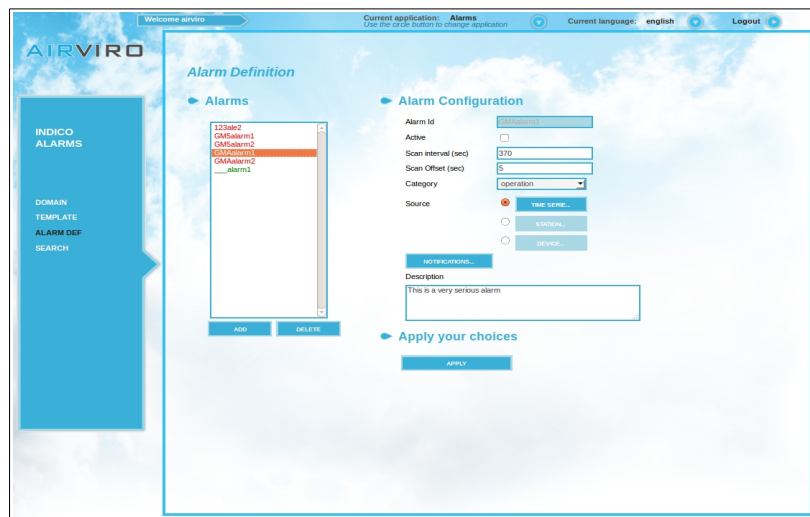


## Working with the Alarm Module



**How to define and configure alarms**

**How to visualize and recognize alarms**

# Working with Alarm Module

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## Amendments

Version	Date changed	Cause of change	Responsible
3.21	September 2010	New release	GS
3.21	June 2012	Review	GS
3.22	April 2013	New release	GS
3.23	Nov 2013	Upgrade	GS
4.00	June 2015	New release	GS
4.00	Aug 2018	Review	GS

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## 8.1 Alarm Module

### 8.1.1 Introduction to the Alarm Module

Using the Alarms Module, alarms can be defined to alert users of events that needs to be followed up by the users. An alarm can be linked/related to a Time Series, an Airviro Station or the devices/ports used to connect to the stations.

Each alarm is associated with an alarm level, indicating the level of severity.

The alarms levels are: **Warning**, **Alert** and **Alarm**. These functions that triggers the alarms are defined for each level. If an alarm is active, notifications can be send indicating changes in the alarm level or status. The user can configure which action to take when the alarm level changes.

The history of alarms is kept in an event data base that can be viewed by the users. Search and Reports can be done for the different type of alarms defined in Airviro, selecting the name or a time period.

The different alarms notifications defined in this module, can be visualize in Real Time Alarms, using the Real Time Alarm Module.

#### 8.1.1.1 General Concepts of the Alarm Module

With the Alarm Module the user can:

- Define alarms for Time Series Data, Monitoring Stations and/or communication devices and ports.
- Configure and define three alarms levels using conditions or functions.
- Define notifications for Alarms visualizations and e-mails.
- Search the event database, by name and time period.

### 8.1.1.2 Functionality of the Alarm Module

Like other Airviro modules, the Alarm Module needs Java Runtime Environment that JAVA JRE (run time plug-in) to be installed and enabled in the web browser.

This Airviro module can be executed and Accessed using a PC or other device running Internet Explorer 6 or Netscape Navigator 7 (or higher) or other internet browsers based on Mozilla like Firefox and Opera.

Initializing the Airviro system.

To be able to Access the Airviro system, the corresponding Airviro installation URL must be known and using a web browser through the internet, Access to it. (<http://< ip direction>/iaviro/>). i.e.: <http://10.13.24.54/iaviro/>.

After entering the user name and password, a working domain must be selected and finally select the **Indico Alarm module**.

Any user that knows the Airviro URL and has the necessary privileges, can access to the Alarm menu. Privileges must be previously defined to avoid undesired or no authorized access.

### 8.1.2 The Main Window

When the Alarm Module has been selected, the user gets a menu in the left side of the module window, named Main Module Menu. The following options are available in the Main Alarm Module Menu:

**Domain:** Allows you to select the Domain to work with.

**Template:** Used to define e-mails format..

**Alarm Def (definition):** Used to define alarms in the system.

**Search:** Allows you to search inside the event database.

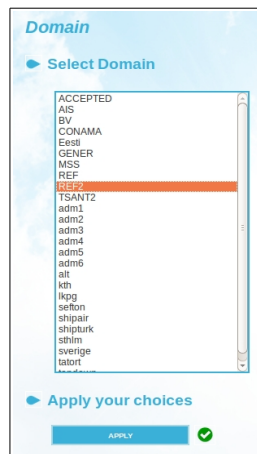


Figure 8.1. Domain

### 8.1.3 Template Definition

Clicking on **TEMPLATE** in the main module menu, a new window is displayed, allowing the user to define the content of emails, used for the different alarms level notifications.

