User Manual

SERIS

Solar Energy Research Institute Singapore

Solar Energy Research Institute of Singapore

Cloud Based Realtime Analytical Monitoring of Photovoltaic Systems and Weather Parameters Project

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Version History

Version	Author/Reviewer		Brief description of changes
Draft	Nay Lin Aung	18/01/ 2019	Initial Version.
1.1	Nay Lin Aung	02/02/2019	Edited and baselined the user manual.

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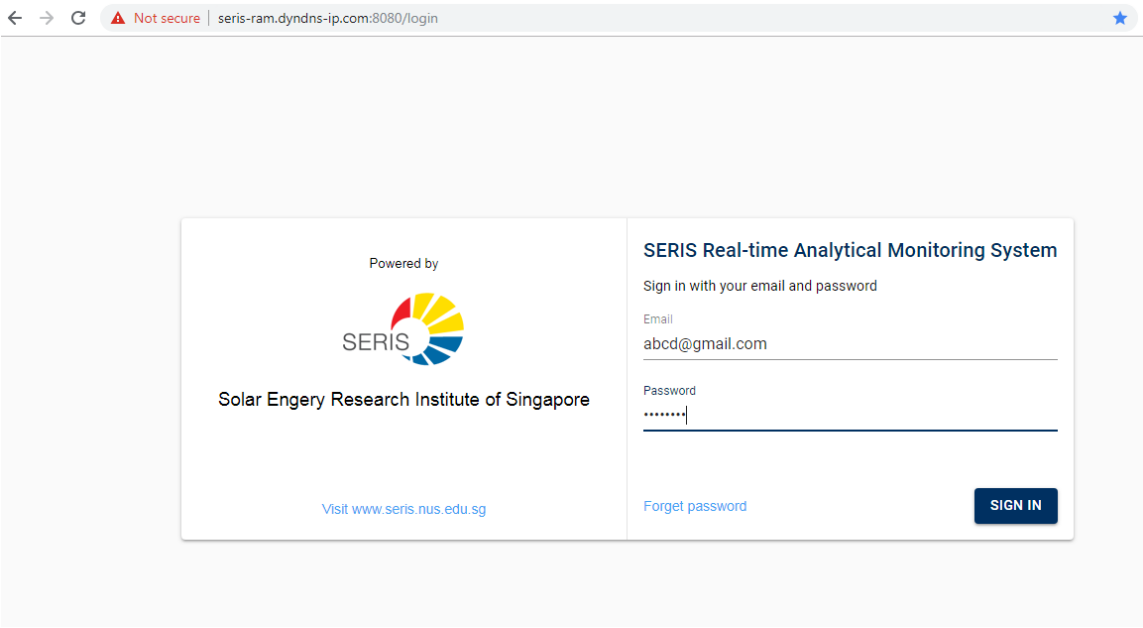
1. Overview

The Solar Energy Research Institute of Singapore (SERIS) conducts research, development testing and consulting on solar energy technologies and their integration into power systems and buildings. SERIS is globally active but focuses on technologies and services for tropical regions, in particular for Singapore and South-East Asia.

The aim of the project is to develop a cloud-based platform for integrating and managing real-time Analytical Monitoring of PV systems performance - from small rooftop systems to large ground- based PV power plants in the multi-MW range across different climate zones. Collected data will be used for extensive research programmes on yield projections, which are of vital importance to project developers as well as investors and degradation studies of PV modules & systems.

2. Login

Open the browser, and by entering URL < http://seris-ram.dyndns-ip.com:8080/login> of SERIS web application, login page will be shown. Keying in registered email and password will lead to login into the SERIS system and it will display the system's dashboard.



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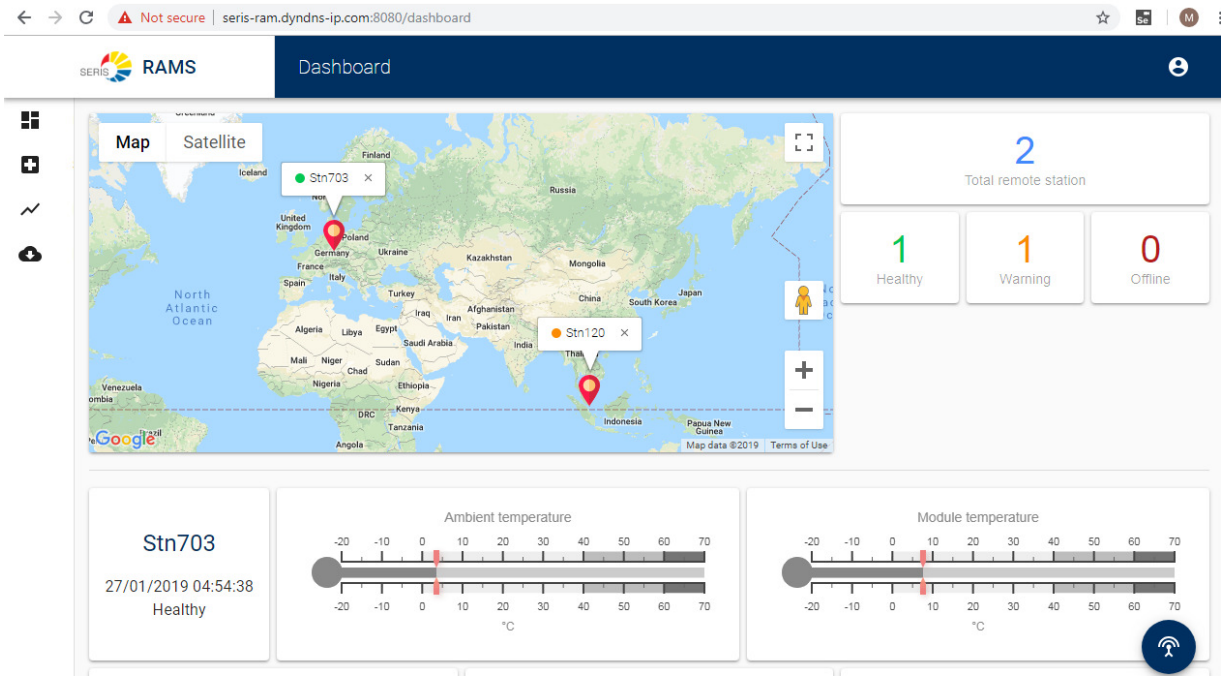

