RCTEM

WebiSmarts User Guide

March 28, 2023

Software Ver. 1.0.2.0

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1 Introduction

1.1 Welcome to WebiSmarts

WebiSmarts **(Web**-based **S**urvey **M**apping **A**utomatic **R**adiation **T**racking **S**ystem) provides a comprehensive solution to regulatory, health safety and production monitoring in cyclotron facilities and PET centers.

The WebiSmarts system comprises of three major sub systems when combined provide a radiation monitoring system which measures, collects and displays radiation data automatically and continuously from various radioactive areas, including the exhaust stack.

WebiSmarts is based on the following sub systems:

- WebiSmarts Software
- Data Processing Unit's (DPU-3) – To collect radiation data from various rooms in the laboratory
- Emissions system – To report on releases of effluent data from the exhaust stacks of the laboratory

Main features:

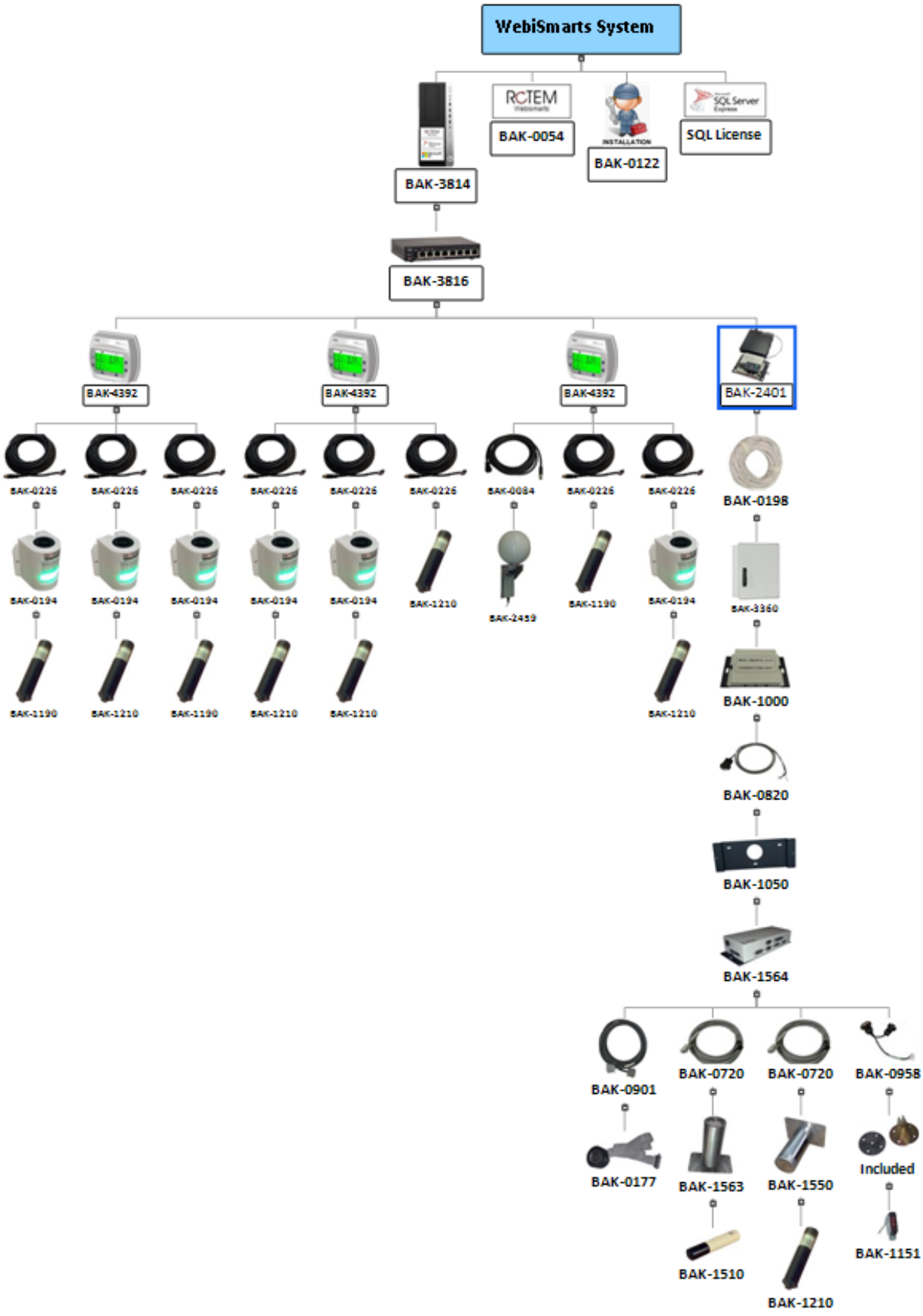
- Web-based analysis software
- Monitors different areas of the facility.
- Monitors various aspects of the production process.
- Compatible with many types of radiation detectors
- Modular, local alarms, and control system

System Architecture

WebiSmarts measures and collects radiation data automatically and continuously from various radioactive areas, including the exhaust stack. WebiSmarts is based on three basic components:

- Data Processing Units (DPU-3's)
- Detectors
- Server

The following diagram describes the WebiSmarts system architecture:


WebiSmarts System
BAK-0054
BAK-0122
SQL License
BAK-3814
BAK-3816
BAK-4392
BAK-4392
BAK-4392
BAK-2401
BAK-0226
BAK-0194
BAK-1190
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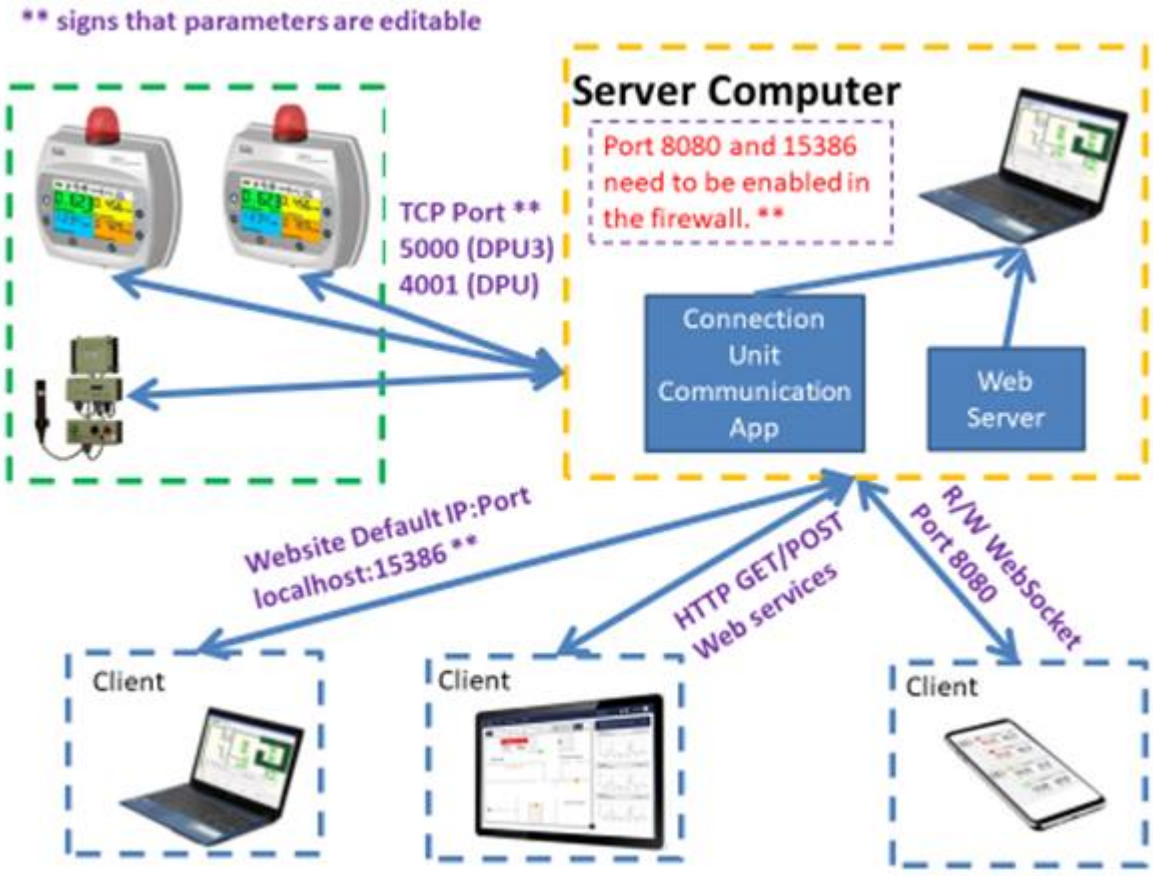
BAK-0720
BAK-1563
BAK-1510
BAK-0720
BAK-1550
BAK-1210
BAK-0958
Included
BAK-1151

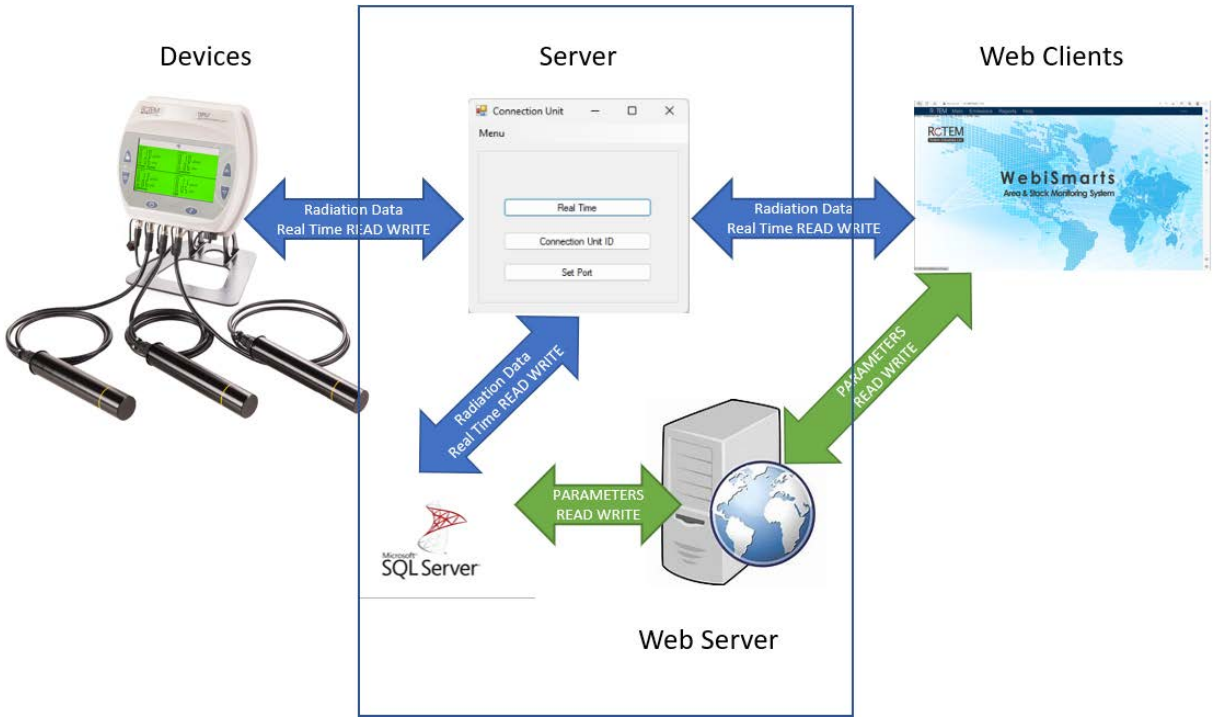
- Every DPU-3 has one internal detector and connections for three external detectors and a 4-20mA input through the Aux Connector
- For a detailed drawing of the parts of the DPU-3, see the WebiSmarts Installation Manual

System Application Architecture



2 Who's running the show

Before we discuss the various functions and applications in WebiSmarts here are some paragraphs explaining the relationship between them:



2.1 The Connection Unit Application

Responsible for communicating radiation data between the DPU-3's and the SQL Server

The Connection Unit queries each DPU-3 in the laboratory and sends the real time radiation data to the WebiSmarts clients in the laboratory. It also updates the SQL Database.

The Web Server updates parameters from the Web Clients to the SQL Database and from the SQL Database to the Web Clients

If a customer opens a graph for a point the following takes place:

The Connection Unit will grab the data lines from the SQL server and present them in the graph. The Connection Unit will continue to update the graph with real time data coming from the detector, it will also write the real time data into the SQL database for as long as the graph is open. So the graph is populated by historical data from the database and real time data from the DPU-3 until the user closes the graph.

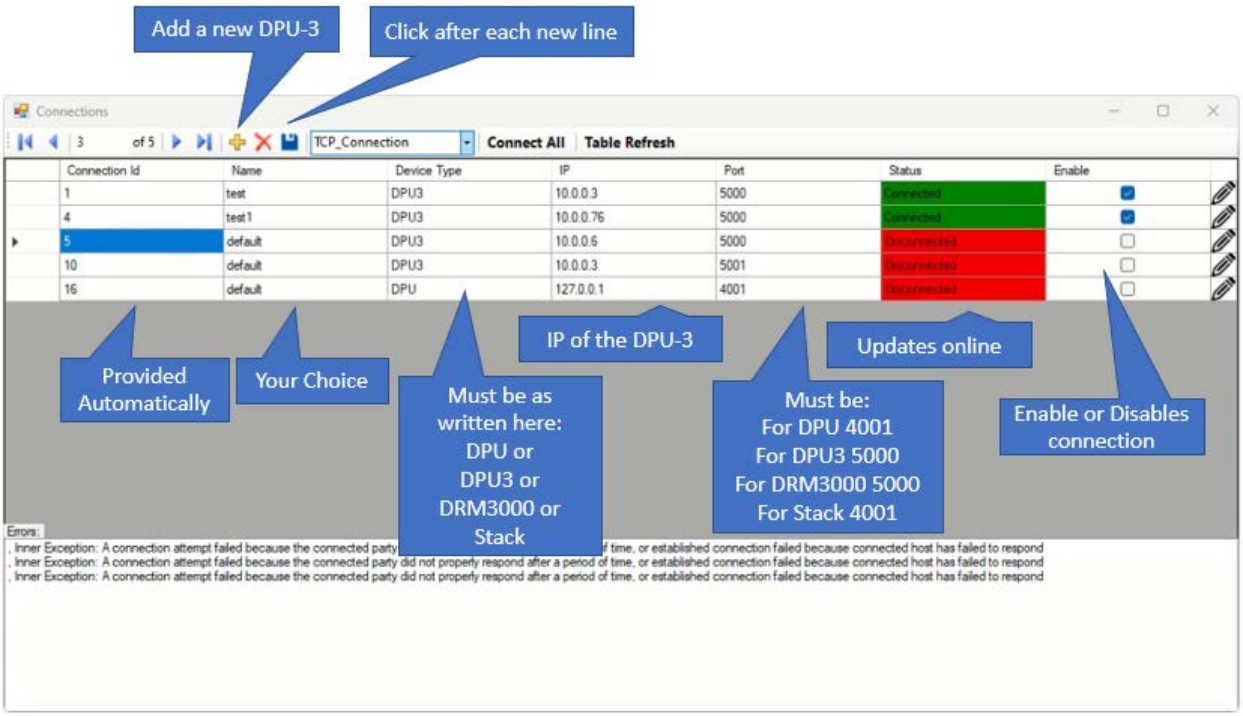
If a user updates any parameter in WebiSmarts then the Web Server will update the SQL database accordingly so that all users will be able to see the latest updates.

2.1.1 The Connections Form

Accessed by opening the Connection Unit Application and clicking on the Set Port Button.

The Connection Unit Application is found in the ThisPC>Windows(C:)> inetpub>wwwroot>WebiSmarts>Connection_Unit folder

This is the first step is creating a connection between the DPU-3's in the laboratory and the WebiSmarts Software



Note that only DPU-3's exist in this list. No need for detectors because WebiSmarts will use the combination of the IP address and Detector # to query each detector.

Connect All and **Table Refresh** can be used to update the table

The Green Connected status means that the Connection application has established a connection between the WebiSmarts database and the DPU-3 but no data is flowing yet because the points have not been created in WebiSmarts. Defining the Device Type is very important and should be defined and spelled as one of the four options below:

Instrument	Device Type	Port
DPU (old version)	DPU	4001
DPU-3	DPU3	5000
DRM-3000	DRM3000	5000
Coincidence Stack	Stack	4001

Note that both the old DPU and Coincidence Stack communicate through a NPort RS485 to TCP/IP converter through port 4001. For more details please see the WebiSmarts Installation Manual

2.2 The Client-side Web Application

Responsible for communicating parameters between the WebiSmarts Software and the SQL Server using port 8080

If you change a point's name, threshold values, user alarm etc. in the WebiSmarts Software this application will update the SQL database which in turn will update the DPU-3

Any modification of the parameters in the DPU-3, whether manually using the Menu or via the RMVC software, this application will update the SQL database which in turn will update the WebiSmarts Software.

The Graphs shown to the right of the map are displaying the last 5 hours of live data provided by the Connection Unit. When opening the graph and clicking RT (Real Time) then the Web Application provides the historical data to present the map and the Connection Unit continues to populate the last entries as they are received from the DPU-3's in the laboratory while also updating the SQL database.

2.3 The DPU-3

The DPU-3 is capable of supporting 1 internal detector and 3 external detectors. The internal detector is referred to as 0 in WebiSmarts and is displayed in the top right-left corner of the display of the DPU-3. The lower left-hand detector connector is known as 1 and is displayed in the top right-hand corner of the display etc. The Aux connector was used to support the flowmeter and is now used to support any external instrument capable of providing the DPU-3 with a 4-

20mA input and is referred to as 4 in WebiSmarts. The IP address of the DPU-3 is set (e.g. 10.0.0.76). It needs to be a static IP address so as to ensure that the WebiSmarts Server finds it even after a reset or power failure. You can configure your DPU-3 to have a static IP address using our RMVC software or you can configure your switch to provide a static IP address per MAC address to the DPU-3. Each DPU-3 is supplied with its own unique MAC address.

3 Standard Operating Procedure

We warmly recommend that users check, once a day, that the system is live and recording data. While we take every precaution making sure that WebiSmarts is a sturdy collecting tool, it is wise to open a browser in the morning and check that the points on the maps are live and data is being updated and that the icon on the top right-hand side of the dashboard is flashing white  which means that the database is being populated with live data.