Figure 8.2.

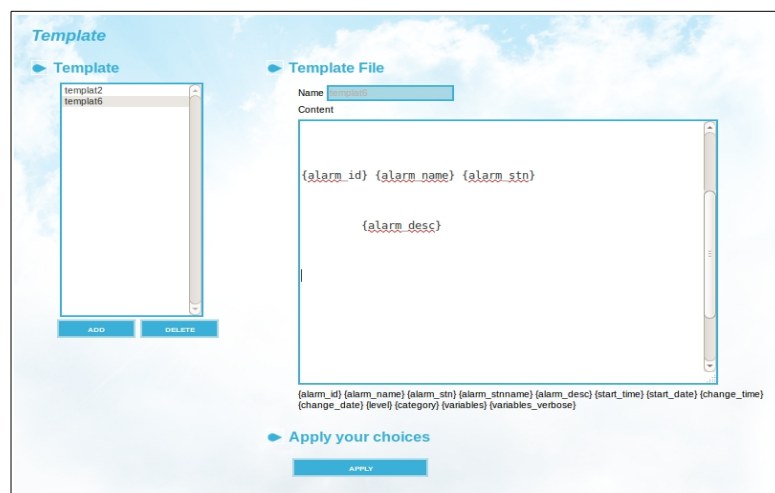


Figure 8.2. Window where templates are defined.

Clicking on **Add**, new templates can be added:

A template name must be specified. The **Content** text box, can contain any description of the alarm and pre defined variables that can be used to get information about the specific alarm into the notification.

Below the Content subwindow, a list with the variables is shown, which can be used to

have a dynamic content in the email notifications. The text between brackets must be exactly as in the list.

The content of the variables is described below. The variables that are used in the notification will be replaced with data for the specific alarm:

- Alarm\_id: is the alarm key.
- Alarm\_name: is the alarm name.
- Alarm\_stn: is the station key for the station related to the alarm.
- Alarm\_stnname: is the station name for the station related to the alarm.
- Alarm\_desc: is the alarm description, as specified in the alarm definition.
- Start\_time: is the alarm start time.
- Start\_date: is the alarm start date.
- Change time: is the time when the alarm changed the alarm level.
- Change date: is the date when the alarm changed the alarm level.
- Level: is the alarm level.
- Category: is the alarm category.
- Variables: a short description of the time series values used in the alarm definition function.
- Variables\_verbose: a more extensive description of the time series values used in the alarm definition function.

In this window Alarm **templates** are defined, that later will be selected in the Notifications, emails subwindows to be used in the notification definition. (See *Figure 8.7.*)

---

**Note:** The user can use the keyword tolls (Ctrl+Copy) and (Ctrl.+Paste) to Copy and Paste the variable options to be used in the template text field.

---

#### 8.1.4 Alarm Definition

To work with the alarm definition the menu **ALARM DEF** must be selected from the main menu. In the **Alarms Definition**, the user can add, select and/or delete alarms. *Figure 8.3*



In **Alarms Configuration** the user can configure the alarm definition.

In the text input **Description** the user can enter a detailed alarm description. For example: SO2 daily average. Major or equal to 200ug/m3. Exceeds 80% of actual environmental legislation level.

After entering the name and the alarm description, it is possible to activate the alarm (**Active**) and to enter the time interval (in seconds) meaning how often the database will be scanned for new data to trigger the alarm level. This is made in **Scan Interval** text input.

**Scan offset** (in seconds) is the delay time, in seconds, before performing a new search in the events data base and it will be done “past” the hour. For example, if Scan Interval is settle down in 3600 and Scan offset (seconds) in 0, the Alarm Module will look for alarms in each hour. However, if one settles down the values to 3600 and 300 then the search will be done every 5 minutes after the hour.

A category must be defined for the Alarm. The user can select two category types, operative and condition. *Figure 8.3*. The category can be used to classify the alarms and is be used to filter alarm reports.