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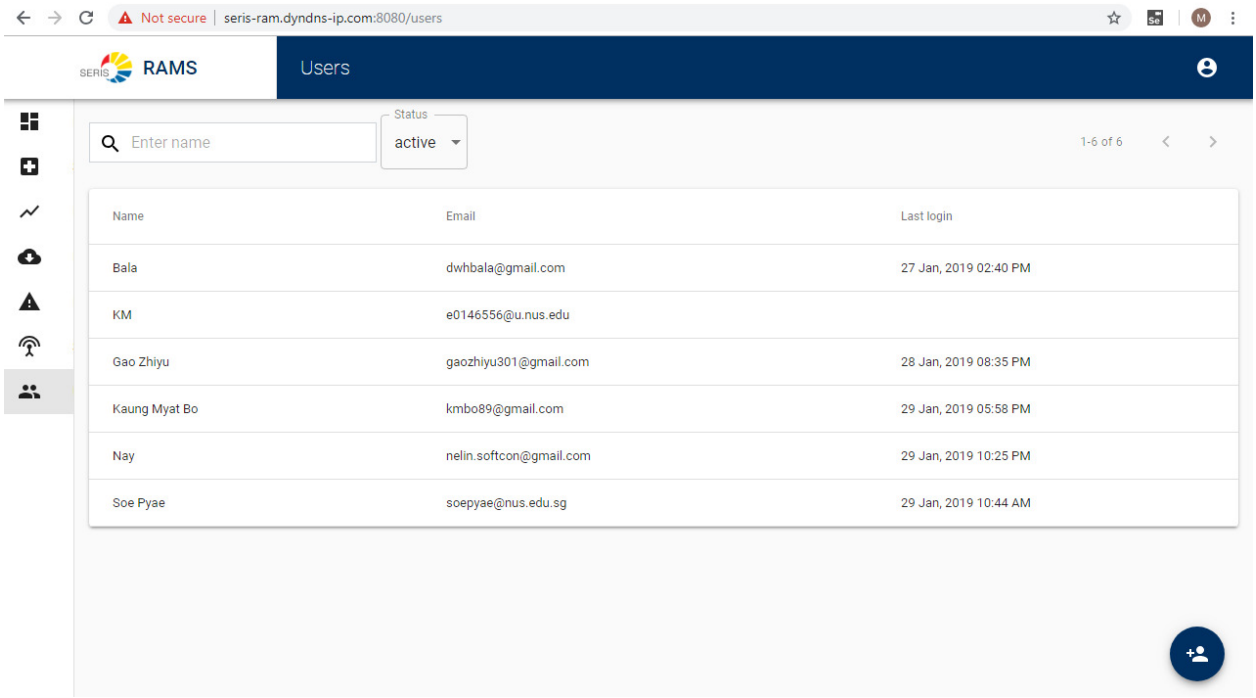
3. New User Registration

To create a new user, the system should be logged in with administrater right. System user without administrater right can not create/delete user.

With admin-right, press the button located at the right-buttom corner for creating new user. It will display the page for adding/creating new user with respective information.



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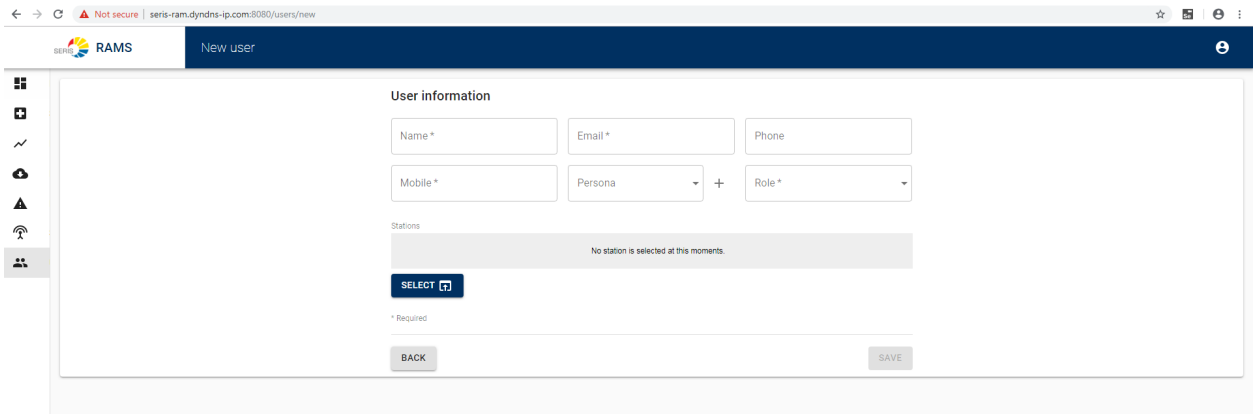
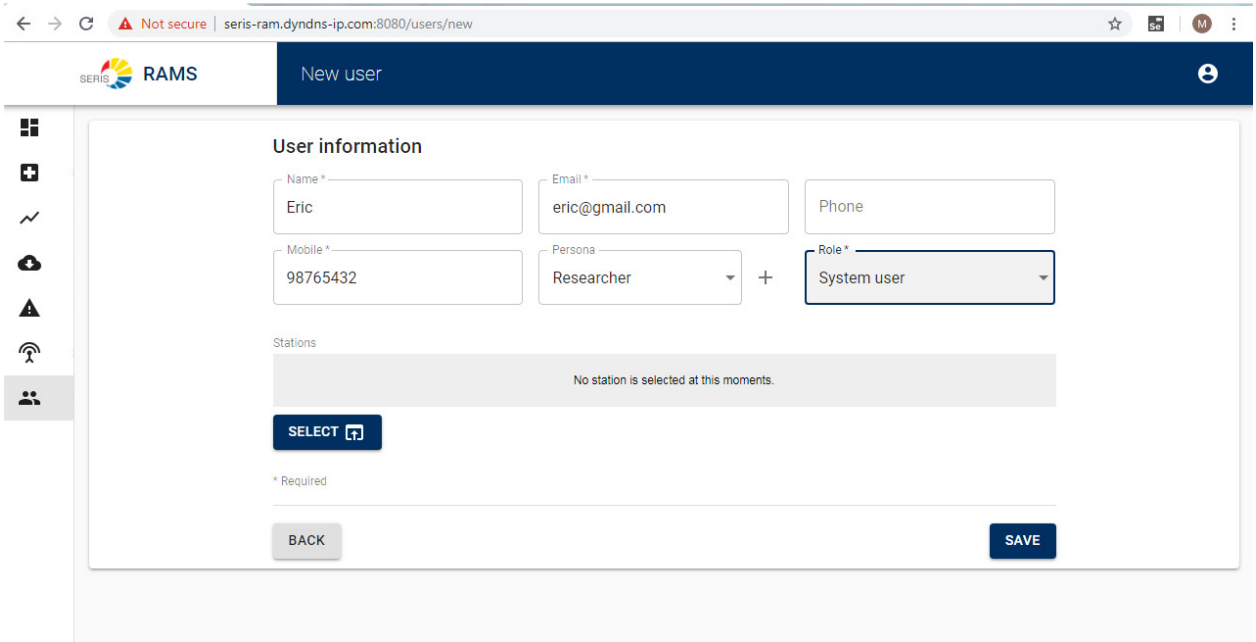
Enter necessary information for new user, assign satations for that particular user, and save it. The system should have created new user and a url link will be sent to the new user's email. The user should check his email, and should have clicked the url link and activated the account. It is strongly advised to set new password.





