

## Overview

Innovaqua designed the integral system **Miranda** with the aim of giving producers a reliable and robust tool which allows real-time monitoring, control and supervision of all the key parameters of an installation. These issues could be done both locally and remotely.

**Miranda** is an exclusive automation control system and can manage the unique self-feeding system developed by Innovaqua.

**Miranda** is an open and adaptable system to any size of fish farms. Thanks to the long experience in aquaculture of the Innovaqua team involved in its development is fitted to every single factory to achieve an optimum performance at the lower possible invest.

**Miranda** is developed in two layers. The first one, **Miranda SDA** (Supervisory Data Acquisition), is a web server based on Linux (Debian distribution), designed to an extreme stability and reliability:

- MySQL database engine.
- Specifically designed communication module.
- Apache web server with php technology, accessible from any standard web browser and simultaneously by multiple devices with a control Access based on users and passwords. It is recommended that to ensure the compatibility of all the components the freely distributed Google Chrome or Mozilla Firefox are used.

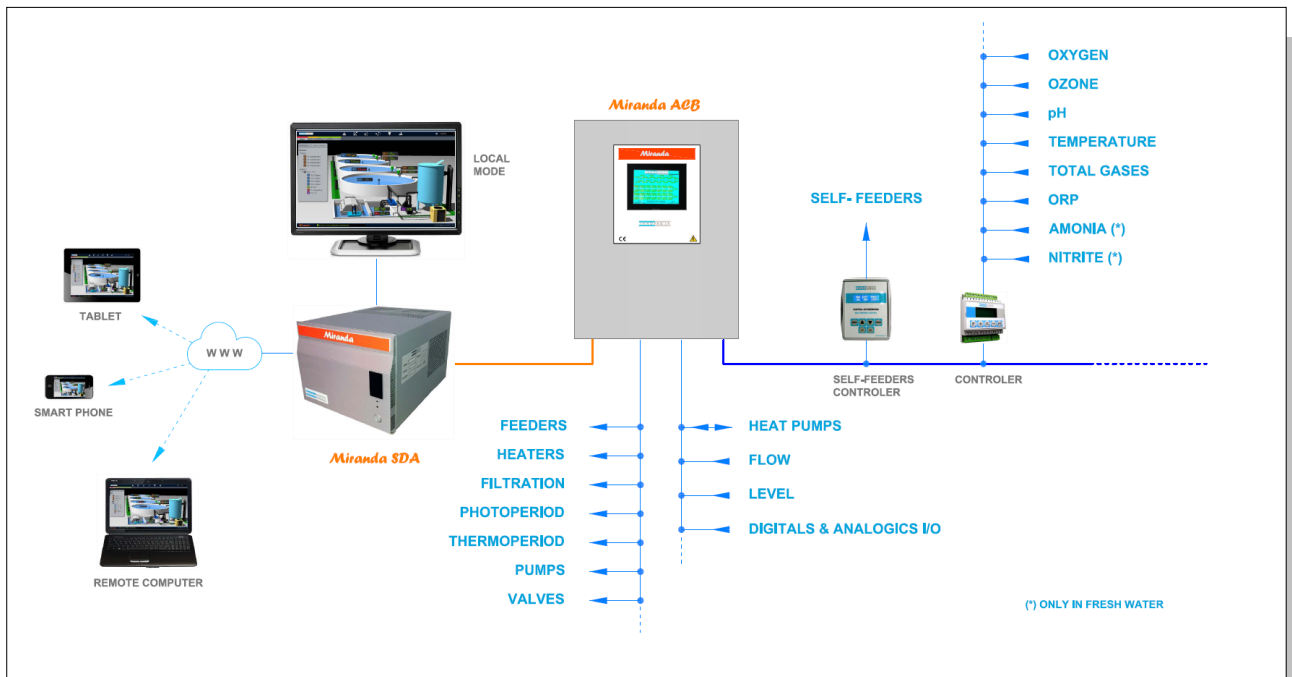
**Miranda SDA** is installed on a reliable system connected to field controllers using copper cable, fiber glass or radio-links (communication network) and records all the field data into the dedicated database, allowing the execution of orders and programming a variety of control systems. It includes the following issues:

- Real time parameter representation.
- Real time device status representation.
- Colour coded representation for a easy and immediate interpretation.
- Historic data management into a graphic interface.
- Csv standard files export of historic data. Csv files are compatible with most of data management applications.
- Alarms can be delivered by the system via SMS and/or e-mail.
- Field device management either in local mode (LAN) or remotely (over Internet)
- Automatic back-up to a detachable SD card and to the system hard disc drive.
- Key-code based system that allows an immediate change of the configuration of the system to a brand new one, maintaining all the previous configuration.

The second layer is **Miranda ACB** (Automation Control Box) that includes an industrial PLC with touch screen. Using the appropriate probes, the PLC can read the parameters to be controlled (pH, dissolved oxygen, temperature, etc.) and perform the desired actuation over the proper devices (pumps, valves, etc.). This control will allow

the maintenance of the parameters within the desired thresholds. **Miranda AEB** is an autonomous system that can operate independently of the **Miranda SDA**. This architecture raises the reliability of the system minimizing risks.

