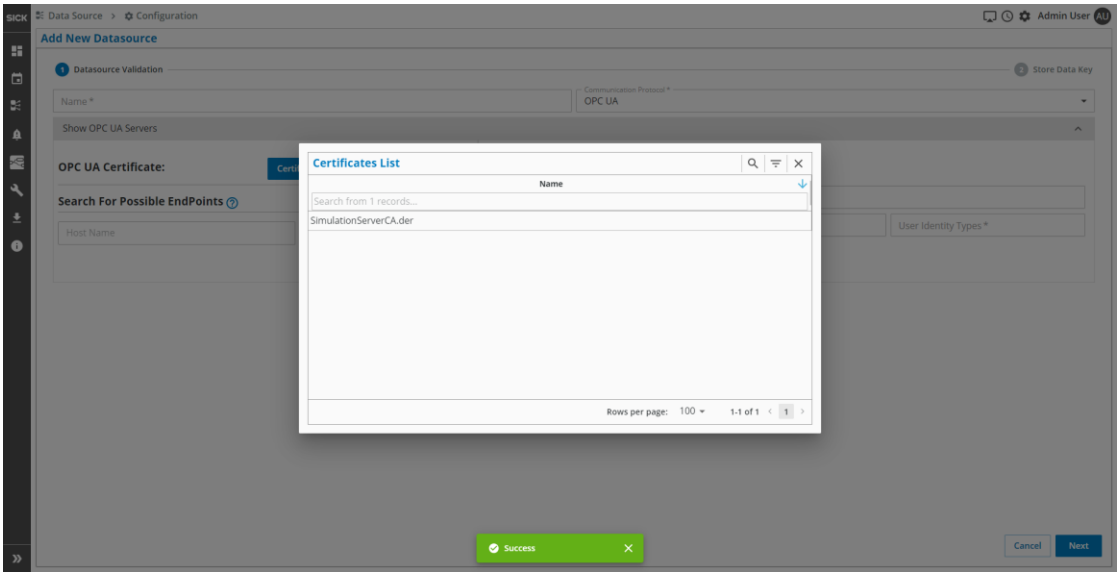

Figure 143: Certificate List

- **Host Name**: User can either search for possible endpoints by providing host name in Host Name Search box or can enter endpoint URL in OPC UA server details.

NOTE: These settings are derived from the simulator, therefore it might or might not have them. Additionally, other options might be shown based on the simulator configuration we made.

OPC UA Server Details

i. **Endpoint URL**: Enter endpoint URL i.e., UA server URL used to connect the server.
ii. **Security Mode**: It has options like **None, Sign and Security**, and **Sign and Encrypt.** Select any of the option from drop-down.
iii. **Message Security Policy**: It has options like **None, Basic256**, and **Basic256SH256**. Select any of the option from drop-down.
iv. **User Identify Types**: It is used for authentication purpose. It has options like **Anonymous** and **Username and Password**. When Username and

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password type is selected, Username and password text box appears. Enter the credentials.

Click the **Test** button.

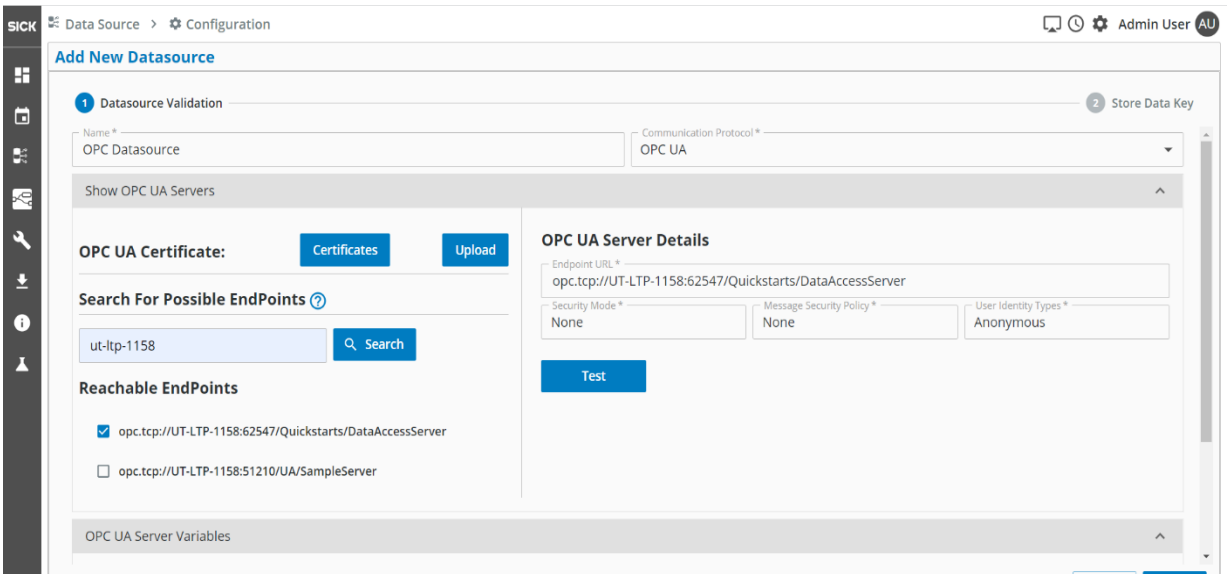

Figure 144: OPC UA Data Source Fields

Once the **Test** button is clicked, it displays OPC UA Server Variables. Select the required variables and click the **Next** button.

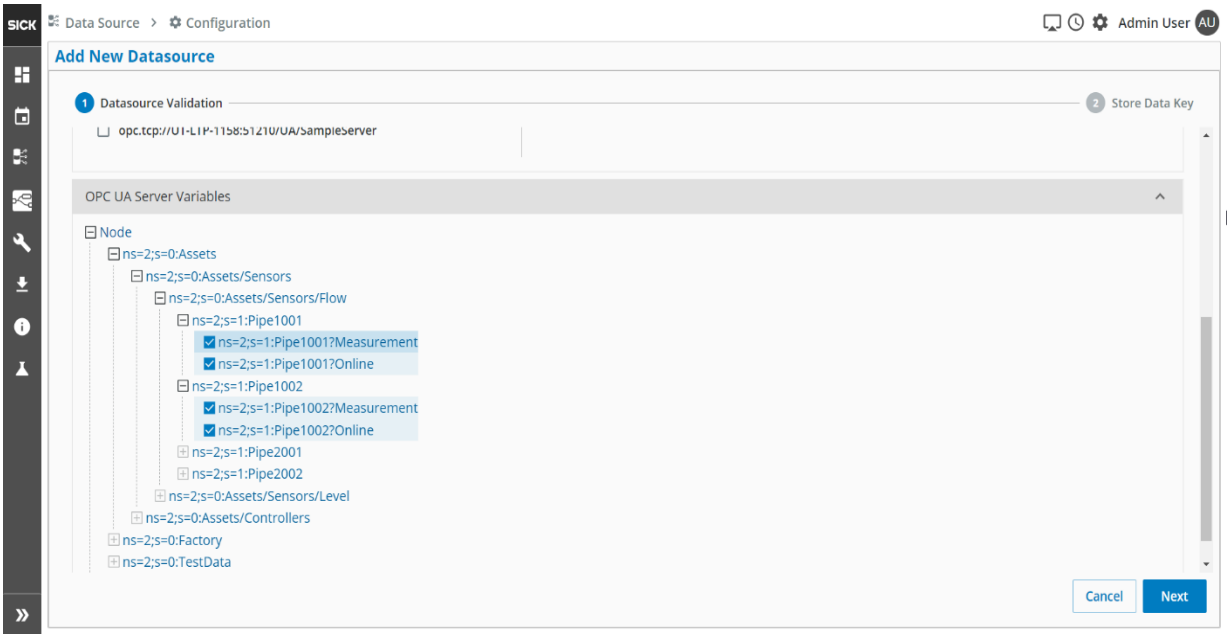

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Figure 145: OPC UA Server Variables

It navigates to **Store Data Key** screen. Enable **Store Data Key** toggle button.

It displays the required configured fields:

- **Data Key to Store**: This will define the data parameter to be stored from the API response.
- **Assign Name to Stored Data Key**: Assign a unique user defined name to the data parameter being stored in Field Analytics time series historian.
- **Tag:** This will set a unique label/tag for the Stored Data Key. Always use Tags as something common to all the variables stored. Example, id of the event (this will help in historian reporting and data pivoting functionality)
- **Storage Option**: Collects and stores a value whenever the value changes.

User can click **Add data key** to add additional parameters from the API response and click the **Save** button.

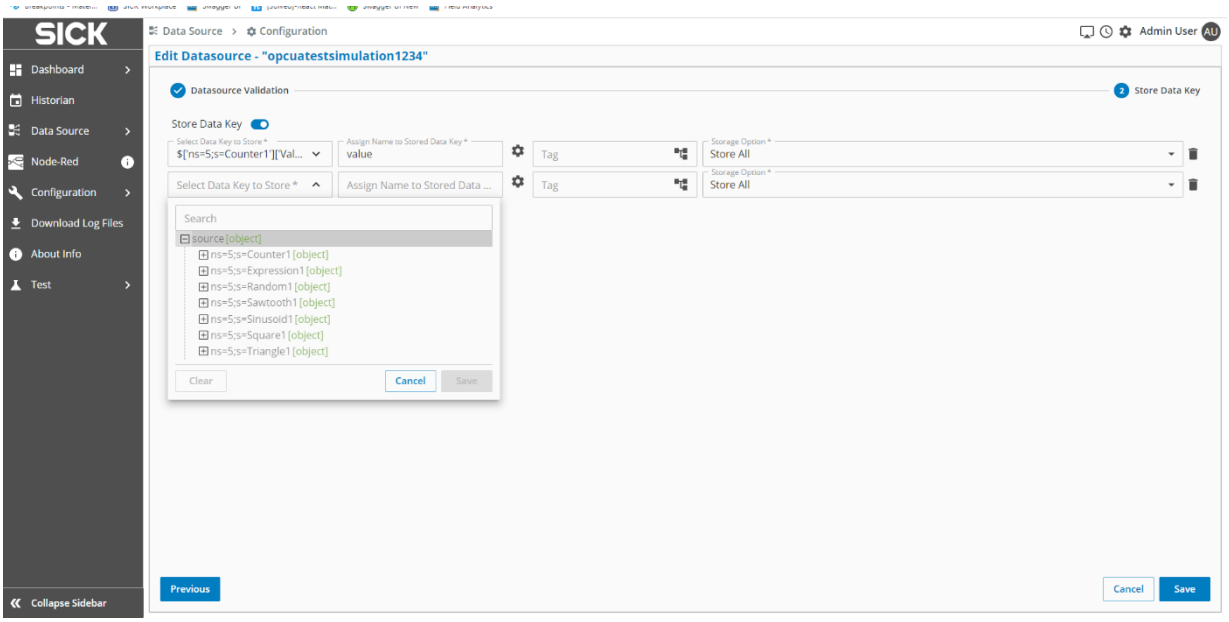

Figure 146: Store Data Key

It creates the OPC UA data source in the Data Source Table.

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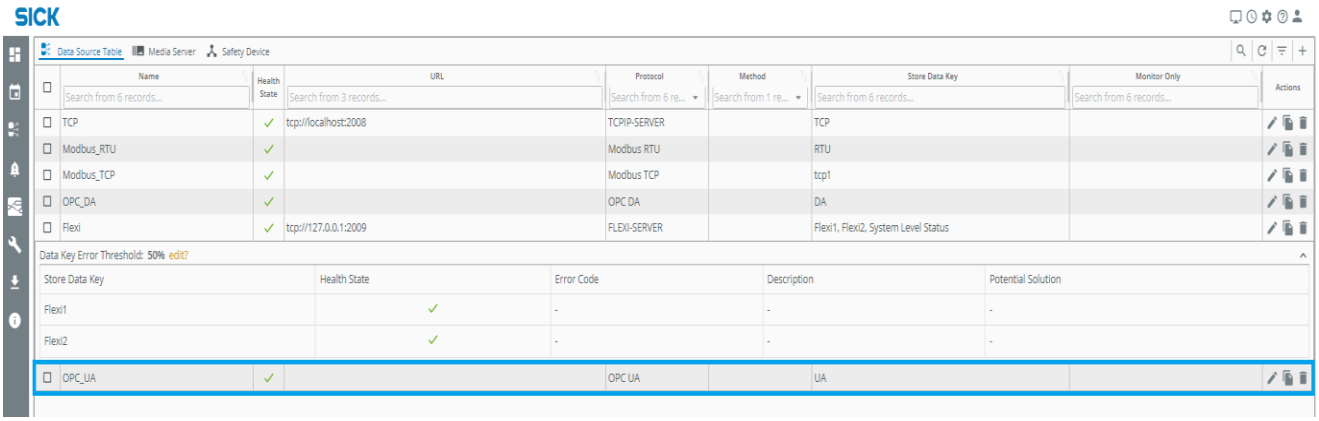

Figure 147: OPC UA in Data Source Table

9.5.2 Edit Data Source

1. User can click on the edit icon in **Actions** column of table for the Data Source to navigate to the edit page.

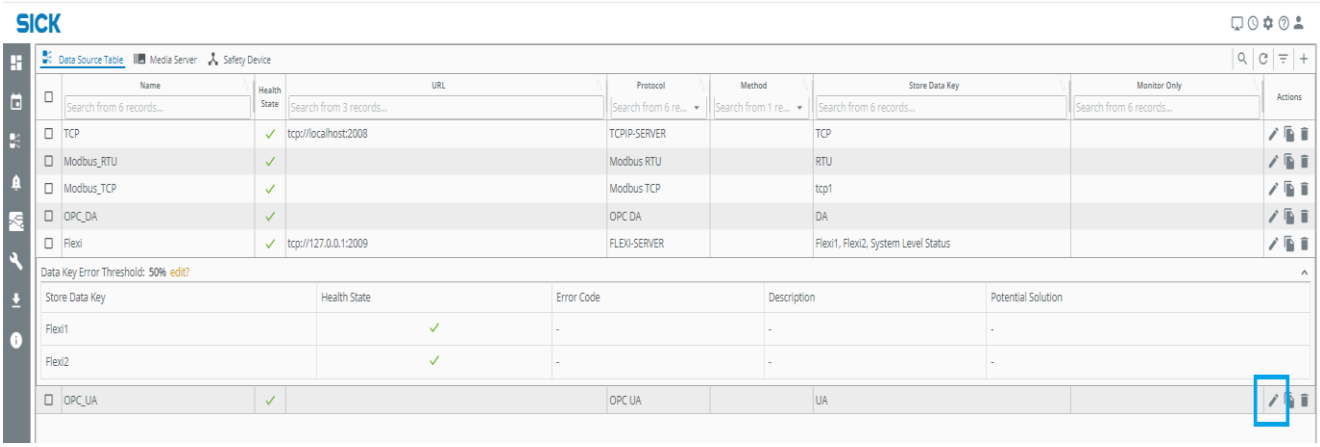

Figure 148: Edit Icon

2. Edit Data Source Page appears.
3. **Name of the Data source** field is non-editable.
4. Modify the fields and click the **NEXT** button.

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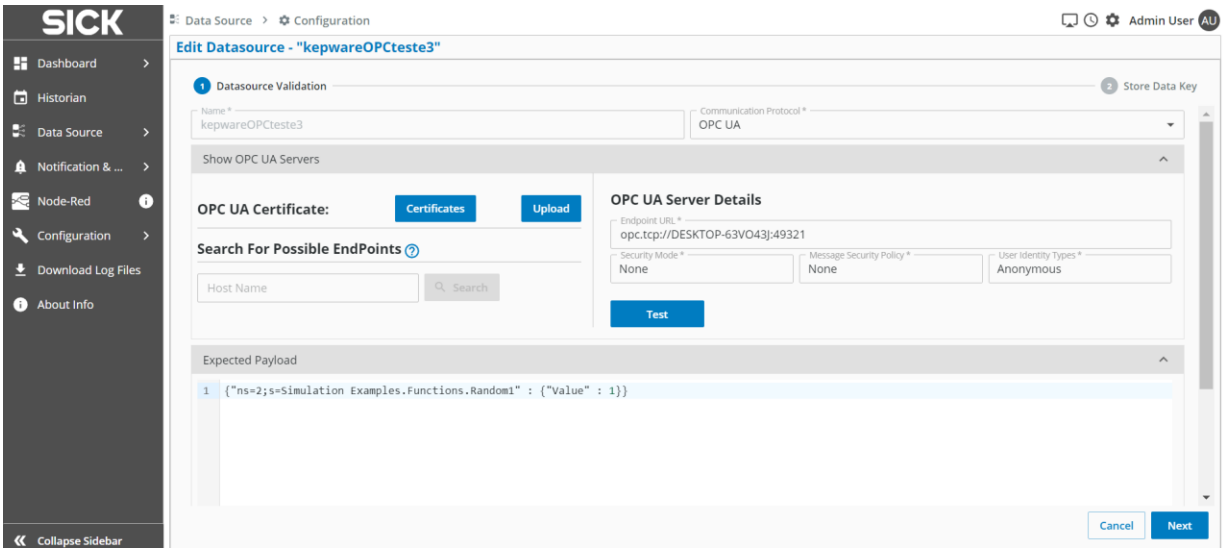

Figure 149: Edit OPC UA Data Source

5. Navigates to the **Store Data Key** section where users can modify the parameters and click the **Save** button to save the changes.

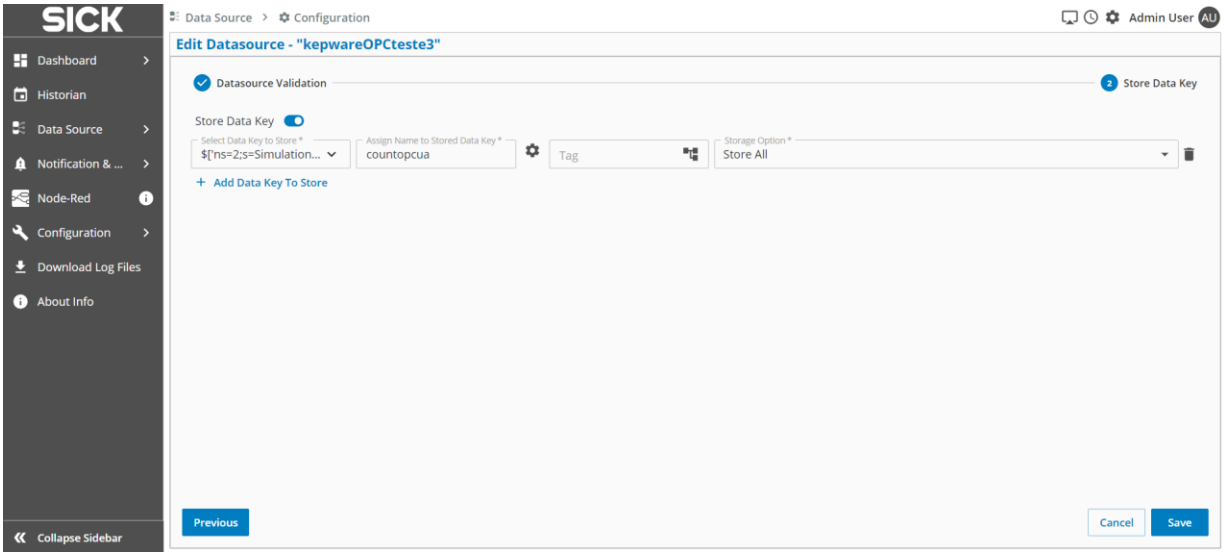

Figure 150: Store Data Key

9.5.3 Delete Data Source

To delete a Data Source, click the delete icon of the preferred data source in the data source table.

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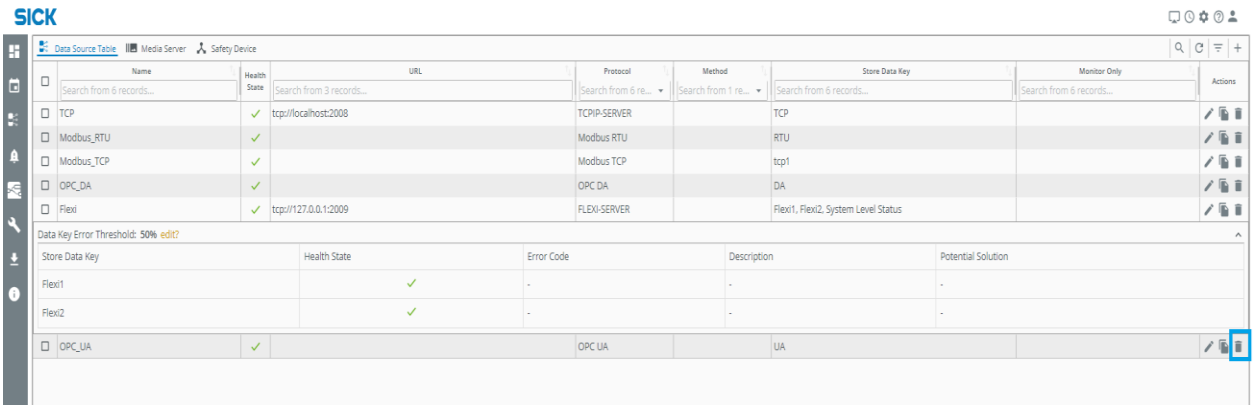

Figure 151: Delete Icon

1. Delete Data Source confirmation box appears.
2. Click the **Delete** button to confirm the deletion.

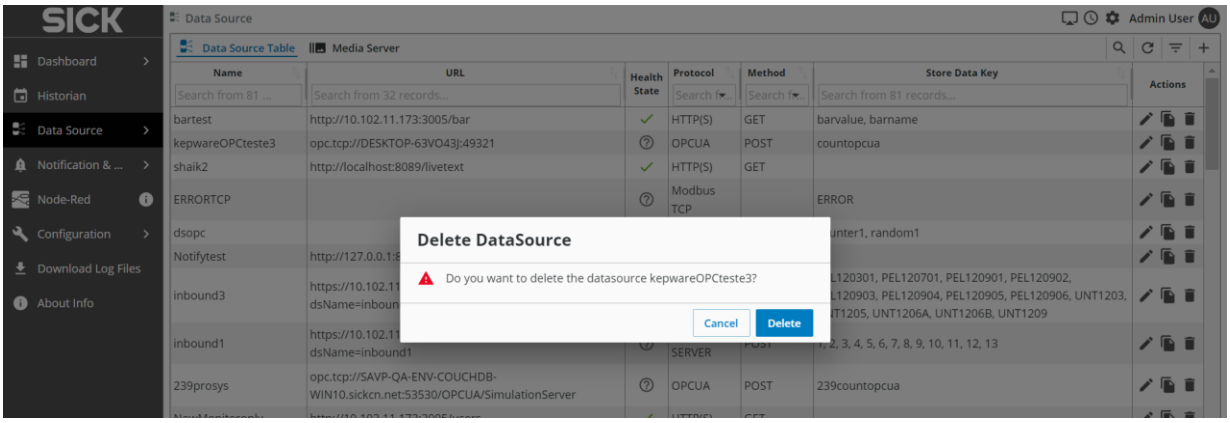

Figure 152: Delete Data Source Confirmation Screen

9.5.4 Copy Data Source

Users can copy a created data source from the Data source page. Copying any of these data sources produces a file that has the same field and data as the original.

To Copy a Data Source

1. User can copy the specified Data Source by clicking on the copy icon in the Data Source Table

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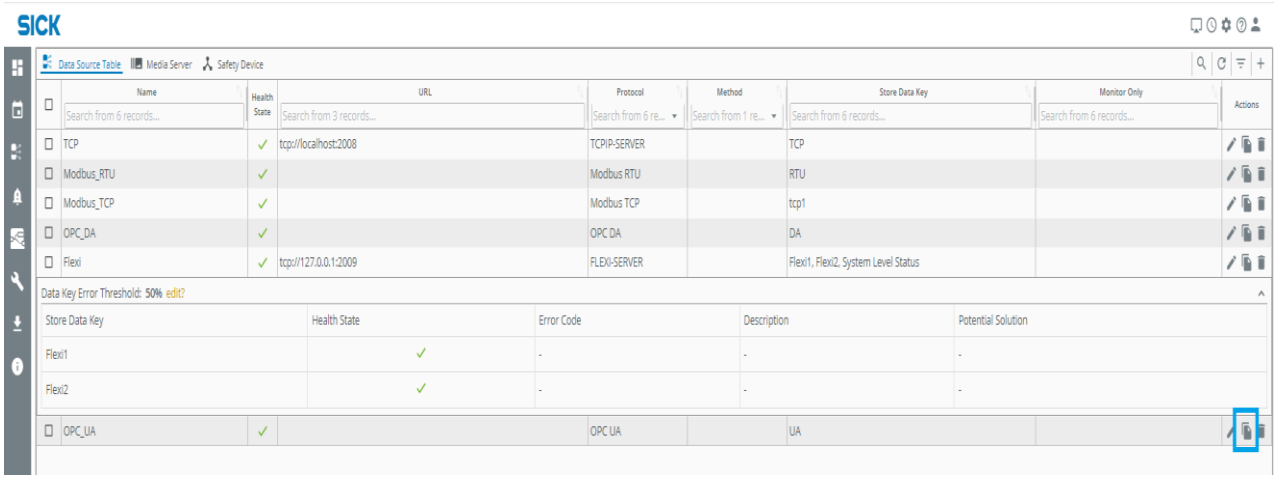

Figure 153: Copy Icon

2. **Clone Data source – "Data"** dialog box appears.
3. Provide new name to cloned data source by default it will appear as data source name along with clone as new data sources name and click the **Copy** button.

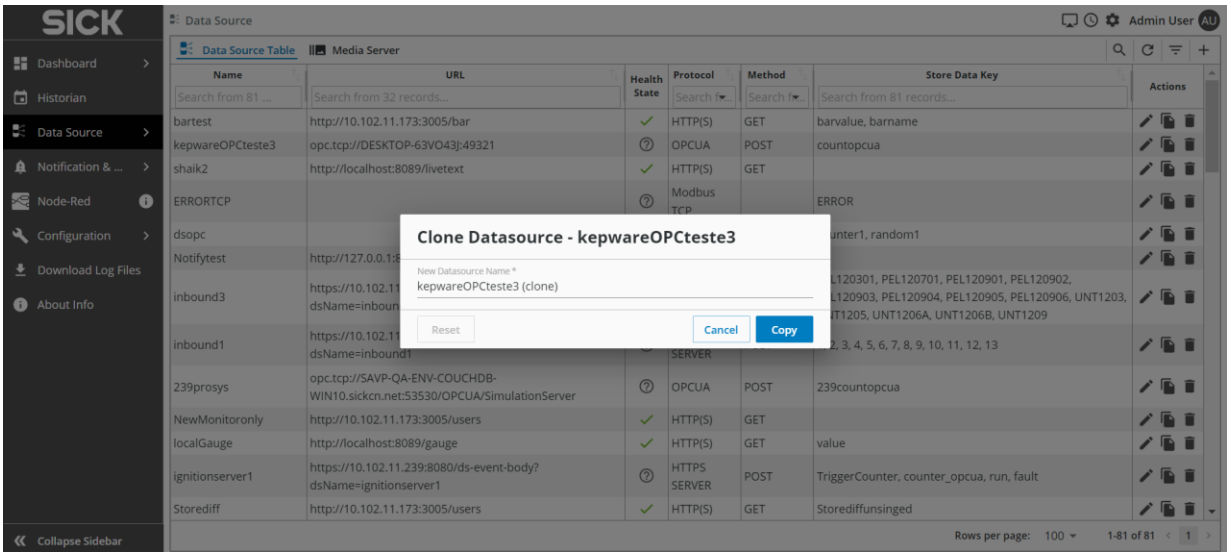

Figure 154: Clone Data Source Dialog Box

4. Cloned Data source will appear in Data Source table.
5. Store data key will be disabled by default. Users are required to edit the cloned Data Source and enable store data key.

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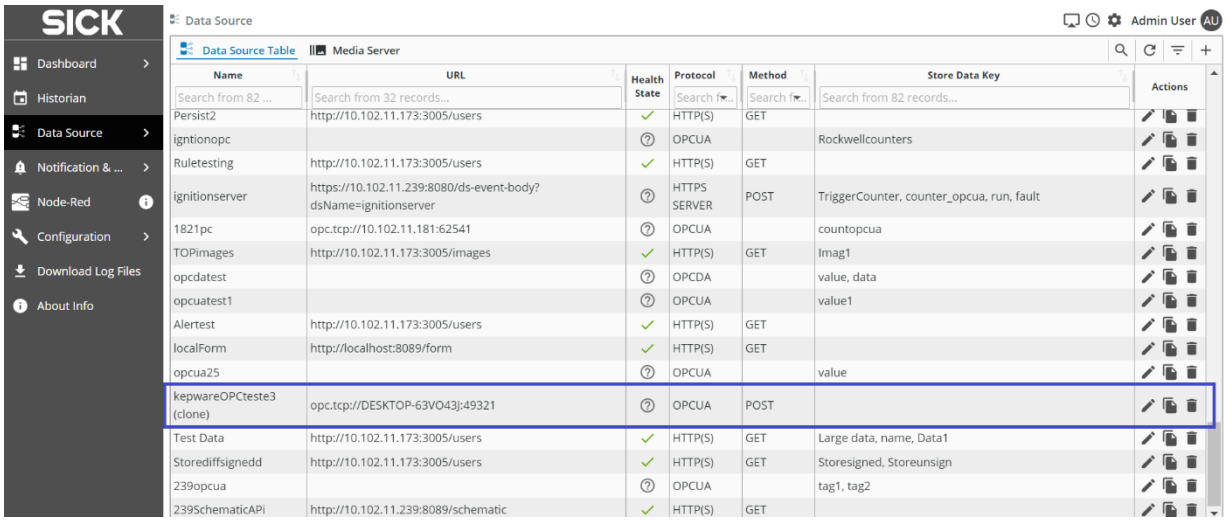

Figure 155: Cloned Data Source

9.6 OPC DA

OPC DA (OPC Data Access) is a standard which describes set of functions for real-time data exchange with various devices.

9.6.1 Add Data Source

Follow below steps to add data source for OPC DA protocol:

1. Navigate to **Data Source** page and click on add icon at top-right corner to Add New Data Source. Refer to Figure 87: Add Data
2. On **New Data Source** page, select **OPC DA** from **Communication Protocol** drop-down.

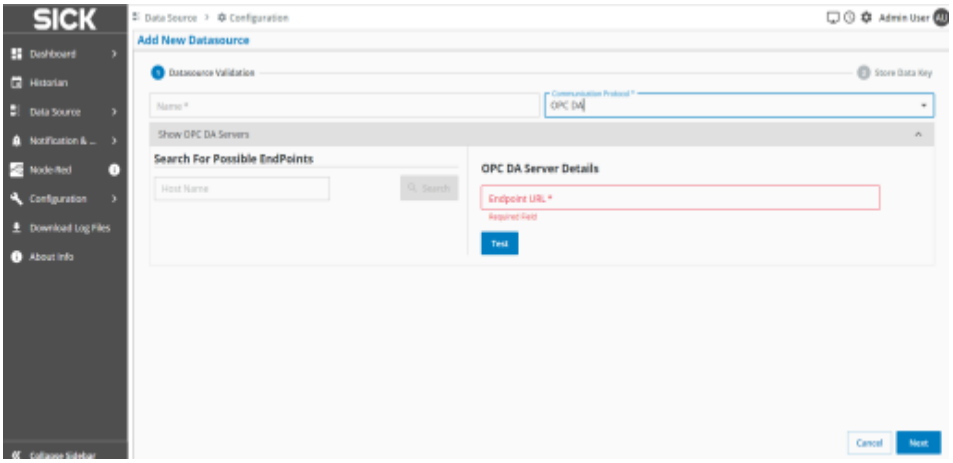

Figure 156: OPC DA Protocol

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3. Once the OPC DA protocol is selected, following fields are displayed:
    - **Host Name**: User can either search for possible endpoints by providing host name in Host Name Search box or can enter endpoint URL in OPC DA server details.
    - **OPC DA Server Details**
        - **Endpoint URL:** Enter endpoint URL i.e., DA server URL used to connect the server

    Click the **Test** button, it displays OPC DA Server Variables then click the **Next** button.

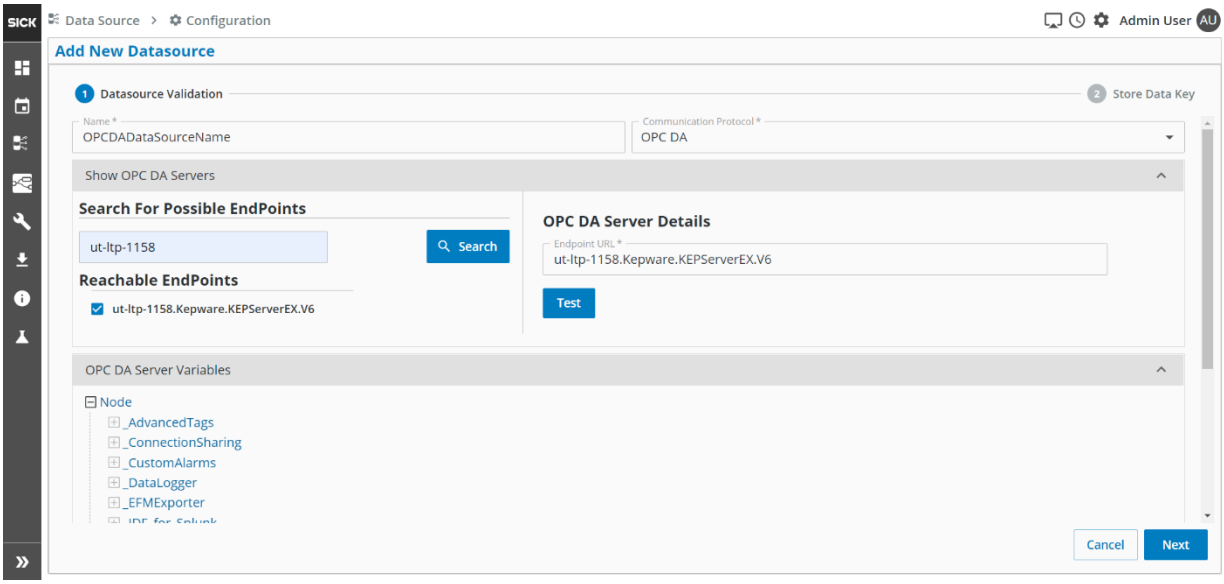

Figure 157: OPC Data Source Fields

It navigates to **Store Data Key** screen. Enable **Store Data Key** toggle button.

It displays the required configured fields:

- **Data Key to Store**: This will define the data parameter to be stored from the API response.
- **Assign Name to Stored Data Key**: Assign a unique user defined name to the data parameter being stored in Field Analytics time series historian.
- **Tag:** This will set a unique label/tag for the Stored Data Key. Always use Tags as something common to all the variables stored. Example, id of the event (this will help in historian reporting and data pivoting functionality)
- **Storage Option**: Collects and stores a value whenever the value changes. It has following options:
    i. **Store All:** Stores all the values.
    ii. **Store on Change:** Changes the store value upon change in data source.
    iii. **Store Difference (Signed)**: Stores the difference value calculated with base value with mathematical minus sign.

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iv. **Store Difference (Unsigned)**: Stores the difference value calculated with base value without any mathematical sign.
v. **Monitor only**: This option does not store any value; it is used to monitor the values and notify when condition is met on configured alert

User can click **Add data key** to add additional parameters from the API response and click the **Save** button.

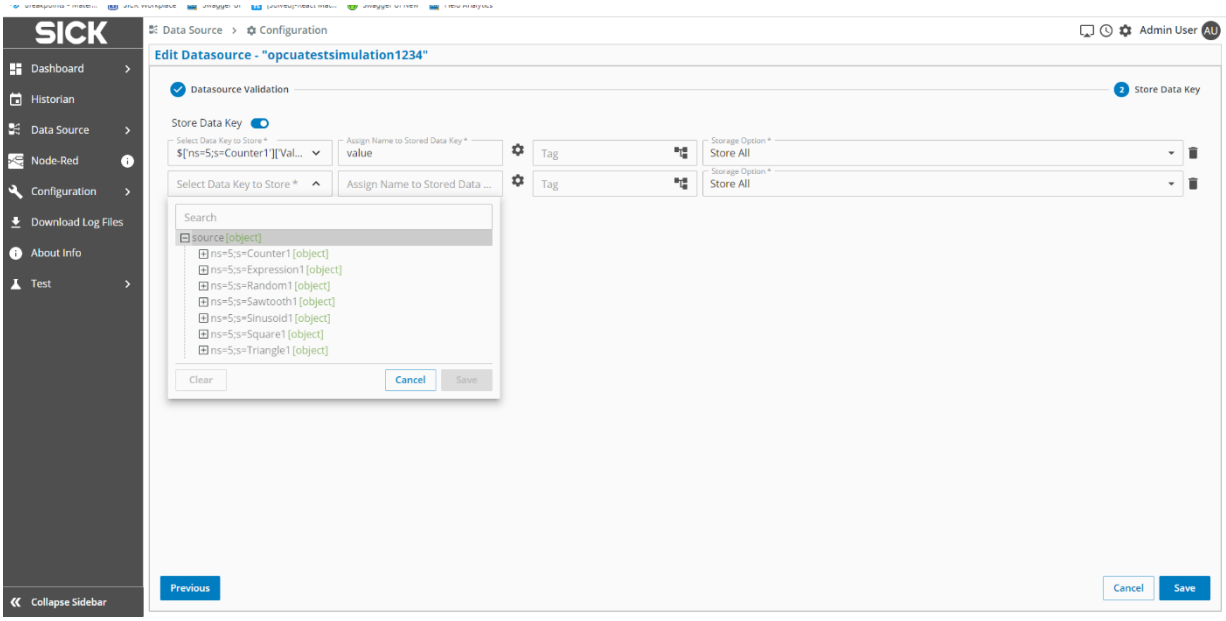

Figure 158: Store Data Key

It creates the OPC DA data source in the Data Source Table.

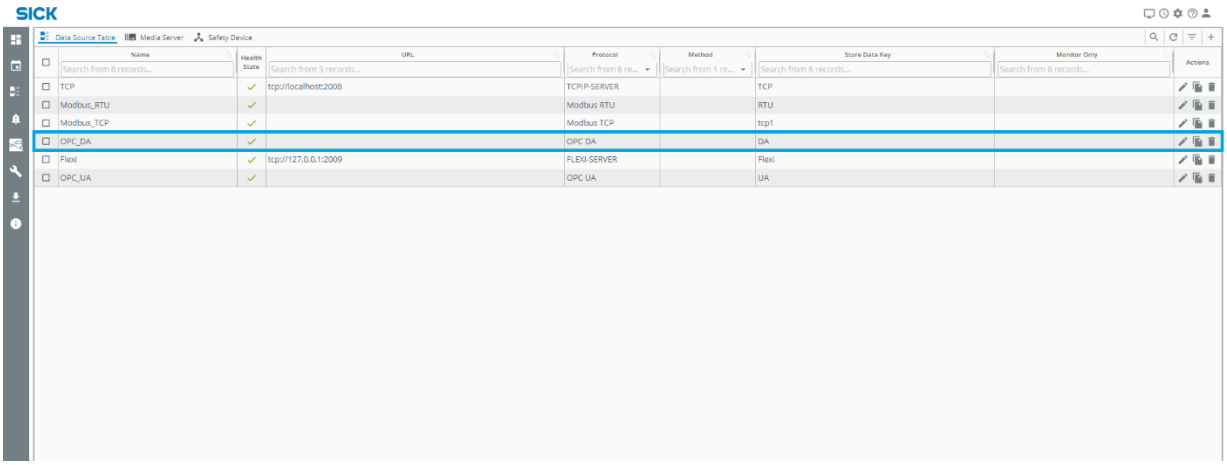

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Figure 159: OPC DA in Data Source Table

9.6.2 Edit Data Source

1. User can click on the edit icon in **Actions** column of table for the Data Source to navigate to the edit page.

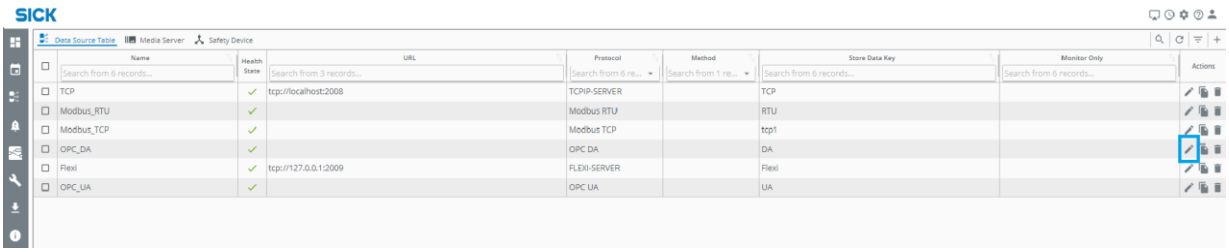

Figure 160: Edit Icon

2. Edit Data Source Page appears.
3. **Name of the Data source** field is non-editable.
4. Modify the fields and click the **NEXT** button.

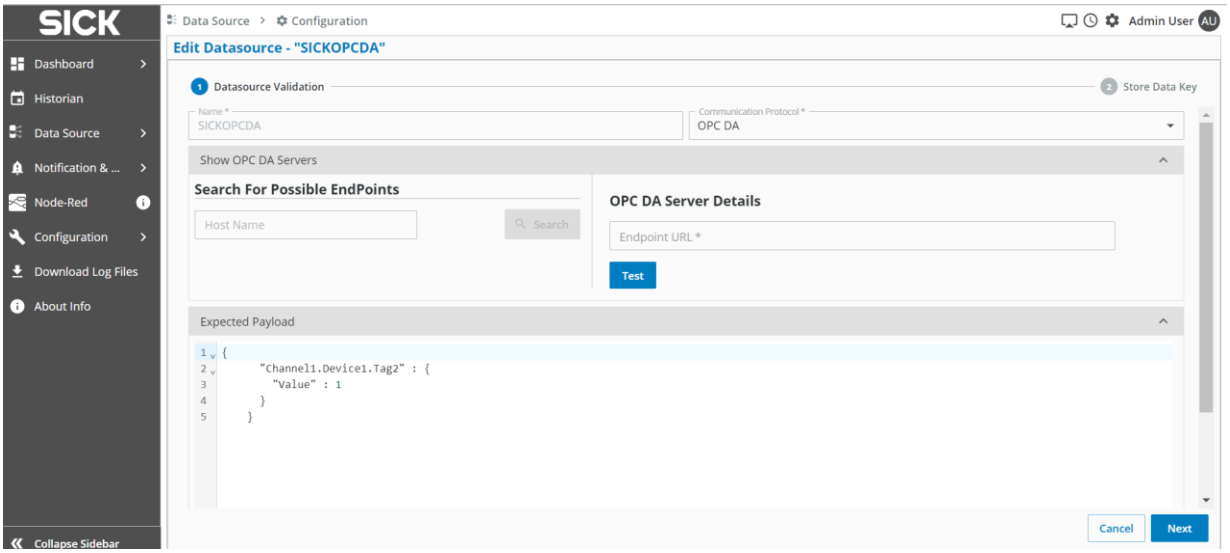

Figure 161: Edit Data Source

5. Navigates to the **Store Data Key** section where users can modify the parameters and click the **Save** button to save the changes.

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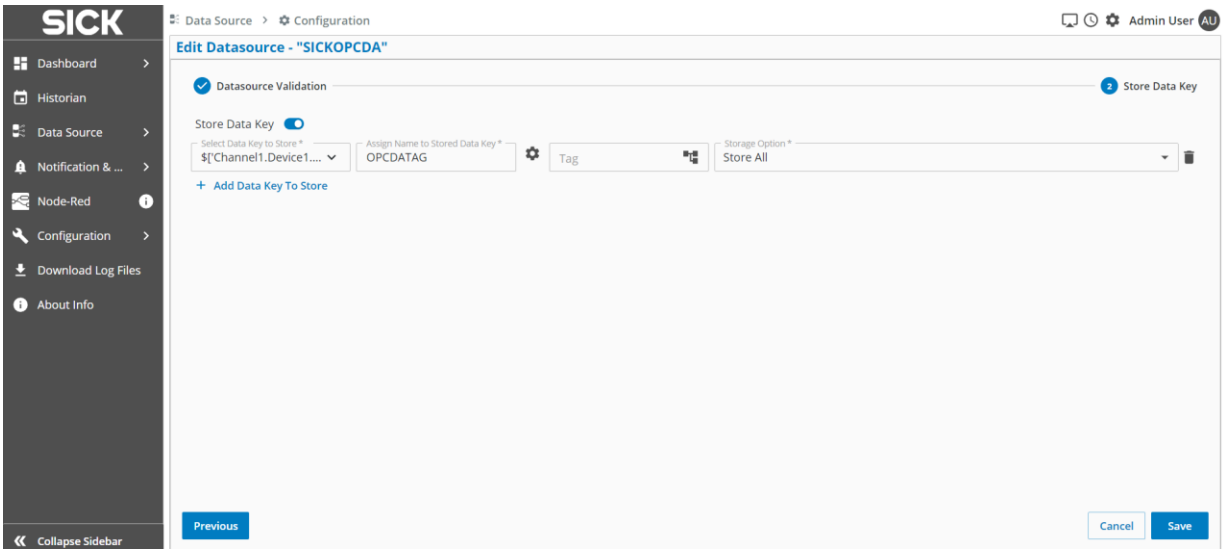

Figure 162: Store Data Key

9.6.3 Delete Data Source

To delete the data source, click the delete icon of the preferred data source in the data source table.

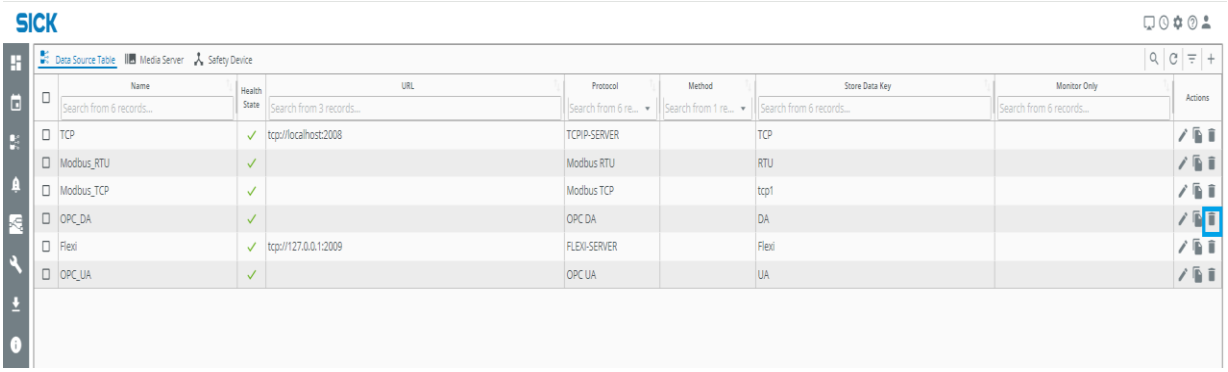

Figure 163: Delete Icon

1. Delete Data Source confirmation box appears.
2. Click the **Delete** button to confirm the deletion.

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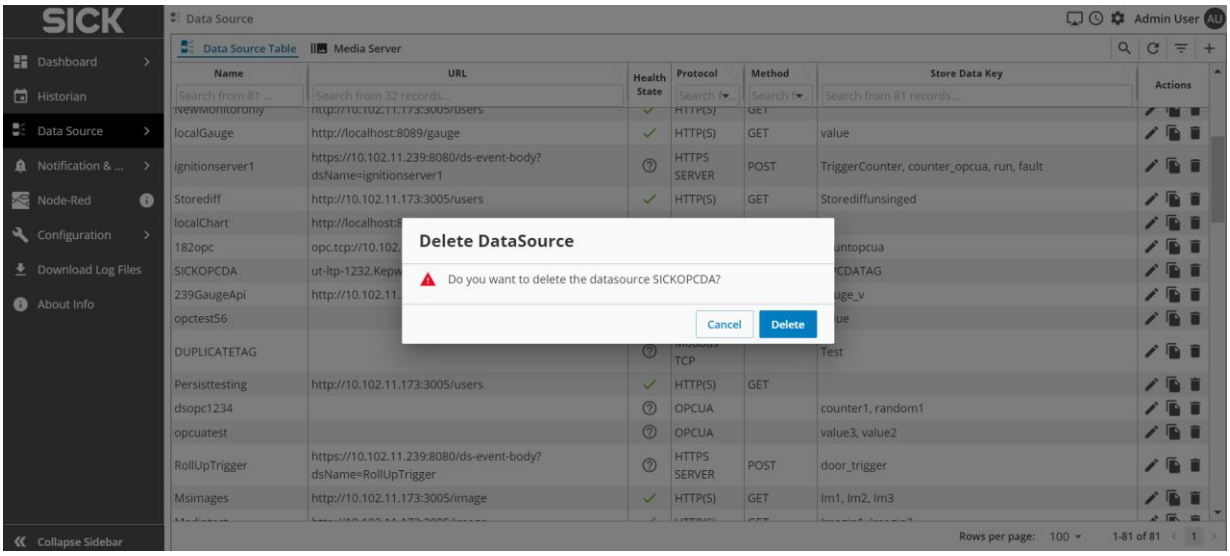

Figure 164: Delete Data Source Confirmation Box

9.6.4 Copy Data Source

Users can copy a created data source from the Data source page. Copying any of these data sources produces a file that has the same field and data as the original.

To Copy a Data Source

1. User can copy the specified Data Source by clicking on the copy icon in the Data Source Table

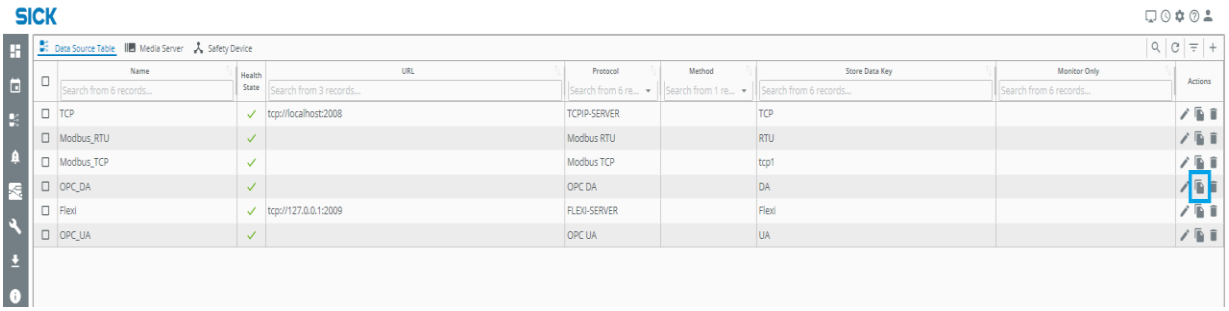

Figure 165: Copy Icon

2. **Clone Data source – "Data"** dialog box appears.
3. Provide new name to cloned data source by default it will appear as data source name long with clone as new data sources name and click the **Copy** button.

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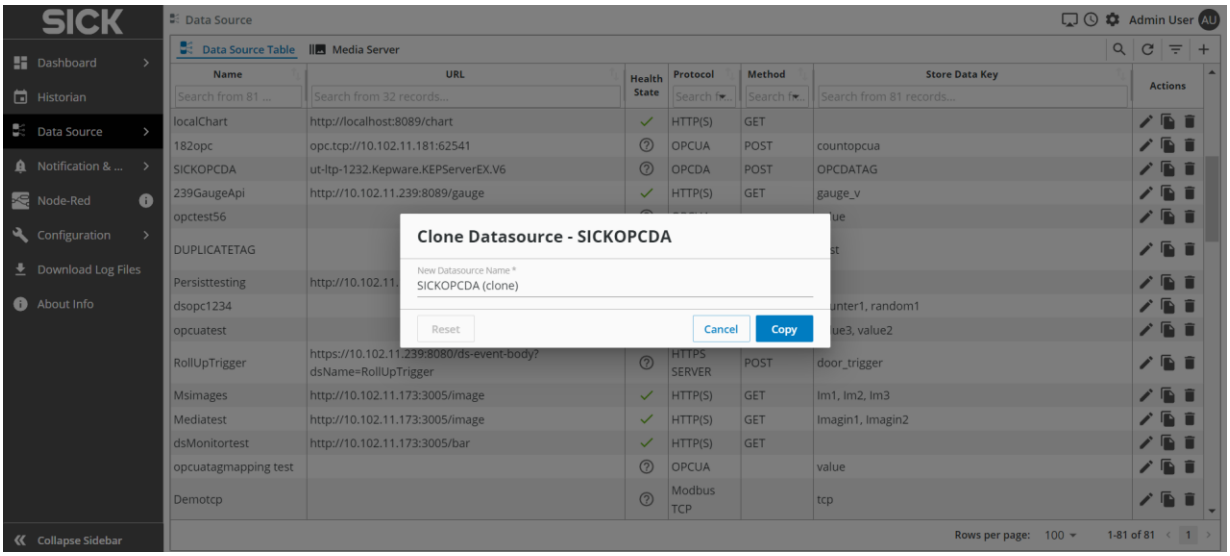

Figure 166: Clone Data Source Dialog Box

4. Cloned Data source will appear in Data Source table.
5. Store data key will be disabled by default. Users are required to edit the cloned Data Source and enable store data key.

9.7 MQTT

MQTT (MQ Telemetry Transport) is a messaging protocol used to establish communication between multiple devices in low band-width environments.

9.7.1 Add Data Source

1. Navigate to **Data Source** page and click on add icon at top-right corner to Add New Data Source. Refer to Figure 87: Add Data
2. On **New Data Source** page, select **MQTT** from communication protocol drop-down.

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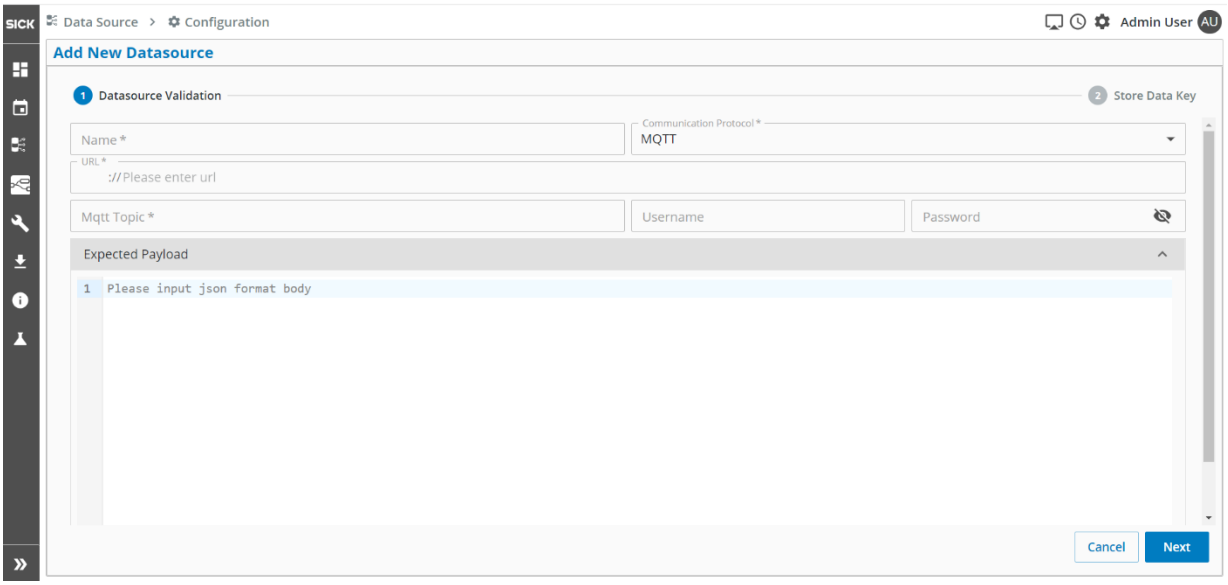

Figure 167: MQTT Protocol

3. Once the MQTT protocol is selected, following fields are displayed:
   - **Name**: Provide unique user defined name of the Data Source
   - **URL**: Provide URL of the server.

     There are two types of URL:

     I. Tcp
     II. Ssl

     User have to provide which URL is required.

   - **MQTT Topic**: Provide MQTT topic name.
   - **Username**: Provide username credential
   - **Password**: Provide password credential
4. Click the **Next** button.

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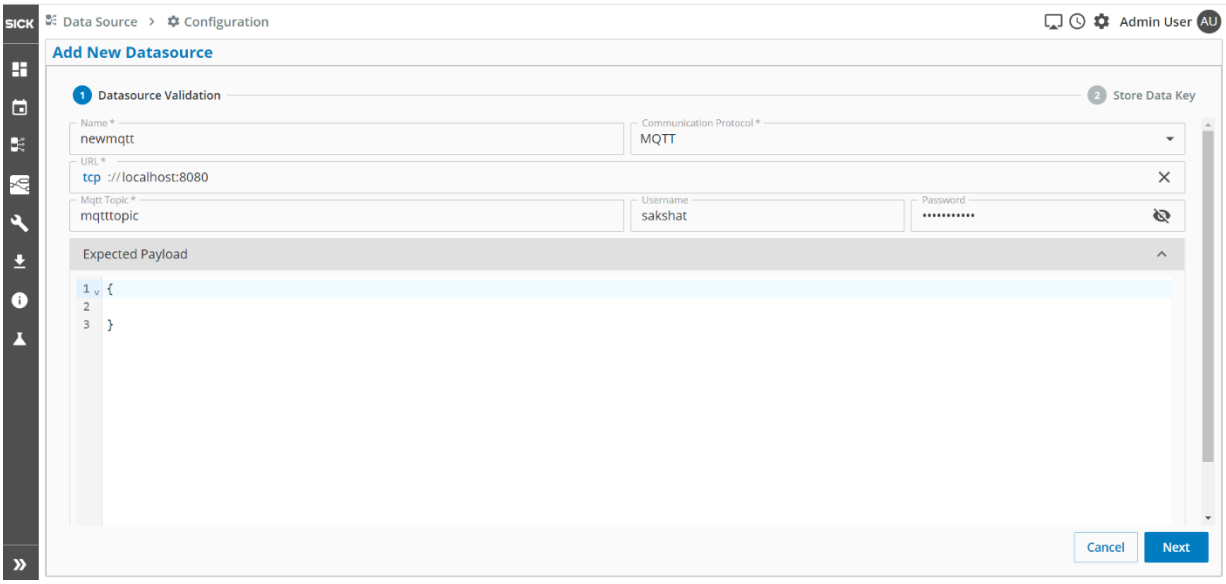

Figure 168: MQTT Data Source Fields

5. Click the **Next** button.

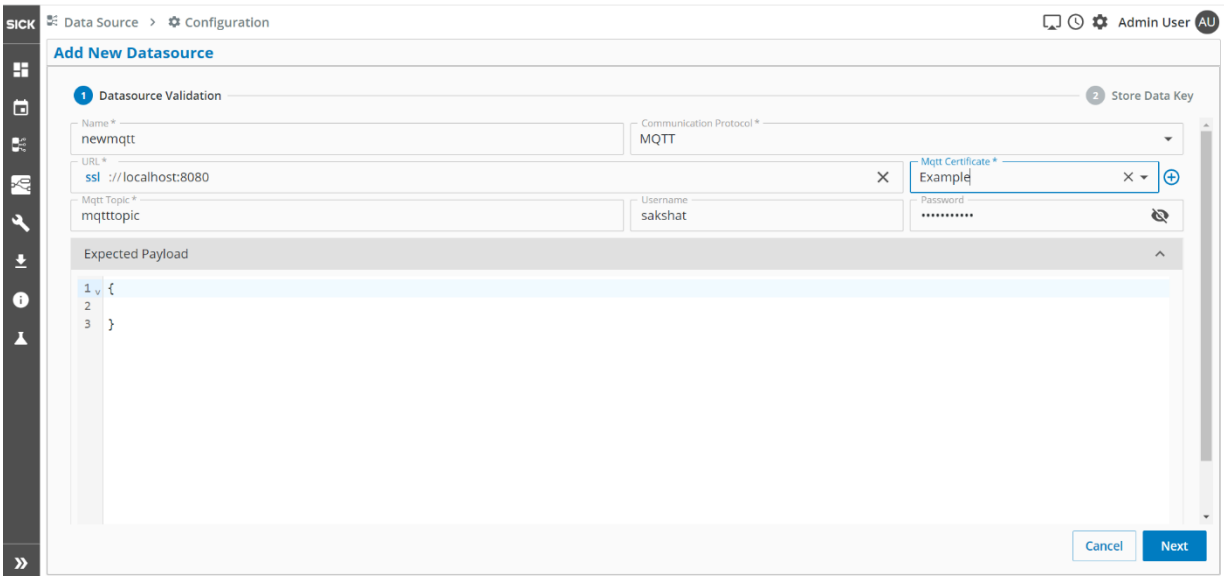

Figure 169: MQTT Certificate

1. When **ssl URL** is selected, User can see the **MQTT Certificate option** where you can select from drop-down or upload new certificate by clicking on "⊕"

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It navigates to **Store Data Key** screen. Enable **Store Data Key** toggle button.

It displays the required configured fields:

- **Data Key to Store**: This will define the data parameter to be stored from the API response.
- **Assign Name to Stored Data Key**: Assign a unique user defined name to the data parameter being stored in Field Analytics time series historian.
- **Tag:** This will set a unique label/tag for the Stored Data Key. Always use Tags as something common to all the variables stored. Example, id of the event (this will help in historian reporting and data pivoting functionality)
- **Storage Option**: Collects and stores a value whenever the value changes.

User can click **Add data key** to add additional parameters from the API response and click the **Save** button.

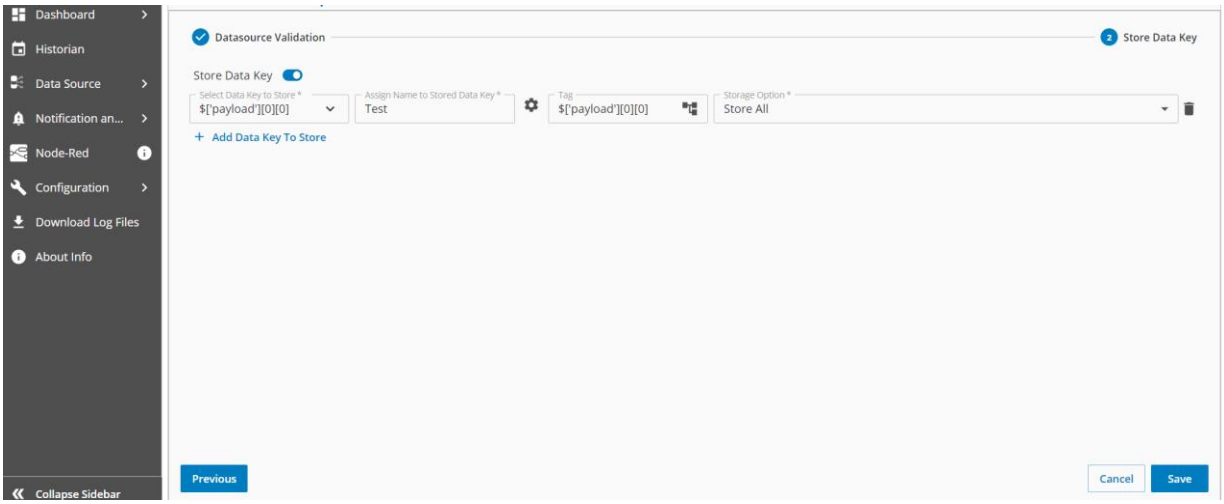

Figure 170: Store Data Key

It creates the MQTT data source in the Data Source Table.

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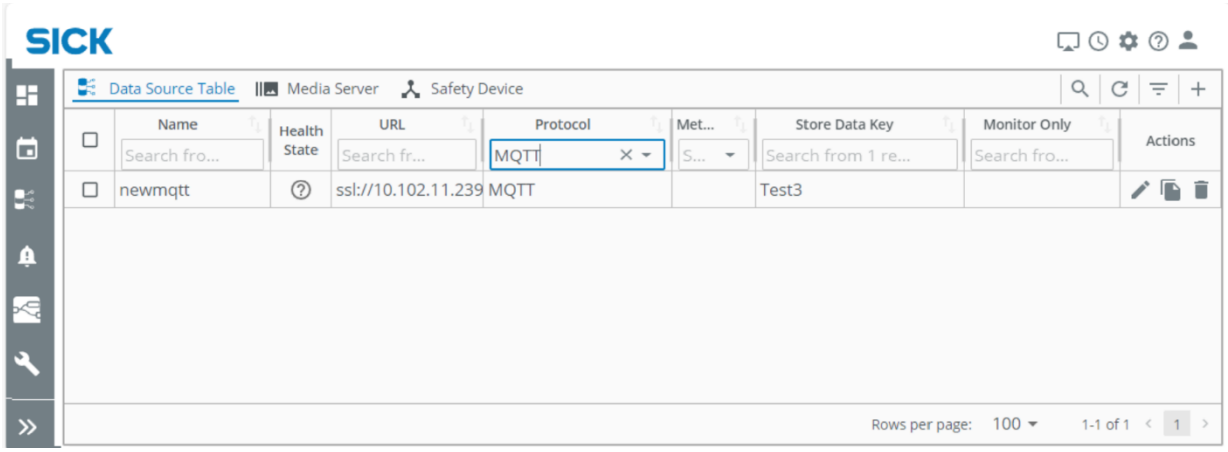

Figure 171: MQTT Data Source Created

9.7.2 Edit Data Source

1. User can click on the edit icon in **Actions** column for the Data Source to navigate to the edit page.

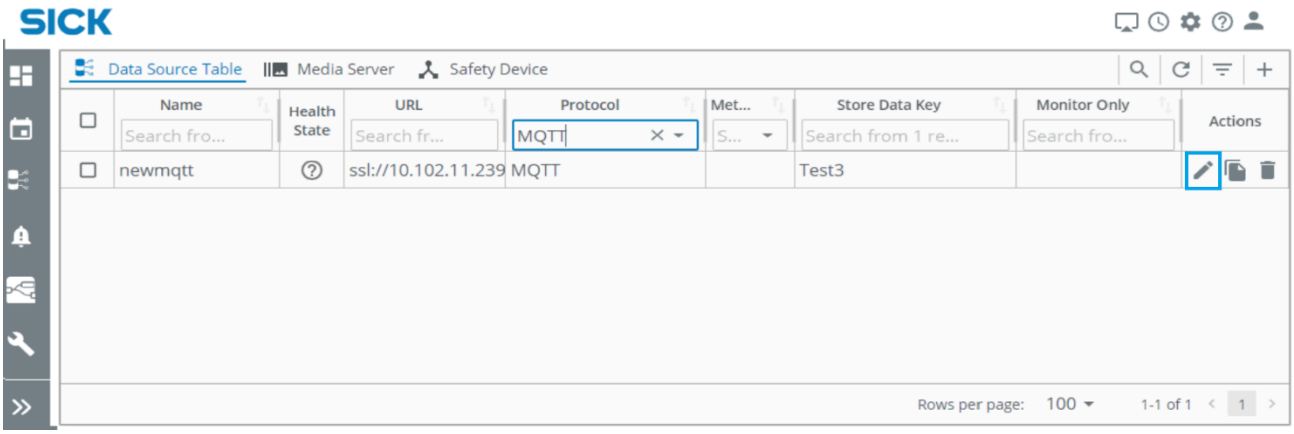

Figure 172: Edit Icon

2. Edit Data Source Page appears.
3. **Name of the Data source** field is non-editable.
4. Modify the fields and click the **Next** button.

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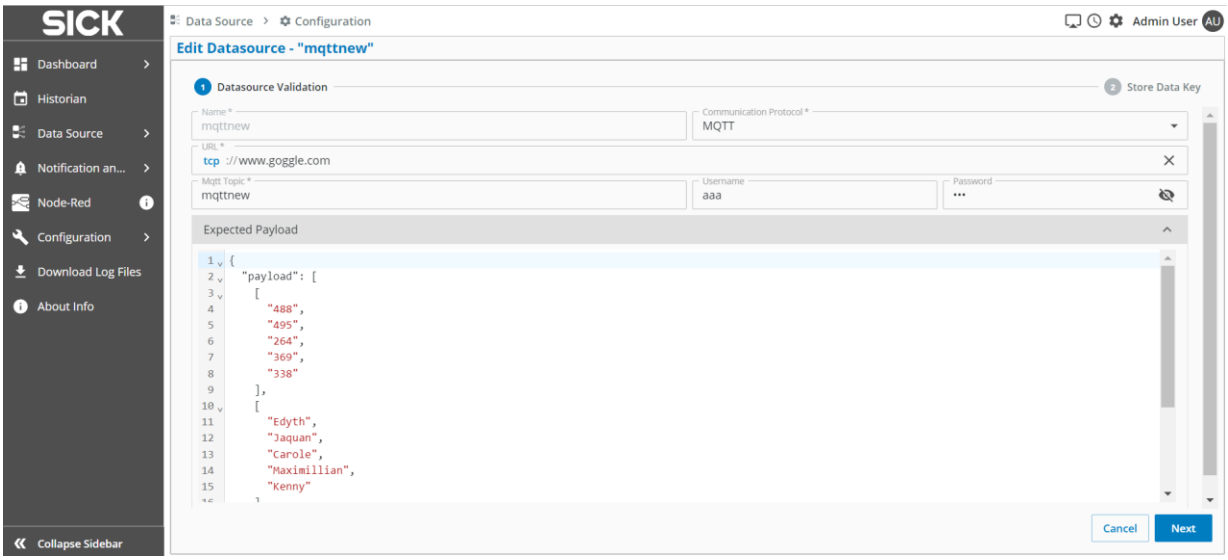

Figure 173: Edit Data Source

5. Navigates to the **Store Data Key** section where users can modify the parameters and click the **Save** button to save the changes.

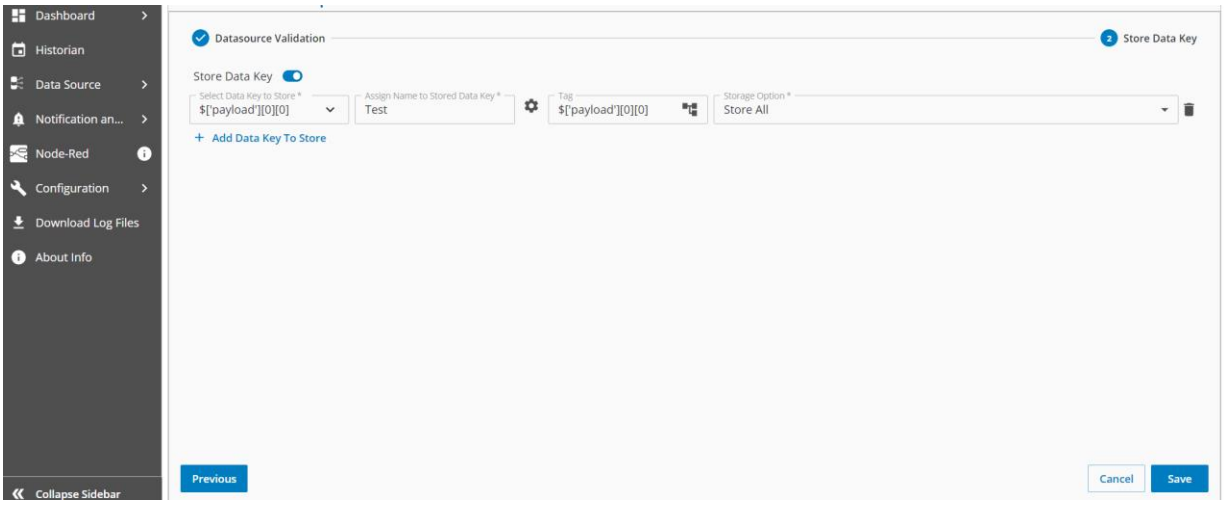

Figure 174: Edit Store Data Key

9.7.3 Delete Data Source

To delete a Data Source, click the delete icon of the preferred data source in the data source table.

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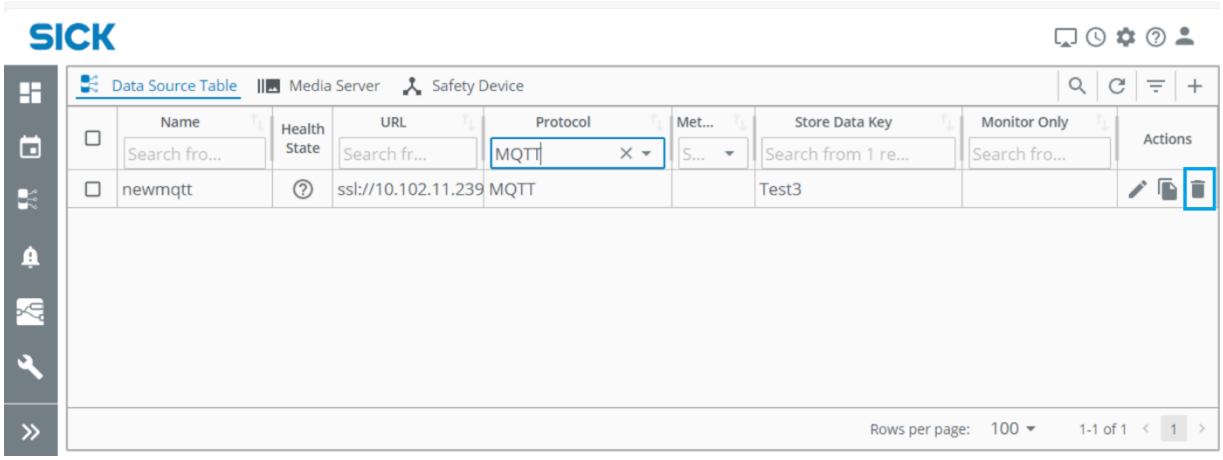

Figure 175: Delete Icon

1. Delete Data Source confirmation box appears.
2. Click the **Delete** button to confirm the deletion.

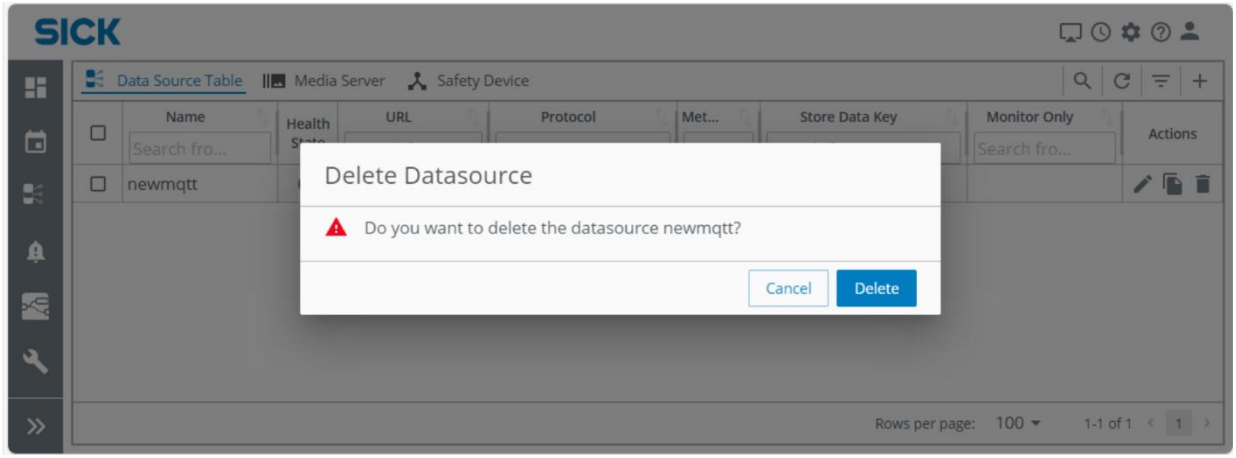

Figure 176: Delete Data Source Confirmation Box

9.7.4 Copy Data Source

Users can copy a created data source from the Data source page. Copying any of these data sources produces a file that has the same field and data as the original.

To Copy a Data Source

1. User can copy the specified Data Source by clicking on the copy icon in the Data Source Table

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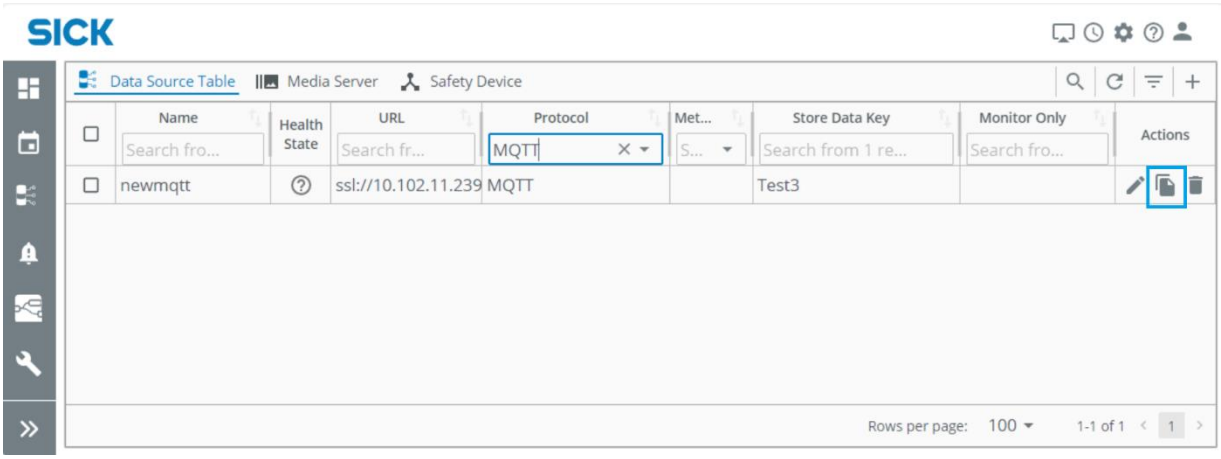

Figure 177: Copy Icon

2. **Clone Data source – "Data"** dialog box appears.
3. Provide new name to cloned data source by default it will appear as data source name along with clone as new data sources name and click the **Copy** button.

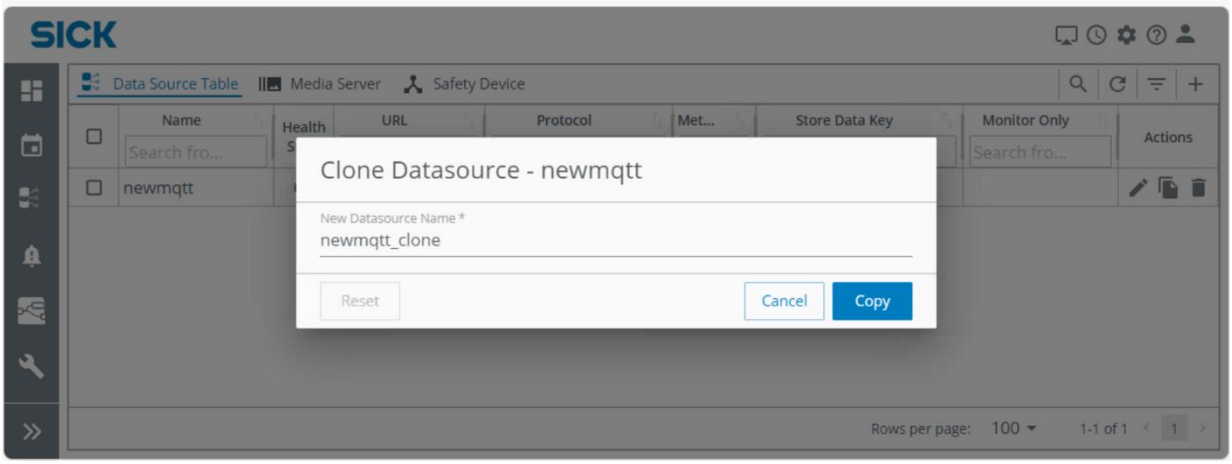

Figure 178: Clone Data Source

4. Cloned Data source will appear in Data Source table.
5. Store data key will be disabled by default. Users are required to edit the cloned Data Source and enable store data key.

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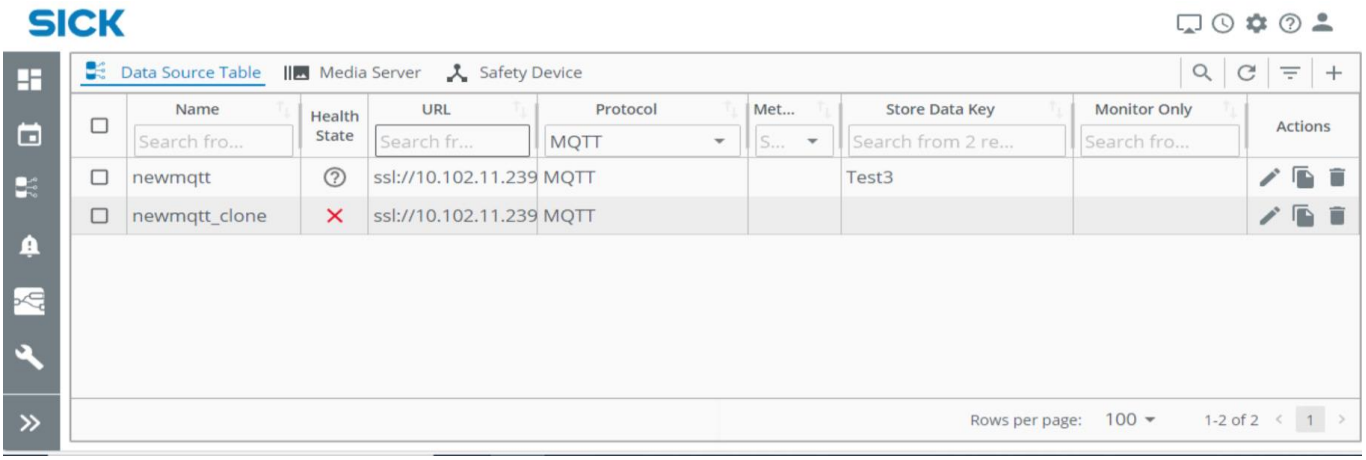

Figure 179: Cloned Data Source

9.8 Searching Data Source

Users can search on the full set of data source in the search field.

Note: Search can be performed using any of the parameters like Name, URL, Protocol, Method or Store Data Key.

1. Click on the search icon at the top-right corner of the Data Source Table. Refer to Figure 180: Search Tab.

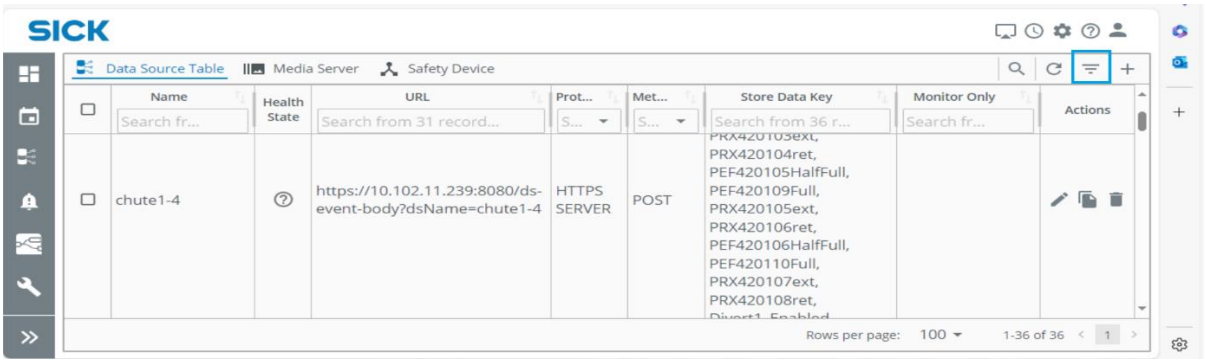

Figure 180: Search Tab

2. It will display a text box to perform the search. Refer to Figure 181: Search Box.
3. In the text box enter the keywords to search in the data sources.

Figure 181: Search Box

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4. It will display all the results matching the search criteria. Refer to Figure 182: Search Results.

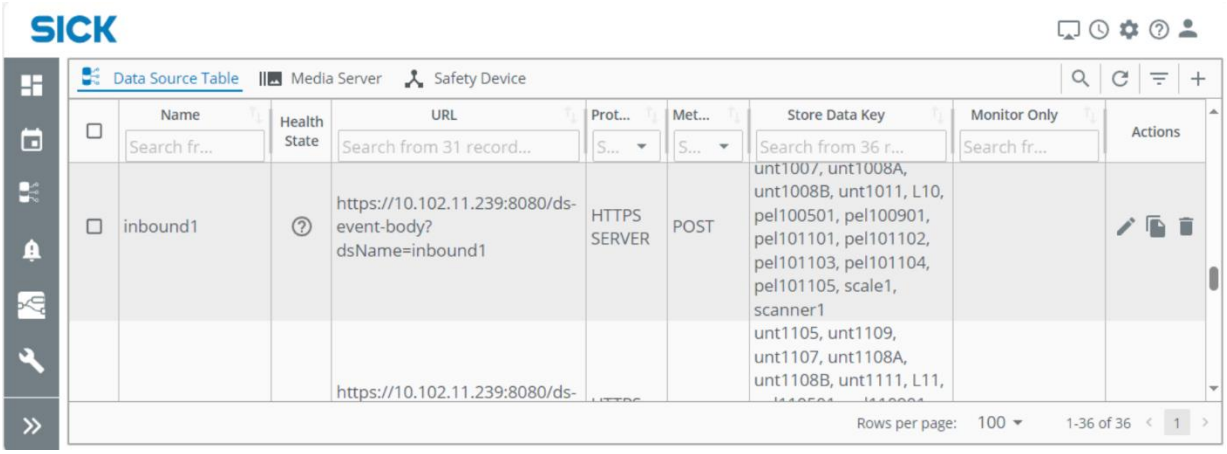

Figure 182: Search Results

9.9 TCP/IP-SERVER

TCP/IP (Transmission Control Protocol/Internet Protocol) refers to the suite of communication protocols used to interconnect network devices in the internet.

9.9.1 Add Data Source

1. Navigate to **Data Source** page and click on add icon at top-right corner to Add New Data Source.
2. On **New Data Source** page, select **TCP/IP** from communication protocol drop-down.