When an alarm is defined, the specified ID will be preceded by an ID corresponding to the Station Key. This is automatically added by the system.

For example, if an alarm is defined over a monitoring station, the name is preceded by the station key. In example: 503SO2DIA, where 503 is the station key and SO2DIA the user defined part of the ID.

*Figure 8.3. Alarm Definition.*

### 8.1.4.1 Source: Alarm Type

Indico Alarm supports three different alarm types:

- **Time Series:** the alarm is defined using stored time series data stored in the Airviro TSDB. Data can be visualized using the Indico Presentation.
- **Station:** the alarm is defined using data from the data collection progress, from data defined in monitoring stations using the Airviro Indico Administration Module.
- **Device:** the alarm is defined on devices used for data collection. Example, /dev/ttyS0 for the device associated to a modem.

**Note:** An alarm can only be defined for one alarm type. The type of alarm to use is selected with the radio button in front of the buttons.

**Note:** The time resolution has been previously set under **Project-Time Resolution**.

### 8.1.4.2 Time Series

When selecting **Time Series**, in the **Alarm Definition** window, a Windows is displayed allowing the user to define and configure the alarm using Time Series Data. (Figure 8.4)

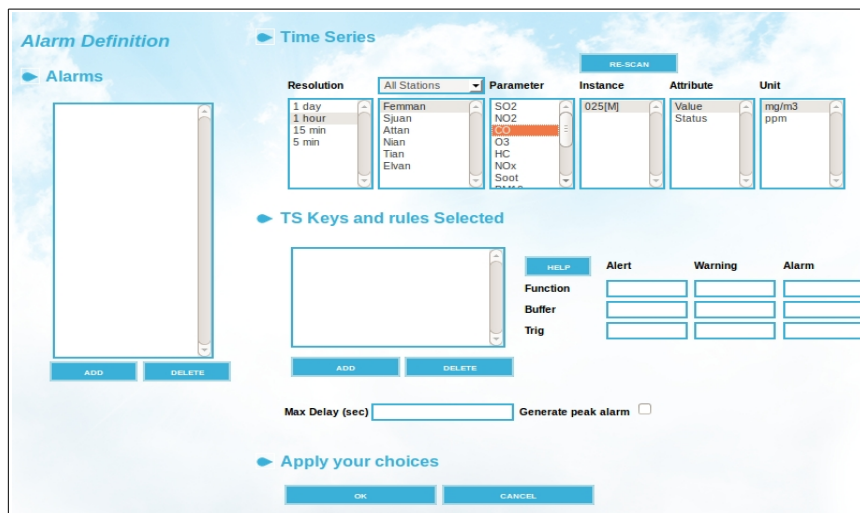


Figure 8.4. Time Series.

The **Time Series** subwindow, allows the user to select the station, resolution parameter, instance, attribute and measurement unit. (Figure 8.4)

The **Re-scan** button is used to rescan the time series.

In **TS Keys and Rules Selected** subwindow, the user defines the function, buffer and trig for each alarm level. (Figure 8.4)

**Function:** is the alarm condition for the three available levels (Alert, Warning, and Alarm). This condition is a formula. The user must enter the condition in the same way that is used in Indico Presentation. For example,  $x1 \geq 200$  indicates that the alarm activates when  $x1$  parameter values are higher or equal to 200. Click the **HELP** button to get a help for the mathematical functions available in the Airviro.

**Buffer:** Number of values that the alarm is monitoring backwards. (timesteps)

**Trig:** It is the number of values within the buffer that has to fulfil the alarm condition to trigger an alarm.

Example: If in the defined Function is  $x1 > 3$ , and the Buffer is set to 5 (that is to say 5 values are monitored backwards), if trig is set to 2 at least 2 of the values in the buffer (last 5 values) must greater then 3 to trigger an alarm.

---

**Note:** The  $x1, x2...$  time series may be time series from different stations but they must have the same time resolution.

---

Max Delay: If there is an active alarm and there are missing values for more than **Max Delay seconds**, there will be a new "System Alarm". This alarm continues until there are values again. If there is no active alarm and there are missing values for more than maxDelay seconds, there will be a "Missing Event" (a single entry with "cat: missing, evt: MIS"). This is not an alarm, just an event.