Nowadays, **Miranda AEB** could be connected to any standard 4-20 mA, 0-20 mA y 0-10 Volts device, or use communications protocols with any external device.



### General Architecture of **Miranda**

## 1.- Description of the system

### 1.1.- System requirements

**Miranda** is delivered configured and ready to use. It is very convenient that the power supply is stabilized using an UPS (Uninterruptable Power Supply) with battery that allows **Miranda** continues switched on if a momentary power supply occurs. In addition to this, no data will be lost.

**Miranda** can be accessed though the Ethernet network, either locally from the LAN or from Internet if the router has been configured to allow the access using the port number 80. The recommended Internet browser is Google Chrome which can be freely downloaded from Google and the free plug-in Adobe Flash Player has to be installed also. The plug-in can be downloaded, freely also, from [www.adobe.com](http://www.adobe.com).

## 1.2.- Installation and system recovery

**Miranda** is already configured and need no further software adjustments.

It is very important that a standard SD card is introduced in the front side of the system with, at least, 16 Gb. free space, This SD card is used by the system to periodically save backups copies of the database that will be necessary if the system has to be recovered after a general failure. The procedure will be explained later.

For **Miranda** to be accessed from the Internet, out of the LAN of the facilities, the router or proxy should be configured to allow this access. For clients to access **Miranda**, the port number 80 should be redirected to the system. For remote maintenance, ports 40 and 9000 should be redirected to the system as well.

In case of failure of **Miranda**, there is a procedure to recover the system (configuration and data) from a brand new **Miranda**. Into the key-code (the supplied pen drive) all the configuration and license is stored. If it is necessary to recover the system to a new **Miranda**, just plug the key-code in the brand new system with a screen, mouse and keyboard. Just follow the wizard that will start in less than a minute. WARNING: all the configuration and data existing in the system will be lost. Once the system has been restablished, and after reboot the system, you can recover your data simply introducing the SD card with the backups using the backup icon.

The recovery system from an installation to a brand new **Miranda SDA** is extremely simple. It needs a local screen, keyboard and mouse directly connected to the system. Simply follow the instructions on the screen to recover the system.

## 1.3.- Main screens

### 1.3.1.- Access screen:



This screen allows the user to introduce the user and password to begin using the system.

## 1.3.2.- Main screen;

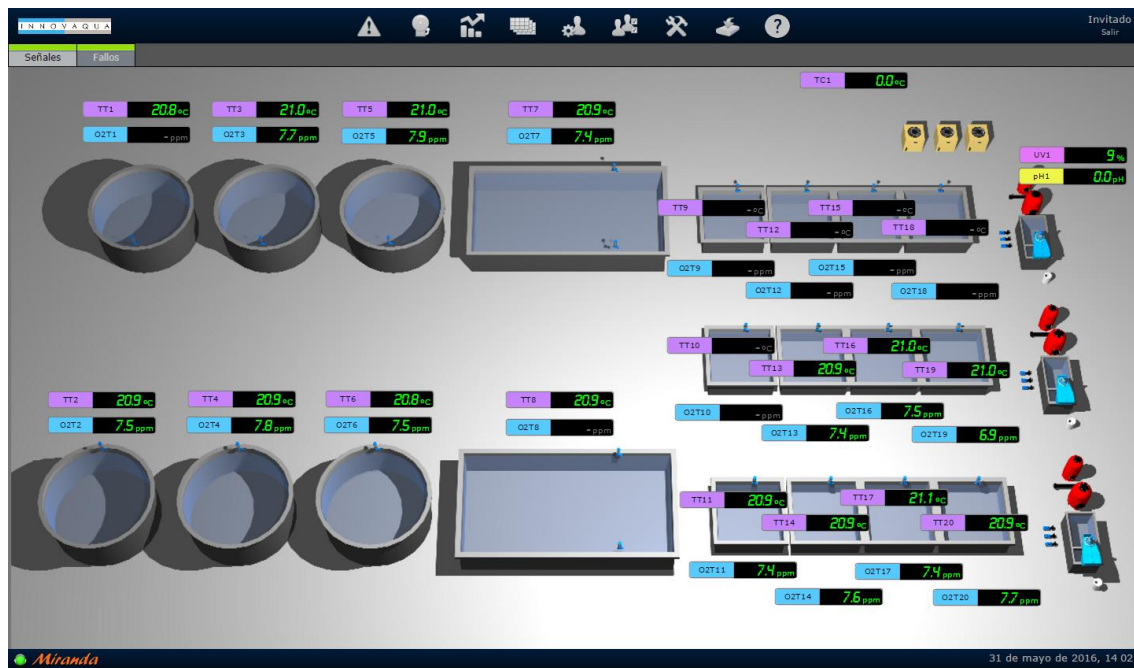


Figure 1 – Main screen.