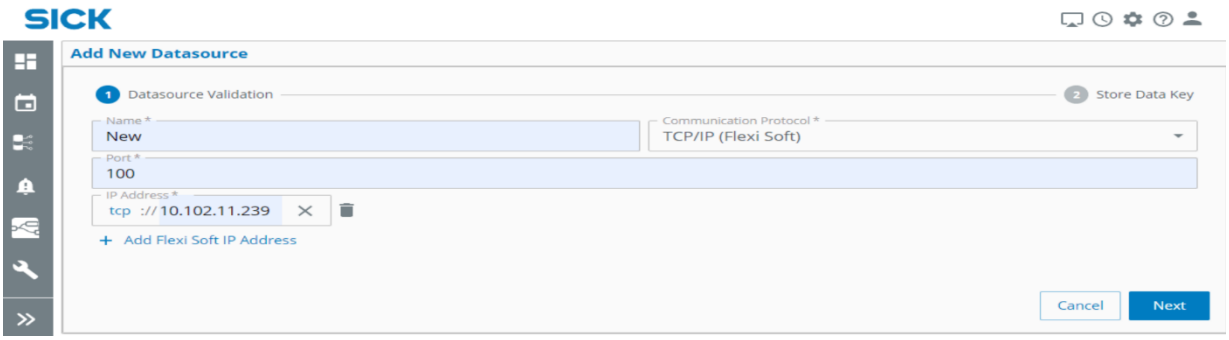

Figure 183: TCP/IP Protocol

6. Once the TCP/IP protocol is selected, following fields are displayed:
   - **Name**: Provide unique user defined name of the Data Source
   - **Communication Protocol**: Select TCP/IP in the dropdown
   - **Port**: Provide port number.

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7. Click the **Next** button.

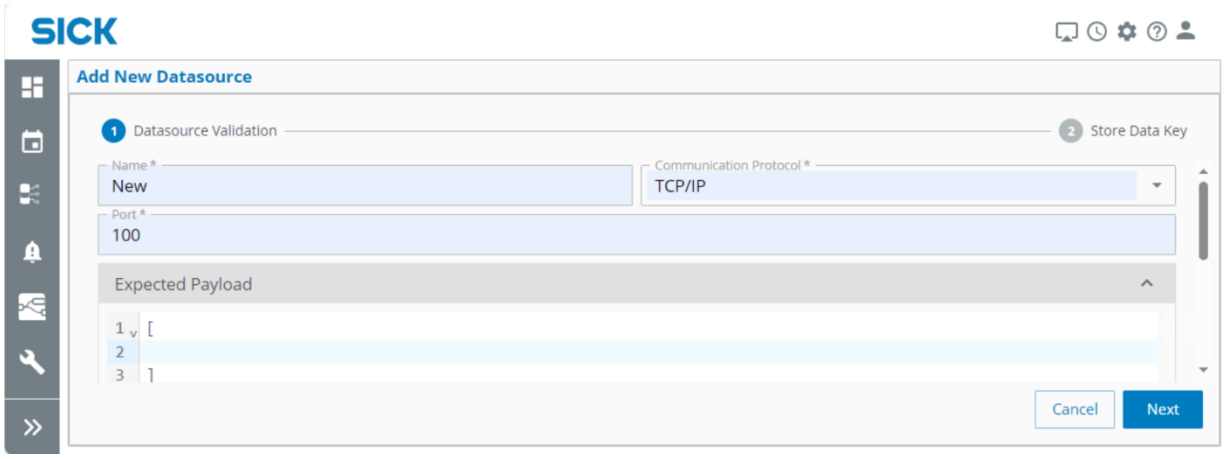

Figure 184: TCP/IP Data Source Fields

8. Click the **Next** button.

It navigates to **Store Data Key** screen. Enable **Store Data Key** toggle button.

It displays the required configured fields:

- **Data Key to Store**: This will define the data parameter to be stored from the API response.
- **Assign Name to Stored Data Key**: Assign a unique user defined name to the data parameter being stored in Field Analytics time series historian.
- **Tag:** This will set a unique label/tag for the Stored Data Key. Always use Tags as something common to all the variables stored. Example, id of the event (this will help in historian reporting and data pivoting functionality)
- **Storage Option**: Collects and stores a value whenever the value changes.

User can click **Add data key** to add additional parameters from the API response and click the **Save** button.

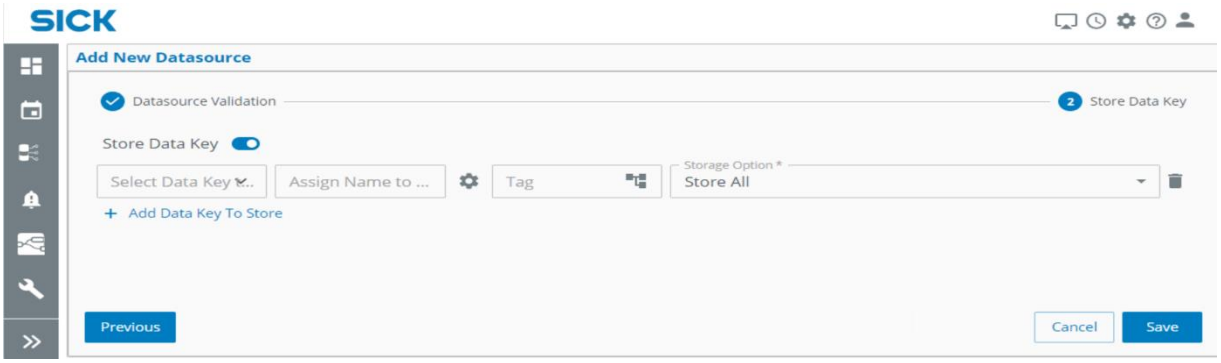

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Figure 185: Store Data Key

It creates the TCP/IP data source in the Data Source Table.

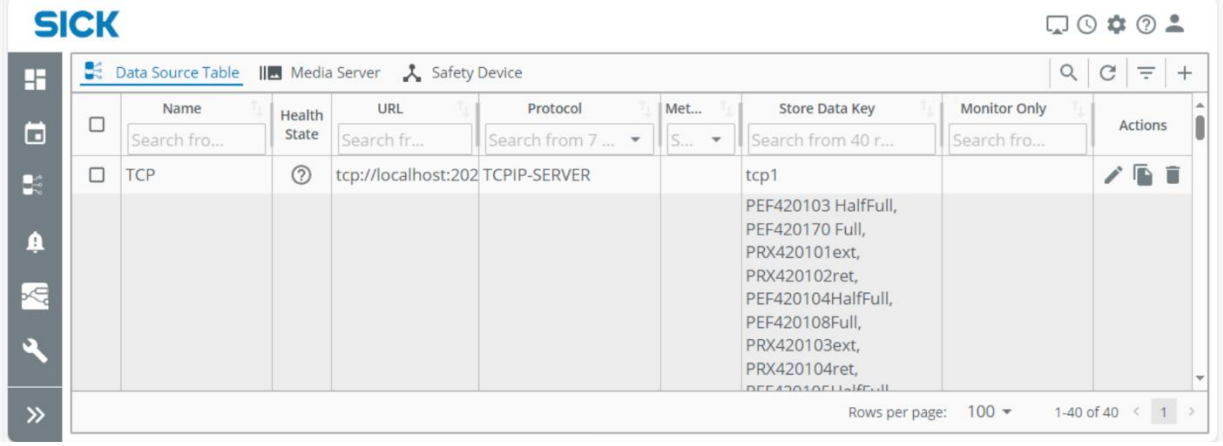

Figure 186: TCP/IP Data Source Created

9.9.2 Edit Data Source

6. User can click on the edit icon in **Actions** column for the Data Source to navigate to the edit page.

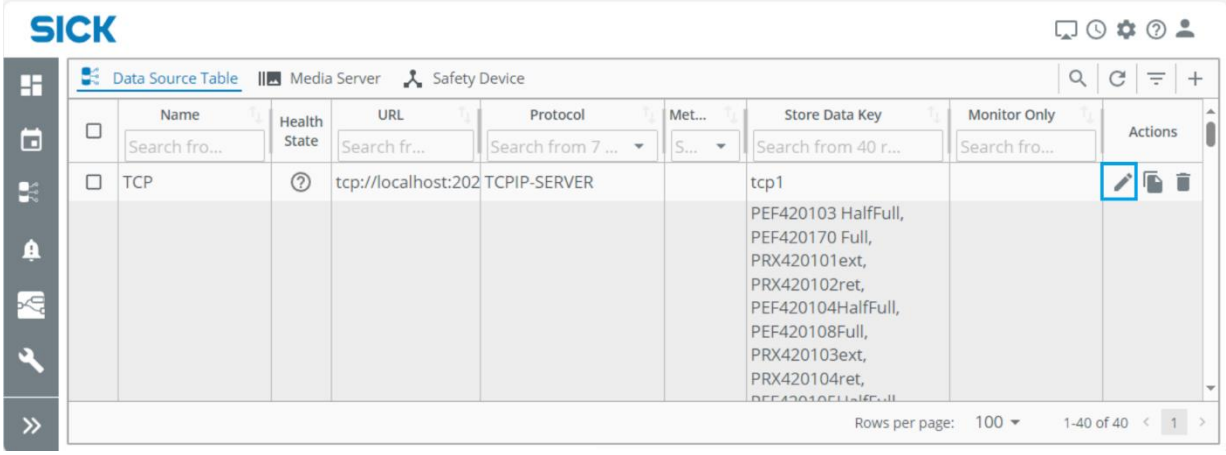

Figure 187: Edit Icon

7. Edit Data Source Page appears.
8. **Name of the Data source** field is non-editable.
9. Modify the fields and click the **Next** button.

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9.9.3 Delete Data Source

To delete a Data Source, click the delete icon of the preferred data source in the data source table.

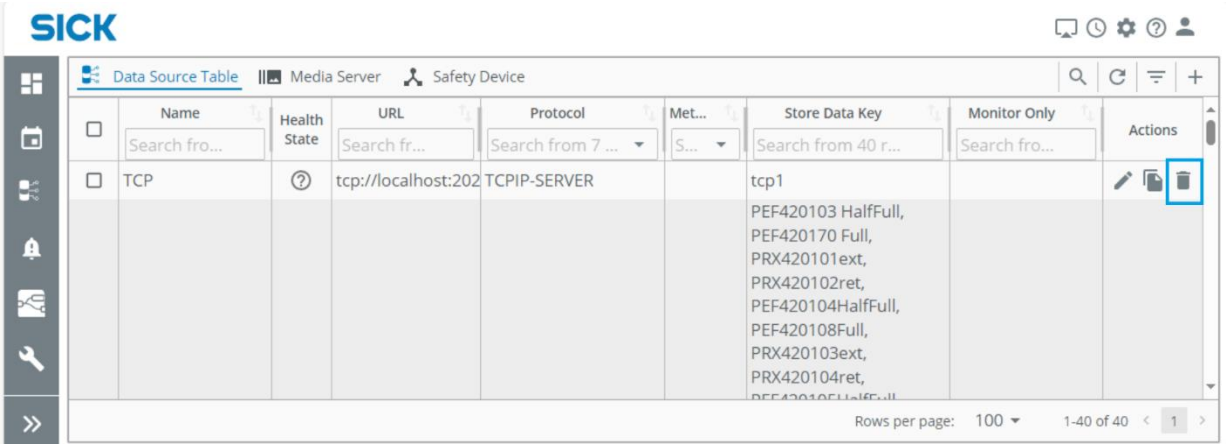

Figure 188: Delete Icon

3. Delete Data Source confirmation box appears.
4. Click the **Delete** button to confirm the deletion.

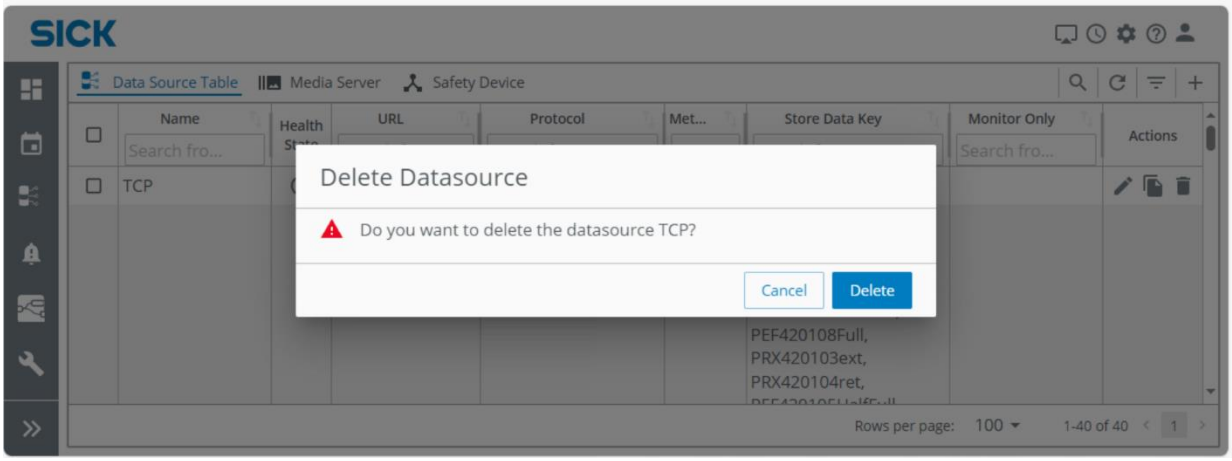

Figure 189: Delete Data Source Confirmation Box

9.9.4 Copy Data Source

Users can copy a created data source from the Data source page. Copying any of these data sources produces a file that has the same field and data as the original.

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To Copy a Data Source

6. User can copy the specified Data Source by clicking on the copy icon in the Data Source Table

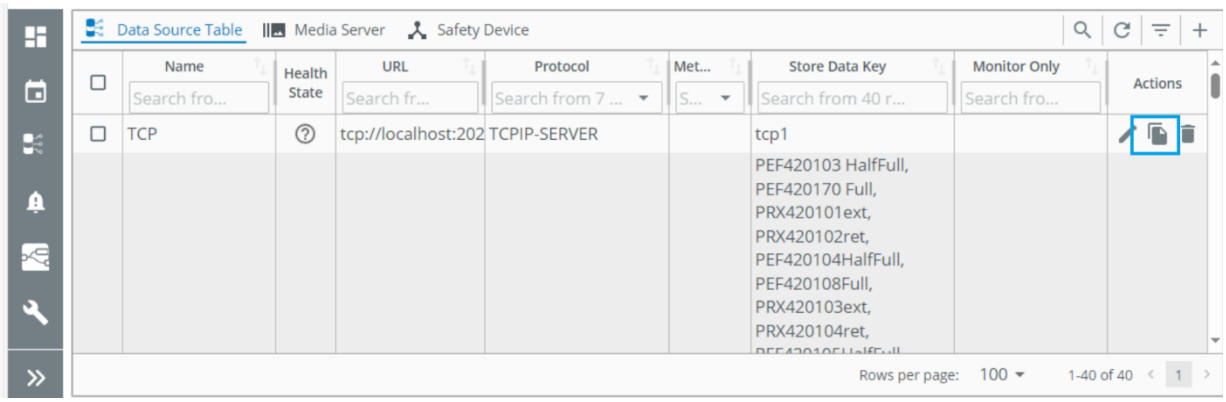

Figure 190: Copy Icon

7. **Clone Data source – "Data"** dialog box appears.
8. Provide new name to cloned data source by default it will appear as data source name along with clone as new data sources name and click the **Copy** button.

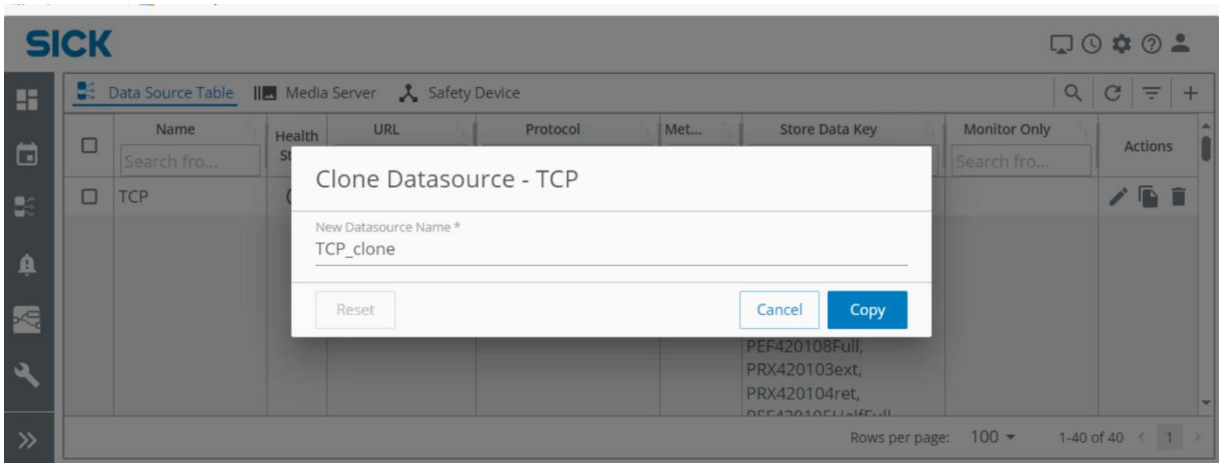

Figure 191: Clone Data Source

9. Cloned Data source will appear in Data Source table.
10. Store data key will be disabled by default. Users are required to edit the cloned Data Source and enable store data key.

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9.10 Searching Data Source

Users can search on the full set of data source in the search field.

Note: Search can be performed using any of the parameters like Name, URL, Protocol, Method or Store Data Key.

5. Click on the search icon at the top-right corner of the Data Source Table. Refer to Figure 180: Search Tab.

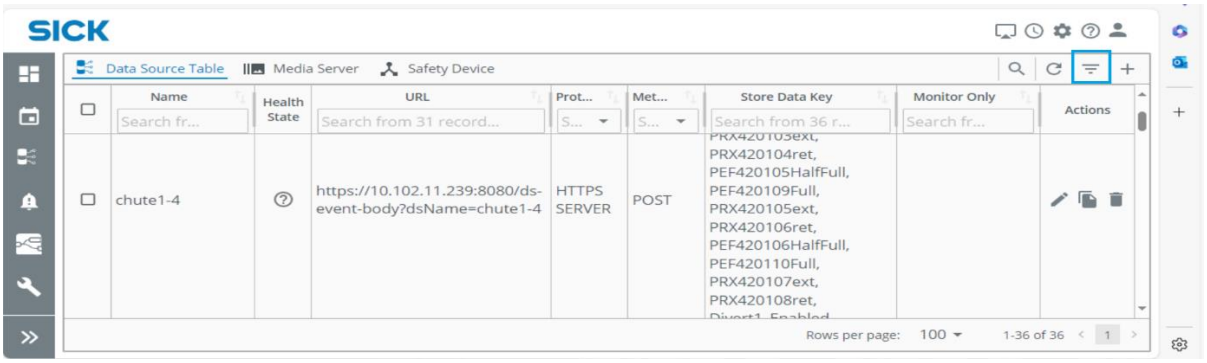

Figure 192: Search Tab

6. It will display a text box to perform the search. Refer to Figure 181: Search Box.
7. In the text box enter the keywords to search in the data sources.

Figure 193: Search Box

8. It will display all the results matching the search criteria. Refer to Figure 182: Search Results.

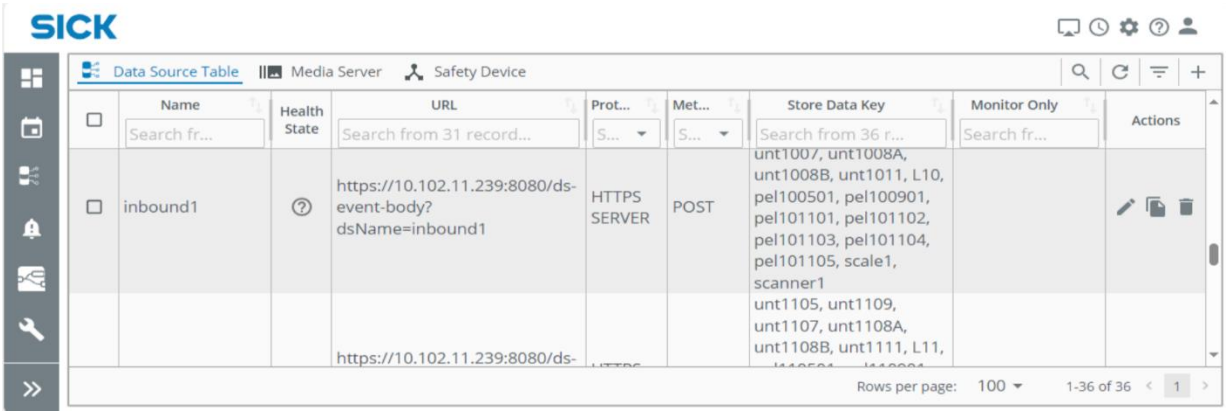

Figure 194: Search Results

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9.11 Media Server

Media server is used to fetch the preferred media to the application from the media server application. The fetched files can be viewed in the Historian tab and also user can download the media files.

To use the media server feature, user needs to upload the license with media server feature in it and also add the media server feature privilege in the preferred role. When above mentioned conditions are fulfilled then only user can access the media server feature.

9.11.1 Adding Media Server in Preferred Role

To add the Media server feature in the preferred role, follow below steps:

1. Users can click on the **Profile** icon at the top right corner and then click on the '**Manage Role**' option. Refer to Figure 34: Manage Roles.
2. It displays the **Manage Role page** with the list of roles. From this screen, you can add, edit, delete. Refer to Figure 35: Manage Role Page.
3. On the Manage Role page, there are three vertical ellipsis icons in front of the screen. It has following tabs. Refer to Figure 32: Vertical ellipsis.
   - Edit
   - Delete
4. Select any of the preferred role vertical ellipsis and click on '**Edit'** option. Refer to Figure 409: Edit Role.
5. Under the privileges field, add "**Media Server**" which displays privileges related to media server like:
   - **Download Media server Logs:** User can download the logs of the media server.
   - **Read Media Server Configuration:** User can only view the media server configuration.
   - **Delete Media Server Configuration:** User have the privilege to delete the added media server configurations.
   - **Create Media Server Configuration:** User can add new media server configuration.
   - **Edit Media Server Configuration:** User can update or modify the existing media server configuration.
6. Check the preferred privileges for the preferred role and click on '**Save'** button.

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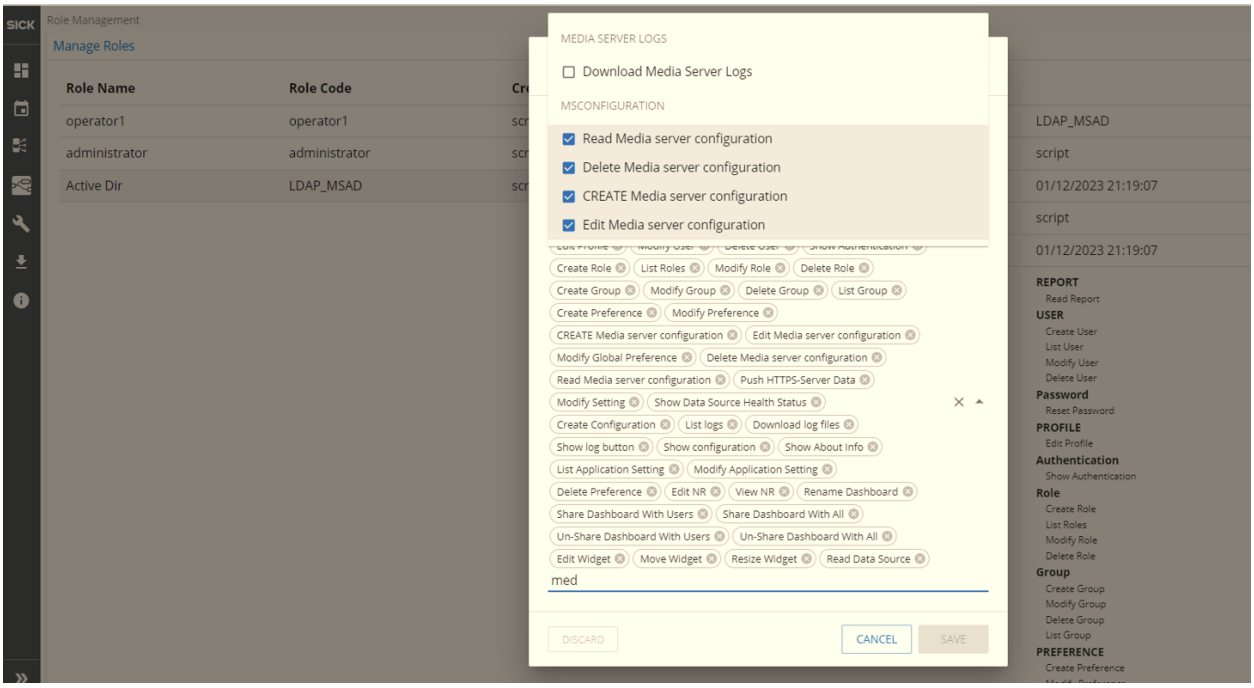

Figure 195: Adding Media Server Privilege in Preferred Role

9.11.1.1 Creating Media Server Configuration

To fetch the media, user need to add the specific media server in the application. To add Media server, click on '**+**' on top right corner of the screen.

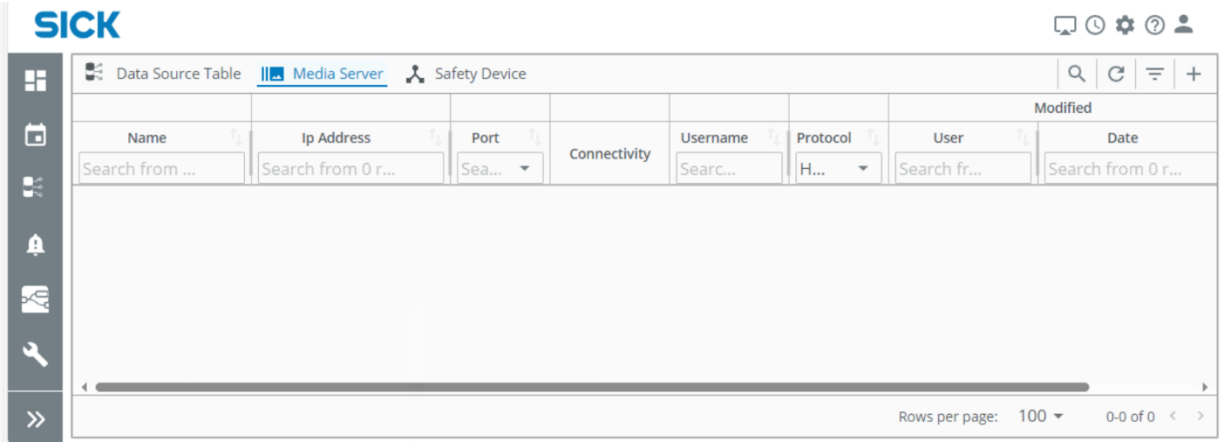

Figure 196: Media Server Screen

Media Server Configuration window appears with following fields:

- **Name**: Provide the name of the Media Server

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- **HTTP/HTTPS**: Select any one of the Protocol's radio buttons
- **IP Address**: Provide the IP address
- **Port**: Provide the port number
- **Username**: Provide Username
- **Password:** Provide password
- **Devices**: Provide the preferred number for each device from which media is required.
- Click on **'Save'** button.

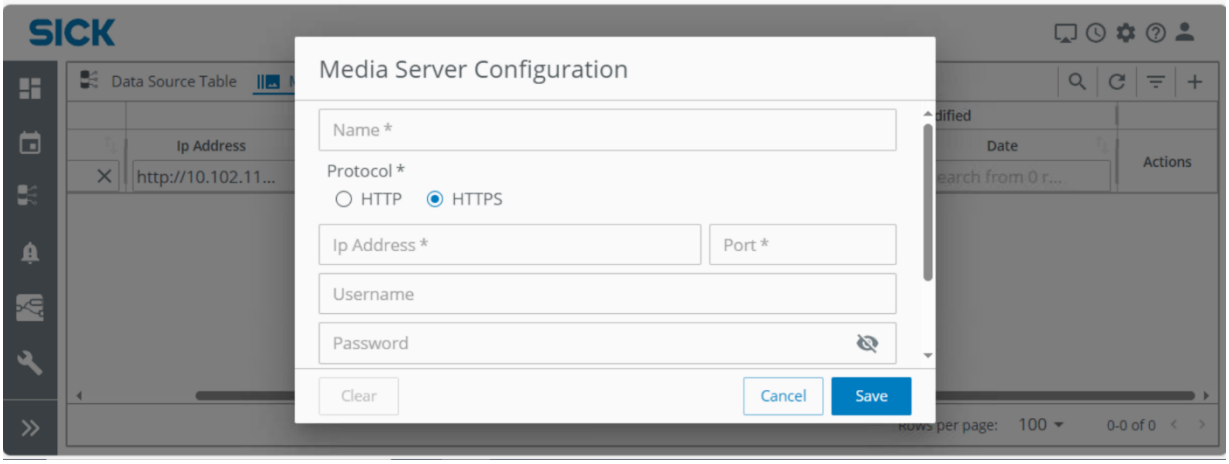

Figure 197: Media Server Configuration-1

The license with media server feature is added with maximum number of devices, a user can add while configuring. User can either add the maximum devices mentioned in license in one configuration or add in multiple configurations.

For example, if the maximum number for each device added in the license is 100, then user can add the number of devices while media server configuration either 100 at a time in one configuration or split the devices in multiple configurations as 80 devices in one configuration and 20 in other configuration as shown in Figure 198: Media Server Configuration-2.

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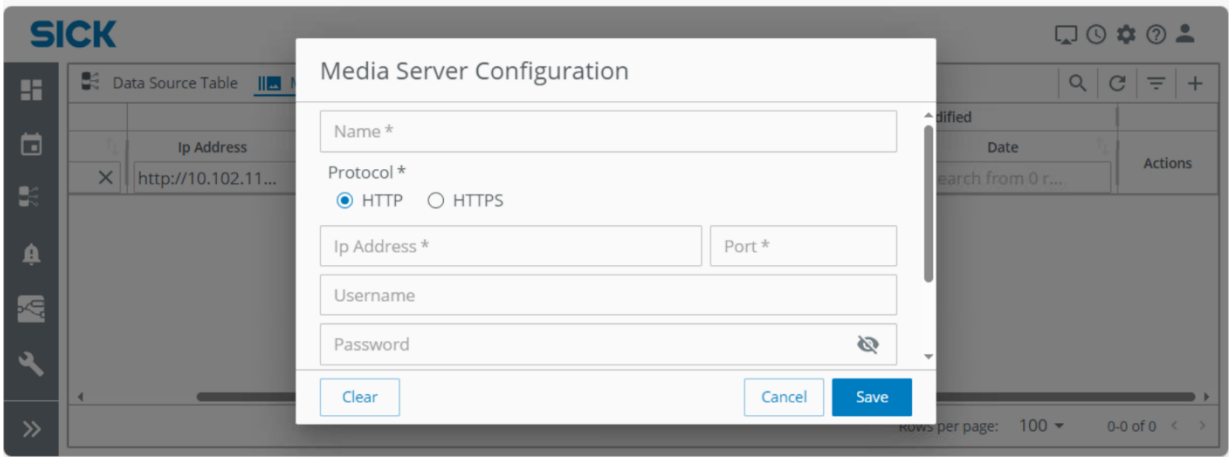

Figure 198: Media Server Configuration-2

If the user adds more devices than the number of devices given in the license, then an error message appears showing a max value to be added. Refer to Figure 199: Error Message in Media Server Configuration.

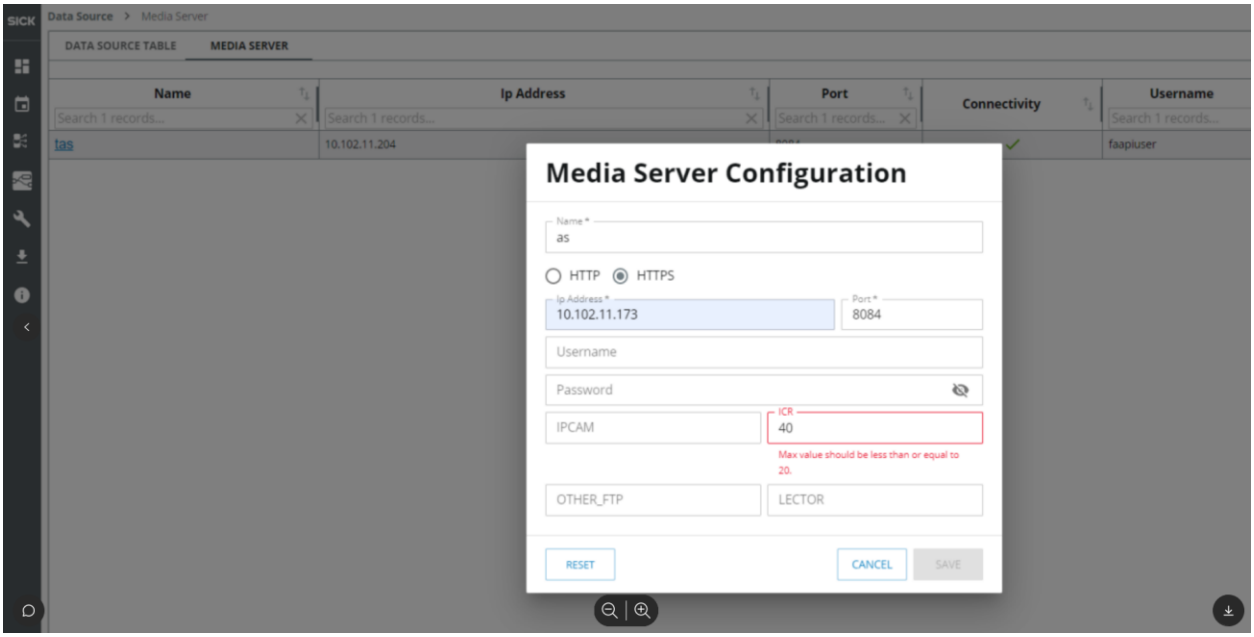

Figure 199: Error Message in Media Server Configuration

The configured media server is shown in the Media server screen.

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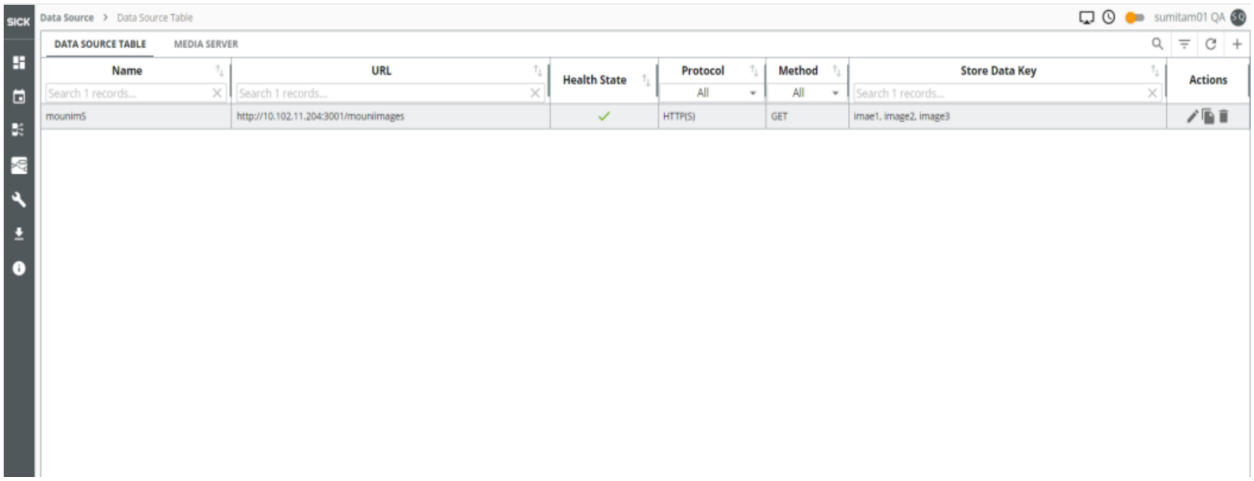

Figure 200: Configured Media Server

Note: User can add only one Media server IP address at a time.

Now we need to add the media data source. Navigate to **Data Source** screen and click on '**+**' on top right corner of the screen.

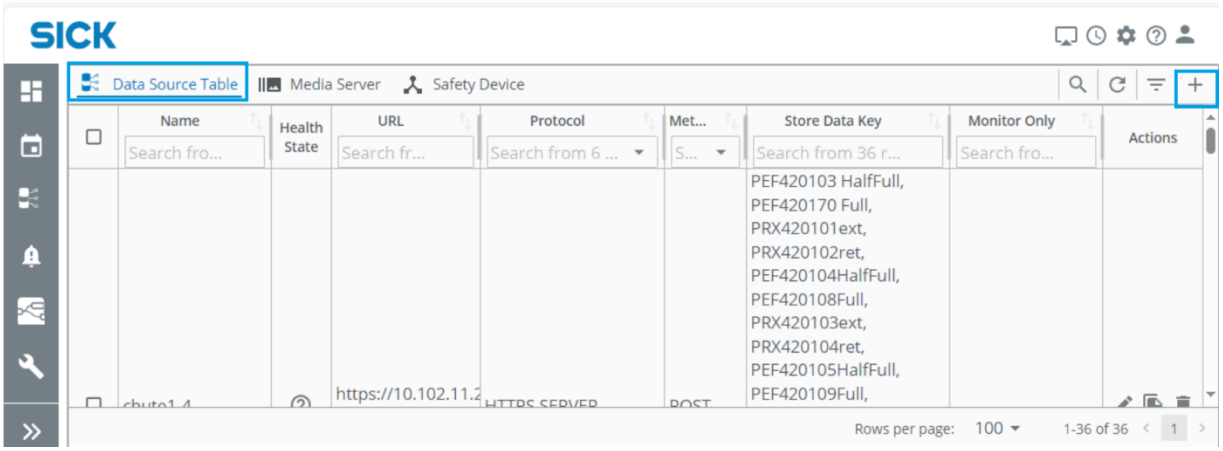

Figure 201: Data Source Screen

Add New Data Source screen appears with following fields:

- **Name**: Provide unique user defined name of the Data Source.
- **Communication Protocol**: Set to Http(s) by default.
- **HTTP(s) Method**: **GET** or **POST** will be used to retrieve or create data.
- **URL**: The URL of the API that will be used to get the information or create information.
- **TEST**: use to verify if the entered URL is hitting the targeted server and getting a valid response code.

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- **Header**: Add Key and Value in case header information is required to access the API URL.
- **Parameter**: Add Key and Value in case additional parameters are required to access the API URL.

Click on '**NEXT'** button. It will navigate to the **Store Data Key** page. Enable the store data key ' ' and select the preferred data key to be stored from the drop-down. Assign name to the stored data key.

Note: Ensure the assigned name is same as the media file name in the Media server application.

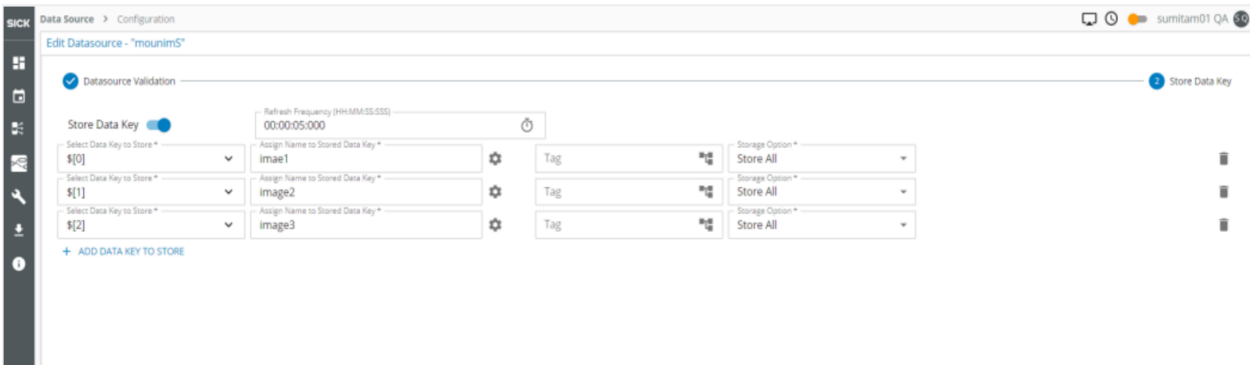

Figure 202: Store Data Key Screen

Click on ' ' icon. A dialog box appears with three options which are **Raw Data**, **Transform Function** and **Media Binding**. Click on '**Media Binding'** and select the '**Media server**' and '**Media Server Clients'** from the drop-down which we configured in the media server tab. Click on '**Save**' button. Also click on '**Save**' button to save the data source.

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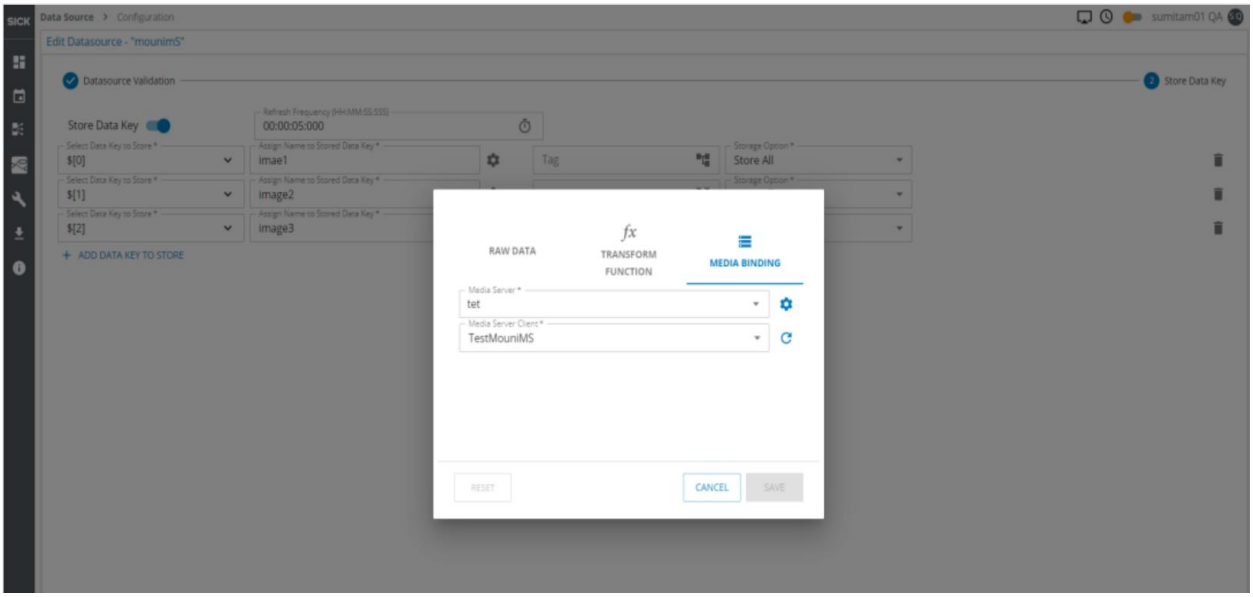

Figure 203: Media Binding

To view the fetched media files, navigate to '**Historian**' tab. Select the created data source from the drop-down under the '**Data Source Name'** field and click on '**Search**' button.

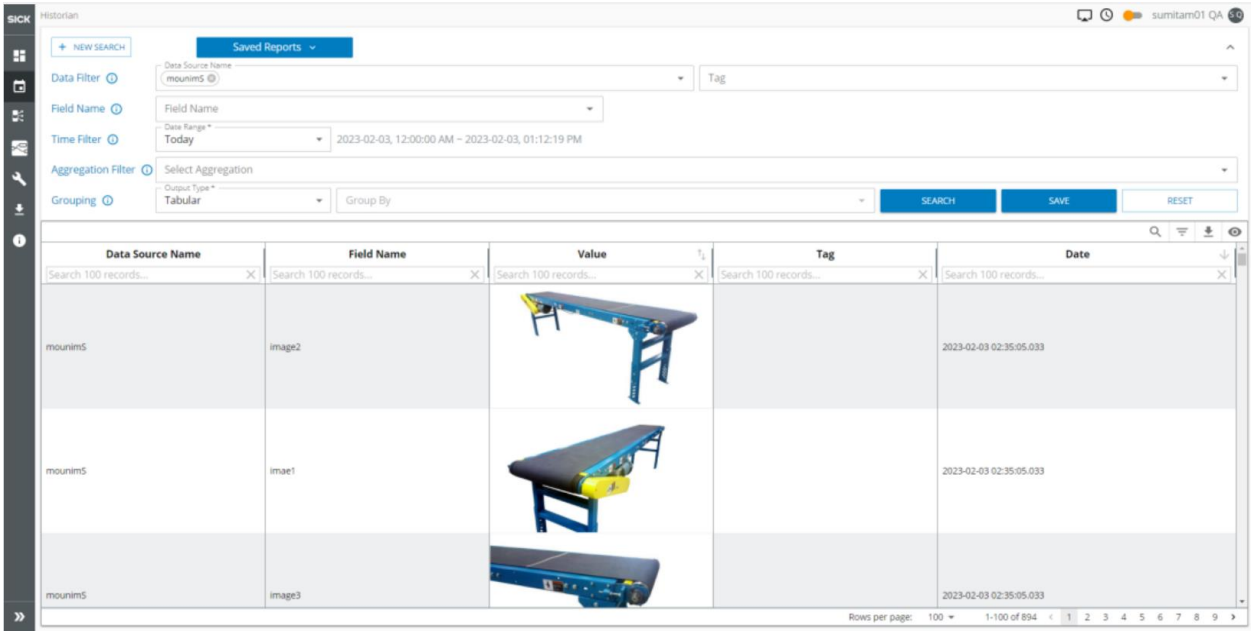

Figure 204: Media Files in Historian

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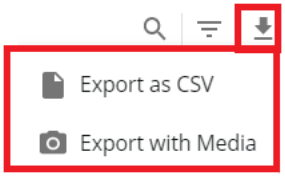
User can download the fetched files by clicking on download icon ‘ ‘on top right corner of the screen. There are two options to download which are ‘**Export with CSV’** and ‘**Export with Media’**.

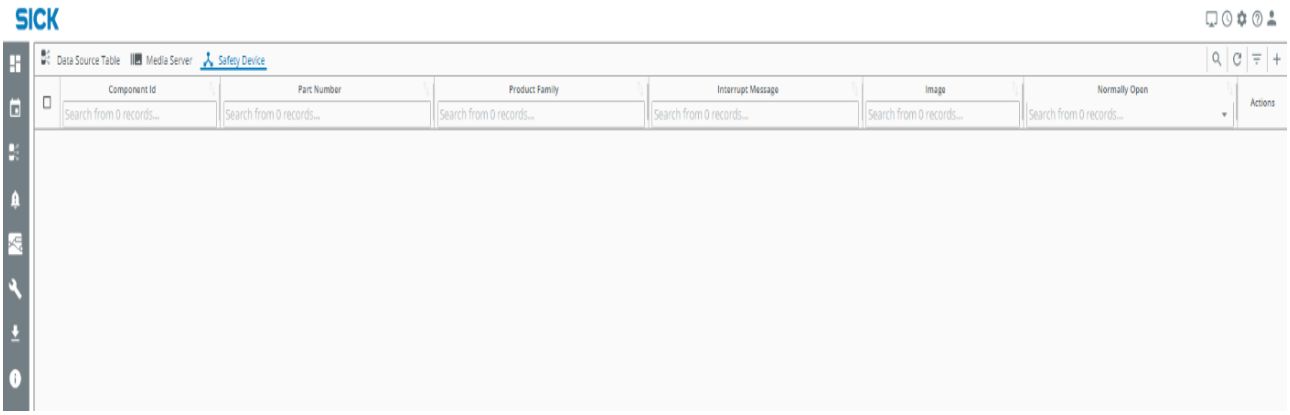


When ‘**Export as CSV’** is selected, the files are downloaded in excel format and if ‘**Export with Media’** is selected then the files are downloaded in image format and excel format.

9. Safety Device

Safety Devices is used to ensure the well-being of personnel and the accuracy of data collection in potentially hazardous environments. Implementing these protocols can significantly reduce risks and ensure a safer environment for field analytics.

To use the safety device feature, user needs to upload the license with safety device feature in it and also add the safety device feature privilege in the preferred role. When above mentioned conditions are fulfilled then only user can access the safety device feature.



9.11.2 Adding Safety device in Preferred Role

To add the Safety Device feature in the preferred role, follow below steps:

7. Users can click on the **Profile** icon at the top right corner and then click on the ‘**Manage Role**’ option.
8. It displays the **Manage Role page** with the list of roles. From this screen, you can add, edit, delete.

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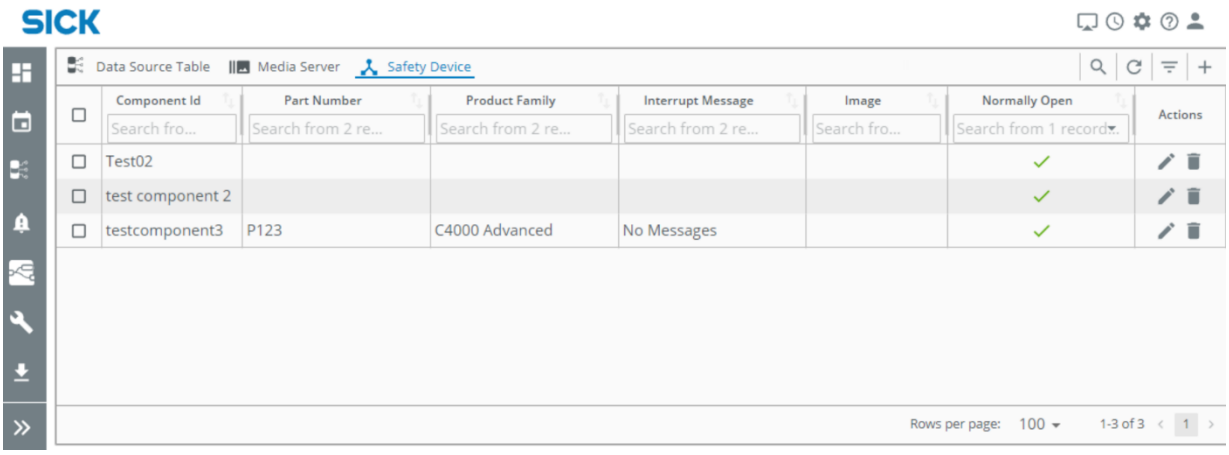
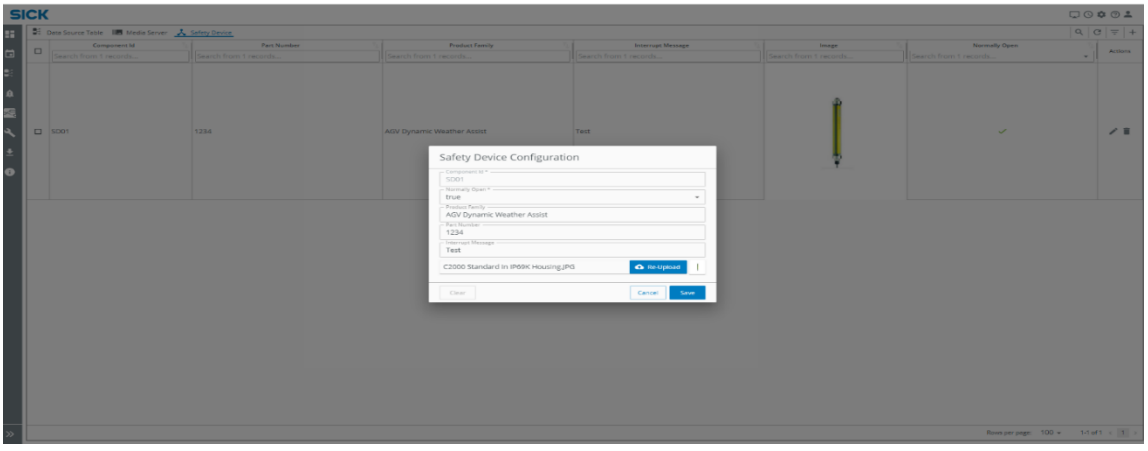


9. Under the privileges field, add "**Safety Device**" which displays privileges related to Safety Device like:
    - **Component ID:** User has to give the component ID.
    - **Part Number:** User has to give Part number.
    - **Product family:** User might have several product families each catering to different safety needs.
    - **Interrupt Message:** User can manage to give their own message.
    - **Image:** User can update or modify the existing Image.
    - **Actions:** User can edit or delete the privileges.

9.11.2.1 Creating Safety Device Configuration

To create a safety device configuration, click on '+' icon in the right-hand side corner. Then you can see the pop-up displayed with different sections.



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Once user has given all the details, click on '**Save**' button.

9.11.3 Delete Safety Device

To delete a Safety Device, click the delete icon of the preferred data source in the data source table.

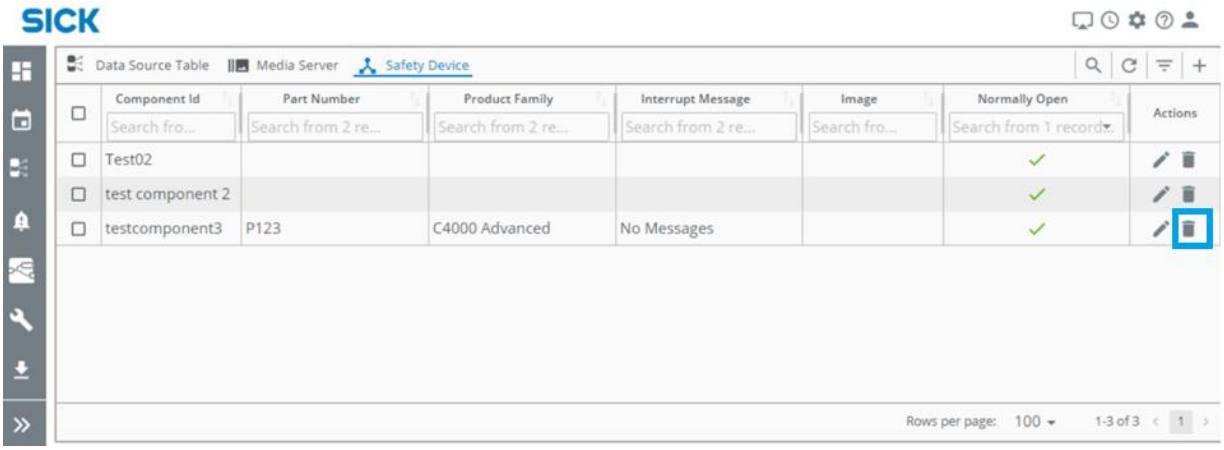

Figure 205: Delete Icon

5. Delete Data Source confirmation box appears.
6. Click the **Delete** button to confirm the deletion.

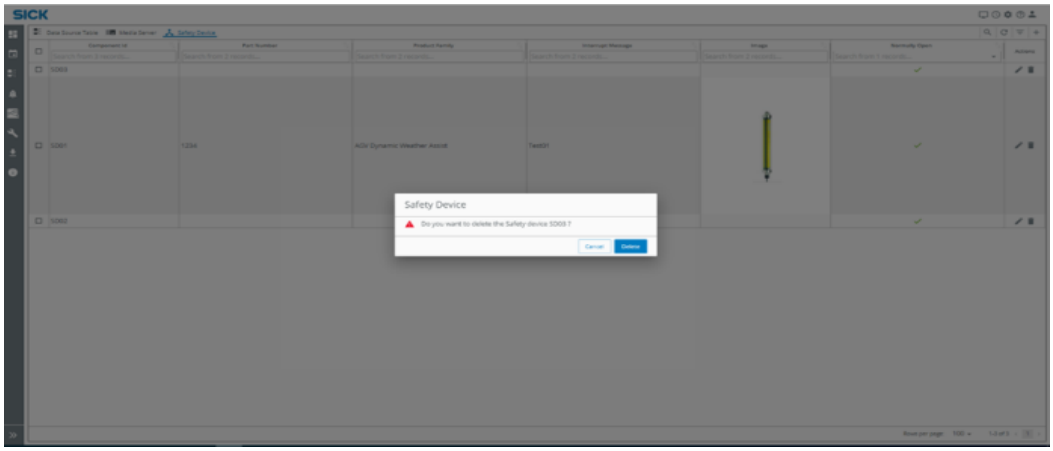

Figure 206: Delete Safety Device Confirmation Box

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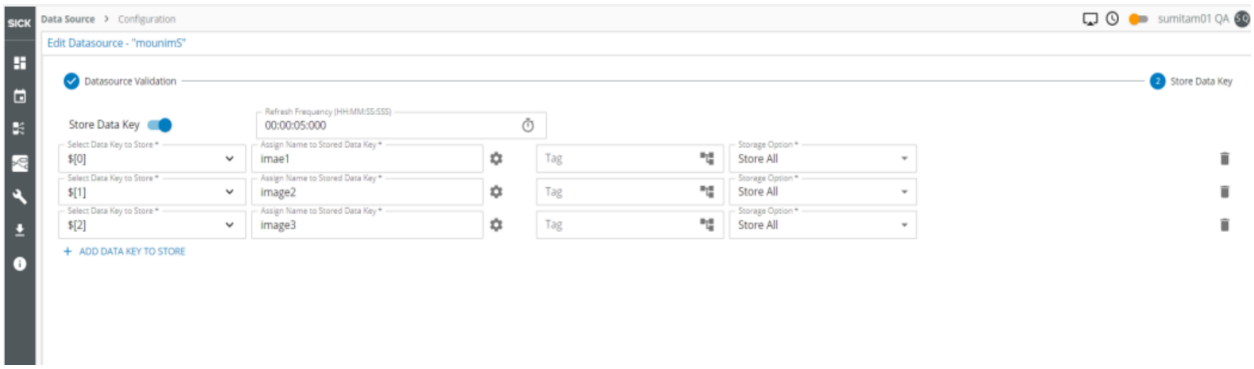
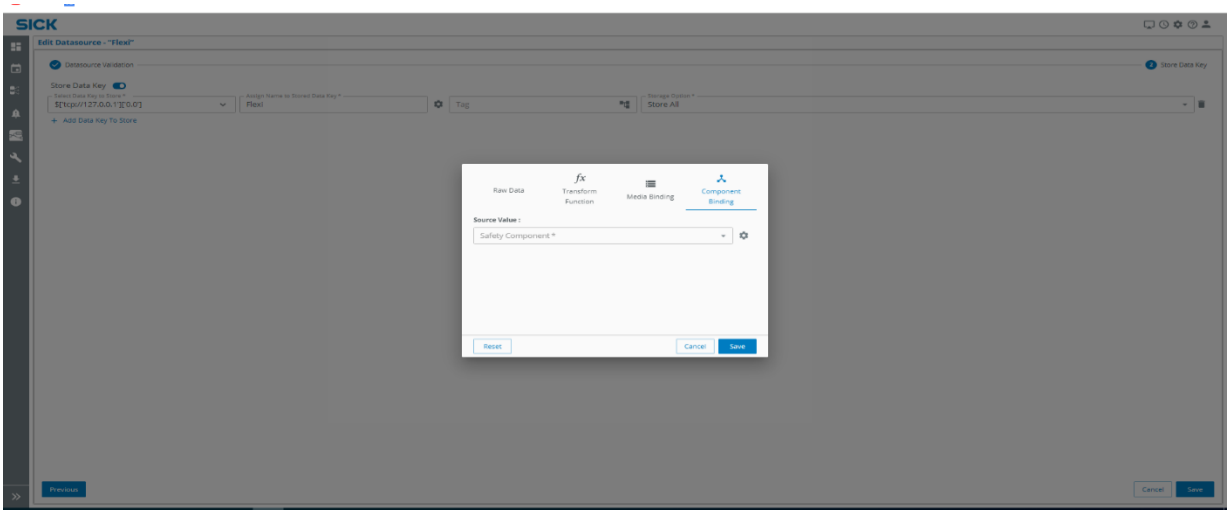


Figure 207: Store Data Key Screen

Click on ' ⚙ ' icon. A dialog box appears with four options which are **Raw Data**, **Transform Function** and **Media Binding,component Binding**. Click on '**Component Binding'** and select the '**Source Value'** from the drop-down which we configured in the safety device tab. Click on '**Save**' button. Also click on '**Save**' button to save the data source.



To view the fetched safety devices, navigate to '**Historian**' tab. Select the created data source from the drop-down under the '**Data Source Name'** field and click on '**Search**' button.

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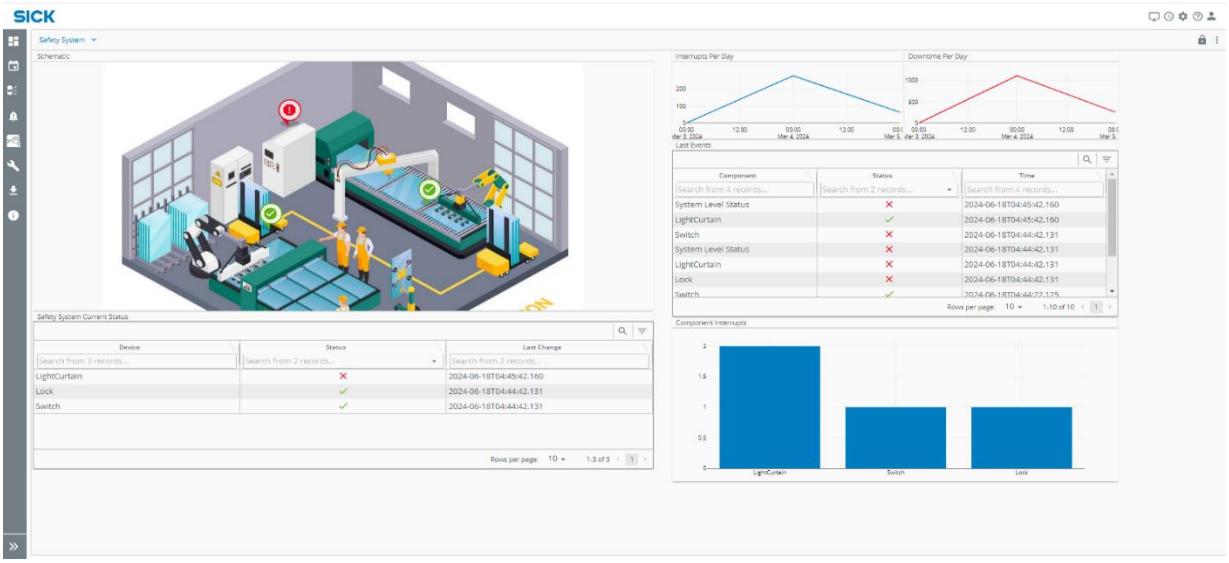

10 Historian

On the home page, Click the historian icon in the navigation bar it will display all the pre-defined data sources for trending and analysis. Refer to Figure 208: Home Page.

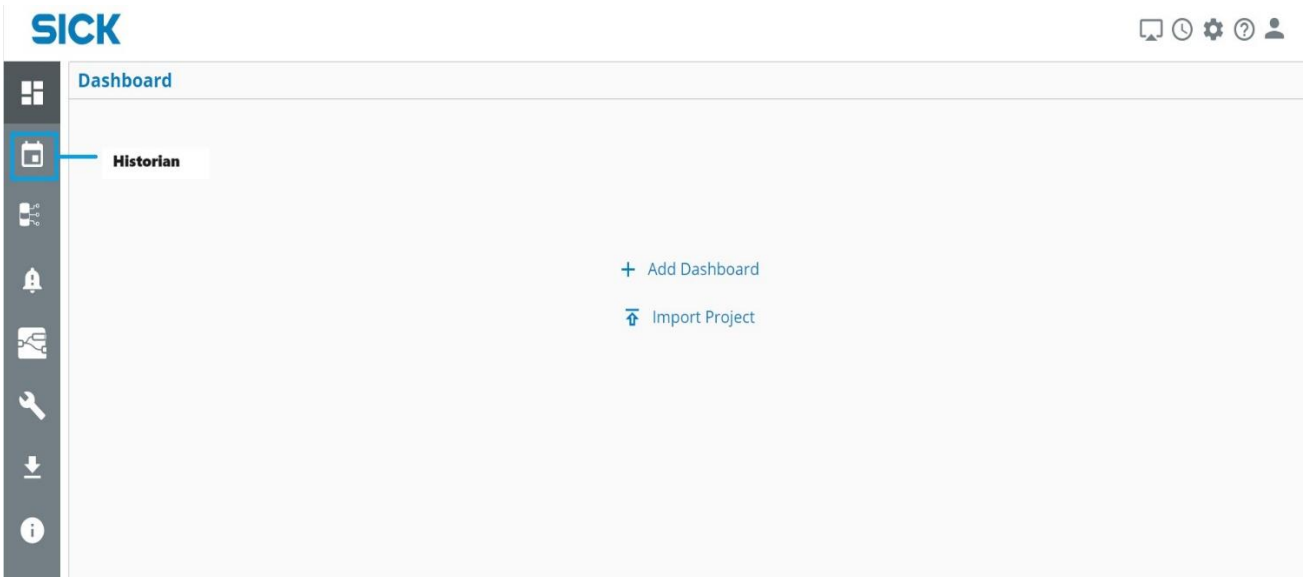

Figure 208: Home Page

When clicked on Historian icon, a dialog box appears on screen. Refer to Figure 209: Historian.

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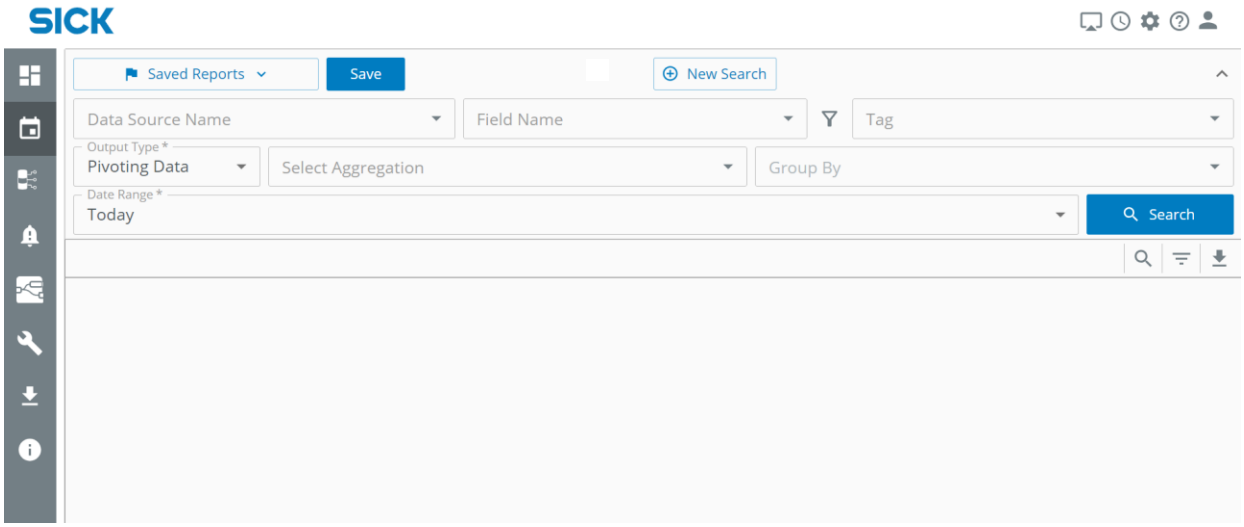

Figure 209: Historian

It displays following fields:

- **Data Filter-** Filter data based on one or all of the following criteria:
  a. **Data Source Name-** Search based on all predefined data sources names.
  b. **Tag** – Search based on all predefined tags added to Field Analytics.
- **Field Name** – Search based on all predefined data sources field names added to FA.
- **Date Range** – Select custom date ranges to filter data of interest.
- **Aggregation Filter-**It should include Select Aggregation field where we can select the aggregation from the drop-down accordingly.
- **Grouping-** It should have Group by field where we can select the Fields accordingly from the drop-down and it can only get enabled when the user selects value in Aggregation filter. Output can be seen in the form of Tabular and pivoting Data format as per user selection.

10.1 Search Filters

Data Filters:

1. User can click data filters and select value from **Data Source, and Tag** dropdowns. Refer to Figure 210: Data Filters.
2. Click on SEARCH button.
3. It displays the result matching the search criteria.

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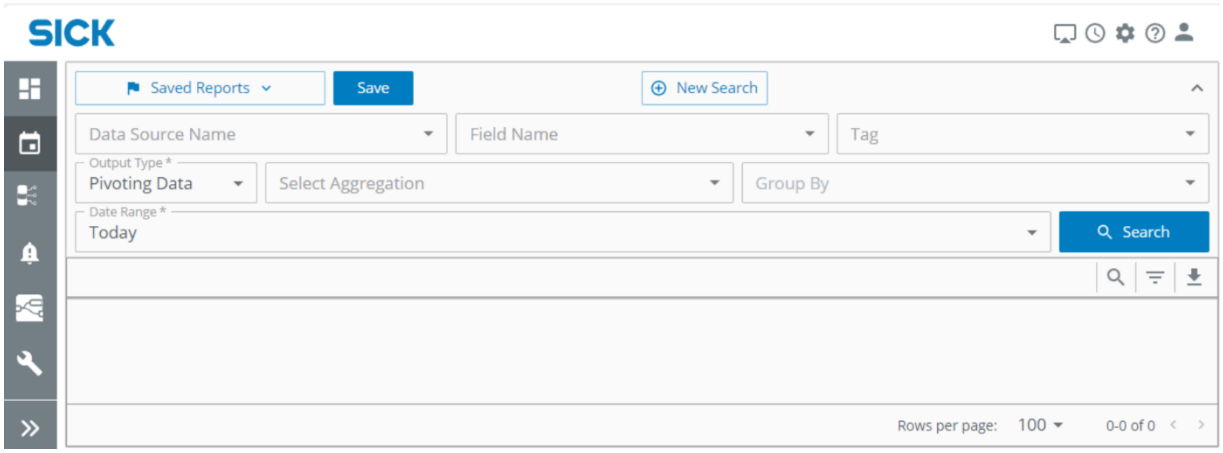

Figure 210: Data Filters

Field Name:

1. User can click Field Name and select value from dropdowns. Refer to Figure 211: .

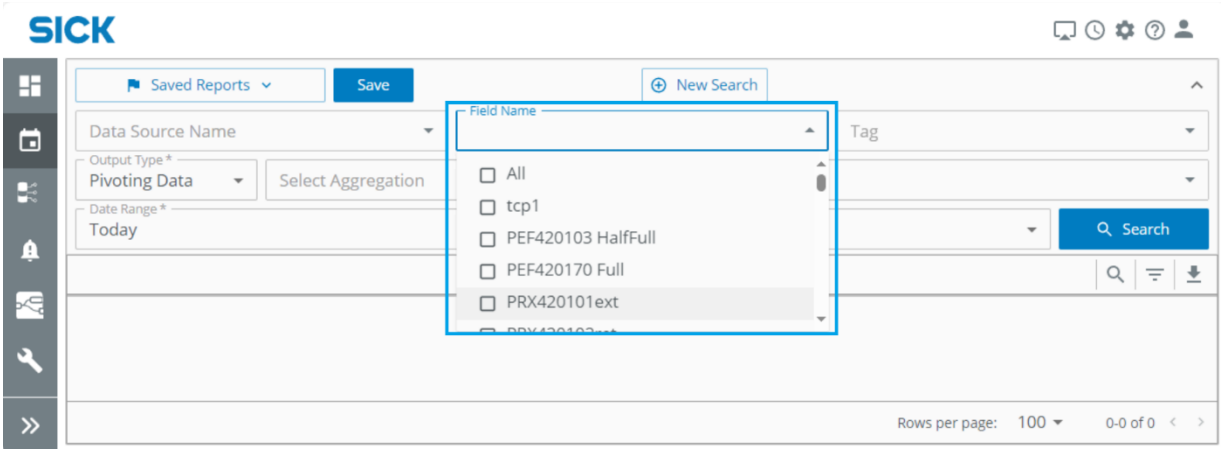

Figure 211: Field Name

Date Range:

1. Here, we can see the badge icon, where User has configured the query builder.
2. User can click Date Range and select any date Range from dropdown. Refer to Figure 212: Date Range.
3. Click on SEARCH button.
4. It displays the result matching the search criteria.

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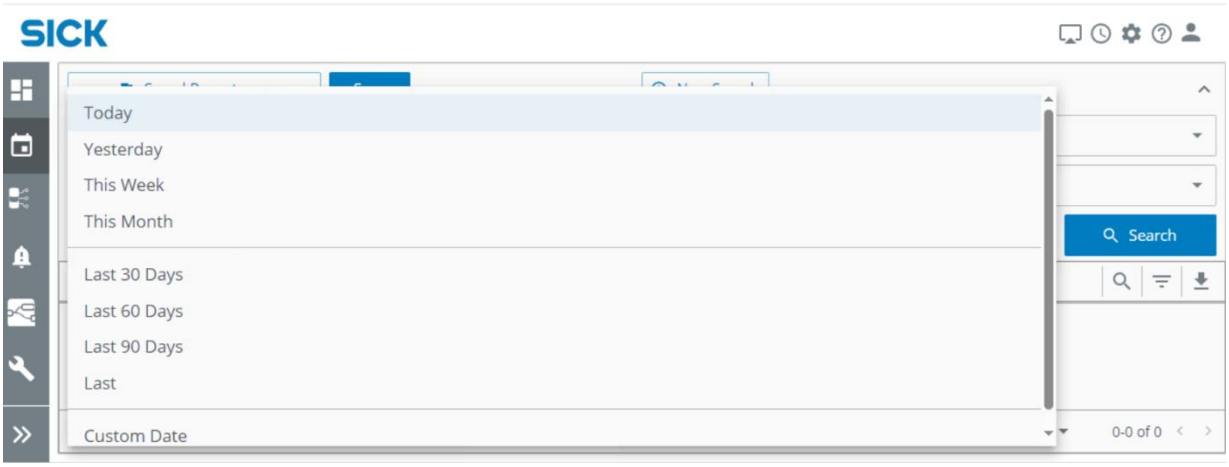

Figure 212: Date Range

Aggregation Filter:

1. User can click Aggregation dropdown and select the required aggregation from the dropdown. Refer to Figure 213: Aggregation Filter.
2. Click on **SEARCH** button.
3. It displays the result matching the search criteria.

Aggregation functions	Description
count	Display the count value
Min	Display the min value
Max	Display the max value
Sum	Display the sum value
Average	Display the avg value
Median	Display the median value
Mode	Display the mode value
Integral	Display the Integral value
Spread	Display the Spread value
Stddev	Display the stddev value

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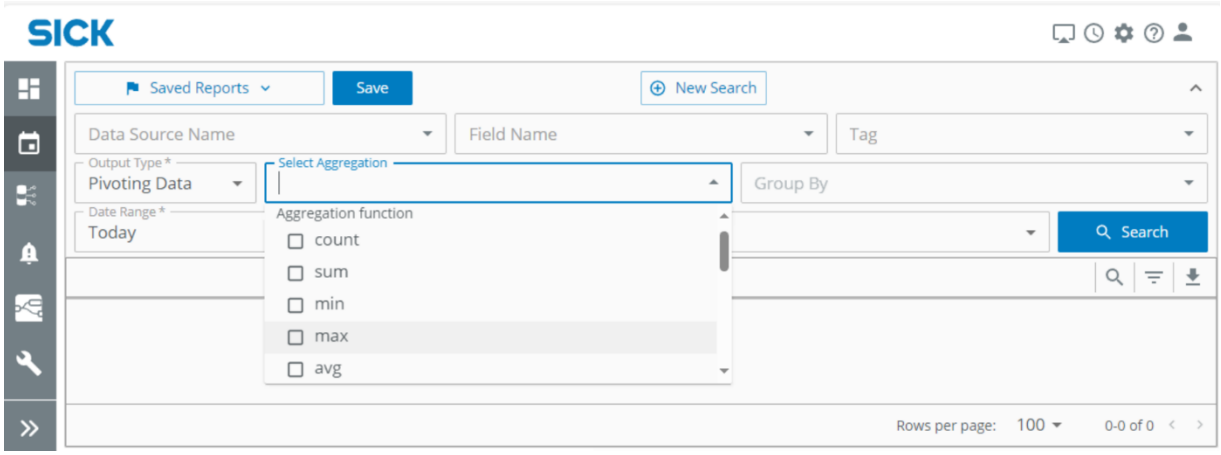

Figure 213: Aggregation Filter

Grouping filter:

1. User can select Output type Tabular or Pivoting charts. Refer to Figure 214: Grouping Filter.

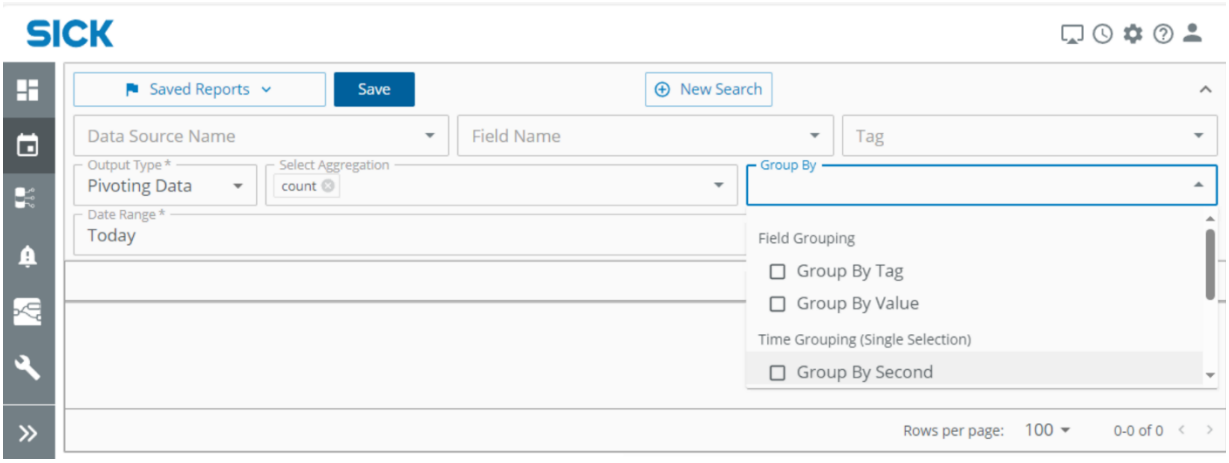

Figure 214: Grouping Filter

2. Expand Group By drop-down and select the required value.

Grouping Filter	Description
Group By Second	Gives ability to group by particular second timeline.
Group By Minute	Gives ability to group by particular minute timeline.
Group By Hour	Gives ability to group by particular hour timeline.
Group By Day	Gives ability to group by day
Group By Month	Gives ability to group by month
Group By Year	Gives ability to group by year
Group By Data Source Name	Gives ability to group by Data Source name
Group By Tag	Gives ability to group by tag

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Group By Data Source Field Name	Gives ability to group by Data Source field name

3. Click on **SEARCH** button.
4. It displays the result matching the search criteria.

Note: All the filters can be selected together and on clicking SEARCH the results will be displayed according to the one Data Source. Also, when more than one Data source is selected and select any grouping filter then click on SEARCH, the results will be displayed for single Data source.

10.2 Save (Create Report)

To save the data

1. Go to Filters sections (Data Filter, Date Range, Aggregation Filter, and Grouping) and select accordingly.
2. User can verify the results according to the selected filters.
3. Click on **Save** and provide the name to the report. Refer to Figure 215: Saving Report.
4. A new report will be created with saved filters.

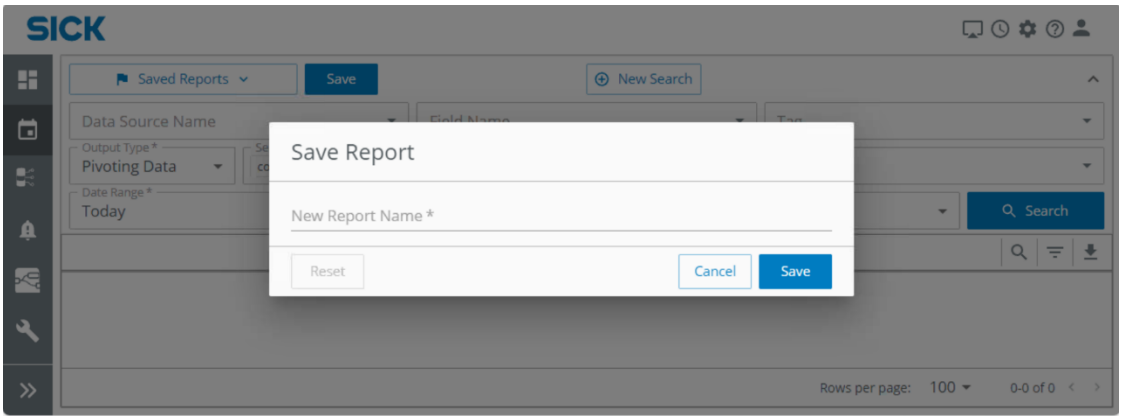

Figure 215: Saving Report

5. Click on **Reset** to enter new report name.
6. Click **Cancel** to cancel creating new report.

10.3 Download

1. Go to Filters sections (Data Filter, Time Filter, Aggregation Filter, and Grouping) and select accordingly.
2. Verify the results according to the selected filters.
3. Click on **Download** icon .
4. A report will be downloaded according to the record displayed on the screen.

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11 Widgets

Field Analytics has a large library of configurable tables, charts, gauges, and live video streaming widgets for data visualization of user centric (KPI's) in order to meet the needs.