If the icon is flashing orange  you need to access the Server and reconnect the system by first closing the Connection Unit application in the Task Manager and then restarting it. You can then open the real time screen to verify that data is flowing.

The WebiSmarts Software package includes a watchdog called surprisingly, WebiWatch and its function is to make sure that the Connection Unit application is sending data to the SQL database and in case of a restart of the WebiSmarts Server, activate the Connection Unit application.

3.1 Units of Measurement

Table 1 below lists the units appearing in this document to measure radioactivity.

Table 1. Units of Measurement

Unit	Description
R/h, R	Dose Rate and Accumulated Dose displayed in Roentgen Units
Sv/h, Sv	Dose Rate and Accumulated Dose displayed in Sievert Units
CPS, Counts	Dose Rate and Accumulated Dose displayed in Count Units
Ci/ml, Ci	Concentration and Activity displayed in units of Curie
Bq/m^3, Bq	Concentration and Activity displayed in units of Becquerel
m/sec, m^3/Sec	Velocity and volume of air moving through the exhaust stack
4-20 mA	Input from any device producing a 4-20mA output. Users insert Min and Max values along with Units of measurement

The Unit of measurement is displayed in the Points on the Map and Grid and on all reports and graphs.

On the Point, the unit of measurement will update to display the Dose Rate in units of uSv/h, mSv/h, Sv/h or mR/h, R/h or nCi, mCi, Ci…

On the Graphs, the unit of measurement will always be the lowest denominator (uSv/h, mR/h, pCi/ml, Bq/m3…) and the Y axis will show K (Thousands) or M (Millions)

3.2 Terms and Abbreviations

Table 2 below lists terms and abbreviations appearing in this document.

Table 2. Terms and Abbreviations

Term	Definition
CPS	Counts per second.
Dose Rate	The [Counts/Sec] measured by a detector and divided by the known and fixed sensitivity of the detector [CPS/mR/h] provides a reading of mR/h or uSv/h
Cyclotron	An accelerator that accelerates charged particles outwards from the center along a spiral, used to produce particle beams in physics and nuclear medicine.
DPU-3	Data Processing Unit. A fixed display and measurement unit allowing visualization of the values recorded by the attached radiation detectors.
PET	Positron Emission Tomography. A type of nuclear medicine procedure that uses radioactive tracers to aid in the diagnostic process.
Point	Widget representation of a detector on the map or grid view of the dashboard.
Positron Emission	Positron emission is a subtype of radioactive decay used for medical diagnostic purposes.
Stack Monitoring	Refers to monitoring and recording contamination levels of effluents being released from cyclotron sites and nuclear medical departments through the air conditioning or waste water systems.
Dose	Reflects the amount of energy that ionizing radiation sources deposit in materials through which they pass.

4 WebiSmarts Workflows

4.1 The Radiation Detection Workflow

Using WebiSmarts involves creating a map of the areas that the user is monitoring. The user then adds points to the map at the locations where detectors and related devices are installed. This section describes:

- A Use Case Scenario
- User Activity Flow

4.2 Use Case Scenario

A typical case scenario would be in a cyclotron where the radiation safety officer (RSO) monitors the radiation emitted in the building. Radiation detectors of different types and sensitivity are placed in several locations within the building according to the requirements of the RSO . The detectors are connected through the DPU-3's, with the online WebiSmarts interface, then send continual live data of dose rates and doses. The data is also stored and can be used to report, review, analyze, and adjust the work and safety procedures in place.

4.3 User Activity Flow

Table 3 below describes, at a high level, the radiation detection workflow in WebiSmarts.

Table 3. Radiation Detection Workflow

Activity	Description	Refer to …
Launching WebiSmarts	Enter the WebiSmarts user interface.	Section 5.1
Defining Users and Roles	Add, edit, and remove users, while assigning them roles in the system.	Section 5.2
Viewing the dashboard	■ **Map view:** The user can monitor current radiation levels from this view. The Map dashboard displays maps of the physical environment, including radiation detection point locations. Each radiation detection point displays current data. ■ **Grid view:** A concise single view of all the points in all the maps.	Section 5.3

Activity	Description	Refer to …
Creating Maps	Access map options and settings; add maps to the WebiSmarts dashboard.	Section 6
Adding and Graphing Points	Manage, add, and configure the detection points displayed in the dashboard; view graphical representations of detection points.	Section 7
Configuring Peaks	Peaks enable the user to report to the authorities the radiation activity data over a given period.	Section 9.3
Alerts and Alarms	Manage and configure the parameters to suit your needs	Section 10
Accessing Reports	Generate and read graphs providing information on alerts, faults, deactivation points, and exposure doses.	Section 11.2
Reviewing Logs	Display an extensive listing of activities performed by users of the system during a defined period.	Section 11.3
Adjusting Global Settings	The user can adjust the alarm thresholds.	Section 15

5 Getting Started in WebiSmarts

WebiSmarts is configured to work best on a 1220 x 780 display resolution

This section describes the steps the user takes to launch and configure WebiSmarts. The following topics are covered:

- Launching WebiSmarts
- Managing Users
- Viewing the WebiSmarts Dashboard
- Changing Your Password
- Logging Out

5.1 Launching WebiSmarts

The following procedures describe the process of launching and configuring the WebiSmarts Interface.

5.1.1 Logging into WebiSmarts

This section describes logging into the WebiSmarts Interface. Sign-in requires the following:

- An IP address for the server on which your WebiSmarts system resides;
- A username. An initial admin username will be provided by WebiSmarts;
- A password.

> **Note**
>
> After logging in for the first time as a WebiSmarts user, you should change your password.

1. Enter the IP address provided by Rotem.

   The WebiSmarts welcome screen is displayed.

Figure 1. WebiSmarts Welcome Screen

2. In the top right corner, click **Log in**.

   *The **Log In** page opens.*

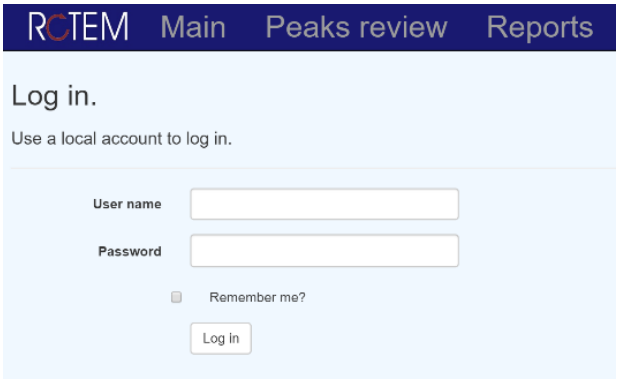


Figure 2. Login Screen

3. Enter a username and password.
4. Click **Log in**.

   The WebiSmarts user interface opens, displaying the WebiSmarts dashboard.

   The sub-section that follows covers user management. To continue with a description of the WebiSmarts dashboard and the map and grid views, go to section 5.3.

5.2 Managing Users

This section describes how to define users in the WebiSmarts interface. The following topics are covered:

- Adding a user
- Modifying a user
- Deleting a user

Figure 3 below displays the user management functions appearing in the WebiSmarts user interface.

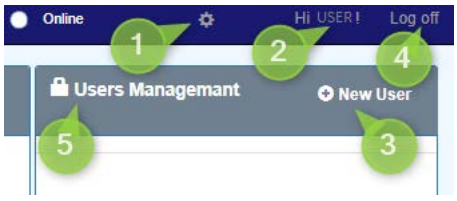


Figure 3. User Management

Table 4 below describes the functions visualized in figure 3 above.

Table 4. User Management

1	Opens System Setting and Users Management.
2	Opens Manage Account page where user, with relevant access level, can change their password.
3	Add User

4	Log Off
5	Users Management panel where a list of users to select from would display.

5.2.1 Add a User

As an Admin user, you can add additional users to the WebiSmarts system.

To add a WebiSmarts user and define their credentials:

1. In the top Rotem menu bar, click the gear icon.

   The WebiSmarts configuration view opens.

2. In the right-side panel, under **User Management**, click the New User icon.

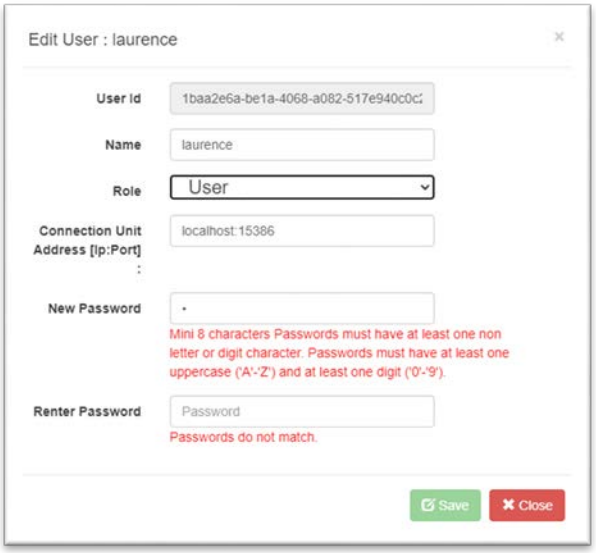


Figure 4. Add User

3. In the **Add User** dialog, define all of the following parameters for the newly added user:

   - Name
   - Role
     - User – Full Viewing, Export and Reporting privileges only. No access to Emissions
     - Manager – Used by Rotem exclusively
     - Admin – managerial privileges with full control over the system
   - Connection Unit
     - This software version allows for more than one connection unit.
   - Password

4. When you are finished defining credentials for the newly added user, click **Add**.

   A new user is added to the WebiSmarts system.

5.2.2 User Privileges

This sub-section describes editing user settings to personalize or update information. See Appendix A User Password Access levels for details

5.2.3 Modifying a User

To edit the credentials of a WebiSmarts user:

1. In the top Rotem menu bar, click the gear icon.

   The WebiSmarts configuration view opens.

2. In the right-side panel, under **User Management**, click the edit icon for a particular username and role.

Figure 5. WebiSmarts. User Management

3. In the **Edit User** dialog, for the listed User ID, edit any of the following:
   - Name
   - Role
     - User – Full Viewing, Export and Reporting privileges only. No access to Emissions
     - Manager – Used by Rotem exclusively

Admin – managerial privileges with full control over the system

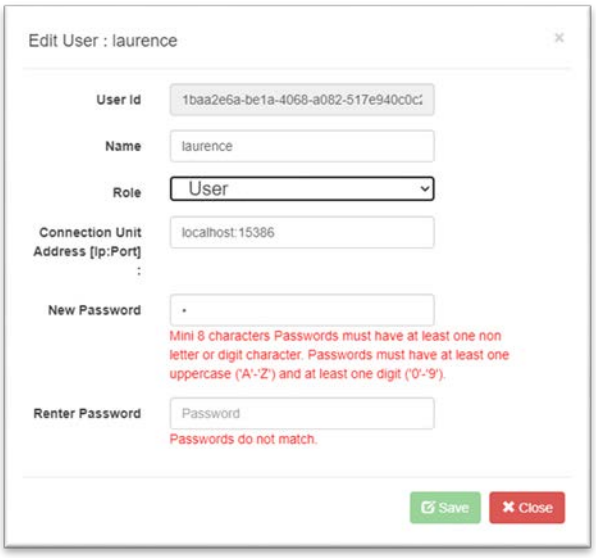


Figure 6. Edit User

4. When you are finished editing credentials for the selected user, click **Save**.

   The user's credentials are modified in the WebiSmarts system.

5.2.4 Delete a User

This sub-section describes how, as a WebiSmarts admin, you can remove a user from the WebiSmarts system.

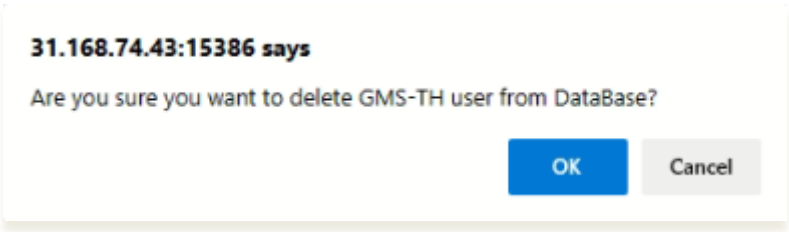
To delete a WebiSmarts user:

1. In the top Rotem menu bar, click the gear icon.

   The WebiSmarts configuration view opens.

2. In the right-side panel, under **User Management**, click the trash can icon for a particular username and role.

A dialog appears confirming your decision.



3. Click **OK**.

   The selected user is removed from the WebiSmarts system.

5.3 Viewing the WebiSmarts Dashboard

The WebiSmarts **Main** page is the dashboard. There are two views: map view and grid view:

- The Map view is a visual representation of the physical location where the radiation detectors are installed.
- The **Grid** view presents a summary of all maps and points displayed in grid format, enabling you to view all the data together.

To view the WebiSmarts dashboard:

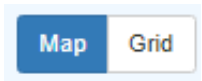
At the top of the welcome screen, click **Main**.

Figure 7. WebiSmarts Top Menu

The map view dashboard opens.

To view the dashboard in Maps view:

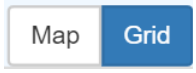
In the top right corner of the dashboard, make sure **Map** is selected.



The dashboard displays in Map view.

To view the dashboard in Grid view:

In the top right corner of the map dashboard, click **Grid**.



The dashboard displays in Grid view.

The sub-sections that follow explain how to view detection data in WebiSmarts' two distinct dashboard views.

5.3.1 Dashboard Map View

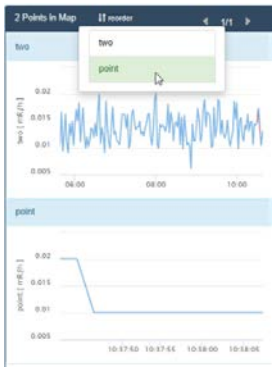
This section describes how to configure the dashboard to represent the physical locations of the detectors.

Figure 8 below and table 5, which follows, describe the main elements of the **Maps** dashboard.

Figure 8. Maps View of WebiSmarts Dashboard

Table 5. Maps Dashboard Elements

Element	Description
1	Opens to the Map view of the dashboard.
2	A separate Tab for each Map configured in the system. Each user can select which maps are available for viewing and which are not. The selection is saved per work station
3	Map options dropdown for Adding or deleting maps and points
4	Toggle between Map and Grid view of the dashboard.
5	Total number of detectors per map

6	Reorder point graphs per map. Clicking on the Reorder option open a drop-down box showing all the graphs in the list. Simply drag the graphs to the order you require 
7	Navigate through pages of detectors.
8	Display extended graph(s) in full screen mode.
9	Add existing or new map.
10	Thumbnail that displays 5 hours of live data from the detector. These appear in the right-side panel of the dashboard. When you move your mouse over these "mini-maps," some detection data appears describing the various peaks along the graph. 
11	An indicator informing the user that the system is online and that the database is receiving the data from the DPU-3's in the laboratory.  WebiSmarts checks the time stamp of the last data entry into the database against the Computers Time Stamp and if the difference is less than 2 secs then the icon stays white  If the difference is longer than 7 seconds then the icon turns orange showing the user that there is a connection problem.

The sub-section that follows describes viewing detection details in the dashboard Grid view.

5.3.2 Dashboard Grid View

The **Grid** view presents a listing of all detection points currently in the system.

Figure 9 below and Table 6, which follows, depicts the display of points in grid format, enabling you to view all points and their radiation detection data together. The color thresholds provide a visual display of live data and status levels.

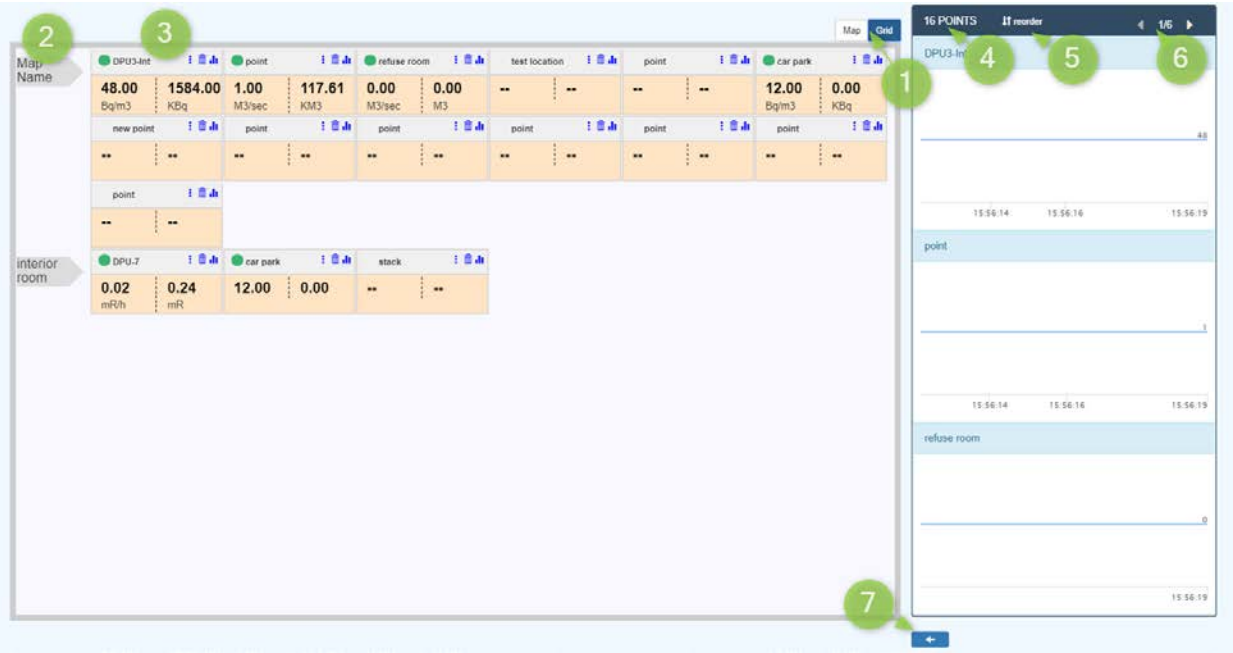


Figure 9. Grid View of WebiSmarts Dashboard

Table 6. Grid Dashboard Elements

Element	Description
1	Dashboard view. Select **Map** or **Grid**.
2	Map(s) configured in the system.
3	Radiation detection point(s) associated with each map.
4	Total number of detectors.
5	Reorder graphs.
6	Navigate through pages of graphs.
7	Display extended graph(s) in full screen mode.