It is divided in four areas:

## 1.- Icons bar:



With the following parts:

- Shortcut to Innovaqua data.



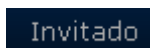
By clicking this icon, you can access the Innovaqua website (if accessing remotely) or the contact data (if accessing locally).

- Function icons:



Depending on the privileges of the actual user, there could be more or less icons. It allows access to the main system functions.

- Actual user name.



- Exit button to the access screen.

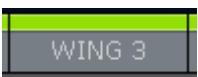


Logout

## 2.- Installations bar:

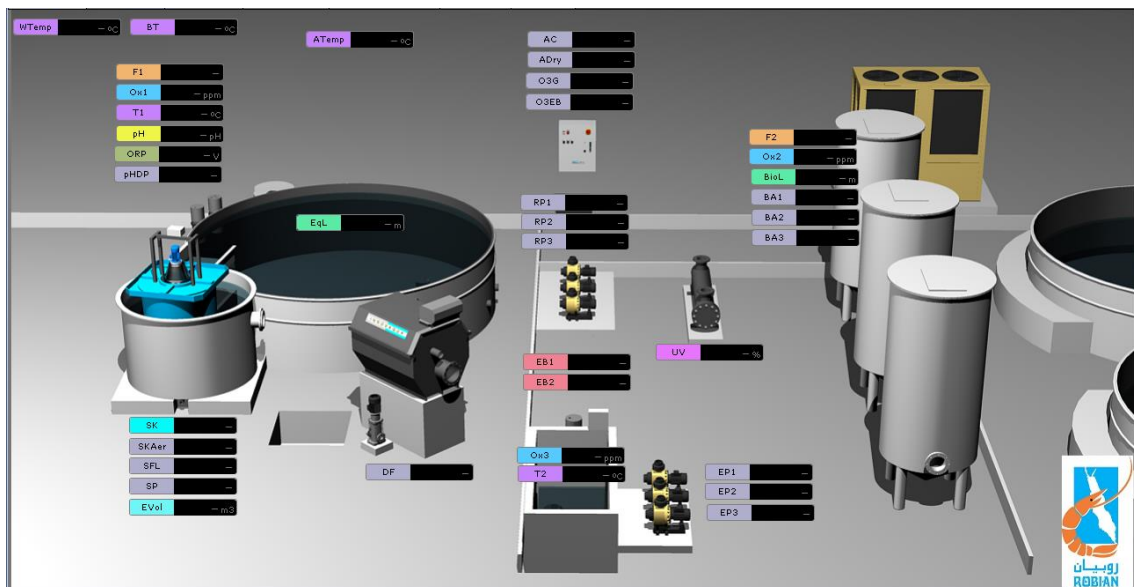


There are different tabs that allow access to different part of the facility. By clicking at each tab, user can access different parts. The upper part of the tab shows the state using a color coded system:

Depending on the color of the upper part of the tab it shows:

-  If it is in green, no alarm is active for this part.
-  If blinking in yellow and red, there is an active alarm in this moment.
-  If in red, there is an alarm but it has already been acknowledged.

## 3.- Synoptic:



It shows a sketch of the facility with the different displays of the parameters that are being monitored.

Displays has two fields:



At the left side, there is shown the short name of the parameter. At the right side, the parameter and the unit are represented; The color of the parameter depends on the existence or not of alarms.

4.- Bottom bar:

It has two parts:

- A system status indicator:



If the lamp is in green, the system is running with no problems.

If it is in yellow, the system is in demo mode and will stop within 30 days from the date it started. By positioning the mouse over the lamp, the date of expires will be shown. This happens if a valid key-code is not detected.

If the lamp is in red, the system is stopped. No data are being logged and the system is in navigation mode. In this mode, the user can browse recorded data, but no new data is being added to the database, and there is no real time information.

- Hour and date. Indicates the local date and hour of the system. If the system has access to the Internet it will connect to a time server using NTP protocol to assure that the hour and date are updated. It is very convenient that the network administrator allows *Miranda* to access NTP services using UDP port 123.

18 March 2014, 18:04

## 1.6.- General icons bar

The icons bar is used to access to the main control options.