11.1 Gauge Widgets

11.1.1 Solid Gauge

To add Solid Gauge to the dashboard:

1. Click **Add Widget** button at top-right corner on home page. Refer to Figure 216: Add Widget

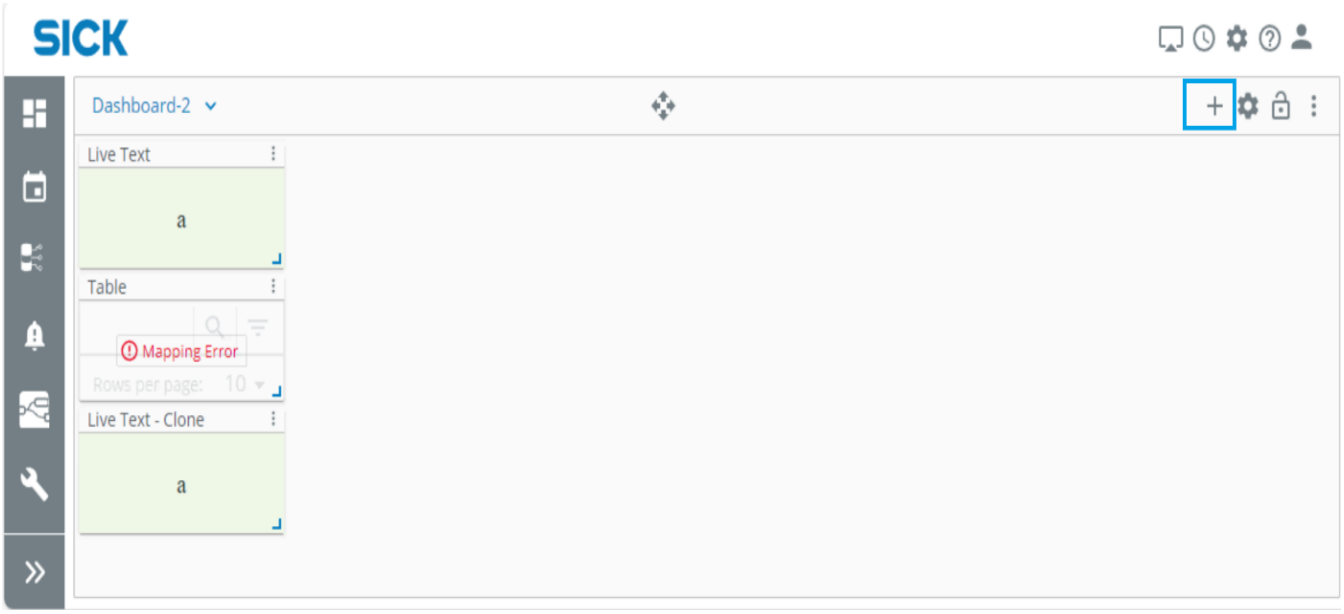

Figure 216: Add Widget

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2. It will open **Add Widget** window displaying list of widgets. Refer to Figure 217: Widget List

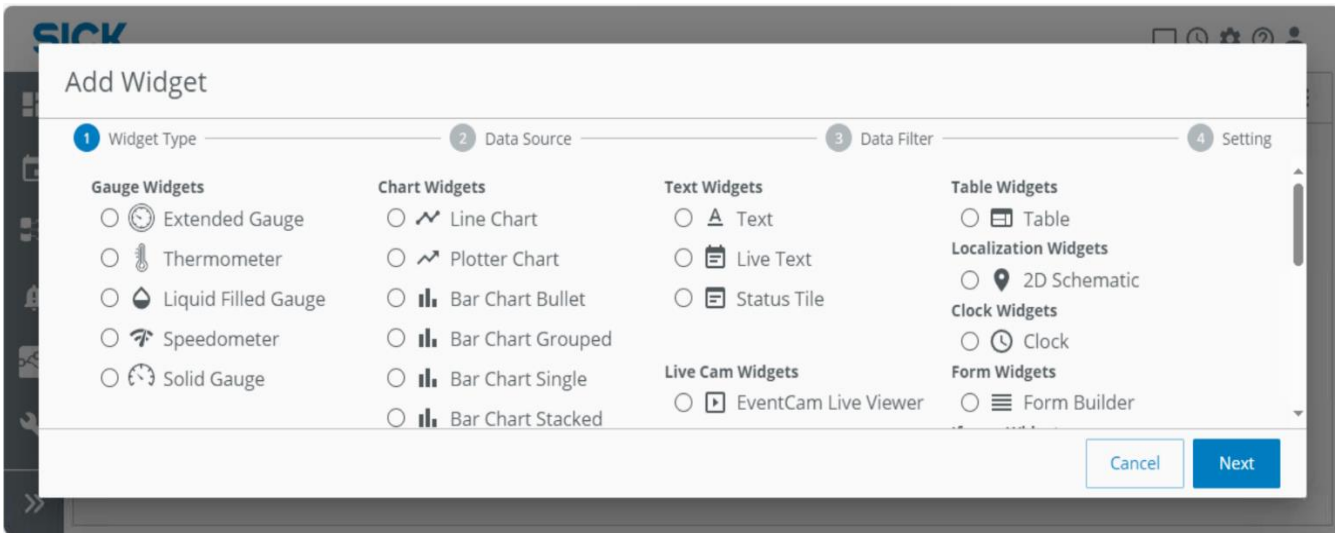

Figure 217: Widget List

3. Select **Solid Gauge** radio button, under **Gauge Widgets** section and click the **Next** button

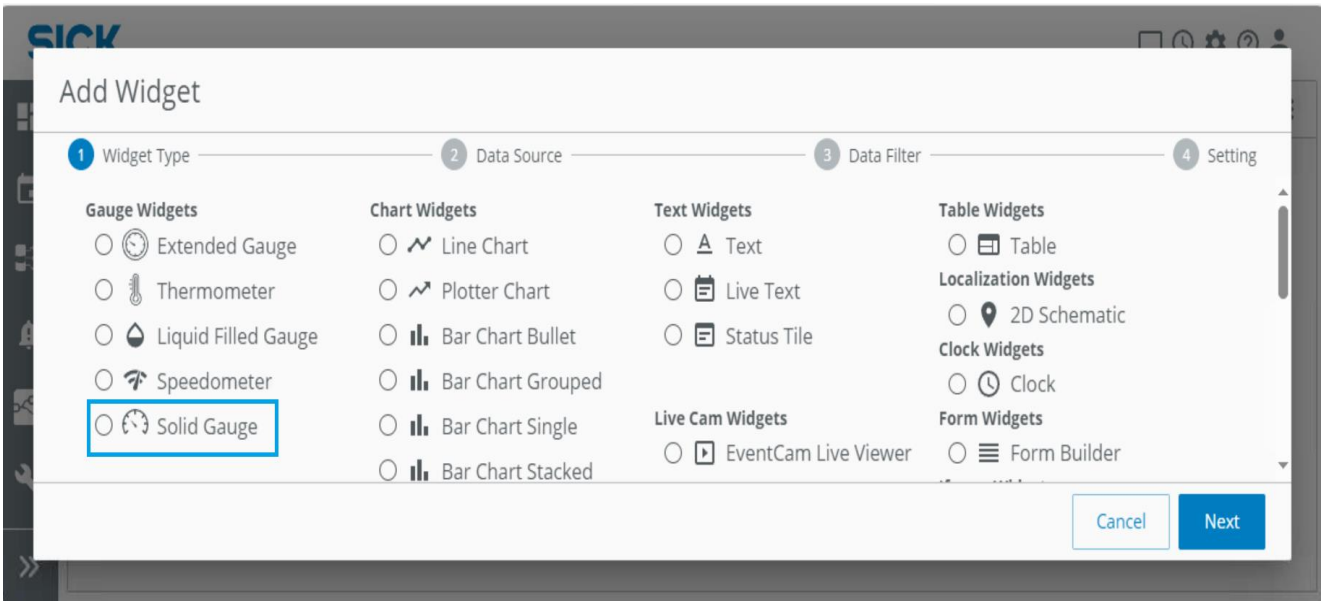

Figure 218: Solid Gauge

4. It will navigate to the Data Source selection tab

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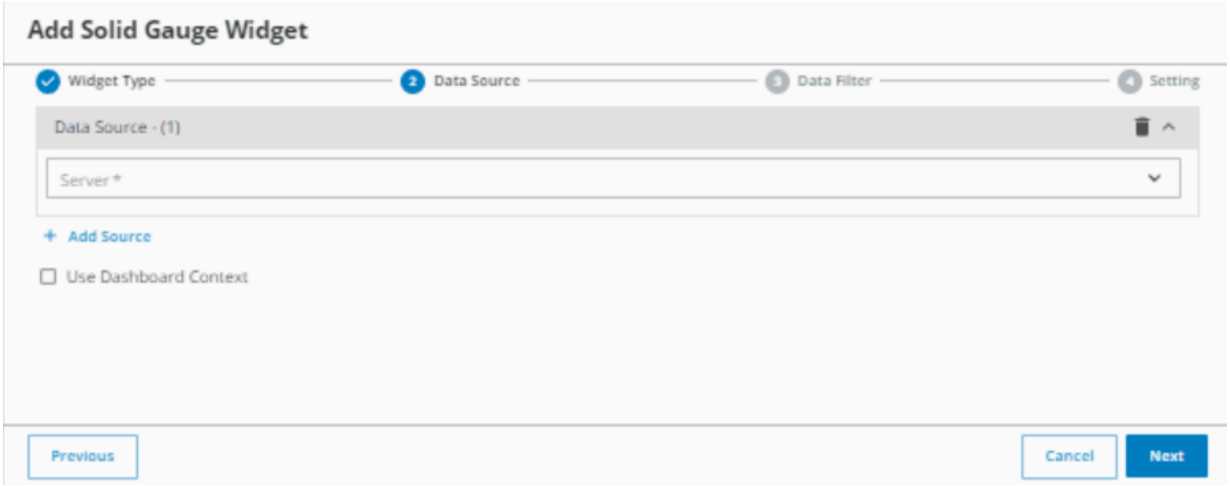

Figure 219: Data Source

5. It consists of the following fields to configure as required:
   - **Server**: The data source from where the data is acquired (can be from **Data Source**, **Reports**, **Historian**)

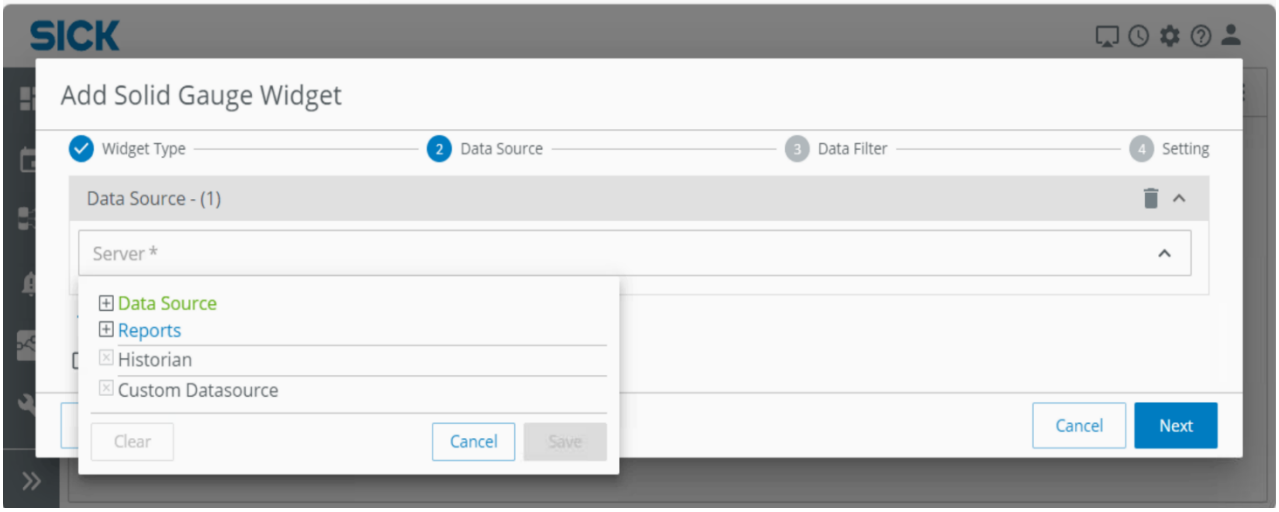

Figure 220: List of Data Source

- **Add Data Source:** Data Source 2 will display with same fields to configure. Refer to Figure 230: Add Data Source.

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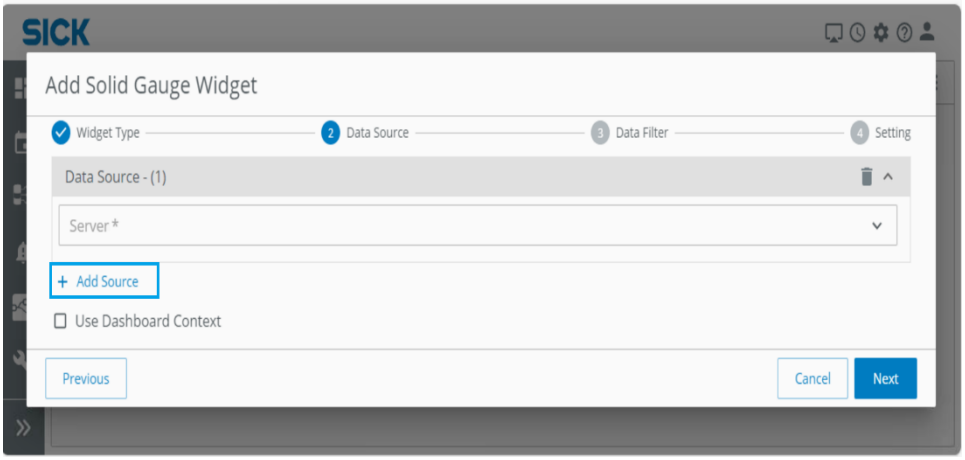

6. Click the **Next** button
7. It will navigate to the Data Filter section where the data to be displayed will be filtered from the API response
8. It consists of following fields to be configured as required:
    - **Map Data Sources > Data Fields from Sources**: Select the field value from the API response to display (Widget will function as per the selected value) in Data fields from sources. This step auto-generates Java Script code which can be seen in Transform Function section

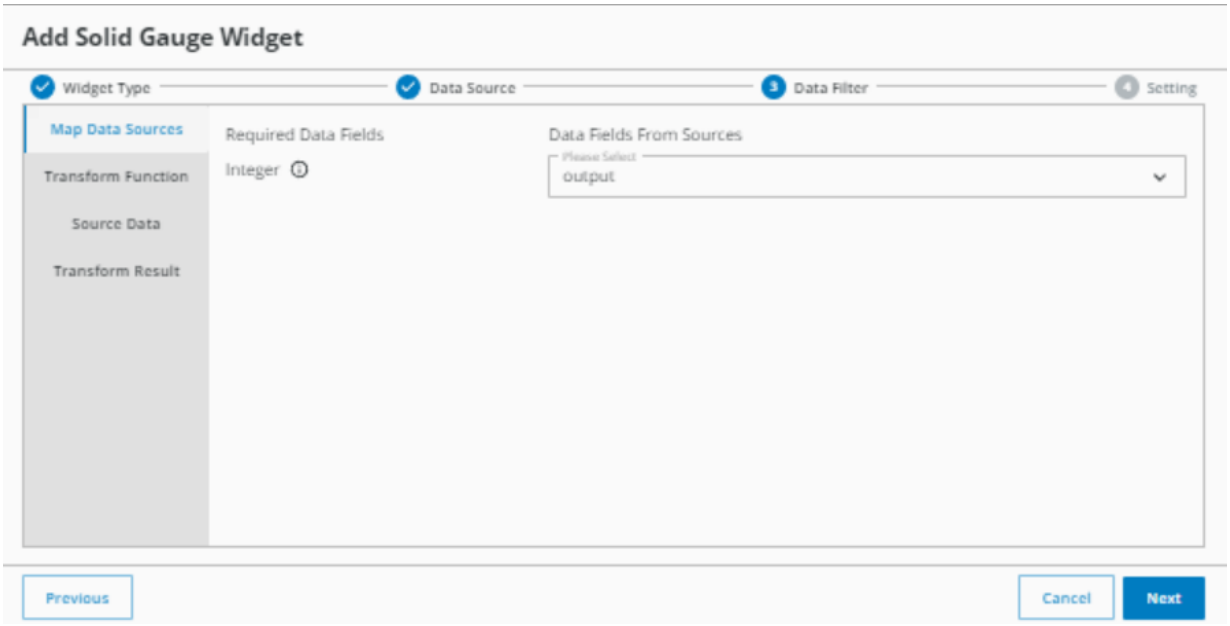

Figure 221: Map Data Sources

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- **Transform Function**: This option enables users to fetch values from the API response using JavaScript to perform a task or calculate a value. If you want to use "Transform Function" then "**Map Data Source**" will be disabled & will not be used in calculating the output

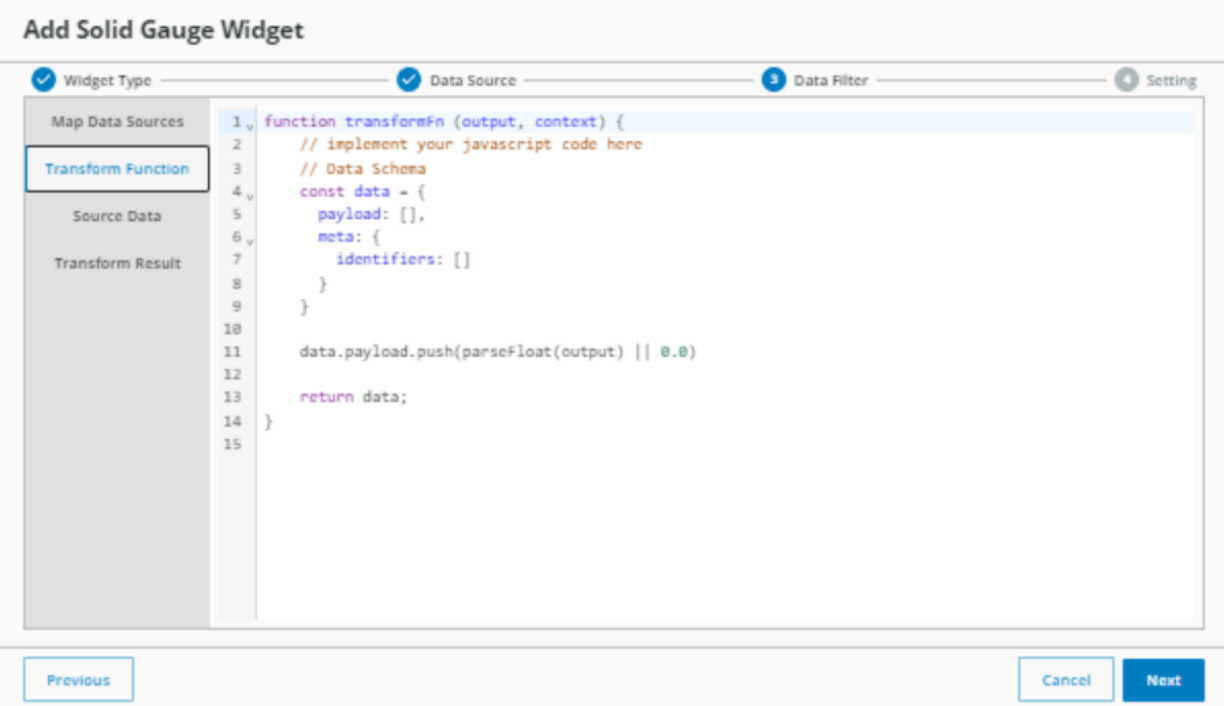

Figure 222: Transform Function

- **Source Data**: This will display the entire response from the API call

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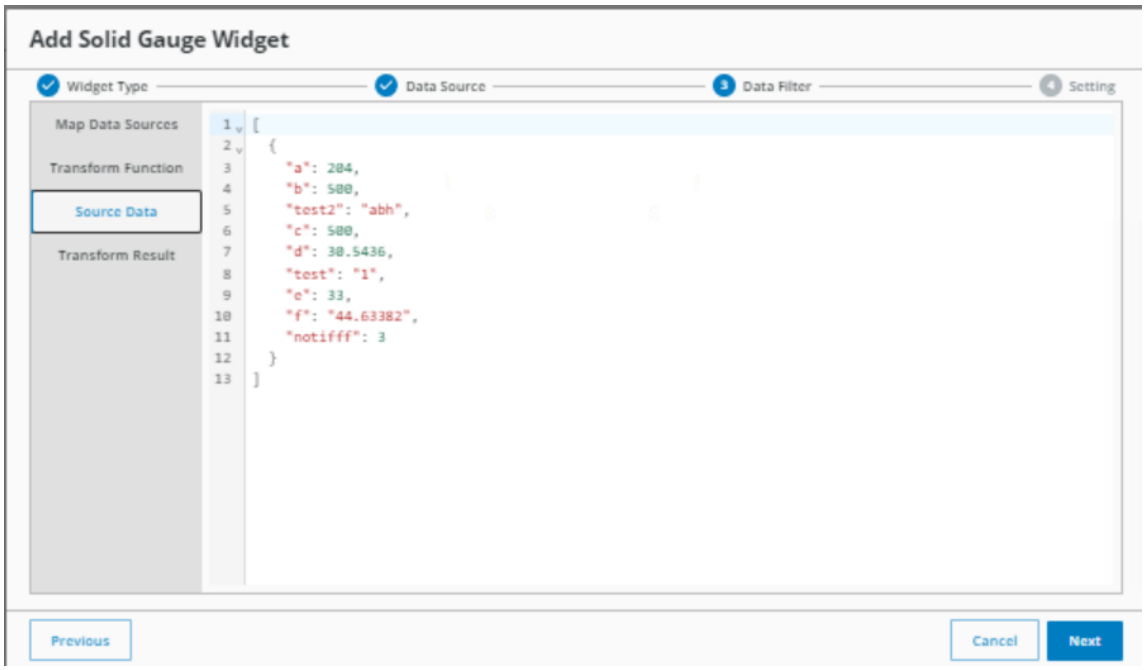

Figure 223: Source Data

9. **Transform Result**: This will display the filtered response value from the transform function

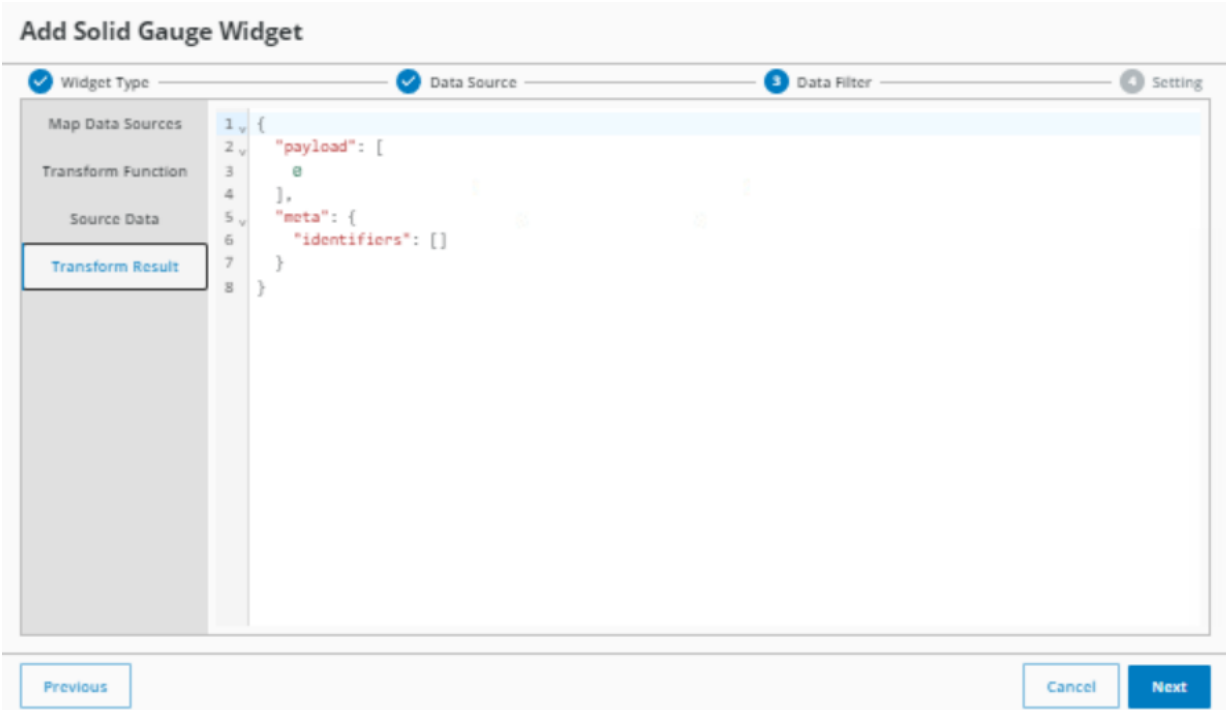

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Figure 224: Transform Result

10. Click the **Next** button to move to the next section
11. Users can configure and manage settings related to the gauge widget display
12. The following fields will need to be configured as required:
    - **Title:** This will be the title of the widget
    - **Show Title (Checkbox):** The widget title will be displayed if the checkbox is checked, else it will not be displayed
    - **Show Footer (Checkbox):** The widget footer (displaying Start Range and End Range values) will be displayed if the checkbox is checked, else it will not be displayed
    - **Refresh Frequency:** This will set the refresh frequency of the widget display
    - **Min Range:** This will set the minimum range value to be displayed
    - **Max Range:** This will set the maximum range value to be displayed
    - **Unit:** Assign the unit of measure (i.e., kg, feet, mph etc.…)
    - **Precision:** Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0
    - **Section:** Enter the section value
    - **Gauge Section Color:** This will set the color of the gauge section based on the Start and End Range values
    - **Section Label:** Enter the name of the section to be displayed
    - **Pick Symbol:** Select a related symbol to be displayed on the widget from the drop-down
    - **Show Legend:** Enable **Show Legend** toggle button to display the legend on the widget
    - **Absolute Scale:** Check **Absolute Scale** to scale the widget to a precise size
    - **Display Trend:** Check **Display Trend** to show the data over a specified range on a widget. Uptrends icon are marked by rising data points showcased in percentage increase on last data point, Downtrends are marked by falling data points showcased in percentage decrease on last data point

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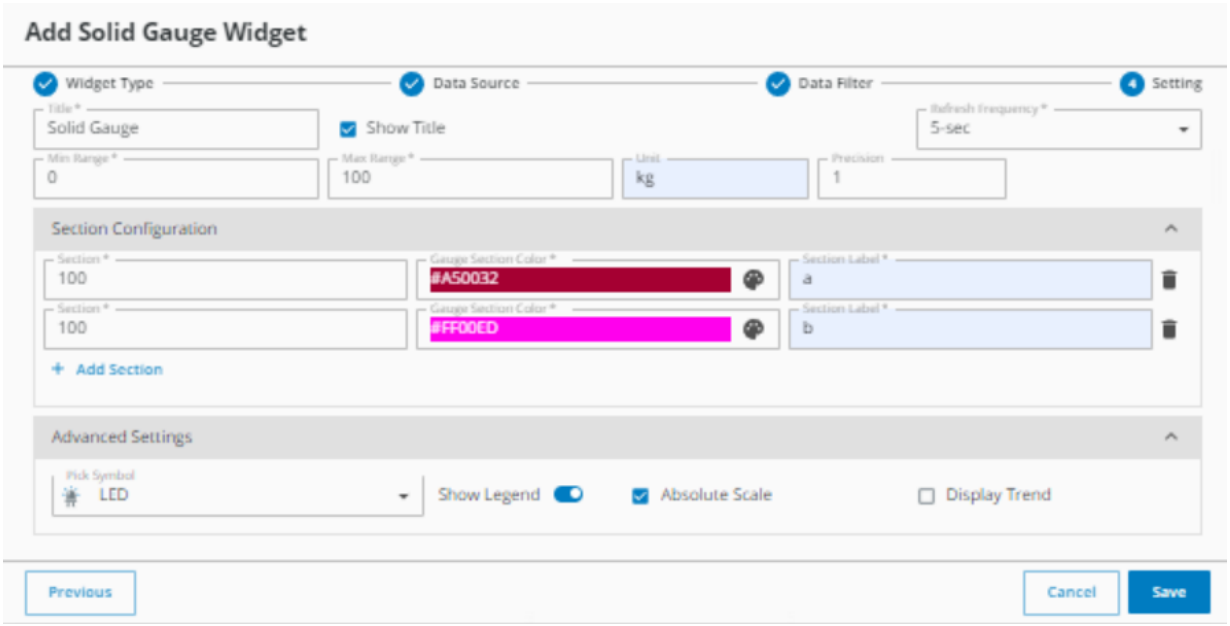

Figure 225: Widget Settings

13. Click the **Save** button
14. Field Analytics will add **Solid Gauge** widget as configured by the user on the Dashboard

Figure 226: Solid Gauge Widget

11.1.2 Extended Gauge

Extended Gauge visualizes data points in form of a gauge. Min and max target values are visualized dynamically (0-360◦).

To add Extended Gauge widget to the dashboard:

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1. Click **Add Widget** button at top-right corner on home page. Refer to Figure 216: Add Widget
2. It will open **Add Widget** window displaying list of widgets. Refer to Figure 217: Widget List
3. Select **Extended Gauge** radio button, under **Gauge Widgets** section and click **NEXT**. Refer to Figure 227: Extended Gauge.

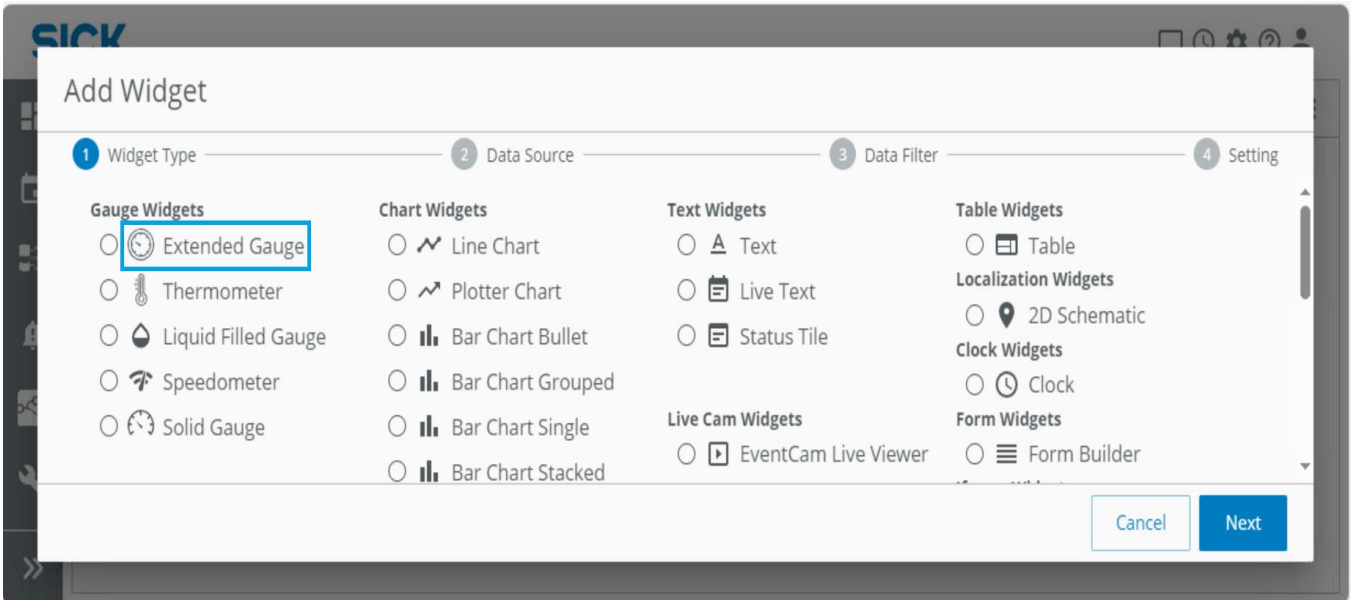

Figure 227: Extended Gauge

4. It will navigate to the Data Source selection tab

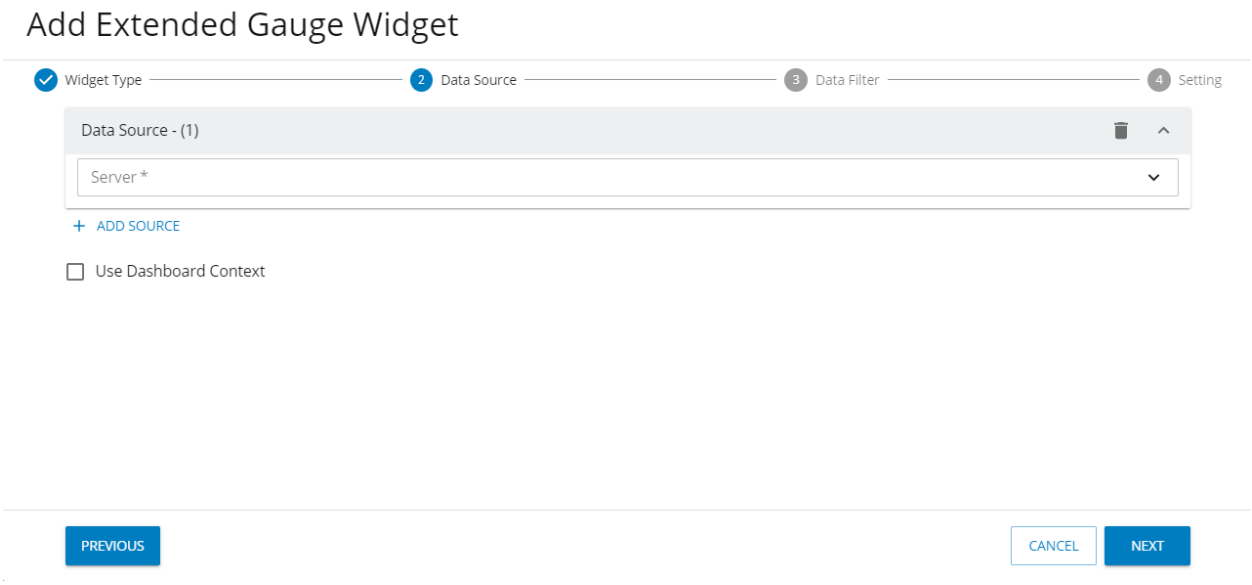

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Figure 228: Data Source

It consists of the following fields to configure as required:

a. **Server**: The data source from where the data is acquired (can be from **Data Source**, **Reports**, **Historian**). Refer to Figure 229: List of Data Source.

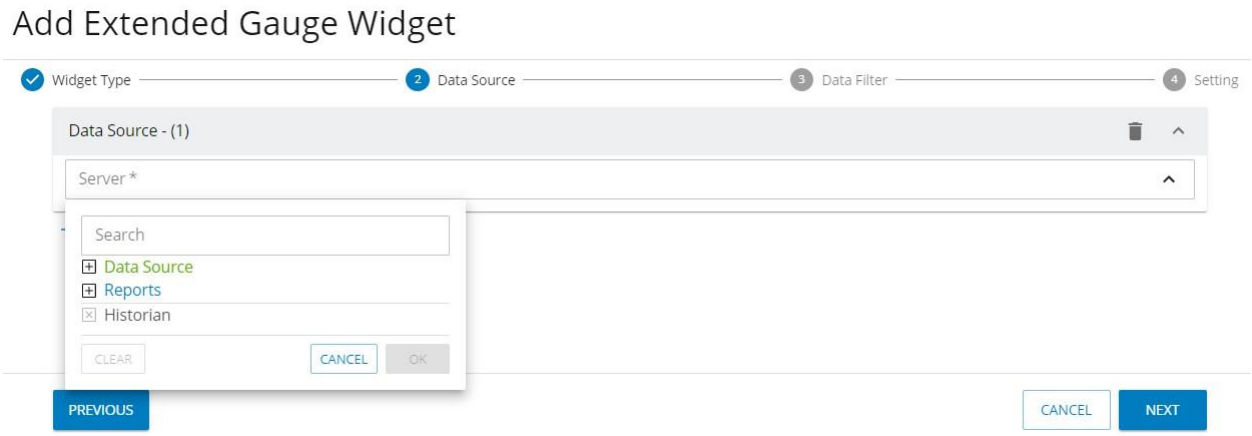

Figure 229: List of Data Source

b. **Add Data Source:** Data Source 2 will display with same fields to configure. Refer to Figure 230: Add Data Source.

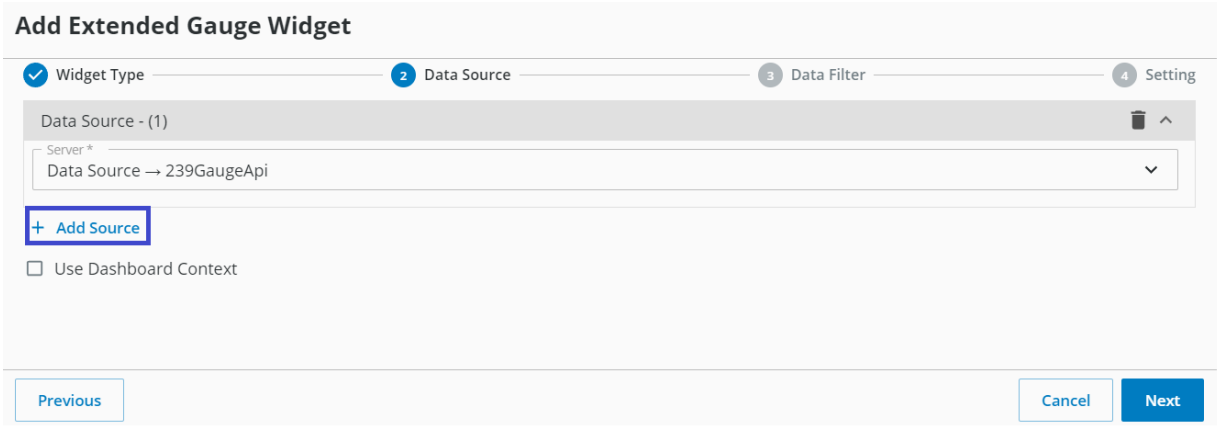

Figure 230: Add Data Source

5. Click the **Next** button.
6. It will navigate to the Data Filter section. Select the field value from the API response to display (Widget will function as per the selected value) in Data fields from sources.

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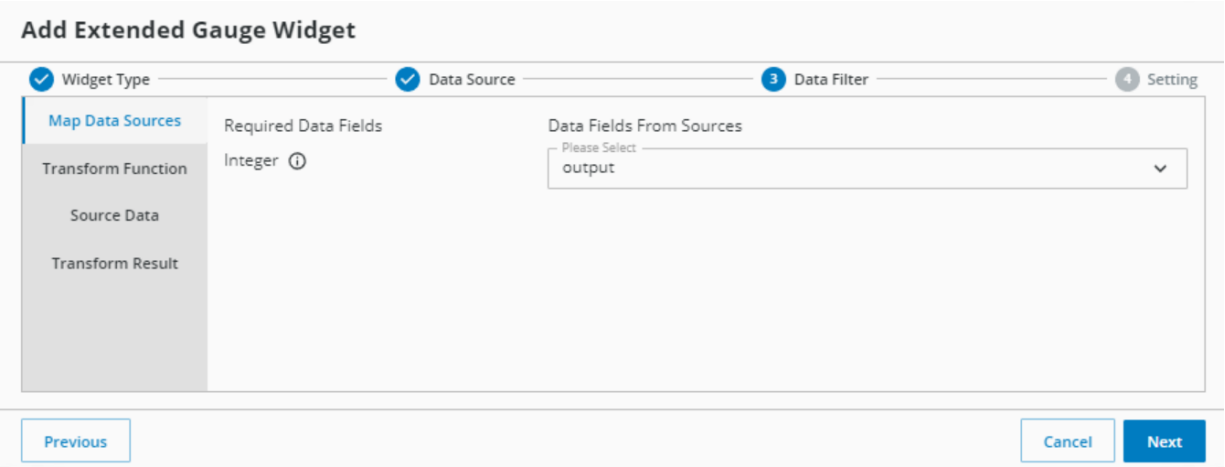

Figure 231: Data Filter

To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8.

7. Click the **Next** button to move to the next section
8. Users can configure and manage settings related to the gauge widget display. Refer to Figure 232: Settings

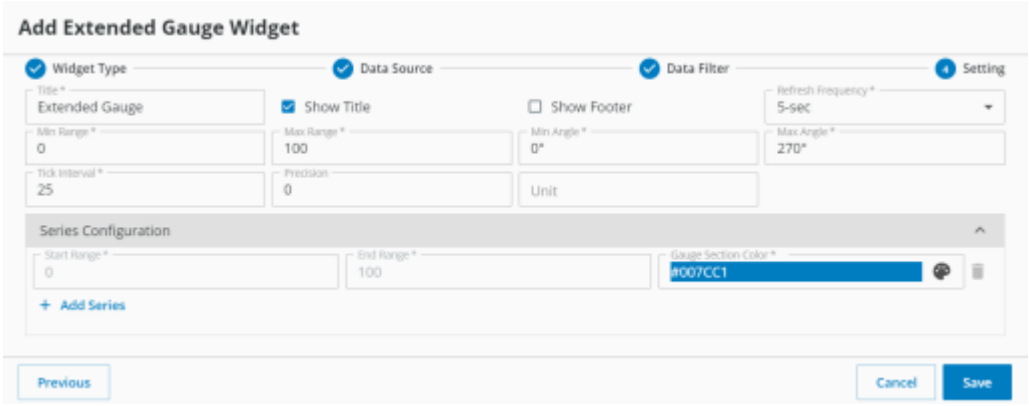

Figure 232: Settings

The following fields will need to be configured as required:

b. Title: This will be the title of the widget

c. Show Title (Checkbox): The widget title will be displayed if the checkbox is checked, else it will not be displayed

d. Show Footer (Checkbox): The widget footer (displaying Start Range and End Range values) will be displayed if the checkbox is checked, else it will not be displayed

e. **Refresh Frequency:** This will set the refresh frequency of the widget display

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f. **Min Range:** This will set the minimum range value to be displayed
g. **Max Range:** This will set the maximum range value to be displayed
h. **Tick Interval:** This will display the interval settings on the widget
i. **Min Angle:** This will set the value of the minimum angle the widget should display. At minimum, it can be set to 0
j. **Max Angle:** This will set the value of the maximum angle the widget should display. It can maximum be set to 360
k. **Precision:** Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0
l. **Unit:** Assign the unit of measure (i.e., kg, feet, mph etc.…)
m. **Start Range:** This will set the starting value of a range for which a particular gauge section color can be set
n. **End Range:** This will set the end value of a range for which a particular gauge section color can be set
o. **Gauge Section Color:** This will set the color of the gauge section based on the Start and End Range values

9. Click the **Save** button
10. Field Analytics will add **Extended Gauge** widget as configured by the user on the Dashboard. Refer to Figure 233: Extended Gauge Widget

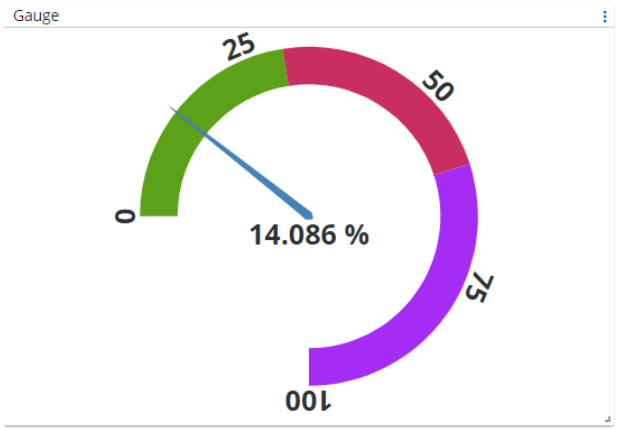

Figure 233: Extended Gauge Widget

11.1.3 Thermometer

Thermometer widget used to represent the data points.
To add Thermometer widget to the dashboard:

1. Click **Add widget** button at top-right corner on home page. Refer to Figure 216: Add Widget
2. It will display list of widgets. Refer to Figure 217: Widget List

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3. Select **Thermometer** radio button and click the **Next** button. Refer to Figure 234: Thermometer Widget

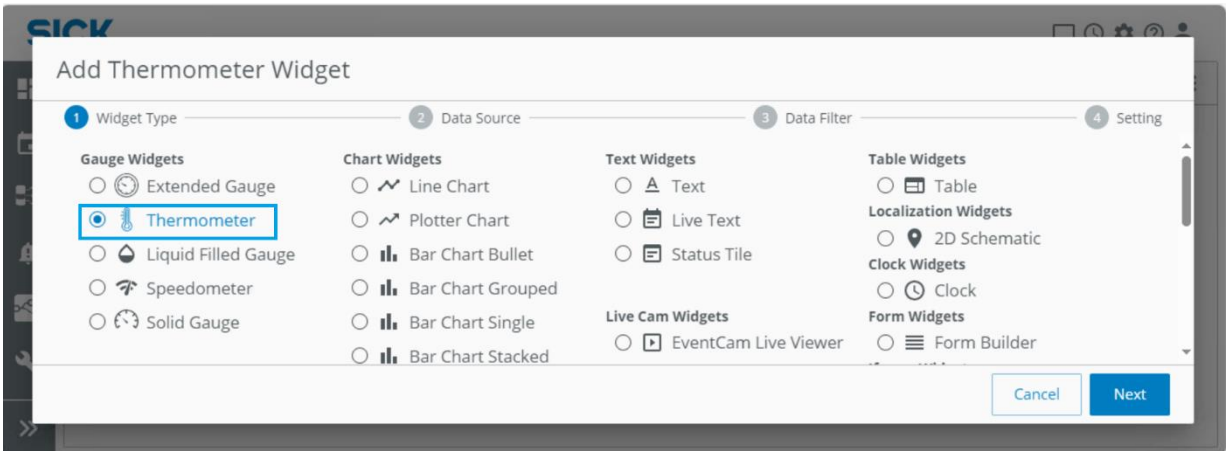

Figure 234: Thermometer Widget

4. It will navigate to the Data Source section where the source of data is acquired. Refer to Figure 235: Widget Data Source.

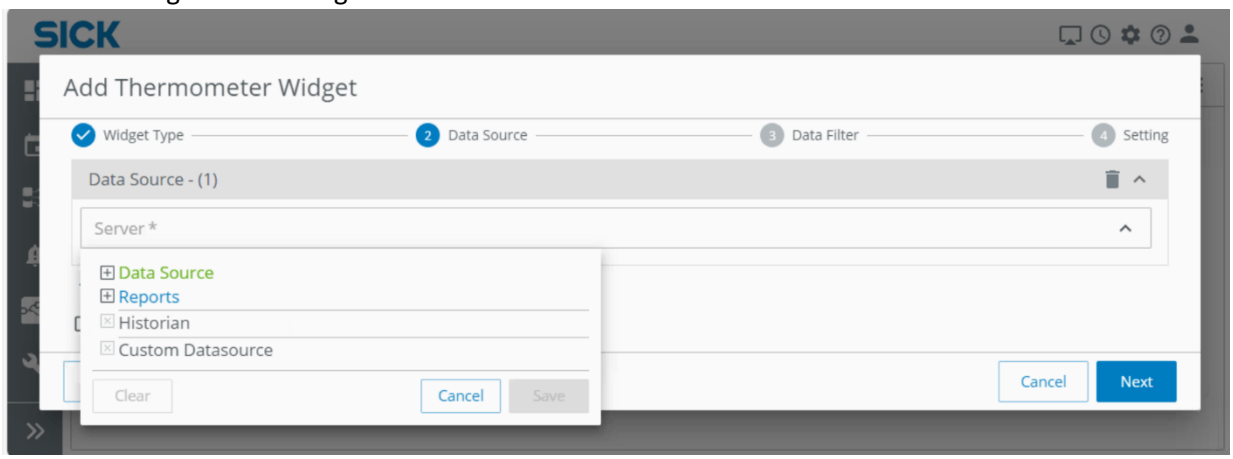

Figure 235: Widget Data Source

It consists of following fields to be configured as required:

- **Server**: The data source from where the data needs to be fetched can be from **Data Source**, **Reports**, **Historian**.
- **Add Data Source:** Data Source 2 will display with same fields to be configured.

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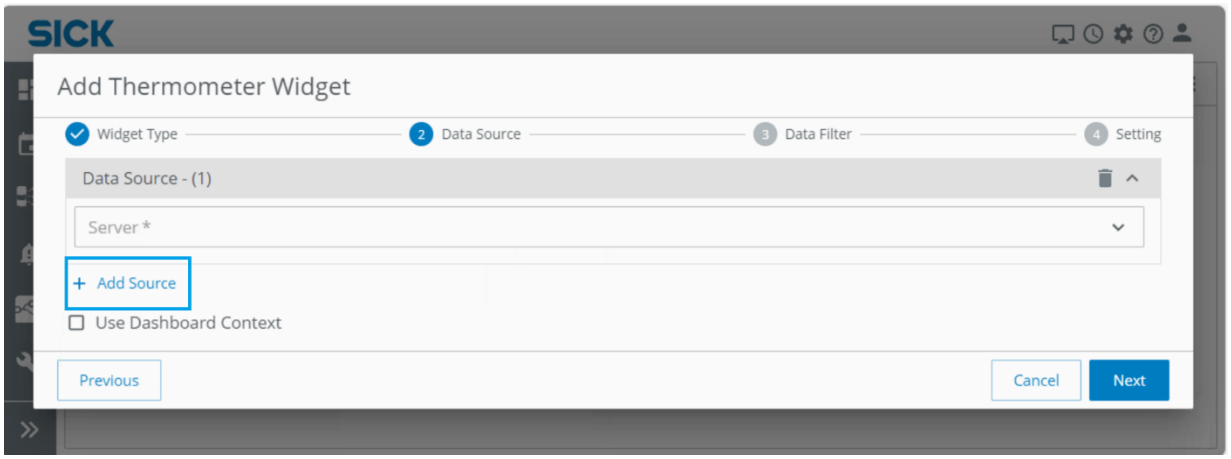

5. Click the **Next** button.
6. It will navigate to the Data Filter section. Select the field value from the API response to display (Widget will function as per the selected value) in Data fields from sources. Refer to Figure 236: Widget Data Filters.

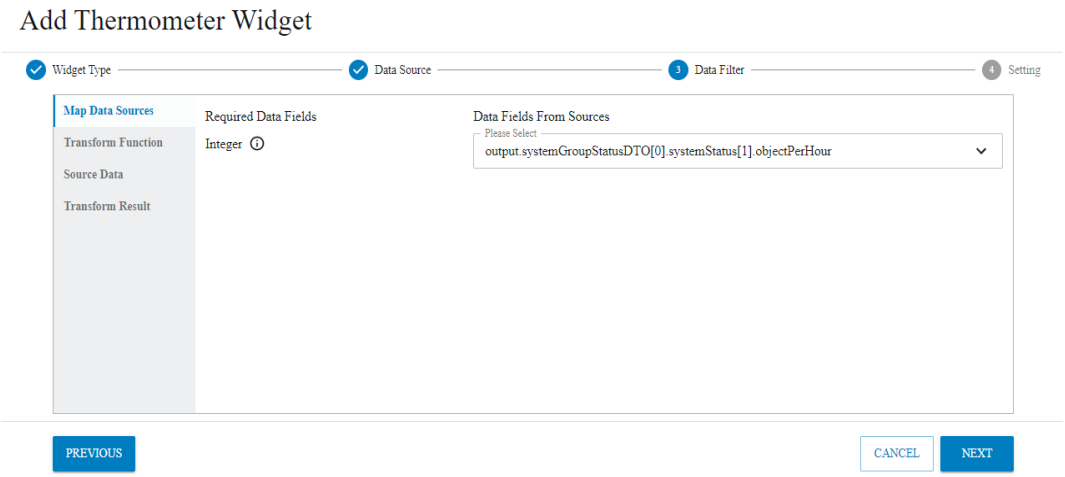

Figure 236: Widget Data Filters

To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8.

7. Click the **Next** button to move to the next section.
8. Configure and manage settings related to the thermometer widget display. Refer to Figure 237: Widget Settings.

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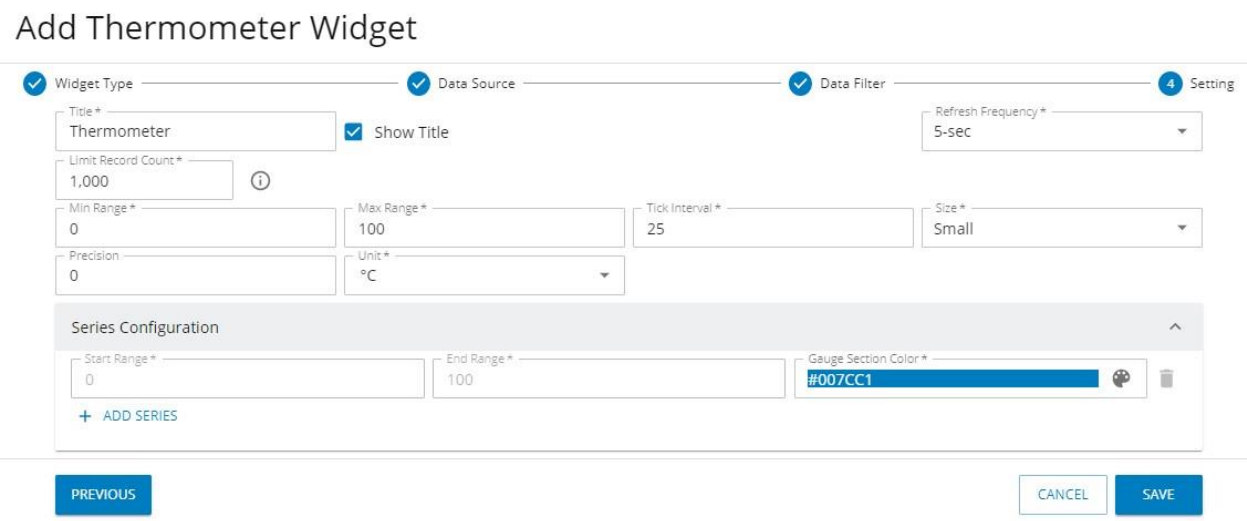

Figure 237: Widget Settings

It consists of following fields to be configured as required:

- **Title**: Provide the title of the widget.
- **Show Title (Checkbox)**: The widget title will be displayed if the checkbox is checked, else it will not be displayed.
- **Refresh Frequency**: It will refresh the frequency of the widget display.
- **Min Range**: It will display the minimum range of the widget.
- **Max Range**: It will display the minimum range of the widget.
- **Tick Interval**: This will display the interval settings on the widget.
- **Unit:** This will set the measuring unit. It can be set to C (Celsius), F (Fahrenheit), and K (Kelvin).
- **Precision**: Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0.
- **Start Range**: This will set the starting value of a range for which a particular gauge section color can be set.
- **End Range**: This will set the end value of a range for which a particular gauge section color can be set.
- **Gauge Section Color**: This will set the color of the gauge section based on the Start and End Range values.

9. Click on **SAVE** button.
10. It will add the **Thermometer** widget as configured by the user on the Dashboard. Refer to Figure 238: Thermometer Widget.

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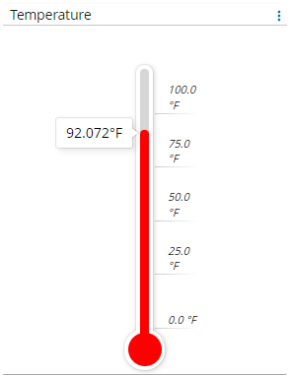

Figure 238: Thermometer Widget

11.1.4 Liquid Filled Gauge

Liquid Filled Gauge visualizes data in a relative or aggregate scale in numeric or percentage.
To add Liquid Filled Gauge widget to the dashboard:

1. Click **Add widget** button at top-right corner on home page. Refer to Figure 216: Add Widget
2. It will display list of widgets. Refer to Figure 217: Widget List
3. Select **Liquid filled gauge** and click '**NEXT'**. Refer to Figure 239: Liquid Filled Gauge

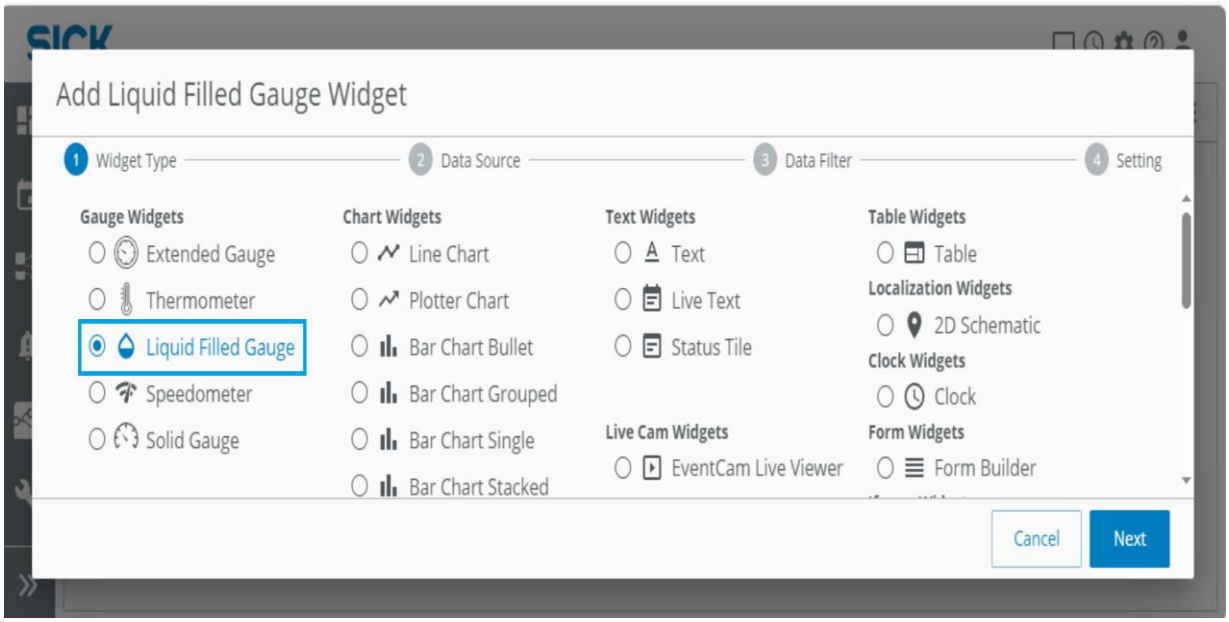

Figure 239: Liquid Filled Gauge

4. It will navigate to the **Data Source** section where the source of data is acquired. Refer to Figure 240: Widget Data Source

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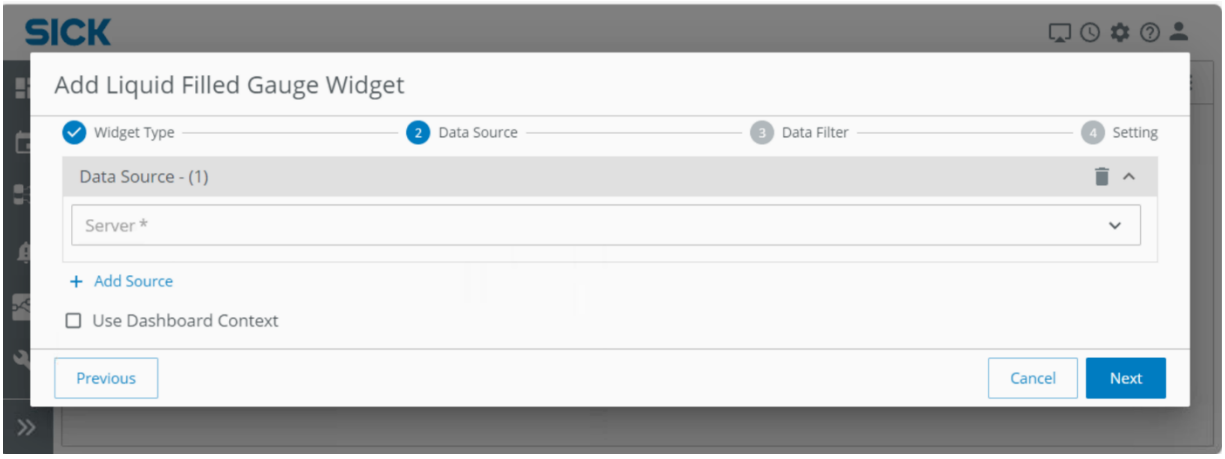

Figure 240: Widget Data Source

The following fields will need to be configured as required:

- **Server**: The data source from where the data is acquired (can be from **Data Source**, **Reports**, **Historian**)
- **Add Data Source:** Data Source 2 will display with same fields to be configured

5. Click the **Next** button
6. Field Analytics will navigate to the Data Filter section. Select the field value from the API response to display (Widget will function as per the selected value) in Data fields from sources. Refer to Figure 241: Widget Data Filter

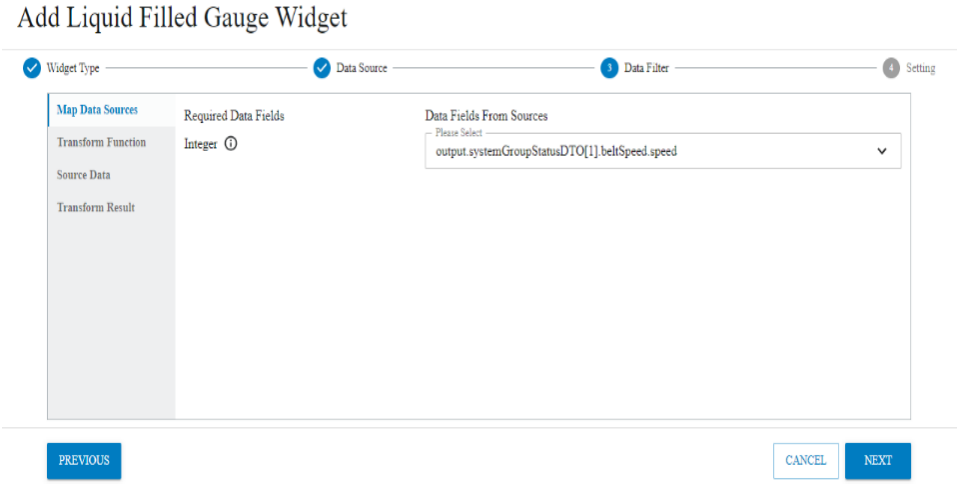

Figure 241: Widget Data Filter

To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8.

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7. Click the **Next** button
8. It will display liquid filled gauge settings. Refer to Figure 242: Widget Settings

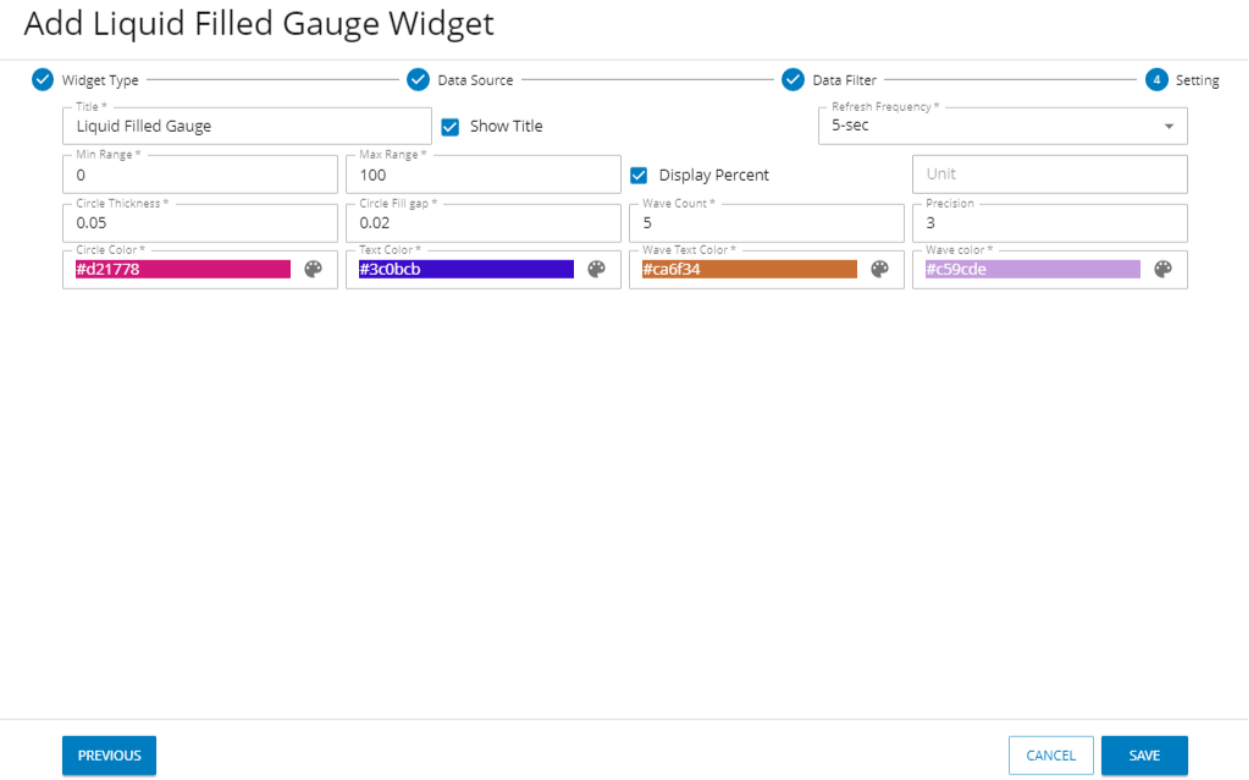

Figure 242: Widget Settings

The following fields will need to be configured as required:

- **Title**: This will be the title of the widget.
- **Show Title (Checkbox)**: The widget title will be displayed if the checkbox is checked, else it will not be displayed.
- **Refresh Frequency**: This will set the refresh frequency of the widget display.
- **Min Range**: This will set the minimum range value for the widget to display.
- **Max Range**: This will set the maximum range value for the widget to display.
- **Precision**: Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0.
- **Unit:** Assign the unit of measure (i.e., kg, feet, mph etc.…)
- **Display Percent** (Checkbox): The value on the widget will be displayed in percentage.
- **Circle Thickness**: This will set the thickness of the circle displaying inside the widget
- **Text Color**: This will set the color of the text value displaying in the widget when the gauge value is less than 50%

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- **Wave Text Color**: This will set the color of the text value displaying in the widget when the gauge value is more than 50%
- **Wave Color**: This will set the color of the wave inside the widget

9. Click the **Save** button
10. It will add the **Liquid Filled Gauge** widget as configured by the user on the Dashboard. Refer to Figure 243: Liquid Filled Gauge

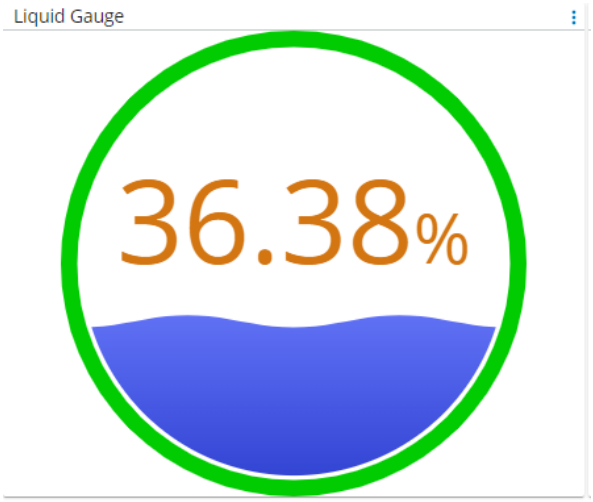

Figure 243: Liquid Filled Gauge

11.1.5 Speedometer

Speedometer widget visualizes data points in form of a gauge that allows you to present data on a relative or aggregate scale.

To add Speedometer widget to the dashboard:

1. Click **Add widget** button at top-right corner. Refer to Figure 216: Add Widget
2. It will open list of widgets. Refer to Figure 217: Widget List
3. Select **Speedometer** and click the **Next** button. Refer to Figure 244: Speedometer Widget

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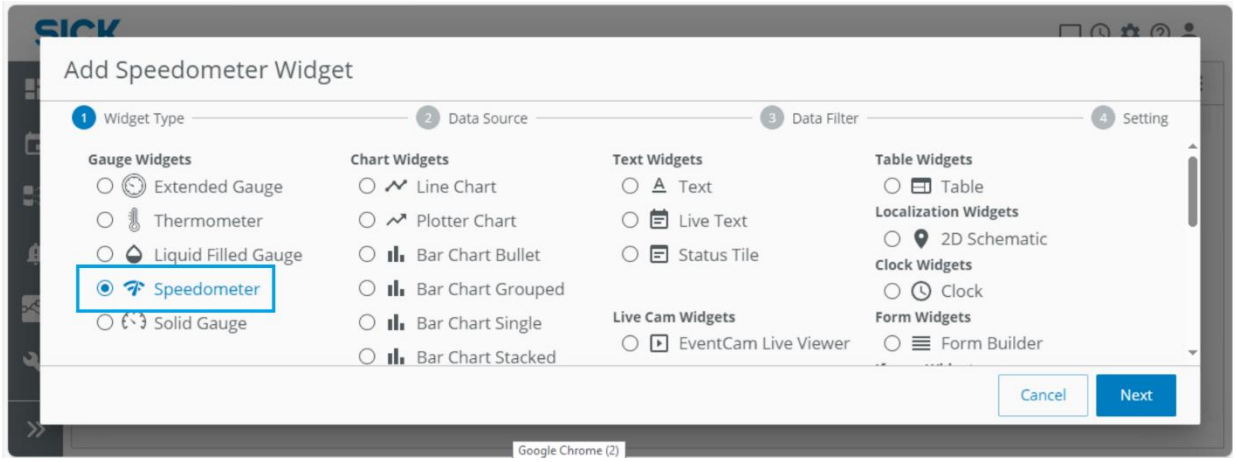
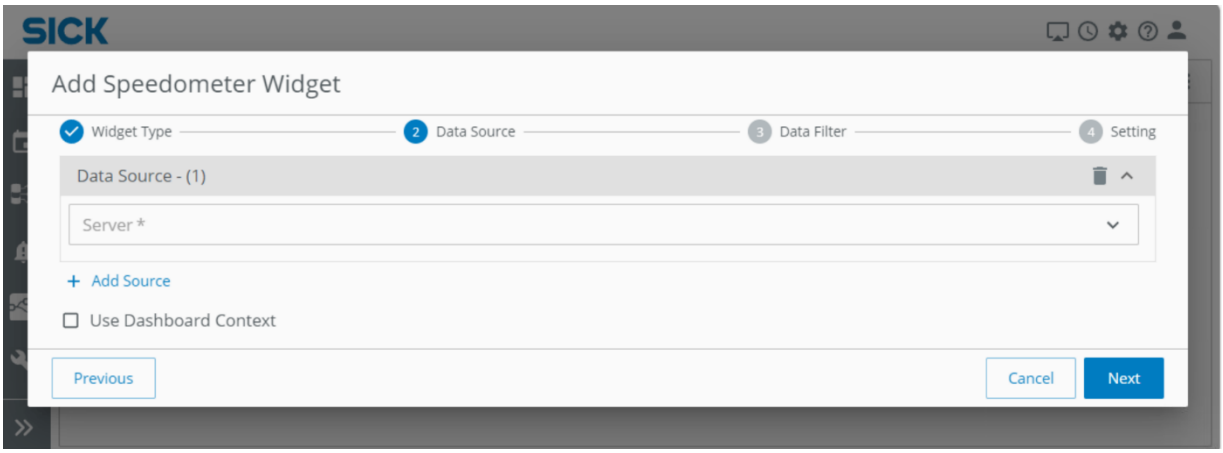


Figure 244: Speedometer Widget

4. 

It will navigate to the Data Source section where the source of data is acquired. Refer to Figure 245: Widget Data Source

Figure 245: Widget Data Source

The following fields will display and needs to be configured as required:

I. **Data Sources**: The data source from where the data is acquired (can be from **Data Source**, **Reports**, **Historian**)

II. **Add Data Source:** Data Source 2 will display with same fields to configure

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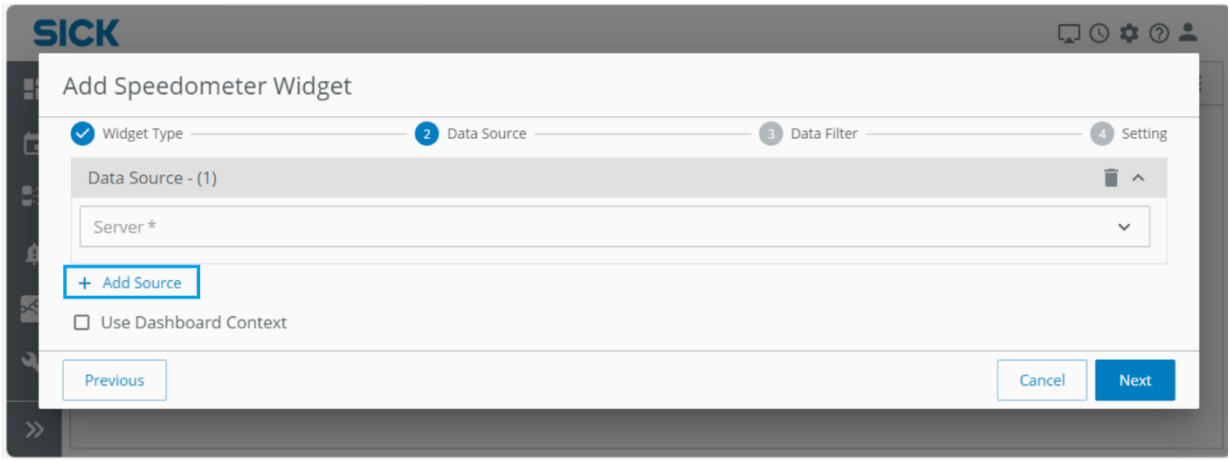

5. Click the **Next** button
6. Select the field value from the API response to display (Widget will function as per the selected value) in Data fields from sources.

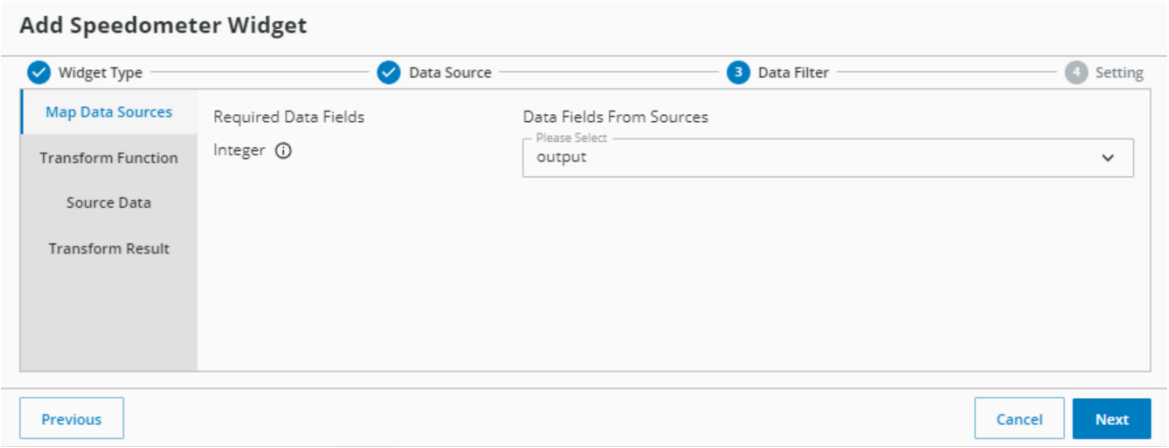

Figure 246: Widget Data Filter

To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8.

7. Click the **Next** button to move to the next section

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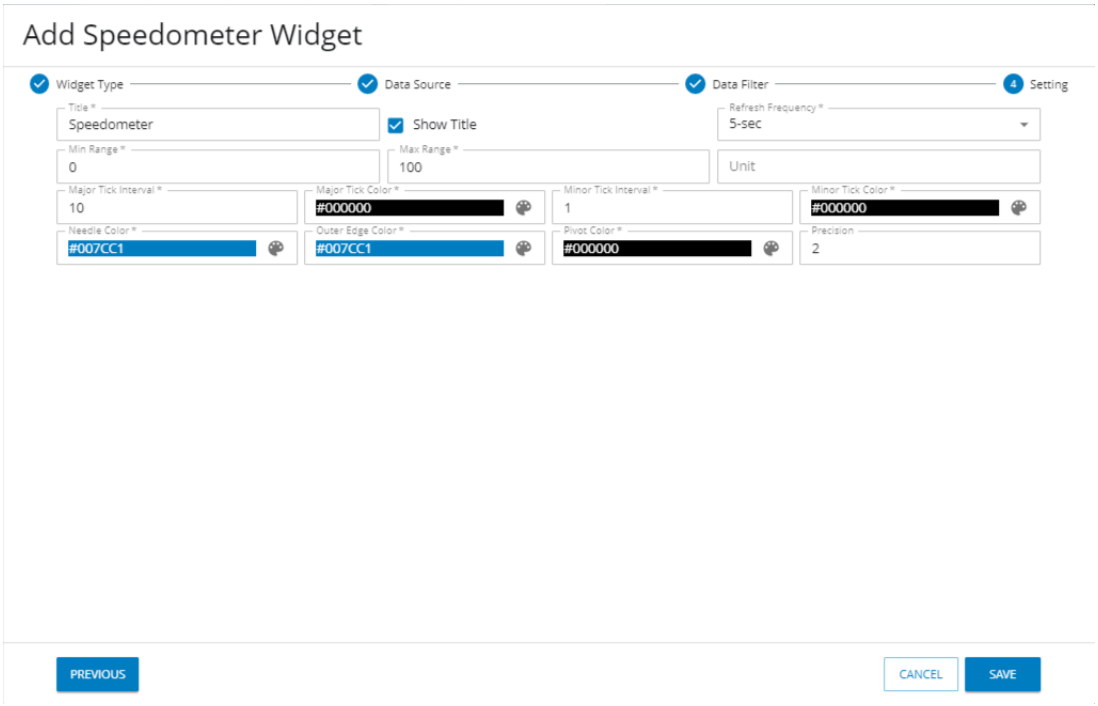

Figure 247: Widget Settings

The following fields need to be configured as required:

I. **Title**: This will be the title of the widget
II. **Show Title (Checkbox)**: The widget title will be displayed if the checkbox is checked, else it will not be displayed
III. **Refresh Frequency**: This will set the refresh frequency of the widget display
IV. **Min Range**: This will set the minimum range value for the widget to display
V. **Max Range**: This will set the maximum range value for the widget to display
VI. **Precision**: Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0
VII. **Unit:** Assign the unit of measure (i.e., kg, feet, mph etc.…)
VIII. **Major Tick Interval**: This will set the difference in major tick intervals on the speedometer
IX. **Major Tick Color**: This will set the color of major tick appearing on the speedometer
X. **Minor Tick Interval**: This will set the difference in minor tick intervals on the speedometer
XI. **Minor Tick Color**: This will set the color of minor tick appearing on the speedometer
XII. **Needle Color**: This will set the color of the needle on speedometer widget
XIII. **Outer Edge Color**: This will set the color of the outer edge circle of speedometer
XIV. **Pivot Color**: This will set the color of the pivot (the central point of widget)

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8. Click the **Save** button
9. Field Analytics will add **Speedometer** widget as configured by the user on the Dashboard

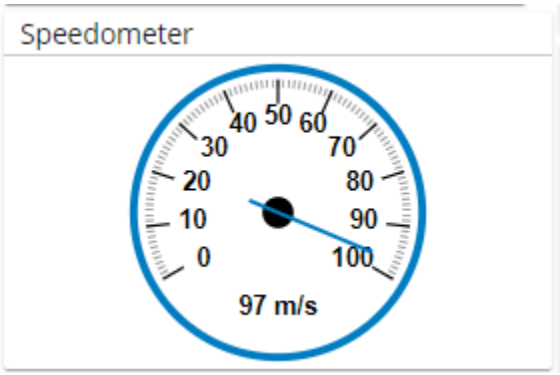

Figure 248: Speedometer

11.2 Chart Widgets

The chart widgets display X-Y data plots to observe the relationship between two variables with respect to the timeline.

11.2.1 Line Chart

To add the Line Chart widget to the dashboard:

1 Click **Add widget** button at the top-right corner on the home page. Refer to Figure 216: Add Widget
2 It will open **Add Widget** dialog box displaying list of widgets. Refer to Figure 217: Widget List
3 Select **Line Chart** radio button, under the **Chart Widgets** section and click **Next**. Refer to Figure 249: Add Line Chart Widget

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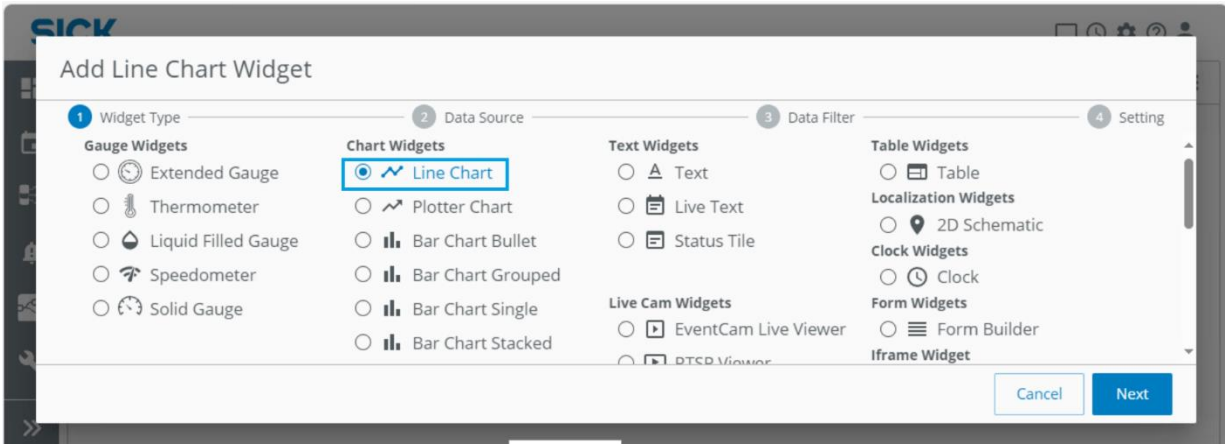

Figure 249: Add Line Chart Widget

4 Field Analytics will navigate to the Data Source configuration workflow. Refer to Figure 250: Widget Data Source

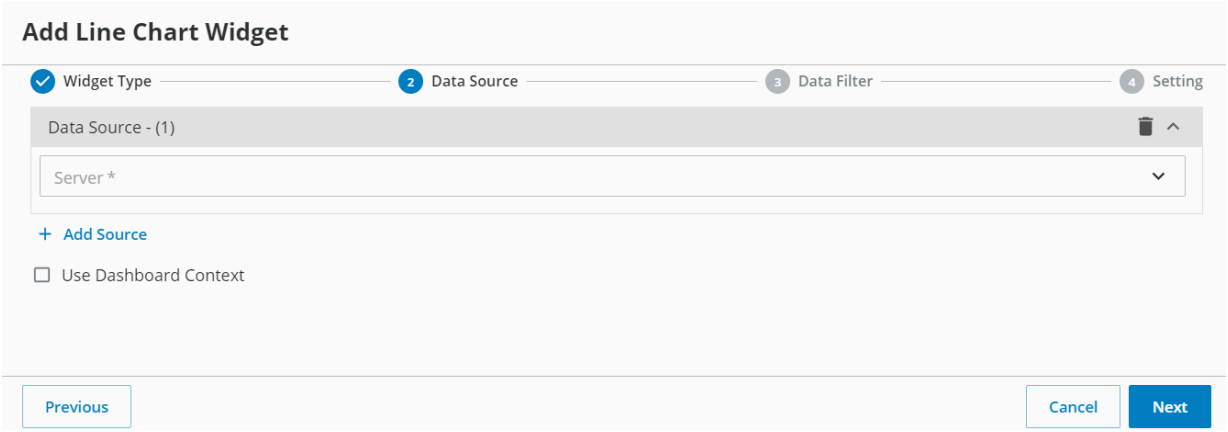

Figure 250: Widget Data Source

The following fields will need to be configured as required:

a. **Data Source**: The data source from where the data is acquired (**Data Source – Data, Report & Historian)**

b. **Add Data Source:** Data Source 2 will display with same fields to be configured

5 Click the **Next** button. It will navigate to Data Filter section

6 The following fields display: Refer to Figure 251: Data Filter

a. **Data Array**: Select the field value from the API response to display (Widget will function as per the selected value) in Data array

b. **Data key**: select the key value from the drop-down list

c. **Identifier**: Provide a unique name in Identifier field

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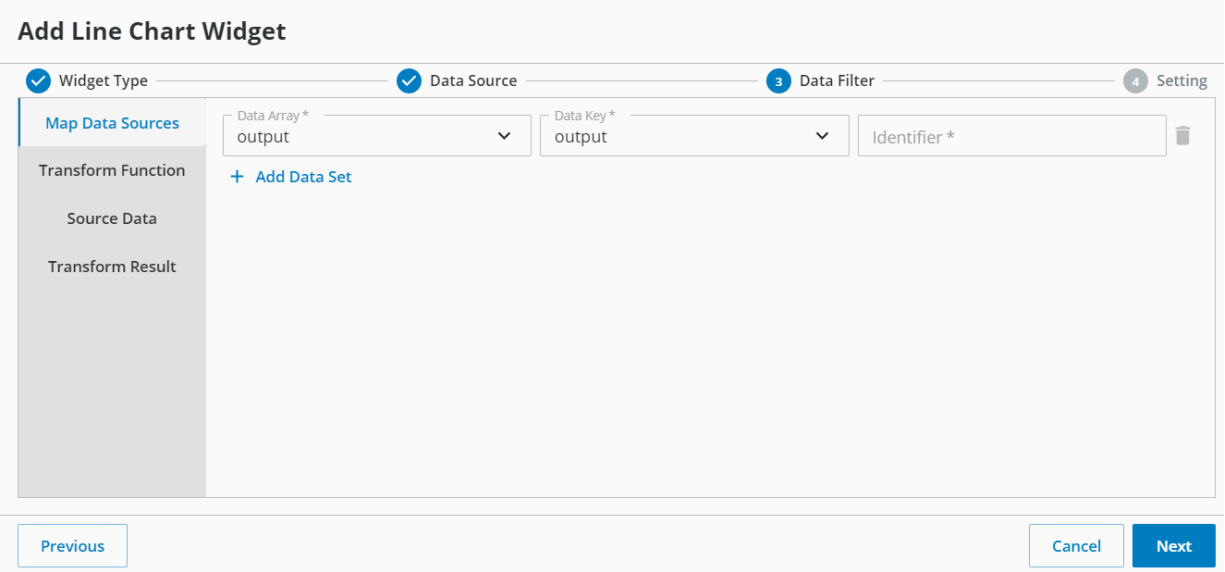

Figure 251: Data Filter

.

To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8.