5.4 Changing Your Password

This section describes changing *your own* password when logged into WebiSmarts.

To change your password:

1. In the top Rotem menu bar, click your username (shown below as "User").

The Manage Account dialog is displayed.

Figure 10. Manage Account dialog

2. In the **Manage Account** dialog, enter both the current password and the new one password.
3. Confirm the new password.
4. Click **Change Password**.

   Your password is now modified in the WebiSmarts system.

5.5 Logging Out

You can log out and exist the WebiSmarts system by clicking "Log off".

To log out of WebiSmarts:

In the top Rotem menu bar, click **Log off**.

WebiSmarts returns you to the main login screen.

6 Managing Maps

6.1 Overview

This section describes how to manage and utilize maps in the WebiSmarts system. The following topics are covered:

- Accessing Map Options and Settings

- Adding Maps
- Deleting Maps

6.2 Accessing Map Options and Settings

Configuring the dashboard involves displaying maps and detection points. To configure the WebiSmarts dashboard, you need to access the various map options and settings. This section describes how to access those options and settings.

Procedure

1. From the WebiSmarts welcome screen, click **Main**.

   The map dashboard is displayed.

2. At the top right corner of the map, click the 3-dotted icon.

   Map options drop-down menu appears.

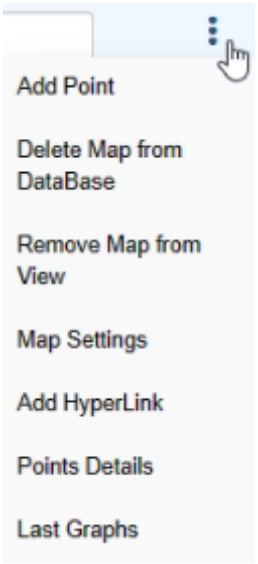


Figure 11. Map Options Dropdown

Table 7. Map Option Dropdown Explained

Menu	Description
Add Point	Add a radiation detection point to the Map. To configure the point, see section 7.
Delete Map from Database	Delete the map from the WebiSmarts system.
Remove Map from View	Delete the map from the dashboard. The map remains in the database. To re-use the map, add a new map and select from **Existing**.

Menu	Description
Map Settings	■ Change the name of the map ■ Change the map image used ■ Delete the map from the database
Add Hyperlink	■ Add a hyperlink to a map that, when pressed will open another map. Useful for displaying a single, master map with hyperlinks to individual maps. The hyperlink's button color reflects the worst-case scenario in the target map.
Points Details	■ Provides a detailed table of the details of all points in WebiSmarts – Can be exported to a CSV file or saved as PDF file.
Last Graph	■ Opens the last graph that was accessed

Map Formats

In the WebiSmarts system, the map can be a layout diagram that you created on your own, an architectural drawing, or even a photograph of the area. However, note that the map must be saved in one of the following formats:

- BMP
- JPG
- PNG

IMPORTANT!

The optimal image size is 1200 x 780 pixels. Your image should be correctly sized or scaled prior to importing it to WebiSmarts.

6.3 Adding Maps

This section describes adding maps to the WebiSmarts dashboard. This includes the following:

- Adding a new map to the database; This new map will only be visible to the user that added the map. Others can add the map as an Existing map.
- Adding an existing map.

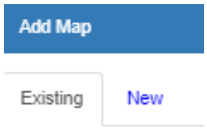
For both of these procedures, the basic steps are the same.

Procedure

1. From the WebiSmarts menu, click **Main.**

   The map view of the dashboard opens.

2. At the top of the map, click the plus + sign.



3. Choose one of these two options:
   - New Map (see section 6.3.1, below).
   - Existing Map (see section 6.3.2, below).

6.3.1 Adding a New Map

The procedure below explains how to add a new map into the database and onto the dashboard.

To add a new Map:

1. Click **New**.

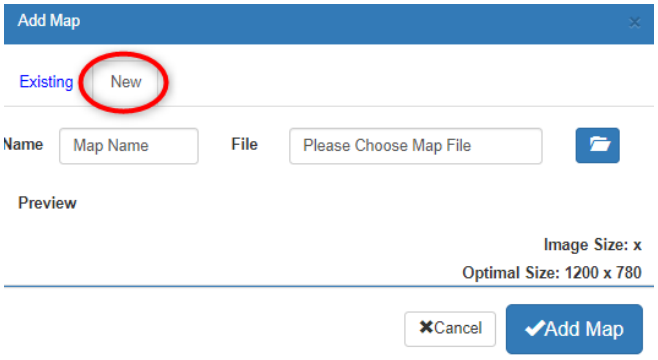


Figure 12. Add Map. New

2. In the **Name** field, enter the name of your new map.
3. Enter the path where your map file is located, or click  to navigate to it.
4. Click ✓ Add Map.

   The new map is added to the database and to the dashboard.

6.3.2 Adding an Existing Map

The procedure below explains how to add a map from the saved database to the dashboard.

To add an existing map:

1. Click **Existing**.
2. Select a map from the **Map to add** dropdown box.

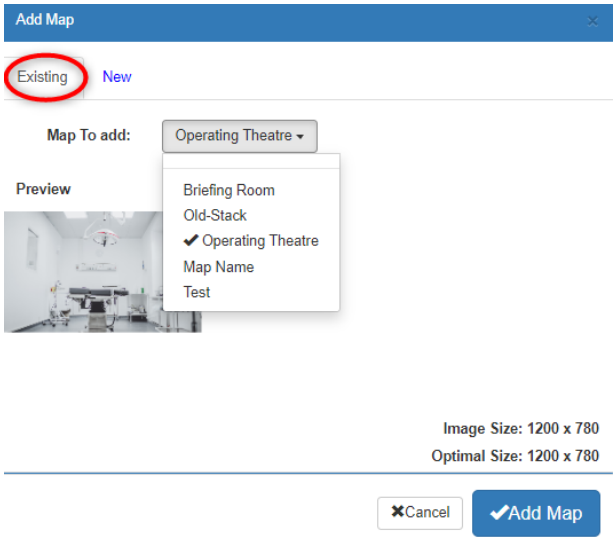


Figure 13. Add Map. Existing

3. Click ✓ Add Map.
4. Check the Image Size against the Optimal Size and make adjustments to the picture.

   The new map is added to the dashboard.

6.4 Deleting Maps

You can remove a map from the WebiSmarts view, as well as from the system's database entirely. This section describes how to do the following:

- Delete a Map from the Database
- Delete a Map from View

6.4.1 Deleting a Map from the Database

You should only delete a map from the database if there is no possibility that you will need the map in the future. Once the map is deleted, all the data that was connected to it is also erased. That is, this process is irreversible.

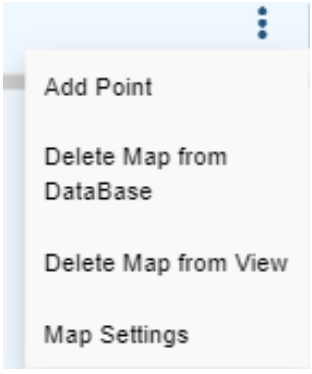
To delete a map from a WebiSmarts database:

1. In the Rotem main menu bar, click **Main**.

   The Map view of the dashboard appears and loads.

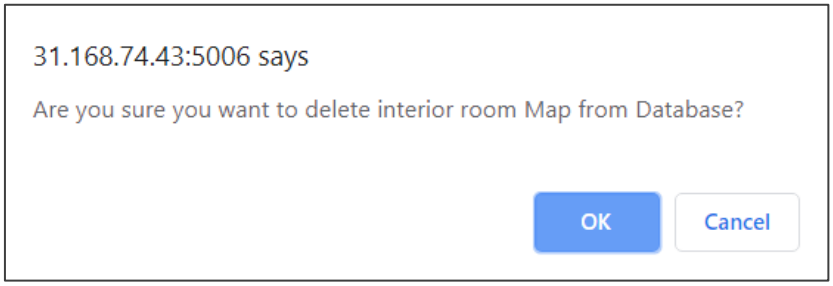
2. At the top right corner of the map, click the 3-dotted ⋮) icon.

   A dropdown menu opens.



3. Select **Delete Map from Database**.

   A confirmation dialog box is displayed.



4. In the confirmation dialog, click **OK**.

6.4.2 Deleting a Map from View

Deleting a map from view will retain the map in the database for future use. If you need the map again, you can add it to the dashboard from an existing map file.

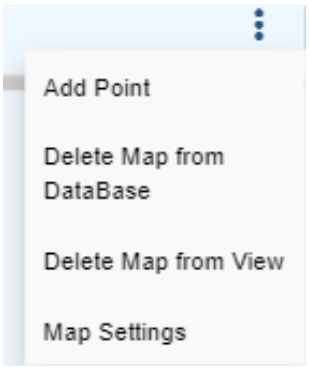
To delete a map from view:

1. In the Rotem main menu bar, click **Main**.

   The Map view of the dashboard appears and loads.

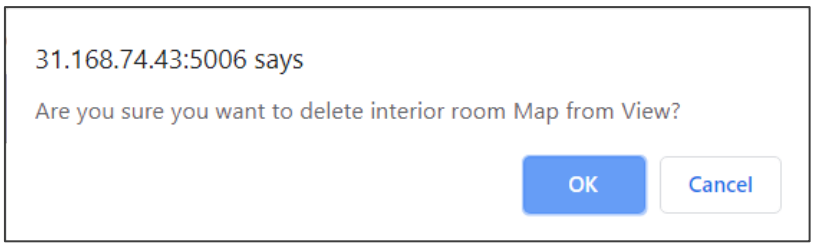
2. At the top right corner of the map, click the 3-dotted icon.

   A dropdown menu opens.



3. Select **Delete Map from View**.

A confirmation dialog box is displayed.



4. In the confirmation dialog box, click **OK**.

7 Managing Points

Points indicate where detectors are positioned in a particular location, such as a building or room, appear on a map.

> **Note**
>
> The location of points on a map is important because those points correspond to the actual physical location of detectors.

This section describes how to manage and configure the points displayed on the dashboard. Topics covered include:

- Adding Points to a Dashboard
- Graphing Points
- Editing Points

7.1 Adding Points to the Dashboard

This sub-section describes how to configure detection points on a map in the WebiSmarts dashboard. You can do either of the following:

- Add a new point to the database and have that point appear on a map.
- Add a point to the map that already exists in the database.

Each point represents the location of the detector. You position widgets on the map that correlate with each point. These widgets contain detection data as well as mini-icons.

Figure 14 shows an example of a point widget; table 8 contains a description of each element displayed in the widget.

Figure 14. Point Widget

Table 8. Point Widget Settings

1	Point Name and Status.
2	Remove Point from Map.
3	Display Graph of point.
4	Current levels of radiation detected: Dose Rate and Dose.

To add a point to the dashboard:

The WebiSmarts system is normally supplied as a turnkey system where the Computer is supplied along with the map and points.

If you are performing a new installation please refer to the Installation guide to see a detailed explanation of adding points. The section below is useful to understand the setup of the points.

1. From the WebiSmarts welcome page, click **Main**.

   *The **Map** dashboard opens.*

2. At the top right corner of the map, click the 3-dotted ⋮ icon.

   *The **Map** settings dropdown menu opens.*

3. Select **Add Point**.

   *Along the right side of the WebiSmarts dashboard view, the **Add Detector** panel is displayed.*

   Figure 15 below displays an example of the Add Detector panel; table 9, which follows below, contains a description of each element:

Figure 15. Adding a Point

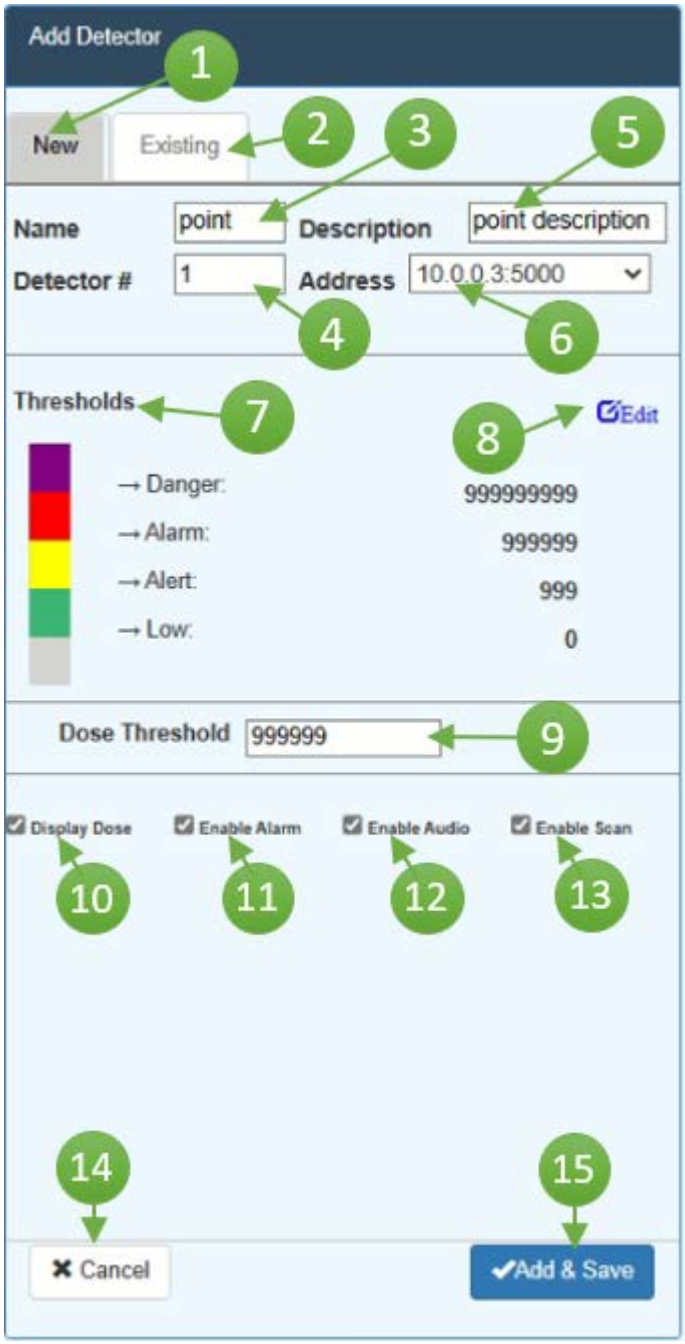


Table 9. Adding a Point Description

1	Click to add a point for a new detector.
2	Used if you want to add an existing point from another map into this map.
3	Enter text in this field to assign a name to the new point. This description will appear in the point widget.
4	Enter the detector number (O-internal detector, 1-left, 2-center, 3-right, 4-flowmeter and 5- Stack)
5	Enter a brief description of the point to differentiate it from the other points. This description will appear in the reports
6	Enter the IP address of the DPU-3
7	List of alarm threshold colors.
8	Edit the threshold levels
9	Input the dose threshold.
10	Check to enable/disable the display of the Dose in the Point.
11	Check to enable/disable the threshold alarm.
12	Check to enable/disable the Audio messages.
13	Check to enable/disable the scanning the detector.
14	Cancel the last inputs
15	Add the point to the map and save it

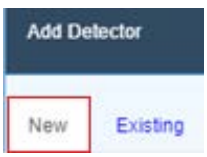
> **Note**
>
> The location of point widgets on a map is important because those points correspond to the actual physical location of detectors.

7.1.1 Adding a New Point

This sub-section describes and illustrates how to add a **New Point** to a map. This requires creating a completely new point to be added to the currently displaying view of the dashboard. It also involves defining alarm thresholds and the detection levels that trigger them.

To add a new point to the currently displayed dashboard:

1. In the **Add Detection** panel, select the **New** tab.



*The **New** tab will open and the word New will turn from blue to grey.*

2. In the **Name** textbox, enter a name by which the system will identify the point.

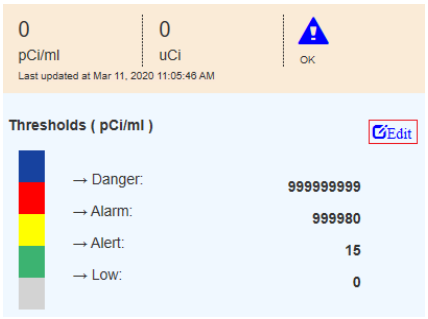
3. In the **Description** field, enter text describing the new point.
4. To define the default alarm thresholds, click **Edit**.

7.1.2 Defining thresholds

We have defined that the egg came first! Both the WebiSmarts software and the DPU-3 have threshold values for each detector and it's not acceptable that they be different values, so upon the initial connection between the two, the DPU-3 sends threshold values to WebiSmarts. The synchronization between the two entities makes the setting of threshold levels a little more complicated. You need to set the threshold levels, send them to the DPU-3 and then Click Apply to save them into the database.

To set the threshold for one of the default alarm points, click on the Point Settings mini icon on the Point Widget

5. Click **Edit**



The following screen appears:

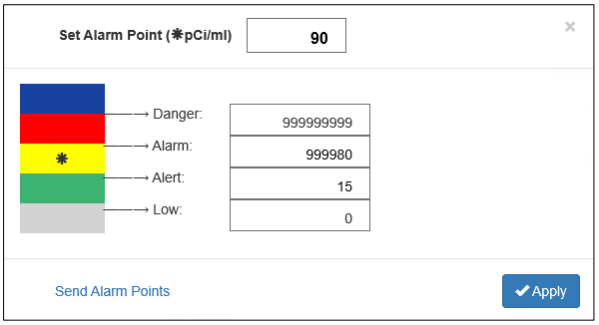
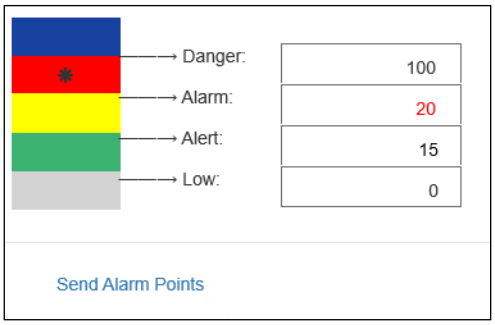


Figure 16. Define Thresholds Dialog

6. Change the numbers that appear for the various thresholds. After modifying the Alarm and Danger thresholds the screen shows the Alarm threshold in red and the Danger threshold in black.