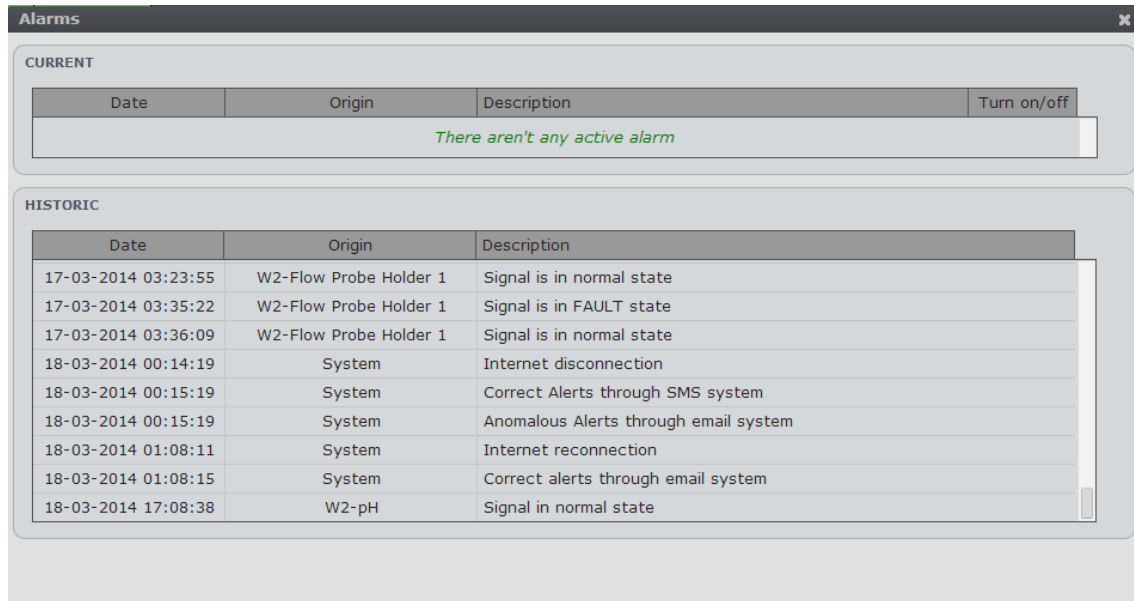
### 1.6.1.- Alarms

To access the alarm list, the following icon should be clicked. Using this icon the general list of alarms is accessed. To access only to the alarms related to one display, just right click on the display and select Alarms.



If the icon is in grey, there are no active alarms. If it blinks in yellow and red, there is an active alarm. If it is in red, there is an acknowledged active alarm.

The following screen allows alarm management:



On the upper side of the window, there is a list of the active alarms with further information regarding the origin, description and the hour and date when it was generated. With the bottoms at the right, the active alarms could be acknowledged or dis-acknowledged:



: is used to acknowledge an active alarm. This way, the alarms icon on the main screen stays in red and the upper side of the tab installation stays in red without blinking.



: is used to turn on an active alarm that has already been acknowledged.

### 1.6.2.- General alarms

Clicking the following icon the general alarm configuration window is accessed:



The configuration window is the following:

**General alerts configuration** ✕

Configuration

**INTERNET DISCONNECTION**

States	Alarm groups
Internet reconnection	<input checked="" type="checkbox"/> Non Critical <input checked="" type="checkbox"/> Critical
Internet disconnection	<input checked="" type="checkbox"/> Non Critical <input checked="" type="checkbox"/> Critical

**PROBLEMS WITH THE ALERTS THROUGH EMAIL SYSTEM**

States	Alarm groups
Correct alerts through email system	<input checked="" type="checkbox"/> Non Critical <input checked="" type="checkbox"/> Critical
Anomalous Alerts through email system	<input checked="" type="checkbox"/> Non Critical <input checked="" type="checkbox"/> Critical

**PROBLEMS WITH THE ALERTS THROUGH SMS SYSTEM**

States	Alarm groups
Correct Alerts through SMS system	<input checked="" type="checkbox"/> Non Critical <input checked="" type="checkbox"/> Critical
Anomalous Alerts through SMS system	<input checked="" type="checkbox"/> Non Critical <input checked="" type="checkbox"/> Critical

**A NETWORK DISCONNECTION**

States	Alarm groups
Network reconnected	<input checked="" type="checkbox"/> Non Critical <input checked="" type="checkbox"/> Critical
Network disconnected	<input checked="" type="checkbox"/> Non Critical <input checked="" type="checkbox"/> Critical

**SAVE**



In this window all the general alarms of the system are set, as well as the alarm groups as explained later.

There are several kinds of general alarms:

INTERNET DISCONNECTION	
States	Alarm groups
Internet reconnection	<input checked="" type="checkbox"/> Non Critical
	<input checked="" type="checkbox"/> Critical
Internet disconnection	<input checked="" type="checkbox"/> Non Critical
	<input checked="" type="checkbox"/> Critical

This alarm warns that the system is not able to connect to the Internet. As a consequence, **Miranda** will not be reachable from the outside (WAN). Furthermore, the system could not send e-mail with warnings. This alarm will only be delivered by SMS.

PROBLEMS WITH THE ALERTS THROUGH EMAIL SYSTEM	
States	Alarm groups
Correct alerts through email system	<input checked="" type="checkbox"/> Non Critical
	<input checked="" type="checkbox"/> Critical
Anomalous Alerts through email system	<input checked="" type="checkbox"/> Non Critical
	<input checked="" type="checkbox"/> Critical

This alarm warns that **Miranda** is already connected to the Internet but can not send e-mail. It will be delivered by SMS.