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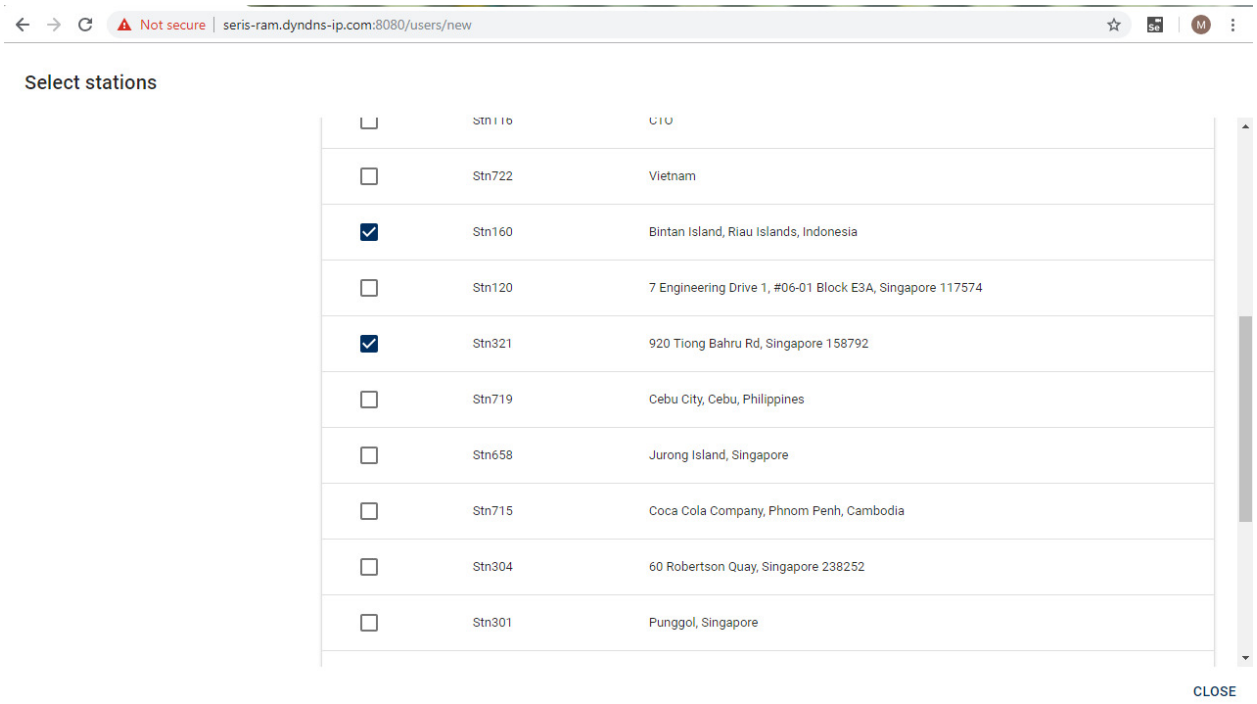