7. The DPU-3 contains the first three thresholds and WebiSmarts holds the last threshold. The Alarm threshold is red signifying that you need to send it to the DPU-3 to update the existing alarm. Once you click **Send Alarm Points** and the DPU-3 confirms the acceptance of the new threshold, the number in the Alarm threshold will turn black. The Danger alarm is black because it does not update in the DPU-3

   a. In the **Set Alarm Point** field, enter a value. If the radiation level exceeds this alarm point, the buzzer will sound, the internal solenoid will be activated and WebiSmarts will register an Alarm.

   b. At the bottom left of the dialog, click **Send Alarm Points (*)**. The Alarm point value is sent to the DPU.

8. When you are happy defining thresholds and alarm points, click ✓ Apply. And then click Save to save your modifications to the database

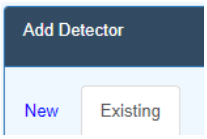
9. To set (or disable) an alarm threshold, select (or clear) the **Enable Alarm** checkbox.

7.1.3 Adding an Existing Point

This sub-section describes and illustrates how to add an existing point to the currently displayed dashboard. The point is already saved in the system, and the user is now placing it onto the dashboard.

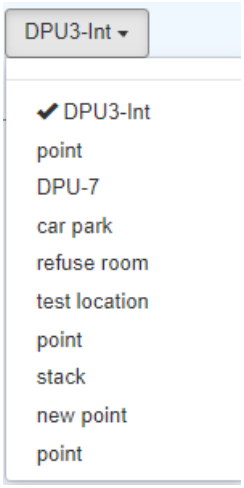
To add an existing point to the currently displayed dashboard:

1. In the **Add Detector** panel, select the **Existing** tab.



2. Open the points dropdown menu.

   A list of already saved points will be displayed.



3. Select a point from the list.
4. Click ✓ Add & Save.

> **Note**
>
> Adding detection points requires that at least one map be included in the WebiSmarts UI. For instructions on adding a map, see section 6.3.

Once points have been added to a map, you can set parameters that ensure the information displayed on a map is timely and relevant. For details on defining point parameters, see General and Advanced settings under section 7.3.

7.2 Graphing Points

This section describes how to generate a graphical representation of a specific detection point on a WebiSmarts map. Topics covered include:

- Displaying a graph for a specific detection point
- Displaying a graph for multiple detection points

7.2.1 Display Graph for Specific Detection Point

This section explains and illustrates how to display a graph for a particular detection point.

Procedure

1. In the map view of the dashboard, click the tab for the map containing the point you wish to graph.
2. For the detection point of interest, click the graph (📊) mini icon.

A graph of the point you selected is displayed.

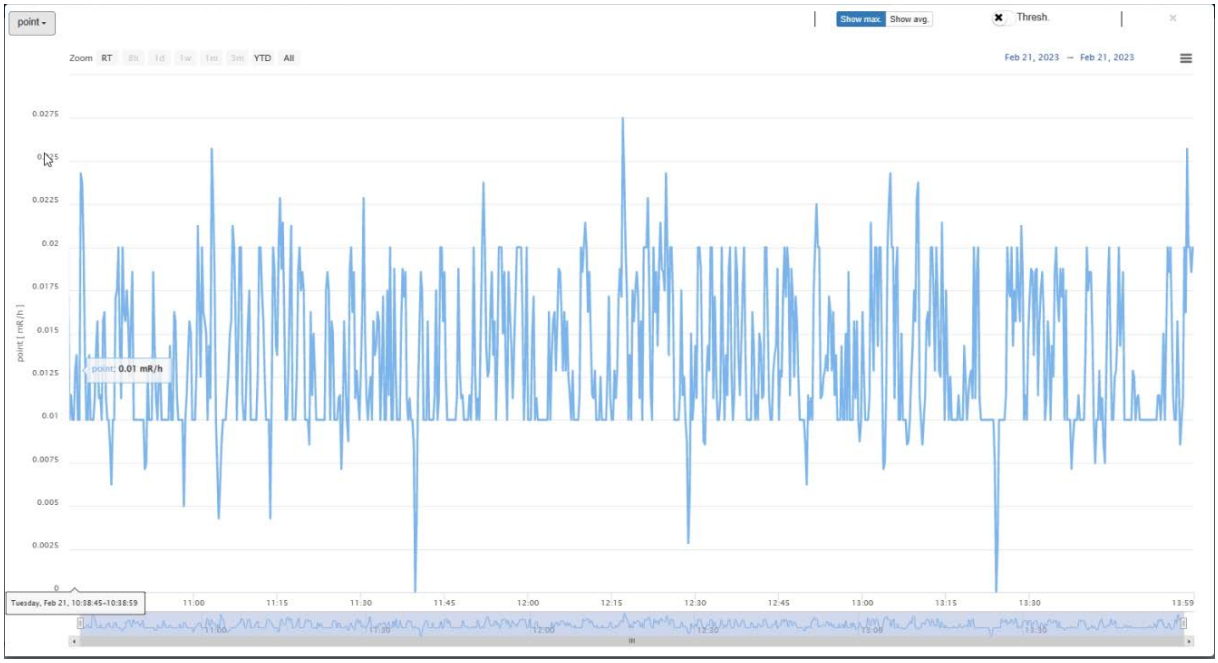


Figure 17. Graphical Display of a Specific Point

> **Note**
>
> The user is able to zoom in to focus on a particular point of interest on a graph.

7.2.2 Display Graph for Multiple Detection Points

This section describes and illustrates how to display a graph for multiple detection points.

Procedure

To display graphs for multiple points in a single view, open the "Checked" dropdown menu and select additional points.

Alternatively, you can remove selection as well as reset selection by clicking **X Uncheck All**.

For instructions on refining the graphical display to show particular subsets of detection point data. See section **Error! Reference source not found.**, **Error! Reference source not found.**.

7.3 Editing Points

This section describes configuration parameters that determine how points are defined and displayed in the system. This ensures that the dashboard presents information that is timely and relevant.

You edit parameters that characterize point settings on a map in the General and Advanced Settings panels.

7.3.1 General Settings

In the General Settings panel, you define the basic identity of the radiation detectors and the radiation thresholds governing when they trigger alarms.

Figure 18 below displays user interface elements residing in the General Settings panel.

Figure 18. Editing Points. General Settings

For both settings panels, General and Advanced, the fields shown in table 10, below, are displayed.

Table 10. Editing Points. General Settings

Parameter	Description
Name	The name by which you identify a point.
Detector	Automatically detected by the DPU-3 (GM-42, internal…)
Point Description	Enter a brief description of this point.

Parameter	Description
Dose Threshold	This is the radiation dose level per room and is useful for identifying areas or rooms that have sudden or gradual increased doses over time. **Note** Dose is reset automatically on a periodic basis as set in the Advanced Settings Tab. See below
High Rate Delay	Duration, in seconds, of latency between a threshold being exceeded and an alarm being sounded. Useful when knowingly moving radiation sources for short periods
Lost Contact Interval	The time you allow between not receiving radiation data and receiving a Lost Contact alert
Enable/Disable Display Dose	For the flow meter, the dose is the total amount of expelled air from the last reset. Absolutely not interesting and can be removed from the display of the point.
Enable/Disable Display Alarm	Disabling alarms will not activate the audio alarms and will not write any alarm in the reports
Enable/Disable Audio	Disabling Audio will mute the alerts and alarms but will continue to write the alarms in the reports
Enable/Disable Display Scan	Disabling scanning will cause WebiSmarts not to query this point.

Notes

Blinking indicates threshold was exceeded, but that the rate returned to within normative limits.

For details on advanced configuration of thresholds, see section 15.

7.3.2 Advanced Settings

In the Advanced Settings panel, you further define the identity of the radiation detectors and how the measure, convert, and reset radiation dose.

Figure 19 below displays user interface elements residing in the Advanced Settings panel.

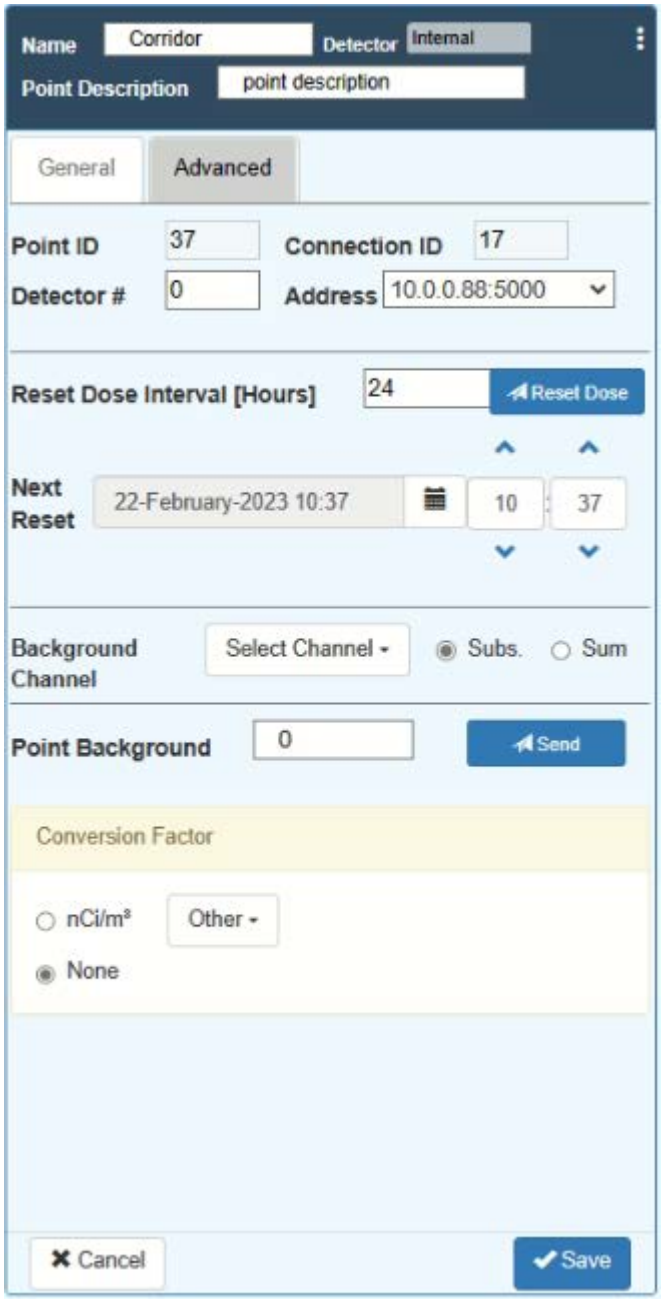


Figure 19. Editing Points. Advanced Settings

Table 11 below lists and describes the parameters available (only) in the Advanced Settings panel.

Table 11. Editing Points. Advanced Settings

Parameter	Description
Name	The name by which you identified the point.
Detector	Automatically detected by the DPU-3 (GM-42, internal…)
Description	Enter a brief description of this point.

Parameter	Description
Point ID	A unique identifier (system-generated) for the point that you are adding. This number corresponds to the ConnectionId field in the Connections application
Connection ID	Connector ID. A unique identifier (system-generated) for the IP address and port number associated with the DPU for this point.
Detector #	O-internal detector, 1-left, 2-center, 3-right, 4-flowmeter and 5-Stack
Address	The IP address and Port # the DPU-3 connected to the system
Reset Dose Interval [Hours]	The duration of time before the accumulated dose is reset and the result is saved in the Exposure Dose Report.
Next Reset	The date and time at which dose measurement will be reset is specified. The period will normally be as per the Interval setting above unless a Reset Dose was manually activated and in this case the next Reset will occur as per the Interval above from the Manual Reset.
Background Channel	Define an existing Point as the background radiation..
0 Subs 0 Sum	If you select Subs then the displayed dose rate on this Point will be its radiation level minus the radiation level of the background Channel. If you select Sum then the displayed dose rate will be the sum of both this point and the background channel
Point Background	Detectors in the exhaust Stack are meant to measure released effluent only and ignore the background radiation "noise" you should check the radiation levels for the detectors when the laboratory is not operating and insert that dose rate into the window and click Send
Conversion Factor	Choose Bq/m^3 or nCi/m^3 or None (i.e., no conversion). This parameter is obtained from your local support group
Air Flow	Define the Air Flow channel for this specific detector. The software uses this data to display units if activity (uCi or MBq) in the Peaks review Window. We suggest that you set the Fixed Flow to be a similar value as currently shown by the actual flow meter because in the event that the flow meter stops working, the system will use the Fixed Flow parameter.

For additional advanced configuration parameters, see section 15.5.1, which describes Device Editing.

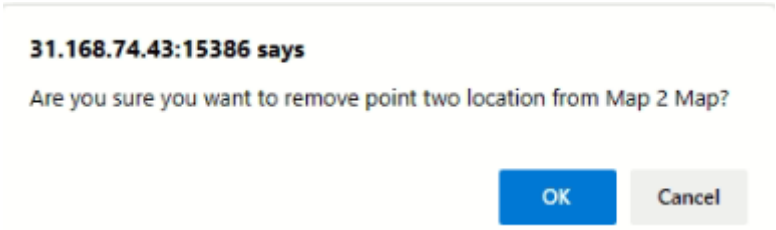
7.3.3 Removing a Point from a map

You can remove a detection point from the WebiSmarts map by using the trashcan.

To delete a point:

1. For a particular point, click the trashcan mini-icon located inside the point widget.

   The following window appears:

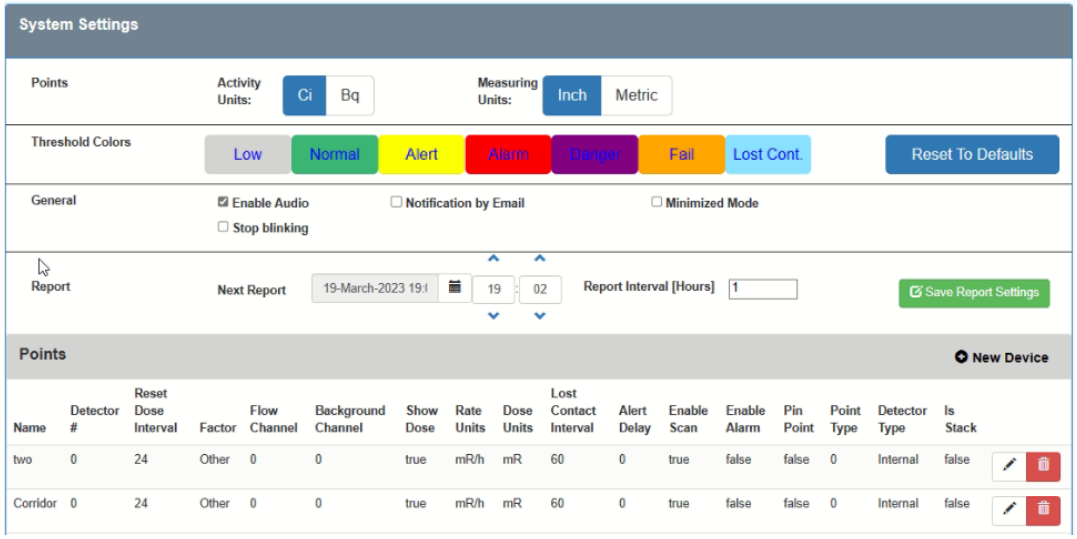


2. Click **OK**.

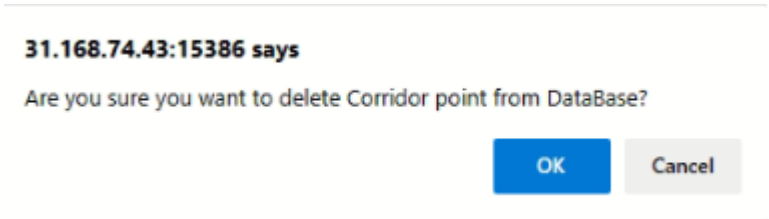
   The widget for that point is removed from the map but remains in the database

7.3.4 Deleting a Point

Access the Points Table by clicking on the Global Settings Icon as show here, the following screen appears:



To permanently remove a point from the database, click on the red trashcan icon, the following window appears:



Click OK to delete the point from the map.

8 Managing Graphs

Graphs provide graphic representation of directions or developments in data.

For area monitoring we expect to see a more or less straight line with occasional spikes where radiation was exposed for short periods.

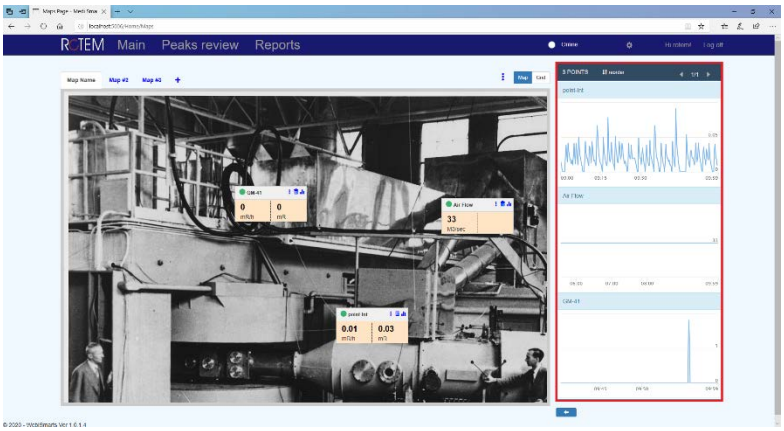
For Stack Monitoring, which is our most important feature we expect to see spikes of radiation occurring when effluent is released into the atmosphere. These spikes are more significant than area monitoring spikes and are known as peaks. For FDG manufacturer's we have developed a method of isolating background radiation and identifying the borders of each release (peak) of those peaks and finally identifying the isotope being released (first 5 isotopes seen below). For the rest of the isotopes seen below, the user needs to review the effluent graph and mark the borders of the release to allow the Emissions software to integrate the peak and report on the total amount of effluent released per peak. We have developed methodology to handle the following isotopes:

Fluorine-18
Carbon-11
Gallium-68
Oxygen -15
Nitrogen-13
Iodine-131
Technetium-99M
Gallium-67
Thallium-201
Iodine-123
Iodine-125
And Lutetium-177

8.1 About Graph Displays

There are 3 different ways to display graphs:

1. Three of the most interesting Graphs to the right of the map, showing the last 5 hours of online data and sorted according to your requirement

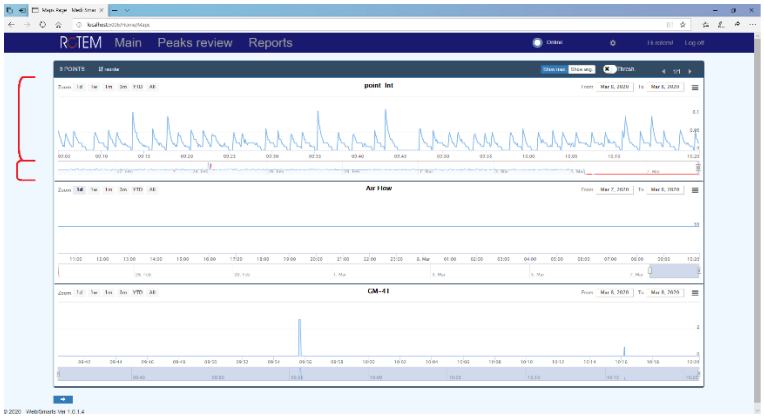


2. Opening the Graphs using the  button shows a period of one day on the upper graph and up to one year on the lower graph.