PROBLEMS WITH THE ALERTS THROUGH SMS SYSTEM	
States	Alarm groups
Correct Alerts through SMS system	<input checked="" type="checkbox"/> Non Critical
	<input checked="" type="checkbox"/> Critical
Anomalous Alerts through SMS system	<input checked="" type="checkbox"/> Non Critical
	<input checked="" type="checkbox"/> Critical

This alarm warns that **Miranda** can not send SMS properly. It will be delivered only by e-mail.

**A NETWORK DISCONNECTION**

States	Alarm groups
Network reconnected	<input checked="" type="checkbox"/> Non Critical <input checked="" type="checkbox"/> Critical
Network disconnected	<input checked="" type="checkbox"/> Non Critical <input checked="" type="checkbox"/> Critical

This alarm warns that **Miranda** has lost the connection to a device network. As a consequence, no data will be collected from all the devices connected to that network.

**A CONTROLLER DISCONNECTION**

States	Alarm groups
Controller reconnected	<input checked="" type="checkbox"/> Non Critical <input checked="" type="checkbox"/> Critical
Controller disconnected	<input checked="" type="checkbox"/> Non Critical <input checked="" type="checkbox"/> Critical

Despite the previous alarm, this one warns that the connection with one controller has been lost, but the network is still working.

**LICENCE STATE**

States	Alarm groups
System with activated licence	<input type="checkbox"/> Non Critical <input type="checkbox"/> Critical
System in trial mode	<input type="checkbox"/> Non Critical <input type="checkbox"/> Critical
System working with another Key	<input type="checkbox"/> Non Critical <input type="checkbox"/> Critical
System in navigation mode	<input type="checkbox"/> Non Critical <input type="checkbox"/> Critical

These are alarms related to the license:

If the system is in test mode, **Miranda** has not a valid keycode and it will remain in test mode for 30 days. The status indicator at the left bottom part of the screen is in yellow.

If the system is running with another keycode, it means that **Miranda** has found a valid keycode, but it belongs to another system. The configuration of the keycode could be loaded to **Miranda**, for instance when recovering a damaged unit. All the data into the system will be lost.

In navigation mode, the test period of **Miranda** has expired and the system has stopped. No data is being logged and **Miranda** is only valid to explore recorded data, no new data will be read or stored. The status indicator at the bottom left part of the main screen is in red.

### 1.6.3.- Graphs

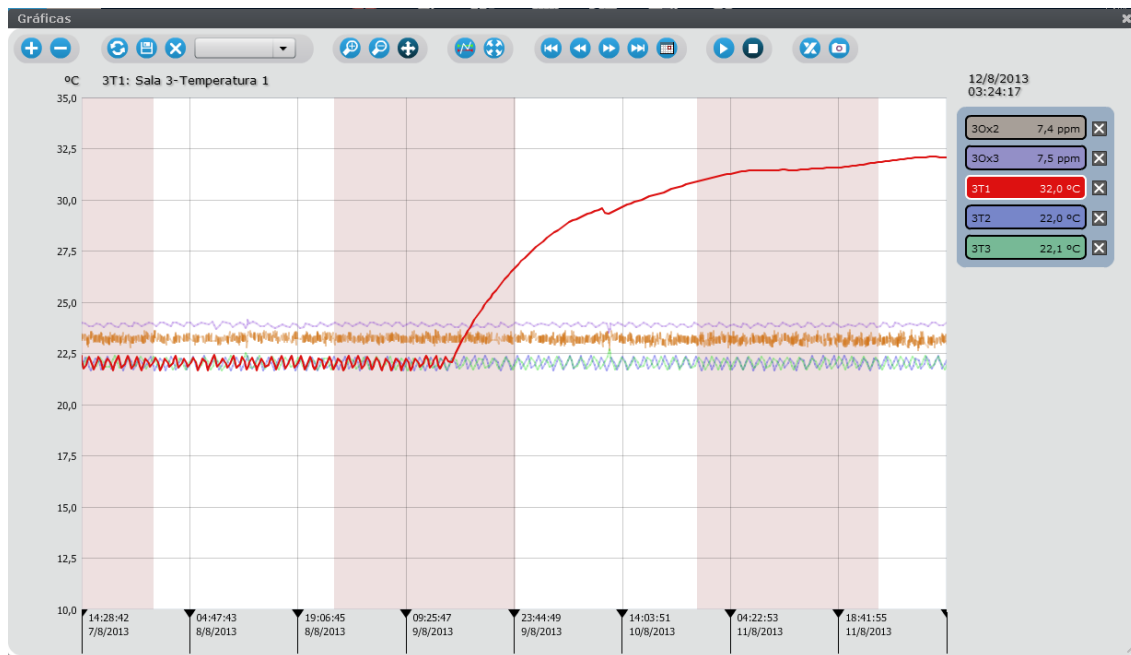
The following icon should be clicked to generate a generic graph. User can generate a graph of a particular variable in the contextual menu of the display.



**NOTE:** **Miranda** uses Flash technology for managing graphs. The browser used for accessing **Miranda** should necessarily have permission for using Flash technology complement.