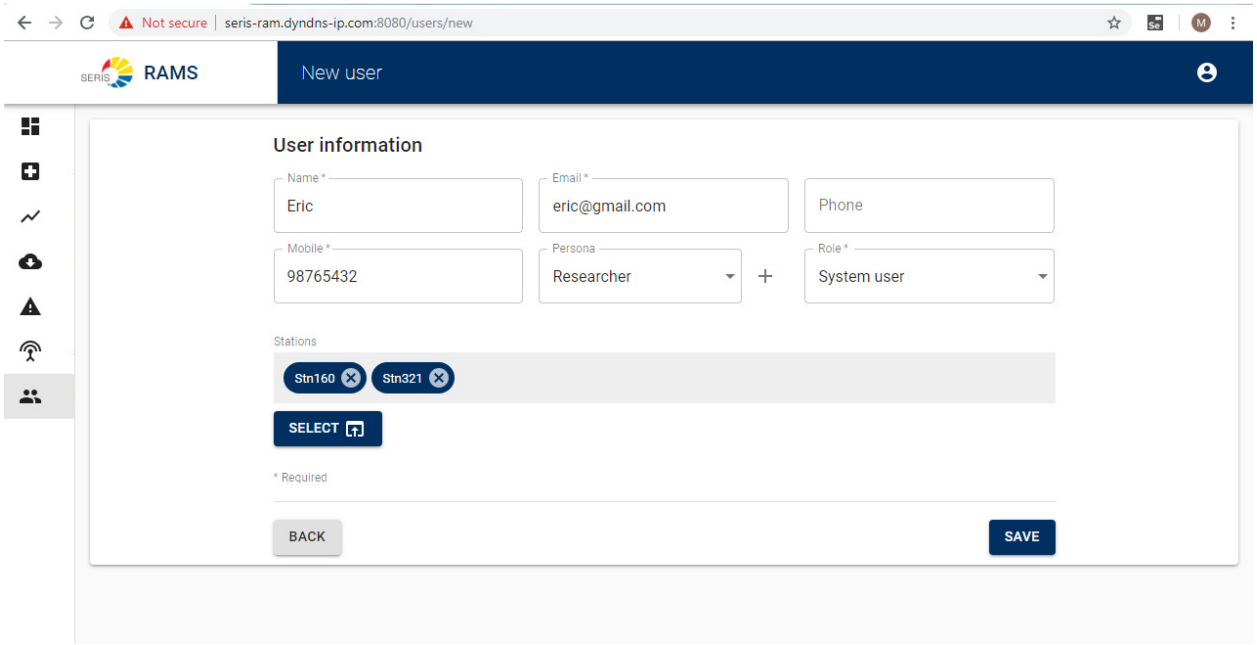

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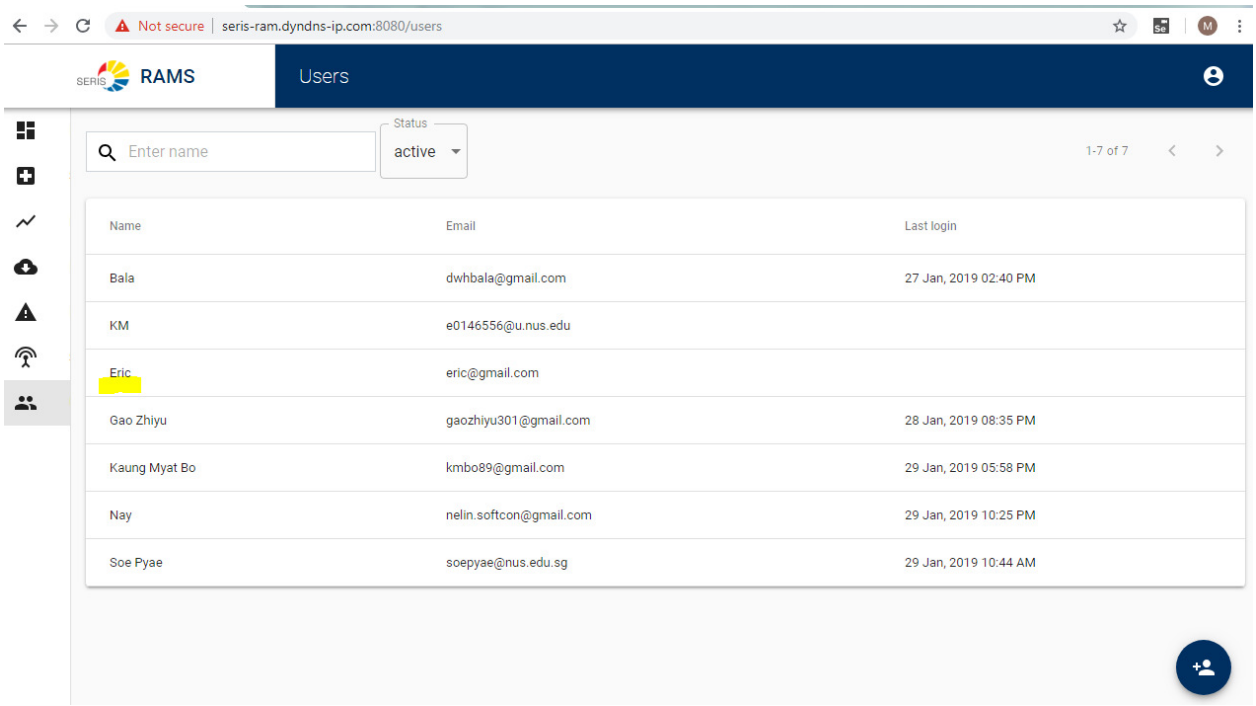

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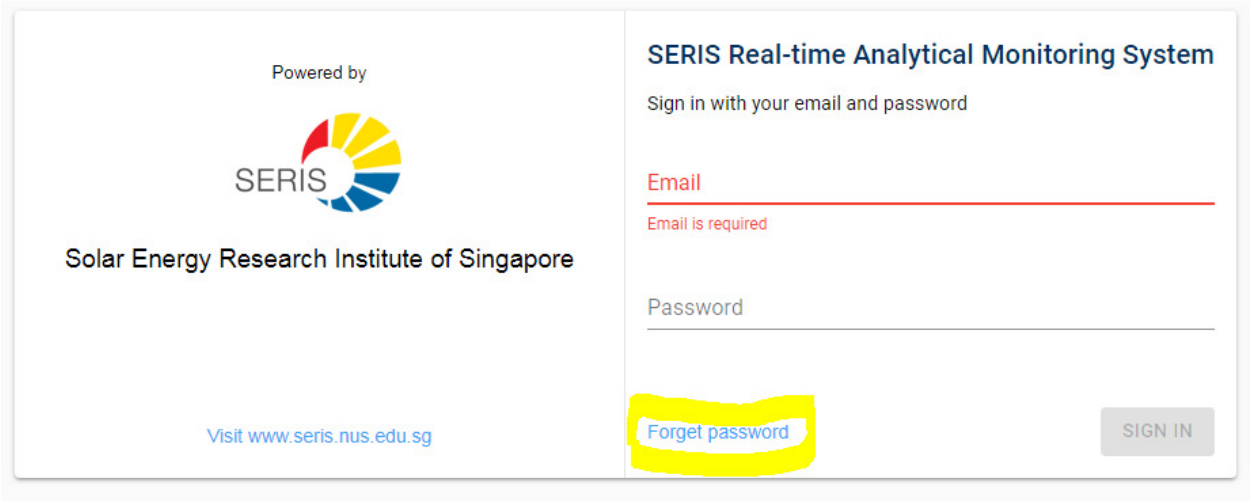
4. Forgot Password

This option allows an existing user to reset password, in case he/she is not able to recall his/her current password. A registered user can request for a password reset link to be sent to his/her registered email address. Using this link, the user will be able to choose and assign a new password.