7 Click the **Next** button to navigate to the widget settings section

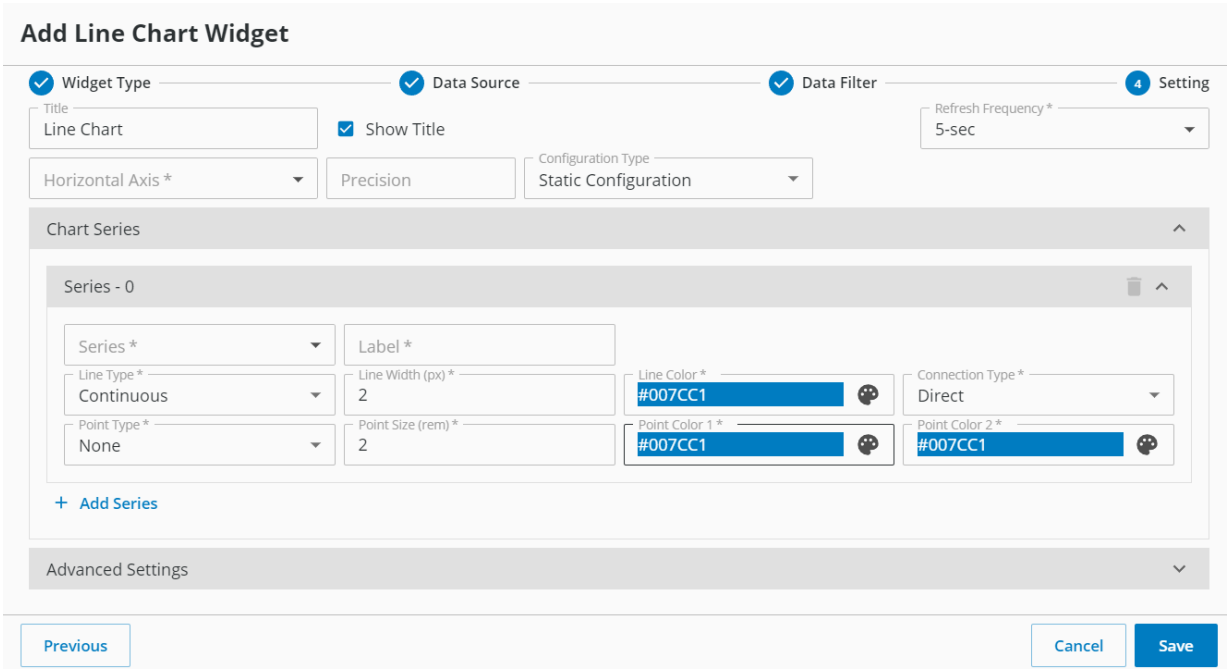

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Figure 252: Widget Settings – Static Configuration

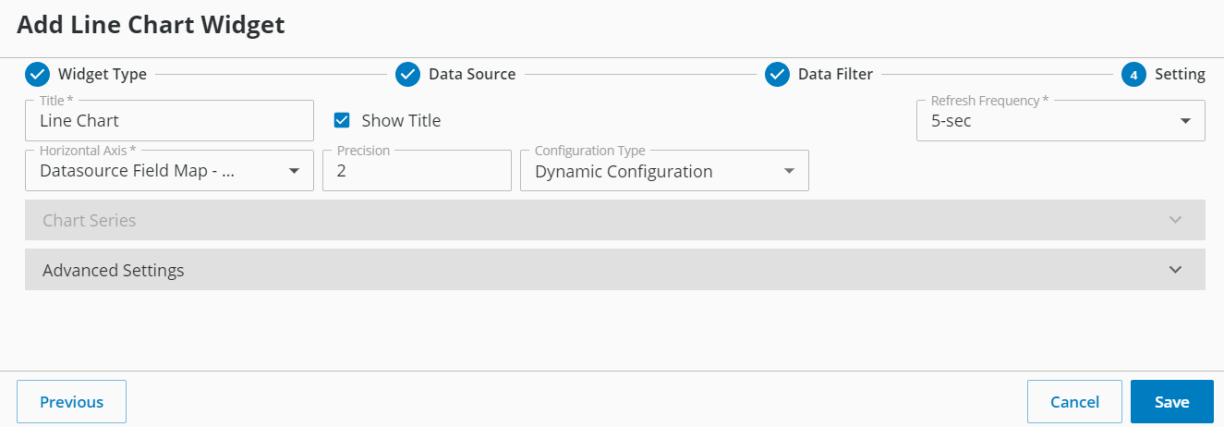

Figure 253: Widget Settings – Dynamic Configuration

The following fields will need to be configured as required:

a. **Title**: This will be the title of the widget

b. **Show Title (Checkbox)**: The widget title will be displayed if the checkbox is checked, else it will not be displayed

c. **Refresh Frequency**: This will set the data refresh frequency/update to the widget

d. **Horizontal Axis**: Select the mapped Data source

e. **Precision**: Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0

f. **Configuration Type:** There are two types of configurations that are **Static Configuration** and **Dynamic Configuration.** Dynamic Configuration is not user defined. In this configuration, the widget automatically configures all the static series items based on the number of data arrays received from the source. By default, static configuration type is displayed

Static Configuration: Set the following parameters to configure the series:

i. **Series Name**: This will be the name of the series

ii. **Label**: This will be the name of the series

iii. **Line Type**: Select the type of line to be displayed like Continuous, dotted, Small dashes, Large dashes, None

iv. **Line Width**: Provide the width of the line

v. **Point Type**: Select from the drop-down options like circle, dot, none

vi. **Point Size**: Provide size of the point

10. Click the **Save** button
11. Field Analytics will add **Line Chart** widget as configured by the user on the Dashboard

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Figure 254: Line Chart Widget

11.2.2 Bar Chart Bullet

To add the Bar Chart Bullet widget to the dashboard:

1. Click **Add widget** button at the top-right corner on the home page. Refer to Figure 216: Add Widget
2. It will open **Add Widget** dialog box displaying list of widgets. Refer to Figure 217: Widget List
3. Select **Bar Chart Bullet** radio button, under the **Chart Widgets** section and click **Next**

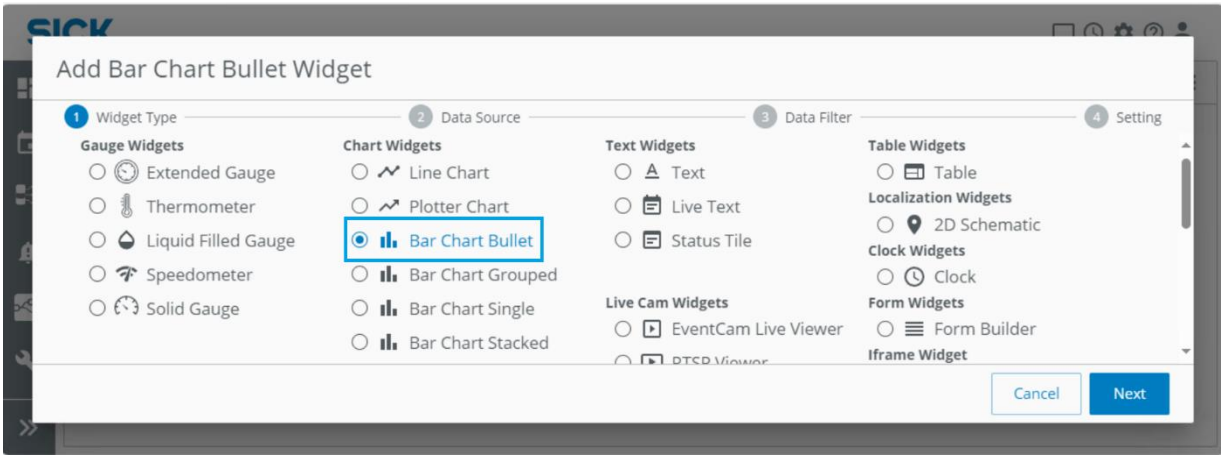

Figure 255: Bar Chart Bullet

4. Field Analytics will navigate to the Data Source configuration

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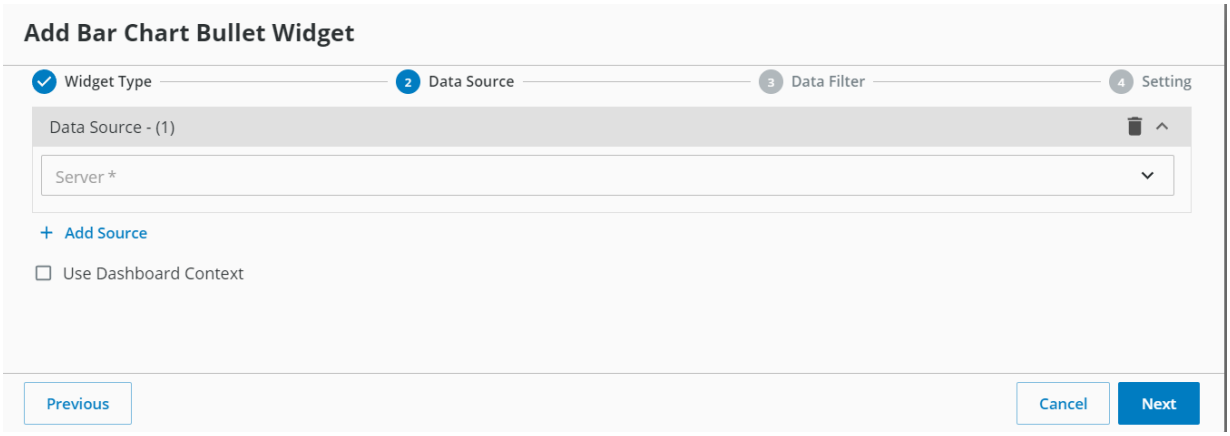
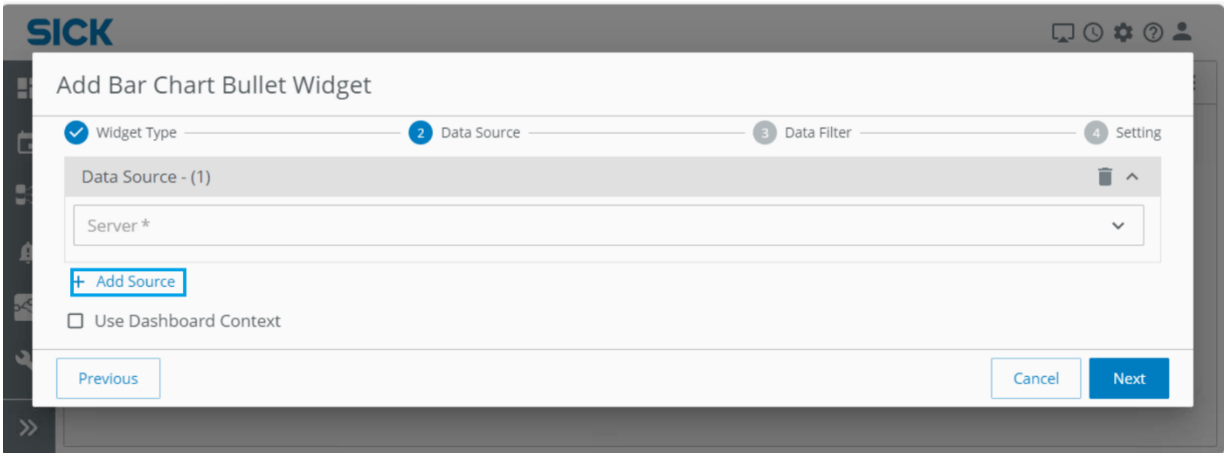


Figure 256: Data Source

5. The following fields will need to be configured as required:
   a. **Data Source**: The data source from where the data is acquired (**Data Source – Data, Report & Historian)**
   b. **Add Data Source:** Data Source 2 will display with same fields to be configured



6. Click the **Next** button. It will navigate to Data Filter section
7. The following fields display:
   - **Current Value**: Select the current value to be displayed from the drop-down
   - **Start Value**: Select the Start value to be displayed from the drop-down
   - **End Value**: Select the End value to be displayed from the drop-down
   - **Identifier**: Provide a unique name in Identifier field

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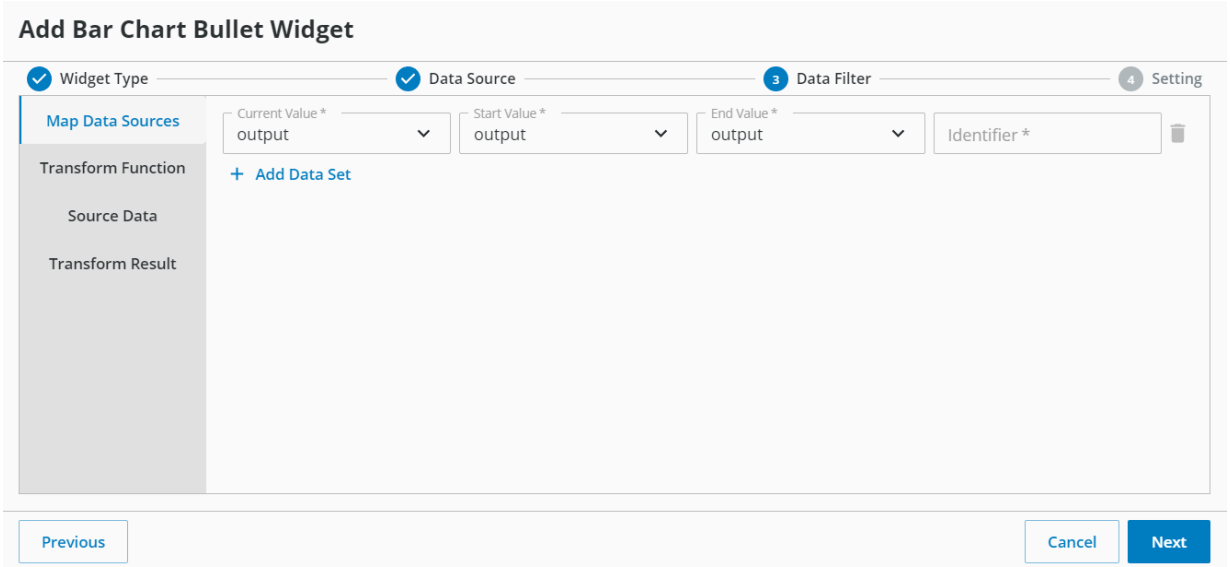

Figure 257: Data Filter

To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8.

8. Click the **Next** button to navigate to the widget settings section

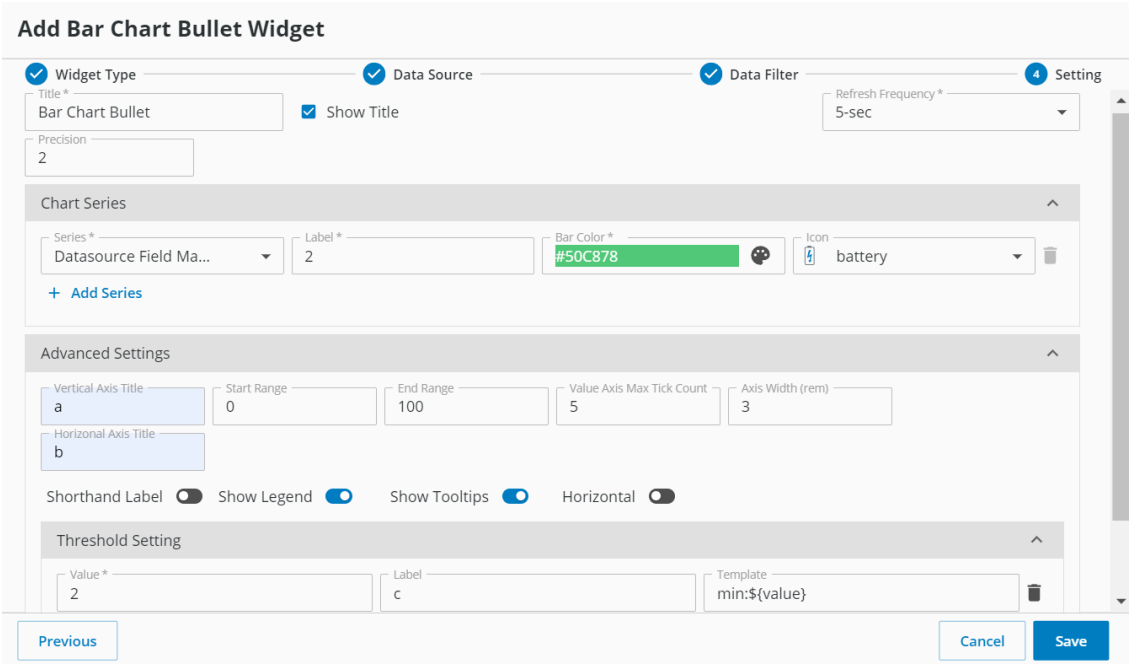

Figure 258: Widget Settings

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The following fields will need to be configured as required:

a. **Title**: This will be the title of the widget
b. **Show Title (Checkbox)**: The widget title will be displayed if the checkbox is checked, else it will not be displayed
c. **Refresh Frequency**: This will set the data refresh frequency/update to the widget
d. **Precision:** Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0
e. **Chart Series**
    i. **Series:** This will set the chosen value parameter
    ii. **Label:** This will be the name of the series
    iii. **Bar Color:** Select the preferred color for the bar
    iv. **Icon:** Select related icon from the drop-down list to display on the widget
f. **Advance Settings**
    i. **Vertical Axis Title:** Enter title for the vertical axis
    ii. **Horizontal Axis Title:** Enter title for the horizontal axis
    iii. **Start Range:** This will set the starting value of a range for which a particular gauge section color can be set
    iv. **End Range:** This will set the end value of a range for which a particular gauge section color can be set
    v. **Value Axis Max Tick Count:** This will display the interval settings on the widget
    vi. **Max Width:** This will display the maximum width of the widget
g. **Threshold Setting**
    i. **Value:** Enter the threshold value
    ii. **Label:** Enter the Label name
    iii. **Template:** This will set the template from the chosen data source

9. Click the Save button
10. Field Analytics will add **Bar Chart Bullet** widget as configured by the user on the Dashboard

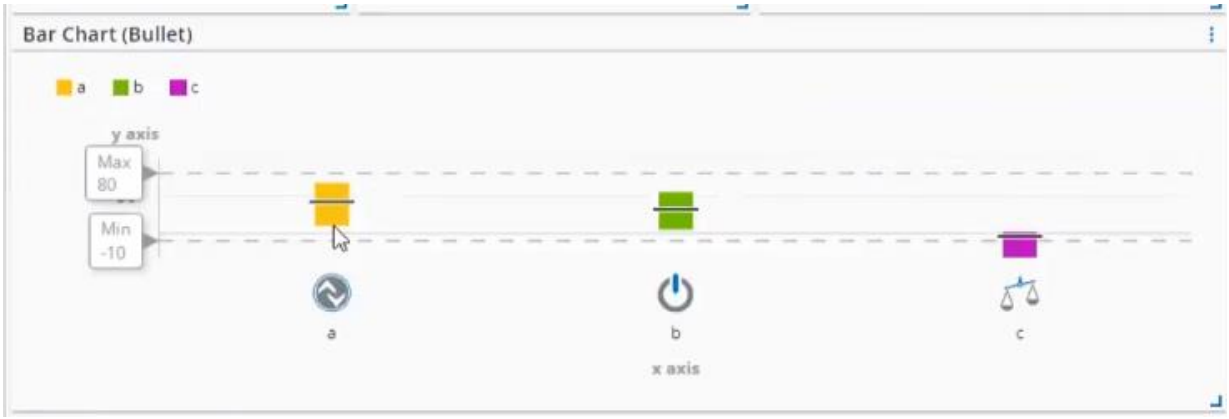

Figure 259: Bar Chart Bullet Widget

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11.2.3 Bar Chart Grouped

To add the Bar Chart Grouped widget to the dashboard:

1. Click **Add widget** button at the top-right corner on the home page. Refer to Figure 216: Add Widget
2. It will open **Add Widget** dialog box displaying list of widgets. Refer to Figure 217: Widget List
3. Select **Bar Chart Grouped** radio button, under the **Chart Widgets** section and click **Next**

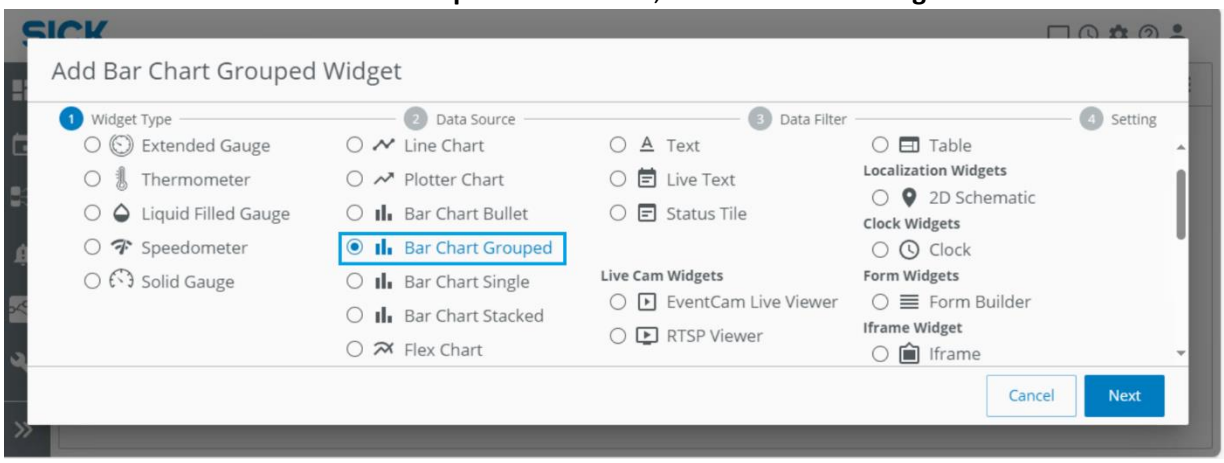

Figure 260: Bar Chart Grouped

4. Field Analytics will navigate to the Data Source configuration

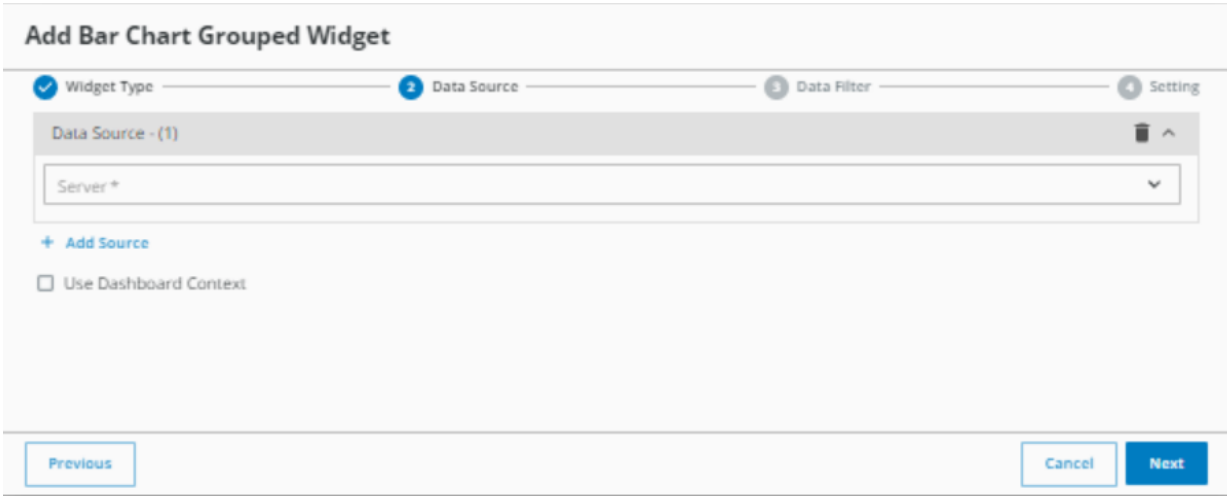

Figure 261: Data Source

5. The following fields will need to be configured as required:

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a. **Data Source**: The data source from where the data is acquired (**Data Source – Data, Report & Historian)**
b. **Add Data Source:** Data Source 2 will display with same fields to be configured

6. Click the **Next** button. It will navigate to Data Filter section
7. The following fields display:
    - **Data Array**: Select the field value from the API response to display (Widget will function as per the selected value) in Data array
    - **Data key**: select the key value from the drop-down list
    - **Identifier**: Provide a unique name in Identifier field

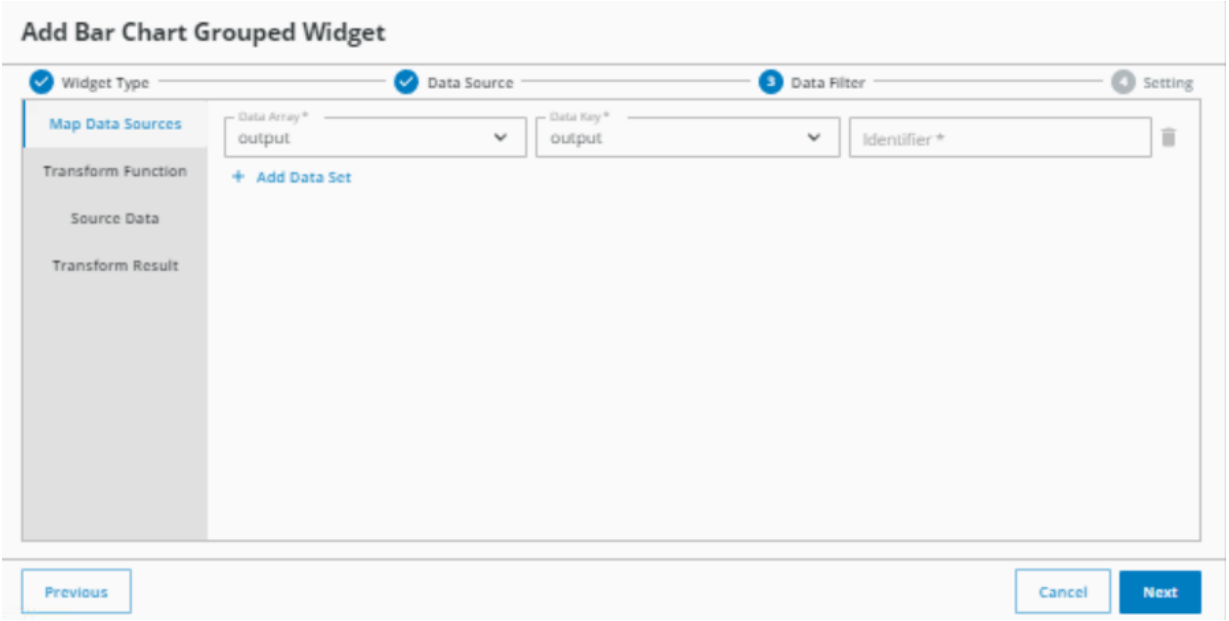

Figure 262: Data Filter

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To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8.

8. Click the **Next** button to navigate to the widget settings section

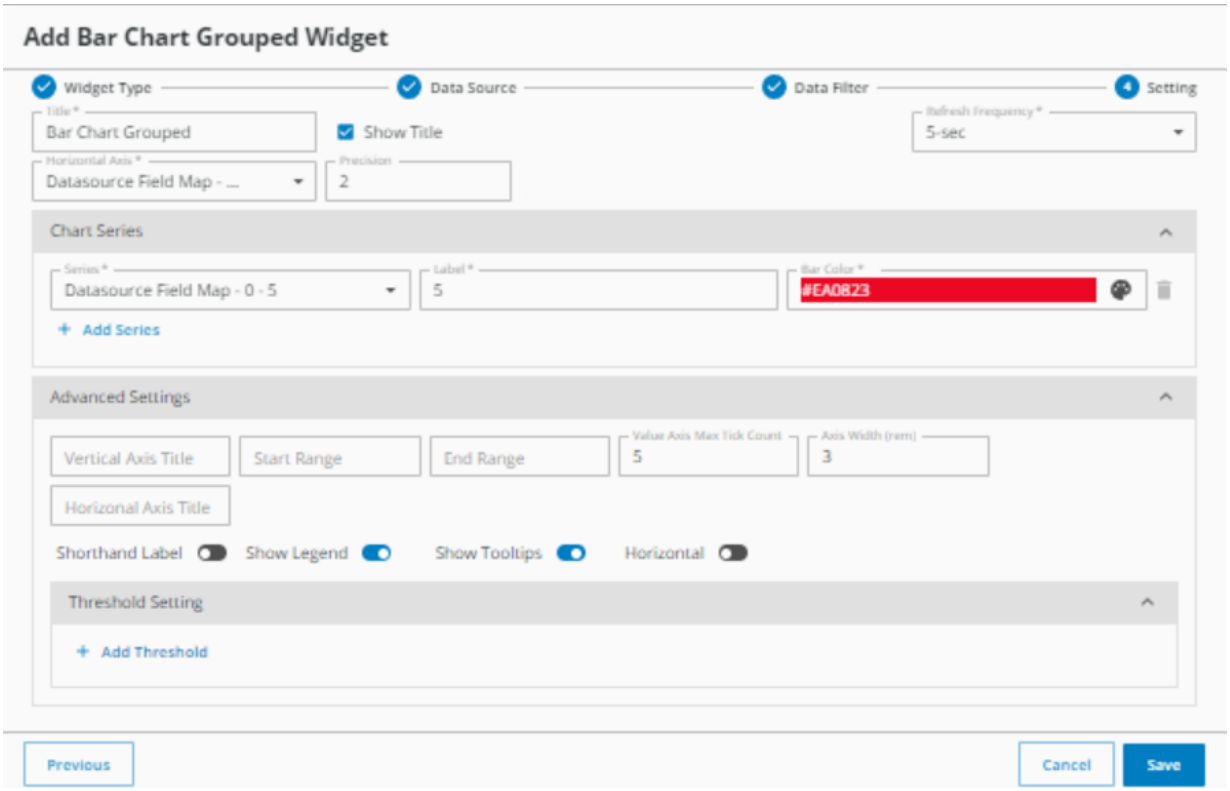

Figure 263: Widget Settings

The following fields will need to be configured as required:

a. **Title**: This will be the title of the widget
b. **Show Title (Checkbox)**: The widget title will be displayed if the checkbox is checked, else it will not be displayed
c. **Refresh Frequency**: This will set the data refresh frequency/update to the widget
d. **Precision:** Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0

9. Click the **Save** button
10. Field Analytics will add **Bar Chart Grouped** widget as configured by the user on the Dashboard

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11.2.4 Bar Chart Single

To add the Bar Chart, Single the dashboard:

1. Click **Add widget** button at the top-right corner on the home page. Refer to Figure 216: Add Widget
2. It will open **Add Widget** dialog box displaying list of widgets. Refer to Figure 217: Widget List
3. Select **Bar Chart Single** radio button, under the **Chart Widgets** section and click **Next**

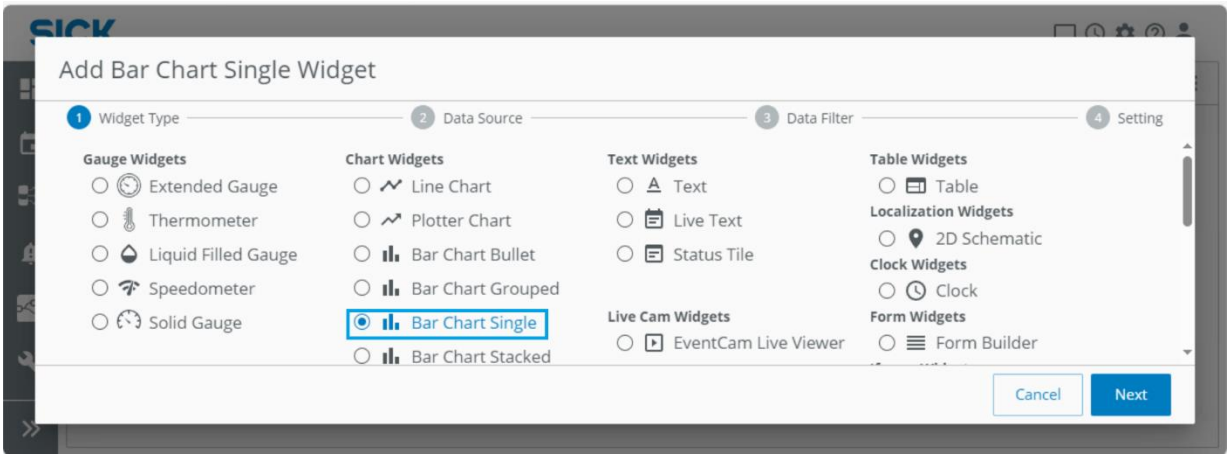

Figure 264: Bar Chart Single

4. Field Analytics will navigate to the Data Source configuration

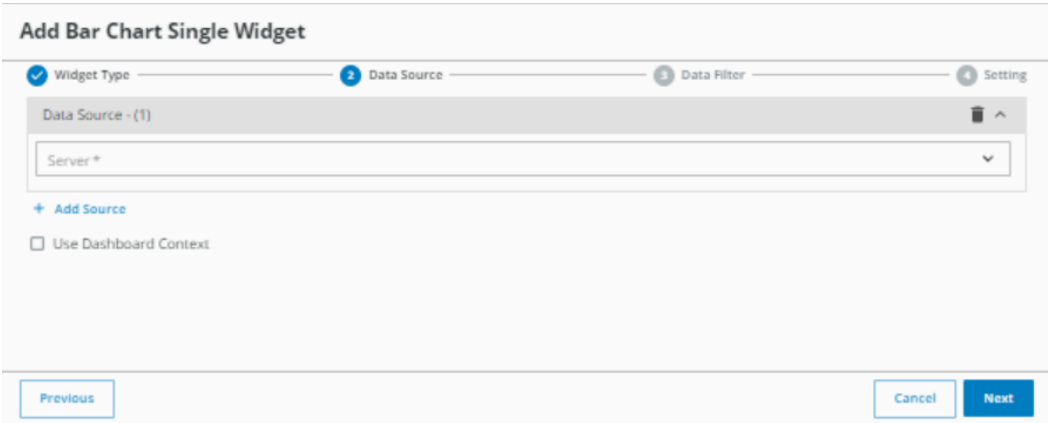

Figure 265: Data Source

The following fields will need to be configured as required:

a. **Data Source**: The data source from where the data is acquired (**Data Source – Data, Report & Historian)**

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b. **Add Data Source:** Data Source 2 will display with same fields to be configured

5. Click the **Next** button. It will navigate to Data Filter section
6. The following fields display:
    - **Value**: Select the field value from the API response to display (Widget will function as per the selected value) in Value field
    - **Identifier**: Provide a unique name in Identifier field

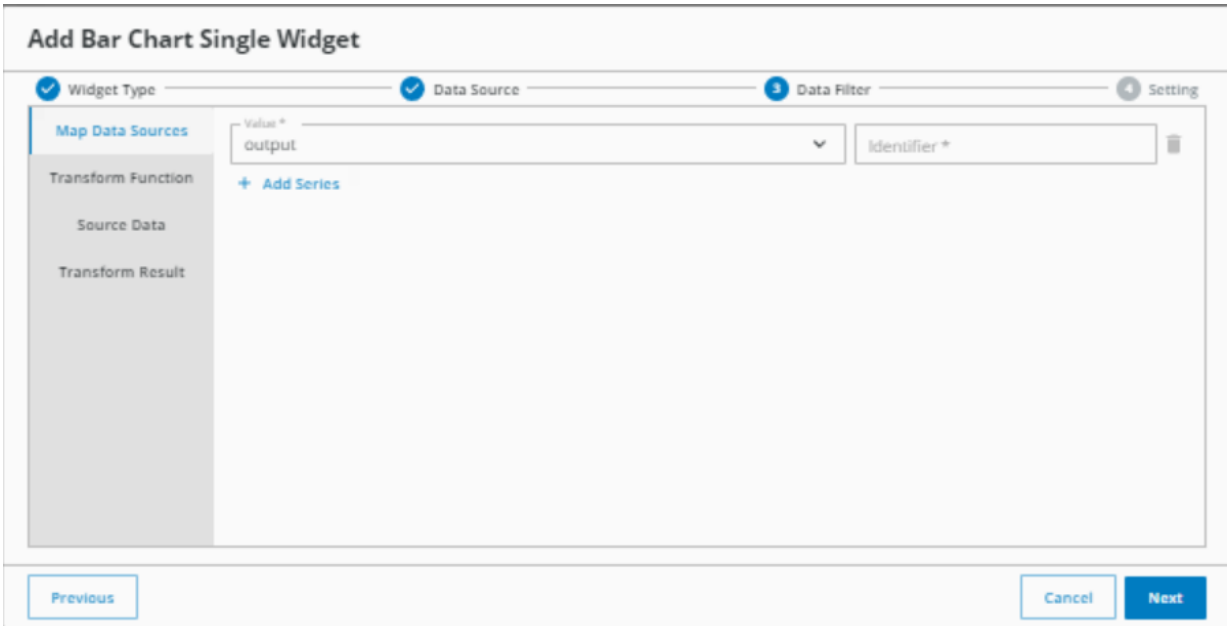

Figure 266: Data Filter

To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8.

7. Click the **Next** button to navigate to the widget settings section

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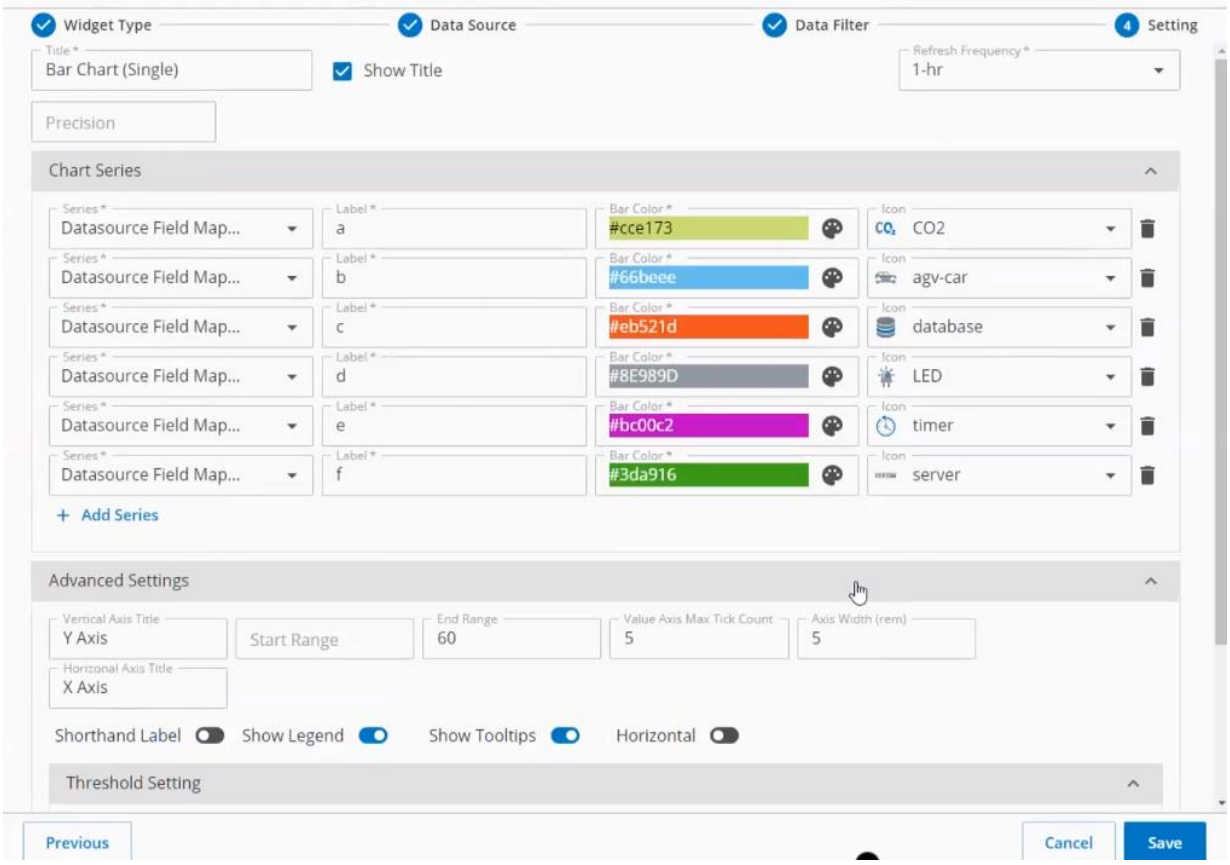

Figure 267: Widget Settings

The following fields will need to be configured as required:

a. **Title**: This will be the title of the widget
b. **Show Title (Checkbox)**: The widget title will be displayed if the checkbox is checked, else it will not be displayed
c. **Refresh Frequency**: This will set the data refresh frequency/update to the widget
d. **Precision:** Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0
e. **Series:** Select the data source from drop-down from which data to be retrieved
f. **Label:** Enter the name of the label to be displayed
g. **Bar Color:** Configure the Bar color
h. **Icon:** Select the preferred icon from the drop-down
i. **Advance Settings**
    i. **Vertical Axis Title:** Enter title for the vertical axis
    ii. **Horizontal Axis Title:** Enter title for the horizontal axis
    iii. **Start Range:** This will set the starting value of a range for which a particular gauge section color can be set

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iv. **End Range:** This will set the end value of a range for which a particular gauge section color can be set
v. **Value Axis Max Tick Count:** This will display the interval settings on the widget
vi. **Max Width:** This will display the maximum width of the widget

j. **Threshold Setting**
i. **Value:** Enter the threshold value
ii. **Label:** Enter the Label name
iii. **Template:** This will set the template from the chosen data source

8. Click the **Save** button
9. Field Analytics will add **Bar Chart Single** widget as configured by the user on the Dashboard

Figure 268: Bar Chart Single Widget

11.2.5 Bar Chart Sacked

To add the Bar Chart Sacked the dashboard:

1. Click **Add widget** button at the top-right corner on the home page. Refer to Figure 216: Add Widget
2. It will open **Add Widget** dialog box displaying list of widgets. Refer to Figure 217: Widget List
3. Select **Bar Chart Sacked** radio button, under the **Chart Widgets** section and click **Next**

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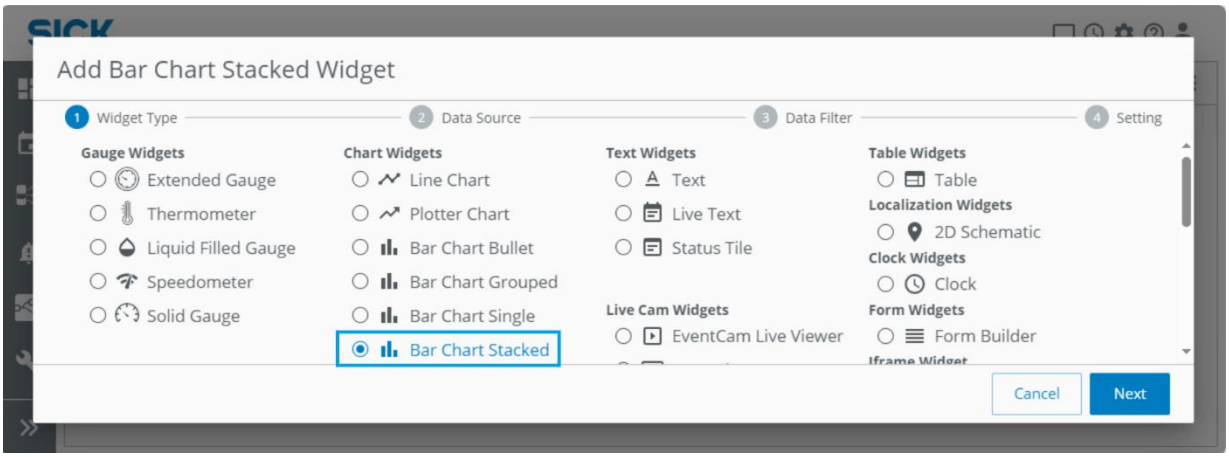

Figure 269: Bar Chart Sacked

4. Field Analytics will navigate to the Data Source configuration

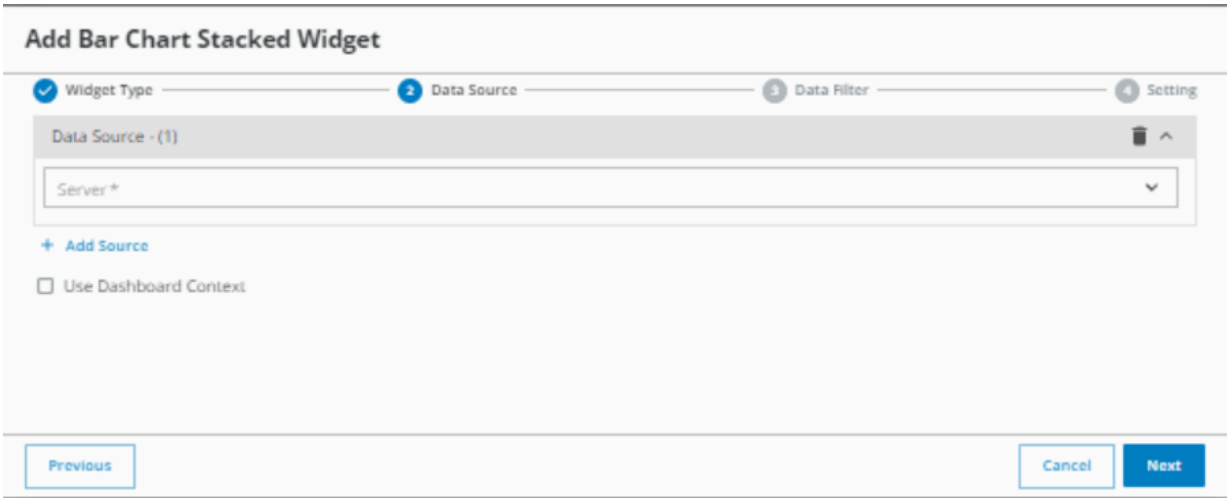

Figure 270: Data Source

The following fields will need to be configured as required:

a. Data Source: The data source from where the data is acquired (**Data Source – Data, Report & Historian)**

b. **Add Data Source:** Data Source 2 will display with same fields to be configured

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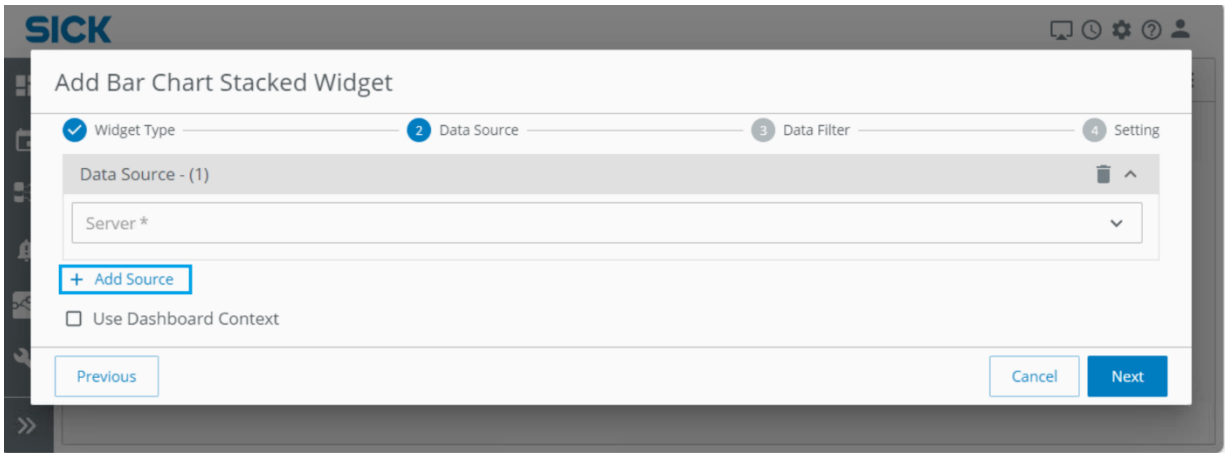

5. Click the **Next** button. It will navigate to Data Filter section
6. The following fields display:
    - **Data Array**: Select the field value from the API response to display (Widget will function as per the selected value) in Data array
    - **Data key**: select the key value from the drop-down list
    - **Identifier**: Provide a unique name in Identifier field

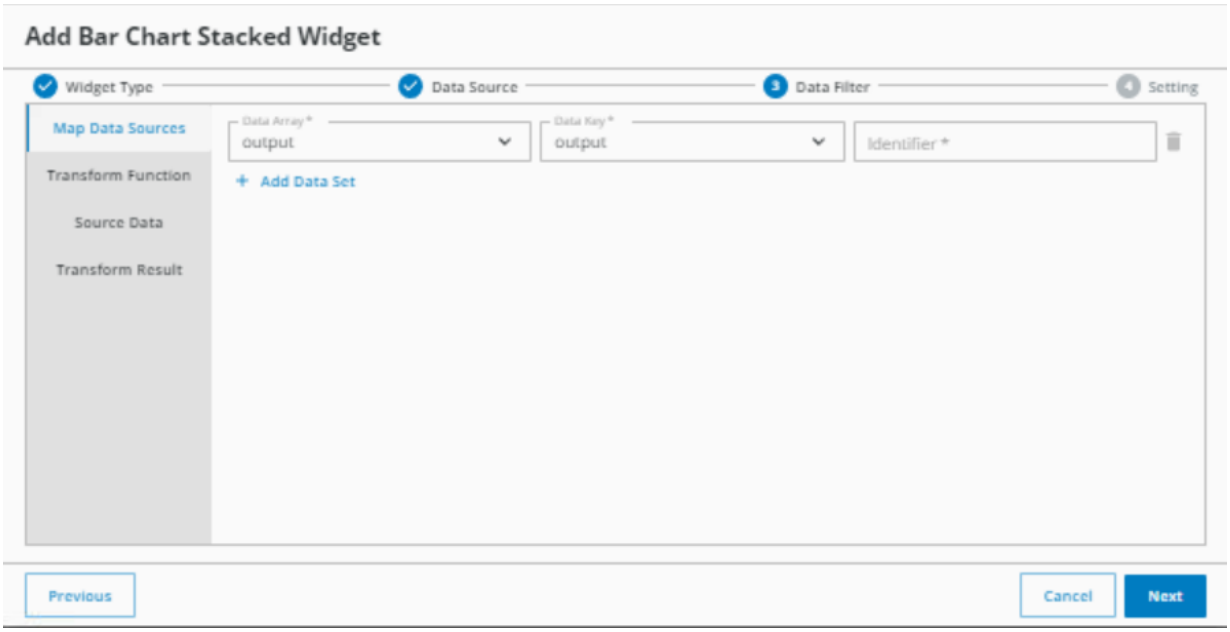

Figure 271: Data Filter

To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8.

7. Click the **Next** button to navigate to the widget settings section

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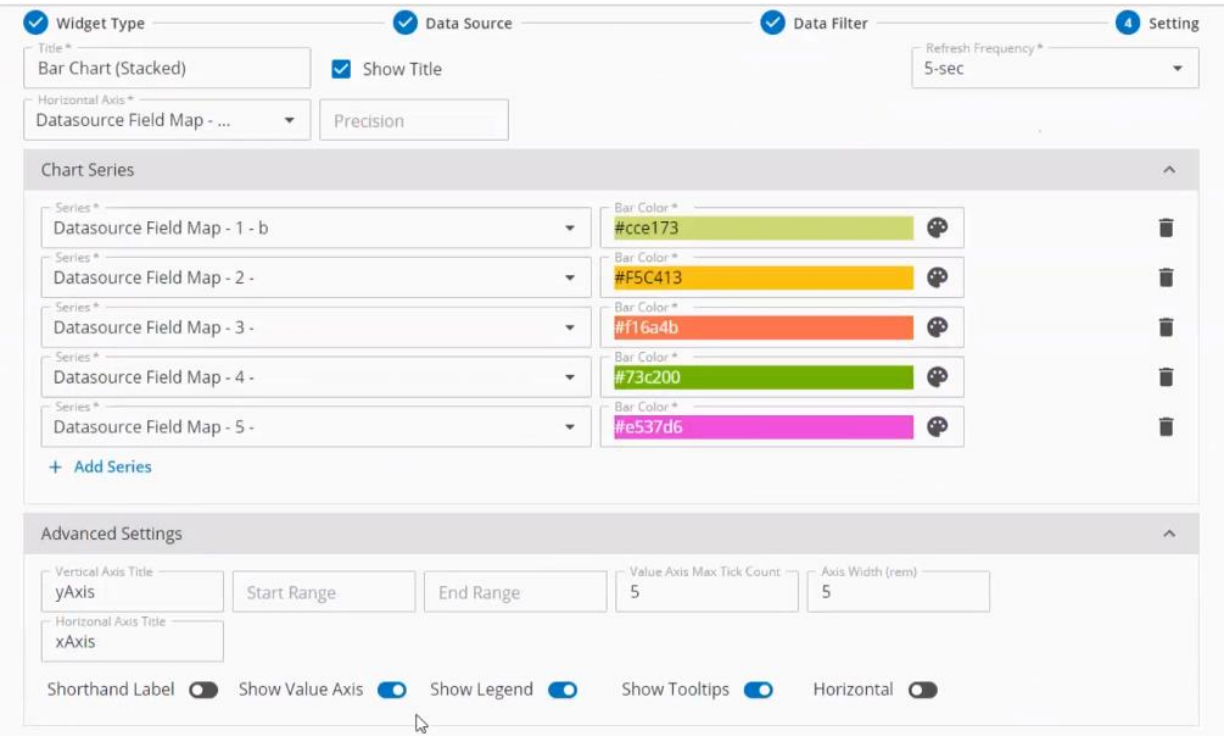

Figure 272: Widget Settings

The following fields will need to be configured as required:

- **a. Title**: This will be the title of the widget
- **b. Show Title (Checkbox)**: The widget title will be displayed if the checkbox is checked, else it will not be displayed
- **c. Horizontal Axis:** Select the Data source to be mapped
- **d. Refresh Frequency**: This will set the data refresh frequency/update to the widget
- **e. Precision:** Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0
- f. **Series:** Select the mapped data source for the series
- **g. Bar Color:** Configure bar color
- **h. Advance Settings**
  - **i. Vertical Axis Title:** Enter title for the vertical axis
  - **ii. Horizontal Axis Title:** Enter title for the horizontal axis
  - iii. **Start Range:** This will set the starting value of a range for which a particular gauge section color can be set
  - **iv. End Range:** This will set the end value of a range for which a particular gauge section color can be set
  - **v. Value Axis Max Tick Count:** This will display the interval settings on the widget

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vi. **Max Width:** This will display the maximum width of the widget

i. **Shorthand Label:**

j. **Show Value Axis:** Enable to display the value on the axis

k. **Show Legend:** Enable to display the legend on the widget

l. **Show Tool Tips:** Enable to display the tool tips

m. **Horizontal:** To view the widget in horizontal axis

8. Click the **Save** button
9. Field Analytics will add **Bar Chart Sacked** widget as configured by the user on the Dashboard

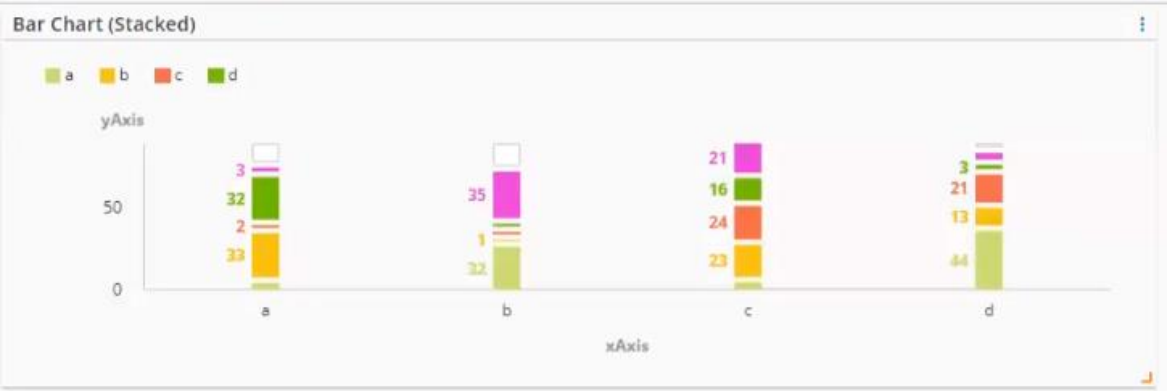

Figure 273: Bar Chart Sacked Widget

11.2.6 Flex Chart

A Flex X-Y data chart configurable for Lines, bars, or dots is used to observe the relationship between variables.

To add the Flex Chart widget to the dashboard:

1. Click **Add widget** button at the top-right corner on the home page. Refer to Figure 216: Add Widget
2. It will open **Add Widget** dialog box displaying list of widgets. Refer to Figure 217: Widget List
3. Select **Flex Chart** radio button, under the **Chart Widgets** section, and click the **Next button**. Refer to Figure 274: Add Flex Chart Widget

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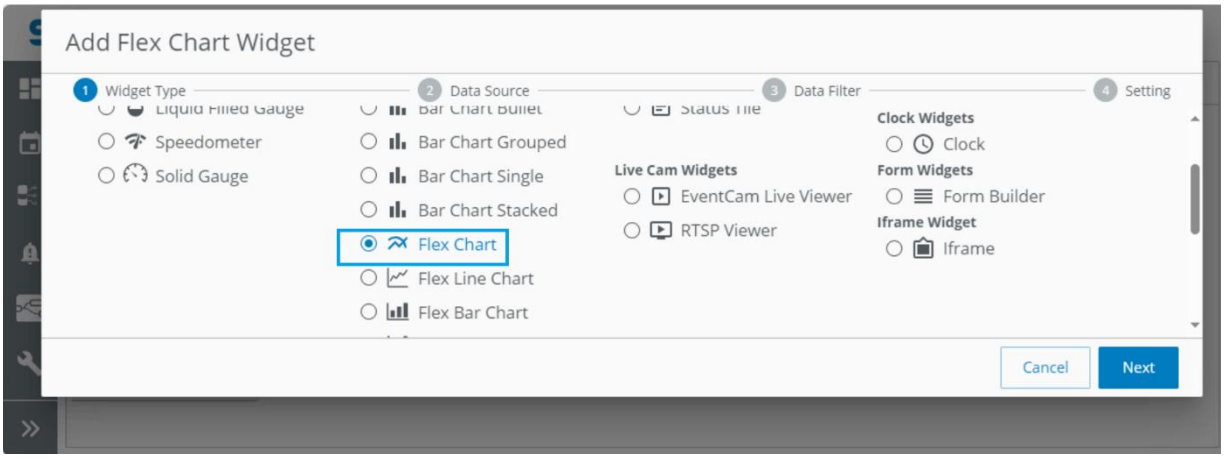

Figure 274: Add Flex Chart Widget

4. Field Analytics will navigate to the Data Source configuration workflow. Refer to Figure 275: Widget Data Source

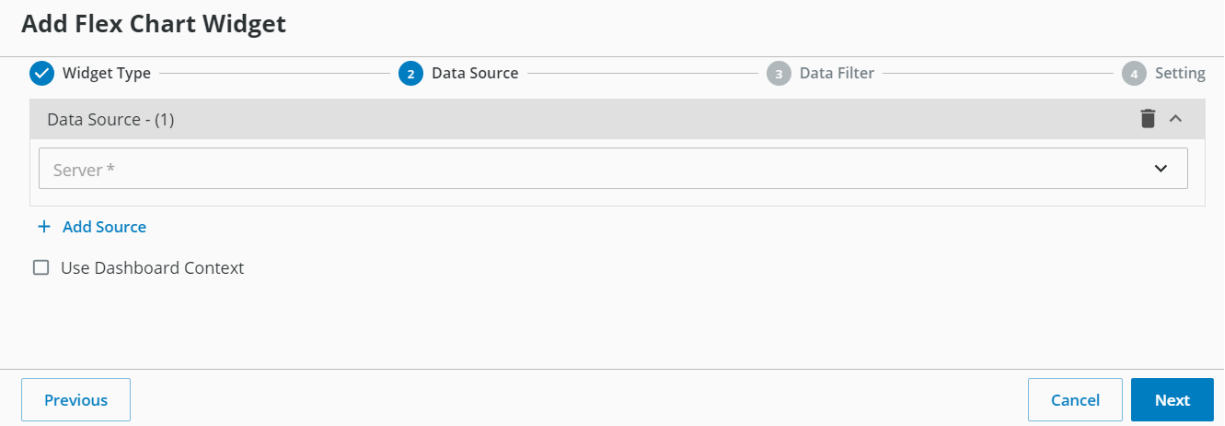

Figure 275: Widget Data Source

The following fields will need to be configured as required:

a. **Data Source**: The data source from where the data is acquired (**Data Source – Data, Reports & Historian)**

b. **Add Data Source:** Data Source 2 will display with same fields to configure

5. Click the **Next** button.

8 It navigates to Data Filter section. The following fields display:

a. **Data Array**: Select the field value from the API response to display (Widget will function as per the selected value) in Data array

b. **Data key**: select the key value from the drop-down list

c. **Identifier**: Provide a unique name in Identifier field

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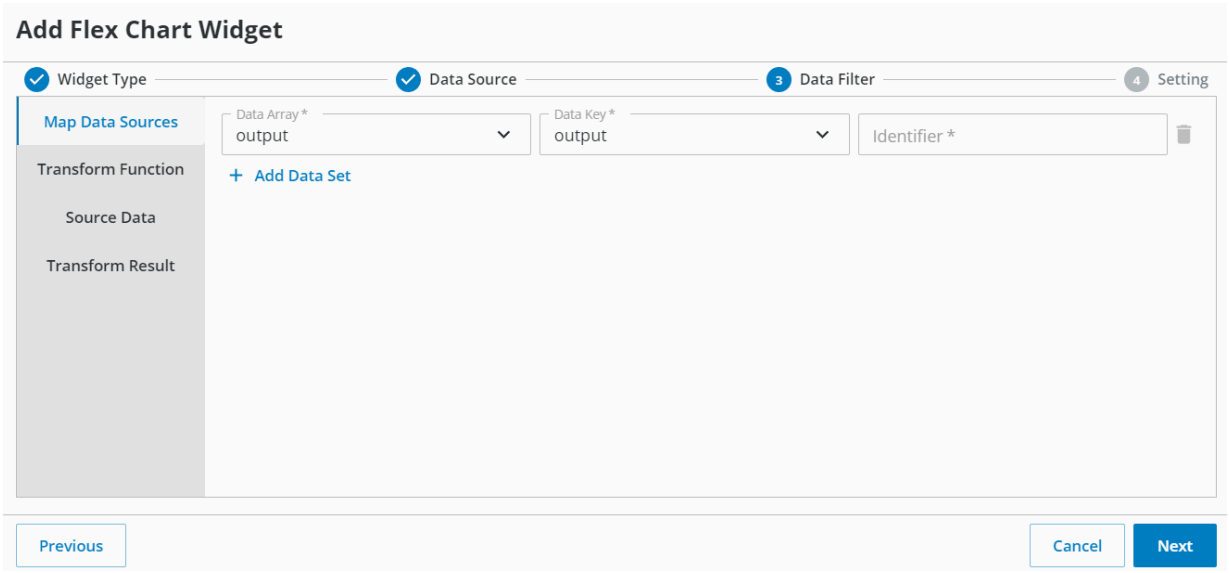

Figure 276: Widget Data Filter

To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8.

6. Click the **Next** button to move to the next section. Refer to Figure 277: Static Configuration Widget Settings

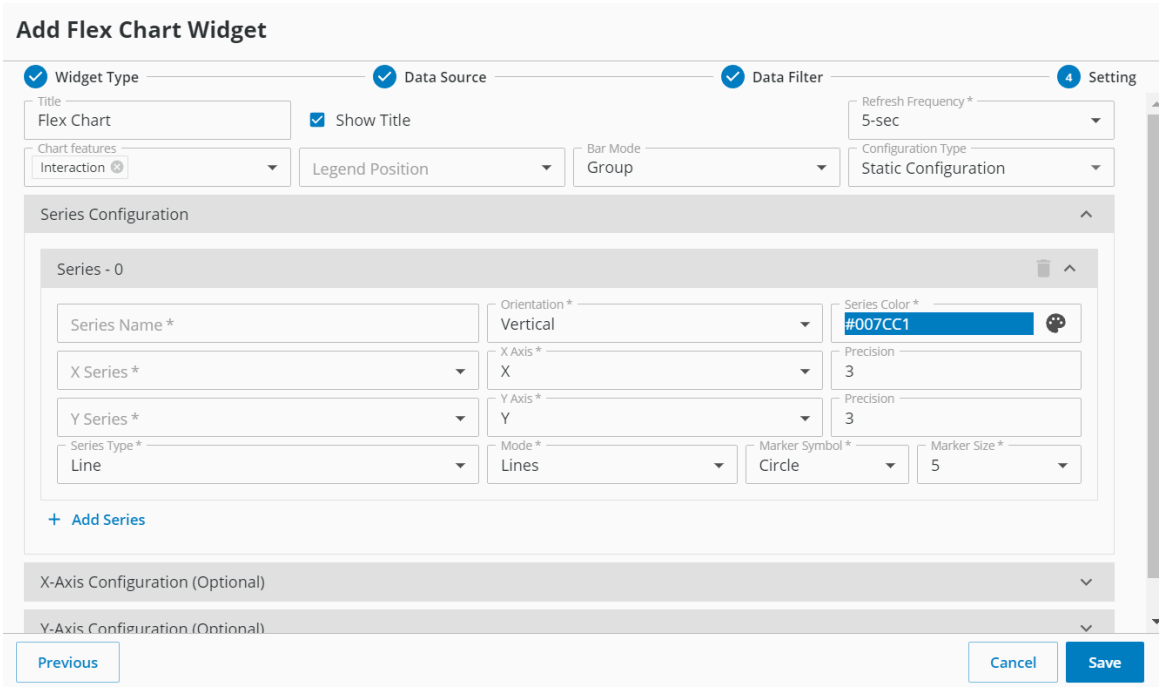

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Figure 277: Static Configuration Widget Settings

The following fields will need to be configured as required:

a. **Title**: This will be the title of the widget
b. **Show Title (Checkbox)**: The widget title will be displayed if the checkbox is checked, else it will not be displayed
c. **Refresh Frequency**: This will set the data refresh frequency/update to the widget
d. **Chart Features**: This feature enables user to interact with the chart to get data between specific time intervals
e. **Legend Position**: This will set the position of the legends on the chart. It can be set to **Top Left**, **Top Center**, **Top Right**, **Right Top**, **Right Middle** or **Right Bottom**
f. **Bar Mode**: The bars on the chart can be set to Group, Stack or Relative
g. **Configuration Type:** There are two types of configurations that are **Static Configuration** and **Dynamic Configuration**

   Static Configuration: Set the following parameters to configure the series:

   i. Series Name: This will be the name of the series
   ii. Orientation: This will set the orientation of the chart to either Vertical or Horizontal
   iii. Series Color: This will set the color of the series
   iv. X Series: This will set the chosen value parameter of the X-axis
   v. X Axis: Set the X Axis configuration as it is set under X-Axis
   vi. Precision: Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0
   vii. Y Axis: Here we can set the Y Axis configuration as it is set under Y-Axis
   viii. Precision: Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0
   ix. Series Type: This will set how the information will be displayed on the chart. It can be set to Line, Bar, Scatter and Area
   x. Mode: This will set the mode of the series. It can be set to Lines, Markers or Lines+ Markers
   xi. Marker Symbol: In case the mode is Markers or Lines + Markers, the application will enable users to set symbol of the marker on the chart
   xii. Marker Size: This will set the size of the marker on the chart

h. **X-Axis Configuration (Optional)**: The user can configure the X-Axis:

   i. Title: This will be the title of the X-Axis
   ii. Tick Angle: This will be the angle at which the X-Axis value will be displayed.
   iii. Position: This will set the position of the values appearing on X-Axis. It can be set to Top or Bottom (or none by default)
   iv. Front Color: This will set the color of the values appearing on X-Axis
   v. Grid Color: This will set the color of the grid values on X-Axis

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vi. Tick Value: This will configure the value that you are setting on X-Axis. It will be mapped from the defined Data source or based on the selected value from the API response

vii. Tick Size: This will set the tick size on X-Axis i.e., specifies the interval, in slider values on both axes, between the appearance of ticks. For example, if you enter 20 in a slider that contains values between 0 and 100, a tick appears at 20, 40, 60, 80, and 100

viii. Tick Format: This will set the format of the X-Axis Tick value. It can be set to **.2f**, **.0%**,,**.2r**, **~s**, **,.1s**, **,.2s** or **HH:MM**

Tick Format	Description
.2f	localized fixed-point notation.
.0%	rounded percentage
.2r	grouped thousands with two significant digits
~s	decimal notation with an SI prefix, rounded to significant digits.
.1s	SI-prefix with one significant digit
.2s	SI-prefix with two significant digits
HH:MM	Time format

i. **Y-Axis Configuration (Optional)**: The user can configure the Y-Axis:

i. Title: This will be the title of the Y-Axis

ii. Tick Angle: This will be the angle at which the Y-Axis value will be displayed

iii. Position: This will set the position of the values appearing on Y-Axis. It can be set to Top or Bottom (or None by default)

iv. Front Color: This will set the color of the values appearing on Y-Axis

v. Grid Color: This will set the color of the grid values on Y-Axis

vi. Tick Value: This will configure the value that you are setting on Y-Axis. It will be mapped from the defined Data source or based on the selected value from the API response

vii. Tick Size: This will set the tick size on Y-Axis i.e., specifies the interval, in slider values on both axes, between the appearance of ticks. For example, if you enter 20 in a slider that contains values between 0 and 100, a tick appears at 20, 40, 60, 80, and 100

viii. Tick Format: This will set the format of the Y-Axis Tick value. It can be set to **.2f**, **.0%**,,**.2r**, **~s**, **,.1s**, **,.2s** or **HH:MM**

Tick Format	Description
.2f	localized fixed-point notation.
.0%	rounded percentage
.2r	grouped thousands with two significant digits
~s	decimal notation with an SI prefix, rounded to significant digits.
.1s	SI-prefix with one significant digit

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.2s	SI-prefix with two significant digits
HH:MM	Time format

- **Dynamic Configuration**: It is not user defined. The widget automatically configures all the static series items based on the number of data arrays received from the source.

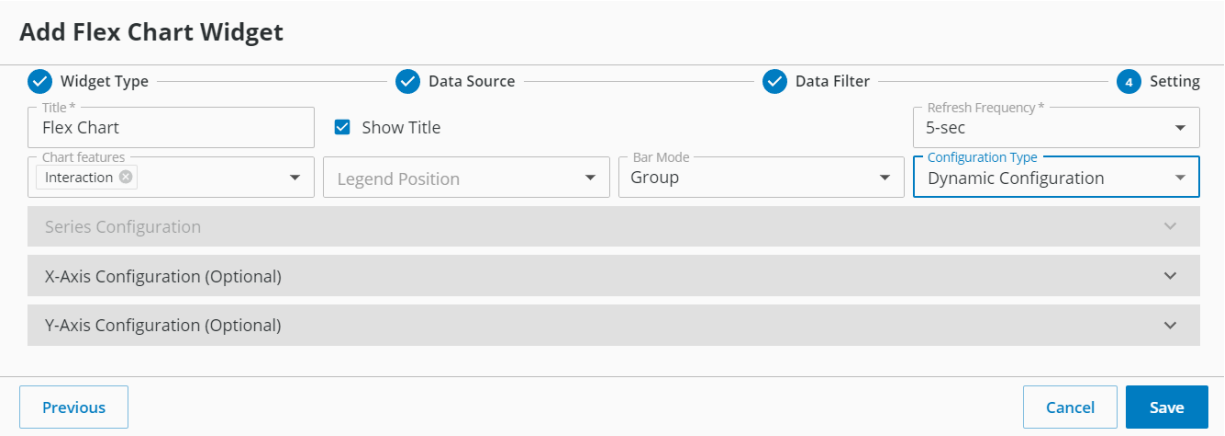

Figure 278: Dynamic Configuration Widget Settings

7. Click the **Save** button
8. Field Analytics will add **Flex Chart** widget as configured by the user on the Dashboard. Refer to Figure 279: Flex Chart

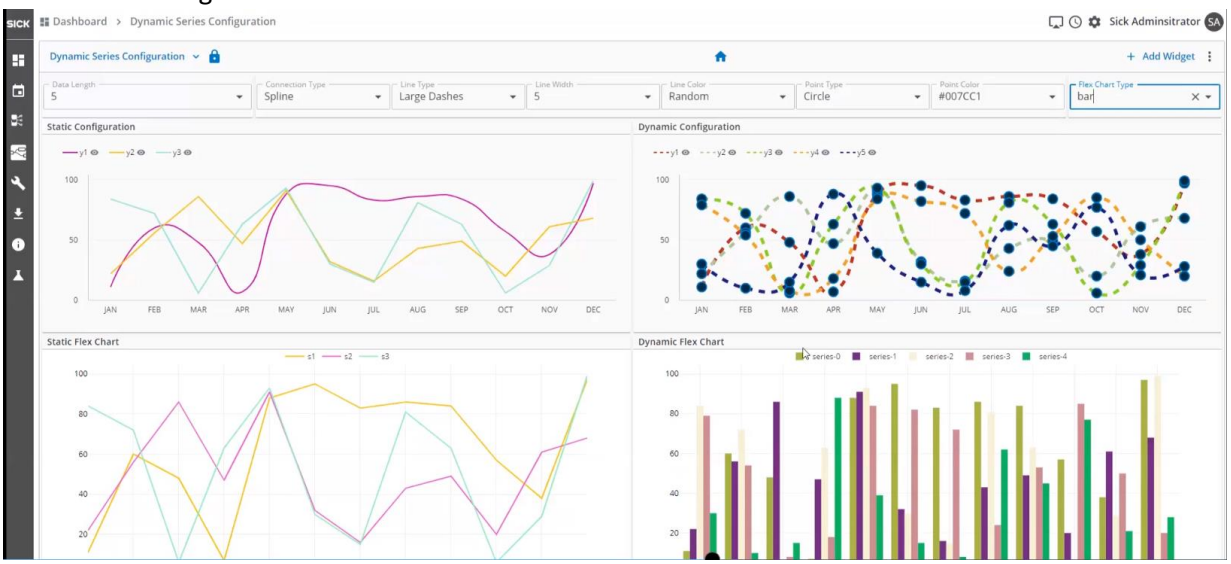

Figure 279: Flex Chart

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11.2.7 Flex Line Chart

X-Y data line chart configurable to observe the relationship between variables.
To add the Flex Line Chart widget to the dashboard:

1. Click **Add widget** button at the top-right corner of the home page. Refer to Figure 216: Add Widget
2. It will open Add Widget dialog box displaying list of widgets. Refer to Figure 217: Widget List
3. Select **Flex Line Chart** radio button, under the **Chart Widgets** section, and click **NEXT**. Refer to Figure 280: Flex Line Chart

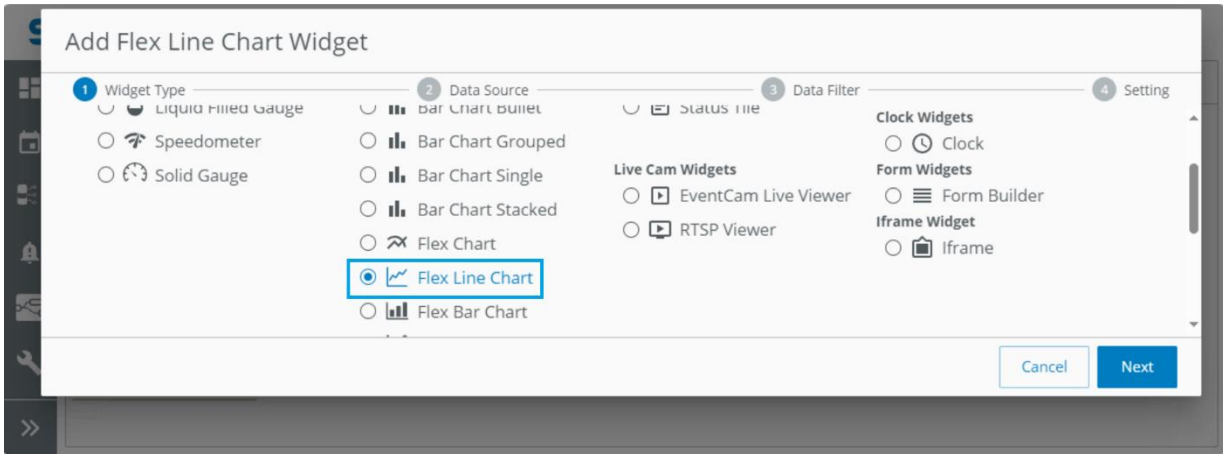

Figure 280: Flex Line Chart

4. Field Analytics will navigate to the Data Source configuration workflow. Refer to Figure 281: Widget Data Source

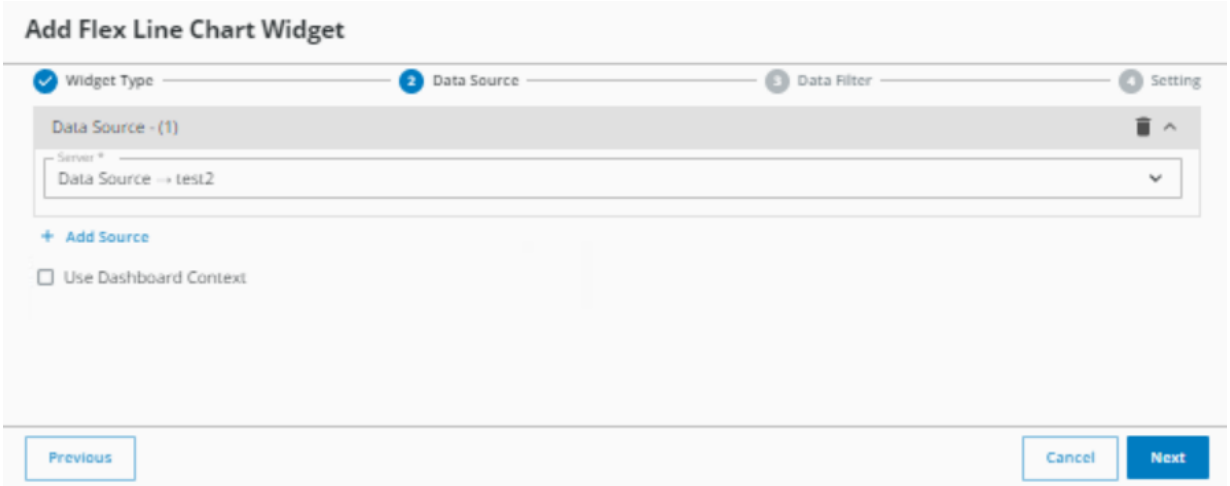

Figure 281: Widget Data Source

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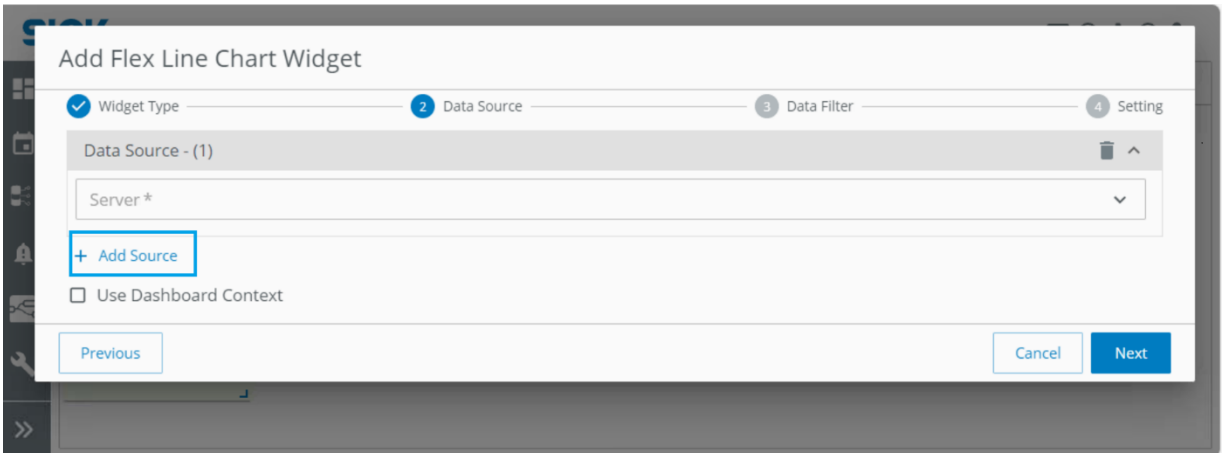
The following fields will need to be configured as required:

a. **Data Source**: The data source from where the data is acquired (**Data Source – Data, Reports & Historian)**

b. **Add Data Source:** Data Source 2 will display with same fields to be configured



5. Click the **Next** button
6. Field Analytics will navigate to the Data Filter section. Refer to Figure 282: Widget Data Filter
7. The following fields display:
    - **Data Array Name**: Provide Data Array Name to be displayed
    - **Parent Array**: select the Parent Array value from the drop-down list
    - **Data Array**: Select the field value from the API response to display (Widget will function as per the selected value) in Data array field

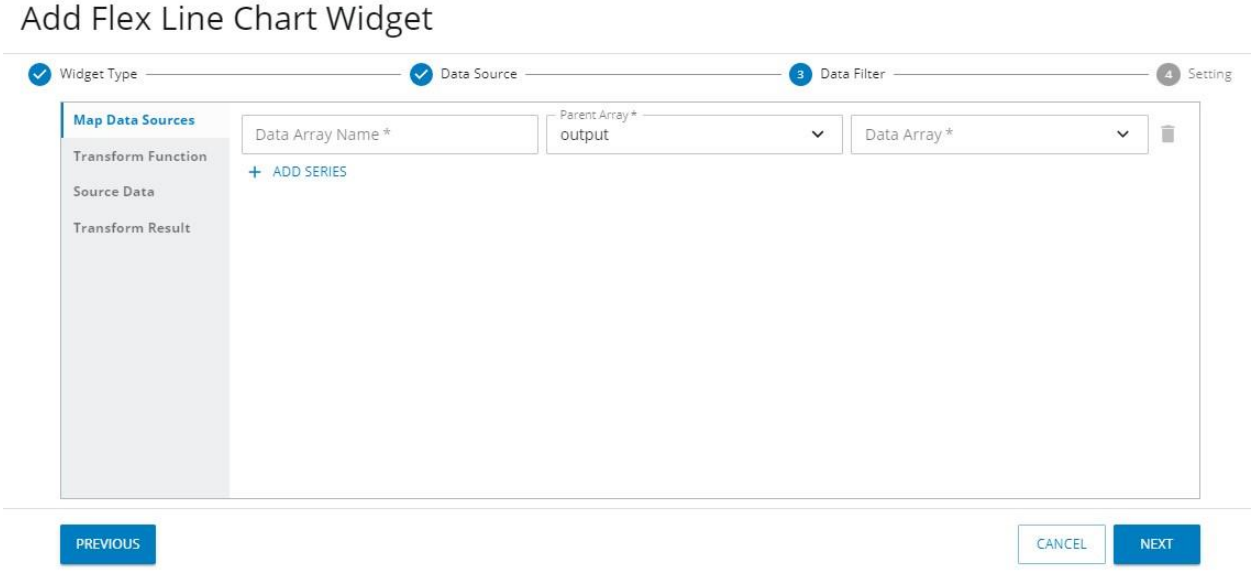


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Figure 282: Widget Data Filter

The following fields will need to be configured as required:

a. **Map Data Sources > Data Array Name**: This will be the name of the data array we are creating
b. **Map Data Sources** > **Parent Array**: The parent element from the response from where the response needs to be fetched
c. **Map Data Sources** > **Data Array**: This will set the value that needs to be displayed on the Flex Chart

To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8.

8. Click the **Next** button to move to the next section
9. The Field Analytics will move to the setting section where settings related to widget display are managed. Refer to Figure 283: Widget Settings

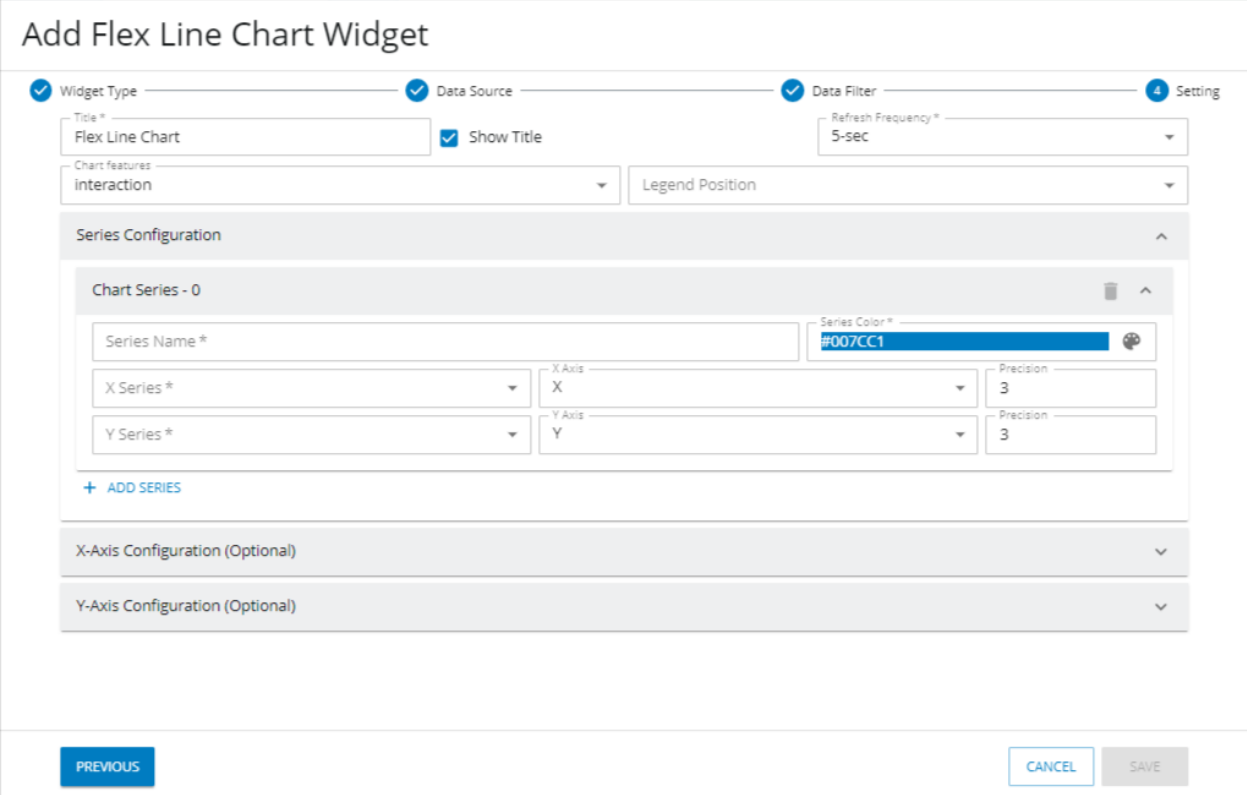

Figure 283: Widget Settings

The following fields will need to be configured as required:

d. **Title**: This will be the title of the widget

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e. **Show Title (Checkbox)**: The widget title will be displayed if the checkbox is checked, else it will not be displayed
f. **Refresh Frequency**: This will set the refresh frequency of the widget
g. **Chart Features**: This will set the chart feature
h. **Legend Position**: This will set the position of the legends on the chart
i. **Series Configuration**: Set the following parameters to configure the series:
    i. Series Name: This will be the name of the series
    ii. Series Color: This will set the color of the series
    iii. X Series: This will set the chosen value parameter at X-axis
    iv. X Axis: Here we can set the X Axis configuration as it is set under X-Axis Configuration (Optional) section
    v. Precision: Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0
    vi. Y Series: This will set the chosen value parameter at Y-axis
    vii. Y Axis: Here we can set the Y Axis configuration as it is set under Y-Axis Configuration (Optional) section
    viii. Precision: Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0
j. **X-Axis Configuration (Optional)**: The user can configure the X-Axis:
    i. Title: This will be the title of the X-Axis
    ii. Tick Angle: This will be the angle at which the X-Axis value will be displayed
    iii. Position: This will set the position of the values appearing on X-Axis. It can be set to Top or Bottom (or None by default)
    iv. Front Color: This will set the color of the values appearing on X-Axis
    v. Grid Color: This will set the color of the grid values on X-Axis
    vi. Tick Value: This will configure the value that you are setting on X-Axis. It will be mapped from the defined Data source or based on the selected value from the API response
    vii. Tick Size: This will set the tick size on X-Axis i.e., specifies the interval, in slider values on both axes, between the appearance of ticks. For example, if you enter 20 in a slider that contains values between 0 and 100, a tick appears at 20, 40, 60, 80, and 100
    viii. Tick Format: This will set the format of the X-Axis Tick value. It can be set to **.2f**, **.0%**,,**.2r**, **~s**, **,.1s**, **,.2s** or **HH:MM**

Tick Format	Description
.2f	localized fixed-point notation.
.0%	rounded percentage
.2r	grouped thousands with two significant digits
~s	decimal notation with an SI prefix, rounded to significant digits.
.1s	SI-prefix with one significant digit

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.2s	SI-prefix with two significant digits
HH:MM	Time format

k. Y-Axis Configuration (Optional): The user can configure the Y-Axis:

i. Title: This will be the title of the Y-Axis
ii. Tick Angle: This will be the angle at which the Y-Axis value will be displayed
iii. Position: This will set the position of the values appearing on Y-Axis. It can be set to Top or Bottom (or none by default)
iv. Front Color: This will set the color of the values appearing on Y-Axis
v. Grid Color: This will set the color of the grid values on Y-Axis
vi. Tick Value: This will configure the value that you are setting on Y-Axis. It will be mapped from the defined Data source or based on the selected value from the API response
vii. Tick Size: This will set the tick size on Y-Axis i.e., specifies the interval, in slider values on both axes, between the appearance of ticks. For example, if you enter 20 in a slider that contains values between 0 and 100, a tick appears at 20, 40, 60, 80, and 100
viii. Tick Format: This will set the format of the Y-Axis Tick value. It can be set to **.2f**, **.0%**,,**.2r**, **~s**, **,.1s**, **,.2s** or **HH:MM**

Tick Format	Description
.2f	localized fixed-point notation.
.0%	rounded percentage
.2r	grouped thousands with two significant digits
~s	decimal notation with an SI prefix, rounded to significant digits.
.1s	SI-prefix with one significant digit
.2s	SI-prefix with two significant digits
HH:MM	Time format

10. Click the '**Save'** button.
11. Field Analytics will add **Flex Line Chart** widget as configured by the user on the Dashboard.

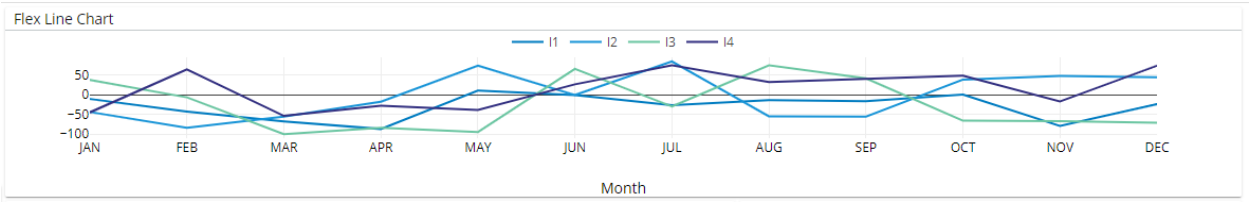

Figure 284: Flex Line Chart

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11.2.8 Flex Bar Chart

X-Y data bar chart configurable to observe the relationship between variables.