Allow Flash complement in Google Chrome:

- 1.- Open *Settings* in the 3-dot icon on the upper right part of the screen.
- 2.- Open *Advanced* at the bottom of the page.
- 3.- Open *Content Settings*.
- 4.- Open *Flash*.
- 5.- Set the first slider in *Ask First* (recommended) Make sure that it is not set in *Block sites* from running Flash.
- 6.- Press *ADD* under *Allow* to write the URL (or IP) of the **Miranda** site.
- 7.- Restart the browser.



Icons for managing the graphs:



: It allows the user to add or remove variables to the displayed graph by selecting them on the new window that will be opened.



: This control allows to save graphs and load previously saves ones.

- To save the current graph (with the displayed variables and interval that is being represented) first the user should write a name to identify the graph and later, click on the icon to save:
- To load a previously saved graph, the user should first select the graph on the pop-up menú and then click on the icon to load:
- To delete a saved graph, the user should select the graph to delete from the pop-up menú, and later click the icon to delete:



: It allows to zoom in or out the selected graph. If the button is selected (in dark blue) the user can move freely the graph on the x axis and make zoom with the central wheel of the mouse.

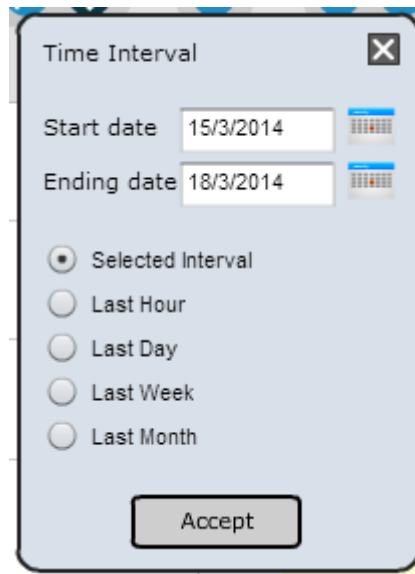


Clicking , the automatic scale is selected and the y axis will be automatically scaled according to the represented variables.



: It allows to navigate through the x axis (time):

- Clicking on or the user can navigate to the first or the last data recorded on the database.
- Clicking on or The user can move, back or forward, a complete page, with the same zoom status previously selected.
- Clicking on The user can select the interval to be represented on the following window:


A dialog box titled "Time Interval" with a close button (X) in the top right corner. It contains two date selection fields: "Start date" with the value "15/3/2014" and "Ending date" with the value "18/3/2014". Below these fields are five radio button options: "Selected Interval" (which is selected), "Last Hour", "Last Day", "Last Week", and "Last Month". At the bottom of the dialog is an "Accept" button.


On it, the user can select the interval by date or the desired last interval in hours, days, weeks, or months.