The System allows the user with appropriate permission to browse list of all stations existing in the system.



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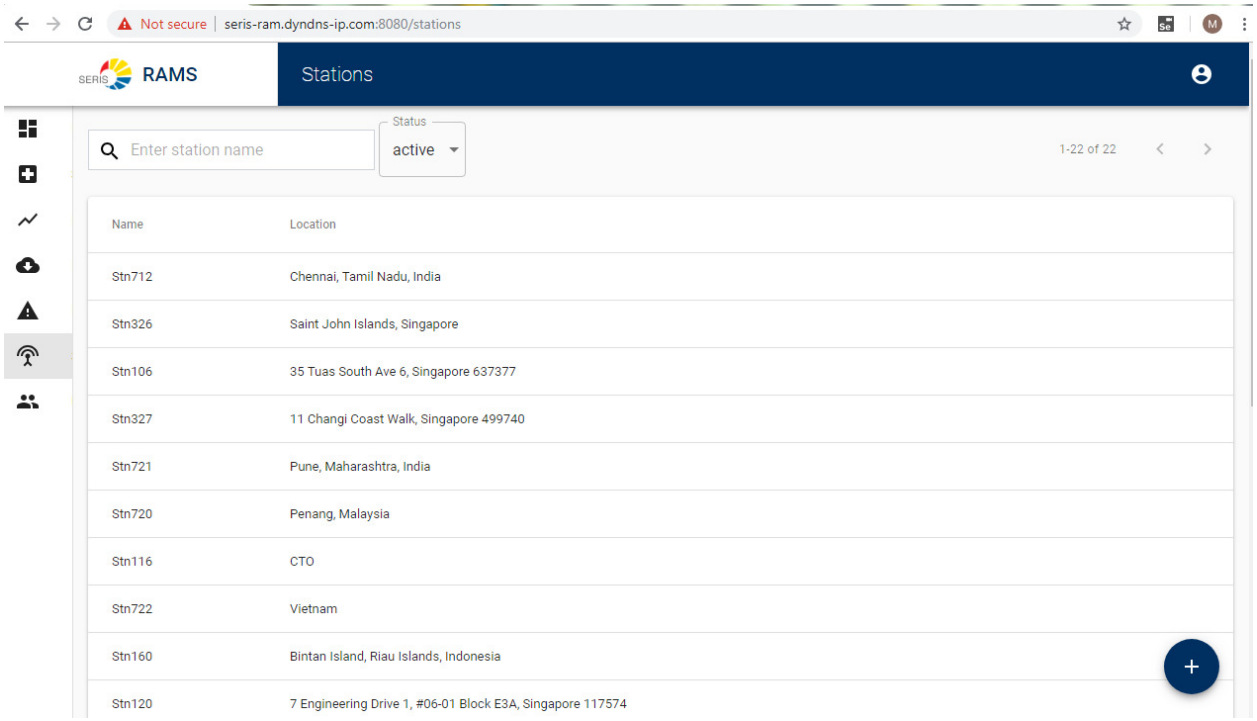
5. Station Management

A station is a site that has sets of IoT devices tagged to them. The station needs to be registered before it can send data to the system. The System should allow the admin user to create, edit, and delete stations to which the IoT devices are tagged to within the RAM application. The lowest level of granularity of devices/sensors has been revised to **stations**, instead of individual devices/sensors.



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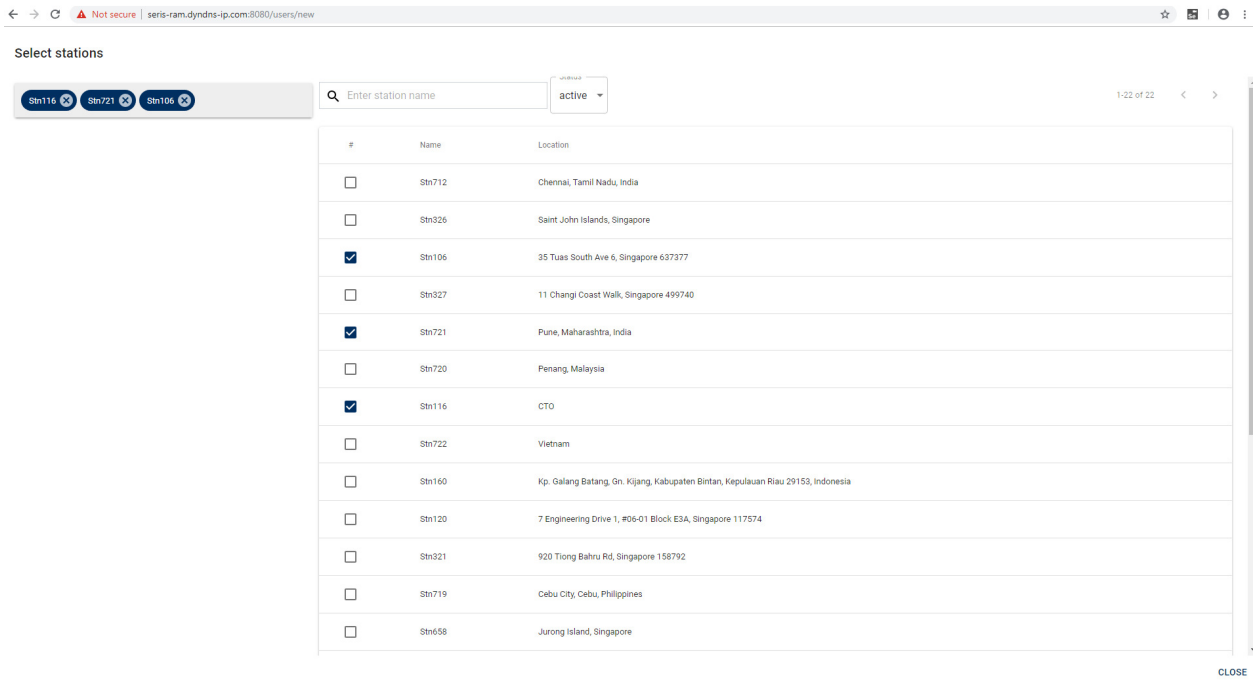
6. User and Station Mapping

The System allows the system's administrator to assign, edit and remove stations mapped to individual users. This is also part of the process while creating new user.