To add the Flex Bar Chart widget to the dashboard:

To add the Flex Bar Chart widget to the dashboard:

1. Click **Add widget** button at the top-right corner of the home page. Refer to Figure 216: Add Widget
2. It will open **Add Widget** dialog box displaying list of widgets. Refer to Figure 217: Widget List
3. Select **Flex Bar Chart** radio button, under the **Chart Widgets** section, and click **NEXT**. Refer to Figure 285: Flex Bar Chart

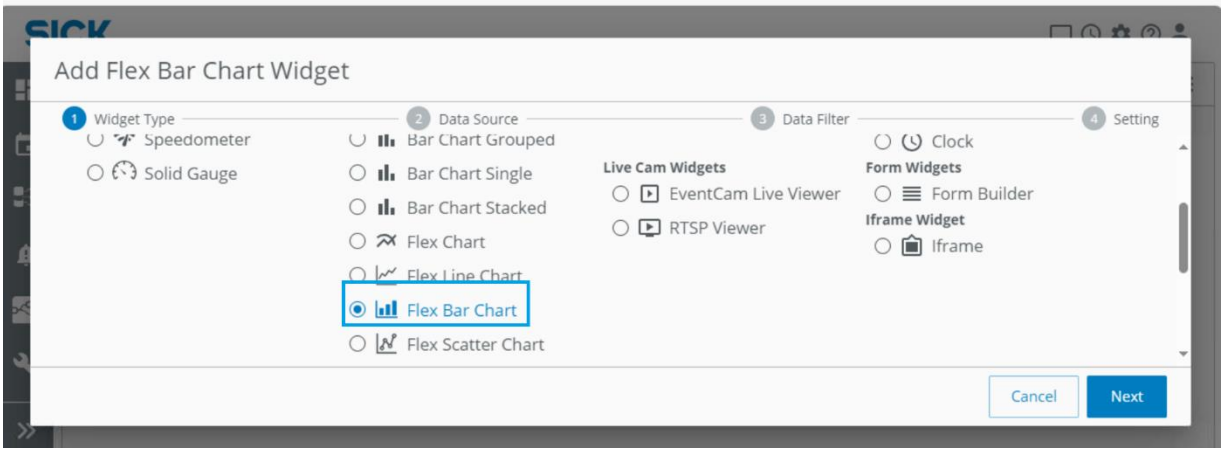

Figure 285: Flex Bar Chart

4. Field Analytics will navigate to the Data Source configuration workflow. Refer to Figure 286: Widget Data Source

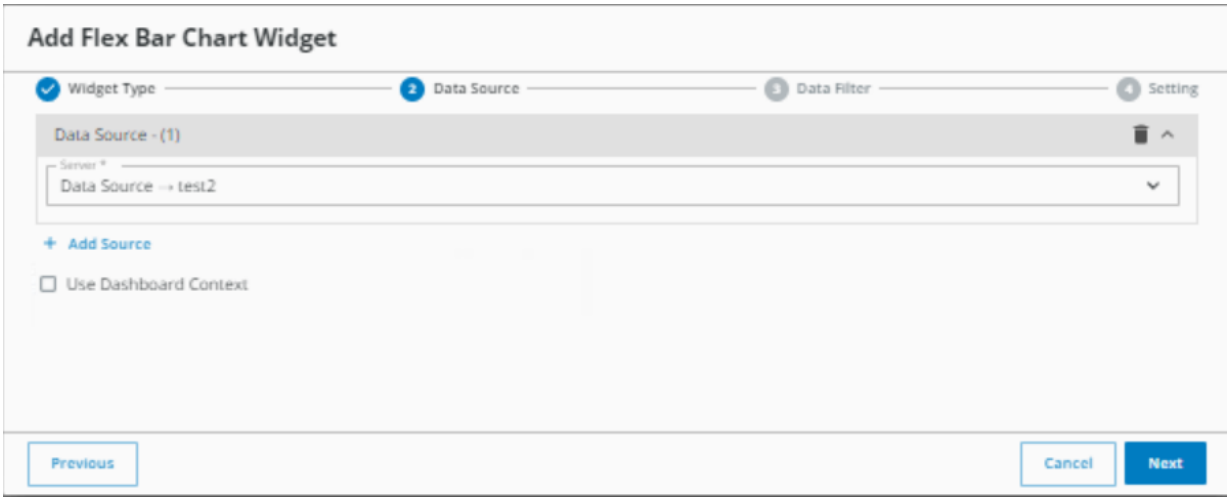

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Figure 286: Widget Data Source

The following fields will need to be configured as required

a. Data Sources: The data source from where the data is acquired (can be from **Data Source**, **Reports**, **Historian**)

b. **Add Data Source:** Data Source 2 will display with same fields to be configured

5. Click the **Next** button. It will navigate to the data filter section
6. The following fields display:
    a. **Data Array Name**: Provide Data Array Name to be displayed
    b. **Parent Array**: select the Parent Array value from the drop-down list
    c. **Data Array**: Select the field value from the API response to display (Widget will function as per the selected value) in Data array field

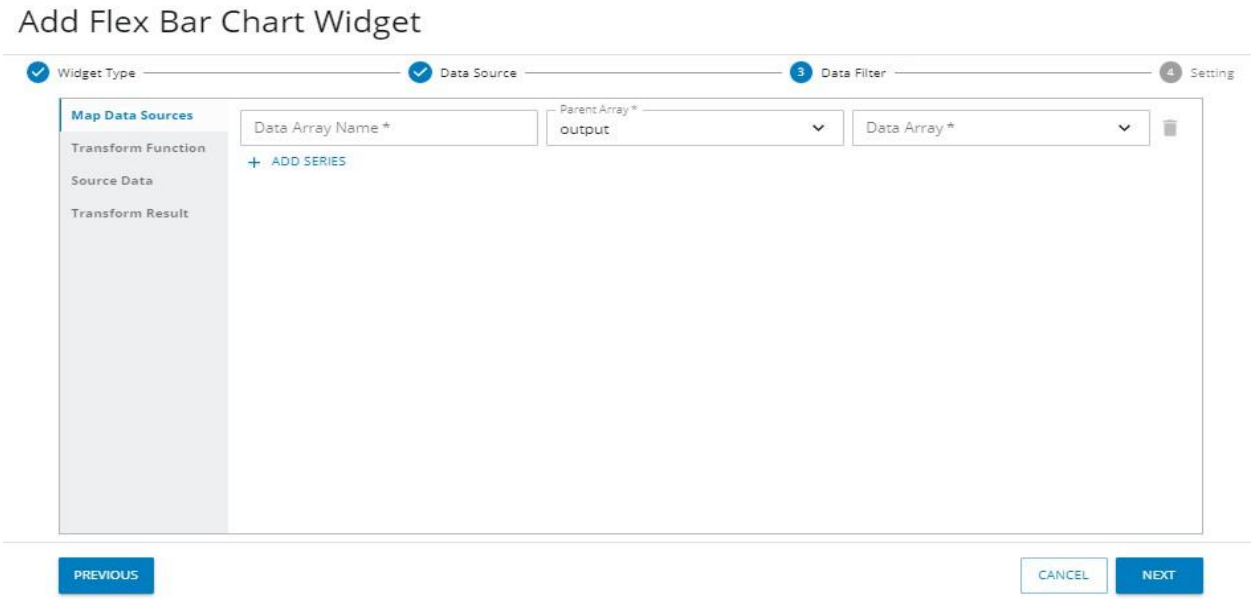

Figure 287: Widget Data Filter

To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8.

7. Click the **Next** button to move to the next section

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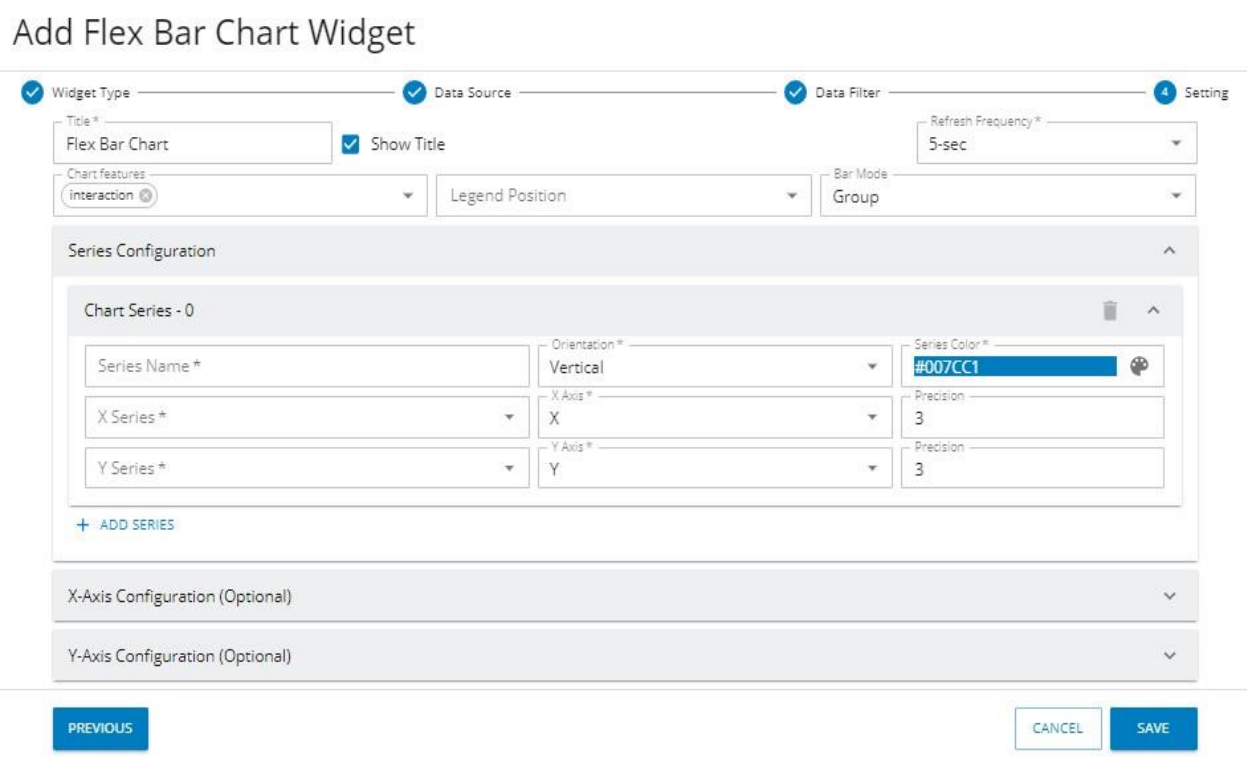

Figure 288: Widget Settings

The following fields will need to be configured as required:

- **c. Title**: This will be the title of the widget
- **d. Show Title (Checkbox)**: The widget title will be displayed if the checkbox is checked, else it will not be displayed
- e. **Refresh Frequency**: This will set the refresh frequency of the widget
- **f. Chart Features**: This will set the chart feature
- **g. Legend Position**: This will set the position of the legends on the chart
- **h. Bar Mode**: The bars on the chart can be set to Group, Stack or Relative
- **i. Series Configuration**: Set the following parameters to configure the series:
  - i. **Series Name**: This will be the name of the series
  - ii. **Series Color**: This will set the color of the series
  - iii. **X Series**: This will set the chosen value parameter at X-axis
  - iv. **X Axis:** Here we can set the X Axis configuration as it is set under X-Axis Configuration (Optional) section
  - v. **Precision**: Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0
  - vi. **Y Series**: This will set the chosen value parameter at Y-axis

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vii. **Y Axis:** Here we can set the Y Axis configuration as it is set under Y-Axis Configuration (Optional) section

viii. **Precision**: Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0

a. X-Axis Configuration (Optional): The user can configure the X-Axis:

i. **Title:** This will be the title of the X-Axis

ii. **Tick Angle**: This will be the angle at which the X-Axis value will be displayed.

iii. **Position:** This will set the position of the values appearing on X-Axis. It can be set to Top or Bottom (or none by default)

iv. **Front Color**: This will set the color of the values appearing on X-Axis.

v. **Grid Color**: This will set the color of the grid values on X-Axis

vi. **Tick Value**: This will configure the value that you are setting on X-Axis. It will be mapped from the defined Data source or based on the selected value from the API response

vii. **Tick Size:** This will set the tick size on X-Axis i.e., specifies the interval, in slider values on both axes, between the appearance of ticks. For example, if you enter 20 in a slider that contains values between 0 and 100, a tick appears at 20, 40, 60, 80, and 100

viii. **Tick Format:** This will set the format of the X-Axis Tick value. It can be set to **.2f**, **.0%**,,**.2r**, **~s**, **,.1s**, **,.2s** or **HH:MM**

Tick Format	Description
.2f	localized fixed-point notation.
.0%	rounded percentage
.2r	grouped thousands with two significant digits
~s	decimal notation with an SI prefix, rounded to significant digits.
.1s	SI-prefix with one significant digit
.2s	SI-prefix with two significant digits
HH:MM	Time format

b. Y-Axis Configuration (Optional): The user can configure the Y-Axis:

i. **Title:** This will be the title of the Y-Axis

ii. **Tick Angle**: This will be the angle at which the Y-Axis value will be displayed

iii. **Position:** This will set the position of the values appearing on Y-Axis. It can be set to Top or Bottom (or None by default)

iv. **Front Color:** This will set the color of the values appearing on Y-Axis

v. **Grid Color:** This will set the color of the grid values on Y-Axis

vi. **Tick Value:** This will configure the value that you are setting on Y-Axis. It will be mapped from the defined Data source or based on the selected value from the API response

vii. **Tick Size:** This will set the tick size on Y-Axis i.e., specifies the interval, in slider values on both axes, between the appearance of ticks. For example,

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if you enter 20 in a slider that contains values between 0 and 100, a tick appears at 20, 40, 60, 80, and 100

viii. **Tick Format:** This will set the format of the Y-Axis Tick value. It can be set to **.2f**, **.0%**,,**.2r**, **~s**, **,.1s**, **,.2s** or **HH:MM**

Tick Format	Description
.2f	localized fixed-point notation.
.0%	rounded percentage
.2r	grouped thousands with two significant digits
~s	decimal notation with an SI prefix, rounded to significant digits.
.1s	SI-prefix with one significant digit
.2s	SI-prefix with two significant digits
HH:MM	Time format

8. Click the **Save** button
9. Field Analytics will add **Flex Bar Chart** widget as configured by the user on the Dashboard. Refer to Figure 289: Flex Chart

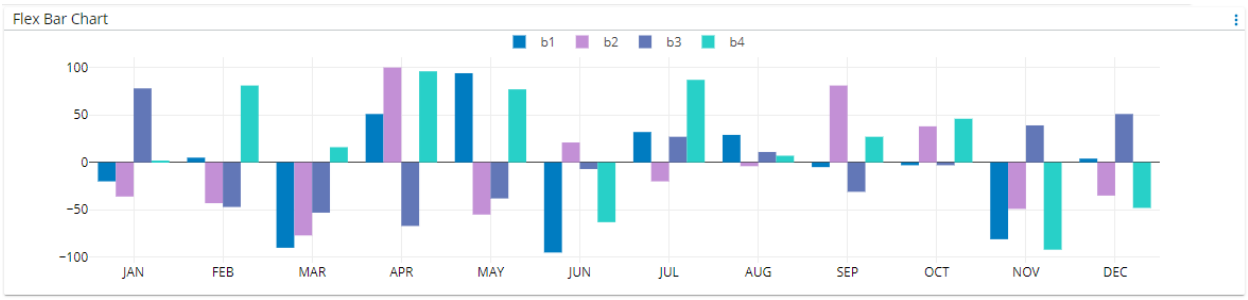

Figure 289: Flex Chart

11.2.9 Flex Scatter Chart

X-Y data scatter chart configurable to observe the relationship between variables.
To add the Flex Scatter Chart widget to the dashboard:

1 Click **Add widget** button at the top-right corner on the home page. Refer to Figure 216: Add Widget
2 It will open **Add Widget** dialog box displaying list of widgets. Refer to Figure 217: Widget List
3 Select **Flex Scatter Chart** radio button, under the **Chart Widgets** section, and click **NEXT**. Refer to Figure 290: Add Flex Scatter Chart Widget

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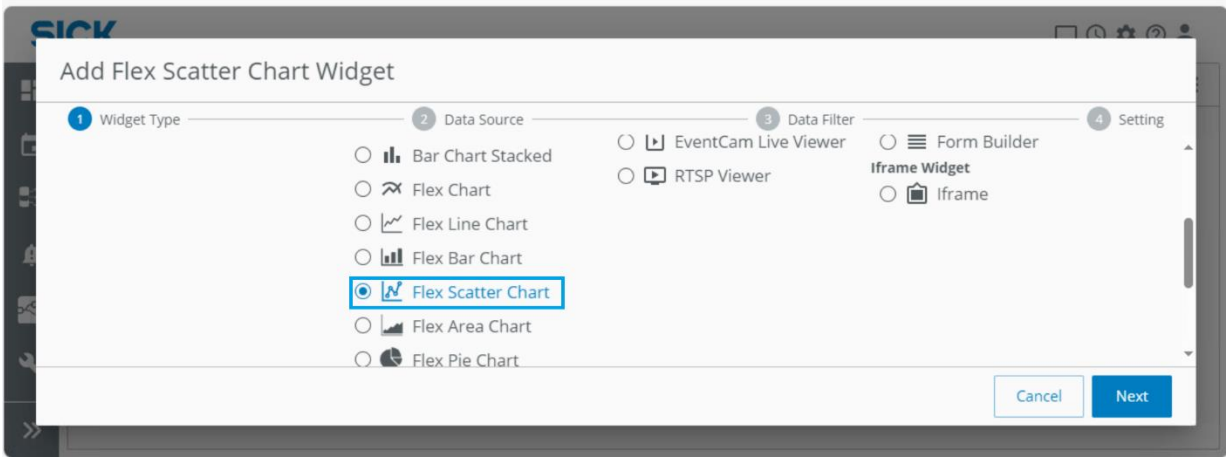

Figure 290: Add Flex Scatter Chart Widget

4 Field Analytics will navigate to the Data Source configuration workflow. Refer to Figure 291: Widget Data Source

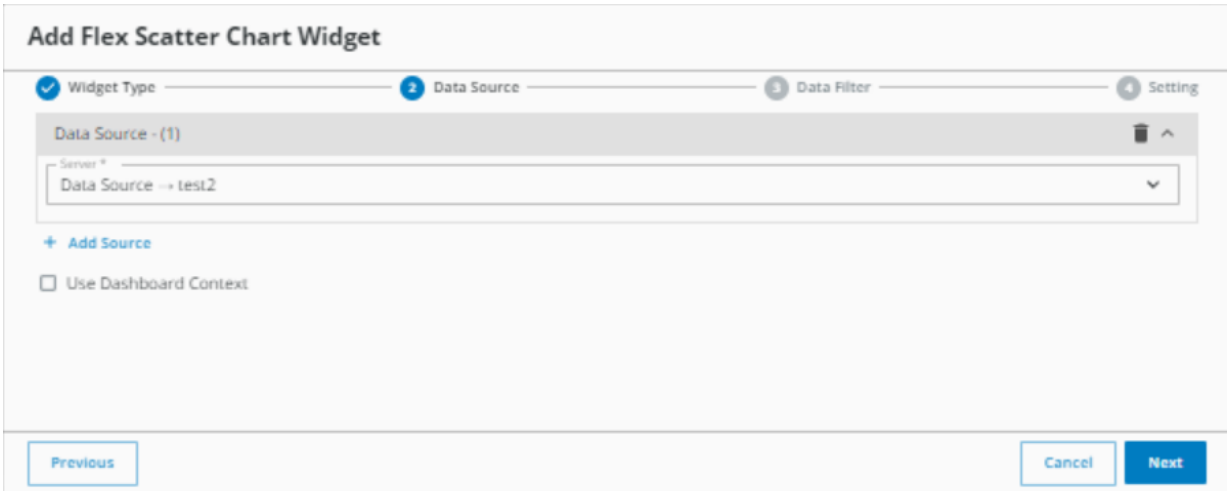

Figure 291: Widget Data Source

The following fields will need to be configured as required

a. **Data Sources**: The data source from where the data is acquired (can be from **Data Source**, **Reports**, **Historian**)

b. **Add Data Source:** Data Source 2 will display with same fields to be configured

5 Click the **Next** button. It will navigate to data filter section

6 The following fields display:

a. **Data Array Name**: Provide Data Array Name to be displayed

b. **Parent Array**: select the Parent Array value from the drop-down list

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c. **Data Array**: Select the field value from the API response to display (Widget will function as per the selected value) in Data array field

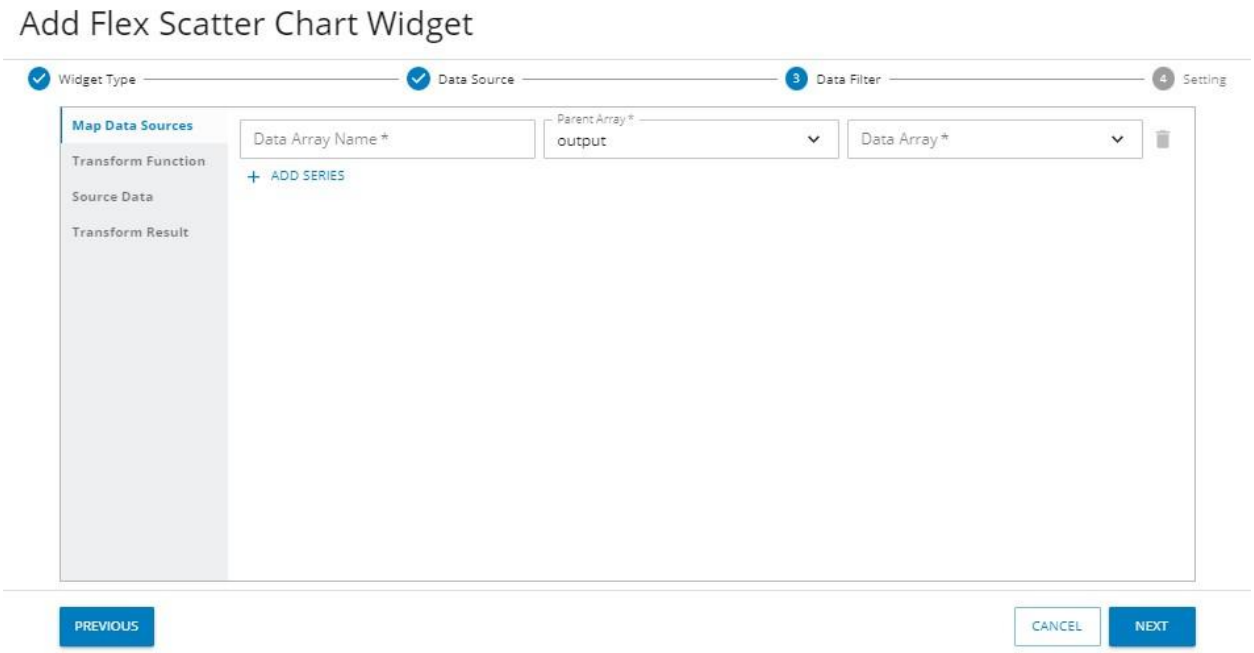

Figure 292: Widget Data Filter

To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8.

7 Click the **Next** button to move to the next section

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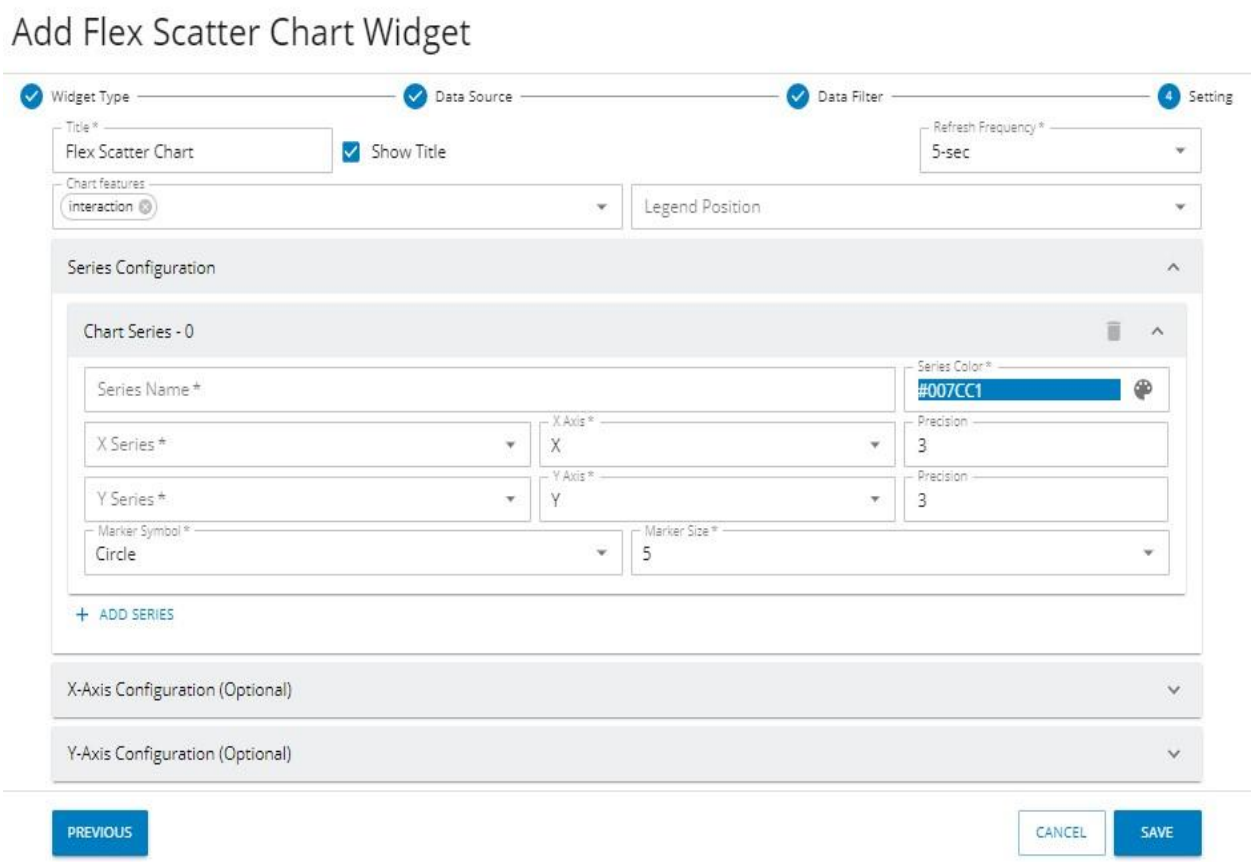

Figure 293: Widget Settings

The following fields will need to be configured as required:

- **c. Title**: This will be the title of the widget
- **d. Show Title (Checkbox)**: The widget title will be displayed if the checkbox is checked, else it will not be displayed
- e. **Refresh Frequency**: This will set the refresh frequency of the widget
- **f. Chart Features**: This will set the chart feature
- **g. Legend Position**: This will set the position of the legends on the chart
- **h. Series Configuration**: Set the following parameters to configure the series:
  - i. **Series Name**: This will be the name of the series
  - ii. **Series Color:** This will set the color of the series
  - iii. **X Series:** This will set the chosen value parameter at X-axis
  - iv. **X Axis:** Here we can set the X Axis configuration as it is set under X-Axis Configuration (Optional) section

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v. **Precision:** Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0
vi. **Y Series:** This will set the chosen value parameter at Y-axis
vii. **Y Axis:** Here we can set the Y Axis configuration as it is set under Y-Axis Configuration (Optional) section
viii. **Precision:** Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0

i. X-Axis Configuration (Optional): The user can configure the X-Axis:

i. **Title:** This will be the title of the X-Axis
ii. **Tick Angle:** This will be the angle at which the X-Axis value will be displayed
iii. **Position:** This will set the position of the values appearing on X-Axis. It can be set to Top or Bottom (or None by default)
iv. **Front Color:** This will set the color of the values appearing on X-Axis
v. **Grid Color:** This will set the color of the grid values on X-Axis
vi. **Tick Value:** This will configure the value that you are setting on X-Axis. It will be mapped from the defined Data source or based on the selected value from the API response
vii. **Tick Size:** This will set the tick size on X-Axis i.e., specifies the interval, in slider values on both axes, between the appearance of ticks. For example, if you enter 20 in a slider that contains values between 0 and 100, a tick appears at 20, 40, 60, 80, and 100
viii. **Tick Format:** This will set the format of the X-Axis Tick value. It can be set to **.2f**, **.0%**,,**.2r**, **~s**, **,.1s**, **,.2s** or **HH:MM**

Tick Format	Description
.2f	localized fixed-point notation.
.0%	rounded percentage
.2r	grouped thousands with two significant digits
~s	decimal notation with an SI prefix, rounded to significant digits.
.1s	SI-prefix with one significant digit
.2s	SI-prefix with two significant digits
HH:MM	Time format

j. Y-Axis Configuration (Optional): The user can configure the Y-Axis:

i. **Title:** This will be the title of the Y-Axis
ii. **Tick Angle:** This will be the angle at which the Y-Axis value will be displayed
iii. **Position:** This will set the position of the values appearing on Y-Axis. It can be set to Top or Bottom (or none by default)
iv. **Front Color:** This will set the color of the values appearing on Y-Axis
v. **Grid Color:** This will set the color of the grid values on Y-Axis
vi. **Tick Value:** This will configure the value that you are setting on Y-Axis. It will be mapped from the defined Data source or based on the selected value from the API response

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vii. **Tick Size:** This will set the tick size on Y-Axis i.e., specifies the interval, in slider values on both axes, between the appearance of ticks. For example, if you enter 20 in a slider that contains values between 0 and 100, a tick appears at 20, 40, 60, 80, and 100

viii. **Tick Format:** This will set the format of the Y-Axis Tick value. It can be set to **.2f**, **.0%**,,**.2r**, **~s**, **,.1s**, **,.2s** or **HH:MM**

Tick Format	Description
.2f	localized fixed-point notation.
.0%	rounded percentage
.2r	grouped thousands with two significant digits
~s	decimal notation with an SI prefix, rounded to significant digits.
.1s	SI-prefix with one significant digit
.2s	SI-prefix with two significant digits
HH:MM	Time format

8 Click the **Save** button

9 Field Analytics will add **Flex Scatter Chart** widget as configured by the user on the Dashboard. Figure 294: Flex Scatter Chart

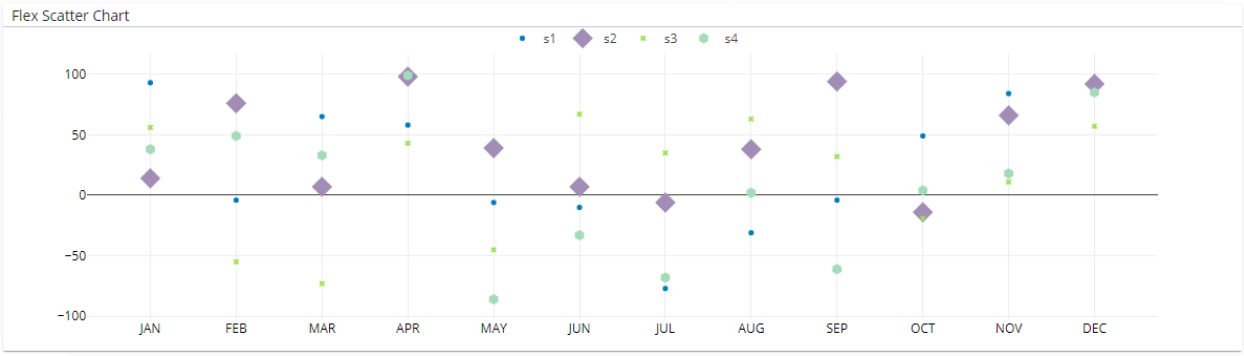

Figure 294: Flex Scatter Chart

11.2.10 Flex Area Chart

X-Y data area chart configurable to observe the relationship between variables.
To add Flex Area Chart widget to the dashboard:

1 Click **Add widget** button at the top-right corner on the home page. Refer to Figure 216: Add Widget

2 It will open **Add Widget** dialog box displaying list of widgets. Refer to Figure 217: Widget List

3 Select **Flex Area Chart** radio button, under the **Chart Widgets** section, and click **NEXT**. Refer to Figure 295: Flex Area Chart

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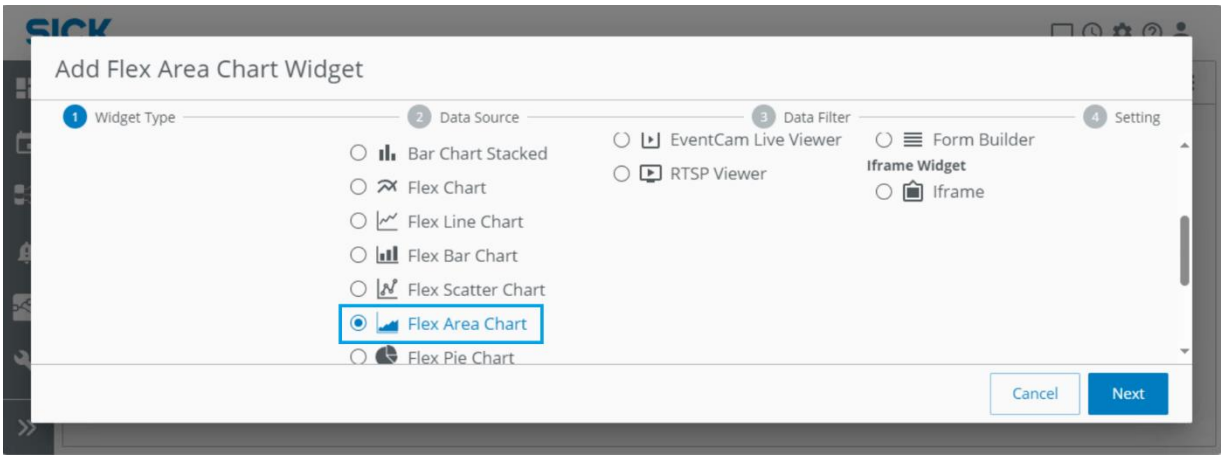

Figure 295: Flex Area Chart

4 It will navigate to the Data Source configuration workflow

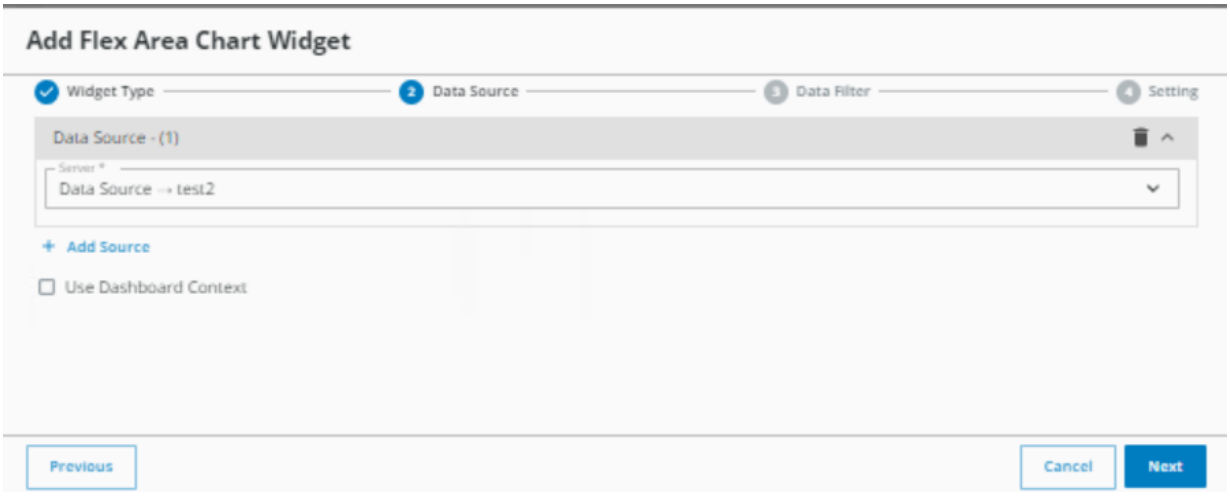

Figure 296: Widget Data Source

The following fields will need to be configured as required:

I. **Data Sources**: The data source from where the data is acquired (can be from **Data Source**, **Reports**, **Historian**)

II. **Add Data Source:** Data Source 2 will display with same fields to be configured

5 Click the **Next** button. It navigates to data filter section.

6 The following fields display:

a. **Data Array Name**: Provide Data Array Name to be displayed

b. **Parent Array**: select the Parent Array value from the drop-down list

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c. **Data Array**: Select the field value from the API response to display (Widget will function as per the selected value) in Data array field

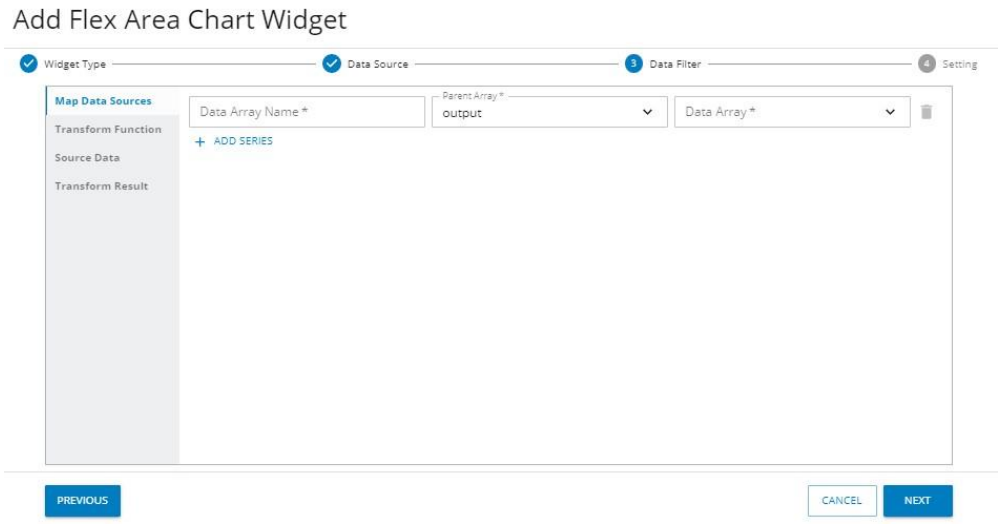

Figure 297: Widget Data Filter

To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8.

7 Click the **Next** button to move to the next section. Refer to Figure 298: Widget Settings

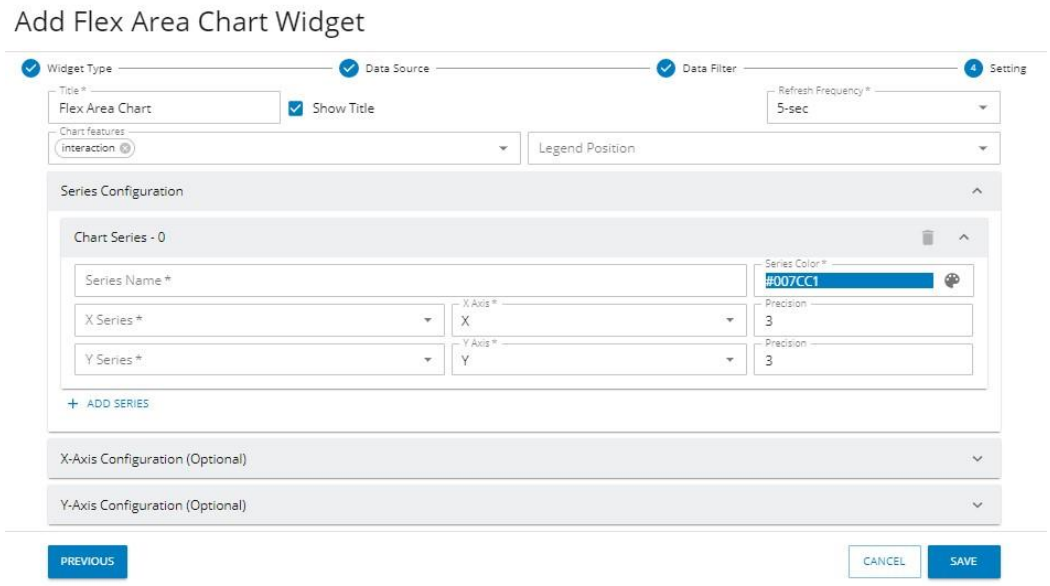

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Figure 298: Widget Settings

The following fields will need to be configured as required:

a. **Title**: This will be the title of the widget
b. **Show Title (Checkbox)**: The widget title will be displayed if the checkbox is checked, else it will not be displayed
c. **Refresh Frequency**: This will set the refresh frequency of the widget
d. **Chart Features**: This will set the chart feature
e. **Legend Position**: This will set the position of the legends on the chart
f. **Series Configuration**: Set the following parameters to configure the series:
    i. **Series Name:** This will be the name of the series
    ii. **Series Color:** This will set the color of the series
    iii. **X Series:** This will set the chosen value parameter at X-axis
    iv. **X Axis:** Here we can set the X Axis configuration as it is set under X-Axis Configuration (Optional) section
    v. **Precision:** Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0
    vi. **Y Series:** This will set the chosen value parameter at Y-axis
    vii. **Y Axis:** Here we can set the Y Axis configuration as it is set under Y-Axis Configuration (Optional) section
    viii. **Precision:** Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0
g. **X-Axis Configuration (Optional)**: The user can configure the X-Axis:
    i. **Title:** This will be the title of the X-Axis
    ii. **Tick Angle:** This will be the angle at which the X-Axis value will be displayed
    iii. **Position:** This will set the position of the values appearing on X-Axis. It can be set to Top or Bottom (or none by default)
    iv. **Front Color:** This will set the color of the values appearing on X-Axis
    v. **Grid Color:** This will set the color of the grid values on X-Axis
    vi. **Tick Value:** This will configure the value that you are setting on X-Axis. It will be mapped from the defined Data source or based on the selected value from the API response
    vii. **Tick Size:** This will set the tick size on X-Axis i.e., specifies the interval, in slider values on both axes, between the appearance of ticks. For example, if you enter 20 in a slider that contains values between 0 and 100, a tick appears at 20, 40, 60, 80, and 100
    viii. **Tick Format:** This will set the format of the X-Axis Tick value. It can be set to **.2f**, **.0%**,,**.2r**, **~s**, **,.1s**, **,.2s** or **HH:MM.**

Tick Format	Description
.2f	localized fixed-point notation.
.0%	rounded percentage

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.2r	grouped thousands with two significant digits
~s	decimal notation with an SI prefix, rounded to significant digits.
.1s	SI-prefix with one significant digit
.2s	SI-prefix with two significant digits
HH:MM	Time format

h. Y-Axis Configuration (Optional): The user can configure the Y-Axis:

i. **Title:** This will be the title of the Y-Axis
ii. **Tick Angle:** This will be the angle at which the Y-Axis value will be displayed
iii. **Position:** This will set the position of the values appearing on Y-Axis. It can be set to Top or Bottom (or none by default)
iv. **Front Color:** This will set the color of the values appearing on Y-Axis
v. **Grid Color:** This will set the color of the grid values on Y-Axis
vi. **Tick Value**: This will configure the value that you are setting on Y-Axis. It will be mapped from the defined Data source or based on the selected value from the API response
vii. **Tick Size:** This will set the tick size on Y-Axis i.e., specifies the interval, in slider values on both axes, between the appearance of ticks. For example, if you enter 20 in a slider that contains values between 0 and 100, a tick appears at 20, 40, 60, 80, and 100
viii. **Tick Format**: This will set the format of the Y-Axis Tick value. It can be set to **.2f**, **.0%**,,**.2r**, **~s**, **,.1s**, **,.2s** or **HH:MM**

Tick Format	Description
.2f	localized fixed-point notation.
.0%	rounded percentage
.2r	grouped thousands with two significant digits
~s	decimal notation with an SI prefix, rounded to significant digits.
.1s	SI-prefix with one significant digit
.2s	SI-prefix with two significant digits
HH:MM	Time format

8 Click the **SAVE** button
9 Field Analytics will add **Flex Area Chart** widget as configured by the user on the Dashboard

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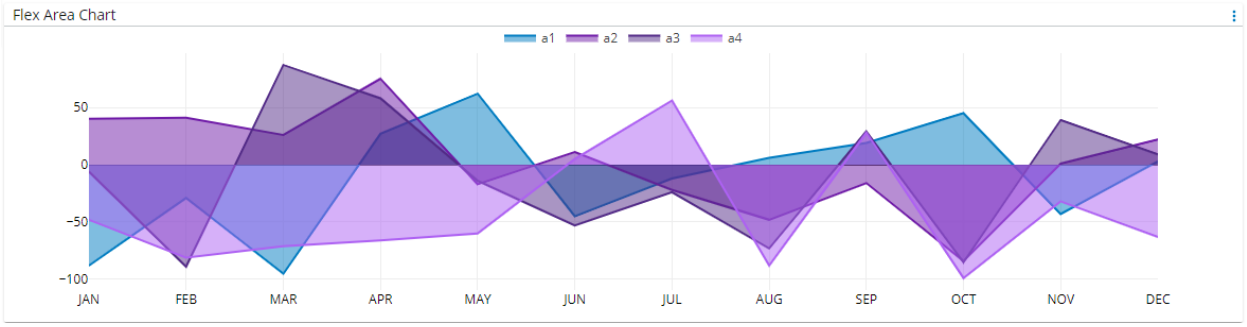

Figure 299: Flex Area Chart

11.2.11 Flex Pie Chart

The Pie chart displays data divided into slices to represent numeric proportion as it relates to the sum of all values. This type of chart is best used when you want a quick comparison of a small set of values in an aesthetically pleasing form.

To add Flex Pie Chart widget to the dashboard:

1 Click **Add widget** button at the top-right corner on the home page. Refer to Figure 216: Add Widget
2 It will open **Add Widget** dialog box displaying list of widgets. Refer to Figure 217: Widget List
3 Select **Flex Pie Chart** radio button, under the **Chart Widgets** section, and click **NEXT**. Refer to Figure 300: Add Flex Pie Chart

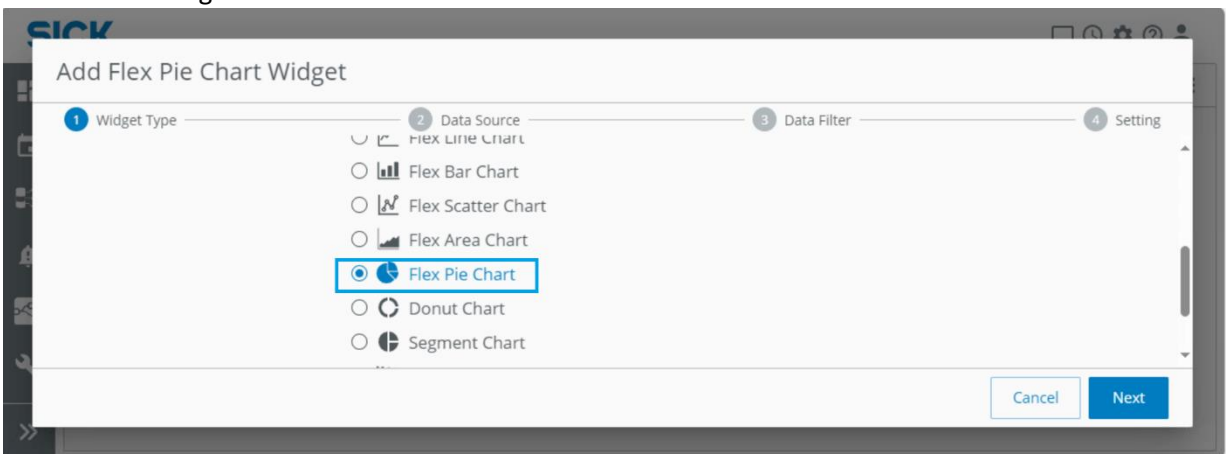

Figure 300: Add Flex Pie Chart

4 Field Analytics will navigate to the Data Source configuration workflow

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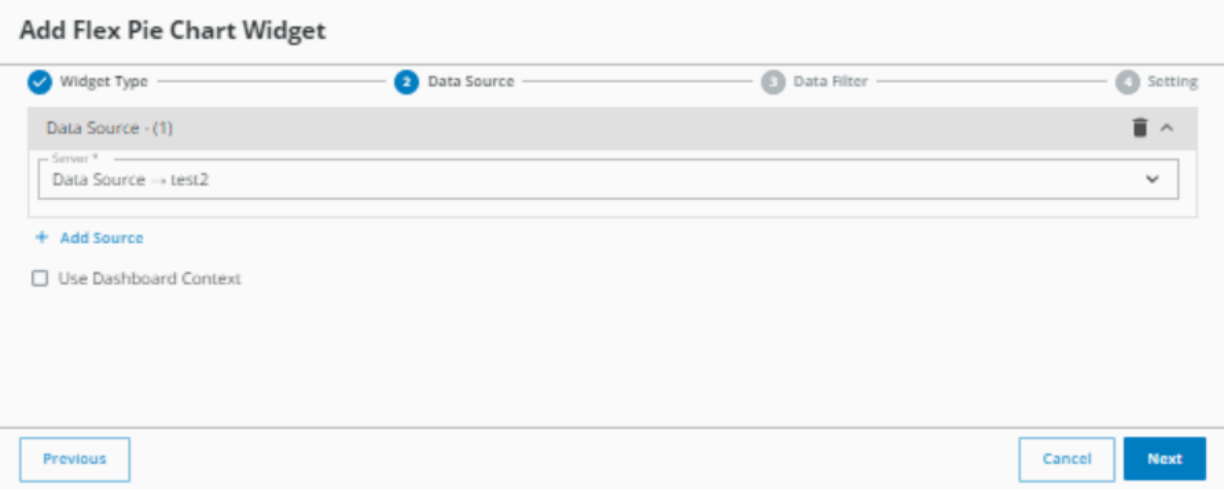

Figure 301: Widget Data Source

The following fields will need to be configured as required:

a. **Data Sources**: The data source from where the data is acquired (can be from **Data Source**, **Reports**, **Historian**)

b. **Add Data Source:** Data Source 2 will display with same fields to be configured

5 Click the **Next** button

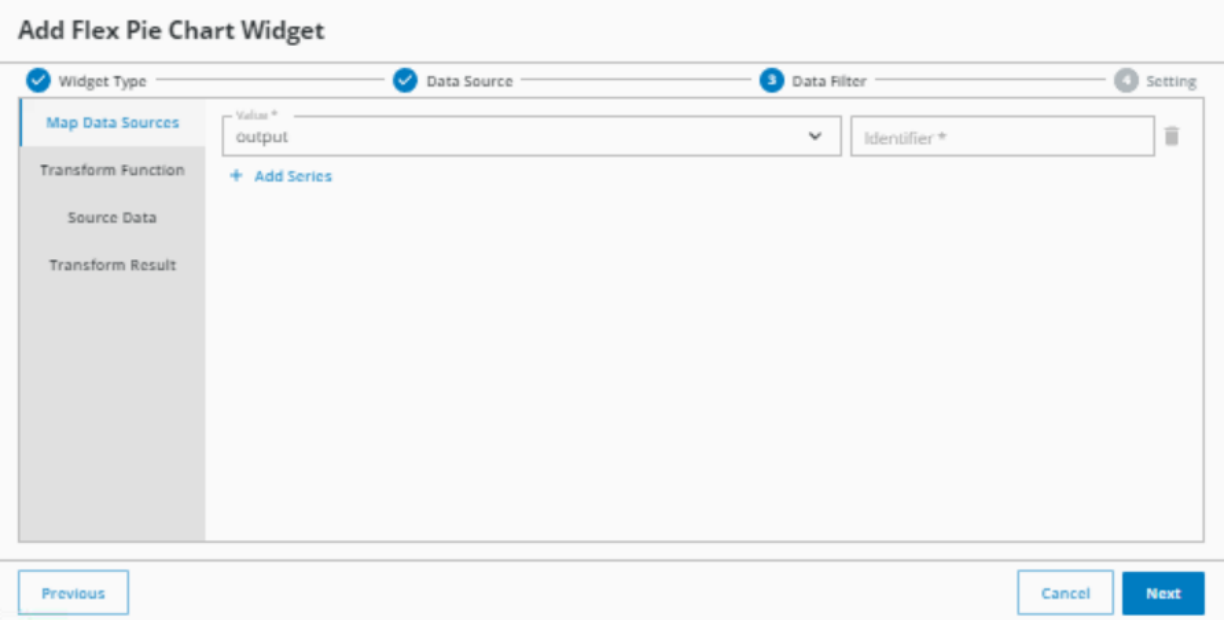

Figure 302: Widget Data Filter

The following fields will need to be configured as required:

a. **Map Data Sources > Series**: This will set as a value parameter for the pie chart

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b. **Map Data Sources > Series > Name**: This will set the name of the series parameter in the pie chart
c. **Map Data Sources > Series > Value**: This will set value of the series parameter in the pie chart

To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8.

6 Click the **Next** button to move to the next section

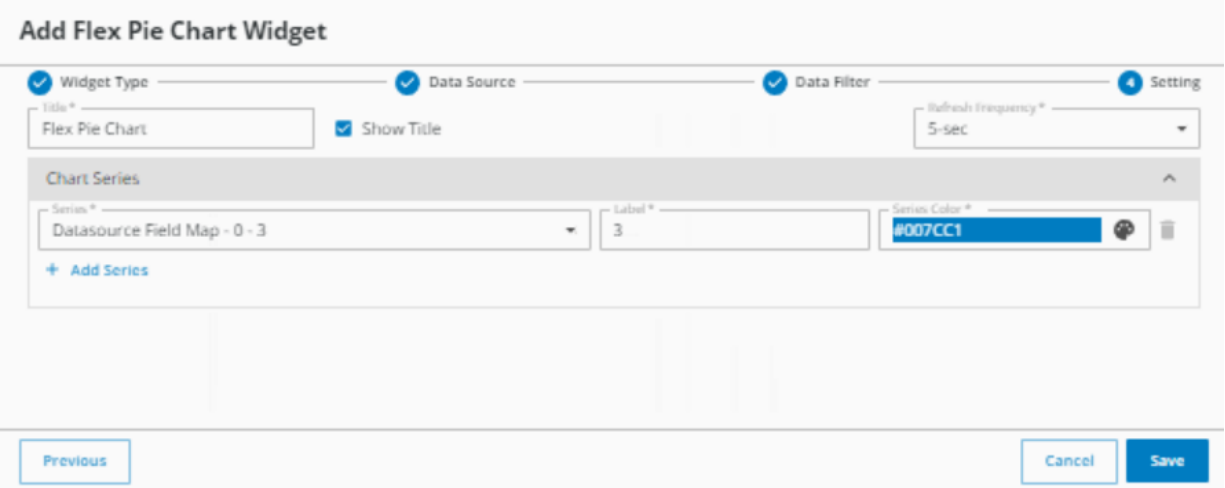

Figure 303: Widget Settings

Following fields will need to be configured as required:

a. **Title**: This will be the title of the widget
b. **Show Title (Checkbox)**: The widget title will be displayed if the checkbox is checked, else it will not be displayed
c. **Refresh Frequency**: This will set the refresh frequency of the widget
d. **Chart Series > Name** > This will set the name of the parameter as it will be displayed on the Pie chart
e. **Chart Series > Series** > This will set the parameter that needs to be displayed
f. **Chart Series > Series Color** > This will set the color of the parameter area on the chart as per the value of the variable
g. **Add Series** > This will add another series to display on the Pie chart

7 Click the **Save** button
8 Field Analytics will add **Flex Pie Chart** widget as configured by the user on the Dashboard

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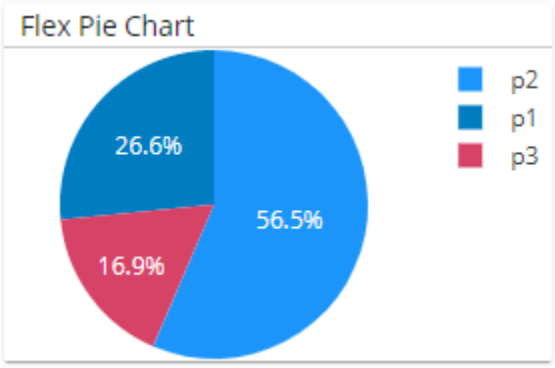

Figure 304: Flex Pie Chart

11.2.12 Donut Chart

To add Donut Chart widget to the dashboard:

1. Click **Add Widget** button at top-right corner on home page. Refer to Figure 216: Add Widget
2. It will open **Add Widget** window displaying list of widgets. Refer to Figure 217: Widget List
3. Select **Donut Chart** radio button, under **Chart Widgets** section and click the **Next** button

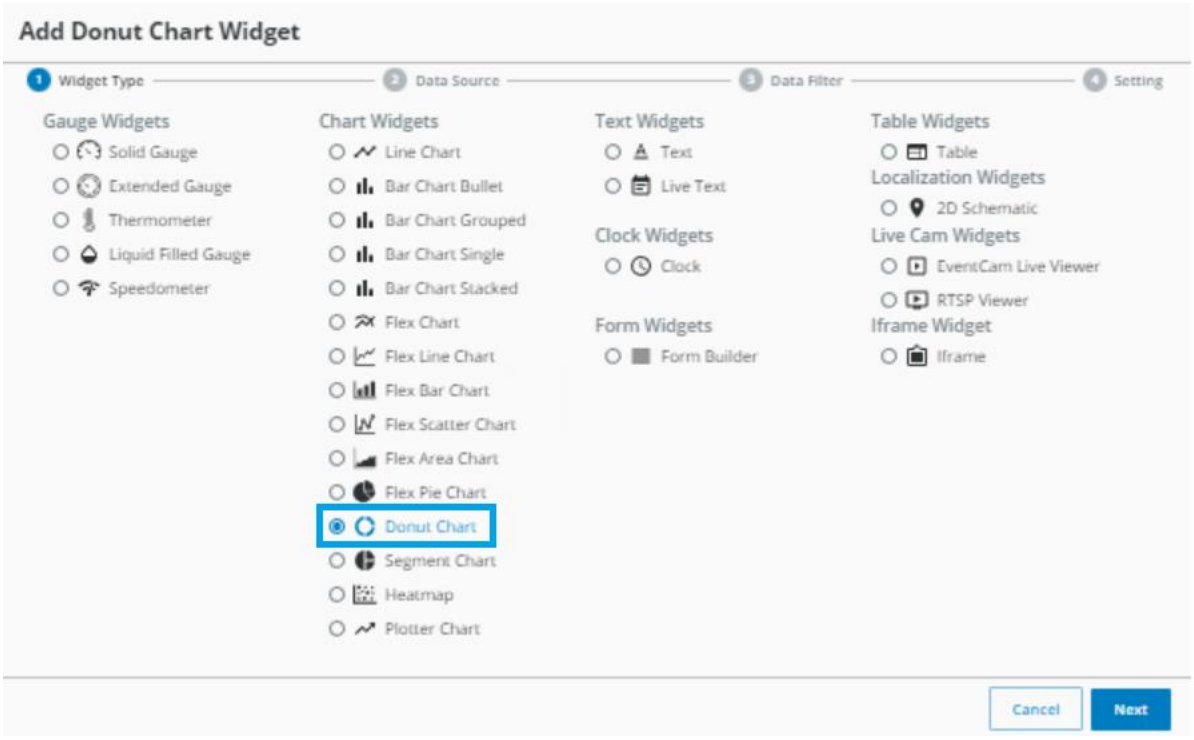

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Figure 305: Donut Chart

4. Field Analytics will navigate to the Data Source configuration

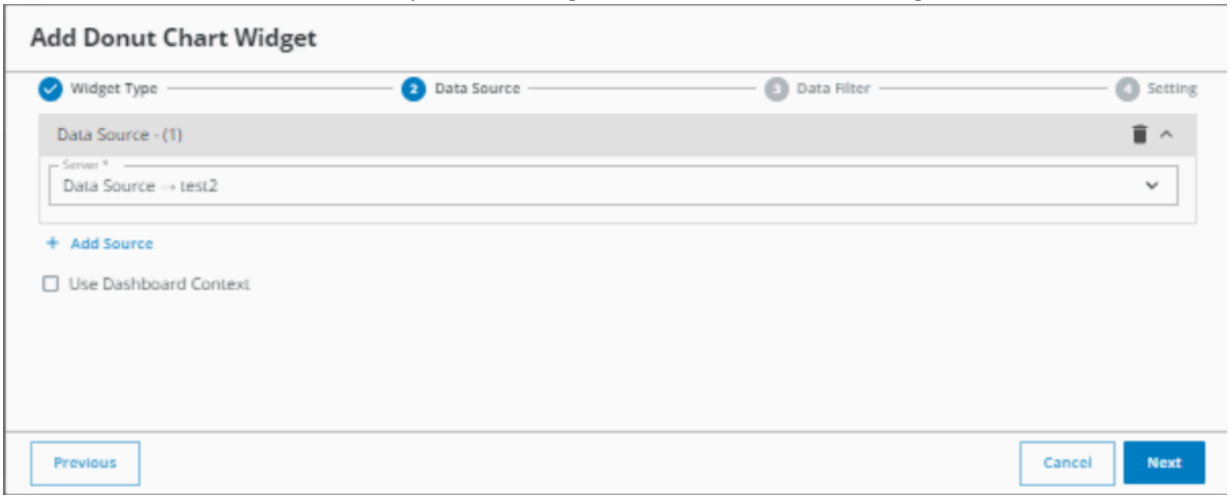

Figure 306: Data Source

The following fields will need to be configured as required:

   a. **Data Source**: The data source from where the data is acquired (**Data Source – Data, Report & Historian)**
   b. **Add Data Source:** Data Source 2 will display with same fields to be configured
5. Click the **Next** button. It will navigate to Data Filter section
6. The following fields will need to be configured as required:
   a. **Map Data Sources > Series**: This will set as a value parameter for the Donut chart
   b. **Map Data Sources > Series > Name**: This will set the name of the series parameter in the Donut chart
   c. **Map Data Sources > Series > Value**: This will set value of the series parameter in the Donut chart

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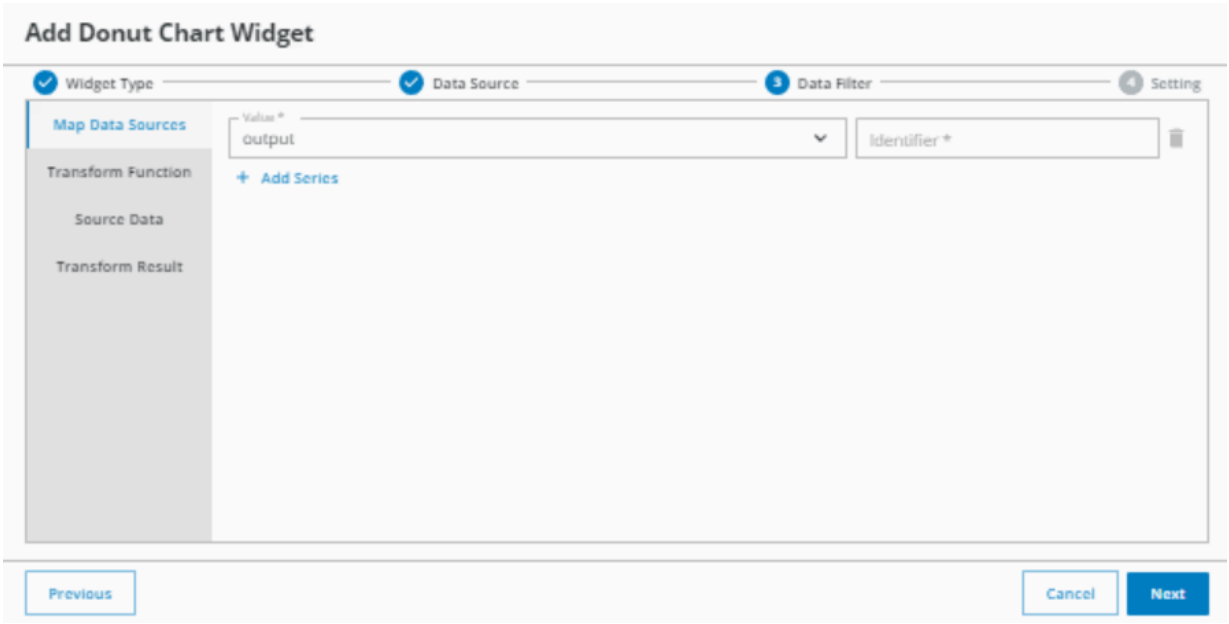

Figure 307: Data Filter

To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8.

7. Click the **Next** button to navigate to the widget settings section

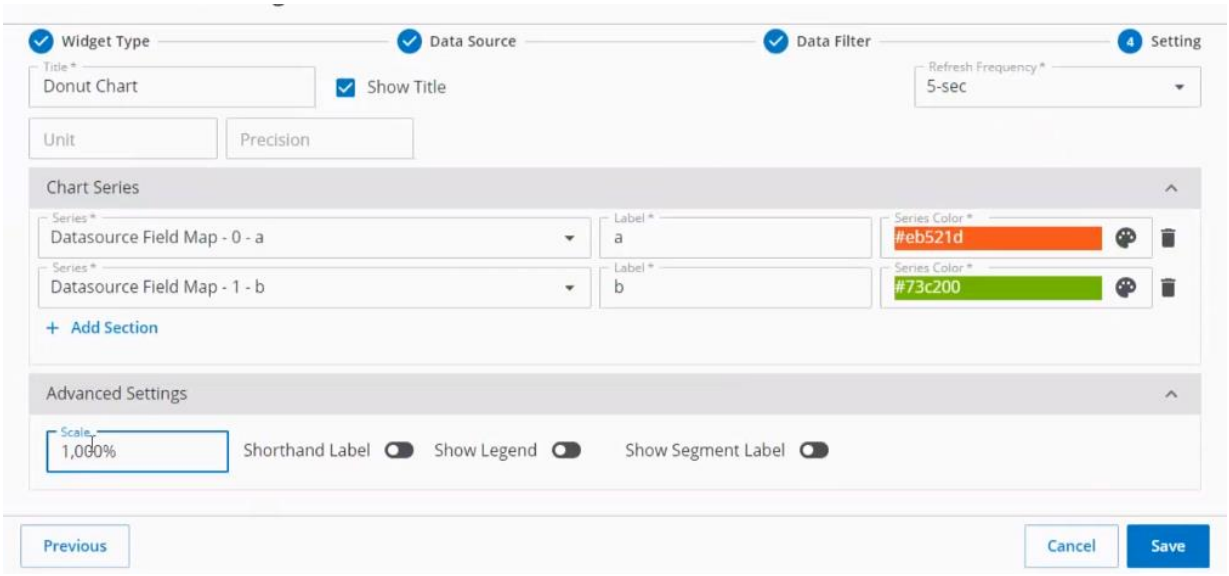

Figure 308: Widget Settings

The following fields will need to be configured as required:

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iv. **Title**: This will be the title of the widget
v. **Show Title (Checkbox)**: The widget title will be displayed if the checkbox is checked, else it will not be displayed
vi. **Refresh Frequency**: This will set the data refresh frequency/update to the widget
vii. **Unit:** Assign the unit of measure (i.e., kg, feet, mph etc.…)
viii. **Precision:** Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0
ix. **Series:** This will be name of the series
x. **Label:** This will be the name of the label to be displayed on widget
xi. **Series Color:** This will set the color of the series
xii. **Scale:** Enter Scale value to scale the widget to a precise size
xiii. **Shorthand label:** Displays the label value along with unit in short form
xiv. **Show Legend:** Enable Show Legend toggle button to display the legend on the widget
xv. **Show Segment Label:** Check Segment Label to display the segment label

8. Click the **Save** button
9. Field Analytics will add **Donut Chart** widget as configured by the user on the Dashboard

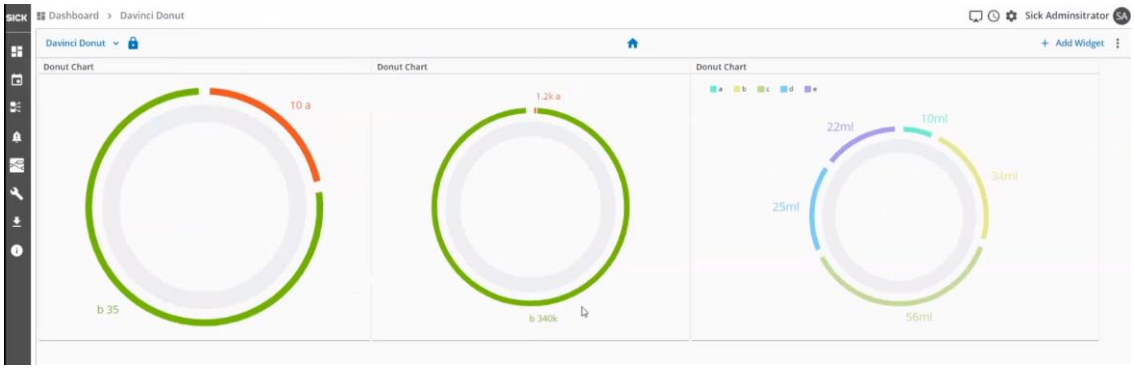

Figure 309: Donut Chart Widget

11.2.13 Segment Chart

To add Segment Chart widget to the dashboard:

1. Click **Add Widget** button at top-right corner on home page. Refer to Figure 216: Add Widget
2. It will open **Add Widget** window displaying list of widgets. Refer to Figure 217: Widget List

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3. Select **Segment Chart** radio button, under **Chart Widgets** section and click the **Next** button

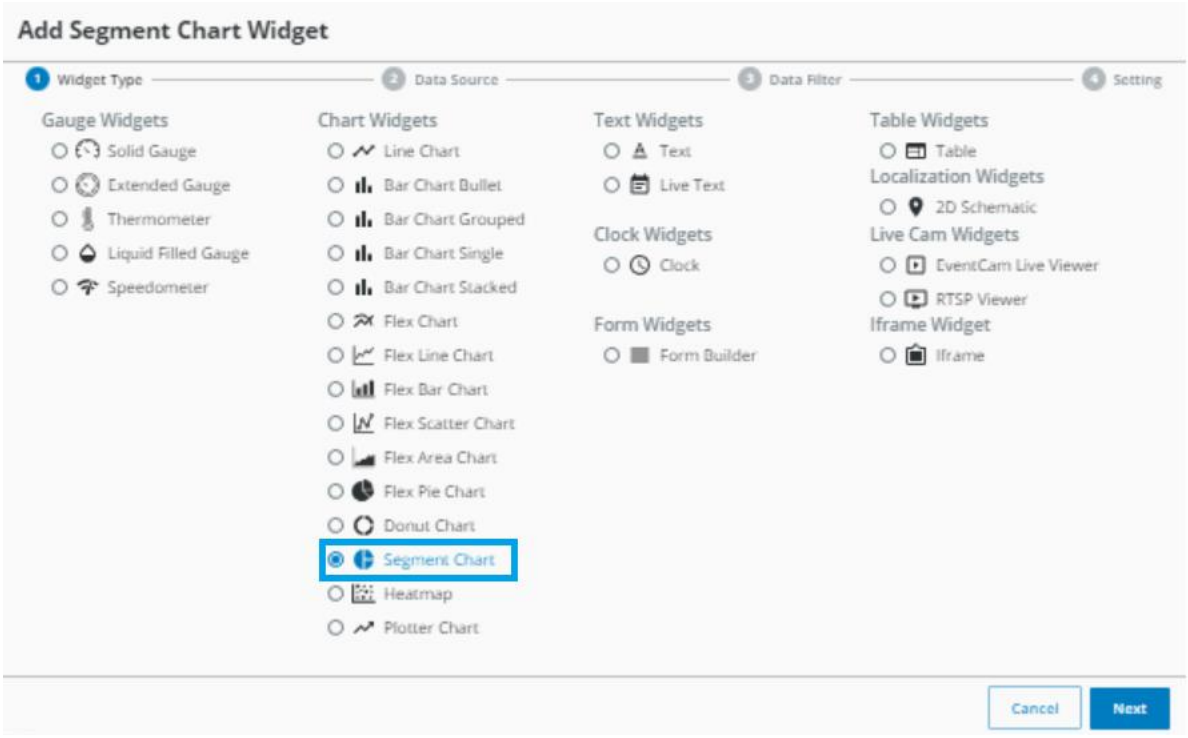

Figure 310: Segment Chart

4. Field Analytics will navigate to the Data Source configuration

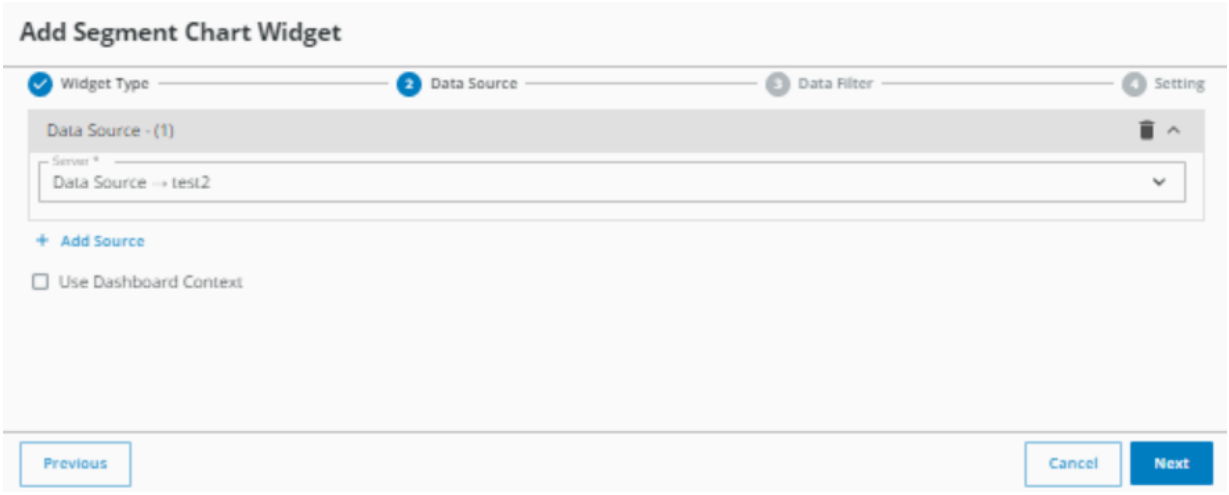

Figure 311: Data Source

The following fields will need to be configured as required:

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a. **Data Source**: The data source from where the data is acquired (**Data Source – Data, Report & Historian)**
b. **Add Data Source:** Data Source 2 will display with same fields to be configured

5. Click the **Next** button. It will navigate to Data Filter section
6. The following fields will need to be configured as required:
    a. **Map Data Sources > Series**: This will set as a value parameter for the Segment chart
    b. **Map Data Sources > Series > Name**: This will set the name of the series parameter in the Segment chart
    c. **Map Data Sources > Series > Value**: This will set value of the series parameter in the Segment chart

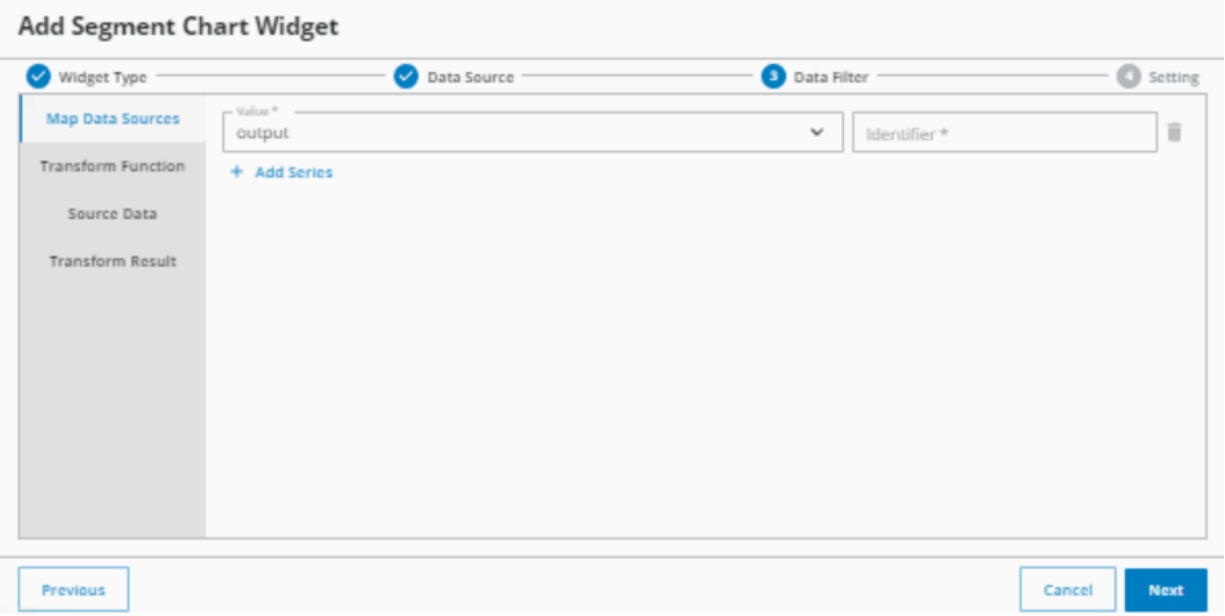

Figure 312: Data Filter

To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8.

7. Click the **Next** button to navigate to the widget settings section

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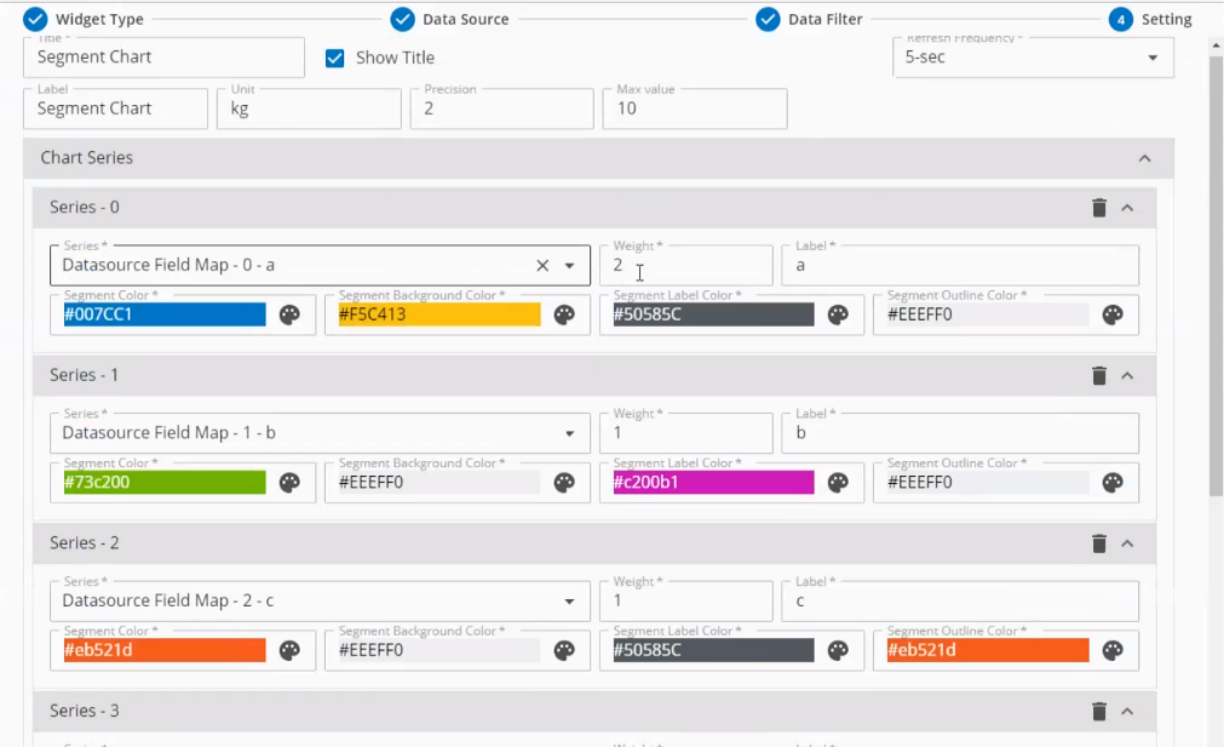

Figure 313: Widget Settings -1

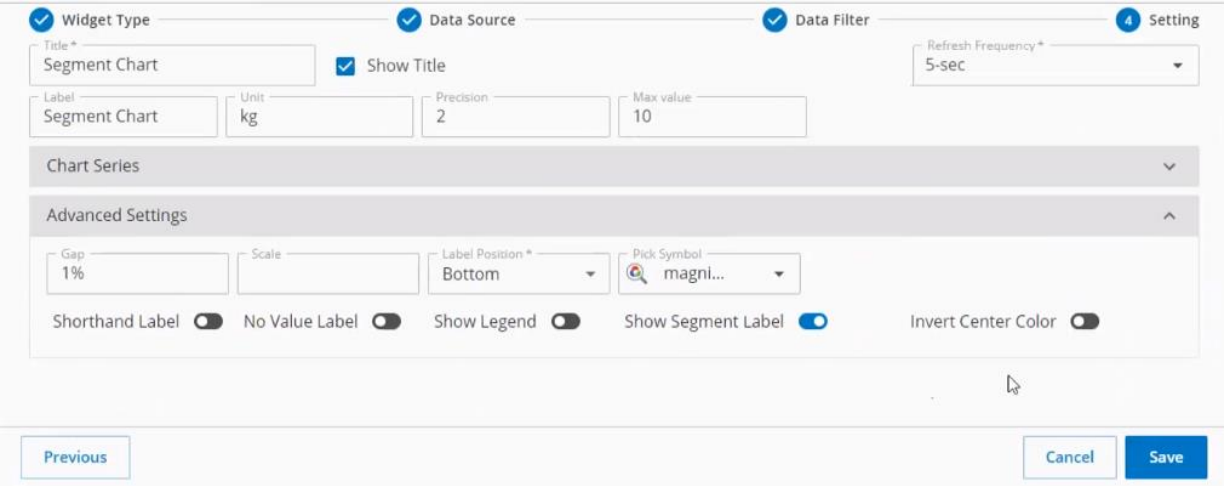

Figure 314: Widget Settings-2

The following fields will need to be configured as required:

a. **Title**: This will be the title of the widget

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b. **Show Title (Checkbox)**: The widget title will be displayed if the checkbox is checked, else it will not be displayed
c. **Refresh Frequency**: This will set the data refresh frequency/update to the widget
d. **Label:** Enter the name to be displayed on widget
e. **Unit:** Assign the unit of measure (i.e., kg, feet, mph etc.…)
f. **Precision:** Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0
g. **Max Value:** It is the maximum value for the widget to be sized
h. **Series:** Select the data source from drop-down list from which data is retrieved
i. **Weight:** It is the space covered by the widget
j. **Label:** The name of the series to be displayed on the widget
k. **Segment Color:** Configure the color of the segment
l. **Segment Background Color:** Configure the background color of the segment
m. **Segment Label Color:** Configure the color of the segment label
n. **Segment Outline Color:** Configure the outline color of the segment
o. **Gap:** It is the distance between each segment on the widget
p. **Scale:** Enter Scale value to scale the widget to a precise size
q. **Label Position:** Select the position of the label name from the drop-down like Centre, Bottom
r. **Pick Symbol:** Select the related symbol from the dropdown to be displayed on the widget
s. **Shorthand Label:** Displays the label value along with unit in short form
t. **No Value Label:** Enable to remove the value labels on the widget
u. **Show Legend:** Enable to display the legend on the widget
v. **Show Segment Label:** Enable to display the segment label
w. **Inverter Centre Color:** Enable to display the center color of the widget

8. Click the **Save** button
9. Field Analytics will add **Segment Chart** widget as configured by the user on the Dashboard

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Figure 315: Segment Chart Widget

11.2.14 Heatmap

To add the Heatmap widget to the dashboard:

1 Click **Add widget** button at the top-right corner on the home page. Refer to Figure 216: Add Widget

2 It will open **Add Widget** dialog box displaying list of widgets. Refer to Figure 217: Widget List

3 Select **Heatmap** radio button, under the **Chart Widgets** section and click **Next**. Refer to Figure 316: Heatmap Widget

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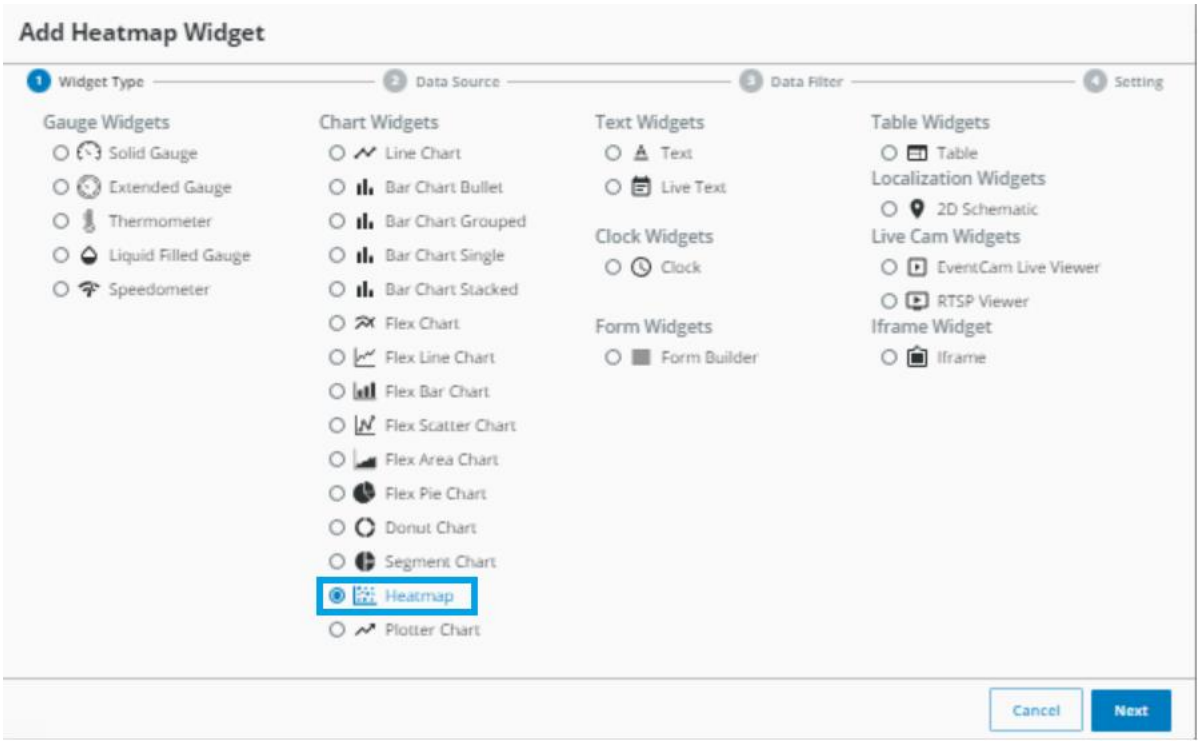

Figure 316: Heatmap Widget

4 It will navigate to the Widget Type section. Refer to Figure 317: Add Heatmap

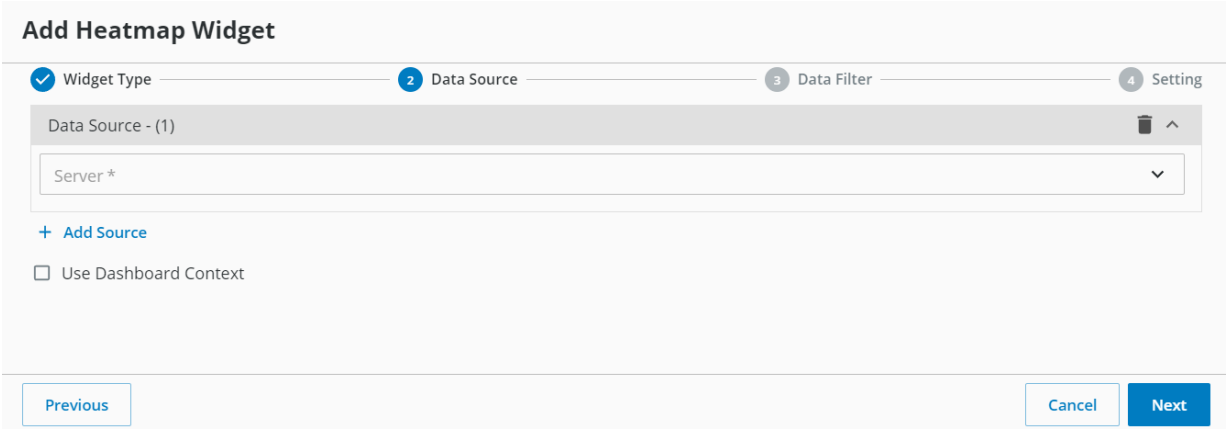

Figure 317: Add Heatmap

The following fields will need to be configured as required:

c. **Data Source**: The data source from where the data is acquired (**Data Source – Data, Report & Historian)**

d. **Add Data Source:** Data Source 2 will display with same fields to be configured

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5 Click the '**Next'** button. It will navigate to Data Filter section. Refer to Figure 318: Data Filter
6 The following fields display:
- **Parent Array**: select the Parent Array value from the drop-down
- **Identifier**: Provide a unique name in Identifier field
- **X**: Select a value for X parameter from drop-down
- **Y**: Select a value for X parameter from drop-down

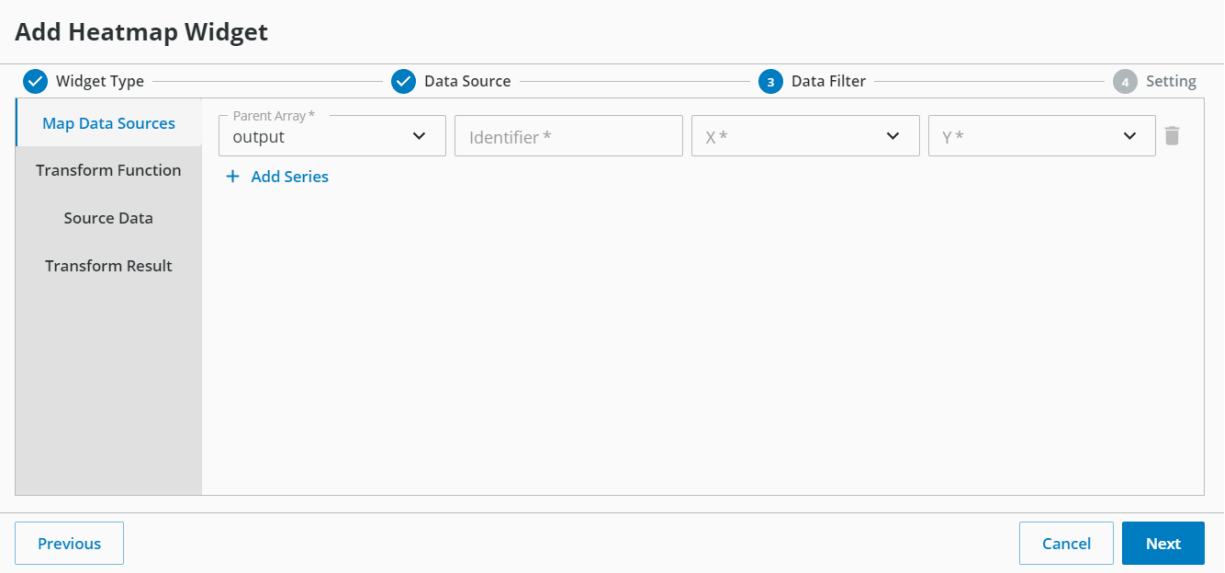

Figure 318: Data Filter

To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8. MapDataSources

7 Click the '**Next**' button to move to the next section
8 Field Analytics will move to the setting section where settings related to widget display are managed. Refer to Figure 319: Add Heatmap – Static Configuration Settings

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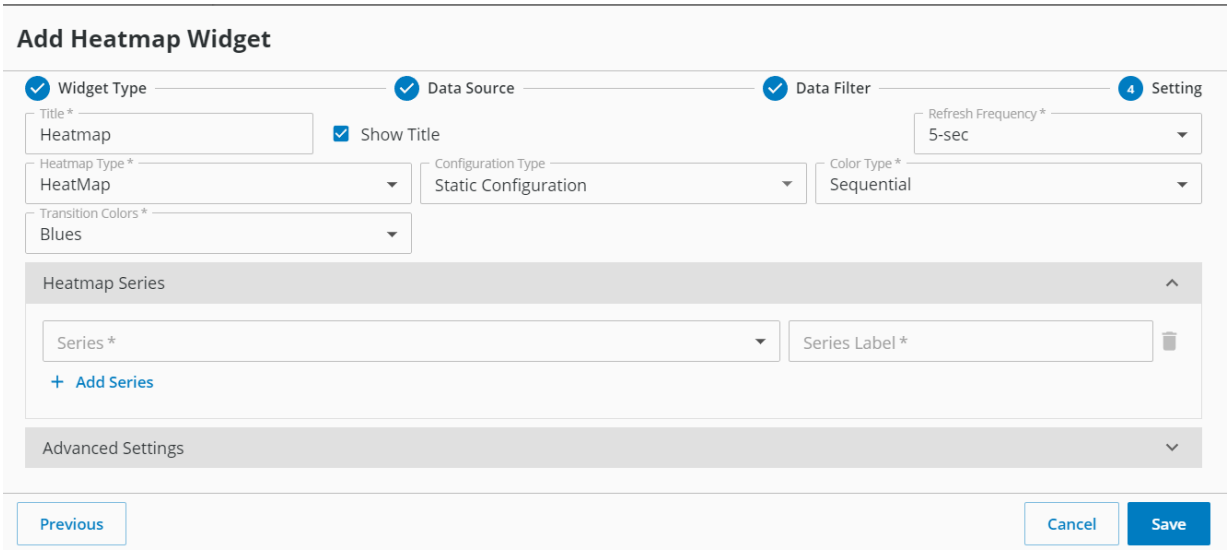

Figure 319: Add Heatmap – Static Configuration Settings

The following fields will need to be configured as required:

- **Title**: This will be the title of the widget
- **Show Title** (Checkbox): The widget title will be displayed if the checkbox is checked, else it will not be displayed
- **Refresh Frequency**: This will set the refresh frequency of the widget
- **Heatmap Type:** This will display the widgets in **Heatmap or Dendrogram**
    - **Heatmap -** Provide an efficient way to quickly identify high points and low points across the data. Refer to Figure 321: Heatmap
    - **Dendrogram -** Represents the distance between the two data points being connected. Refer to Figure 322: Dendrogram
- **Configuration Type:** There are two types of configurations that are Static and Dynamic
    - **Static Configuration**
        a. **Series -** This will set the chosen value parameter
        b. **Series label -** This will be the name of the series
    - **Dynamic Configuration**: It is not user defined. The widget automatically configures all the static series items based on the number of data arrays received from the source.