**Generate peak alarm:** If the alarm definition states that we should look for peaks and a value in a buffer is shifted out of the buffer and the value has never been part of an alarm (due to the trigger criteria), there will be a "Peak Event" (a single entry with "level: x, cat: peak, evt: PEA"). This is not an alarm, just an event.

### 8.1.4.3 Station

Selecting **STATION** in the Alarm Definition page, an interface is displayed that lets you define and configure the alarm associated to a monitoring station. *Figure 8.5.*

A station is selected the station and the limit values for the different alarm levels (Alert, Warning, and Alarm) are specified.

The limit values represent the consecutive number of times that a communication failure to the station must occur before an alarm is triggered..

Click **OK** to apply your choices.

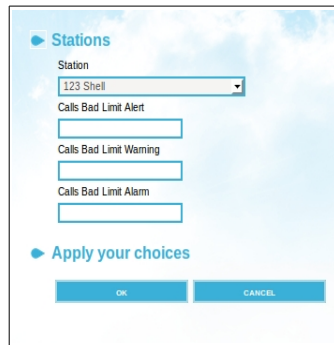


Figure 8.5 Stations

### 8.1.4.4 Device

When selecting Device, in the alarms Definition page, a new window is displayed allowing the user to define the alarms that is associated to the devices used by the data collection.

Figure 8.6

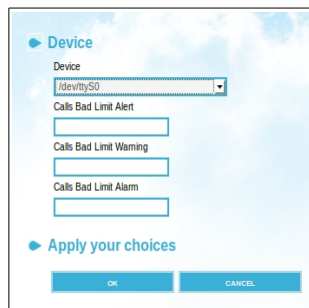


Figure 8.6. Device.

### 8.1.5 Notification, E-mails

Airviro has two kinds of notifications: a notification that is shown in the Real Time Alarm viewer and emails. *Figure 8.7.*

The notifications in the alarm viewer are set up per user. For an alarm definition the Airviro users that should be notified in Real Time Alarm should be added. It is possible to select the levels of the alarms that a user should be notified for.

Notifications can also be sent via emails, the email of the recipient needs to be specified and for which alarm levels the emails should be sent and if it goes up or down from or to a level.

For each email notification, a template must be selected. The different templates are configured under **TEMPLATE** in the main menu.

*Figure 8.7. Notifications and e-mails Window.*

### 8.1.6 How to search in the Events Database

Click on **SEARCH**, in the Alarm Module main menu, and the **Search Events** window will be displayed (*Figure 8.8*)

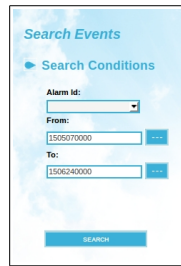


Figure 8.8. Event Search

The search can be restricted by the **Alarm Id** and or a period within the alarm was activated.

To select the dates, the user can use a calendar that is displayed when pressing on the **three dots** button. The date format is Year, Month, Day, Hour and Minutes (YYMMDDHHMM).

The user can also do a click in **SEARCH** without setting any restriction at all and the system will show a window with all the information from the events database regarding alarms.

The search results is displayed, as a list of alarm instances. When selecting one of them, a text box is shown containing the Alarm history and the different level it passed through.

In the **Comment** field, the user can add comments that will be link to the Events when pressing the **APPLY** button. *Figure 8.9*

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**Note:** A finished event instance can be reactivated.

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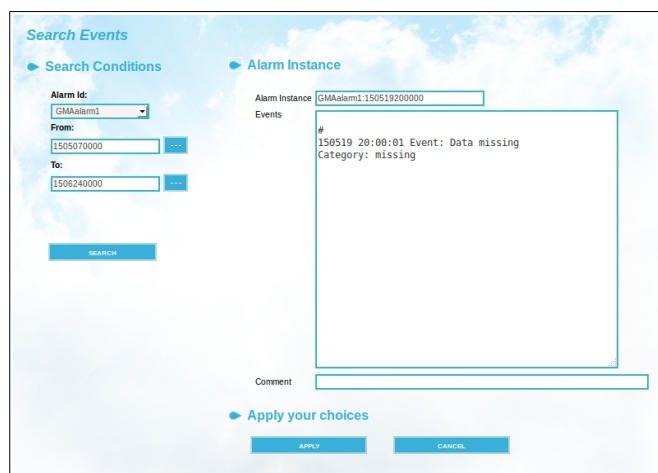


Figure 8.9. Event Search.