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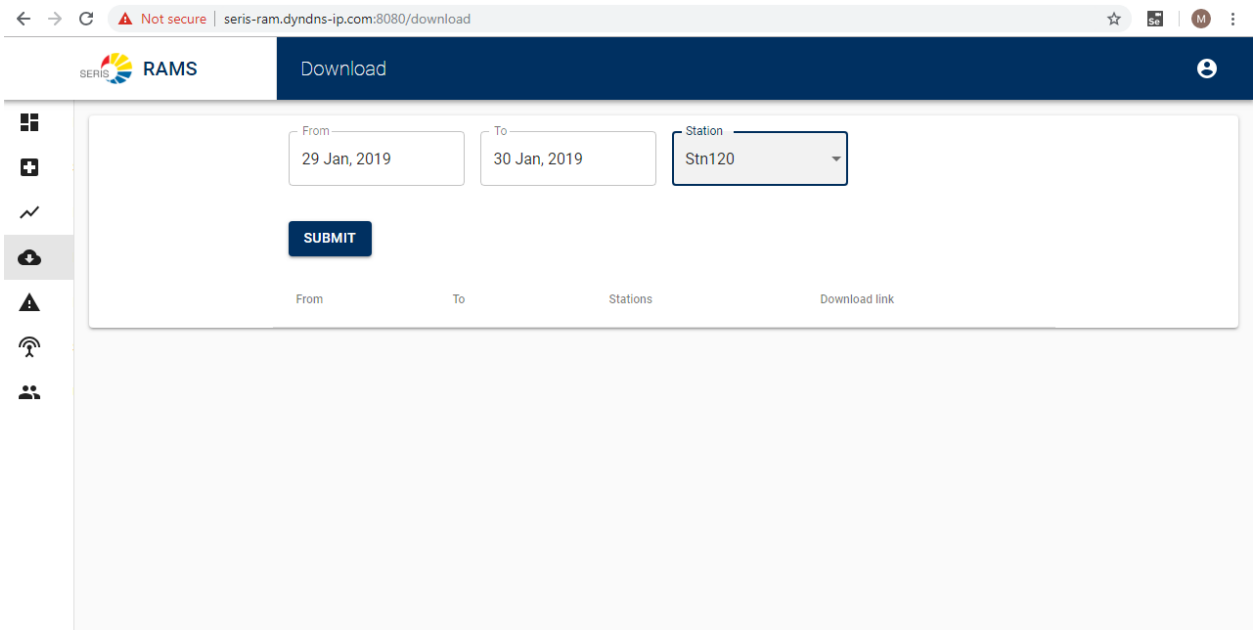
7. Data Download

Go to download page, and the System facilitates an easy way to download the data from the cloud into their local PC. The user can select a specific station tagged to that user. Select a particular station and period of data to be downloaded and press "SUBMIT" button. The data will be downloaded in zip file.

The user can customize the download further by specifying a specific month for the data download. The downloaded data will be in the form of "csv" file to facilitate further data analysis by the users with commonly available tools (for an example excel).



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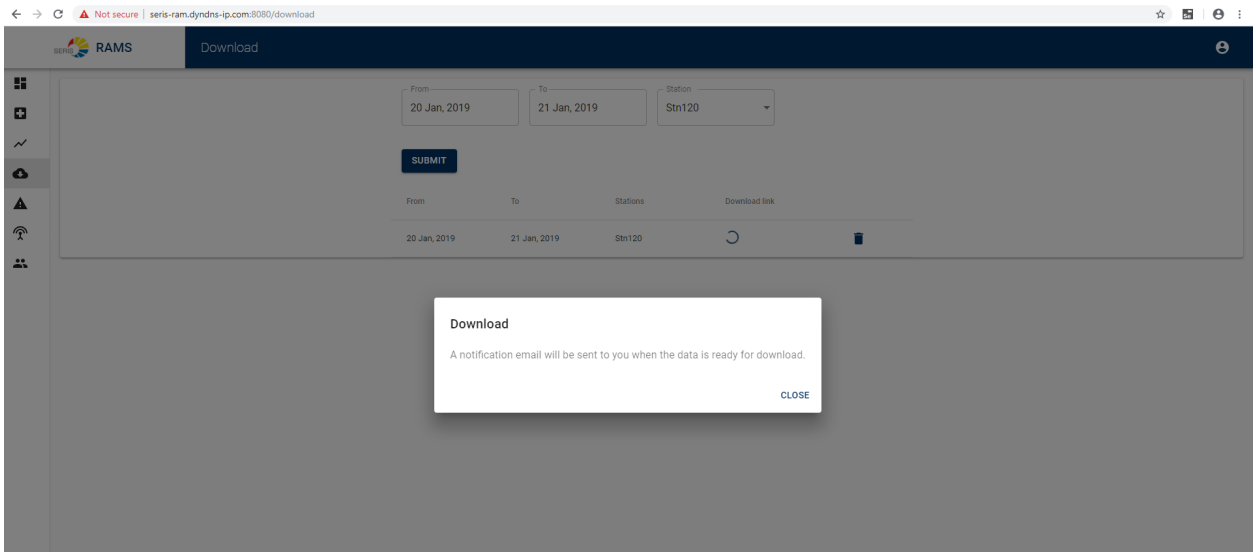