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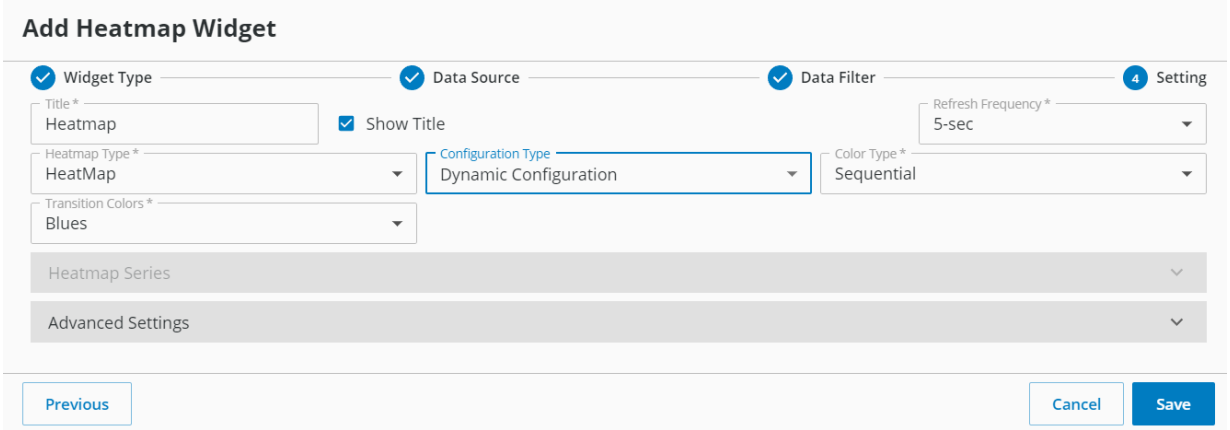

Figure 320: Dynamic Configuration Settings

c. **Color Type**: This allows to choose type of colors like Sequential, Diverging, Quantize
d. **Transition Color:** This will allow users to select the color to be displayed

9 Click the '**Save'** button

10 Field Analytics will add **Heatmap** widget as configured by the user on the Dashboard. Refer to Figure 321: Heatmap

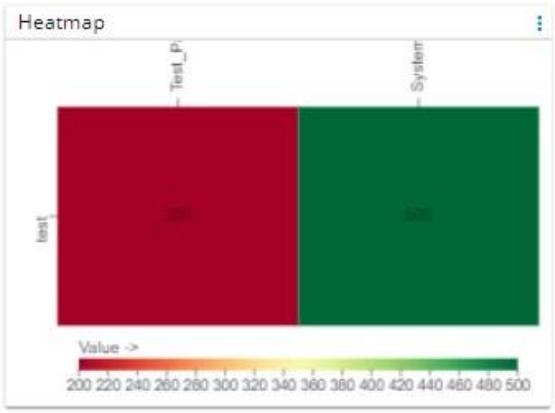

Figure 321: Heatmap

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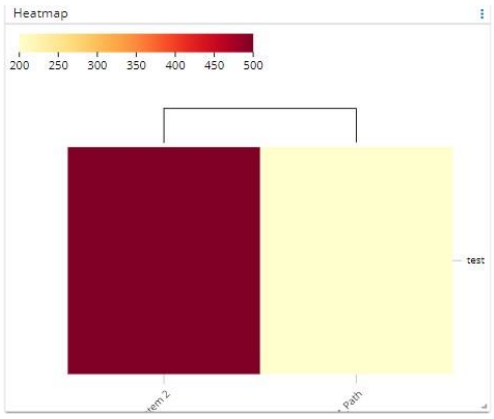

Figure 322: Dendrogram

11.2.15 Plotter Chart

Plotter chart is used to view live single valued data from data sources.

To add the Plotter Chart widget to the dashboard:

1 Click **Add widget** button at the top-right corner on the home page. Refer to Figure 216: Add Widget
2 It will open **Add Widget** dialog box displaying list of widgets. Refer to Figure 217: Widget List
3 Select **Plotter Chart** radio button, under the **Chart Widgets** section and click '**NEXT'**. Refer to Figure 323: Plotter Chart

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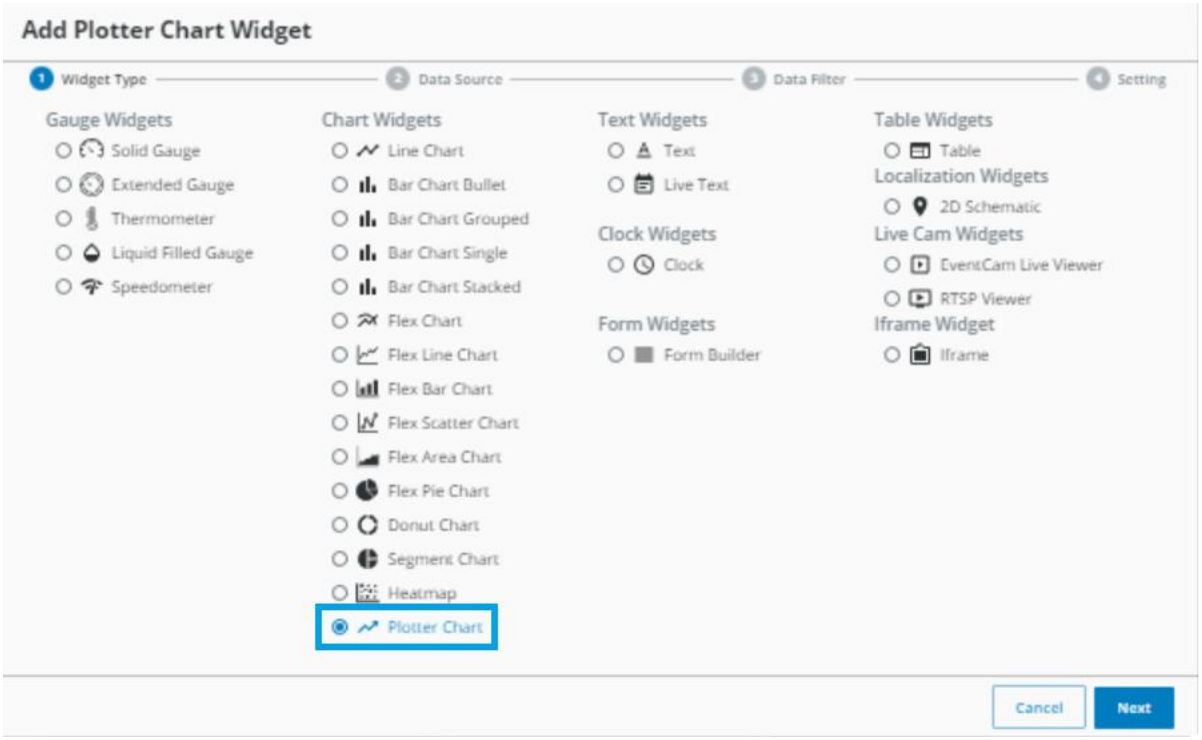

Figure 323: Plotter Chart

4 It will navigate to the Data Source configuration workflow. Refer to Figure 324: Add Plotter

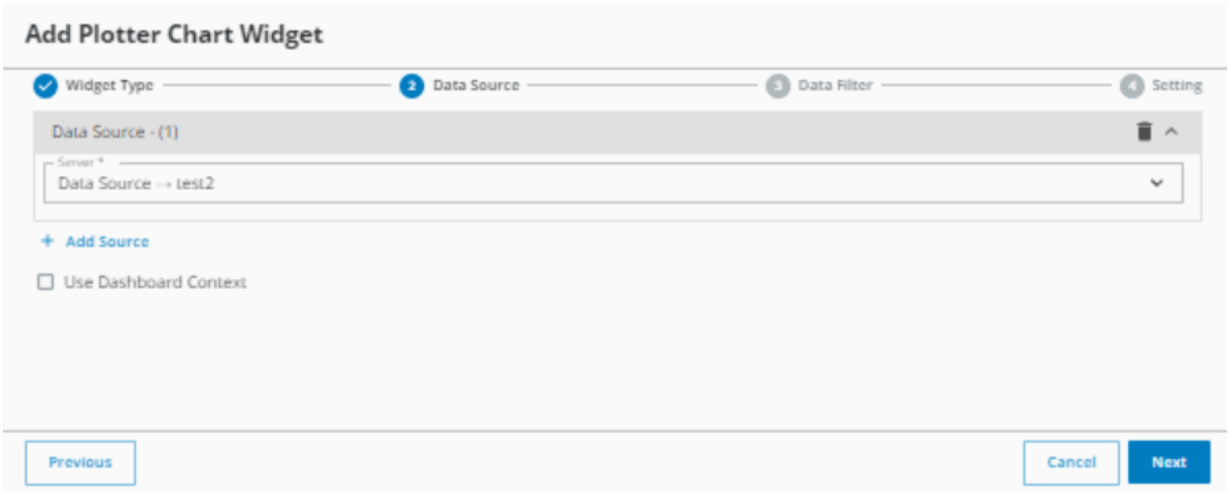

Figure 324: Add Plotter

The following fields will need to be configured as required:

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e. **Data Source**: The data source from where the data is acquired (**Data Source – Data, Reports & Historian)**

f. **Add Data Source:** Data Source 2 will display with same fields to configure

5 Click the **Next** button.

6 It will navigate to the Data Filter section. Select the field value from the API response to display (Widget will function as per the selected value) in **Value** field and provide a unique name in the **Name** field.

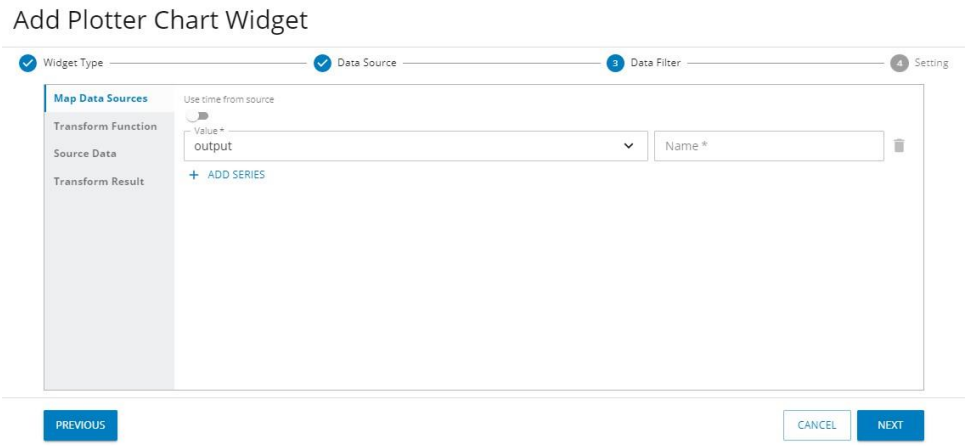

Figure 325: Widget Data Filter

To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8. MapDataSources

7 Click the **Next** button to move to the next section

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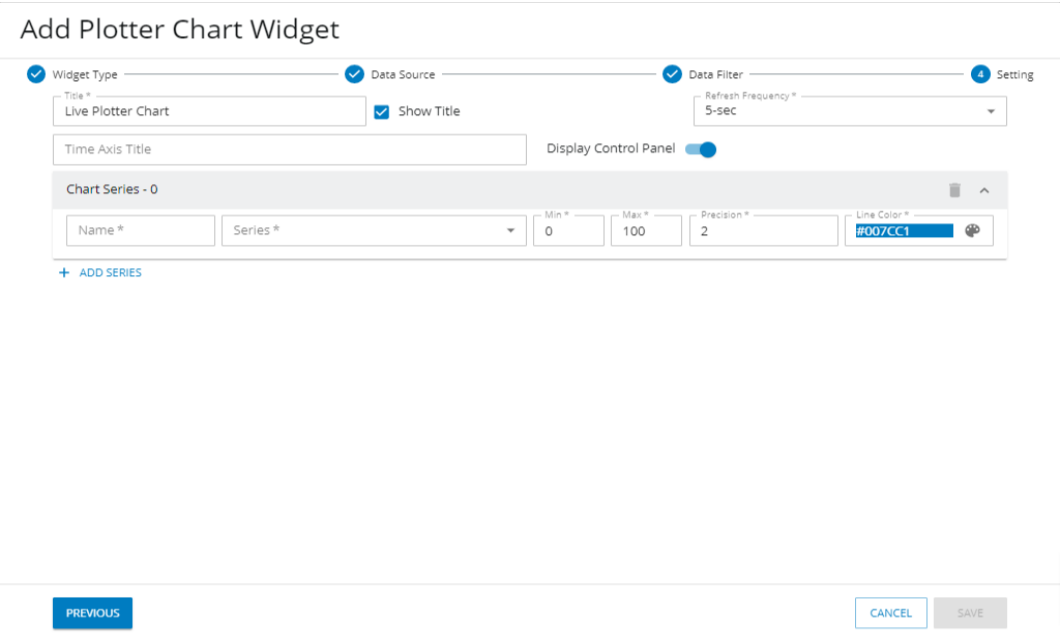

Figure 326: Widget Settings

The following fields will display and needs to be configured as required:

- **a. Title**: This will be the title of the widget
- **b. Show Title (Checkbox)**: The widget title will be displayed if the checkbox is checked, else it will not be displayed
- c. **Refresh Frequency**: This will set the refresh frequency of the widget
- **d. Time Axis Title**: This will be the title of the Time Axis
- **e. Display Control Panel**: This will display the controls on the chart like Zoom, pan data from left to right, pause data update, resize, or reset the scale of the chart
- **f. Chart Series Configuration**: Set the following parameters to configure the series
  - **i. Name:** This will be the name of the series
  - **ii. Series:** This will set the chosen value parameter
  - **iii. Min:** This will set the minimum range of the value that is selected for the widget to display
  - **iv. Max:** This will set the maximum range of the value that is selected for the widget to display
  - **v. Precision:** Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0
  - **vi. Line Color**: This will set the color of the line

8 Click the **Save** button.

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9 Field Analytics will add the **Plotter Chart widget** as configured by the user on the Dashboard. Refer to Figure 327: Plotter Chart.

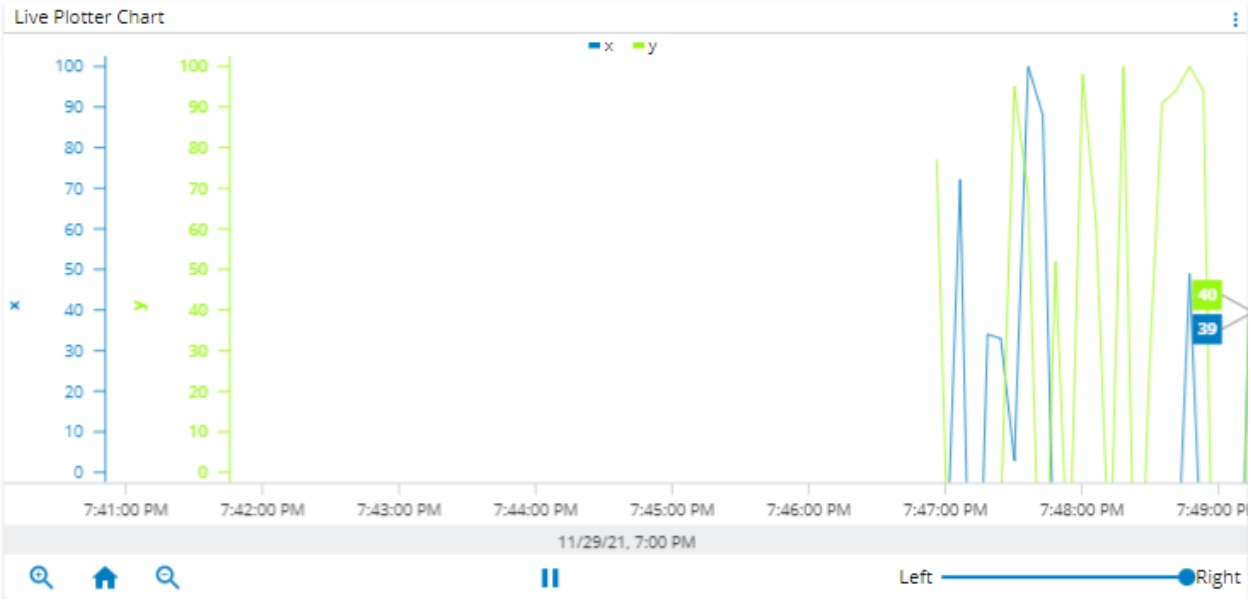

Figure 327: Plotter Chart

11.3 Text Widgets

The Text Widget displays text in the dashboard.

11.3.1 Text

To Add the Text Widget:

1. Click **Add widget** button at top-right corner. Refer to Figure 216: Add Widget
2. It will display list of widgets. Refer to Figure 217: Widget List
3. Select **Text widget** and click the **Next** button. Refer to Figure 328: Text Widgets

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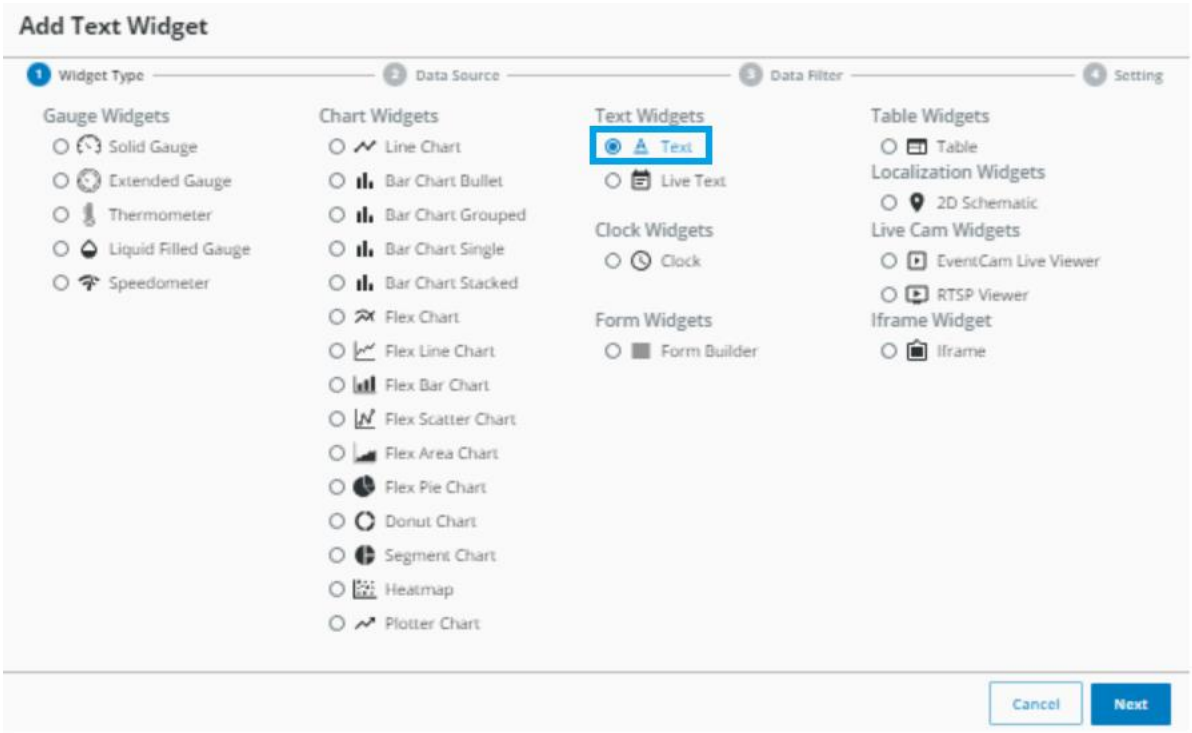

Figure 328: Text Widgets

4. It will display Text widget dialog box. Refer to Figure 329: Text Widgets display
   It consists of following fields
   a. **Title:** User can define the Title Bar of the Text widget
   b. **Show Title**: User can decide to show or hide the Title bar by selecting/deselecting the checkbox. By Default, it is selected
c. **Text Settings**: User can define and format the text, images, etc. as per user preferences

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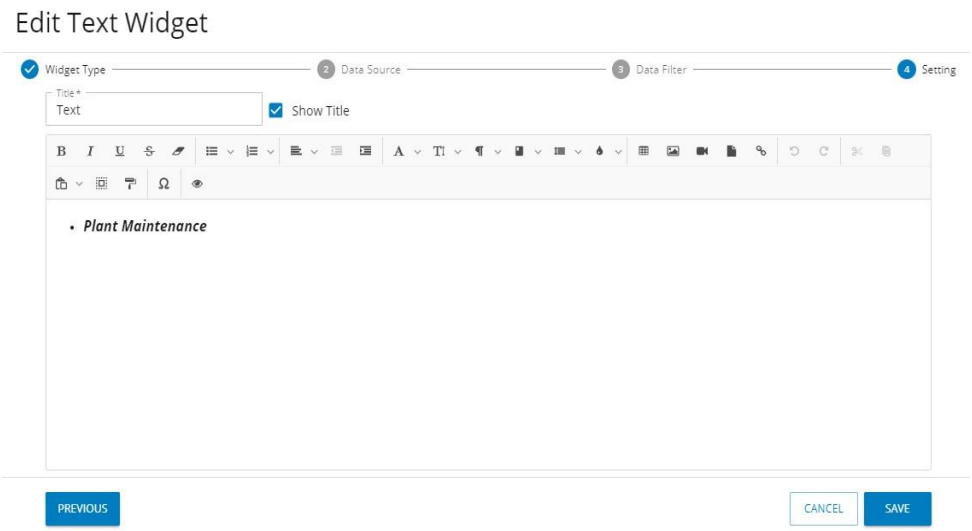

Figure 329: Text Widgets display

5. Enter the text in the writing area and click save to display in the dashboard. Refer to Figure 330: Text Widgets in Dashboard

Figure 330: Text Widgets in Dashboard

11.3.2 Live Text

Live Text Widget allows for the display of structured data and user-defined threshold monitoring.

To add the Live Text Widget:

2. Click **Add widget** button in the top-right corner. Refer to Figure 216: Add Widget
3. It will open a screen with list of widgets. Refer to Figure 217: Widget List
4. Select the '**Live Text'** radio button, under **Text Widgets** section. Click the **Next** button. Refer to Figure 331: Live Text

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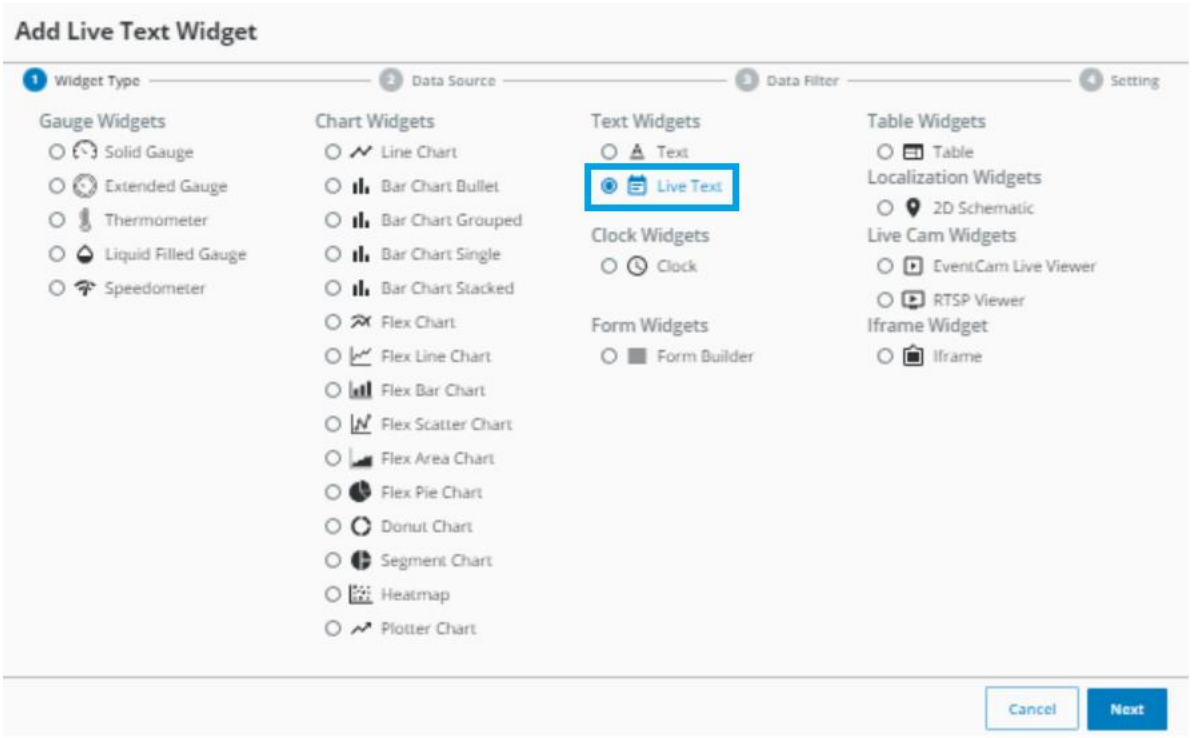

Figure 331: Live Text

5. It will navigate to the Widget Type section. Refer to Figure 332: Add Live Text. For contexting, refer to Section 11.9.

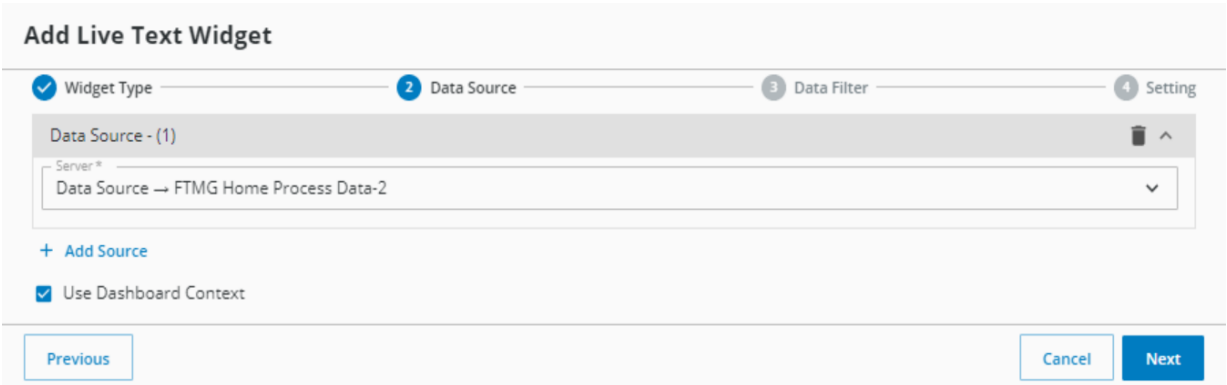

Figure 332: Add Live Text

The following fields will need to be configured as required:

a. **Data Sources**: The data source from where the data is acquired (can be from **Data Source**, **Reports**, **Historian**)

b. **Add Data Source:** Data Source 2 will display with same fields to be configured

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6. Click on the **Next** button
7. It will navigate to Data Filter. Refer to Figure 333: Widget Data Filter-1
8. Click **Add Parameter** to define the parameters
9. **Define Parameter** fields appear:
   a. **Parameter**: Provide unique parameter name
   b. **Source Data**: Select data source parameters listed in drop-down from the API response

Note: *User can click* ***Add Parameter*** *to add more parameters as per preference.*

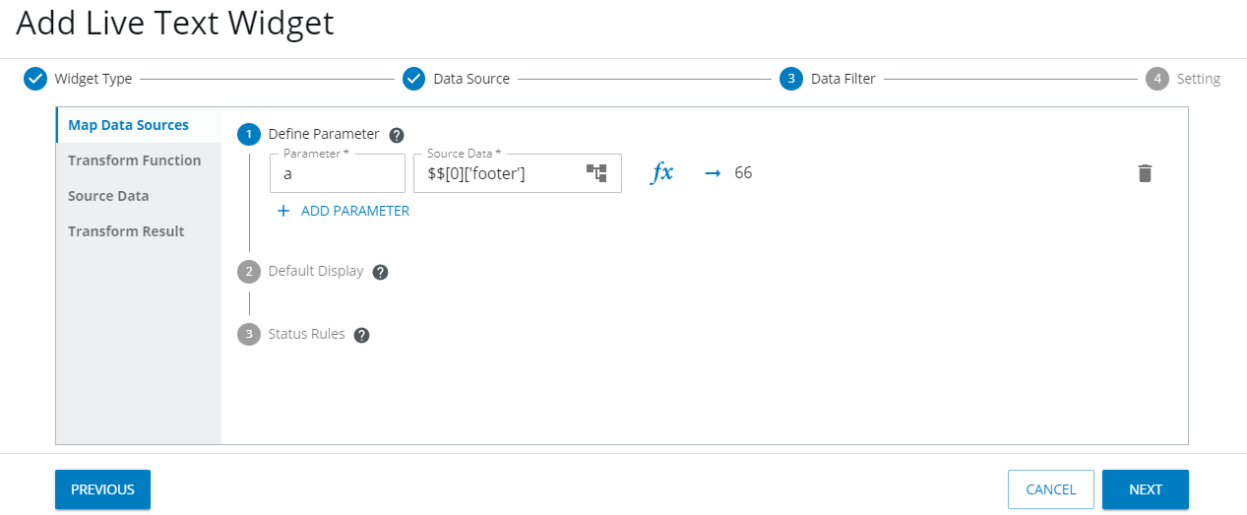

Figure 333: Widget Data Filter-1

10. Click **Default Display** to define the values to displayed on the widget and provide the following fields:
    a. Value Prefix: Provide string or number for value prefix
    b. Value: Select the value from drop-down listed as per the data source API response
    c. Value Postfix: Provide string or number for value postfix
    d. Footer Prefix: Provide string or number for footer prefix
    e. Value: Select the value from drop-down listed as per the data source API response
    f. Footer Postfix: Provide string or number for footer postfix

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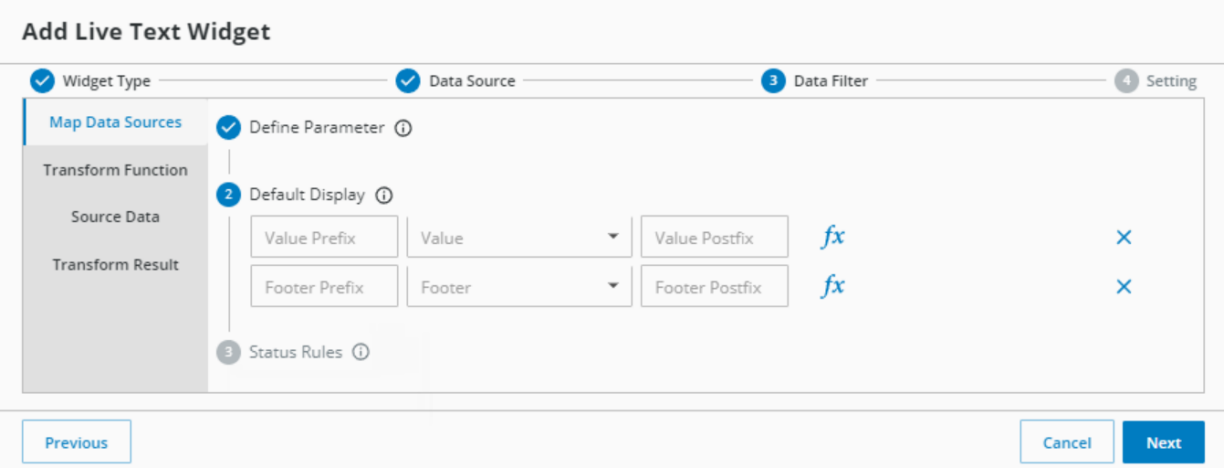

Figure 334: Widget Data Filter-2

11. Click **Add Rule** under Status Role to set the rules for displaying the warning or alert states. It displays two options that are **Add Warning State** and **Add Alert State**

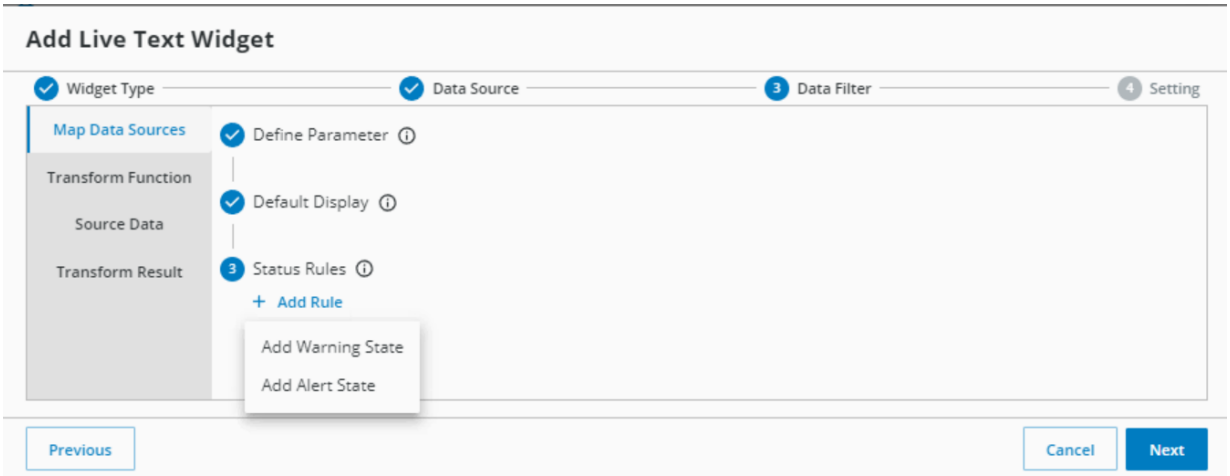

Figure 335: Status Rules

12. When Add Warning State is selected, user can either Add rule or add group and select the field from the drop-down list
13. Provide following fields:
    a. **Value Prefix:** Provide string or number for value prefix
    b. **Value:** Select the value from drop-down listed as per the data source API response
    c. **Value Postfix:** Provide string or number for value postfix
    d. **Footer Prefix:** Provide string or number for footer prefix
    e. **Value:** Select the value from drop-down listed as per the data source API response
    f. **Footer Postfix:** Provide string or number for footer postfix

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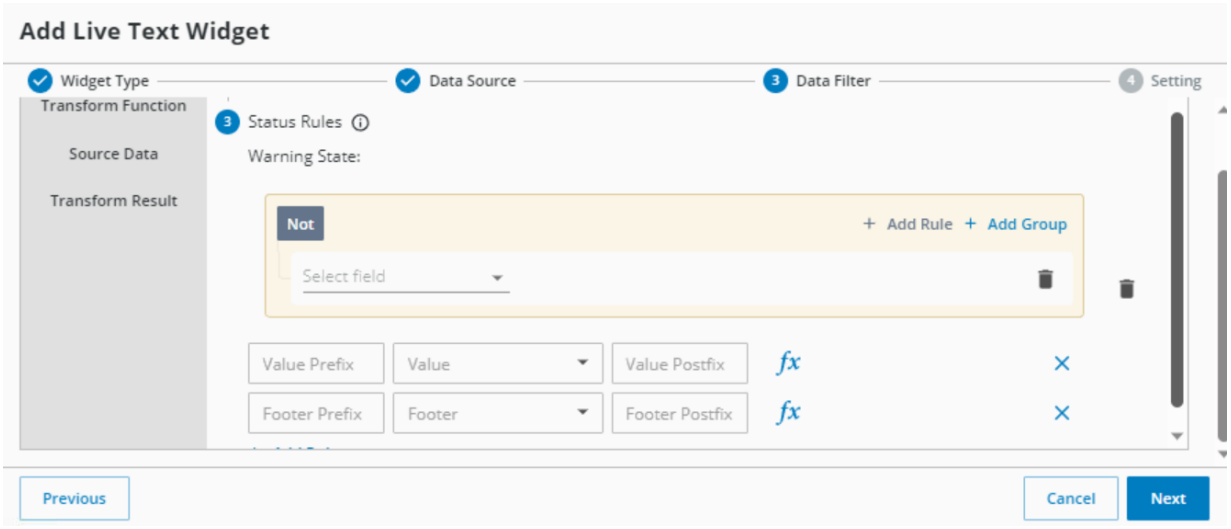

Figure 336: Warning State

14. Similarly for Alert state, define as shown above for warning state

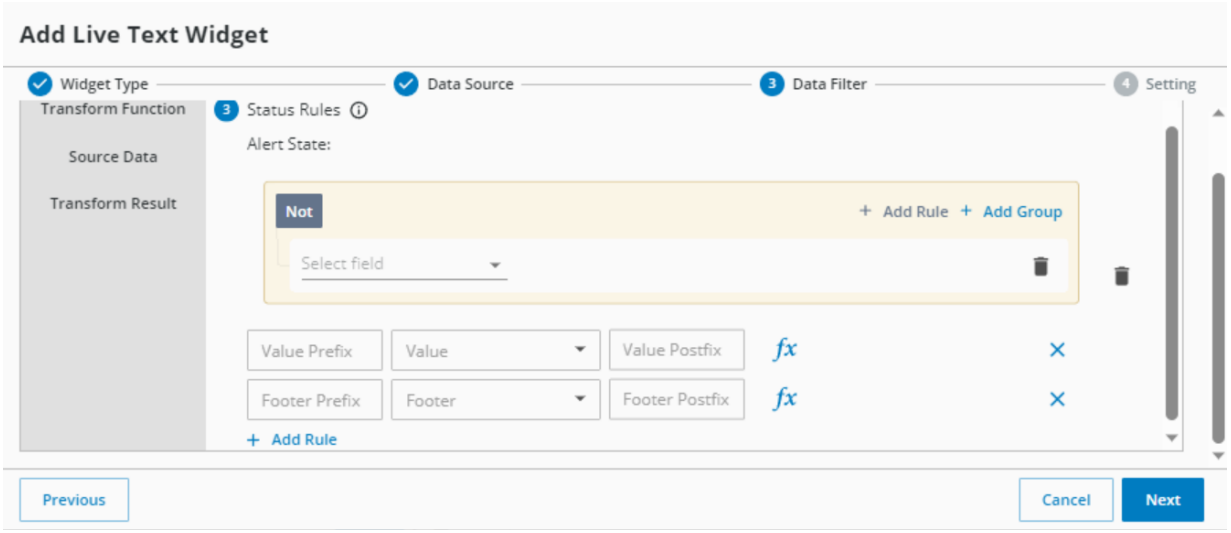

Figure 337: Alert State

To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8.

15. Click the **Next** button to move to the next section
16. Field Analytics will move to the setting section where settings related to widget display are managed. Refer to Figure 338: Widget Settings

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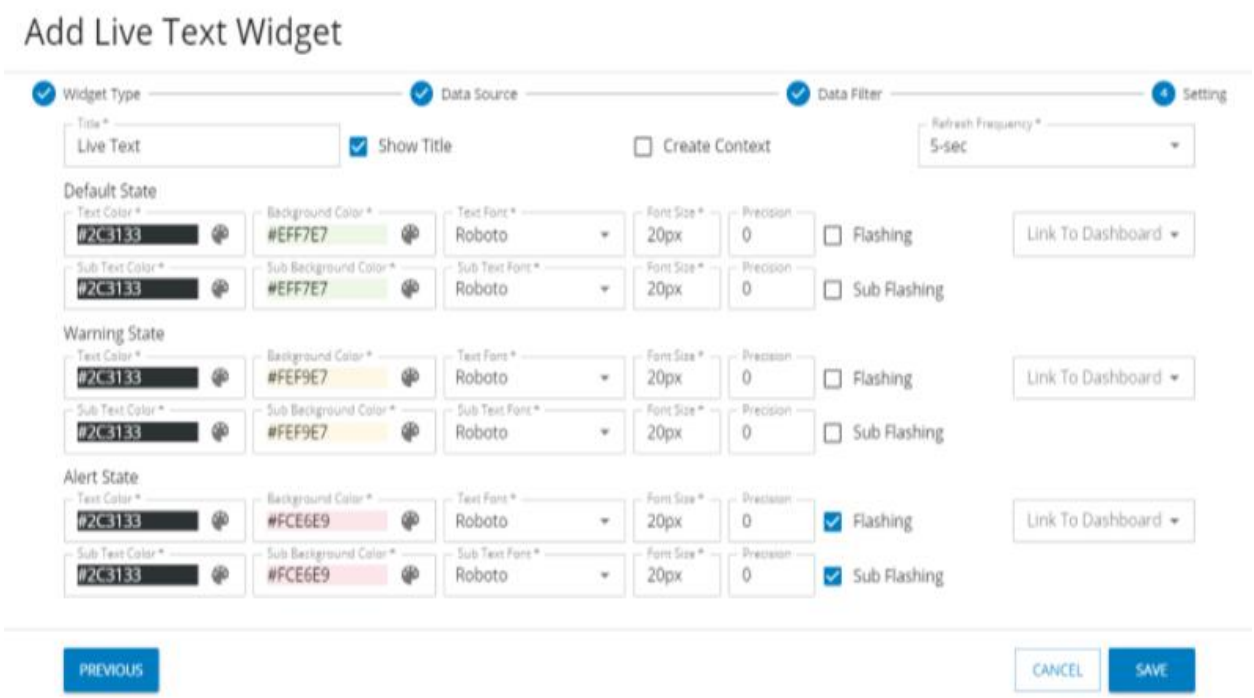

Figure 338: Widget Settings

The following fields will need to be configured as required:

a. **Title**: This will be the title of the widget
b. **Show Title** (Checkbox): The widget title will be displayed if the checkbox is checked, else it will not be displayed
c. **Text Color-** Select the live text color by clicking on Palette icon or by entering the color code on the text box. **#2C3133 should be selected by default**
d. **Background color**- Select the background color for the live text by clicking on Palette icon or by entering the color code on the text box. **#EFF7E7 should be selected by default**
e. **Text Font –**Where we can select the Text Font for the live text from the Drop down accordingly. **Open Sans should be selected by default**
f. **Font Size-**Where we can select the font size for the live text.**20 should be displayed by default**
g. There should be '**Flashing'** option for Live text with checkbox. Enables widget area with the text to flash constantly if matches with the state configured with Flashing.
h. **Text Color-** Select the color for the text by clicking on the Palette icon or by entering the color code. **#2C3133 should be selected by default**
i. **Background color-** Select the ~~sub~~ background color by clicking on Palette icon or by entering the color code on the text box. **#EFF7E7 should be selected by default**

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j. **Precision:** Decimal precision to be displayed. (Default is 3 decimals of precision). For zero decimals of precision, set the value to 0

k. There will be **'Sub Flashing'** option for Sub text of live text with checkbox. Sub flashing is for the footer text. Enables widget area with the text to flash constantly if matches with the state configured with Flashing. This has higher rate of flashing frequency that value field

Note: *It is mandatory to check the 'Create Context' checkbox in the widget settings if the user want to pass the context to other dashboards otherwise the context is not visible even if the dashboard is linked in the widget settings.*

l. **Link to Dashboard**: User can select from list of dashboard to be linked to the state. User should be able to click and navigate to the dashboard if displayed with linked state after configuration is completed.

Note: *More than one dashboard should be present to be populated on the list. If one dashboard present then user should have the ability to just select "Return to Previous page" option in dropdown. Update similar parameters for Warning State and Alert state sections*

17. Click the **Save** button
18. Field Analytics will add '**Live Text'** widget as configured by the user on the Dashboard

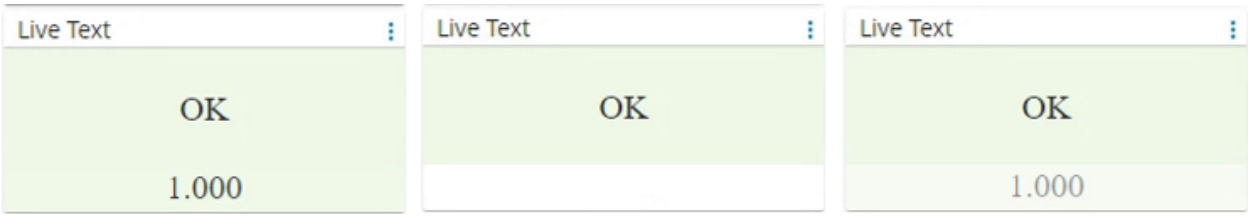

Figure 339: Flashing and sub-flashing in Live Text Widget

11.4 Clock Widgets

11.4.1 Clock

Analog & Digital Clock-Time and Date (12 and 24-hour scaling).

To add clock widgets in dashboard:

1. Click **Add widget** button at top-right corner. Refer to Figure 216: Add Widget
2. It will display list of widgets. Refer to Figure 217: Widget List
3. Select **Clock widget** and click **Next**. Refer to Figure 340: Clock Widgets

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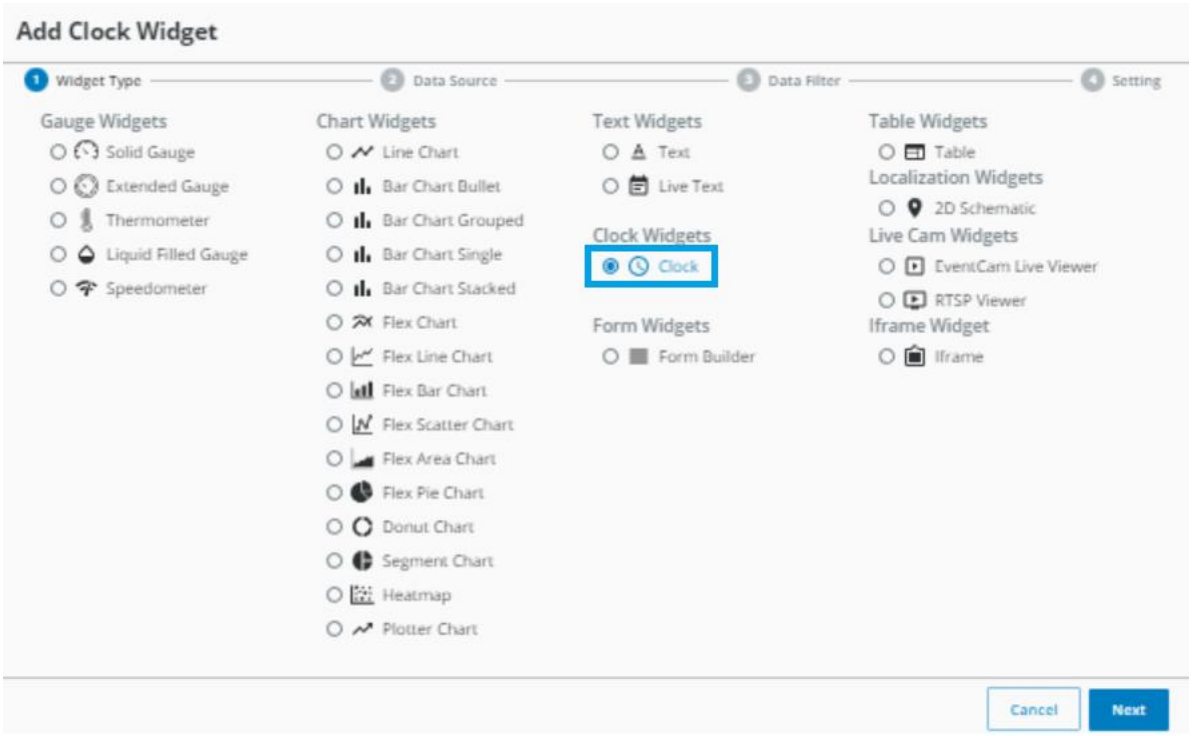

Figure 340: Clock Widgets

4. Select **Country** and **Time Zone** and click '**Next**' button. Refer to Figure 341: Widgets Data Filter

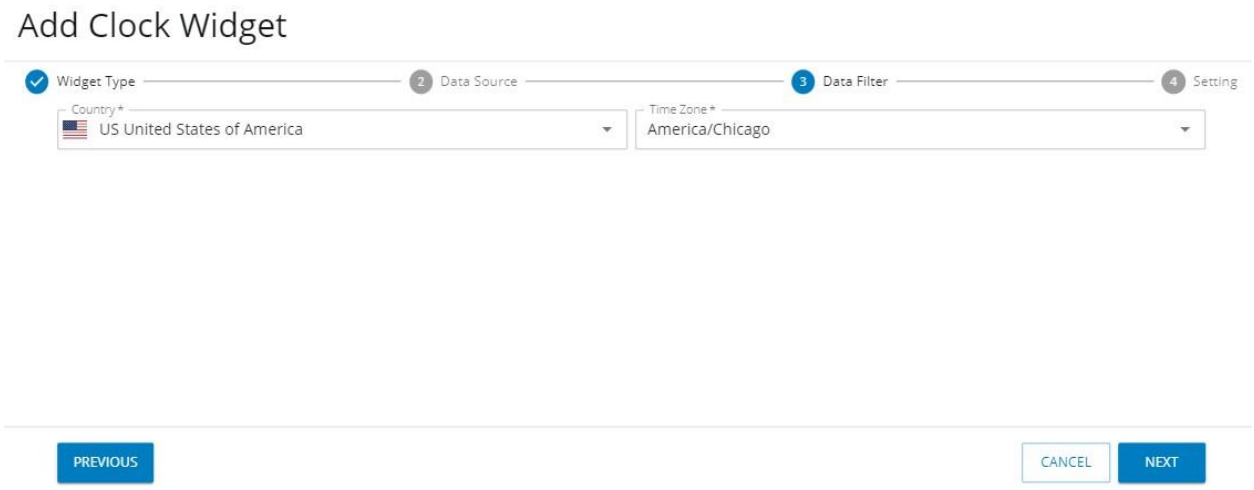

Figure 341: Widgets Data Filter

Following fields will need to be configured as required. Refer to Figure 342: Clock Settings.

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- **Title:** Title for the Clock with **Show Title** and **Show Footer** options
- **Clock Type:** Users can select the Clock Type as Digital or Analog style
- **Digital Clock Format:** Users can select Digital Clock as clock type

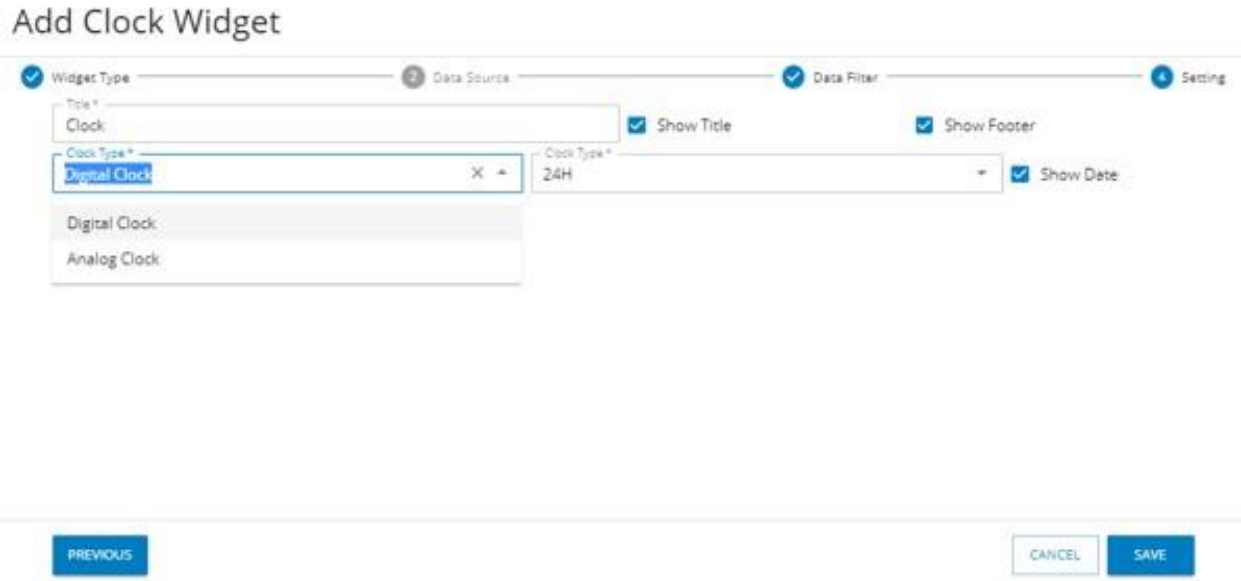

Figure 342: Clock Settings

4 **Clock Type Hours:** User can select Hours as 24H or 12H

5 **Show Date:** It would display the Date in addition to time on the Digital clock if the option selected

6 Click the **Save** button

7 It will add **Clock** widget as configured by the user on the Dashboard. Refer to Figure 343: Digital Clock

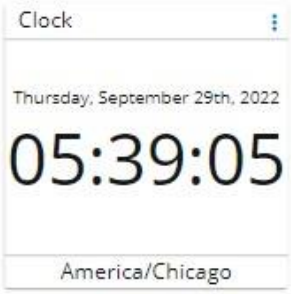

Figure 343: Digital Clock

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Analog Clock Format – This is a simple clock presenting on a 12-hour scale.

8 Users can select clock type as Analog. Refer to Figure 344: Add Analog Clock Widget
9 Click the **Save** button
10 It will add **Clock** widget as configured by the user on the Dashboard. Refer to Figure 345: Analog Clock

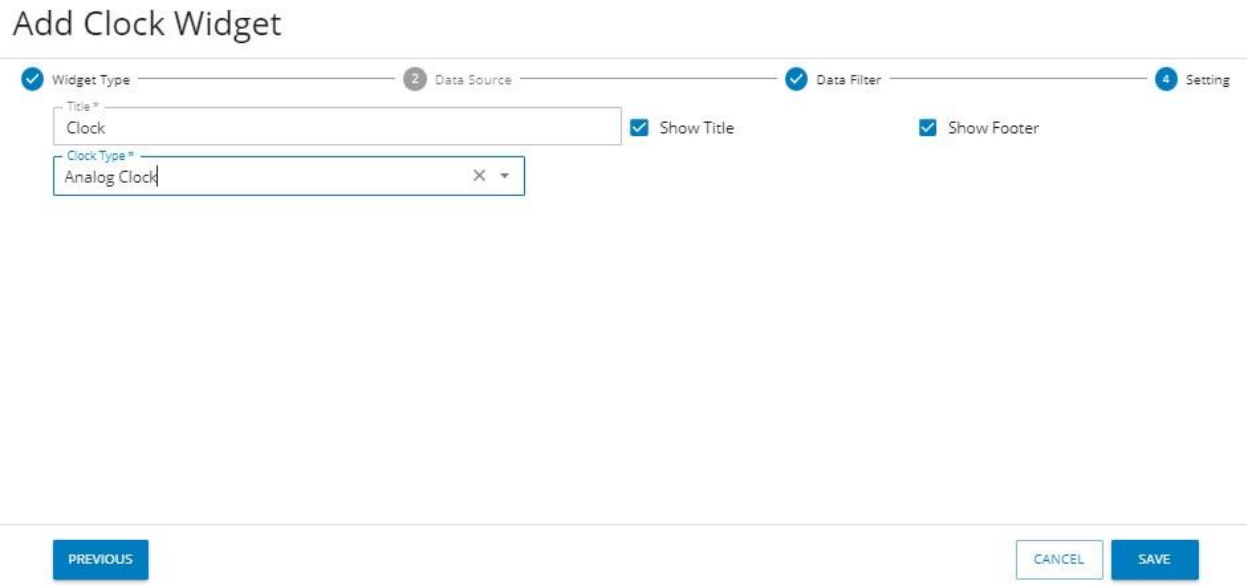

Figure 344: Add Analog Clock Widget

Figure 345: Analog Clock

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11.5 Form Widgets

11.5.1 Form Builder

Form builder helps user to form placeholders from which data is pushed to the application using action buttons.

To add Form Builder widgets

1 Click **Add widget** by clicking on '**Add Widget**' button at the top-right corner on the home page. Refer to Figure 216: Add Widget
2 It will open **Add Widget** dialog box displaying list of widgets. Refer to Figure 217: Widget List
3 Select **Form Builder** radio button, under the **Form Widgets**, and click the **Next** button. Refer to Figure 346: Form Builder Widget

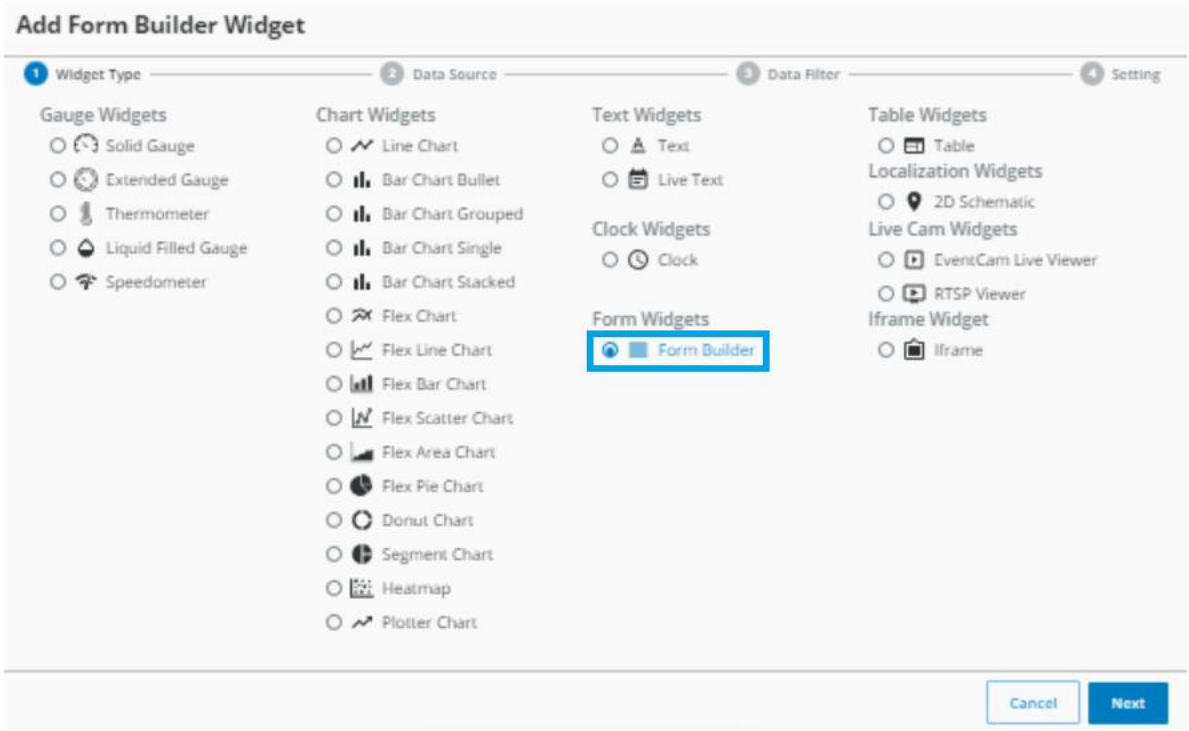

Figure 346: Form Builder Widget

4 The Field Analytics will navigate to the Data Source section where the source of data is configured. Refer to Figure 347: Form Builder Data Source. For contexting, refer to Section 11.9

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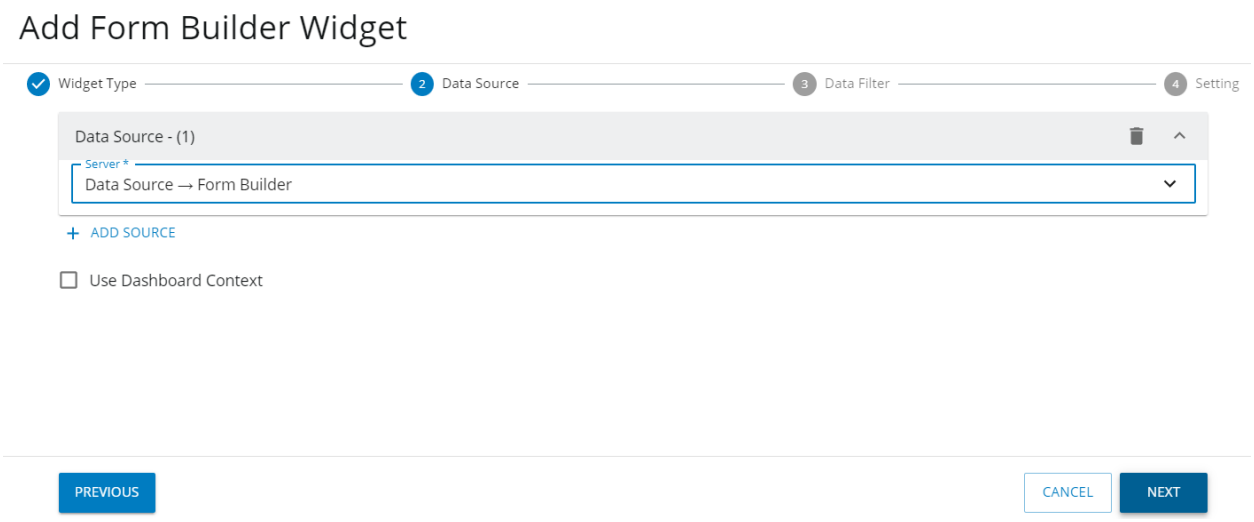

Figure 347: Form Builder Data Source

The following fields will need to be configured as required:

a. **Data Sources**: The data source from where the data is acquired (can be from **Data Source**, **Reports**, **Historian**)

b. **Add Data Source:** Data Source 2 will display with same fields to be configured

5 Click on '**Next'** button**,** it will navigate to data filter page. Refer to Figure 348: Form Builder Data Filter

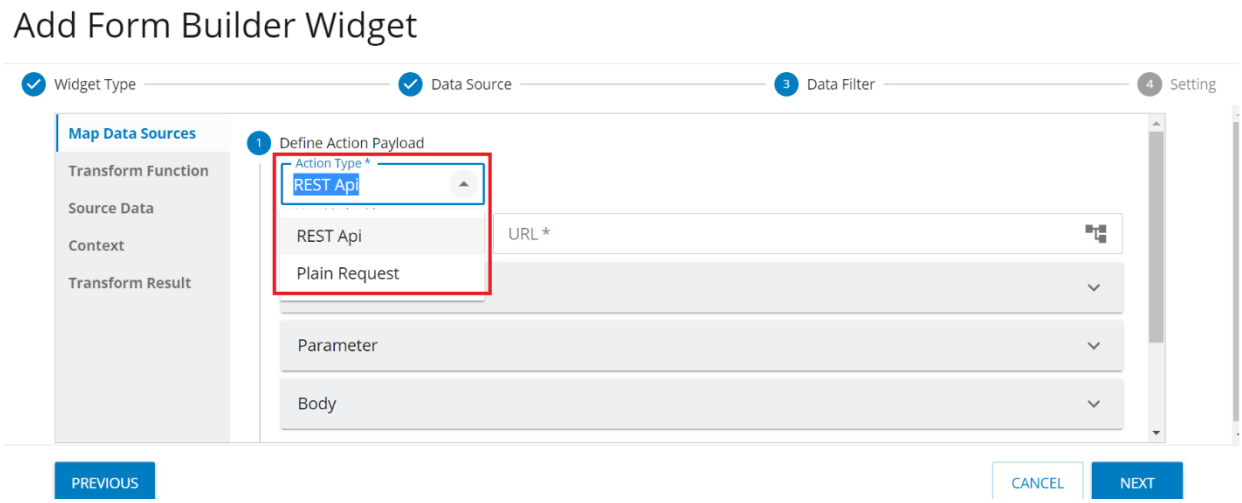

Figure 348: Form Builder Data Filter

The following fields will need to be configured as required:

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I. **Map Data Sources > Data Action Payload > Action Type**: It defines the form action. There are two action types that are **RestAPI** and **Plain Request**. If user selects action type as **RestAPI** then action for the form is to make REST API call

II. **URL**: Provide the URL

III. **Header**: Add **Key** and **Value** in case header information is required to access the API URL

IV. **Parameter**: Add **Key** and **Value** in case additional parameters are required to access the API URL

V. **Body:** Add "**JSON**" body format

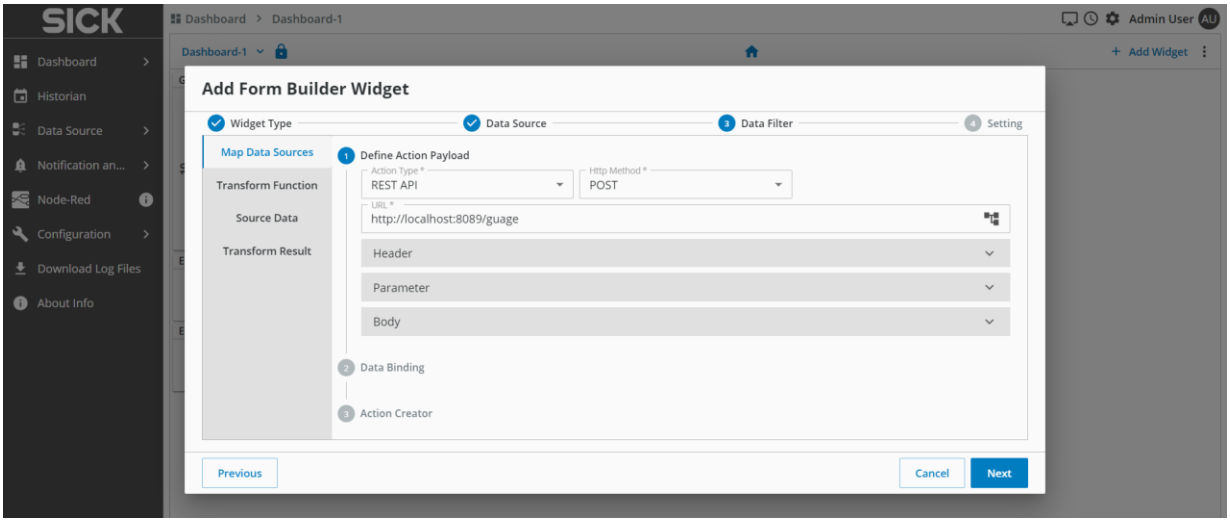

Figure 349: Rest API Type

VI. If user selects action type as **Plain Request,** then action for the form is to bypass the payload and provide "**JSON**" Body

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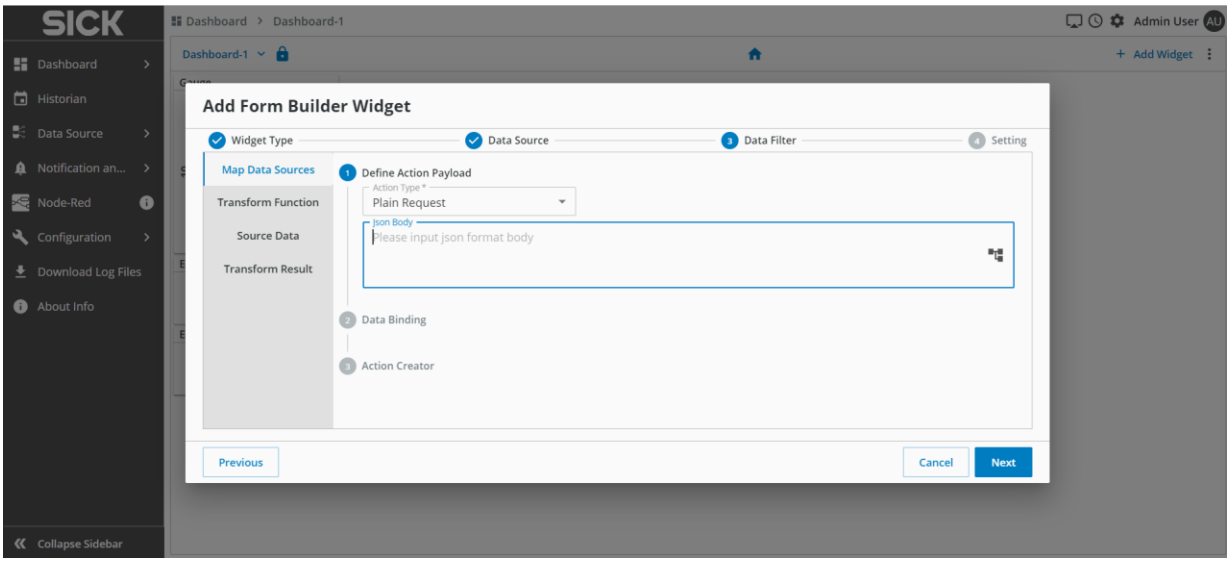

Figure 350: Plain Request Type

To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8.

6 Click the **Next** button it will navigate to setting page. Refer to Figure 351: Form Builder Data Setting

Note: Refer to Section 11.9 for contexting and Section 11.10.2 for widget contexting.

7 Select preferred layout from layouts displayed in the settings screen like **Smaller, Small, Medium, Large** for better appearance of the widget based on the elements in the form

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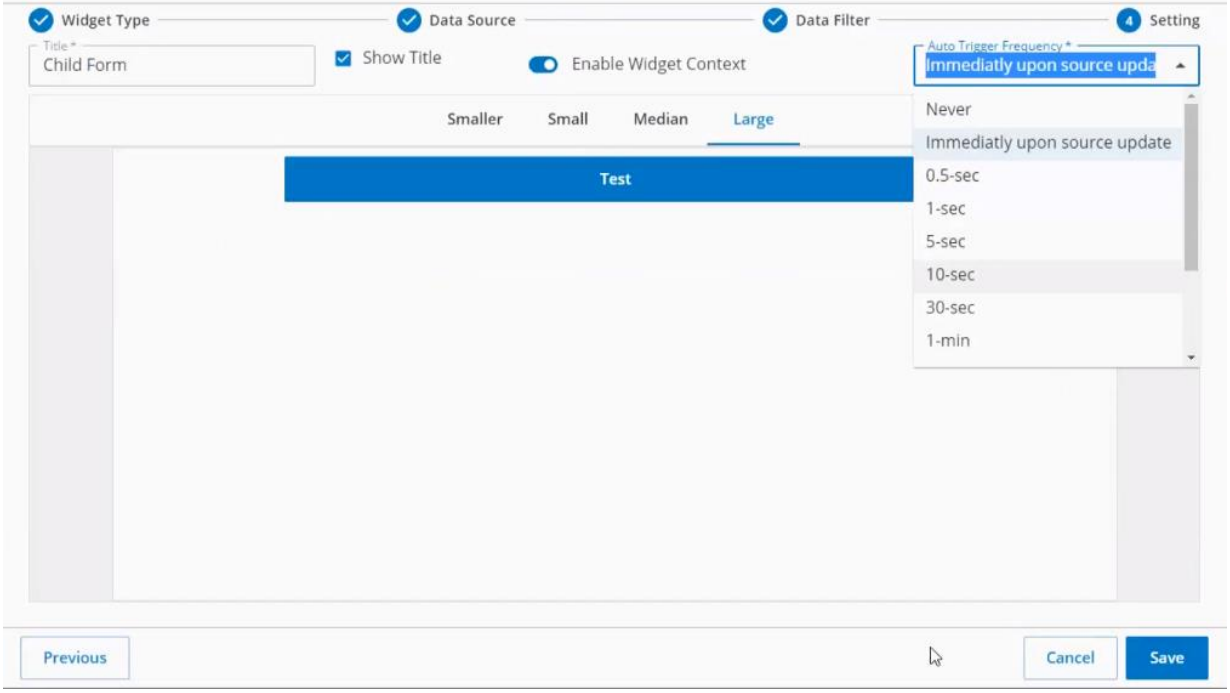

Figure 351: Form Builder Data Setting

8 User can edit the form builder widget by clicking on the vertical ellipsis on the widget and select '**Edit'** option from the list

9 Click the **Save** button to save the changes, '**Cancel'** to cancel the changes and '**Previous'** to return to previous pages

10 It will display in Dashboard

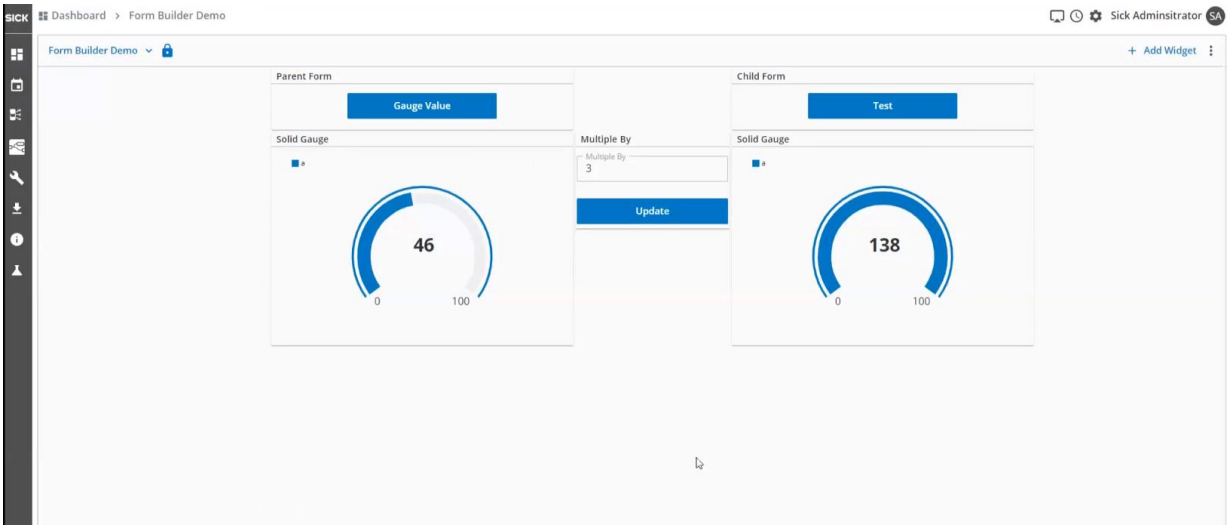

Figure 352: Form Builder Widget

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Note: The basic validation on the form is validated based on the minimum and maximum values provided in regular expression chart of input type in the Transform Function.

Form Builder Widget also has the ability to modify the part of URL segment. For example, as shown in Figure 353: Example of Support Dynamic URL-1 and Figure 354: Example of Support Dynamic URL-2. To view the data of different systems, user can modify part of URL i.e., system id number in the URL in Transform function.

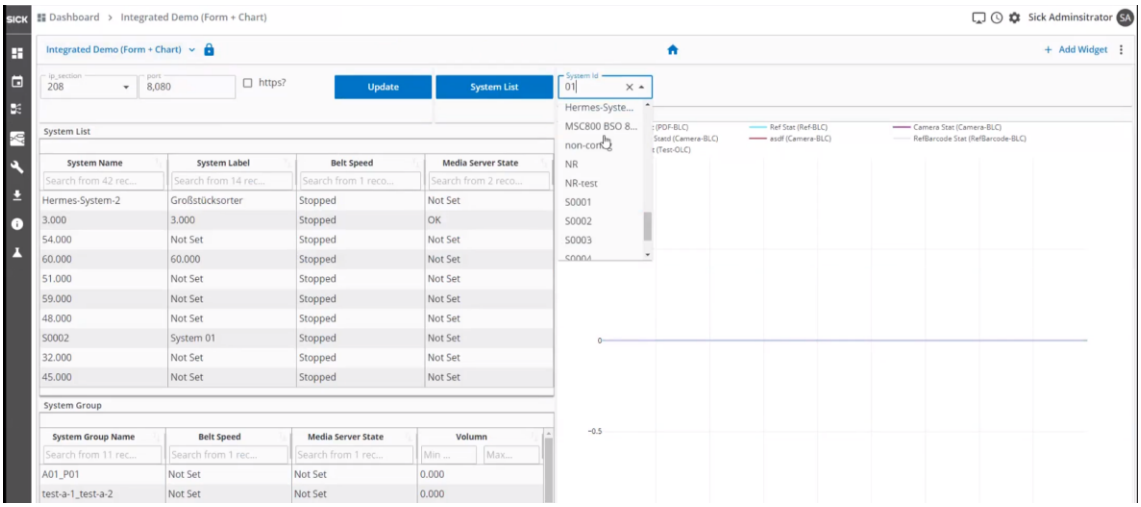

Figure 353: Example of Support Dynamic URL-1

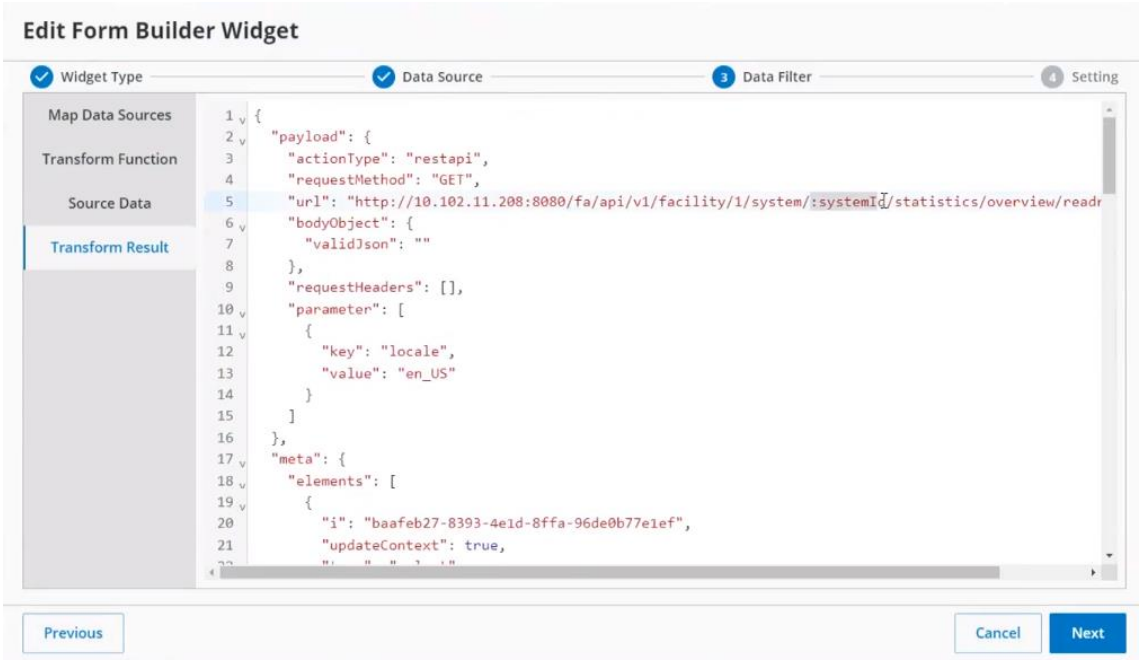

Figure 354: Example of Support Dynamic URL-2

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11.6 Table Widgets

Users can easily compare current data value across multiple data values

11.6.1Table

To add table widgets:

1 Click **Add widget** button at the top-right corner on the home page. Refer to Figure 216: Add Widget
2 It will open **Add Widget** dialog box displaying list of widgets. Refer to Figure 217: Widget List
3 Select **Table** radio button, under the **Table widgets** section, and click **NEXT**. Refer to Figure 355: Table Widget

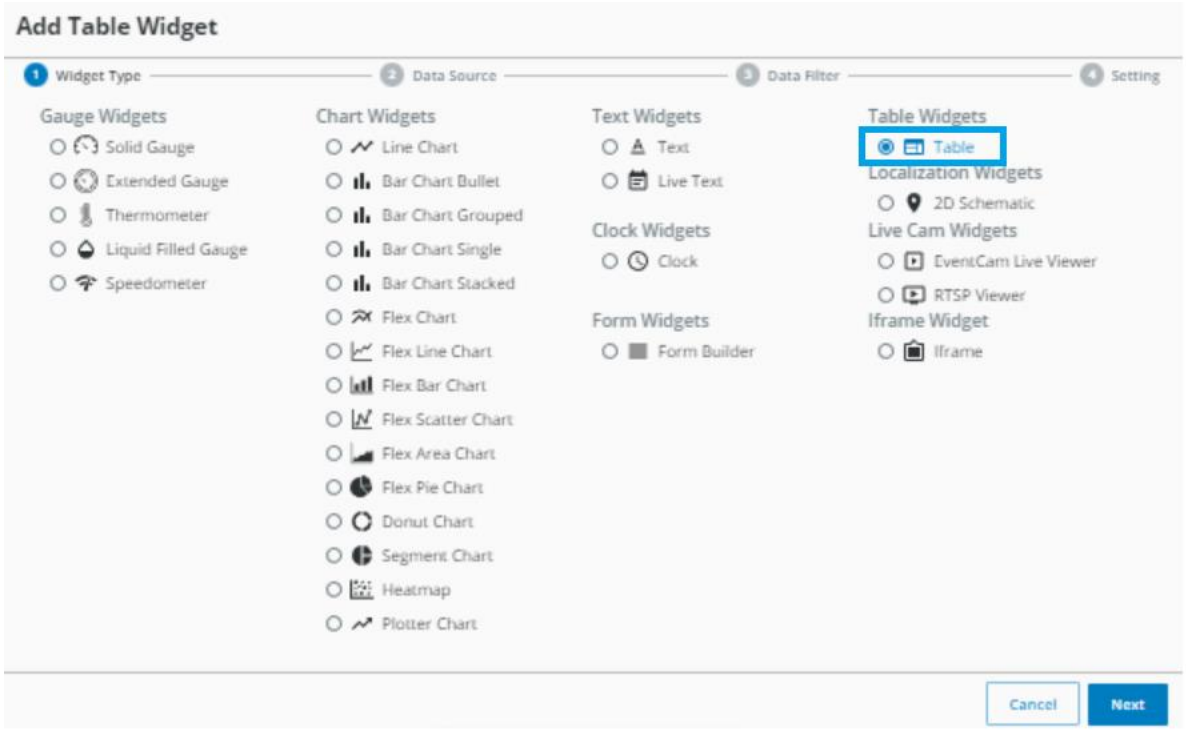

Figure 355: Table Widget

4 The Field Analytics will navigate to the Data Source section where the source of data is configured

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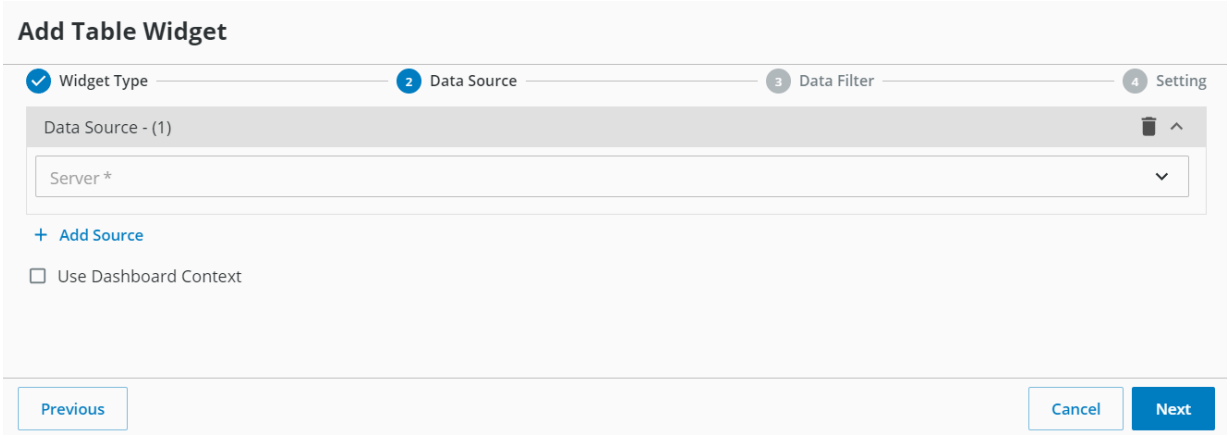

Figure 356: Add table Widget

The following fields will need to be configured as required:

a. **Data Sources**: The data source from where the data is acquired (can be from **Data Source**, **Reports**, **Historian**)

b. **Add Data Source:** Data Source 2 will display with same fields to be configured

5 Click the **Next** button. It will navigate to Data filter section

6 Following fields display:

a. **Array Path**: Select Array path from drop-down

b. **Identifier**: Provide a unique name in identifier field

c. **Value Set**: Select a value from the drop-down

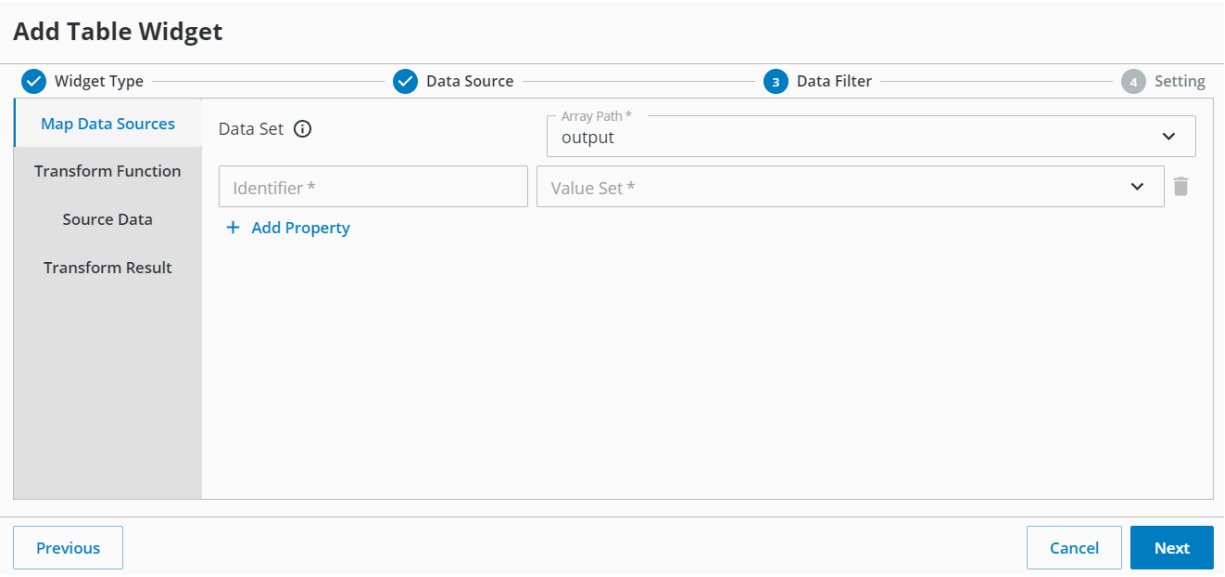

Figure 357: Add Table Widget Source

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To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8.