## 8.2 Real Time Alarm Module

### 8.2.1 Introduction to RT Alarm Module

The *RT Alarm Module* (Real Time Alarm) is an alarm viewer used to visualize active and recent terminated alarms. The different levels of alarms, Warning, Alarm and Alert, are shown with light blue, orange and red colors.

When a new alarm is triggered an alarm beep sounds, and the new alarm is shown in the active alarm list. If the alarm is clicked details of the alarm it is shown in Alarm Detail section above the active alarm. Now the alarm can be recognised and the alarm beep will be turned off. When recognising an alarm a comment can be entered. The “!” symbol in the active alarm list changes to green and a “V” is replacing the “!”.

Below the active alarm list is the terminated alarm list. Here the latest alarms is shown.

### 8.2.2 Functionality of the RT Alarms Module

The RT Alarm Module is an application based on HTML and Java script. This module Airviro can be run from a PC or other device running Internet Explorer 6 or Netscape Navigator 7 (or higher) or other Mozilla based browsers like Firefox and Opera.

The RT Alarm Module only requires Java Runtime Environment running on the PC. Anyone who knows the corresponding URL, can access the RT Alarm Airviro module. You need to configure privilege levels for users, in order to give access to this module.

### 8.2.3 Initializing the RT Alarm module

Once the user has entered the Airviro URL (*http://ip\_adress/iairviro/*) using a web browser either on the Intranet/Internet, you must enter the user name and password. After that a new web interface is displayed showing the menus to access all Airviro modules, including RT Alarm, among others.

After selecting a working domain, you can select the RT Alarm module from the main Airviro menu.

When RT Alarm Module has been selected, the user gets a new menu on the left side of

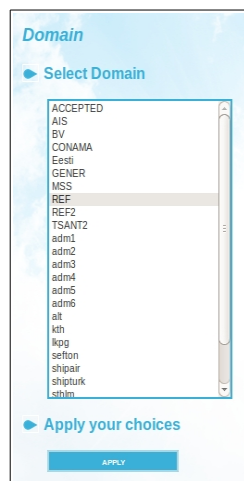
the screen called Module Main Menu.

This menu contains two sub menus:

- *Domain*: Select the domain to which work.
- *Viewer*: Displays alarms.

## 8.2.4 Domain

By clicking on the **DOMAIN** a new sub window is displayed, which allows selecting the domain that contains the alarms that will be monitored. *Figure 8.10*.



*Figure 8.10 Project Window*

## 8.2.5 Viewer

By clicking on Viewer, the window shown in the *Figure 8.11* appears.

If active alarms not yet recognized by the user exist, the system will emit an alarm beep.

The beep can be permanently turned off deselecting the **Sound** option under the **Filter**.

To show details of an active alarm, select it in the list and the details of the alarm will be shown above the list. Here it is possible to recognize the alarm selecting **Acknowledged**.



The screenshot displays the 'Alarm Viewer' interface. It is divided into three main sections: 'Active alarms', 'Finalized alarms', and 'Alarm Detail'.

**Active alarms:** A table with columns: Alarm Id, Description, Station, Category, Level, Start, Passed time. One alarm is listed: LE1tempch1 (green checkmark), Temperatura absoluta (orange), system, alarm, 11/12/11 02:20 31000hr:46min.

**Finalized alarms:** A section with a 'Previous Days' dropdown set to '1'. It has columns: Alarm Id, Description, Station, Category, Level, Start, End. No alarms are currently listed.

**Alarm Detail:** A form showing details for the selected alarm. Fields include: alarm: LE1tempch1:111211022000, Station: (empty), Level: alarm, Start: 11/12/11 02:20. Summary: Actives: 1, Not Acknowledge: 0. Actual values: Lerum, Abs Temp, 008[M], Value, deg. C--. Acknowledge by: =>Acknowledge by you (with a green checkmark icon). A large text area for comments is present, along with a 'COMMENT' button.

**Filter:** A sidebar on the right with dropdowns for Category and Level, and checkboxes for Acknowledged (unchecked) and Sound (checked).

Figure 8.11. Viewer option

In the **Finalized Alarms** section, the Finished Alarm list shows the latest alarms that are terminated.

The green symbol indicates that this alarm has been recognized by the user.

The orange symbol indicates that the alarms have not been recognized by the user.

The user can select from 1-10 days before the actual date.

In the **Alarm Detail** section, a summary and alarm level is shown. The information shown is: alarm, station, level, start, description, actual values and comment.