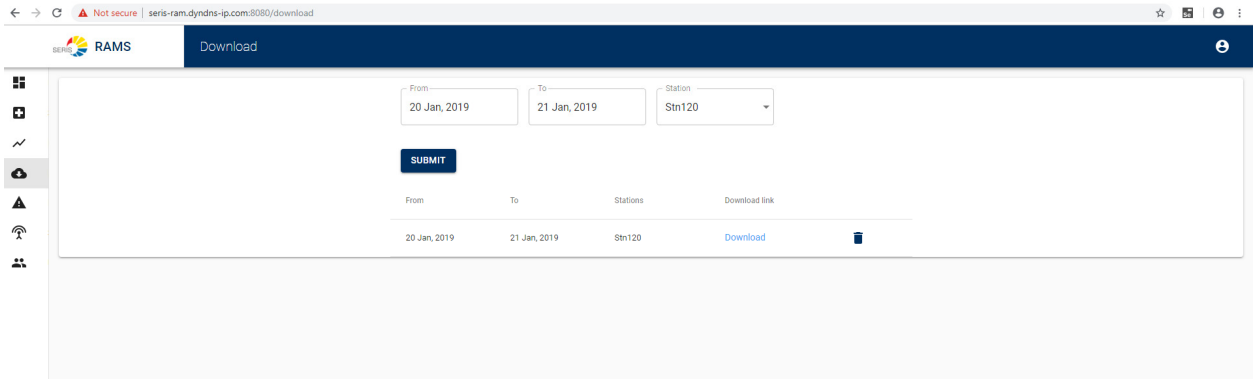

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8. Real-time Dashboard

User can easily access the dashboard in which real-time data will be displayed for assigned stations. User will have to select a particular station which is assigned to him. Ideally the dashboard is divided into 3 sections, the '**map'**, '**health'** and '**sensor'**.

The '**map'** section displays the station(s) attached to the user on a map. The user can interactively navigate through the map that is presented. The user should be able to select a specific station on the map by a simple click of the mouse.

The '**health'** section displays a summary of health status of the stations attached to the user in real-time. Since the health data is sent to the RAM application on a per-minute basis, the health summary is to be refreshed with the same frequency of the incoming health data.

The '**sensor'** section displays the data sent from sensors attached to the station in real-time. This section should work in-sync with the 'map' section. The 'sensor' section displays the selected station's sensor data. Since the sensor data is sent to the RAM application on a per-second basis, this section is expected to be refreshed on a per-second basis.

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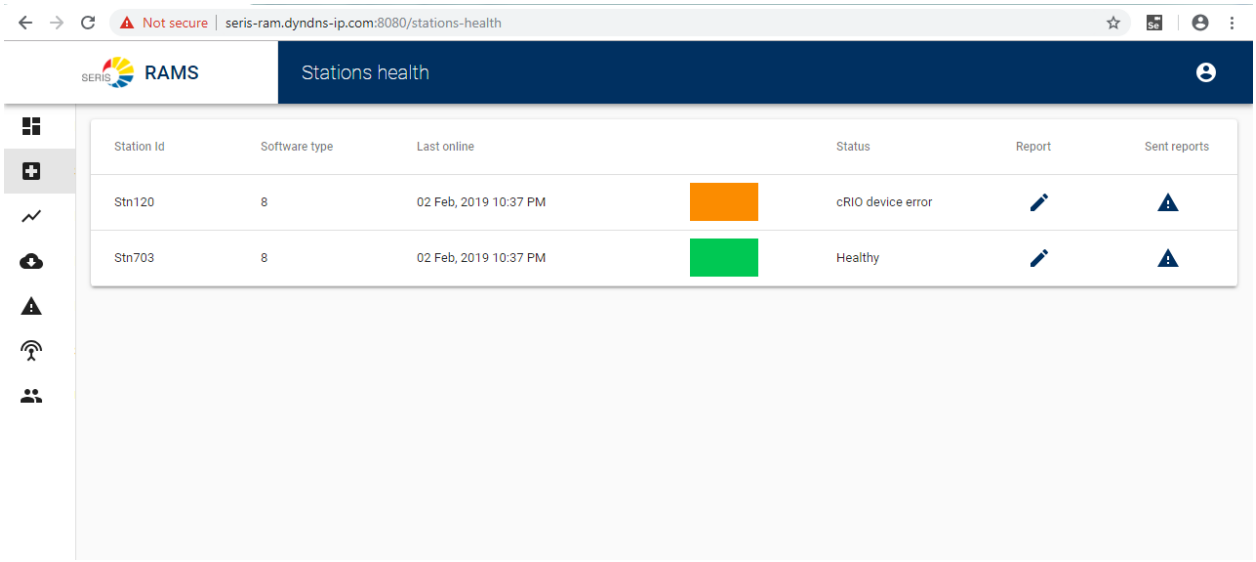
9. Health Check

Go to stations health page, and the system will display a summary of health status of the stations attached to the user in real-time. The station's health data summary is refreshed at every one minute.