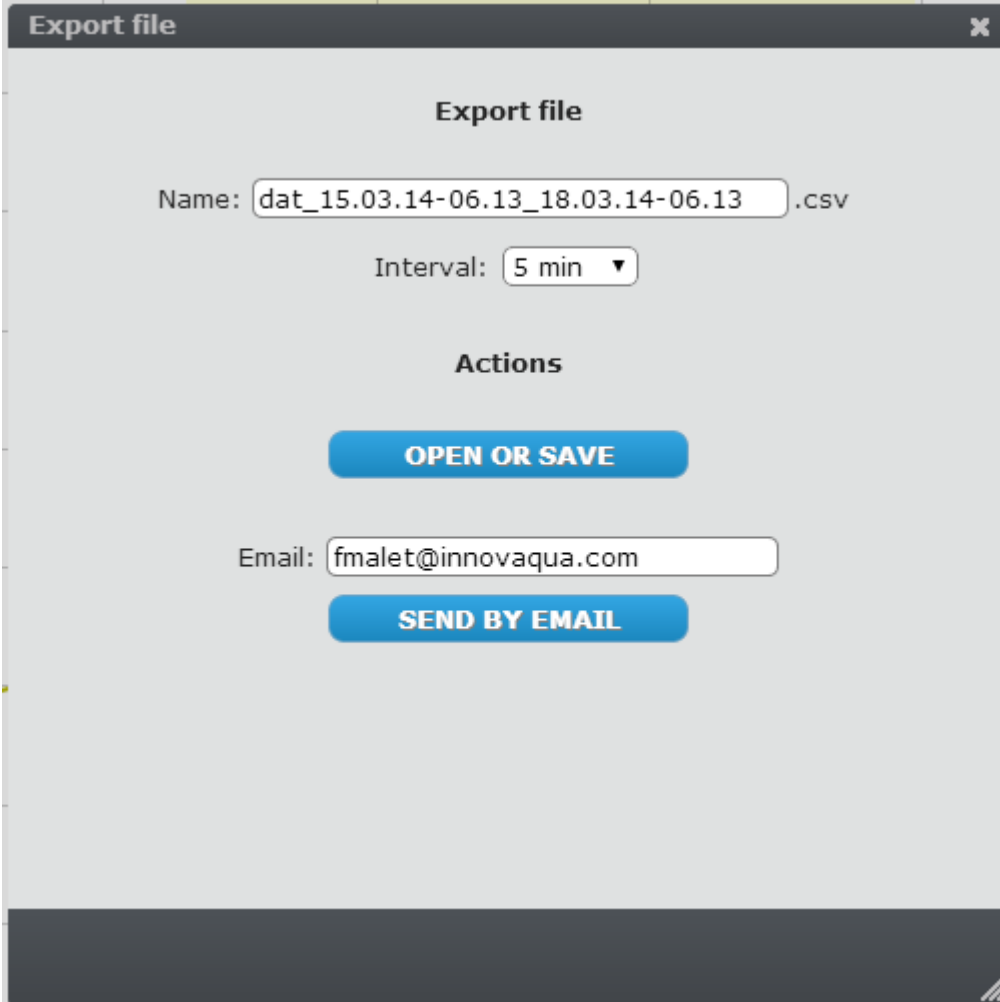


Clicking on the user can activate or deactivate the real-time graph.



By clicking on  The user can manage the data exportation in two possible ways. The exported data will be exactly those that appears on the graph window at this moment.


-  Data are exported in standard format csv. By clicking on it, the user can Access to the following window:

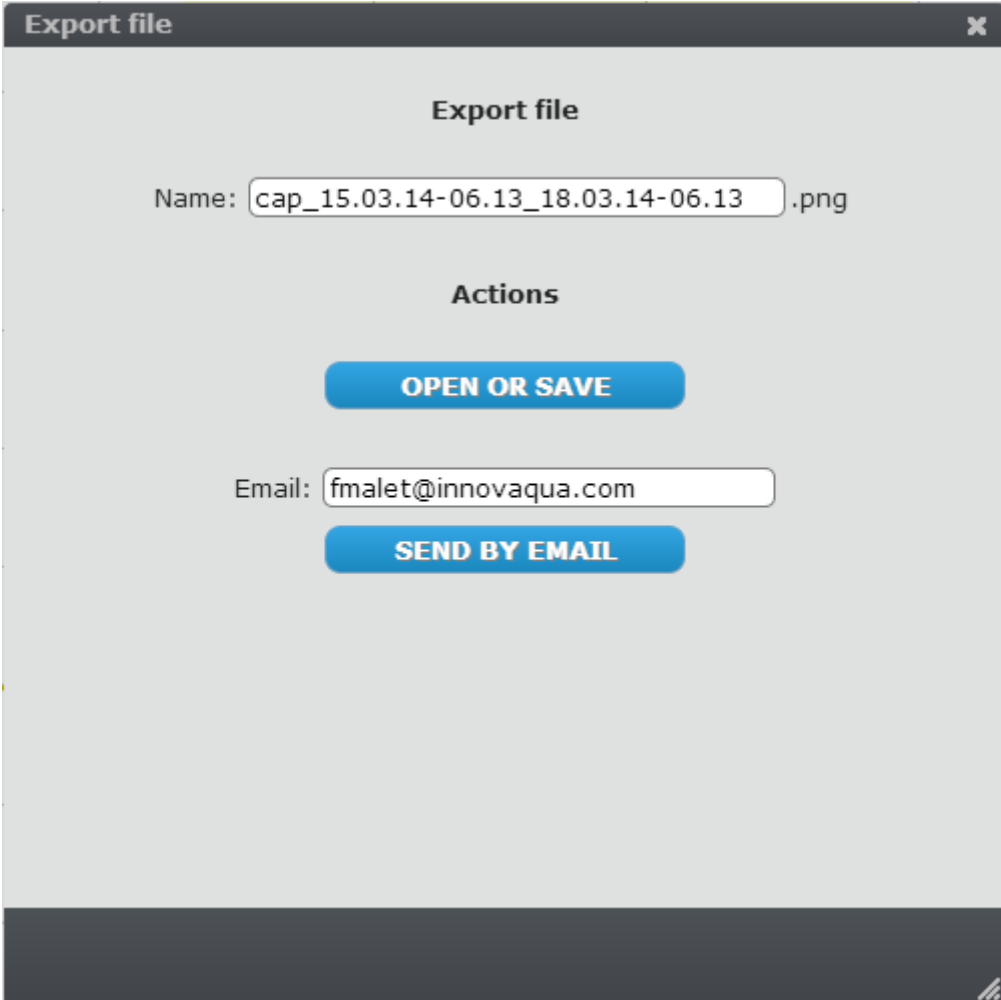


In this window, the user can change the file name. The interval is the time lapse between two data. The user can select 1, 5, 10 or 30 minutes or 1, 2, 6, 12 or 24 hours.

To obtain the data, there are two options:

- Open or save: to open the file directly on the browser or save it to the local hard disk drive. The action depends on the configuration of the browser.
- Send by e-mail: The system sends an e-mail with the csv file attached. Only one recipient can be specified at once.