You can use the movable. scalable ruler on the Lower graph to focus on an interesting period.

Upper graph

Lower graph



3. Clicking the  Graph icon on the Point widget, brings up a pop-up graph which opens in an off-line mode but allows you to see real time data by clicking RT in the Zoom commands. To close this graph, click anywhere on the background

   The Top Left corner shows a drop down box displaying *1 checked*. You can display up to 5 graphs simultaneously by selecting them from the drop down box

8.2 Viewing Radiation Levels

You can view the radiation levels measured by a detector at any point along with timeline depicted in a graph.

To view radiation levels:

1. Using your mouse, slide your cursor laterally along with graph's x-axis.
2. At various junctures, stop to view the data popups for the different points.

The figure below provides a blown-up image of a detection point popup.

The image above shows, for DPU-7, a measurement of 44,666.67 Becquerel's per cubic meter.

9 Emissions Tab

This section explains how to use WebiSmarts' Emissions Tab. Topics covered include:

- About Graph Displays
- Viewing Radiation Levels
- Overview of the Peak review screens
- Preparing the detectors
- Adding a Peak
- Editing a Peak
- Removing a Peak

9.1 Overview of the Emissions

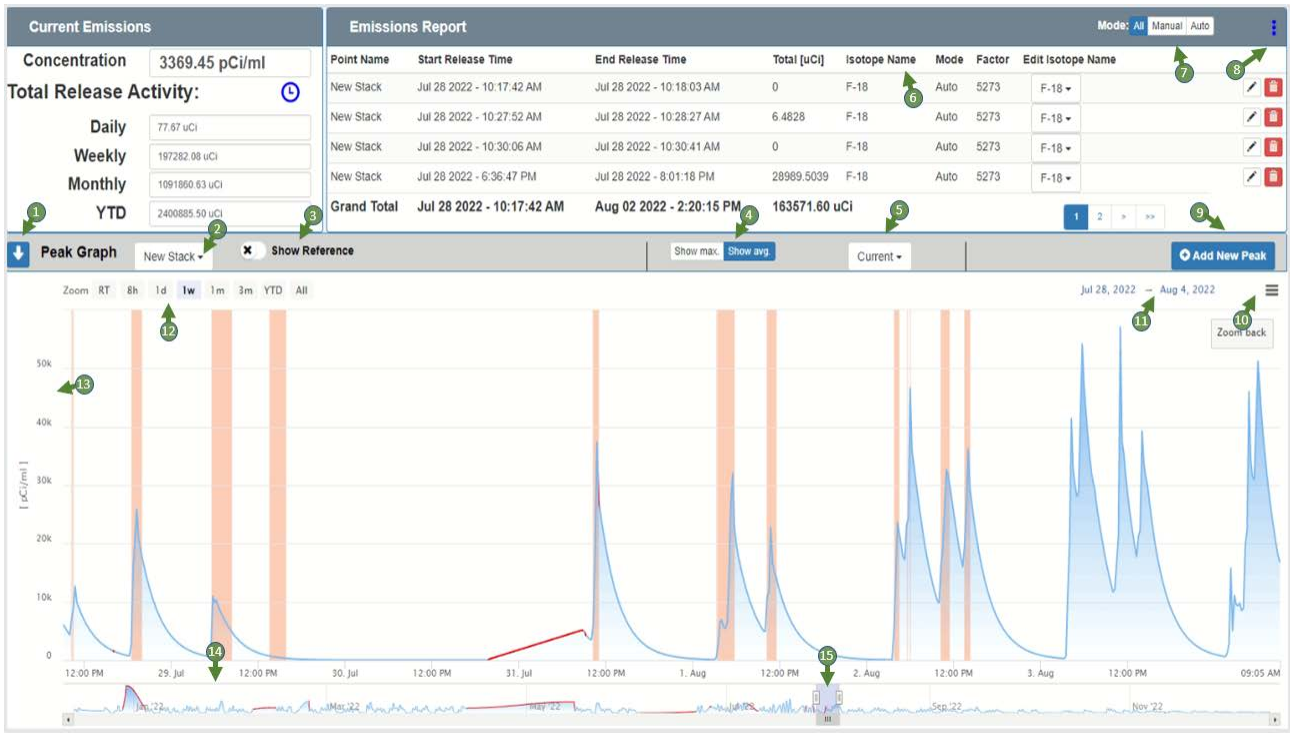
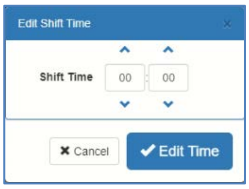


Figure 20. Emissions Initial View

9.1.1 Current Emissions Table

The Current Emissions Table uses the following parameters to calculate the Daily, Weekly and Monthly Emissions:

Setting up the Daily, Weekly, Monthly periods is done by clicking on the clock  (next to the Total Released Activity heading and setting the Start of Shift Time



Element	Description
Concentration	Derived by multiplying the dose rate [CPS] from the PM-11 Detector by the Efficiency Factor [nCi/CPS*m^3] = nCi/m^3
Total Released Activity (derived by integrating the Concentration and multiplying by the total amount of air released in the peak (m^3) = nCi	
Daily	Set from Shift (start) Time and reset to zero after 24 hours
Weekly	Set from Shift (start) Time and reset to zero after 7 * 24 hours
Monthly	Set from Shift (start) Time and reset to zero after 30 * 24 hours
YTD	Total of all releases from the beginning of the year. **This value is displayed in the Point on the map instead of the standard Dose Value**

9.1.2 Emissions Report and Graph

Element	Description
1	Click this arrow to expand the list view of the points, thereby condensing the graph to the bottom of the page.
2	Click this dropdown menu to view and choose from a list of available detection points on different maps to graph.
3	Toggle this switch to display a reference map against which to compare the peak data.
4	Click to specify whether the graph will show maximums or averages for the detection points displayed.
5	Open this dropdown menu to choose which year's data to display.

Element	Description
6	Peak data point parameters: ■ Point Name ■ Start Release Time ■ End Release Time ■ Total- Total detected radiation in Bq. ■ Isotope ■ Mode ■ Factor
7	Click All, Manual, or Auto to filter the results
8	Export the report to a CSV or save as a PDF.
9	Click to highlight an area on the graph and add it to the report as a peak.
10	Click to retrieve the currently displayed data for future reference, in these formats: ■ Print Chart ■ Save as PNG image ■ Save as JPEG image ■ Save as PDF document ■ Download CSV
11	To define a particular data range for the graph date, open the calendar and choose a start and end date for that period.
12	To zoom into a particular timeframe, click on a range option located toward the left-hand portion of the window. Options include: ■ 1 day, ■ 1 week, ■ 1 month, ■ 1 month, ■ Year-to-date (YTD), ■ All The displayed graph refreshes to show only detection activity for the selected zoom period.
13	Y-axis of the graph: (height of the peaks), represents the detected radiation levels in mR/hr.
14	X-axis of the graph: (Angle or Width of the peak); represents the time frame of the correlating detection levels.
15	Horizontal slide bar. Quickly move along the horizontal axis of the graph to show peak data at earlier or later periods.

9.2 Preparing the system for Peak reviewing

In order to be able to report released effluent in units of Activity (uCi or Bq) you need a **detector** installed into exhaust stack recording online radiation levels (CPS), a **flow meter** recording air velocity (m/sec), a **conversion factor** which converts the contact reading of the detector to be relevant to the cross section of the duct that it was installed into and the WebiSmarts Software which puts all these parameters together to provide you with a highly accurate traceable Peak Report.

9.2.1 Add a Flow meter point to the map.

The flowmeter is defined as detector #4 as default. It is not shown in the DPU-3 Display or in the Coincidence Connection Box.

Table 13 below lists and describes parameters pertaining to flow meters.

Table 12. Flow Meter Parameters

Parameter	Description
Fix Flow	If no flow meter is available in the system, then this value is specified by the admin-level user.
Flow Meter	Enter the cross-section.
Ci / Bq	You can specify to display the data from the stack monitor detectors in units of Curies or Becquerel's. Once you select this option, a new widow appears. The first window (Other) is used to define the isotope of interest and the second window (1) is used to set the efficiency factor. See the WebiSmarts installation Manual for more information. 

Parameter	Description
Air Flow	You can select the flowmeter Channel, as created in the Connection Box from the dropdown box or set a fixed flow rate if no flowmeter is available. See the WebiSmarts installation manual for more information.

9.2.2 Setup units of Concentration and Activity

Unlike detectors placed inside the rooms which display and record background levels of radiation, you are not interested in displaying background levels of radiation for detectors placed in the exhaust Stacks. The regulators are interested in the amount of effluent that has been released since the beginning of the year.

WebiSmarts displays graphs in units of concentration (Bq/m^3 or nCi/m^3) which are obtained by multiplying the radiation data (CPS or mR/h) by a calibration factor provided according to the cross section of the exhaust stack.

The units of concentration are then multiplied by the amount of Air released and WebiSmarts reports on the total amount of activity released.

Once you have placed the detectors and flow meter into the Map, you can open the Advanced Settings of the PM-11 and GM-42 and select the option to Display the Conversion Factor but before that you should remove the background readings from the two detectors while they are still displaying units of measurement in dose rate. See next section before continuing

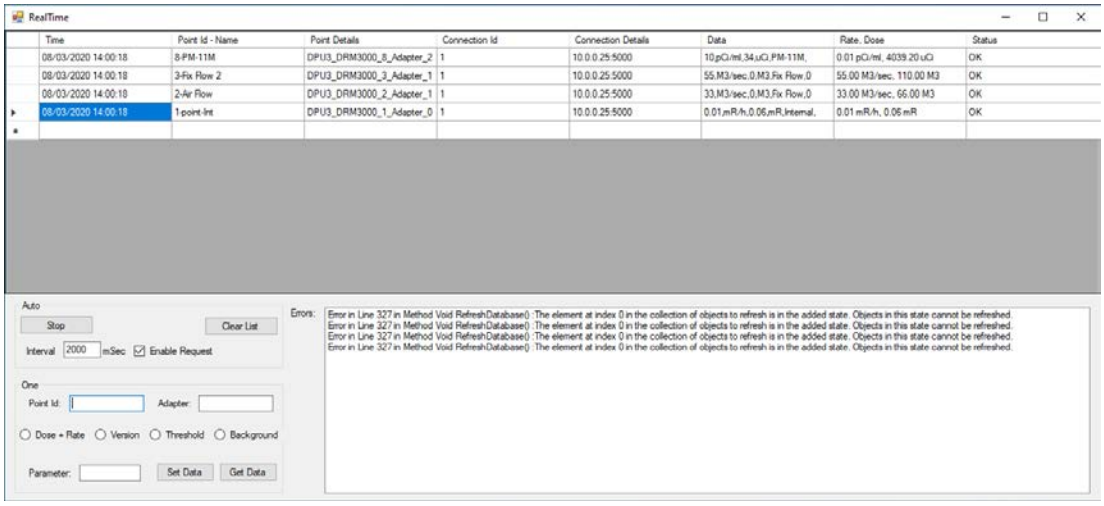
Once your detectors are displaying 0.00 You can apply the Conversion Factors.

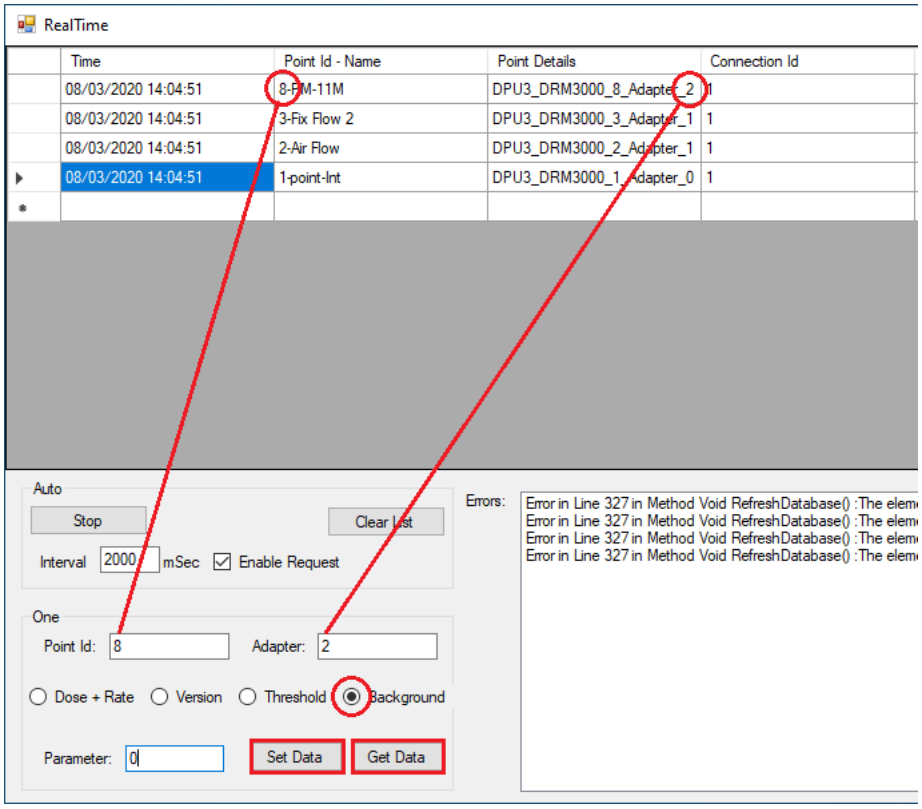
Open the Advanced tab of the detector's point details select Bq/m^3 or nCi/m^3 and type in the Calibration Factor.

Select the Air Flow Channel and we suggest that you copy the actual value of the flow meter into the Fix Flow window because in case the air flow stops working, WebiSmarts will take the value from the Fix Flow.

9.2.3 Remove the background readings from detectors

Open the RealTime Application





You need to input the Point Id and Adapter No and you can find these two parameters from the table above.

Select Background and type the number into the Parameter window and click Set Data. The reading on the DPU should revert to 0.00

If you want to check the setting of the Background level click Get Data

If you want to reset the or cancel the background level, type 0 (zero) into the Parameter and click Set Data.

Once you have finished this step, you can now setup the Calibration Factors for each detector.

Once this is completed your software is ready.

9.3 Creation of Peaks

The WebiSmarts software is designed to support our new Exhaust Stack Detector which is a unique coincidence detector capable of differentiating between effluent and background radiation and the released isotope.

The new exhaust stack monitoring system will display the exact amount of released effluent in units of Ci or Bq from the start of the year on the point in the map and for a more detailed Peaks Review Report shows the exact percentage of released effluent per the following isotopes: F-18, C-11, Ga-68, O-15 and N-13.

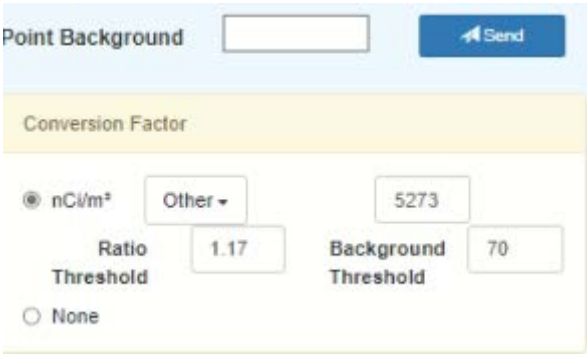
With the capability to differentiate between internal and external radiation levels the peaks will be marked automatically and the point on the map will update only if the detector recognizes that effluent was released within the exhaust stack

The Peaks Review screen also provides editing capabilities to the user so that the report to the authorities can be signed by the user.

9.4 Fine Tuning of Peaks

This procedure should be carried out as soon as your site has produced a week's worth of real effluent data. Once you have set the parameters you can check the results by activating the Recalculate Peaks command and seeing the results of your modifications. The Recalculate Peaks option only modifies effluent data for a period of one week and is only available if the user selects a period of one week or less in the graph. It is part of the installation procedure and should be done immediately following the installation of the WebiSmarts system.

The two parameters used to fine tune the automatic selection of the peak are found in the Advanced Tab of the Point Details Screen once you select the units of Activity and Concentration (nCi/m3 or Bq/m3) and are Ratio Threshold and Background Threshold.



Ratio Threshold:

Parameter of W1/PM (CPS) where W1 is the dose rate (CPS) of the first window of the beta detector and PM is the dose rate of the PM-11 detector (CPS).