7 Click the **Next** button and it navigates to **Setting** page

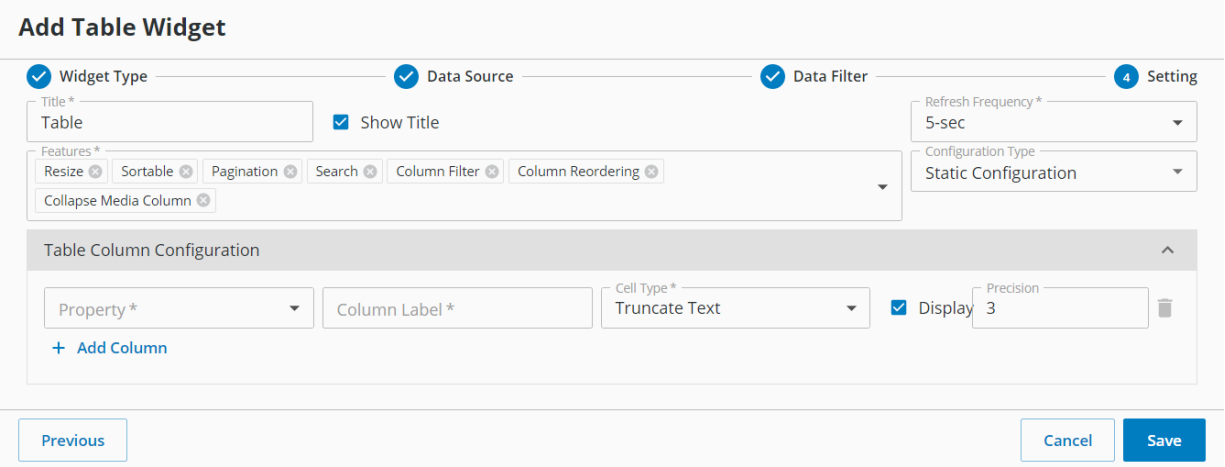

Figure 358: Table Widget Static Configuration Settings

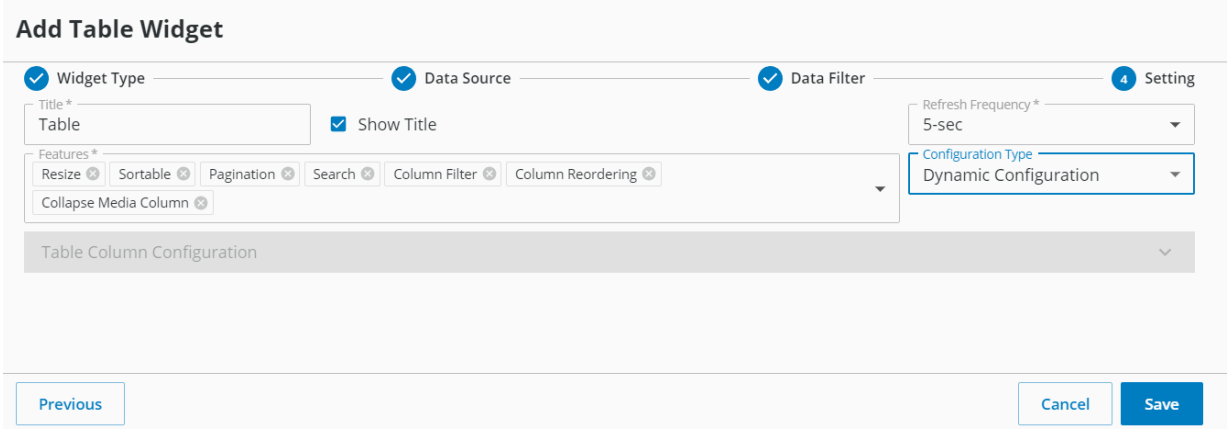

Figure 359: Dynamic Configuration Widget Settings

Following fields will display and needs to be configured as required:

a. Title: This will be the title of the widget
b. Show Title (Checkbox): The widget title will be displayed if the checkbox is checked, else it will not be displayed
c. **Refresh Frequency:** This will set the data refresh frequency/update to the widget
d. **Features**: This feature enables user to interact with the table

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e. **Configuration Type:** There are two types of configurations that are static and dynamic. Dynamic Configuration is not user-defined. The widget automatically configures all the static series items based on the number of data arrays received from the source. By default, static configuration fields display, configure the parameters as following:
   I. **Table Column**: Set the following parameters to configure the column in the table
   II. **Property:** This will be the property of the column
   III. **Column Label**: This will set the name of the column
   IV. **Cell Type**: This will set the type of cell
   V. **Precision**: The default decimal of precision is 3 decimal places. If the user doesn't want the decimal precision, then he should set the value to 0

8 Click the **Save** button

9 Field Analytics will add **table widget** as configured by the user on the Dashboard

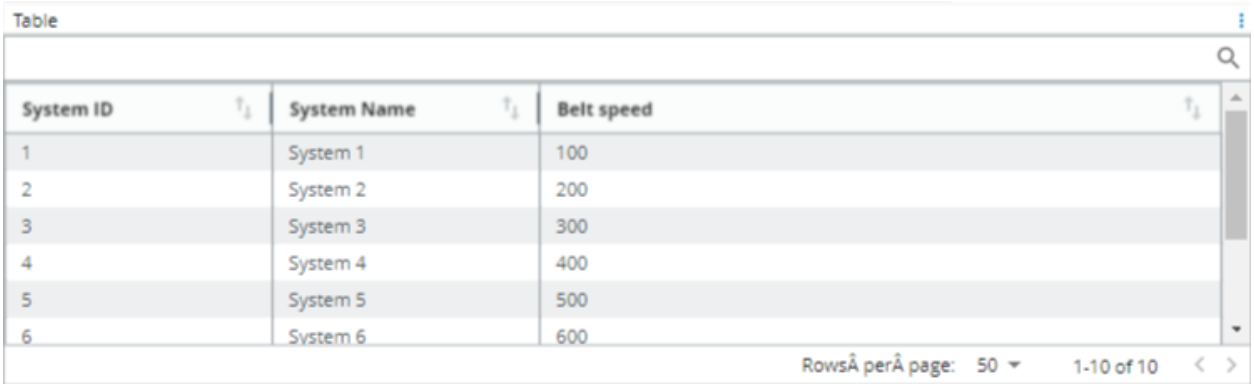

Figure 360: Table

11.7 Localization Widget

11.7.12D Schematic

Localization widget helps in locating the position of the pois on the field. It has capability of building an application and can navigate through it. On the schematic, user can add the icons related to the pois and drill into it further for more details by the linked widgets.

1. To create schematic widget, click the '**Add Widget'** button from the top-right corner of the homepage. Refer to Figure 216: Add Widget
2. It will open '**Add Widget**' dialog box with list of widgets. Refer to Figure 217: Widget List
3. Select '**2D Schematic**' radio button under the '**Localization Widgets'** and click on '**Next'** button

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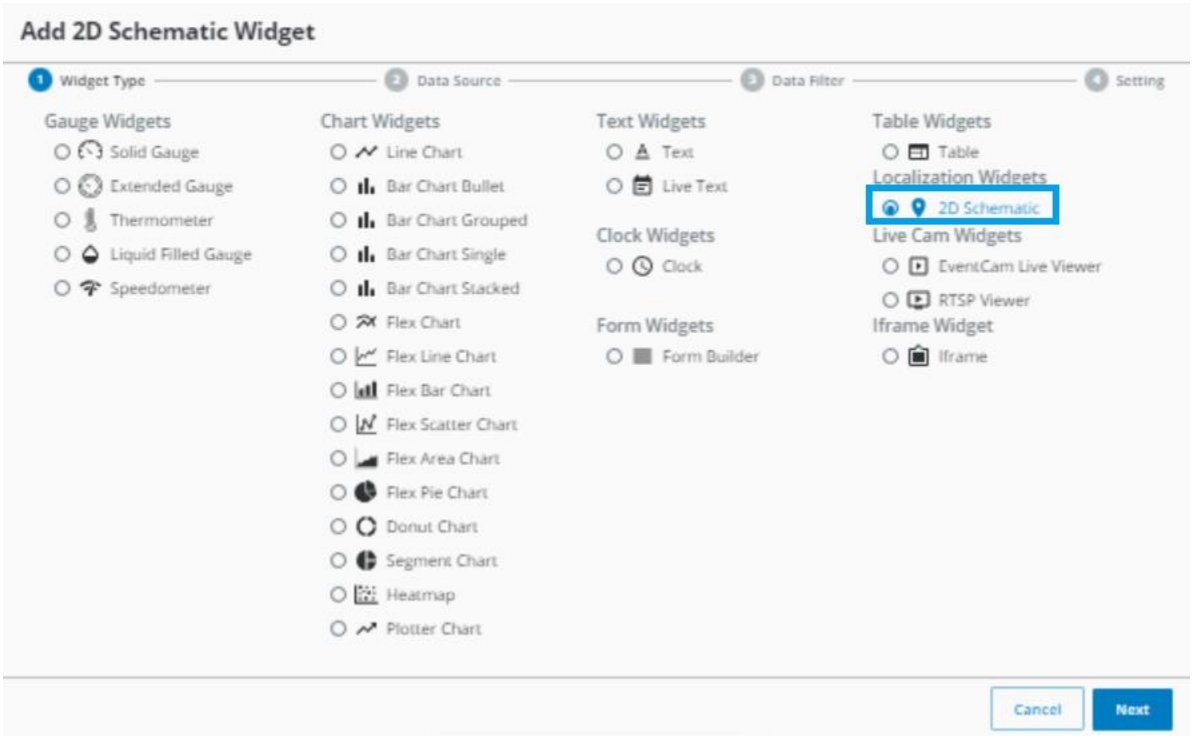

Figure 361: 2D Schematic Widget

4. The Field Analytics will navigate to the Data Source section where the source of data is acquired. Refer to Figure 228: Data Source
5. The following fields need to be configured as required:
   a. **Data Sources**: The data source from where the data is acquired (can be from **Data Source**, **Reports**, **Historian**)
   b. **Add Data Source:** Data Source 2 will display with same fields to be configured
   c. Refer to Section 11.9 for contexting

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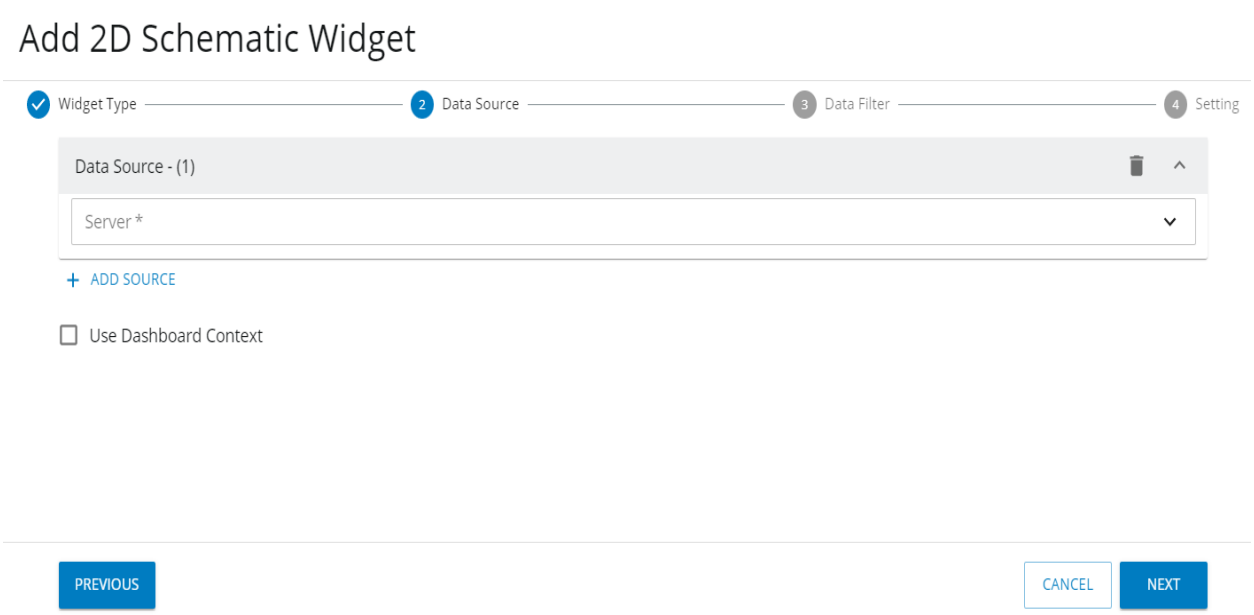

Figure 362: Add 2D Schematic Widget

6. Click the **Next** button
7. It will navigate to the Data Filter section where the data to be displayed will be filtered from the API response.
8. Following Fields appear:
    a. **State:** Select the output state from the data source response list
    b. X Parameter: Select the value from the drop-down list for X parameter
    c. Y Parameter: Select the value from the drop-down list for Y parameter
    d. Pop-up Text: Select the text to be shown as pop-up from data source response
    e. Identifier: Provide a unique name in Identifier field
9. Click **Add Data Set** to add more data sets to the widget as per preference

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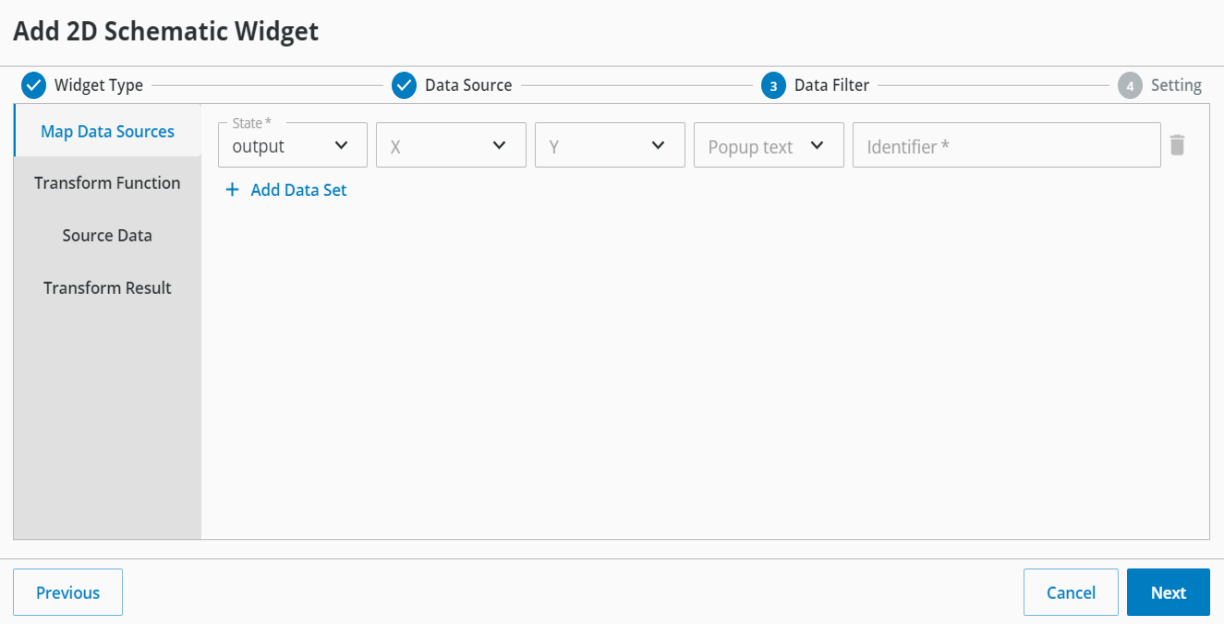

Figure 363: Data Filter

To configure Data filters, Transform function, Source Data, Transform result. Please refer to Solid Guage widget Data Filter Section 11.1.1 Step 8.

10. Click the **Next** button
11. The following fields need to be configured in Settings:
    a. **Title:** Provide the title
    b. **Show Title (Checkbox)**: The widget title will be displayed if the checkbox is checked, else it will not be displayed
    c. **Create Context (Checkbox):** The widget context will be displayed for other widgets if the checkbox is checked, else it will not be displayed
    d. **Refresh Frequency**: This will set the data refresh frequency/update to the widget
    e. **Configuration Type:** There are two types of configurations that are static and dynamic. Dynamic Configuration is not user-defined. The widget automatically configures all the static series items based on the number of data arrays received from the source. By default, static configuration fields display, configure the parameters as following:
        - **ID**: Select the ID from the drop-down. User can add as many pois as possible by clicking on '**Add Poi's** button.
        - **Icon**: Select appropriate icon for each pois from the drop-down
        - **Link to Dashboard**: User can select the existing dashboard widget from the drop-down and link the pois to the dashboard widget. When the user clicks on the pois icon in the schematic widget on dashboard, it re-directs to the

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linked widget for more details. Also, user can check/uncheck each pois icon to **Fixed Position**

- **Add Background Image**: User can upload image by clicking on the '**Add Background Image'** button
- **Delete Image:** User can delete the uploaded image by clicking on **X icon**
- **Set Sensor Position**: User can fix the position of the pois by dragging pois to the desired position then click on **Back to Settings** button and click the **Save** button

Note: User can also view each linked widgets in detail by clicking on the pois in the schematic.

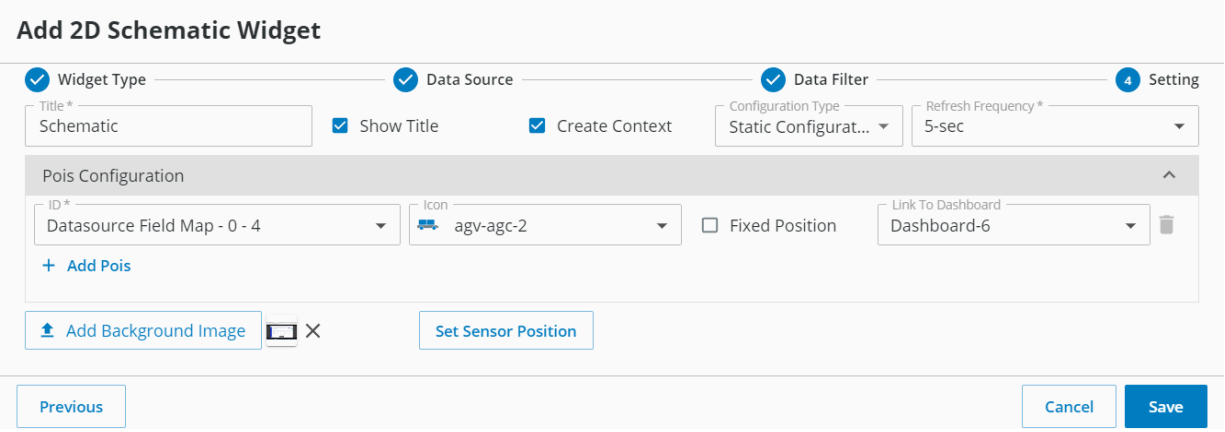

Figure 364: Schematic Widget Settings – Static Configuration

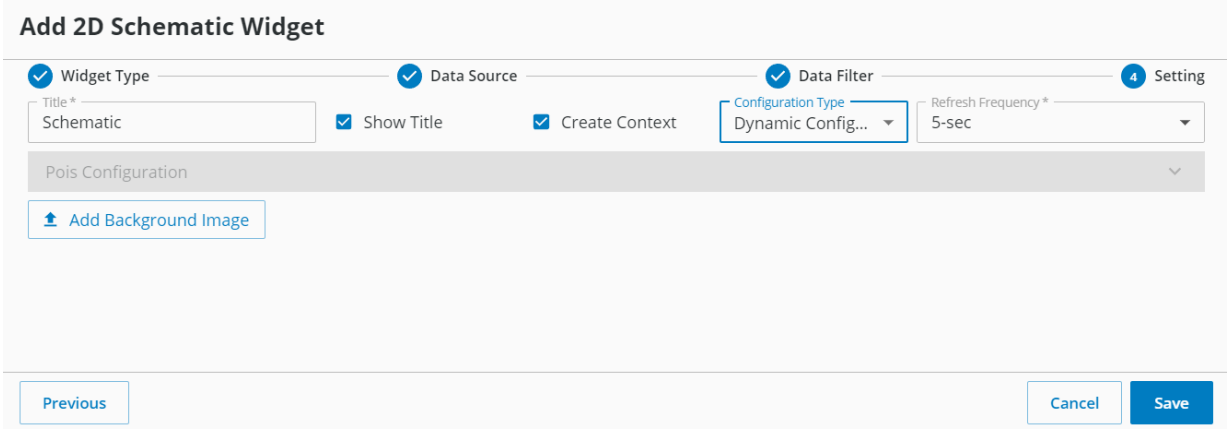

Figure 365: Schematic Widget Settings – Dynamic Configuration

12. When the user clicks on "**Set Sensor Position**", it opens the uploaded image and user can set the position of the pointers and return to Settings page by clicking on "**GO BACK TO SETTING**" button

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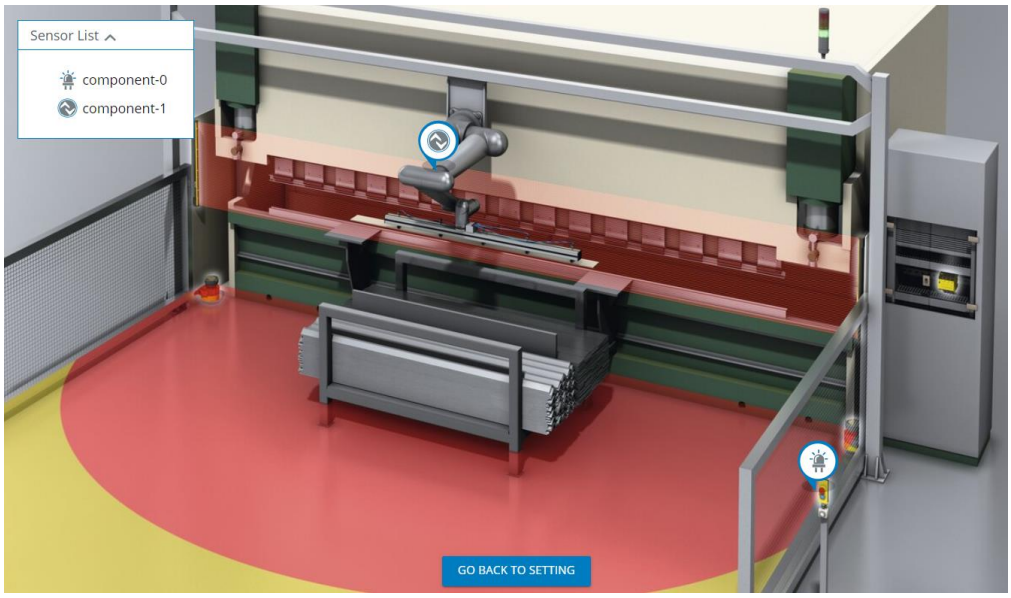

Figure 366: Set Sensor Position

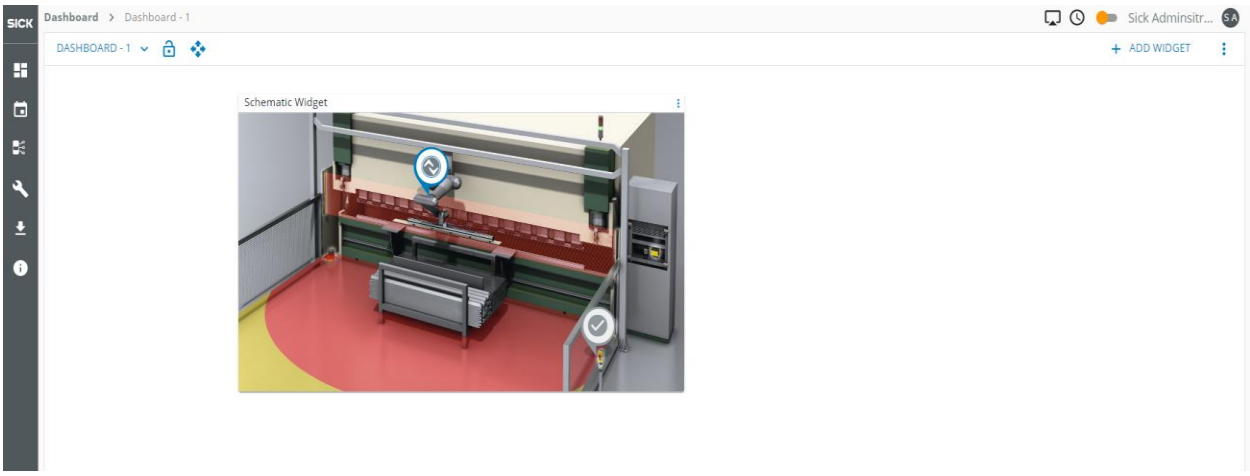

Figure 367: Schematic Widget on Dashboard

13. User can edit the existing schematic widget by clicking on vertical ellipsis on the schematic widget. Select '**Edit'** option from the list. Refer to Figure 368: Edit Option on Schematic Widget

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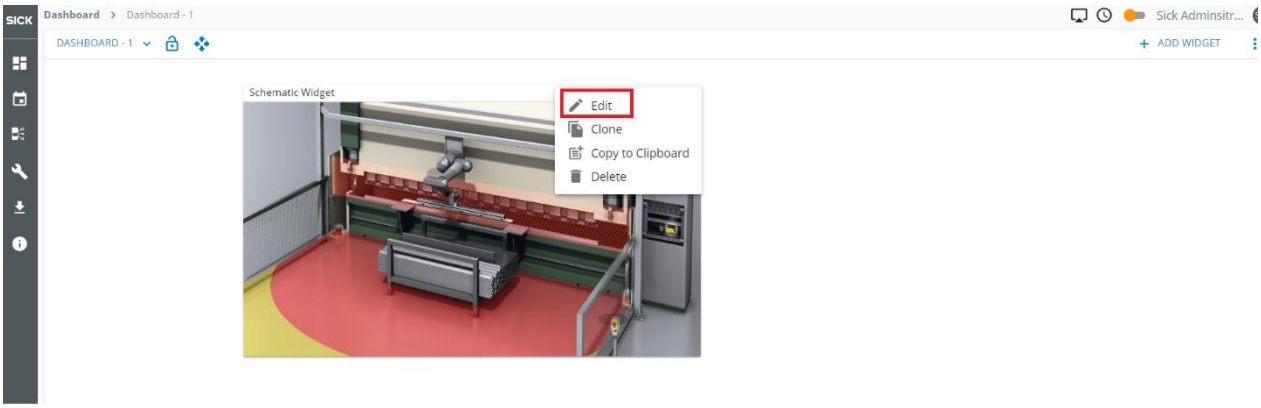

Figure 368: Edit Option on Schematic Widget

14. "**Edit 2D Schematic Widget**" dialog box appears.

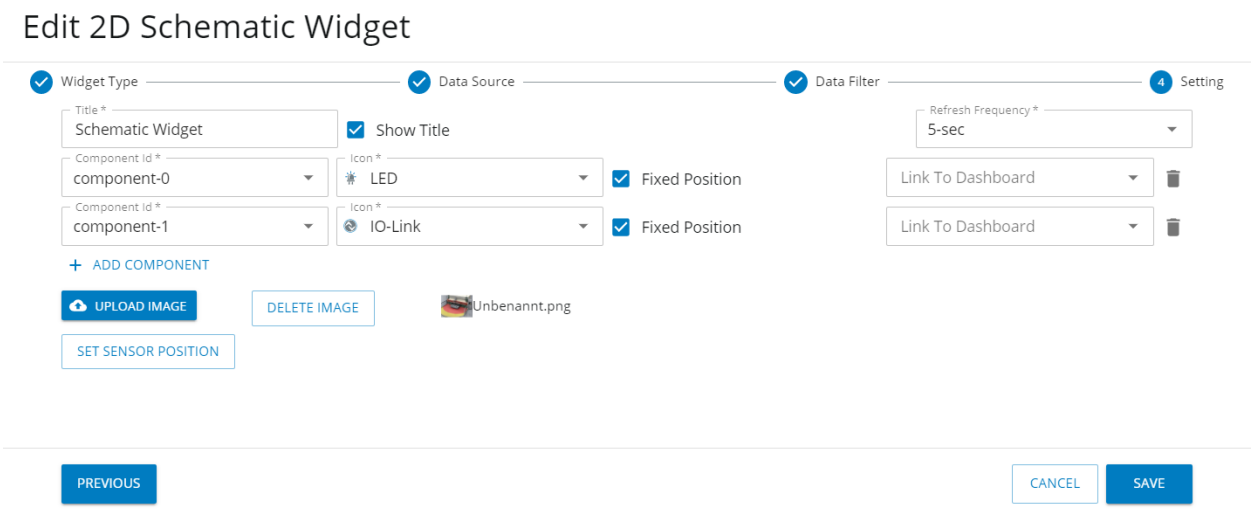

Figure 369: Edit 2D Schematic Widget

15. Update the changes and click on **'Save'** to save the changes, '**Cancel'** to cancel the changes and '**Previous**' to return to previous pages
16. The changes are updated in Dashboard

11.8 Live Cam Widgets

11.8.1 Event Cam Live viewer

This widget allows for image streaming of SICK Event Cam. The Data Source configuration of the Event Cam Live Viewer is different from other widgets. Connectivity is via WebSocket or WebSocket Secure URL.

To add EventCam Live Viewer widget:

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2 Click **Add widget** button at the top-right corner on the home page. Refer to Figure 216: Add Widget
3 It will open **Add Widget** dialog box displaying list of widgets. Refer to Figure 217: Widget List
4 Select **EventCam Live viewer** radio button, under the **LiveCam** section, and click **NEXT**. Refer to Figure 370: EventCam

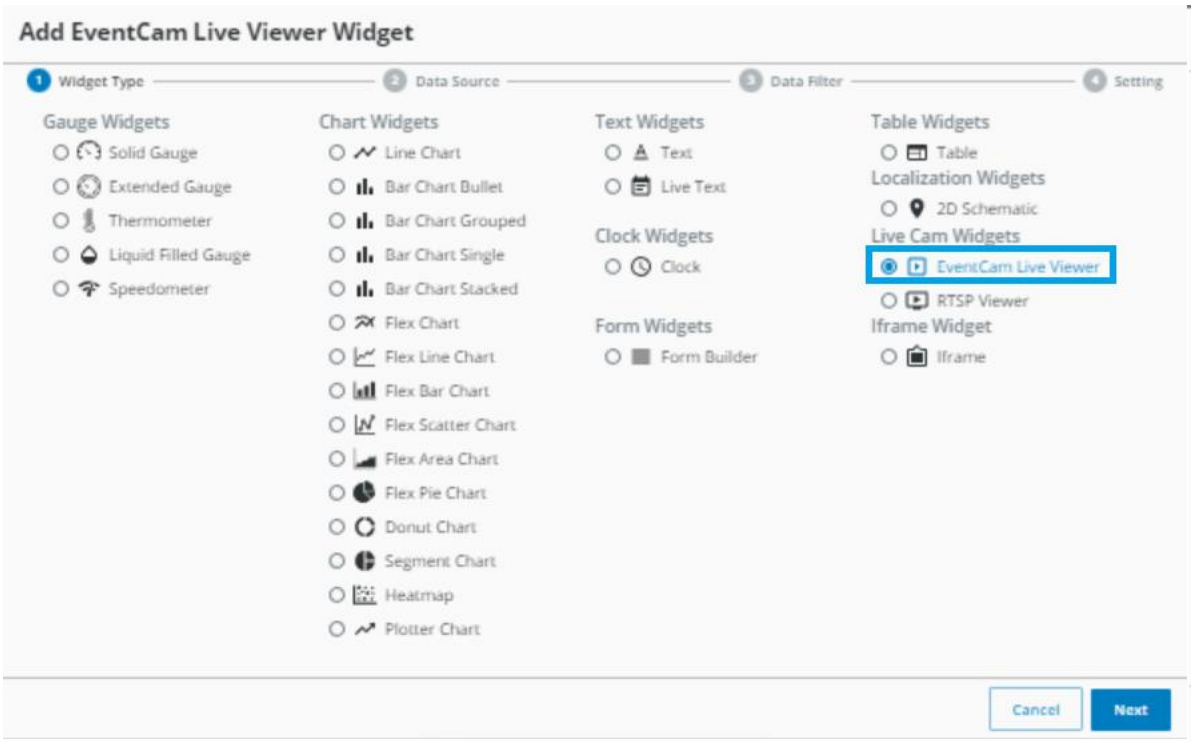

Figure 370: EventCam Live Viewer

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5 The Field Analytics will navigate to the Data Source section where the source of data is configured.

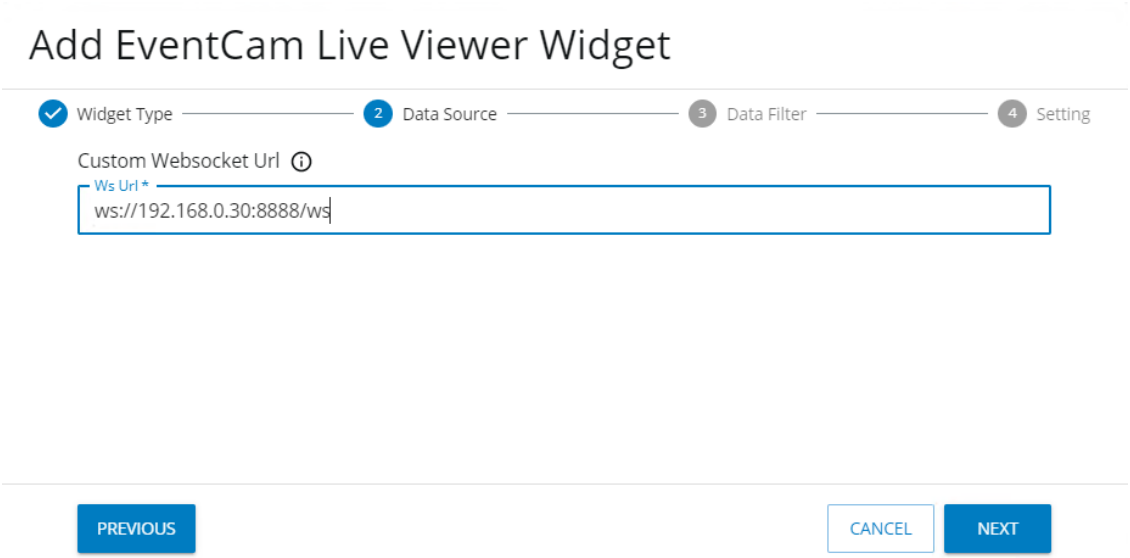

Figure 371: Data Source

The following fields will need to be configured as required

- **Custom WebSocket URL**: Add the WebSocket URL from where the feed will be provided
- Field Analytics connectivity is via https secure protocol and by default, the browser will only handle secure WebSocket content. SICK Event Cam does not connect via secure WebSocket. To allow unsecure WebSocket connectivity from the SICK Event Cam, you must allow the browser to receive unsecure content
  - Steps to allow the following browsers to accept unsecure content (Chrome, Firefox, Edge)
  - https://experienceleague.adobe.com/docs/target/using/experiences/vec/troubleshoot-composer/mixed-content.html?lang=en#task_FF297A08F66E47A588C14FD67C037B3A

6 Click the **Next** button.

7 Field Analytics will navigate to the Settings section where the title for the '**Live viewer'** can be added.

   a. **Max Retry:** determines how many times the application is allowed to retry establishing the WebSocket connection
   b. **Retry Interval** indicates the time gap between connections

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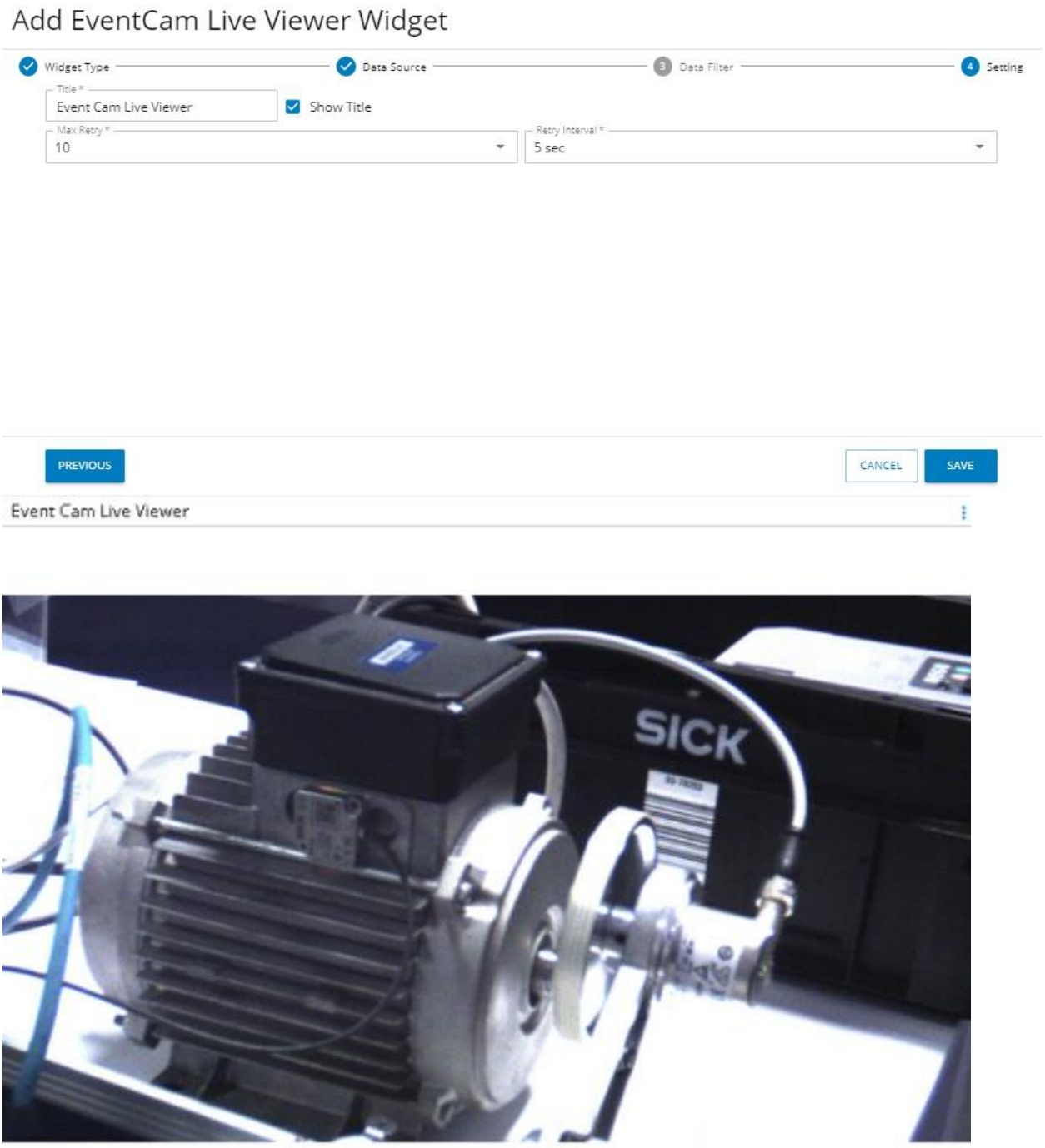

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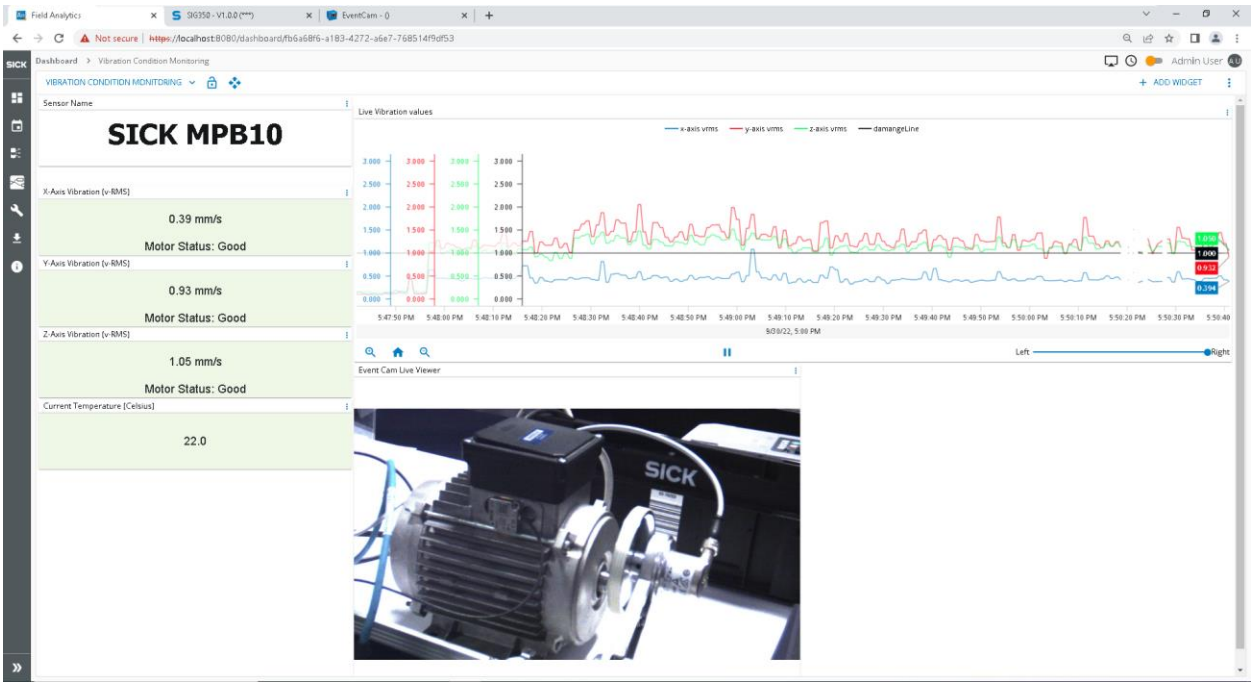

Figure 372: EventCam Live viewer

8 Click the **Save** button

9 Field Analytics will add '**EventCam Live Viewer'** widget as configured by the user on the Dashboard and display the media stream from the EventCam

11.8.2 RTSP viewer

RTSP – Real Time Streaming Protocol. It will transport live stream over a suitable transport protocol.

To add table widgets

1 Click **Add widget** button at the top-right corner on the home page. Refer to Figure 216: Add Widget

2 It will open **Add Widget** dialog box displaying list of widgets. Refer to Figure 217: Widget List

3 Select **RTSP Viewer** radio button, under the **Live Cam widgets** section, and click **NEXT**. Refer to Figure 373: RTSP Widget

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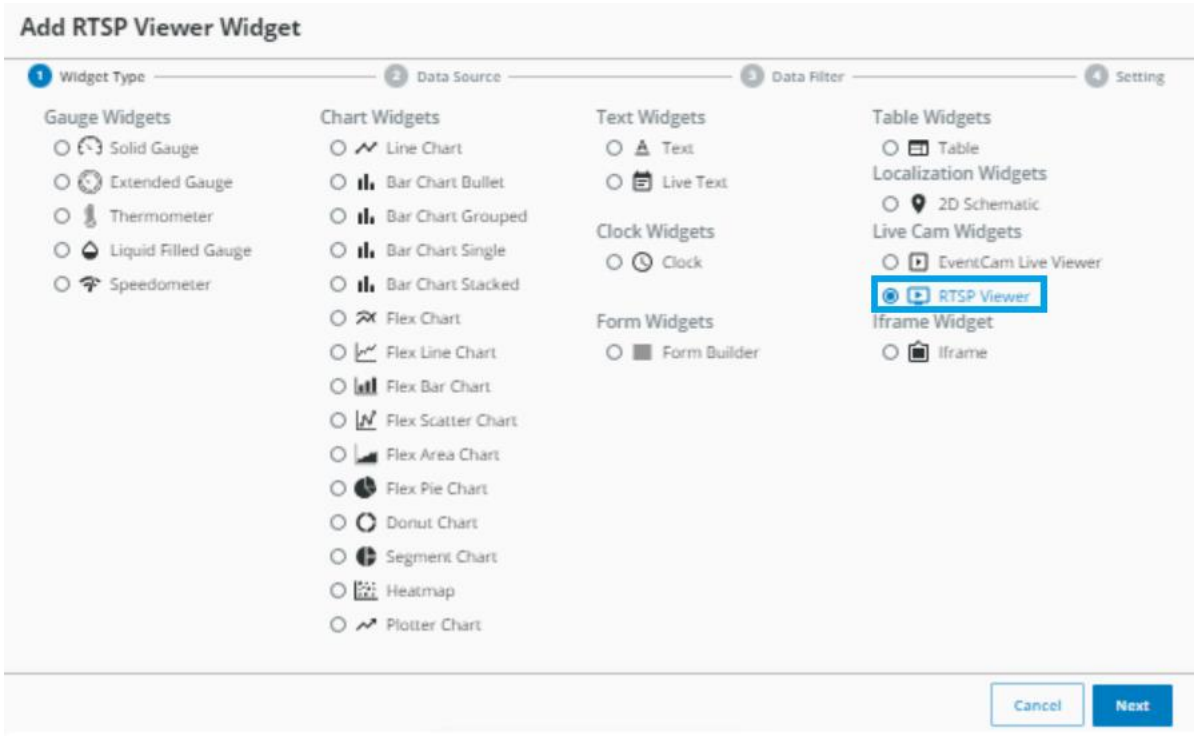

Figure 373: RTSP Widget

4 The Field Analytics will navigate to the Data Source section where the source of data is configured

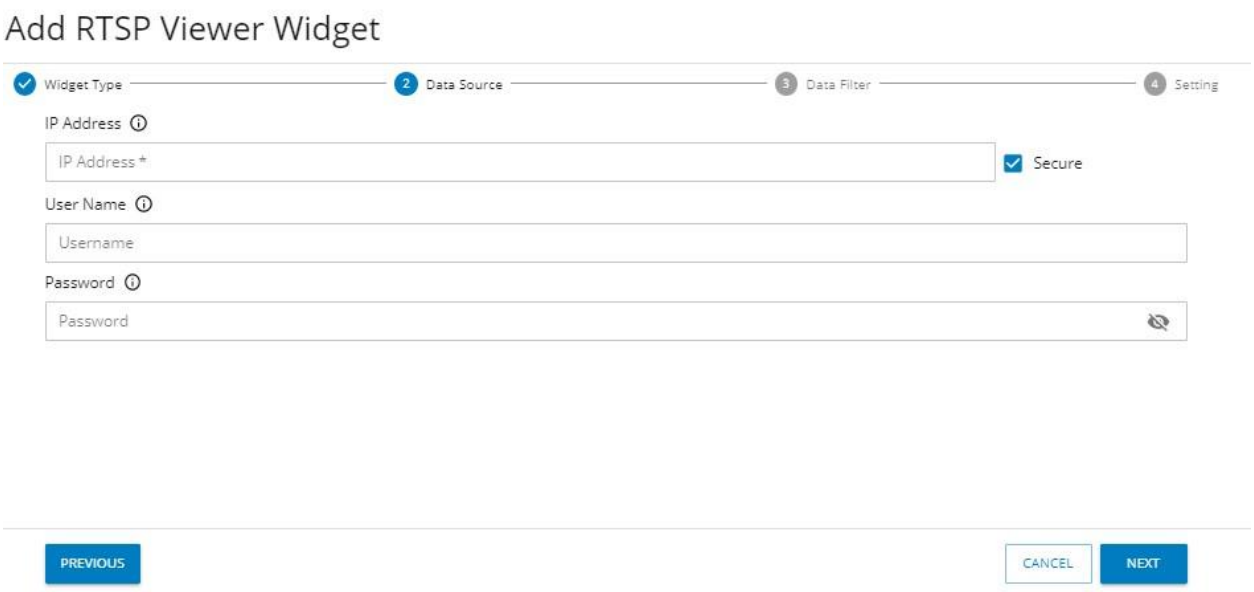

Figure 374: Add RTSP Widget

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The following fields will need to be configured as required:

a. **IP address**: Provide IP address or port Number as per applicable
b. **Secure:** Make sure the connection is secured
c. **Username:** Provide camera server authentication
d. **Password:** Provide password for user camera

5 Click on '**Next'** button. It will navigate to next page

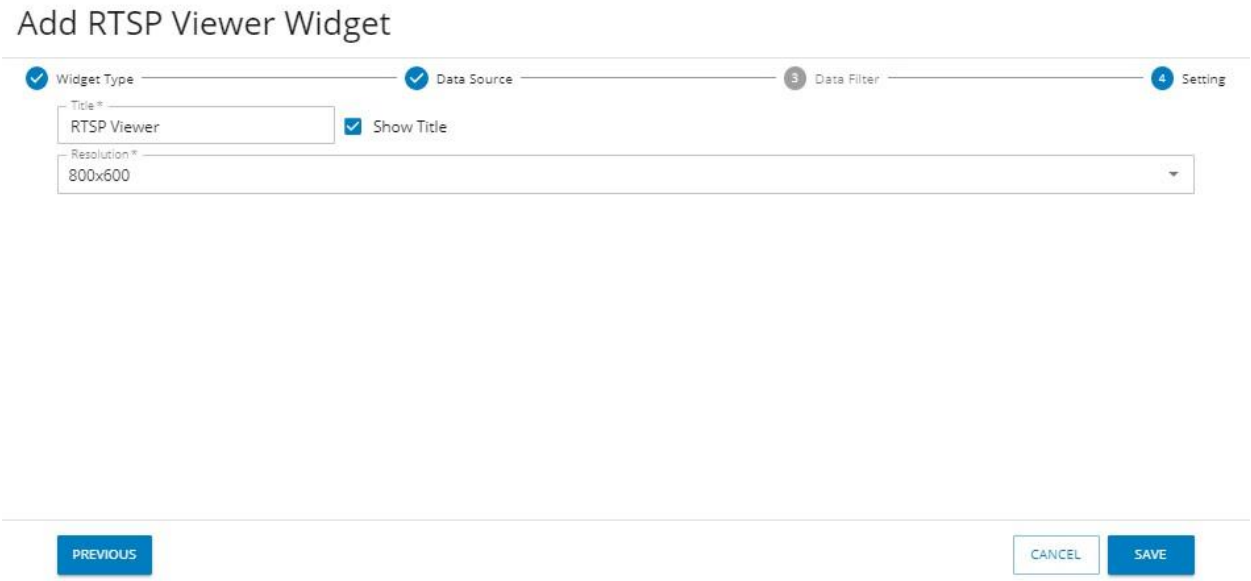

Figure 375: Add RTSP Viewer Widget

The Following fields will display and needs to be configured as required:

I. **Title**: This will be the title of the widget
II. **Resolution:** Select the camera resolution

6 Click the **Save** button

7 Field Analytics will add **RTSP widget** as configured by the user on the Dashboard

Figure 376: RTSP Viewer Widget

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11.9 Iframe

To add Iframe widget to the dashboard:

1. Click **Add widget** button at the top-right corner on the home page. Refer to Figure 216: Add Widget
2. It will open **Add Widget** dialog box displaying list of widgets. Refer to Figure 217: Widget List
3. Select **Line Chart** radio button, under the **Chart Widgets** section and click **Next**.

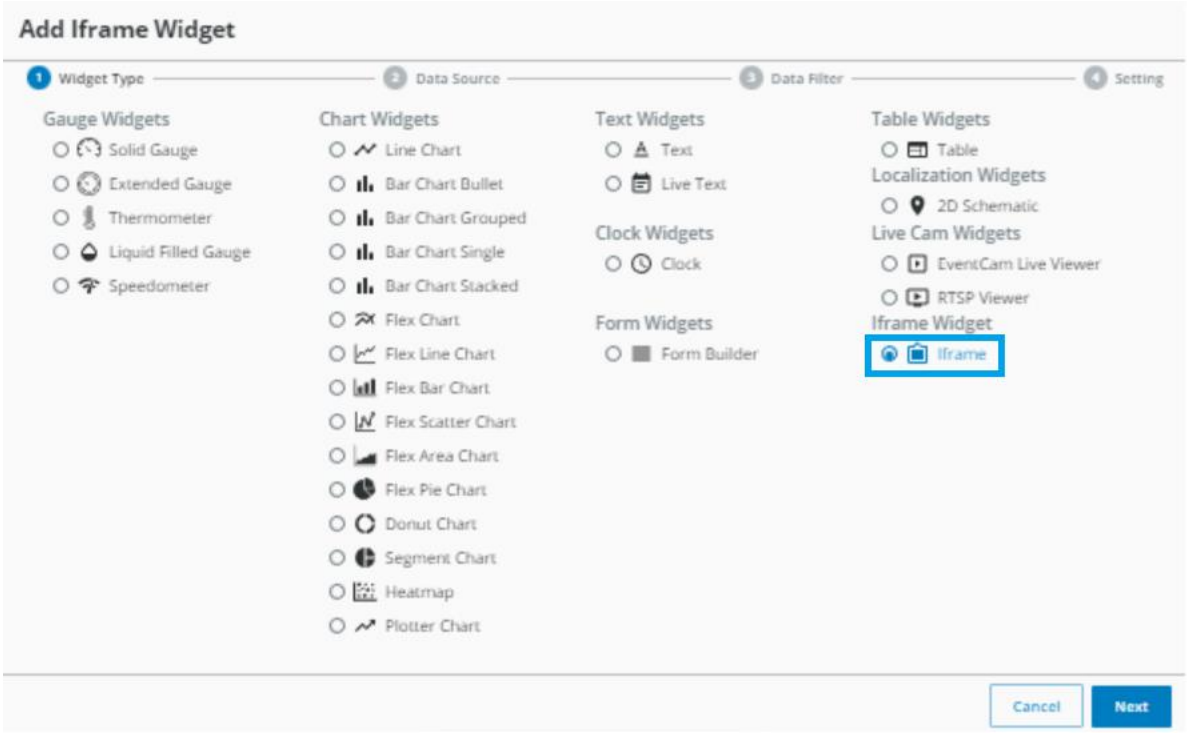

Figure 377: IFrame

4. The Field Analytics will navigate to the Data Source section where the source of data is configured.
5. Enter the external URL in the URL textbox
6. Click the **Next** button

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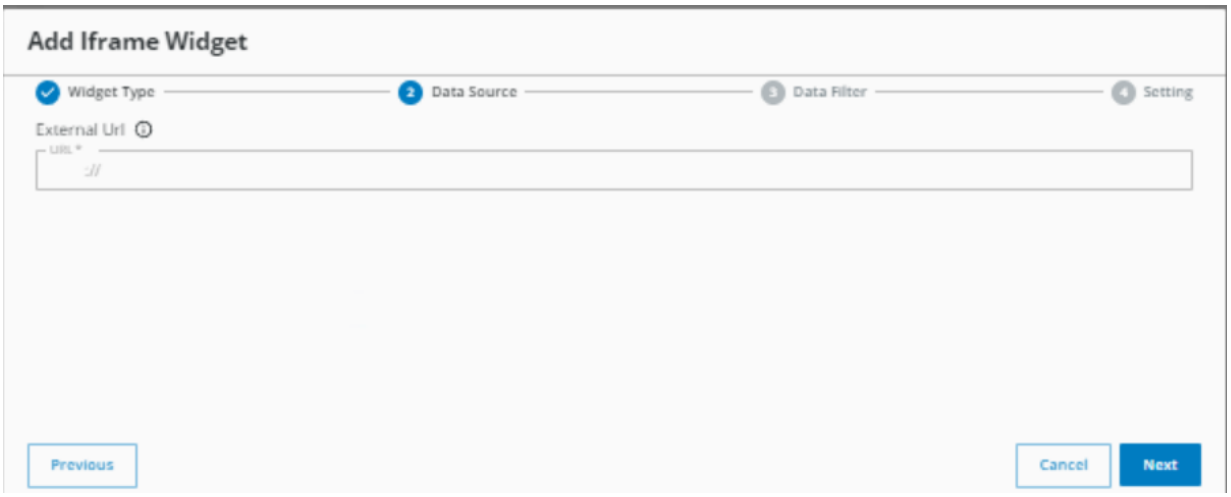

Figure 378: Data Source

7. Settings screen is displayed.
8. Enter the **Title Name** in Title text box and check **Show Title** checkbox if the title is preferred to be displayed on the widget
9. Click the **Save** button

Figure 379: Settings

10. Iframe widget is displayed on the dashboard

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11.10 Contexting

Contexting is binding or connecting a widget to existing widget in same dashboard or other dashboards and enable to use the source data. There are two types of contexting in FA application which are **Dashboard Contexting** and **Widget Contexting**.

User can use the privilege of contexting by adding the feature in the preferred role. Follow below steps to add the contexting feature:

1. Users can click on the **Profile** icon at the top right corner and then click on the '**Manage Role**' option. Refer to Figure 34: Manage Roles.
2. It displays the **Manage Role page** with the list of roles. From this screen, you can add, edit, delete. Refer to Figure 35: Manage Role Page.
3. On the Manage Role page, there are three vertical ellipsis icons in front of the screen. It has following tabs. Refer to Figure 32: Vertical ellipsis.
   - Edit
   - Delete
4. Select any of the preferred role vertical ellipsis and click on '**Edit'** option.
5. Under the privileges field, add "**Use Dashboard Context**" and click on '**Save'** button.

Now the user can view the "**Use Dashboard Context**" in the Data Source page of all the widgets except clock widget and text widget.

11.10.1 Dashboard Contexting

Dashboard Contexting: It means the user passes the context (i.e., source data and the results of the function defined (Fn)) of the live text widget to the other dashboard widgets using the '**Link to Dashboard'** drop-down in widget settings. When dashboard contexting is configured then user can use the source data of the contexted source with configured conditions fulfilled while creating the widget in the linked dashboard.

11.10.1.1 Dashboard Contexting using Extended Gauge Widget

For dashboard contexting using extended widget, first user needs to create source widget i.e., Live Text in dashboard 1 from which the data is passed. Then create extended gauge widget in dashboard 2 and use the data using dashboard contexting from the source widget. Same is explained in below paragraphs using an example.

Create the **Live Text** widget from "**Add Widget**" dialog box in Dashboard 1. Refer to Figure 331: Live Text. In the **Data Source** dialog box, click '**Use Dashboard Context**' checkbox for dashboard contexting. Users need to select the preferred dashboard from the "**Link to Dashboard**" drop-down for dashboard contexting in Live Text widget settings.

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It is mandatory to check the '**Create Context'** checkbox in the live text widget settings if the user want to pass the context to other dashboards otherwise the context is not visible even if the dashboard is linked in the widget settings. Refer to Figure 338: Widget Settings.

In Dashboard 2, user can create any widget. For example, if the user creates **Extended Gauge** from "**Add widget**" dialog box. Refer to Figure 227: Extended Gauge. In the **Data source** dialog box, the context data from live text widget in dashboard 1 is available as a source for Extended Gauge on Dashboard 2 only when the '**Use Dashboard Context'** checkbox is clicked.

11.10.2 Widget Contexting

Widget contexting: It means that the data of a widget and any parameters defined in specific form builder can be modified by the user and send it as context to other widgets by clicking on '**Enable Widget Context**' checkbox in the source widget settings.

This context can be used by any widgets from data source dropdown menu on Add Widget window.

11.10.2.1 Widget Contexting using Form Builder Widget

For widget contexting, user needs to click on '**Enable Widget Context'** on Form builder widget settings page for acquiring the data of this widget while creating other widgets. When the parent form builder triggers an action then the subscribed child widget is updated but the child widget can only pass the updated context to its child based on the **Auto Trigger Frequency** in the child widget settings. Refer to Figure 351: Form Builder Data Setting. Auto Trigger Frequency drop-down has options like Never, immediately upon source update, 0.5 sec, 5 sec, 10 sec, 15 sec and so on. If the **Never** option is selected, then child widget is not updated upon any change in the parent form builder. If the **Immediately upon source update** is selected, then child widget is updated immediately upon any change in the parent form builder and similarly any time frequency selected from drop-down will auto trigger the updates based on the selected time frequency to keep the values up to date in the child form.

After the widget contexting conditions are fulfilled as mentioned in above paragraph then the source data of the contexted widget is shown in the list of data source of newly added widgets. Refer to Figure 380: Source from Existing Form.

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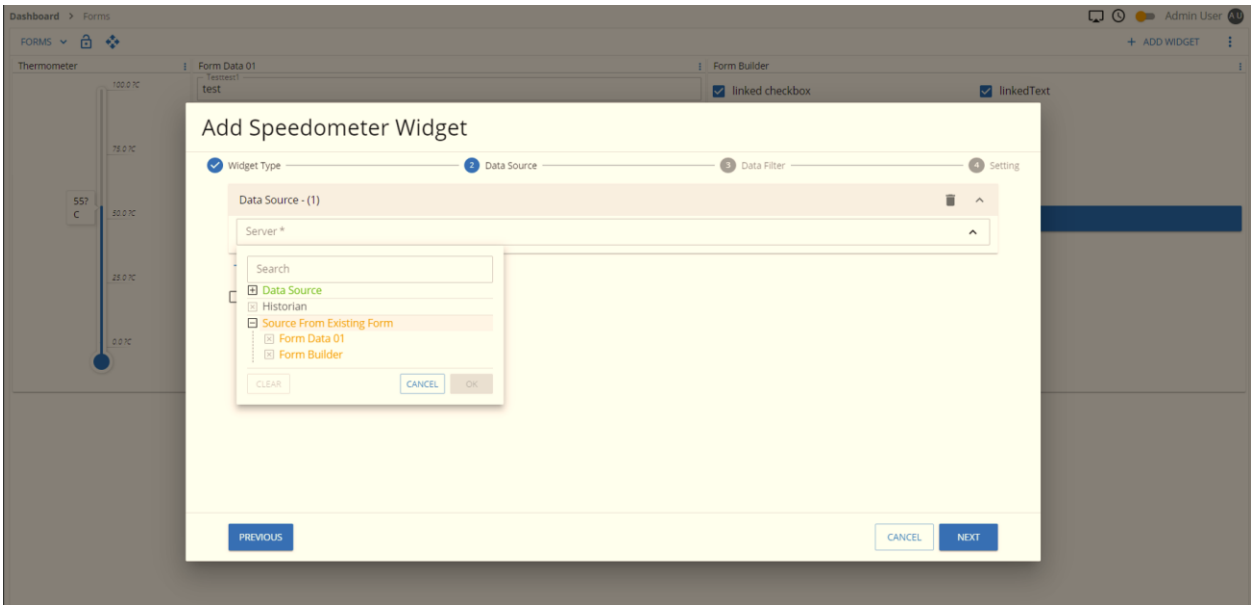

Figure 380: Source from Existing Form

12 Notification & Alert

User can customize the notification and alert settings by selecting the "**Notification & Alert**" from left menu.

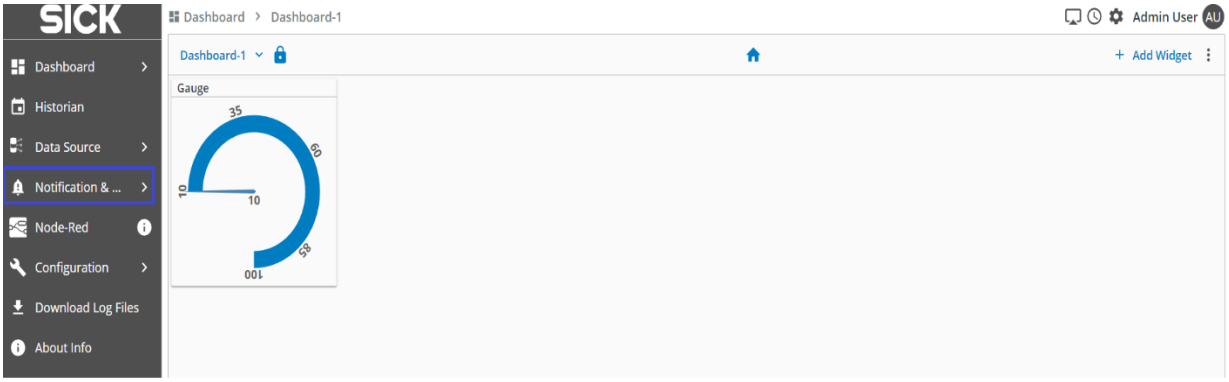

Figure 381: Notification & Alert

12.1 Notification Log Table

Select **Notification Log Table** from notification and alert to view the notification logs, their status and configure notification alert rules.

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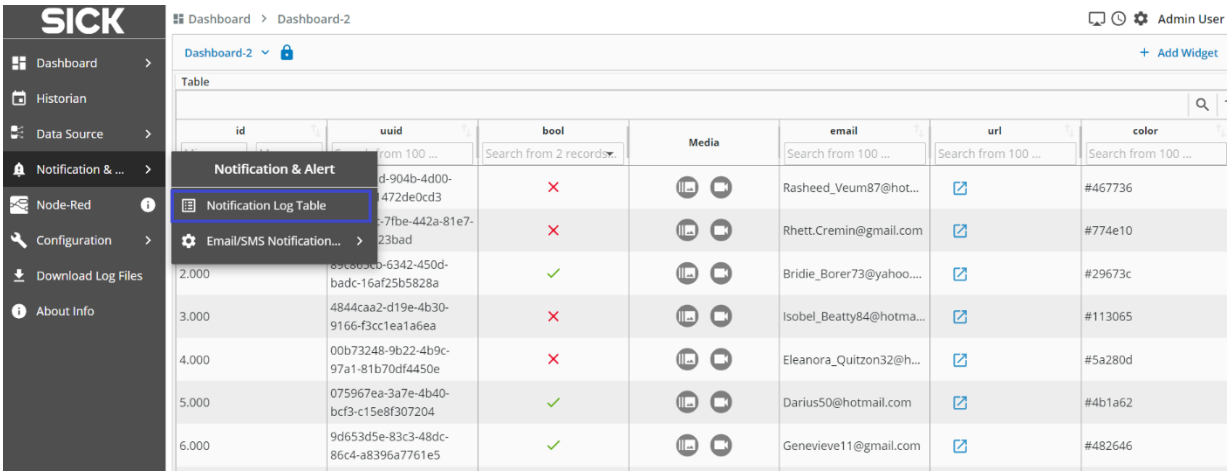

Figure 382: Notification Log Tab

12.1.1 Logs

By default, **Logs** Screen is displayed where information related to notifications are shown such as Time stamp, Notification Title, Notification Mode, Data Source, Recipients, and Status.

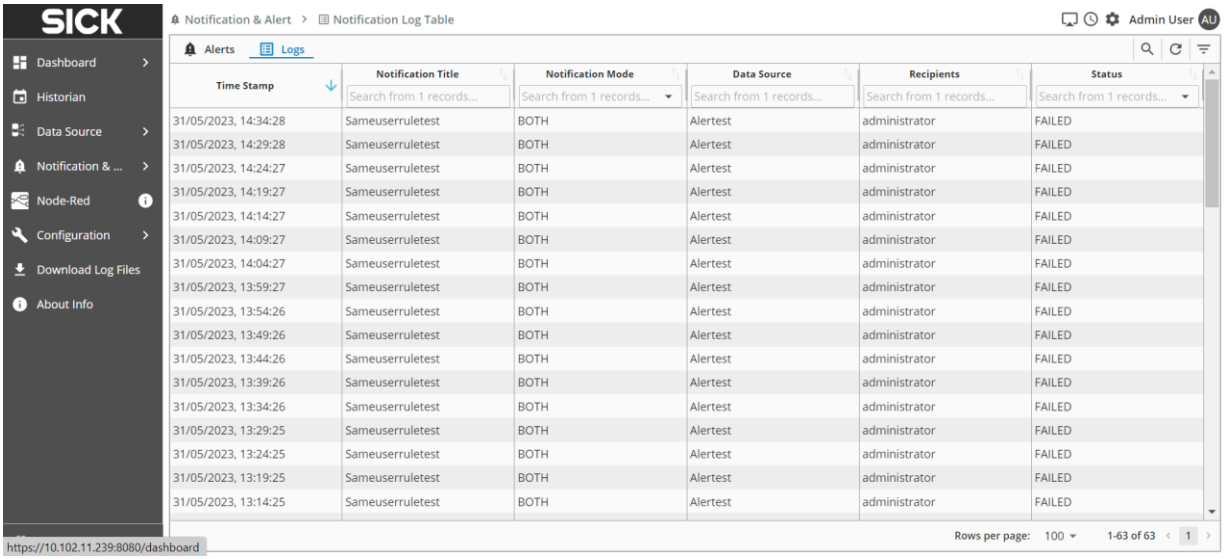

Figure 383: Logs

12.1.2 Alerts

Select **Alerts** Tab on the screen to configure alert rules.

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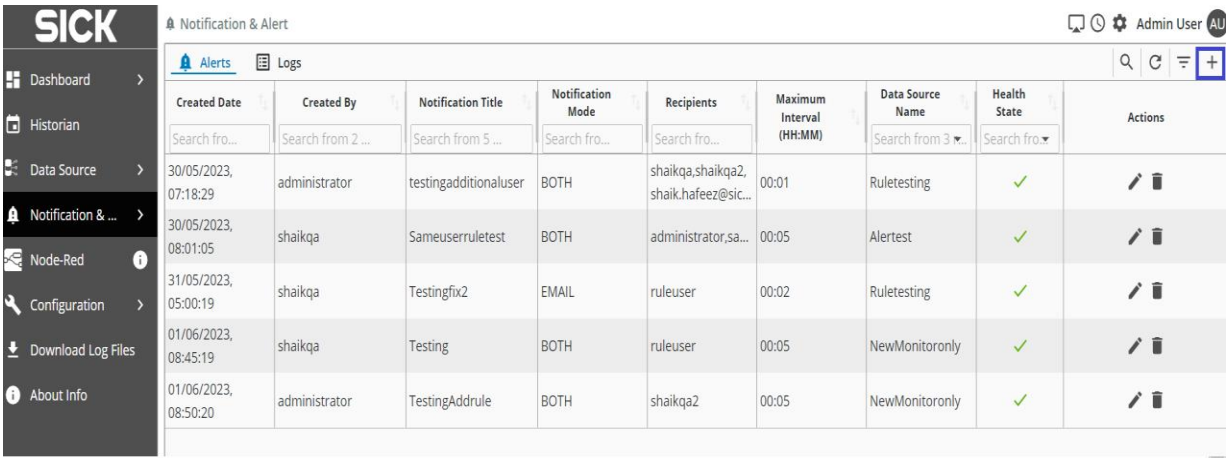

Figure 384: Alerts Tab

12.1.2.1 Add Rule

Click on Add icon from right side of the screen as shown in Figure 384: Alerts Tab. **New Alert** Screen appears. Click on **Add Rule** button to configure new rule.

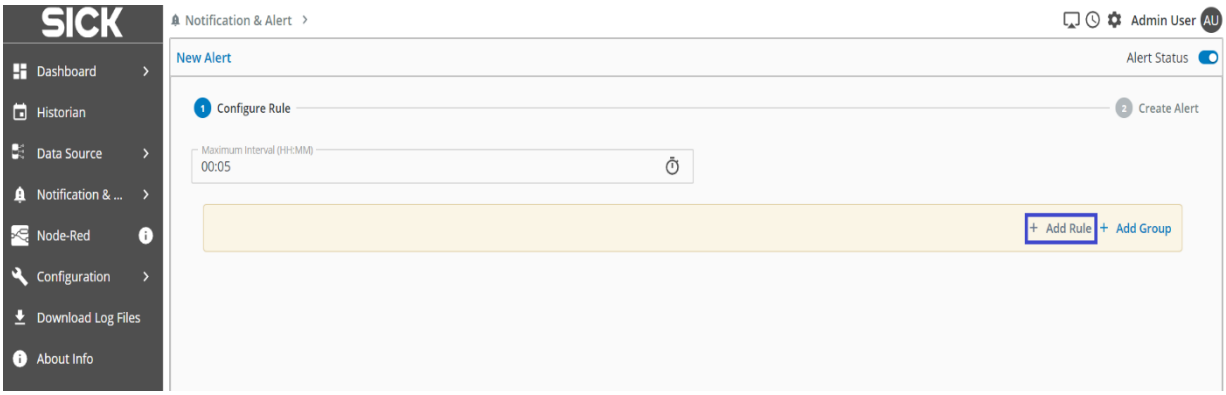

Figure 385: Add Rule Button

When Add rule button is clicked, **Data Source Store Data** drop-down is displayed.

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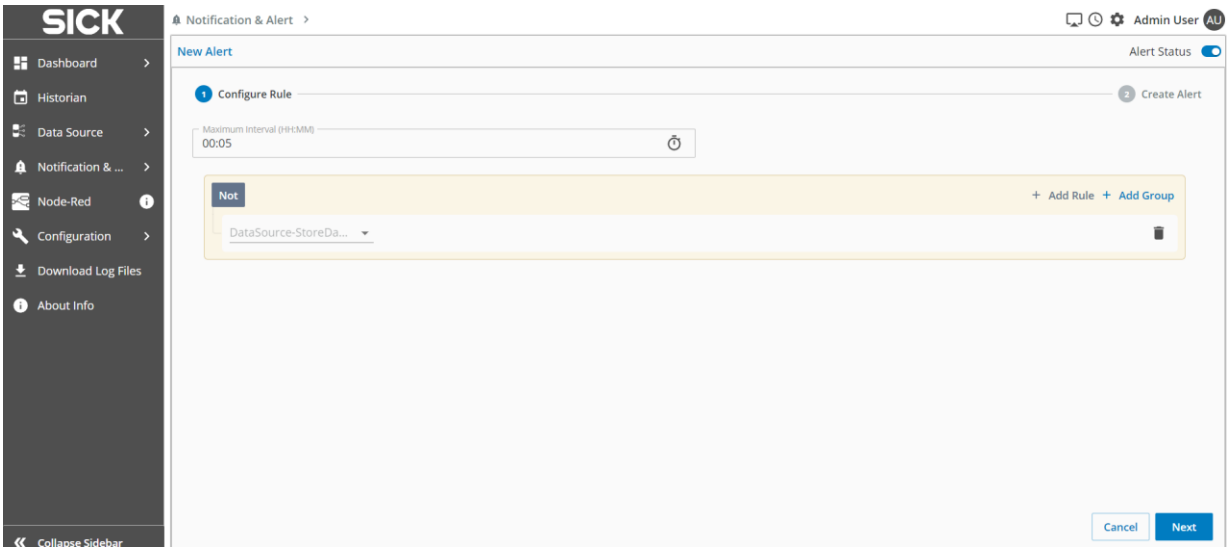
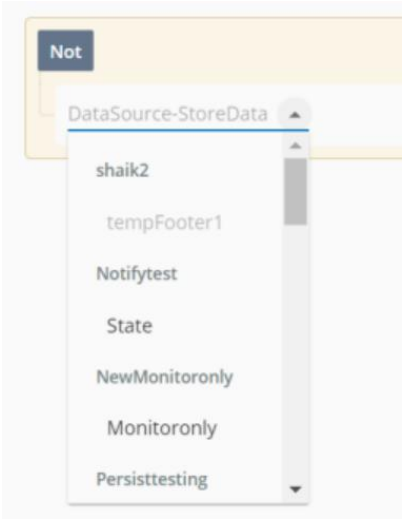
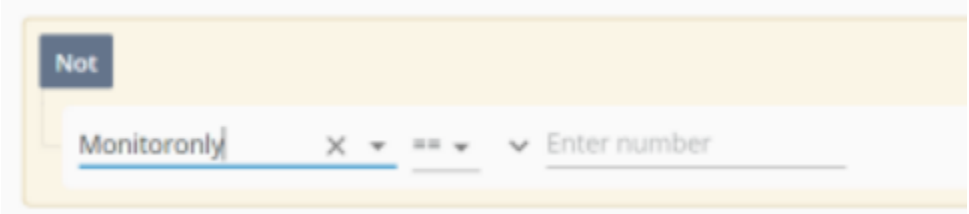


Figure 386: Data Source Store Data

Click **Data Source Store Data** drop-down, it displays list of created data source store data options. Select the preferred option from the list.



When Data Source Store Data is selected, two fields appear as shown in below figure.



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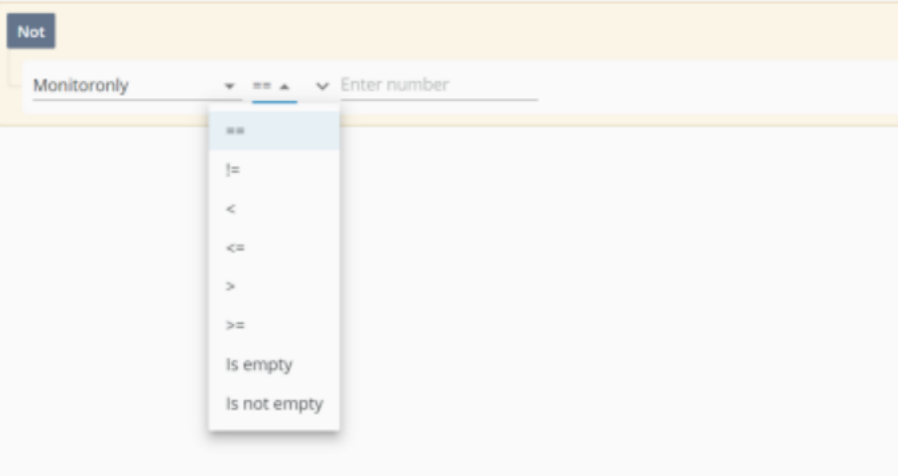
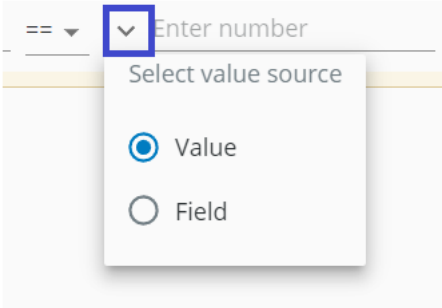
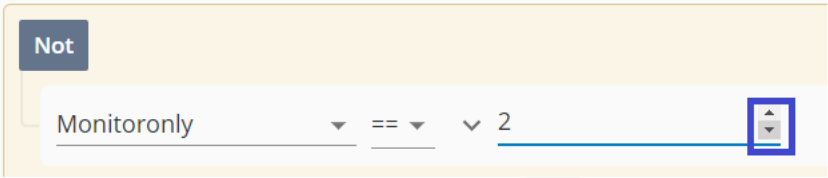
Select any of the mathematical symbol or condition defined from the drop-down.



Select drop-down arrow before the third field as shown in below figure.



If the **Value** is selected, then **Enter number** field is shown. Select the number by clicking on up and down arrows in the field.



If the **Field** is selected, then **Data Source Store Data** field is displayed. Select the preferred option from the list.

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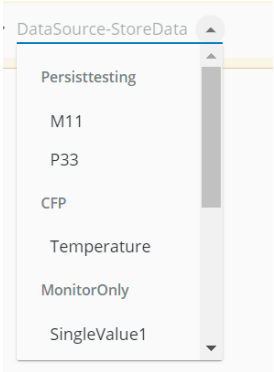

Click the **Next** button. Create **Alert Screen** appears.

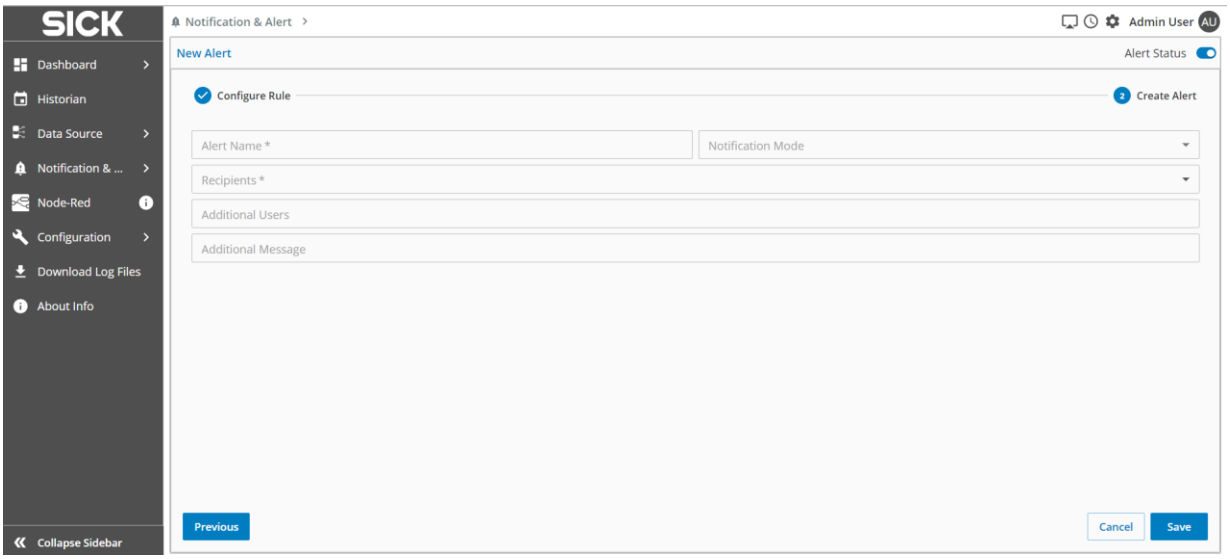

Figure 387: Create Alert

Provide the following fields to create an alert:

- **Alert Name**: Enter the alert name. It is a mandatory field
- **Notification Mode**: There are three notification modes that are **Email, SMS, and Both**. Select the preferred option from the drop down. It is a mandatory field
- **Recipients**: Select the recipients from the drop-down to whom notification alert has to be sent. It is a mandatory field
- **Addition Users**: It is an optional field. User can add additional users
- **Additional Message**: It is an optional field. Enter the message which can be sent along with the alert.