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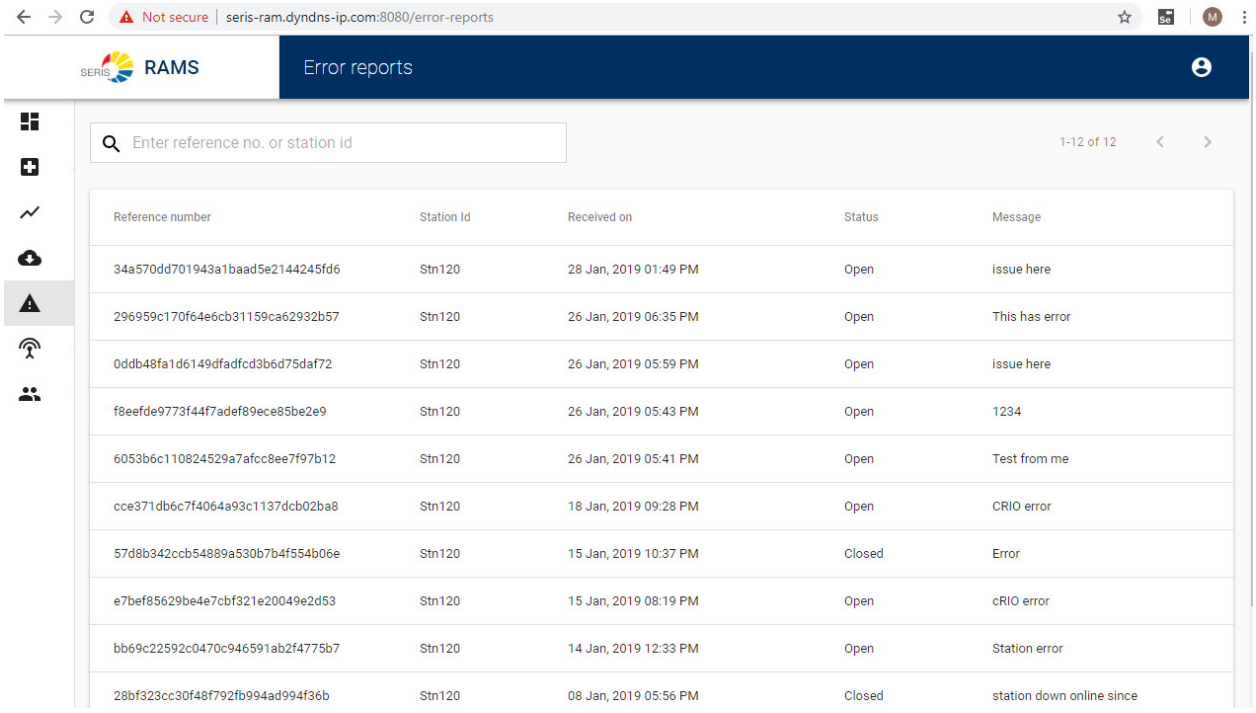
10.Report

Go to report page. Relavant data for stations are available for download, and accessible by users in the form of reports, charts, and graphs. Users can customize these reports further.



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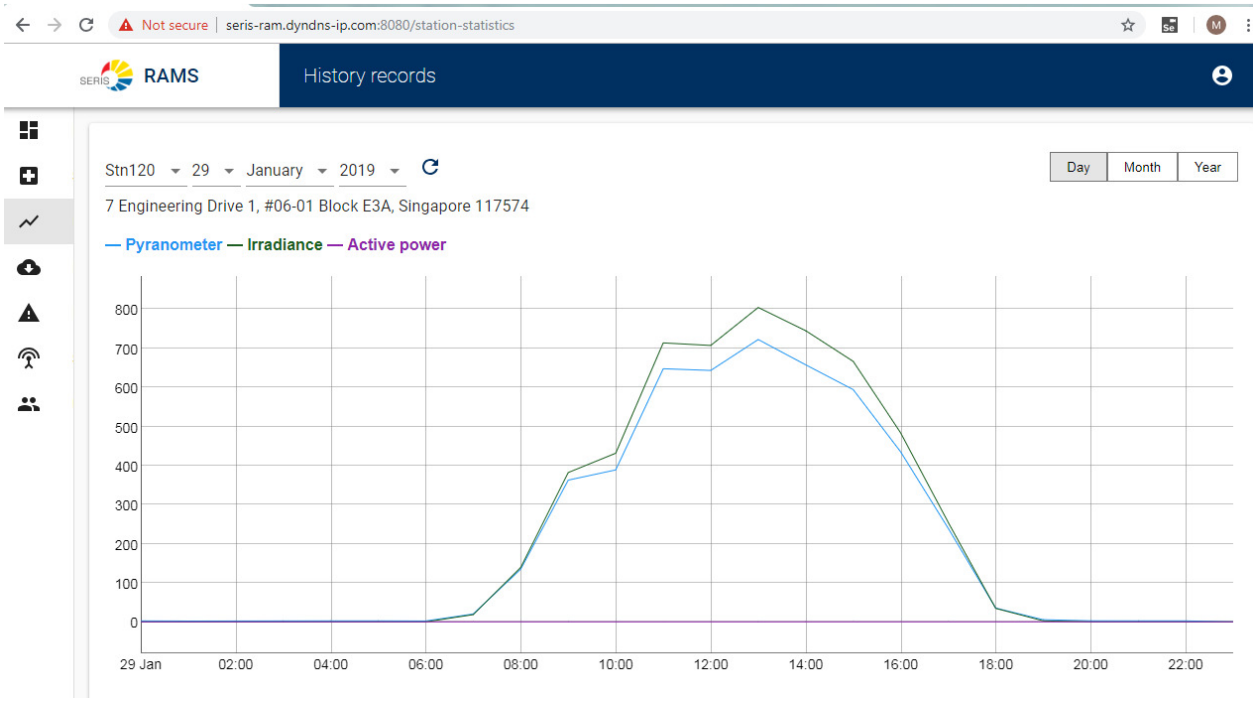
11.History Records

Go to history record page, and select a station and period for which user wants to see the history records. Relevant data for the selected station will be displayed in the graph.



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12.Alerts and Notifications

The RAM application will record certain important or time-sensitive information, especially around station health status.

In case of station failures, the users have requested it to be recorded for their tracking and closure. The application will receive station failure information in real-time from an external station monitoring application managed by SERIS. The RAM application in-turn will record this information in the notification table, to bring such station failures to user's attention.

The station health code sent by the station indicates the health status and error code. Ideally we should be receiving a '1' meaning station in good health and there are no errors. In case the value is not '1' then this needs to be captured and recorded in the notification table. This will help SERIS to intervene and take corrective action in a timely manner.

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13.Auditing and Tracebility

The RAM Application is expected to capture and record certain key events and activities performed with in the system.

These include :

- User Login/Logout details (Session details)
- User Management details, specifically creation and deletion of user accounts
- Station Management details, specifically creation and deletion of stations

The audit data captured should be made available and accessible to SERIS administrators. They should be accessible interactively or through a download option for auditing the RAM application's critical functionalities.

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