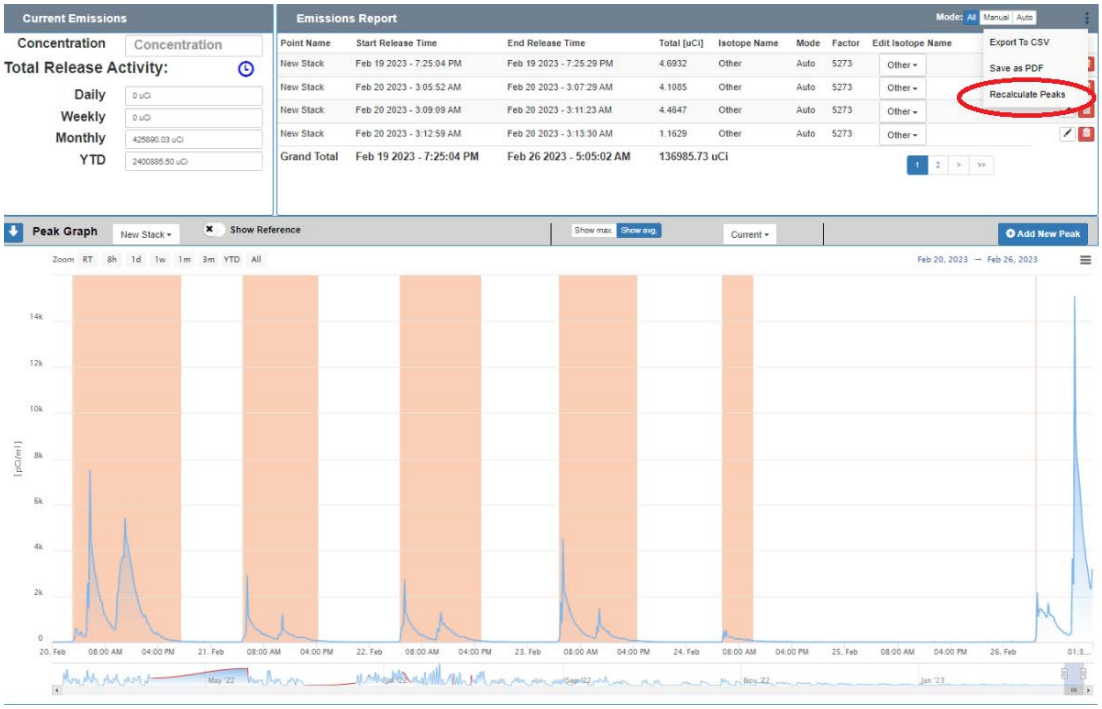
Upon each release the PM-11 detector detects gamma radiation only while the beta detector detects both gamma and beta radiation, so at the onset of a release the dose rate of the detectors may be similar, and the ration will be 1 but as the peak progresses the beta detector will begin to detector more and more radiation. By setting the Ration Threshold to 1.17 we are setting the software to mark the start and end of the peak only when the ratio between the beta detector and the PM-11 detector is greater than 1.17.

Background Threshold:

Sets the background level of the beta detector much like we set the background setting of the PM-11. By setting the background level of the beta detector to 70 (CPS) we are ignoring the background "noise" and showing peaks only where the beta detector is detecting more than 50 cps.

Recalculate Peaks:

To help you fine tune the Coincidence parameters we have developed a tool whereby you can modify the parameters and then activate the Recalculate Peaks command to see the results of the last modification you made. This command is visible only to users with Administration access levels and only if the graph shows a weeks' worth of data or less.

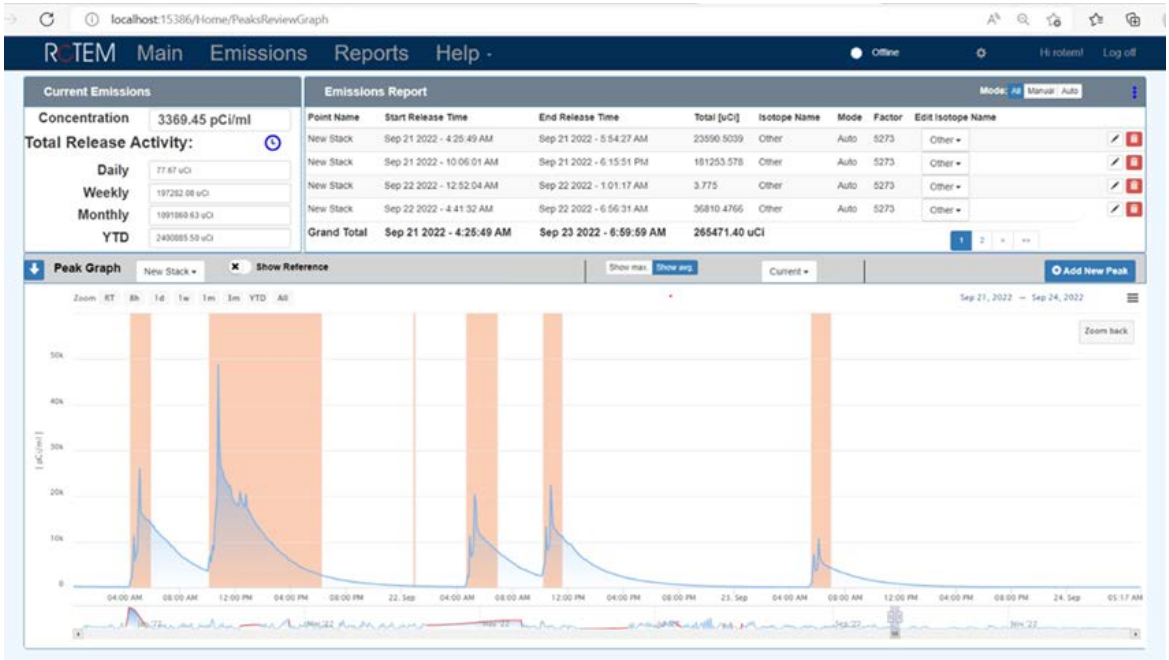


9.5 Displaying Peaks

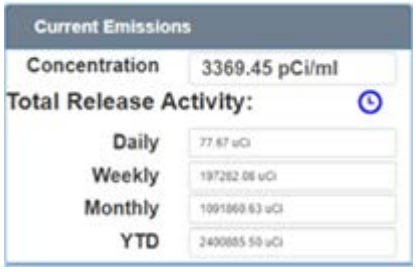
This section describes and illustrates how to display radiation peaks that are of interest.

To display peaks:

1. In the Rotem menu bar, click **Emissions**.



9.5.1 Current Emissions Screen



Concentration: Current and last concentration level recorded

The Clock : Used to set start of work day

Daily: Displays total of all releases from the beginning of the Day

Weekly: Displays total of all releases from the beginning of the Week

Monthly: Displays total of all releases from the beginning of the Month

YTD: Displays total of all releases from the beginning of the Year. This value will be displayed by the point on the map.

Figure 21. Peaks Review

2. In **Peak Graph**, select the map where peak data is of interest.

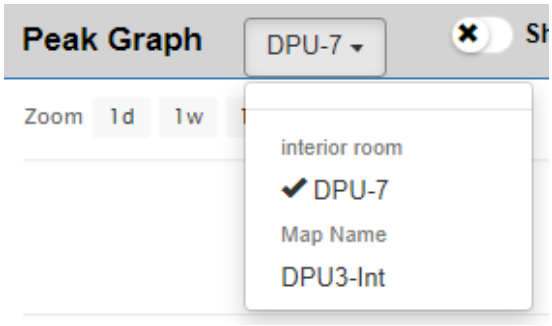
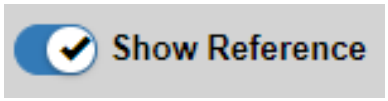
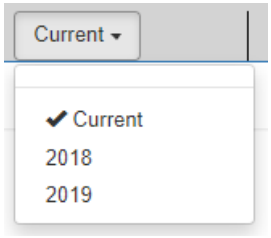


Figure 22. Peak Graph

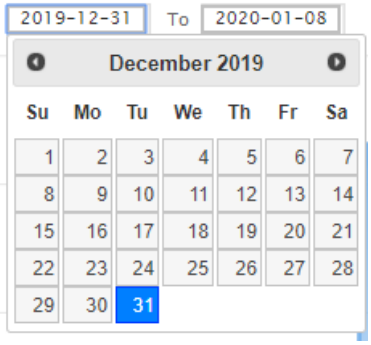
3. To display a reference point against which the peak data will be compared, select the **Show Reference** toggle switch.



4. To specify a particular year for which to display peak data, open the dropdown and select a year (Current, by default).



5. To define a particular data range for the graph date, open the calendar and choose a start and end date for that period.



6. To zoom into a particular timeframe, click on a range option located toward the left-hand portion of the window. Options include:

- 1 day,
- 1 week,
- 1 month,
- 1 month,

- Year-to-date (YTD), and
- All.

Zoom 1d 1w 1m 3m YTD All

The displayed graph refreshes to show only detection activity for the selected zoom period.

Figure 23. Detection Activity for Selected Zoom Period

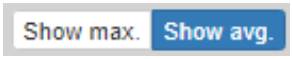
7. To further zoom into a particular graph segment, using your mouse, point, click and drag rightward along the x-axis.

8. Release the mouse.

Figure 24. Detection Activity. Granular View

The displayed graph again refreshes to show a focused and more granular view of activity occurring during the selected stretch of time, to the exclusion of other times shown in the original graph.

9. To specify whether the graph will show maximums or averages for the detection points displayed, click the **Show Max. / Show Avg.** toggle.



10. To zoom out of the graph's currently displayed zoom view and return to the graph's prior format, click **Reset Zoom**.

    Alternatively, if you wish to add peaks to a detection report, see the instructions appearing in the section that follows (Adding Peaks).

9.6 Adding Peaks

This section describes how to add peaks to a detection report. Once you have displayed—in a detection report—peaks that are of interest, you can add more peaks to the report.

To add a new peak to a detection report:

1. For the currently displayed graph, click **Add New Peak**.

   Two vertical red bars appear along the left and right sides of the graph.

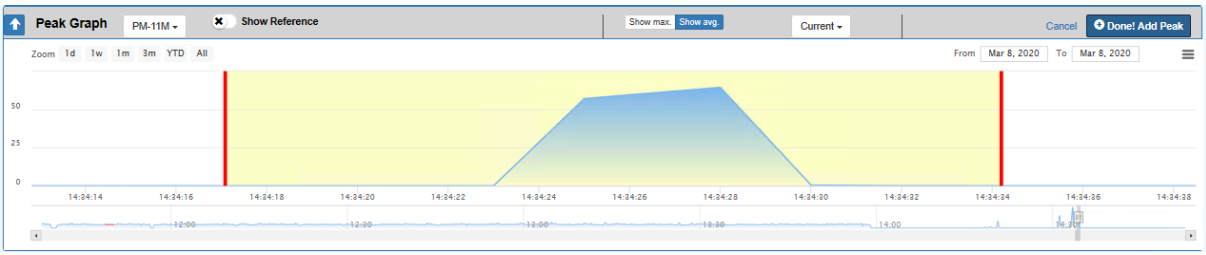


Figure 25. Adding a New Peak

2. Define the left and right boundaries of the peaks you wish to add by grabbing either of the red lines with your mouse pointer and sliding them rightward and leftward.

3. When you are finished moving one of the red lines, release the mouse. If you wish, you may continue by moving the other red line. Otherwise, continue to the next step.

   The result is a more granular segment of the original graph appearing in the Peak Review window.

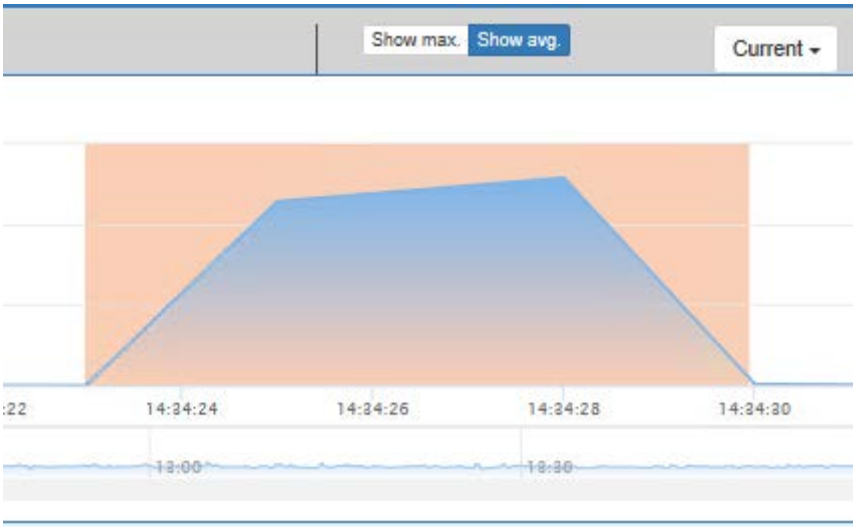


Figure 26. Detection Graph. Granular Segment of Original

4. Click **Done! Add Peak**.

   The newly added point will display in the Peak Detection Report at the top of the Peaks Review window.

   Alternatively, if you decide not to add the peak data that is currently displayed, click **Cancel**.

9.7 Configuring Peak Graphs

This section describes how to determine the default characteristics of peak graphs.

> **IMPORTANT!**
>
> Only a user with Administrator permissions can configure a peak.

When you define a peak, it is displayed in a color different from that of the background; black is the reference color.

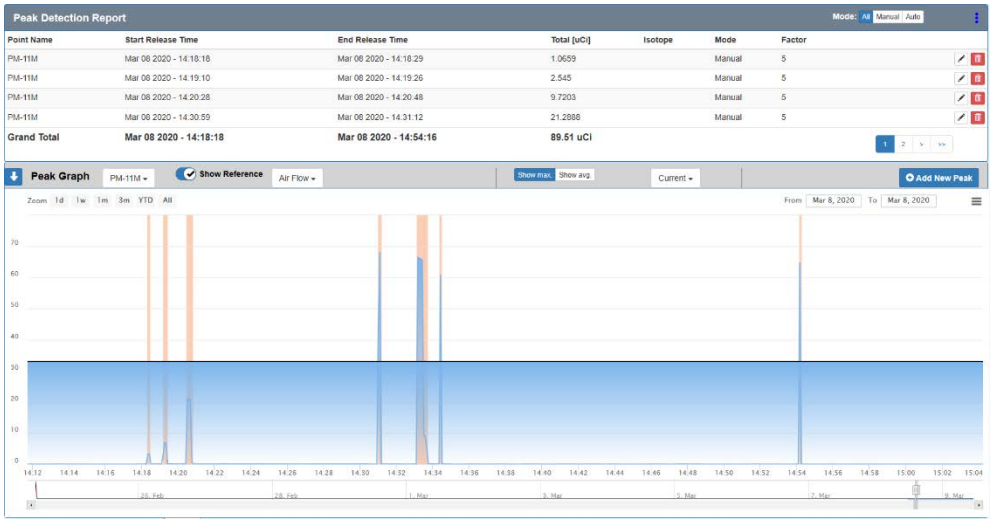


Figure 27. Graph Coloring. Peak and Background

9.8 Editing a Peak

This section explains how to modify the peak data associated with a point in a detection report.

To edit a peak:

1. In the Peak Detection Report portion of the Peaks Review window, click the edit icon associated with a given point.

Figure 28. Peak Detection Report

The image appearing in the Peak Graph portion of the window changes, now displaying the data for the selected detection point.

2. Modify peak data as described in section 9.5, Adding Peaks, above.
3. When you are finished making modifications, click **Done! Update Peak**.

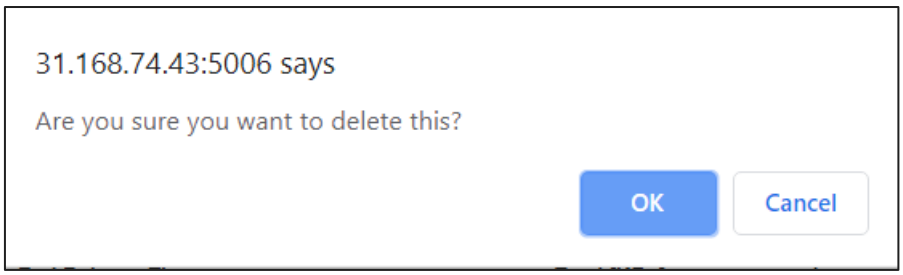
The revised peak data now appears as a point name in the Peak Detection Report.

9.9 Removing a Peak

This section explains how to delete peak data from a detection report.

To remove a peak:

1. In the Peak Detection Report portion of the Peaks Review window, click the trash can icon associated with a given point.



A message is displayed confirming your choice.

2. Click **OK** to confirm your decision to delete.

   Alternatively, click Cancel.

   The peak data that you deleted no longer appears as a point name in the Peak Detection Report.

10 Setting and dealing with Alerts and Alarms

Here is a list of where alerts and alarms can be set:

Parameter	Location/Explanation
Point, map and hyperlink colors	Point Widget - The color of the point reflects the relationship between the threshold values and the current radiation levels. The color of the map tab and hyperlink button reflect the worst-case scenario of the points in the referred map.
Enable Audio	Global Settings - Do you want WebiSmarts to activate the audio signal whenever there is an abnormal condition such as over threshold, lost contact…
Thresholds	Point Settings - Any modification made to the threshold settings in the Point Details screen will update in the DPU-3 and vice versa
Confirm Det. Alarm	Point Settings - A new command that allows the WebiSmarts user to remotely mute the audio signal of the DPU-3. Note that this option is not easily accessible and requires the user to access the point details screen before being able to mute the alarm because we believe that it is dangerous to mute an audio alarm without being present on the scene. For the same reason, pressing this button may mute the DPU-3 but will not mute the Advanced Detector Bracket which may be installed distant to the DPU-3

Parameter	Location/Explanation
Detector Fail and Lost Contact Alarms	Upon either of these conditions the point will change color and the occurrence will be recorded into the Current events and then History Events in the reports

11 Reports and Logs

11.1 About Reporting and Logging in WebiSmarts

This section describes how to derive useful and actionable data from radiation detection reports and WebiSmarts system logs. The following topics are covered:

- Learning from Reports
- Learning from Logs

11.2 Learning from Reports

Reports contain data about radiation detection, captured in real-time. Learn from reports by discovering informative data that you can apply to your radiation detection and monitoring activities. This sub-section covers:

- Scope of Search
- Generating and Viewing Reports

WebiSmarts retains reports from the time of system installation.

11.2.1 Scope of Search

There are four key aspects to a report in WebiSmarts:

- **Alerts** – information regarding events at a particular point and over a certain period; for instance, exceeding a threshold, detector failure, and so forth.
- **Faults** – information about conditions that prevent WebiSmarts from monitoring, detecting, and alerting users regarding radiation levels and exceeded thresholds; occur at a particular point and over a certain period.
- **Deactivated points** – information regarding detectors that are no longer functioning and as a result have been deactivated. Indicates which detectors have been taken offline and when deactivation occurred.
- **Exposure dose** – indicates the level at which radiation exposure occurred at a particular point and during a certain period, including reset times. One of the parameters that should be inserted into each point is the **Reset Dose interval** (See Table 11. Editing Points. Advanced Settings). Before each Dose reset, the Accumulated Dose (Value) along with a time stamp and Remaining is inserted into this report. The Value under Remaining equals the difference between the Dose Threshold and Accumulated Dose. We suggest to begin

with a high Dose Threshold value until you have understood the values of normal working environment and then set the Dose Threshold to be a small percentage above this level. This tool will enable you to monitor the radiation levels in the room and receive an alert if there is an increase.