Click the **Save** button to save the alert.

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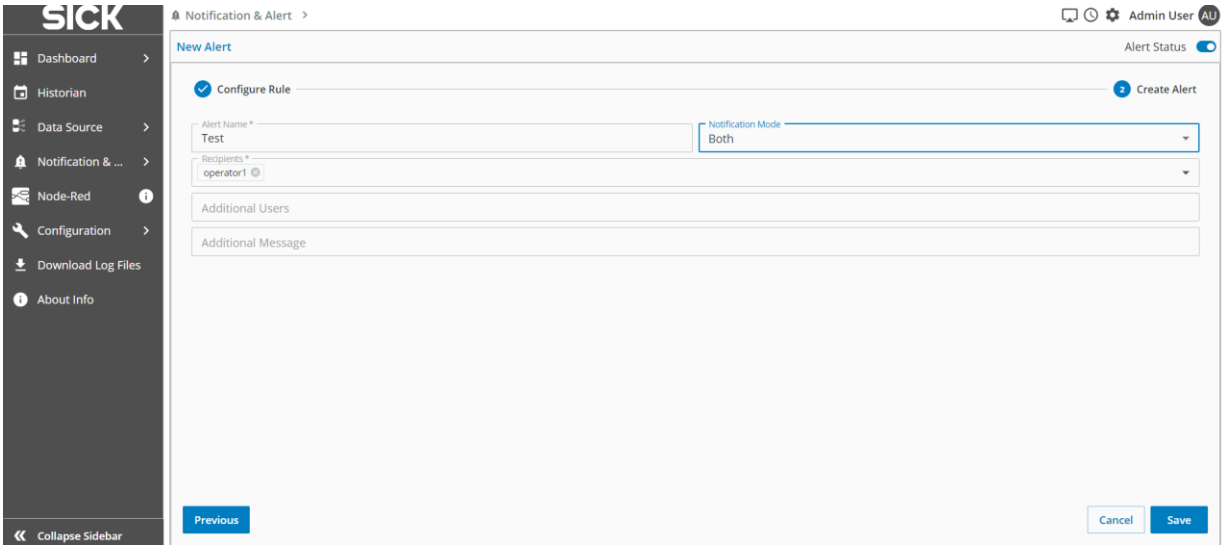

Figure 388: Create Alert Fields

The created Alert is displayed in the Alerts table.

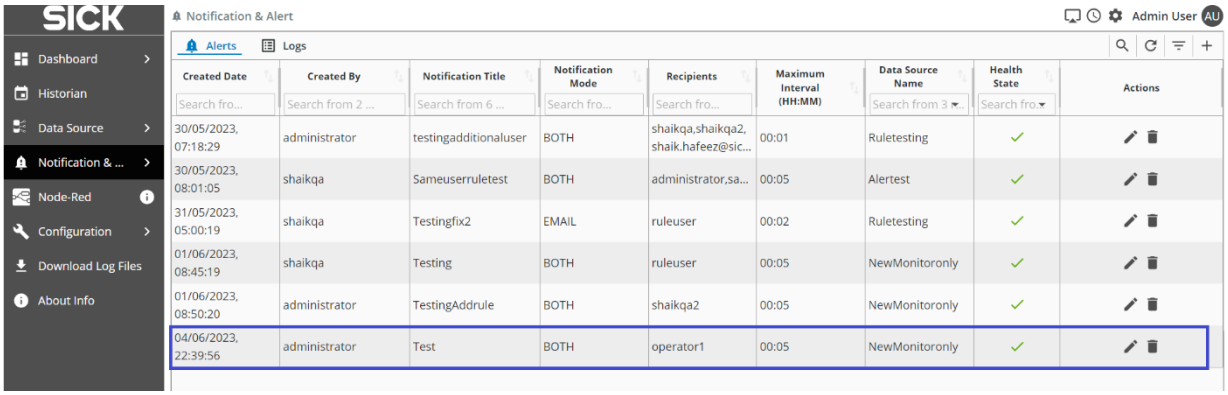

Figure 389: Alerts Table

User can edit or delete the created alert by clicking on the respective icons on the preferred alert.

12.1.2.2 Edit Rule

To edit the alert rule, click the edit icon on the preferred alert.

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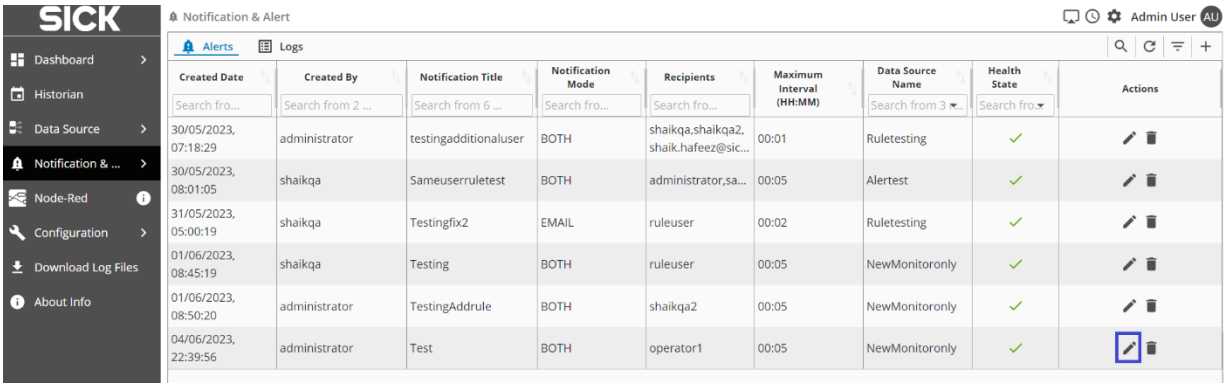

Figure 390: Edit Icon

The selected alert's Configure Rule screen to be edited appears.

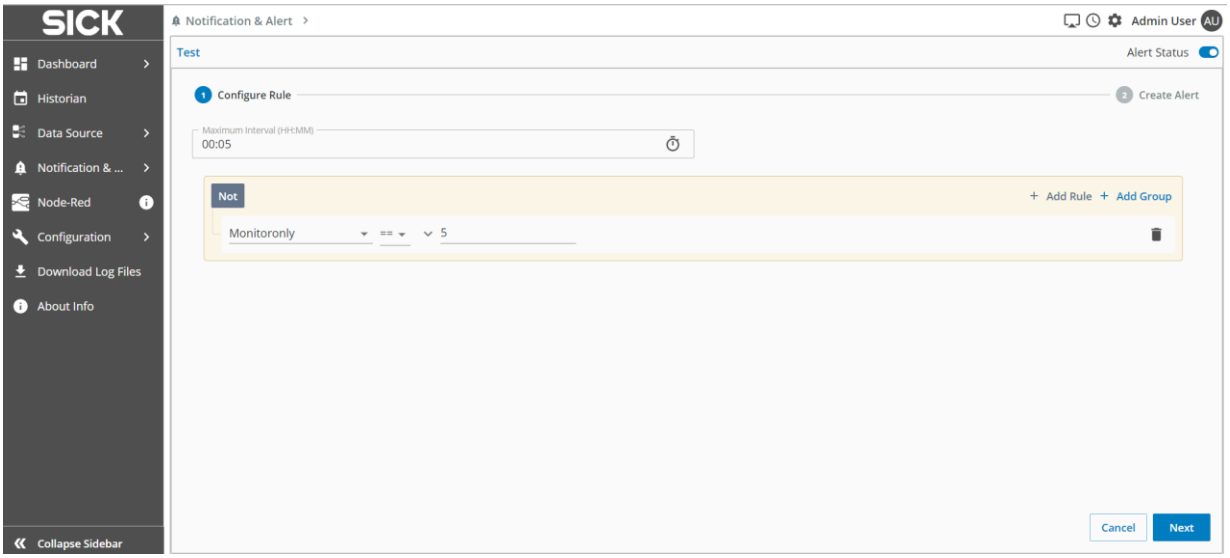

Figure 391: Edit Alert Screen -1

Update the fields and click the **Next** button. Create Alert screen appears, update the fields on the screen. Click the Save button to update the changes.

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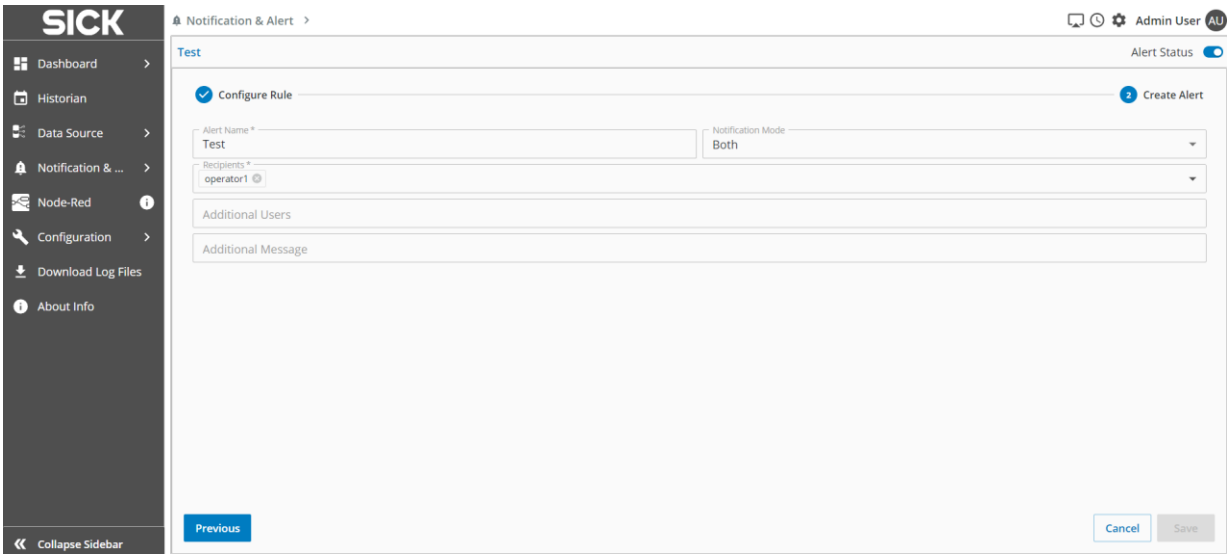

Figure 392: Edit Alert Screen-2

12.1.2.3 Delete Rule

User can delete the preferred alert by clicking on the delete icon from Alerts Table.

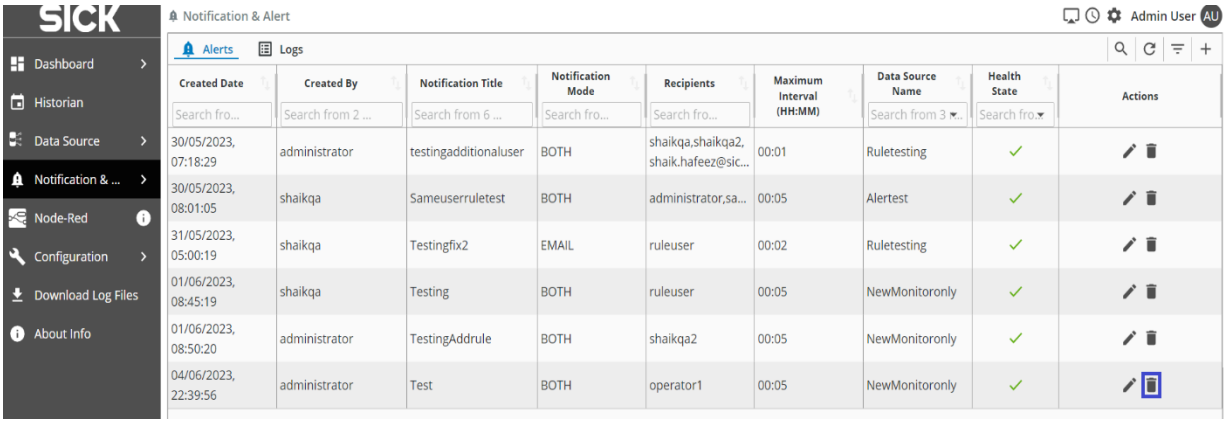

Figure 393: Delete Icon

When delete icon is clicked, Delete Data Source confirmation message box appears.

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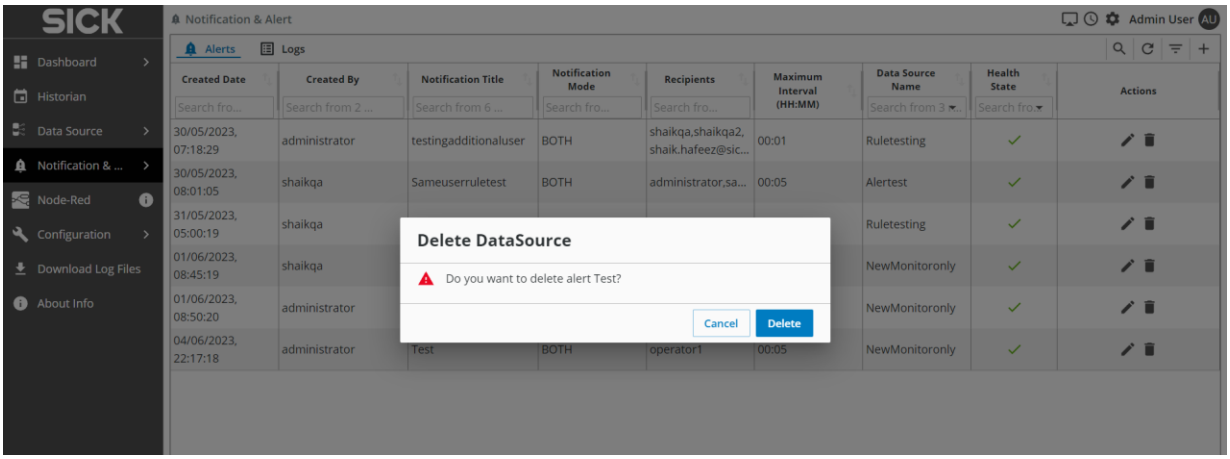

Figure 394: Delete Data Source Confirmation Box

Click the **Delete** button to delete the alert rule or **Cancel** button to return to Alerts Screen.

12.1.2.4 Add Group

Click on Add icon from right side of the screen as shown in Figure 384: Alerts Tab. **New Alert** Screen appears. Click on **Add Group** button to configure new rule for group.

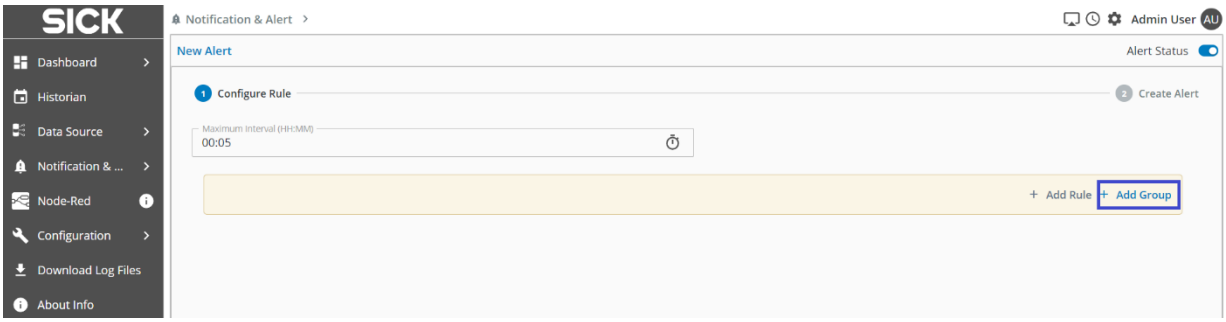

Figure 395: Add Group Button

When Add group button is clicked, **Data Source Store Data** drop-down is displayed.

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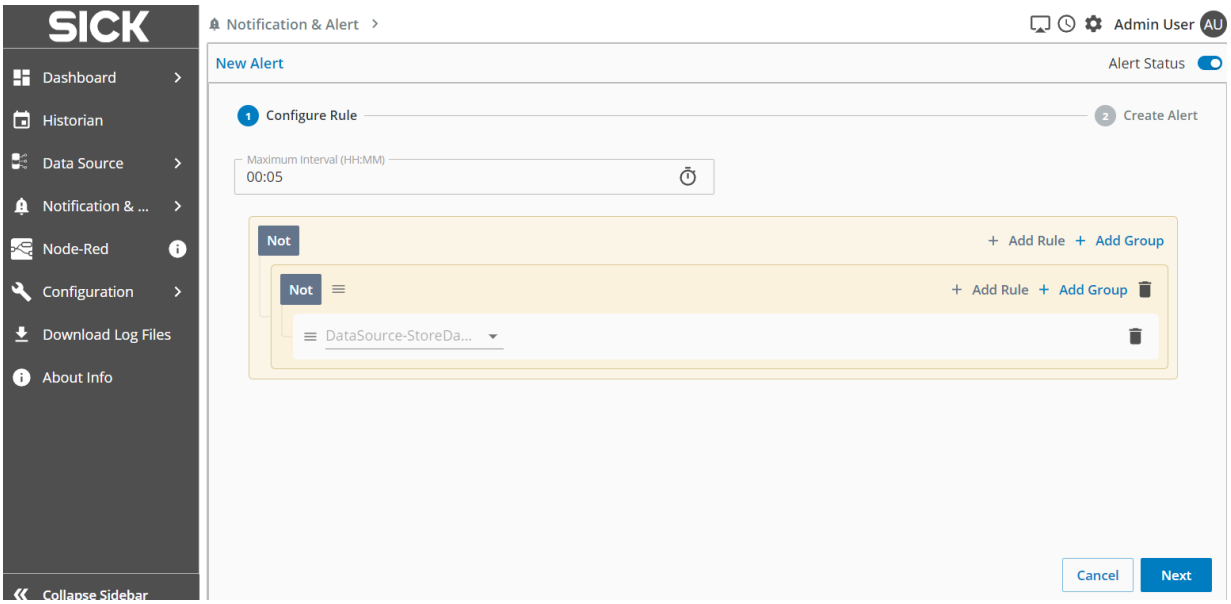
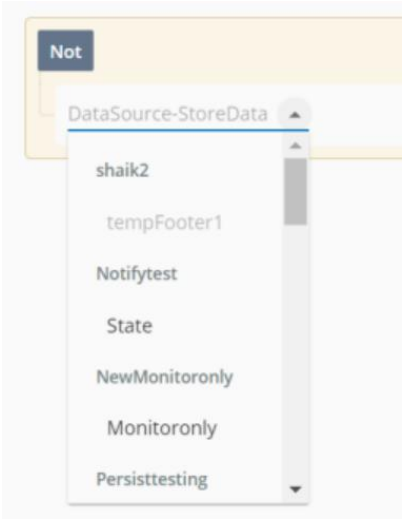


Figure 396: Data Source Store Data

Click Data Source Store Data drop-down, it displays list of created data source store data options. Select the preferred option from the list.



When Data Source Store Data is selected, two fields appear as shown in below figure.

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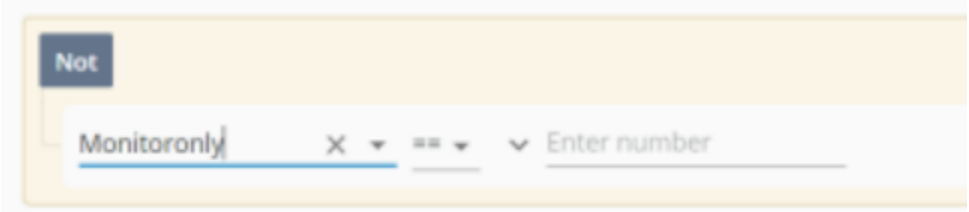
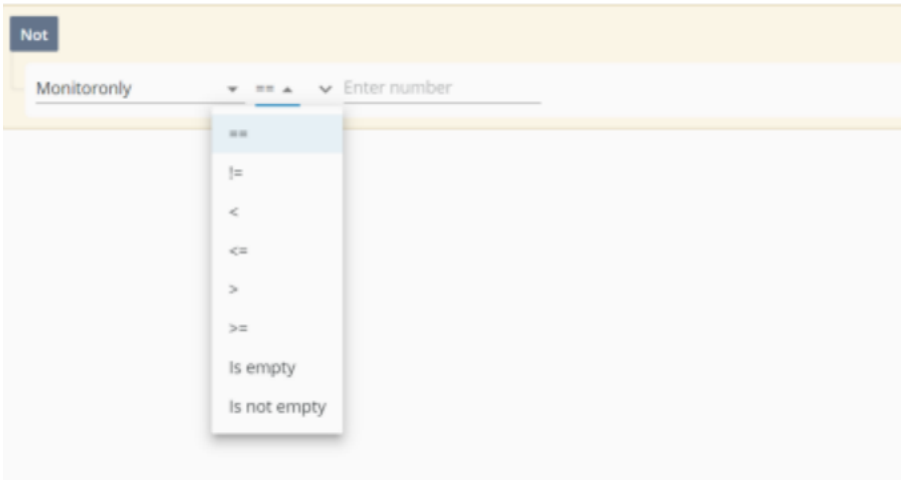
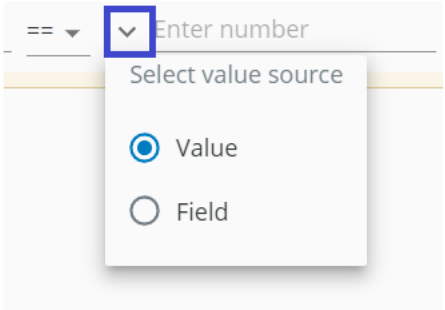


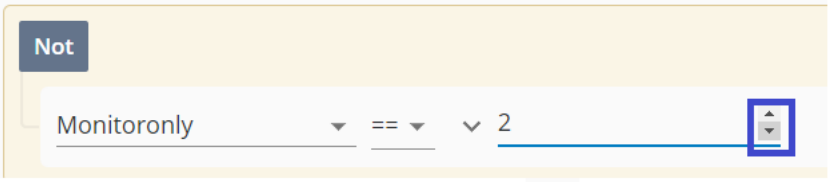
Select any of the mathematical symbol or condition defined from the drop-down.



Select drop-down arrow before the third field as shown in below figure.



If the **Value** is selected, then **Enter number** field is shown. Select the number by clicking on up and down arrows in the field.



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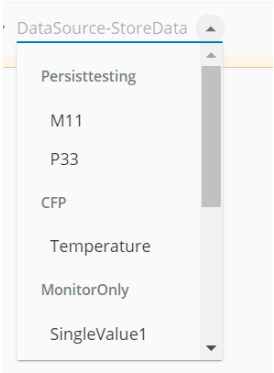
If the **Field** is selected, then **Data Source Store Data** field is displayed. Select the preferred option from the list.



Click the **Next** button. Create **Alert Screen** appears.

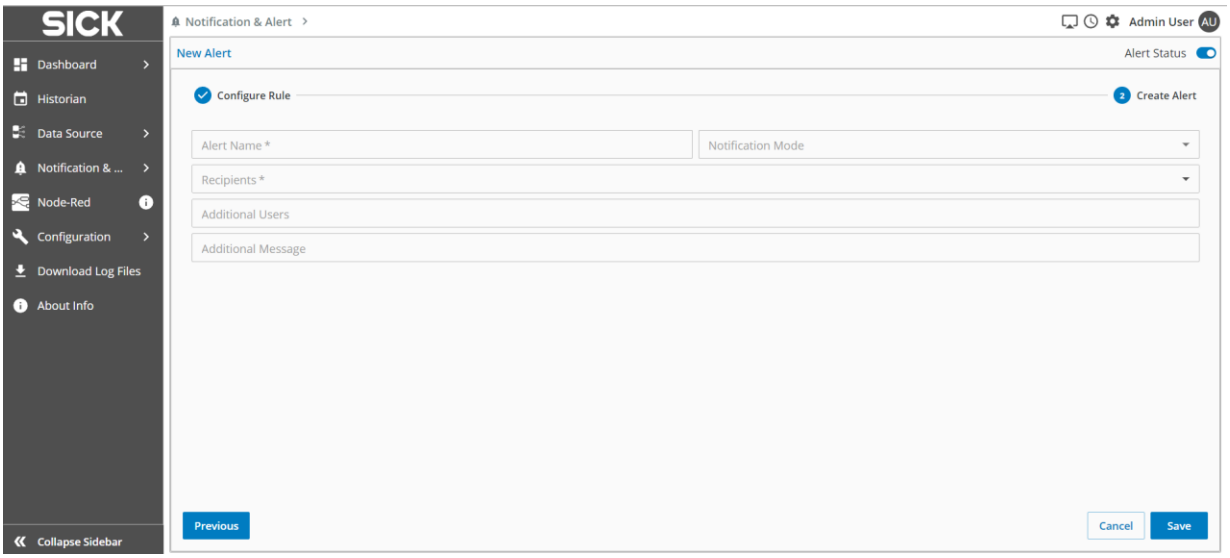


Figure 397: Create Alert

Provide the following fields to create an alert:

- **Alert Name**: Enter the alert name. It is a mandatory field
- **Notification Mode**: There are three notification modes that are **Email, SMS, and Both**. Select the preferred option from the drop down. It is a mandatory field
- **Recipients**: Select the recipients from the drop-down to whom notification alert has to be sent. It is a mandatory field
- **Addition Users**: It is an optional field. User can add additional users
- **Additional Message**: It is an optional field. Enter the message which can be sent along with the alert.

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Click the **Save** button to save the alert.

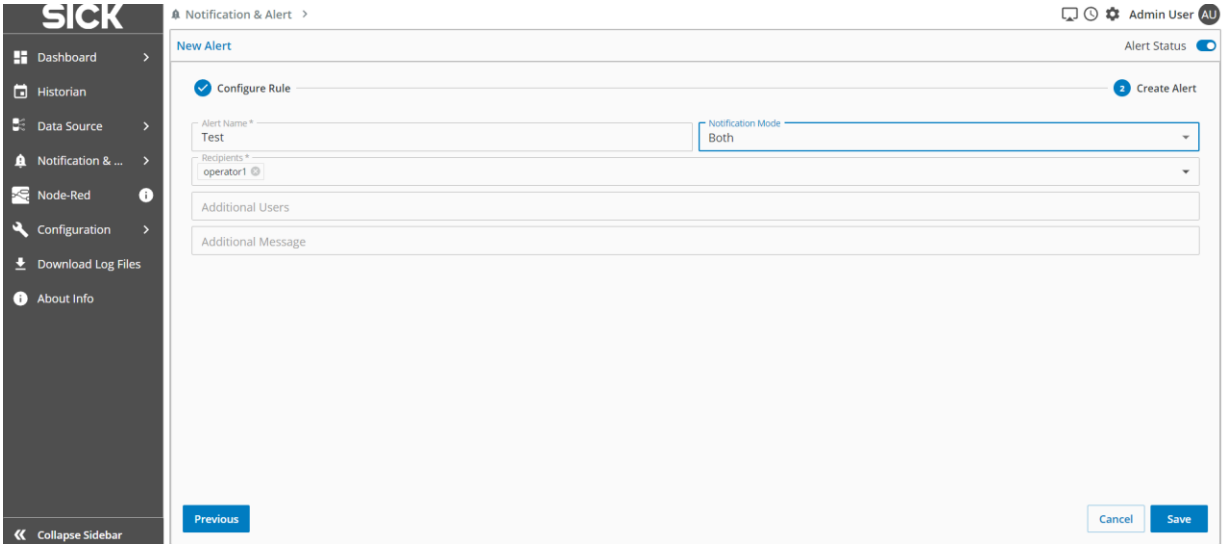

Figure 398: Create Alert Fields

The created Alert is displayed in the Alerts table. User can edit or delete the created alert group similarly as shown in sections 12.1.2.2 and 12.1.2.3.

12.2 Email/SMS Notification Settings

Select **Email and SMS Notification Settings** from notification and alert tab to set-up the email and SMS settings where notifications or alerts are received.

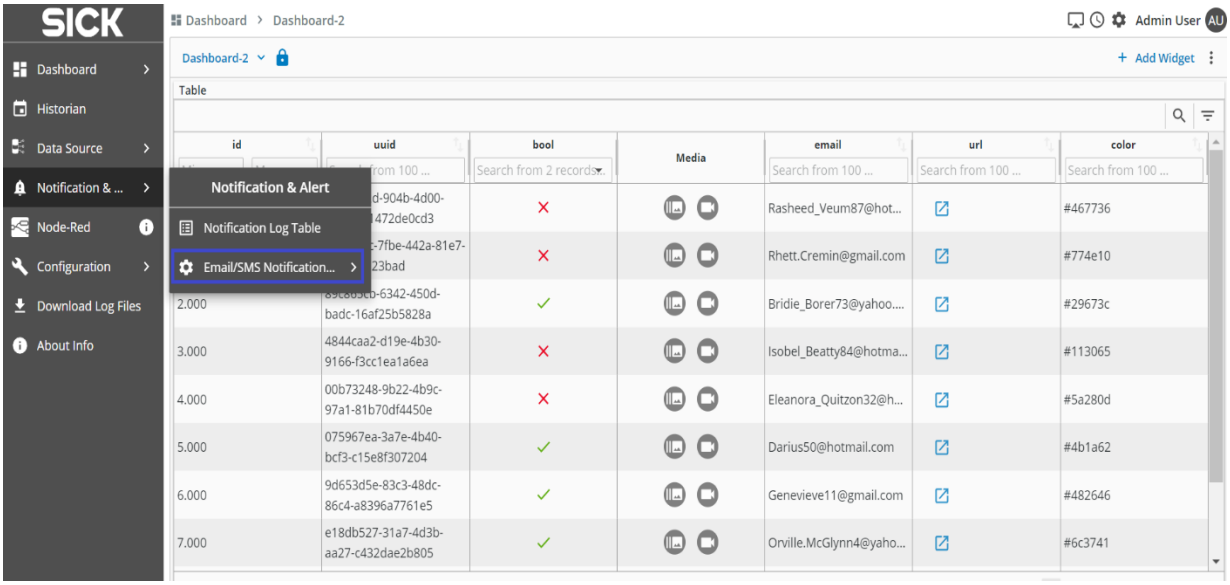

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Figure 399: Email/SMS Notification Settings

12.2.1 Email Settings

By default, Email Settings screen appears. Configure Email settings as shown in below figure. Click the **Test Connection** button to verify if the notification is received to provided mail address.

Note: Ensure Email notification is enabled.

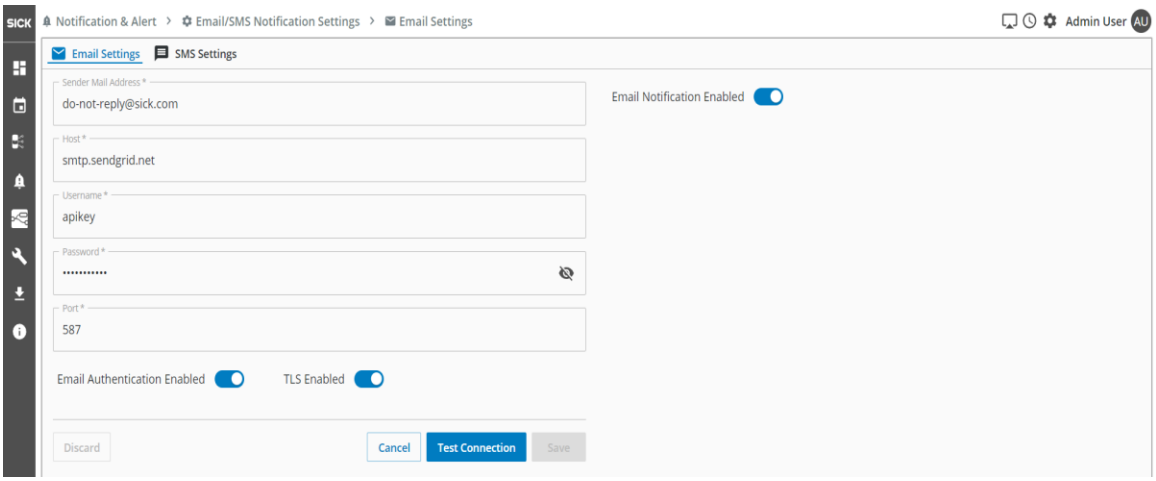

Figure 400: Email Settings

12.2.2 SMS Settings

Select **SMS Settings** tab on the screen. SMS settings screen appears. Configure SMS settings as shown in below figure and click the **Save** button.

Note: Ensure SMS notification is enabled to receive the notifications.

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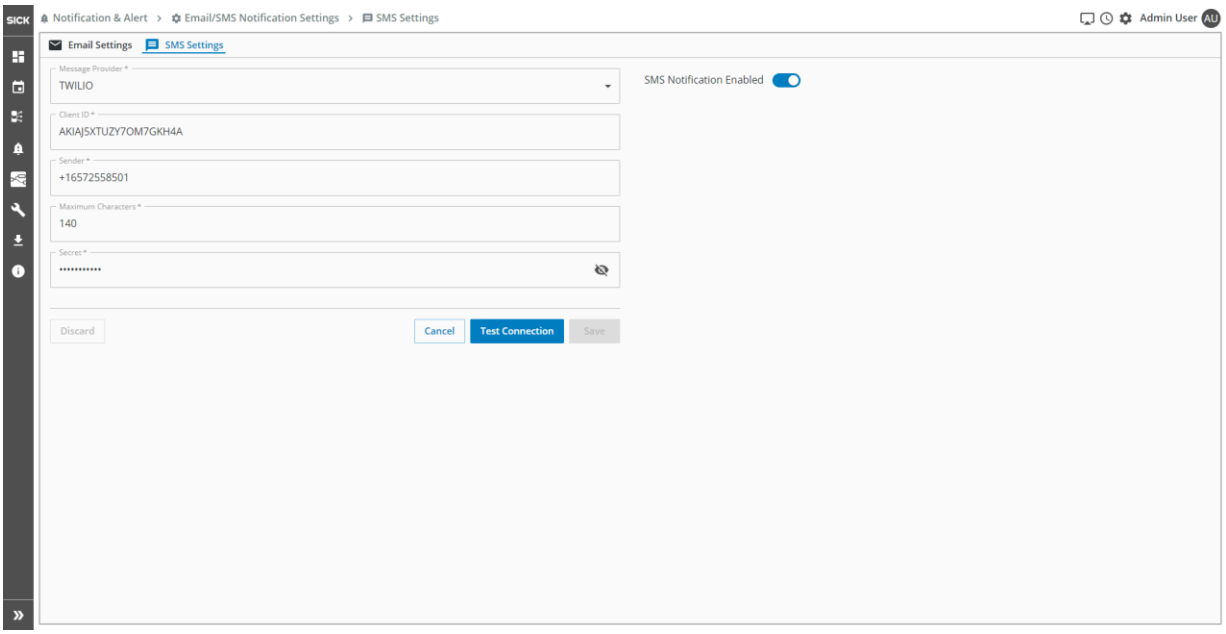

Figure 401: SMS Settings

13 Node-Red

Node-red is an open-source utility programming tool which is integrated in FA application for wiring hardware devices together.

To integrate node-red feature, user need to have the node-red feature privilege in their assigned role and the uploaded license need to have the node-red feature.

13.1 Node-red Feature

To open the node-red page, user need to assign the node-red certificate by adding the cert files in the installation files location **'C:\Program Files\SICK\FieldAnalytics\node-red\certs'** provided by the IT personnel. Now login to the FA application and click on the Node-red feature on left side menu list. It displays Node-red screen.

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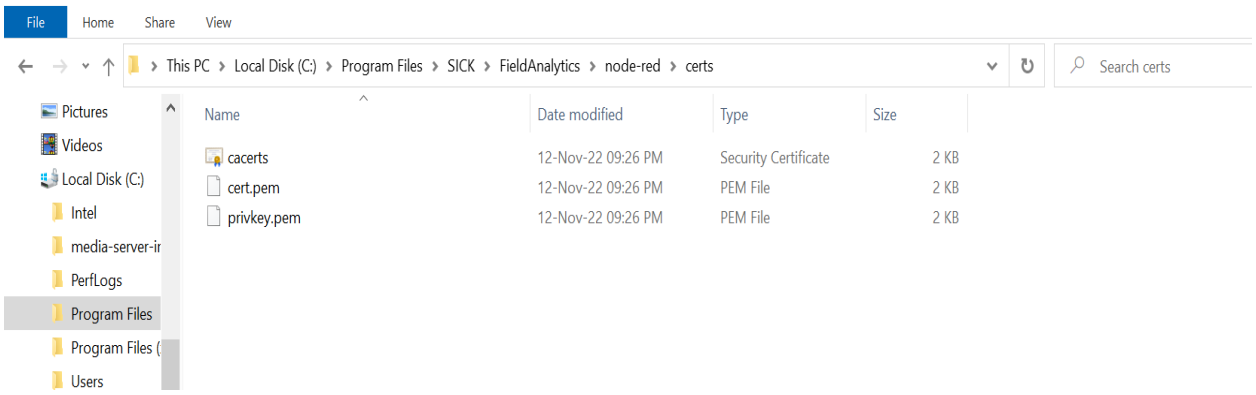

Figure 402: Node-red Certificates

If the certificate files are not added in the installation file location, then the user need to accept the certification after logging in to application as shown in below procedure.

Below example shows how to install new nodes on FA embedded Node-Red from command prompt, example shows installation of MODBUS nodes.

1. Stop Node-red (SICK Node-Red) from services.
2. Navigate to Node-red installation location under Field Analytics Installation location. For example, my installation location for field analytics: C:\Program Files\SICK\Analytics Solutions\MediaServer\, in this folder structure you can see that there is a folder with name Node-Red.
   - Open command prompt in '**C:\Program Files\SICK\Analytics Solutions\MediaServer\node-red\runtime\node-red**' folder location and run below commands.
   - npm config set strict-ssl false
   - npm config set registry http://registry.npmjs.org/
   - npm install node-red-contrib-modbus
3. Start Node-Red
4. After Node-Red starts, login into Field Analytics and click on Node-red icon, now we should see the Modbus nodes.

Note: The below screen appears only for the first-time login user.

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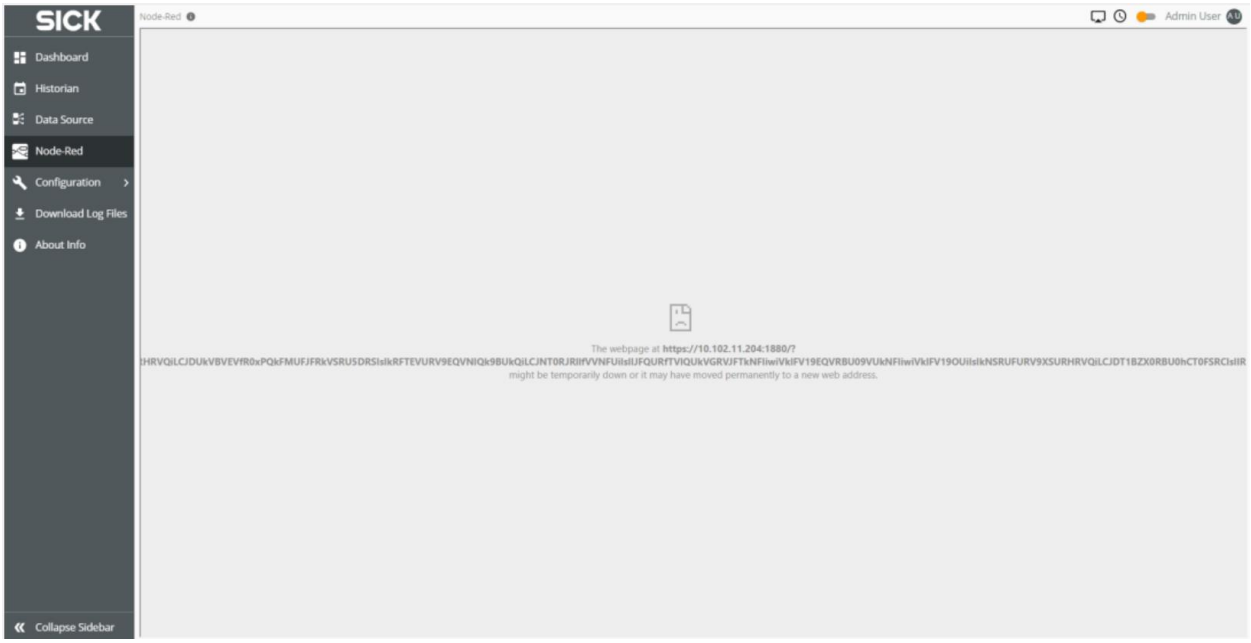

Figure 403: Accept Certificate

Click on the "**Node-red**" on top of the screen as shown in Figure 405: which allows to open node-red on a separate tab and accept the self-signed certificate that allows node-red to load.

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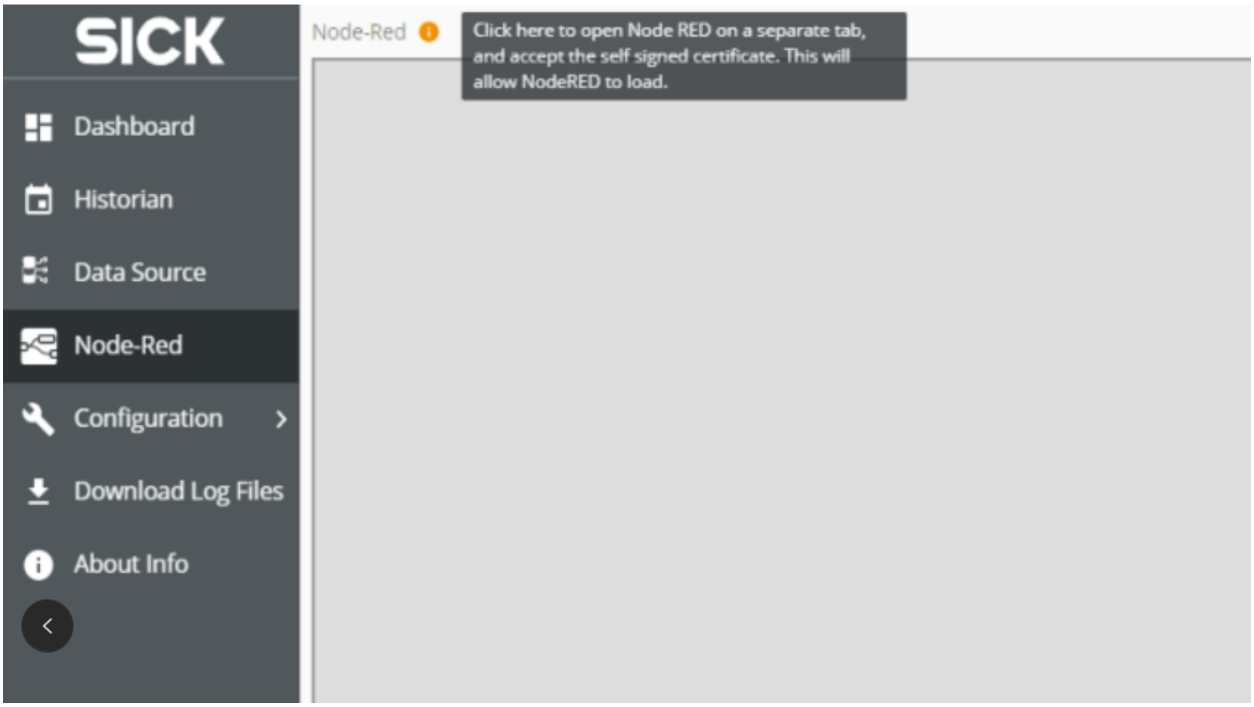

Figure 404: Node-red Screen

When user clicks on the node-red, it re-directs to the link to accept the certification. "**Your connection is not private**" page is displayed. Click on "**Advanced**" then click on "**Proceed to (IP address)**".

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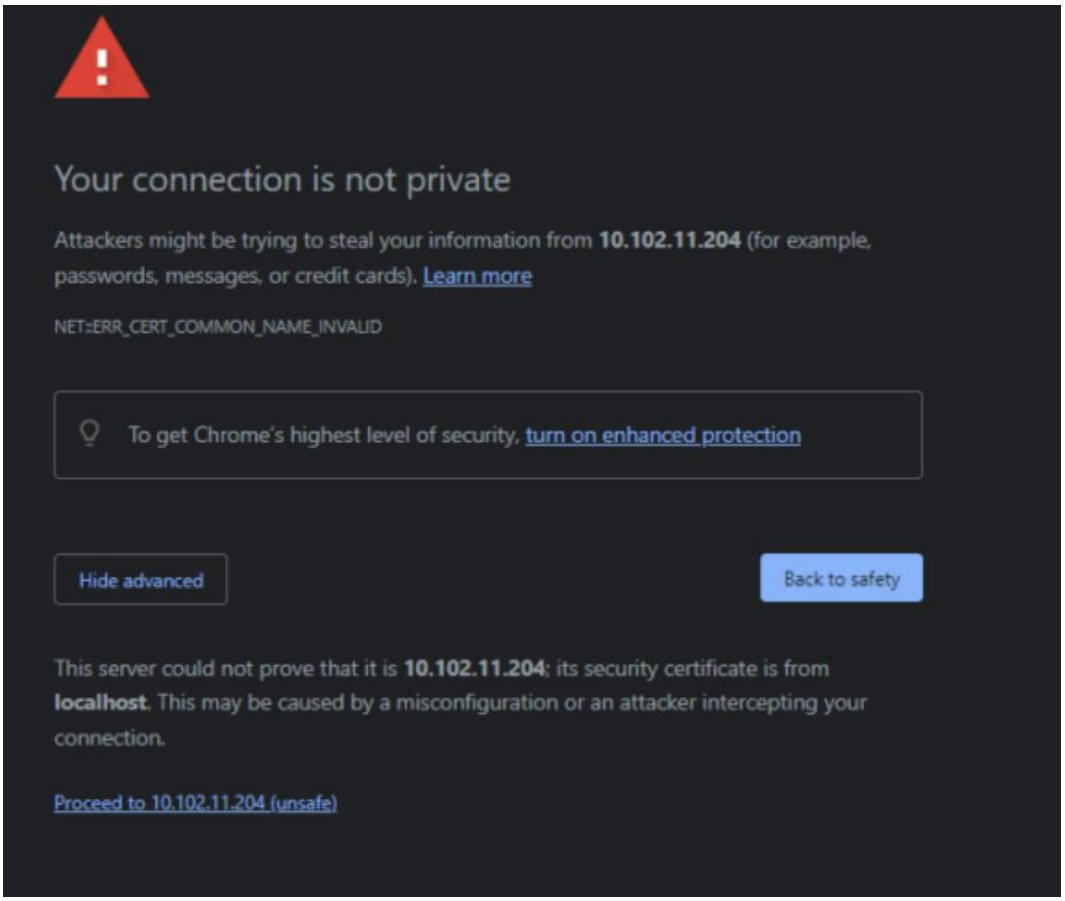

Figure 405: Connection Settings

After clicking on **Node-red**, Node-red page opens with a "**Welcome to Node-red 2.2**" dialog box. Click on '**Start**' button.

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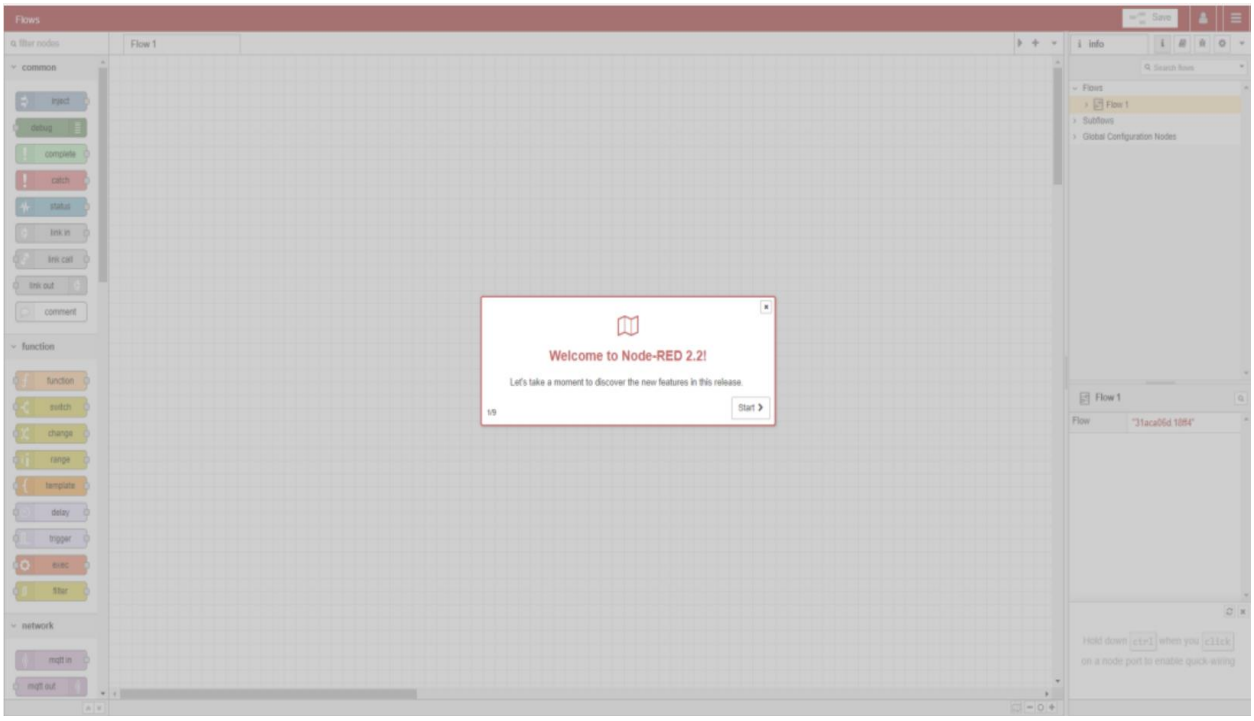

Figure 406: Node-red Page-1

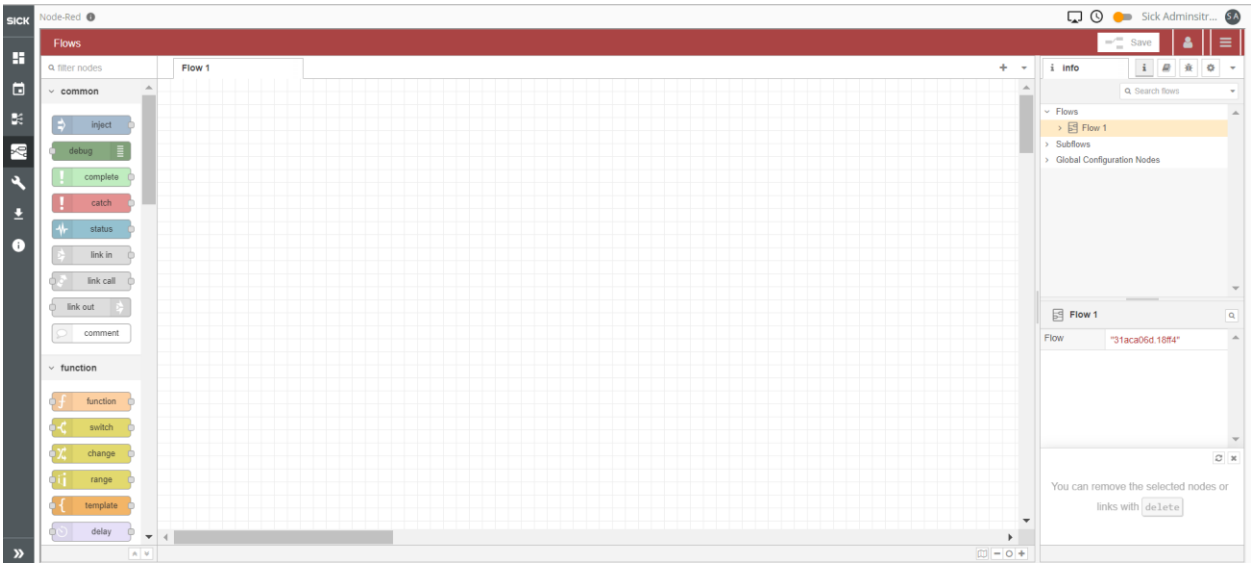

Figure 407: Node-red Page-2

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User can use the nodes listed on left side of the screen which can be dragged and moved to desired place on the screen and connect with other nodes to create a flow as shown in Figure 408: Node-red Flow.

After creation of the flow, click on '**Save'** button to save the created flow.

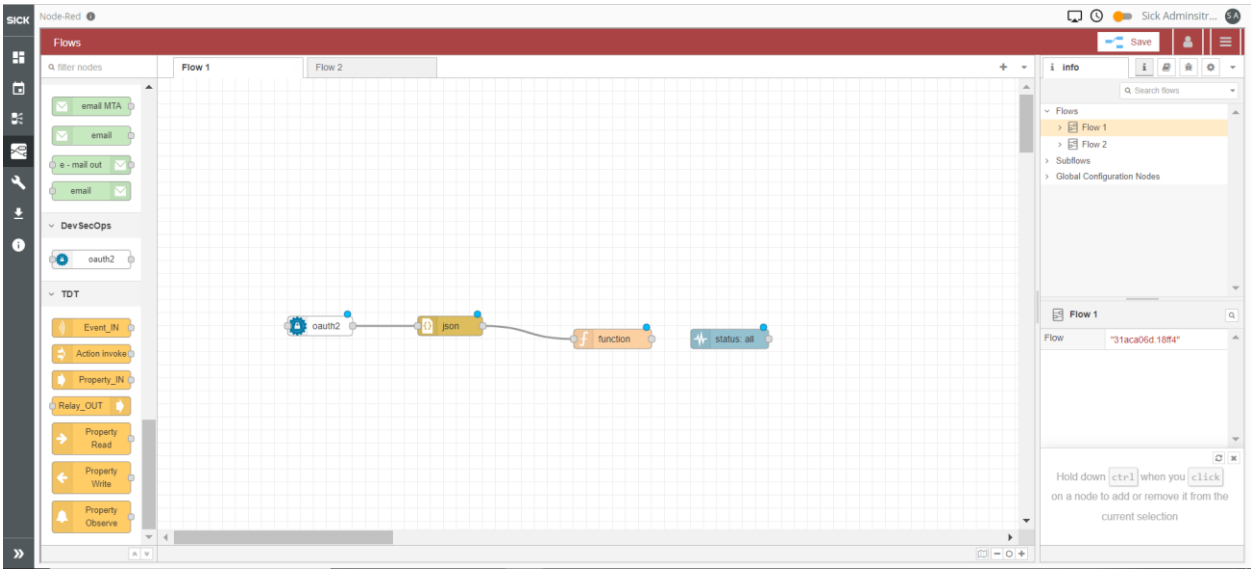

Figure 408: Node-red Flow

13.2 Adding Node-red in Preferred Role

To add the node-red feature in the preferred role, follow below steps:

1. Users can click on the **Profile** icon at the top right corner and then click on the '**Manage Role**' option. Refer to Figure 34: Manage Roles.
2. It displays the **Manage Role page** with the list of roles. From this screen, you can add, edit, delete. Refer to Figure 35: Manage Role Page.
3. On the Manage Role page, there are three vertical ellipsis icons in front of the screen. It has following tabs. Refer to Figure 32: Vertical ellipsis.
   - Edit
   - Delete
4. Select any of the preferred role vertical ellipsis and click on '**Edit'** option.

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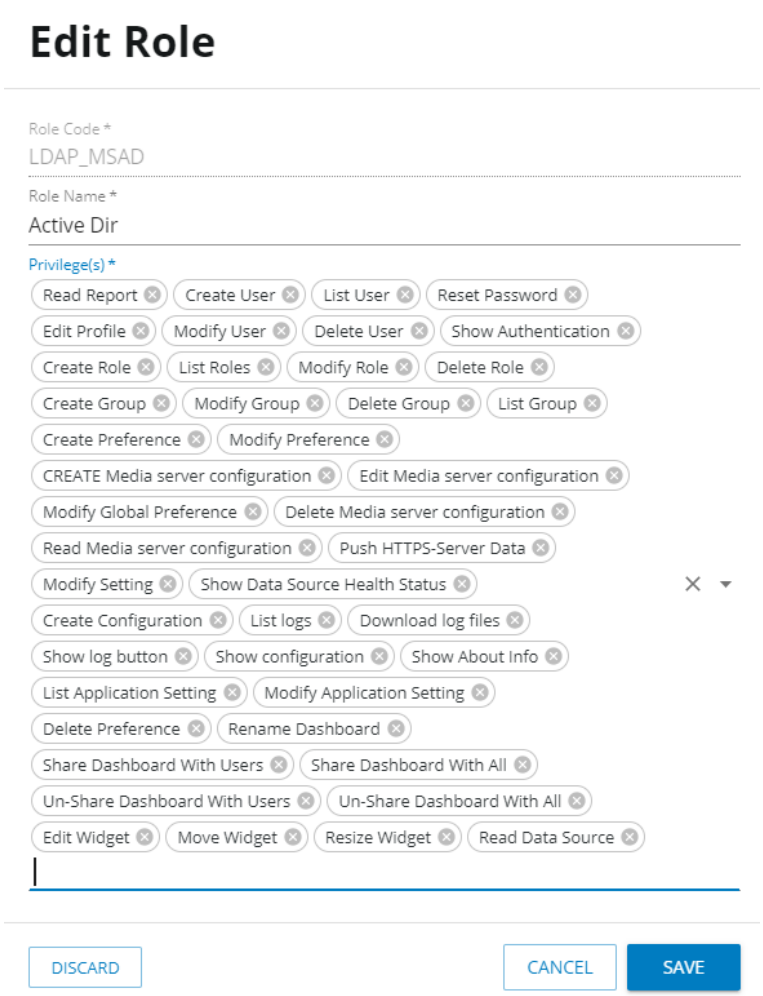

Figure 409: Edit Role

5. Under the privileges field, add "**Node-red**" and click on '**Save'** button.

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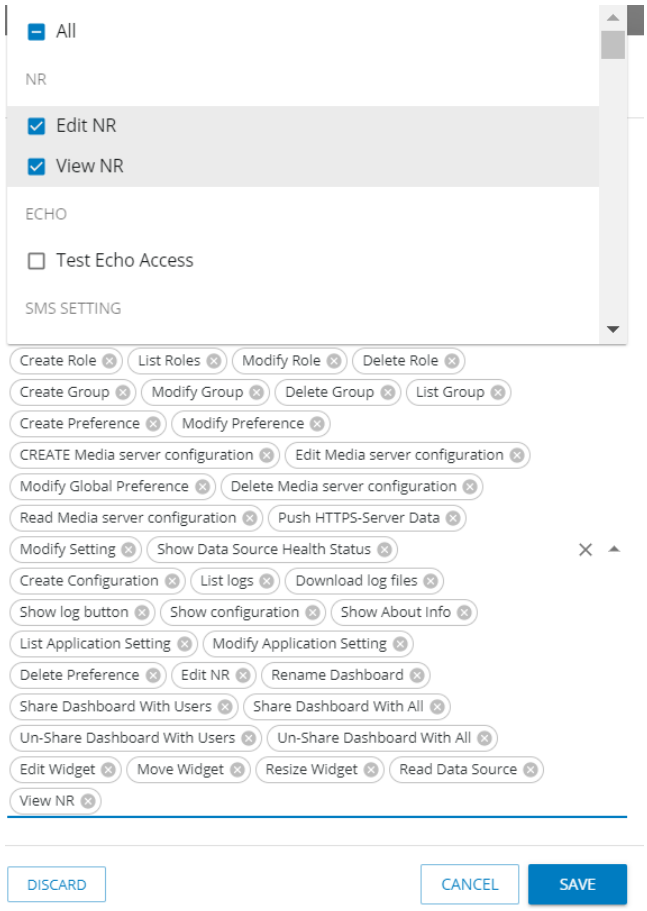

Figure 410: Added NR Privilege

Now the user can view the "**Node-red**" tab in the left side menu list.

Note: If only 'View NR' is checked in the privileges field, user can only view the flows in the NR tab. If 'Edit NR' is checked then user can modify or update the flows and 'Save' button is also enabled to update the changes.

14 Configuration

Configuration involves setting up the software and hardware components effectively gather and analyze data from various devices.

14.1 Backup and Restore Configuration

If User wants to back up configuration, then User should be able to choose option for configuration and FA should backup "config files, node-red flow, license, certificates and Database configuration which

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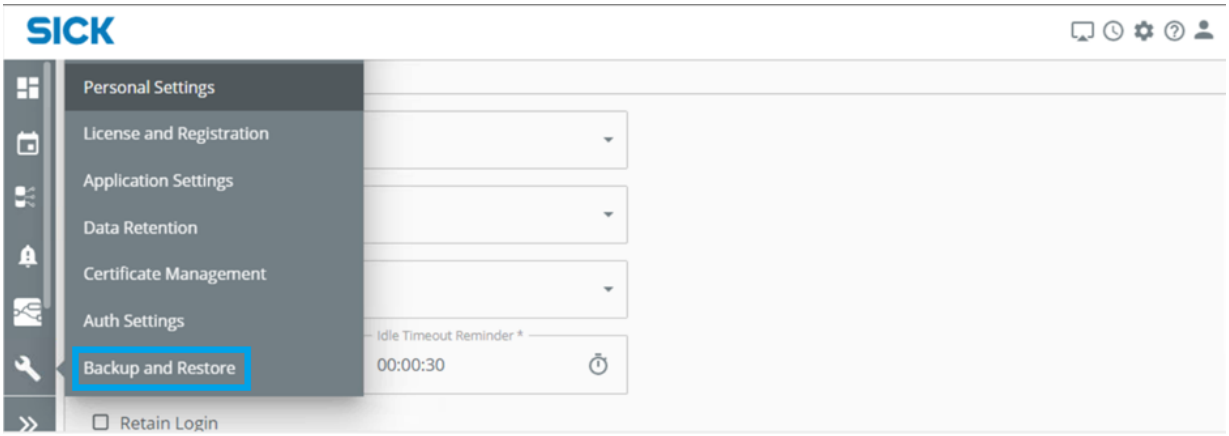
includes LUMP module, Data sources, media server, Notification and Alerts, Dashboards" and store it in location provided by user and click on backup button then it should be backed up.

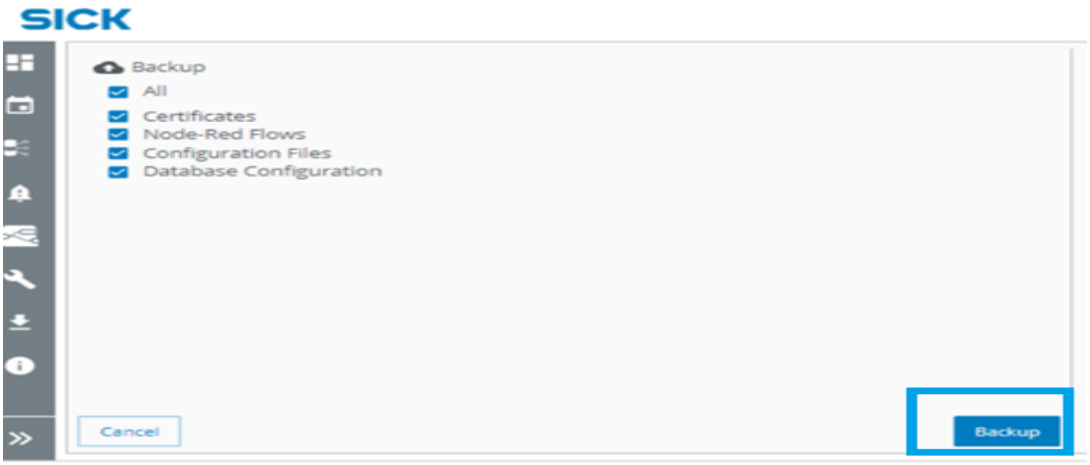
This option should be up and running or create Backup privilege or Restore Backup privilege, when user should enable the feature in license "BACKUP_RESTORE”.

Below figure shows you how to choose Backup and Restore option from Configuration section:



Also, user should Login with valid credentials then only it will navigate to the Configuration page and click on Backup and restore tile

User can Backup the files by clicking of a button which is shown below.



User can also Restore the files by uploading the file, then it will enable the Restore button, which is shown below:

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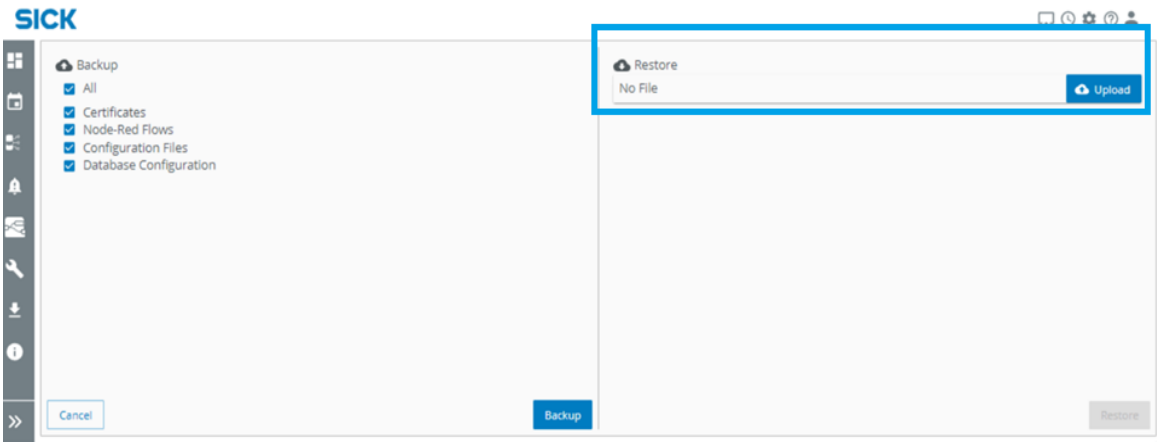

15 Download Log Files

User can download the log files of all the issue logs carried out in the application.

In the homepage, user can access the '**Download log files**' in the left side menu list. In the '**Download log files'** screen, it displays **File Name, File Size** and **Date Modified**.

User can search the preferred file in the search box provided on top of the screen or check the required files to download on the checkboxes provided on left side of the screen. Refer to Figure 411: Download Log Files.

After selecting the required files, click on the download button. The selected log files are downloaded to the local system. Refer to Figure 412: Download Button.

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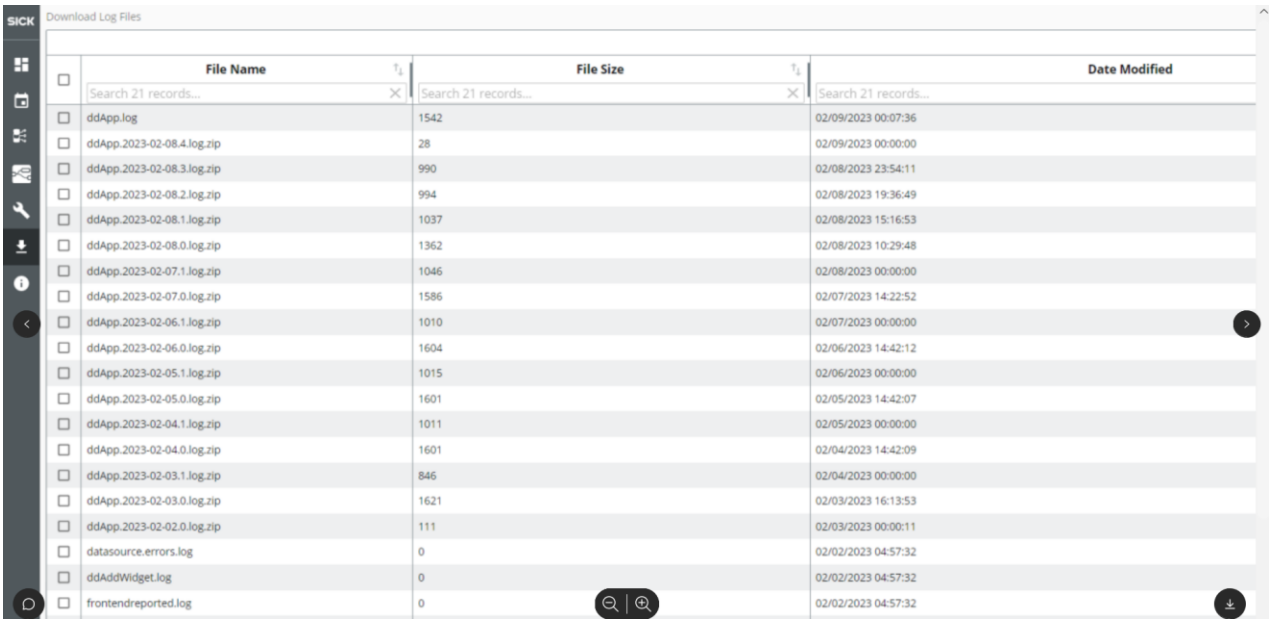

Figure 411: Download Log Files

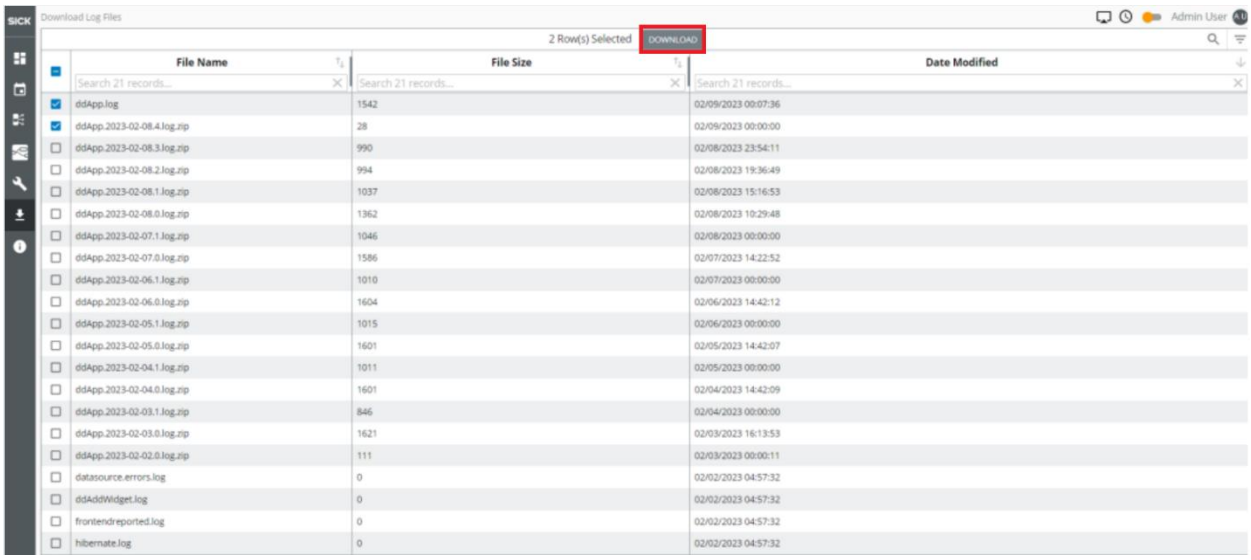

Figure 412: Download Button

16 About info

On the home page, click the last icon in the navigation bar it will display About Info page. Refer to Figure 413: About Info Home Page.

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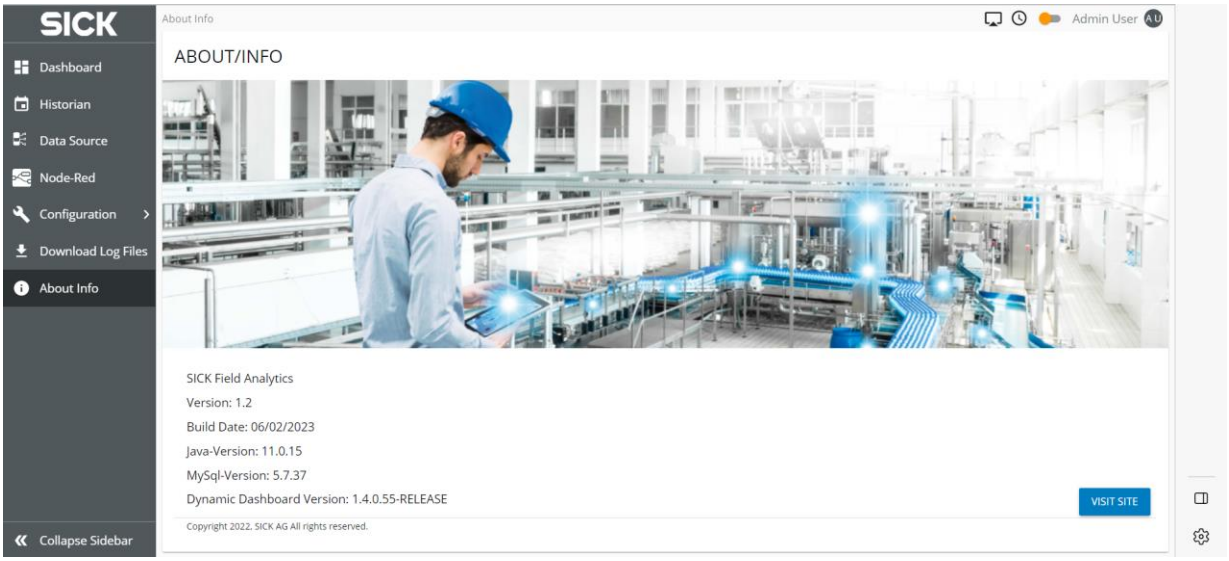

Figure 413: About Info Home Page

The About Info page displays the Product Information which includes the software Info and versions, Build date, copyright, and a Visit site button. Refer to Figure 414: Product Information.

Figure 414: Product Information

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17 Support

Field Analytics Software Support Portal GBC05

Support is handled via the SICK Support Portal:

- 1st level support through SSUs (MPM/MAE/AE)
- 2nd level support through Analytics Application Team via Support Portal
- 3rd level support through Analytics R&D Team

Software support lifecycle policy

Software patches and bug fixes will be listed on the SICK Support Portal page for all Analytics Products.

17.1 Troubleshooting

17.1.1 How to Restart Services

1. User can navigate to windows services app by clicking on windows search icon and search for Services OR via Task Manager.
2. Click on services. This will open the windows services screen. Refer to Figure 415: Windows Services.

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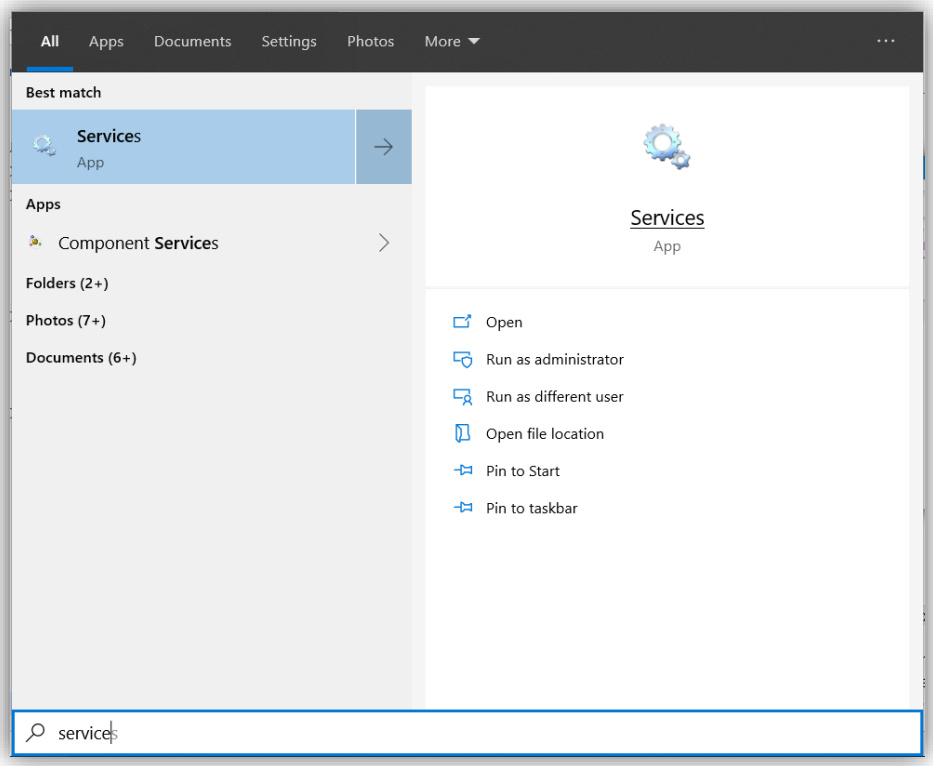

Figure 415: Windows Services

3. Go to SICK Field Analytics. Refer to Figure 416: Analytics Solutions Service.

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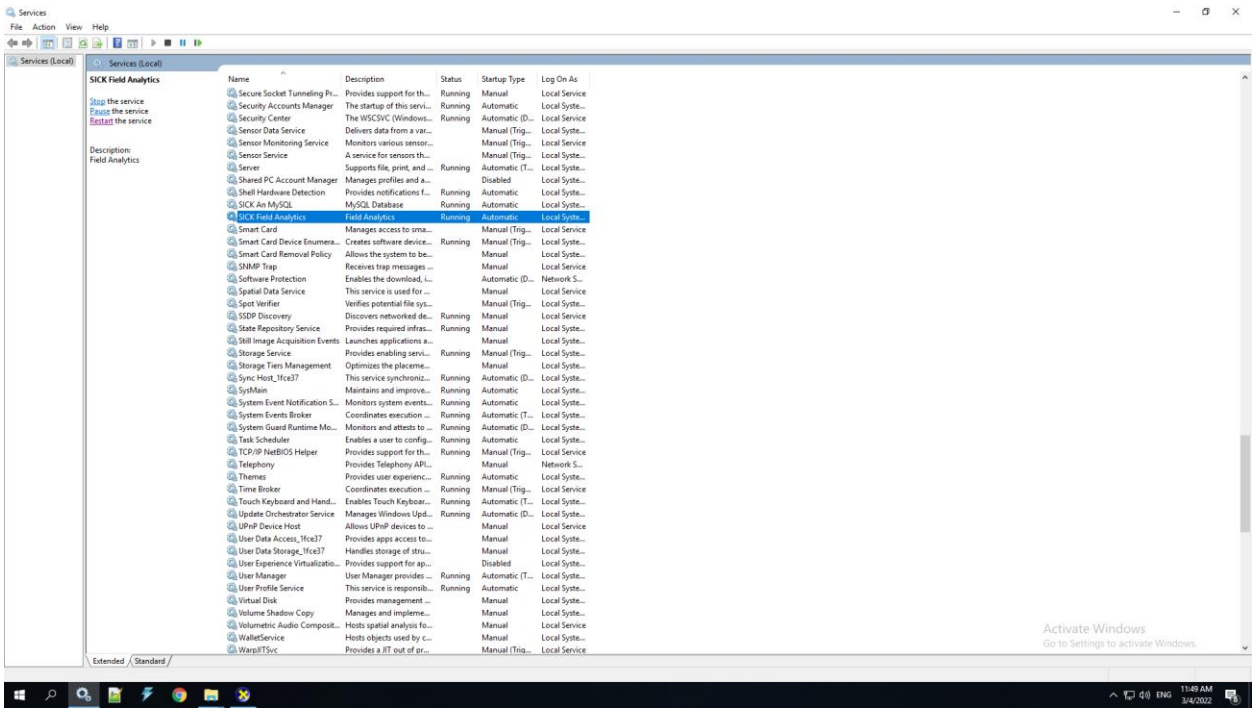

Figure 416: Analytics Solutions Service

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4. Right click on SICK Field Analytics and select restart option. Refer to Figure 417: Restart Service.

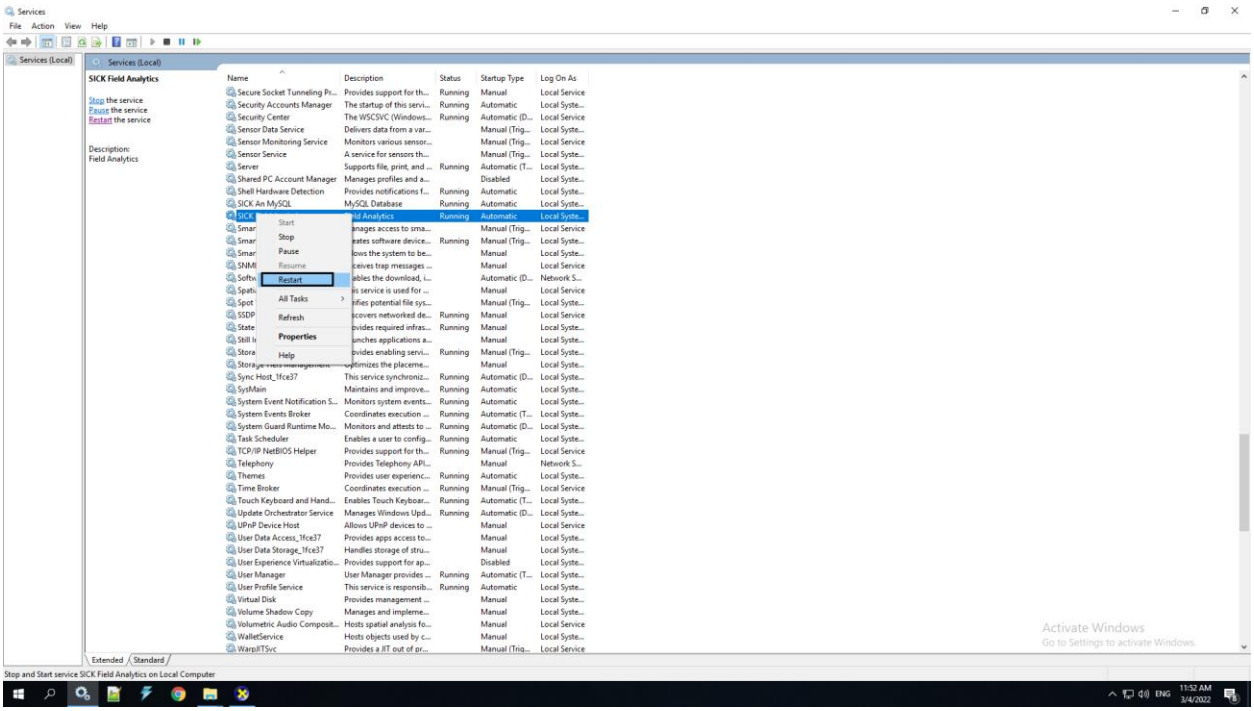

Figure 417: Restart Service

17.1.2 Application is not able to authenticate using secure LDAP

Problem:	After Installing FA application, if user wants to login/authenticate the application using AD (Active Directory) or open LDAP user, it will require the LDAP authentication. 1.LDAP 2.Secure LDAP Currently, user can authenticate using only LDAP. To use secure LDAP user needs an updated 'cacerts' file to verify settings successfully or login.
Cause:	Application does not have the updated cacerts file.
Solution:	Pre-Requisite: User should have 'Sick-root.cer' present in the machine. [For 'sick-root.sert' contact SICK Technical Support]

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	The command to import this cert into cacerts – [run the command from where sick-root.cer file is present] 1.Open command prompt [where sick-root.cer file is present] 2.Copy this command into command prompt "c:\Program Files\SICK\FieldAnalytics\jre\bin\keytool" – import-alias sick-root – file sick-root.cer – trustcacerts- deststorepass chageIt – keystore "c:\Program Files\SICK\FieldAnalytics\jre\lib\security\cacerts" 3 Click Enter Key from keyboard. 4. Close the command prompt. 5. Now, Restart the FA services.

17.1.3 Unable to view images available in Media Server (Historian, widget)

Problem:	FA 1.0 gives capability to integrate with media capturing devices and view the captured media. This is possible by using Media Server. If the Media Server or the widgets displaying media data are not properly configured, captured media won't be displayed properly.
Cause:	There can be multiple causes to the problem. Image not displayed in historian: - Media Server not configured - Media Server is offline - Data key is not binded with the media Server - Authentication is enabled in Media Server
Solution: 1	Media Server not configured • Navigate to Data sources • Click on Media Server tab • Check if Media Server is configured (Refer FA User Manual for details to configure Media Server) • Move to Next step is MS already configured.
Solution: 2	Media Server not configured • Navigate to Data sources • Click on Media Server tab • Observe if connectivity of MS is Offline or online. • If offline, Go to services and check if MS services are running or not. • Move to next step if MS is online.

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Solution: 3	Data Key is not binded with the media server • Navigate to Data sources • Click on edit icon of the Data source that is having issues. • Navigate to store Data key section. • Click on setting icon next to the data key which stores images • Click on Data binding. • Check if configured MS is binded to the data key.

17.2 Known Limitations

Authentication Provider Settings page is only available for the logged in Users having appropriate permissions.

- If you are not logged in or you do not have permissions, you won't be able to access this page.
- If there is an AD group created and the same group is created in Field Analytics then upon using LDAP, those users will be assigned to the default groups on Field Analytics and from there privileges are already assigned or can be modified.
- If Active directory authentication is enabled, the Manage User fields will be disabled.
- When creating groups within Field Analytics to link customer AD, if the AD group already has been created or exists within Field Analytics, the newly logged in AD user will be added to this same group name within Field Analytics. If that group does not exist, the user will be assigned to the pre-defined default group within Field Analytics.
- **Form Builder Widget**> Limitation is on GET/POST String (Cannot differentiate integer at this time).
- **Historian**> All the filters can be selected together and on clicking SEARCH the results will be displayed according to the one Data Source. Also, when more than one Data source is selected and select any grouping filter then click on SEARCH, the results will be displayed for single Data source.
- **Data source**> When Data source is deleted, the saved data will remain in database. However, user will lose filter of it in Historian Filter Field.
- **Surface Pro 7 device**> **Form Builder**> On the Setting tab, user is not able to drag and drop the fields in order to create a form.

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18 Glossary

FA	Field Analytics
Dashboard	Dashboard is a data visualization tool (to keep track of production, quality, system health etc.) that can be represented by customized widgets to track, process, and display relevant data as per user needs.
Widgets	Widgets are a part of the Field Analytics graphical user interface that are used to represent information in a specific way
Data Sources	Data Sources are used to store data that is generated by the APIs
Historian	Historian is searching functionalities for all the data being stored through data sources.
Global Language	Allows Administrator to configure settings for the complete user group, related to Locale, Date format and Time format
Personal Settings	Allows user to personalize changes related to Locale, Date format and Time format for their profiles only and not for the complete group.
Client Computer	The client computer is any PC connected to the FA network. FA's client applications are Rich Internet Applications (RIA). The client applications connect to the FA Application Server to access rich data content and provide a powerful user experience.
MAC	The system Media Access Controller (MAC) is a unique computer ID. It is used by PA to secure your software license to a physical computer.
User Preference	Settings that can be customized for a particular user.

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