The sub-section that follows explains how to optimize the data points described above.

11.2.2 Generating and Viewing Reports

This sub-section describes and illustrates how to create a report in WebiSmarts and how to view report results.

To generate and view a report:

1. In the Rotem main menu bar, click on Reports.

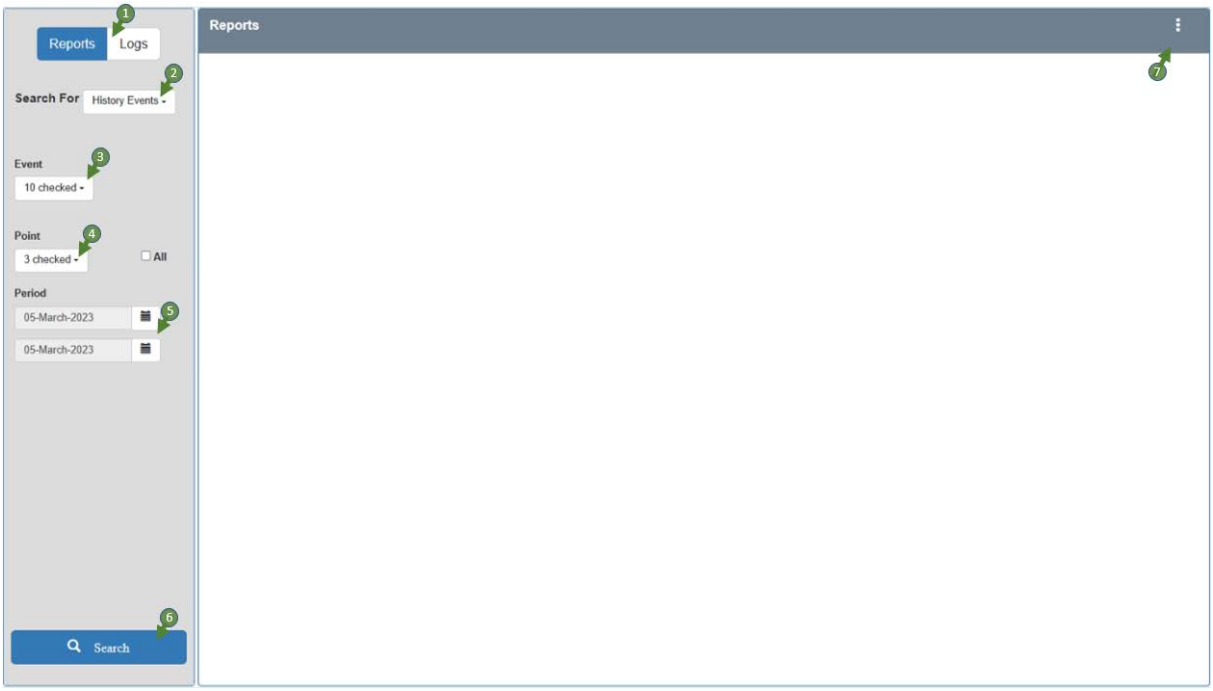


Figure 29. Reports View. Prior to Search

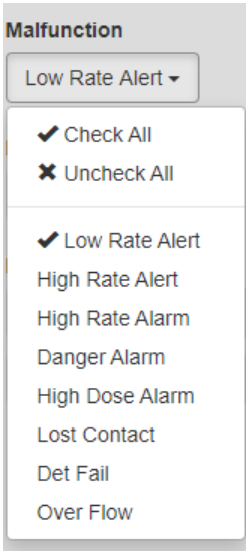
Table 13. Report and Log Page Elements Explained

Element	Description
1	Toggle between the Reports and Logs view.
2	Dropdown menu containing data categories.
3	Dropdown menu containing events.
4	Dropdown menu containing detection points.
5	Calendars for start and end points in search.
6	Search button.

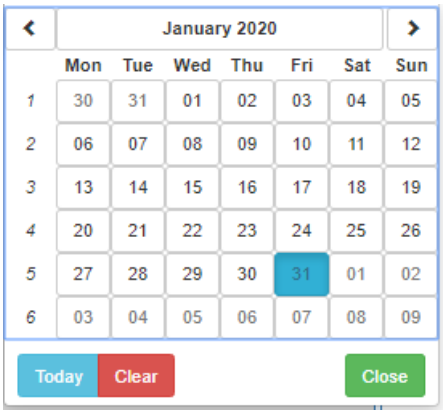
Element	Description
7	Click to retrieve the currently displayed data for future reference, in these formats: ■ Save as PDF document ■ Download CSV

2. In the left-side panel, click the **Reports** button.
3. In the **Search For** field, open the dropdown menu.
4. Specify the scope of search
   - Alerts
   - Faults
   - Deactivation, and
   - Exposure dose. These scopes are described in detail in section 11.2.1, above.

   Specify events that occurred during a given period for a particular detection point.



5. Open the point dropdown menu and specify a detection point—or points—on which to report.
   - To specify all detection points, select ✓ **Check All**.
   - Alternatively, to clear all selections, choose **X Uncheck All**.
6. To define a particular data range for the graph date, click the calendar ( ) mini-icons.



Then, using the calendars, choose a start and end date for that period.

7. Click the **Search** button.

The image shown in figure 30, below, depicts sample report results.

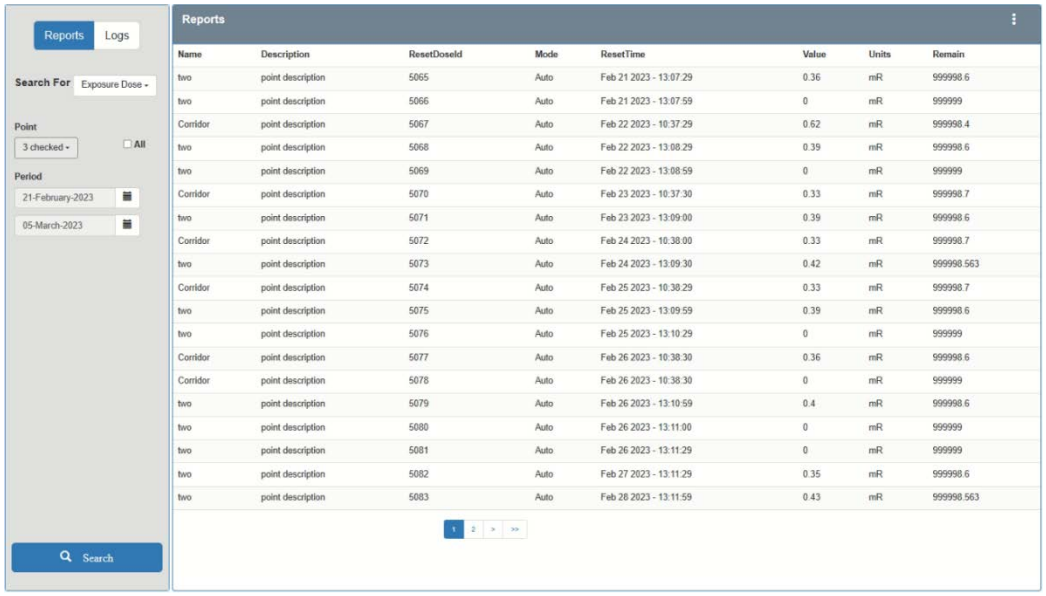


Figure 30. Reports View. with Search Results

11.3 Learning from Logs

Any action performed in the system is logged. Action logging enables you to retrieve data for future reference. This information can be used to compare to peaks and try to correlate detection levels with user actions.

To display log data:

1. In the Rotem top menu bar, make sure **Reports** is selected.
2. In the Reports view, click the **Logs** button.

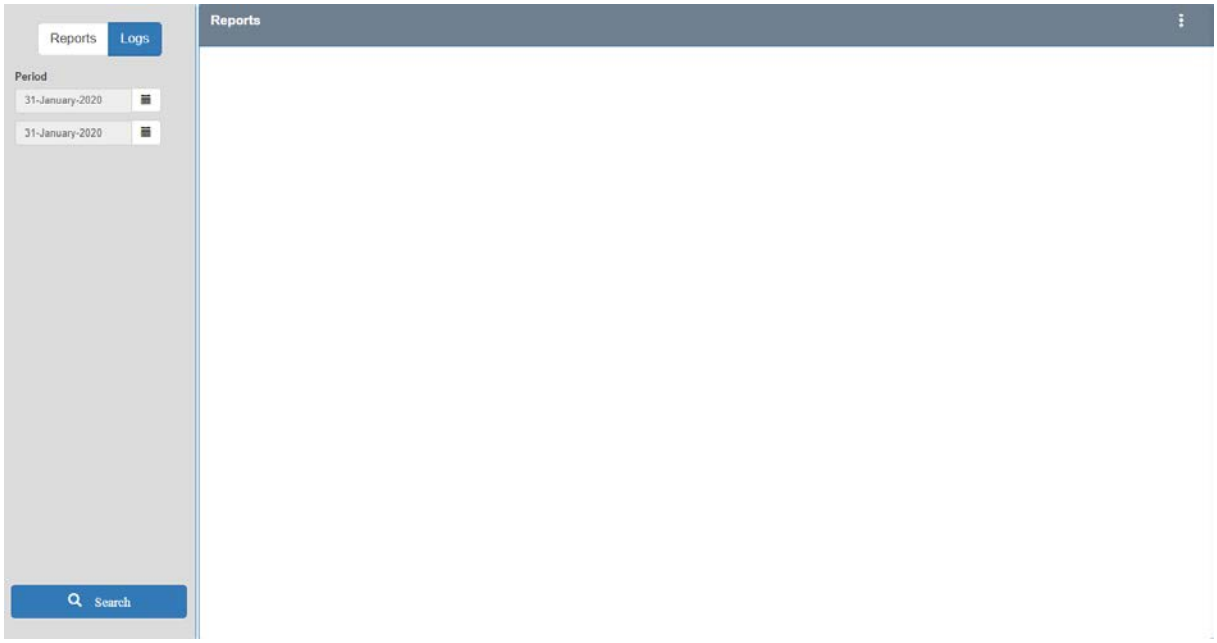


Figure 31. Logs View. Prior to Search

3. Using the Calendar ( ) mini-icons, define a period for which WebiSmarts will generate activity logs. Then, using the calendars, choose a start and end date for that period.

4. Click **Search**.

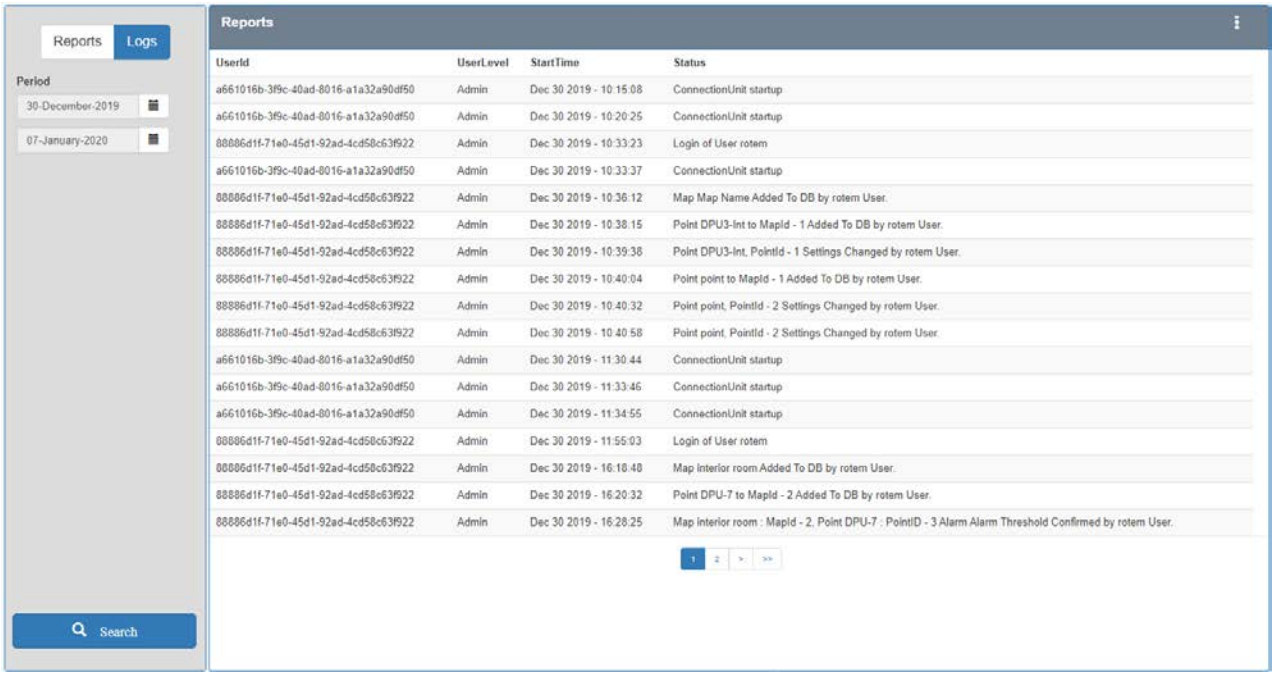


Figure 32. Logs View. with Search Results

12 More than just a Connection Box

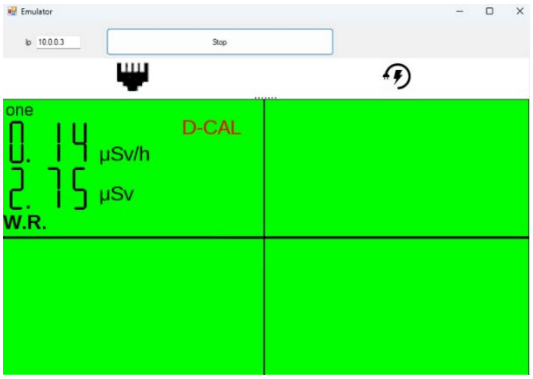
The Connection Box's main function is to connect between the DPU-3's in the laboratory and the WebiSmarts Software but we have added some more functions to help you get the best out of the system. The WebiSmarts installation manual contains more information but here are some useful functions accessed via the Menu in the top left-hand corner of the Connection Box

12.1.1 The Connection Unit Menu

The Connection Unit Menu contains the following Commands:

Login:	Used to access sensitive settings, e.g. adds the command Settings to the end of the drop-down list, which is used to reconstruct Lost contact time. See Activating the Reconstruction section in the WebiSmarts User Manual for more information.
Emulator:	Used to emulate the Display of the DPU-3 for diagnostic purposes. Type in the IP address of the DPU-3 you are interested in querying and click Start. See screenshot below
IP Scanner:	Very useful during the installation for scanning the IP address of the DPU-3's connected to the network.
Network Alarm Messages:	Used to set up the recipients of the alarms via email messages. Emails are sent from medismartssystem@gmail.com as a default but you can set up any email account as long as you know the address and password. Use the provide outgoing email… radio button to set this up.
Print Current Values:	Click to print out a table of the current values in WebiSmarts
Settings:	Available after logging in – password is rotemi19 – used to setup the time for reconstruction of lost contact in graphs

Emulator Screen



13 The WebiWatch

The WebiWatch is the WebiSmarts' watchdog which makes sure that data will continue to be transferred from the DPU-3's in the laboratory to the WebiSmarts database even after a power failure recovery.

After each startup of the Server, the Connection Unit is run as a service and if an Administrator logs into the computer, the service is closed and then re-opened as an application showing the various screens and running the service.

This closing and re-opening is done to provide the User with a visual indication that the Connection Unit is up and running and avoids opening the connection unit a second time which could cause problems

The WebiWatch application should be located in the WebiSmarts Server/ c:/inetpub/wwwroot/WebiSmarts folder. For more information please refer to the Installation Manual

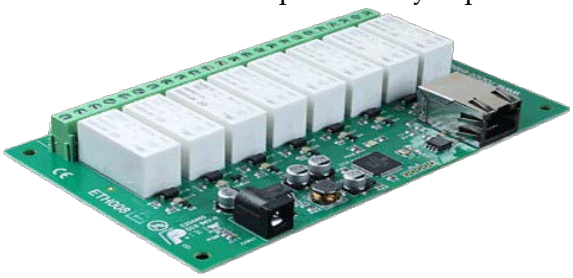
14 Peripherals

14.1 Using the External Light Tower

In cases where the DPU=3 is mounted inside a room and you want to have an indication of the radiation levels before entering the room, we provide an external light tower to provide a quick preview of the radiological conditions by lighting up a green, yellow or red LED according to the **worst-case scenario** after comparing the threshold levels for each of the four detectors mounted on the DPU-3000.

14.2 Using the External Signal Interface

The External Signal Interface is an Ethernet based bank of relays which are activated directly by the DPU-3's in the laboratory. The DPU-3 is programmed using our RMVC software to activate specific relays upon User Alarm condition.



The External Signal Interface (Relay Card, Potential Free Contacts) Board provides eight-volt free contact relay outputs with a current rating of up to 16A.

The WebiSmarts system can support more than one External Signal Interface.

See the WebiSmarts Installation Manual for setup instructions

14.3 Utilizing the 4-20mA Output

THE DPU-3 can provide a 4-20mA output from each of the four detectors. The DPU-3 converts the current displayed dose rate to 4-20 mA outputs on the AUX connector. Those outputs are a logarithmic function of the current displayed dose rate. The outputs are scaled by the full-scale value and low scale value.

See the WebiSmarts Installation Manual for more information

14.4 Using the Advanced Detector Bracket

The Advanced Detector Bracket provides a local interface (Audio and visual) when the DPU-3is mounted in another location and not visible from the detectors' location.

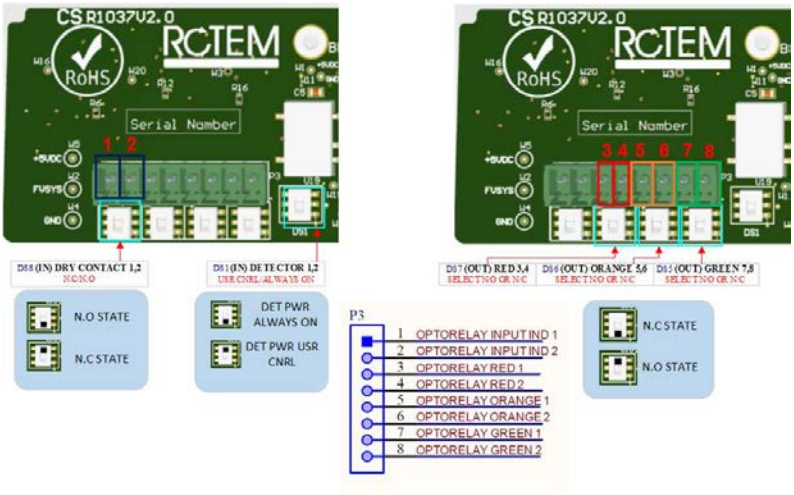
The following detectors can be mounted inside the Bracket: Wide Range, GM-40, GM-41, GM-42, GM-10 and IC-10 and AMP-50, AMP-100, AMP-200 and AMP-300. Other bulkier detectors can be mounted next to the Bracket with a longer interconnection cable.

The Bracket is controlled directly by the DPU-3 and provides Visual feedback of the dose rate levels by lighting one of the three LED's, green yellow or red using the same threshold levels as set in the DRM-3000.

Audio feedback is provided by a volume adjustable buzzer on the bottom of the bracket. Each time a threshold level is breached the buzzer will sound to alert users nearby. Users can mute the buzzer by pressing on the LED cover until the next threshold is breached.

If the buzzer is not required then the red button situated on the underside can be pushed to permanently mute the buzzer and in this case the button will light up to indicate to users that no audible alarm will be issued.

The Bracket also contains a bank of optocoupler relays for each threshold level (3,4 5,6 7,8) that can be used to interface with external controllers. It also contains a single input channel (1,2) that can be connected to an accelerator controller and in the case of BEAM ON, power is cut to the detector (User Controlled) and restored when the Beam is turned off. This is useful for prolonging GM Tube Life Time



15 System Configuration

15.1 Overview

This section describes how to configure WebiSmarts so as to customize system behavior to suit the requirements of your particular WebiSmarts deployment. The following configuration activities are covered:

- Display points
- Threshold colors
- General Global Settings
- Configuring devices, including adding, removing, and defining advanced parameters

15.2 Display Points

Points displayed on the WebiSmarts dashboard display data pertaining to radiation levels. WebiSmarts' system configuration tools let you define the units of measure and activity to be displayed.

To define the Activity and Measuring Units for Points:

In the **Global Settings** control panel, under Points, toggle each of the two icons sets to set your preferred units of measure.

The unit of measure that is clicked on will turn blue and reflect on the point widgets in the system.

15.3 Threshold Colors

This sub-section describes how to define basic threshold parameters, including the colors that appear for various ranges of alert.

Thresholds are the radiation levels at which the system indicates various severities of warning. Thresholds in WebiSmarts are determined by default, although the user can modify them. Thresholds are measured in counts per second (CPS).

- Low
- Alert
- Alarm
- Danger

Choose from seven preset colors to assign to various thresholds. These are gray, green, yellow, red, orange, violet, and light blue. Alternatively, you can define your own colors.

To choose threshold colors:

1. In the **Global Settings** column, **Threshold Colors** box, click any of the colored alarm boxes.

A color configuration box opens.

Figure 33. Threshold Colors with Color Configuration Box Open

2. Specify a color and a shade to reflect the chosen alarm level.
3. Click on the color.

   The alarm box will change to the selected color.
4. Adjust the color until satisfied.
5. On the right lower side of the color shade box, click the **X**.

   The alarm box will now appear as the chosen color.

15.4 General Global Settings

In the Global Settings control panel, **General** section, you can define the notification settings.

To define the notifications:

In the **Systems Settings** control panel, **General** section, click the box to the left of any of the following notification options:

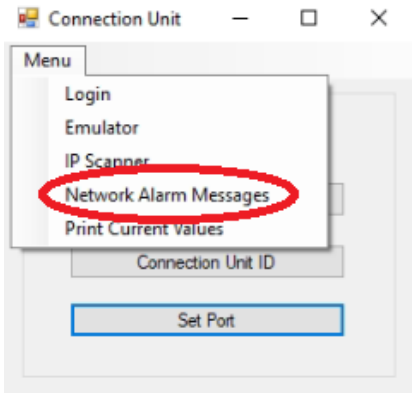
- Enable Audio
- Notification by Email
- Minimized Mode
- Stop Blinking

Enable Audio

Enable WebiSmarts to provide audio feedback to the user in case of irregularities in the system like lost contact, detector failure, Over Threshold condition…

Notification by Email

The option to receive notifications of alerts and alarm via email is set here. The email parameters are set in the Menu/Network Alarm Messages drop down list in the Connection Unit. For more information see Network Alarm Messages in the WebiSmarts Installation Manual.



Minimized Mode

This option is used to declutter a busy map. Instead of displaying each point's widget, this option displays only the point with its color. In case the point begins alarming the widget is displayed.

You can also open the widget by clicking on the point and you may also set a specific point to remain open by clicking on the restore icon as seen below.

Stop Blinking

If a point enters an alarm status and is not confirmed, it will remain in that status until the situation returns to normal. In this case the point will revert to its standard green color but will blink signifying to a user that an alarm situation occurred and has passed. If this is not a welcome feature then select "Stop Blinking"

15.5 Configuring Points in Global Settings

This section explains advanced configuration of detection devices deployed in a WebiSmarts system. This includes the following:

- Adding devices
- Device configuration (defining advanced parameters)
- Removing devices.

15.5.1 Adding a Device

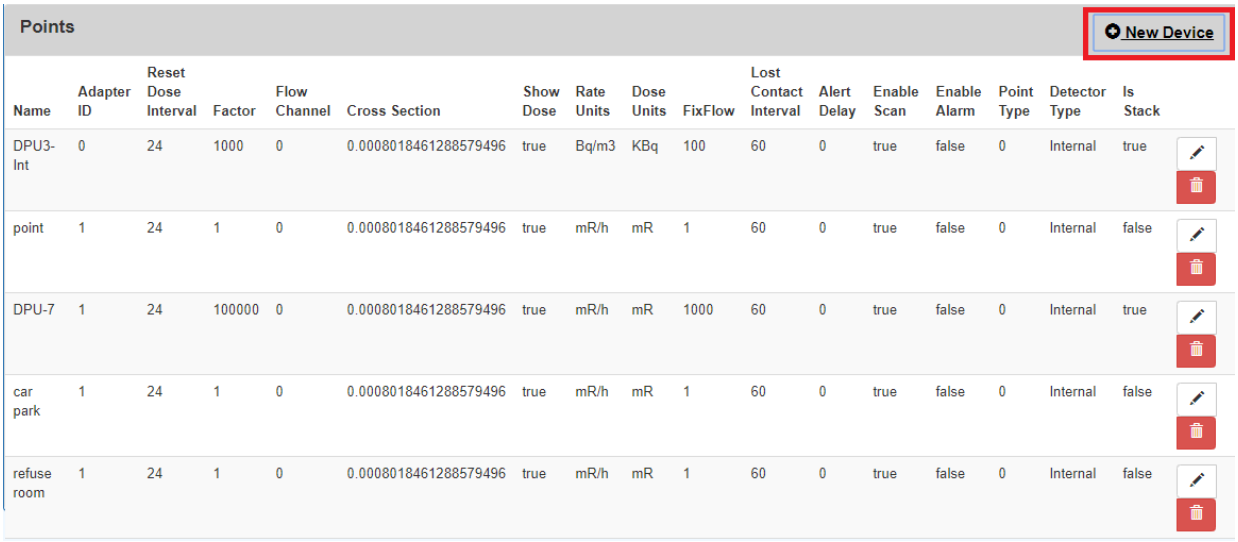
This sub-section describes how to add a device using WebiSmarts system configuration tools.

To add a new device:

1. In the top Rotem menu bar, click the gear ( ) icon.

   The WebiSmarts configuration view opens.

2. Above the right-side of the Points grid, click the **+New Device** button.



Points

New Device

Name	Adapter ID	Reset Dose Interval	Factor	Flow Channel	Cross Section	Show Dose	Rate Units	Dose Units	FixFlow	Lost Contact Interval	Alert Delay	Enable Scan	Enable Alarm	Point Type	Detector Type	Is Stack
DPU3-Int	0	24	1000	0	0.0008018461288579496	true	Bq/m3	KBq	100	60	0	true	false	0	Internal	true
point	1	24	1	0	0.0008018461288579496	true	mR/h	mR	1	60	0	true	false	0	Internal	false
DPU-7	1	24	100000	0	0.0008018461288579496	true	mR/h	mR	1000	60	0	true	false	0	Internal	true
car park	1	24	1	0	0.0008018461288579496	true	mR/h	mR	1	60	0	true	false	0	Internal	false
refuse room	1	24	1	0	0.0008018461288579496	true	mR/h	mR	1	60	0	true	false	0	Internal	false

Figure 34. System Configuration. Points Grid

3. When you are finished defining configuration parameters for the newly added device, click **OK.**

15.5.2 Device Configuration (advanced)

This sub-section describes how to modify a device using WebiSmarts system configuration tools.

To edit a device:

1. In the top Rotem menu bar, click the gear ( ) icon.

   The WebiSmarts configuration view opens.

2. In the right-side of the Points grid, click the edit icon.

   The image appearing in figure 35 below, and table 14, which follows, contain configuration parameters that an admin-level user can define to further refine the behavior of detection devices in a WebiSmarts deployment.

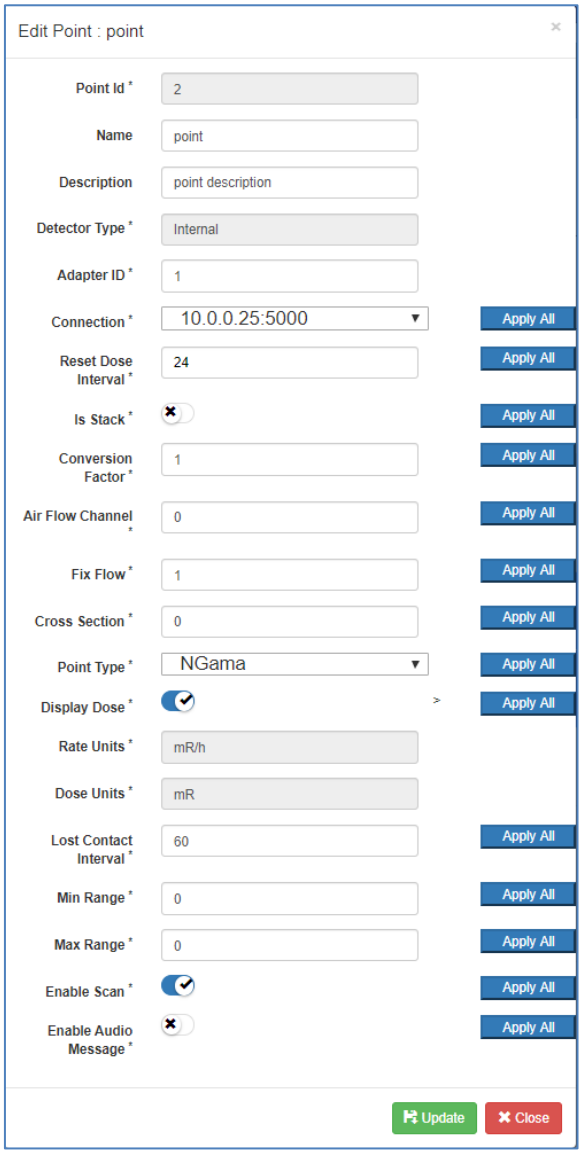


Figure 35. Device Configuration (advanced)

Table 14. Device Configuration Parameters (advanced)

Parameter	Description
Point ID	An integer, assigned by the system
Name	Enter by typing
Description	Enter by typing
Detector Type	Defined by system
Adapter ID	Specify an integer, this is the number of the detector (0-4)
Connection	Choose from the dropdown menu
Reset Dose Interval	Specify an integer (specified by system)

Parameter	Description
Is Stack	Toggle on/off whether radiation detection is occurring inside the exhaust stack.
Conversion Factor	Specify an integer … this relates to the flow
Airflow Channel	Specify an integer
Fix Flow	Specify an integer as close to the actual flow rate as possible
Cross Section	Specify an integer
Point Type	Choose the type of detection
Display Dose	Toggle on/off whether to display the dose threshold (check this)
Rate Units	Specify the units that measure the Dose Rate
Dose Units	Specify the units that measure the (accumulated) Dose
Lost Contact Interval	Select a waiting period before providing alarm
Min(imum) Range	Used to define the value that 4 mA will display. E.g. The flow meter is setup to measure from 0 to 15 m/sec, therefore in this case the Min value will be 0
Max(imum) Range	Used to define the value that 20 mA will display. E.g. The flow meter is setup to measure from 0 to 15 m/sec, therefore in this case the Max value will be 15
Enable Scan	The alternative is to exclude this detector from the requirement to report. Used in case the detector is not in service
Enable Audio Message	Enable WebiSmarts to provide audio feedback to the user in case of irregularities in the system like lost contact, detector failure, Over Threshold condition…

3. When you are finished modifying configuration parameters for the selected device, click **Update**.

   Parameters for the device that you edited are updated in the WebiSmarts system.

15.5.3 Removing a Point

This procedure provides a method of deleting a point from the database along with all its historical data, using the WebiSmarts configuration tools.

Procedure

1. In the top Rotem menu bar, click the gear  icon.

   The WebiSmarts configuration view opens.

2. In the right-side of the Points grid, click the trashcan  icon.

A dialog is displayed confirming your decision.

3. Click **OK**.

The device is removed from the WebiSmarts system and no longer appears in the Points grid and has disappeared from the database along with all its historical data

16 Maintenance

16.1 Check that the database is being populated by all the DPU-3 meters

We warmly recommend that users check, once a day, that the system is live and recording data. While we take every precaution making sure that WebiSmarts is a sturdy collecting tool, it is wise to open a browser in the morning and check that the points on the maps are live and data is being updated and that the icon on the top right-hand side of the dashboard is flashing white  which means that the database is being populated with live data.

If the icon is flashing orange  you need to access the Server and reconnect the system by first closing the Connection Unit application in the Task Manager and then restarting it. You can then open the real time screen to verify that data is flowing.

The Latest WebiSmarts Software includes a new application called WebiWatch. WebiWatch is activated upon startup of the WebiSmarts Server and activates the Communication Application, it also periodically checks that the Communication Application is up and running and if not activates it.

16.2 Creating a backup file

We recommend that you create a procedure to back up the WebiSmarts files to protect your data in case of a mishap.

The Database location is in this path:
C:\inetpub\wwwroot\WebiSmarts\App_Data

For the backup procedure see https://www.sqlshack.com/automate-sql-database-backups-using-maintenance-plans/

The flowing files need to be backed up

MediData	24/02/2022 9:14	SQL Server Database Primary Data File	8,192 KB
MediData_FG_2020_12	17/11/2021 10:45	SQL Server Database Secondary Data File	10,240 KB
MediData_FG_2021_01	17/11/2021 10:45	SQL Server Database Secondary Data File	10,240 KB
MediData_FG_2021_02	17/11/2021 10:45	SQL Server Database Secondary Data File	10,240 KB
MediData_FG_2021_10	17/11/2021 10:45	SQL Server Database Secondary Data File	10,240 KB
MediData_FG_2021_11	01/12/2021 3:15	SQL Server Database Secondary Data File	92,160 KB
MediData_FG_2021_12	24/02/2022 7:34	SQL Server Database Secondary Data File	1,034,240 KB
MediData_FG_2022_01	06/02/2022 12:18	SQL Server Database Secondary Data File	10,240 KB
MediData_log	24/02/2022 9:14	SQL Server Database Transaction Log File	73,728 KB

16.3 Check Disk Size

We suggest that you check that the hard drive is not close to being full

Appendix A User Password Access levels

Site Settings			Administrator Only
	Activity Units		
	Measuring Units		
	Threshold Colors		
	Voice Alert		
	Stop Blinking		
	Notification by Email		
Points	New Device		Administrator Only
	Edit Device		
		Point ID	
		Name	
		Description	
		Detector Type	
		Adapter ID	
		Connection	
		Reset Dose Interval	
		Is Stack	
		Conversion Factor	
		Air Flow Channel	
		Fix Flow	
		Cross Section	
		Point Type	
		Display Dose	
		Rate Units	
		Dose Units	
		Lost Contact Interval	
	Delete Device		

Users Management	New User			Administrator Only
	Edit User			
	Delete User			
Main	Map Tabs			
	Add Map			Administrator Only
	Delete Map from Database			Administer Only
	Remove Map from View			
	Map Settings			
		Name		
		File		
		Open Folder		
		Preview		
		Delete		
		Cancel		
		Save		
	Add Point			
		Point Name		
		Point Description		
		Thresholds		
		Dose Thresholds		
		Enable Alarm		
		Add & Save		
	Point Settings	Name		
		Det.Type		
		Description		
		General		
			Edit Thresholds	
			Dose Thresholds	
			High Rate Delay	
			Enable Alarm	
			Cancel	
			Save	
		Advanced		Administrator Only
			Device ID	
			Adapter ID	
			Conn ID	
			Conn	
			Reset Dose	
			Interval	
			Next Reset	
			Conversion Factor	
				nCi.m3
				None

or
Air Flow
Channel
Fix Flow

Remove Point
Display Graph

Side Graphs

Open Graphs
1d
1w
3m
YTD
All
reorder
Show Max
Show Avg
Show/Hide Threshold
Print Chart
Download PNG Image
Download JPG Image
Download PDF Document
Download CSV
Add lost data from DPU-3 (migration)

Peaks Review

Mode All
Mode Manual
Mode Auto
Export to CSV
Save as PDF
Edit Line
Delete Line
Down Arrow
Point Drop Down Box
Show Reference
Show Max
Show Avg
Add New Peak
Print Chart
Save PNG Image
Save JPEG Image
Save PDF Document
Download CSV

Reports

Alerts
Deactivated Points
Exposed Dose

Point Details

Appendix B Index

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