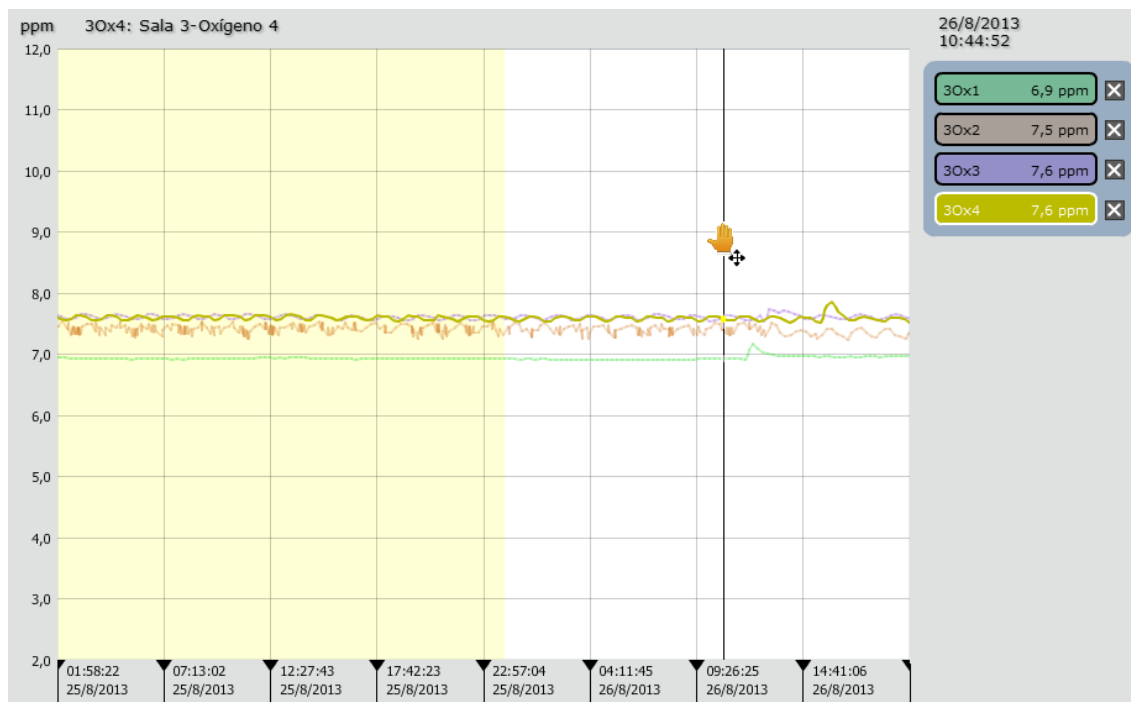
-  it allows to export the graph as an image file in png format. Clicking on it opens the following window:



The name of the file could be modified. To get the image file, there are two options:

- Open or save, that allows to open directly the image on the browser or save it on the local hard disc drive.
- Send by email, that makes the system to send the image file as attached file of the email to the specified recipient.

On the right side of the screen the represented variables are displayed as a list, with the color that the system assigns to each variable. By clicking on the cross of the variable, it will be deleted from the graph.



The value that is displayed on the list depends on the place that the cursor is placed and belongs to the moment displayed on the right top corner.

By selecting a variable on the list, the graph is highlighted.

#### 1.6.4.- Feeding tables



To access the feeding tables, the user should click on the following icon:

The detailed explanation of each table is on the chapter dedicated to the feeding systems.

#### 1.6.5.- User Management



To access the user management, click on the following icon:



The following window will be displayed:

The screenshot shows a window titled "User Management" with a "Configuration" tab. Below the tab is a table titled "USERS TABLE". The table has columns for User, Password, Password repeat, Name, Privileges, Demo, Phone, Email, S T Alerts, and E T Alerts. The data is as follows:

User	Password	Password repeat	Name	Privileges	Demo	Phone	Email	S T Alerts	E T Alerts
config	*****	*****	App. Manager	User Management	<input type="checkbox"/>			00:00	00:00
admin	*****	*****	Administrador	Administration	<input type="checkbox"/>		fmalet@innovaqua.com	00:00	23:59
Demo	*****	*****	Invitado	User Management	<input checked="" type="checkbox"/>			00:00	00:00
juan	*****	*****	Juan Antonio	Alarm Config	<input type="checkbox"/>			00:00	00:00
JM	*****	*****	JM	Administration	<input type="checkbox"/>		jhigueras@innovaqua.c	11:00	21:00
Paul	*****	*****	Paul	User Management	<input type="checkbox"/>			00:00	00:00

At the bottom right of the window is a "SAVE" button.

On it, the user can make the complete user management.

Changes that are made on this window will not be saved until the button

**GUARDAR**

is clicked. To discard the changes, close the window on the right top part by clicking on:

On the right side of the window there are the controls to add or remove users:



Clicking on the user of this row will be deleted.

Clicking on a new row is added for a new user.

Each user has several fields:

- **User:** is the user name that should be used on the welcome screen to access the system.
- **Password:** a password should be assigned to the new user. The user could change the password later.
- **Password repeat:** it is just a security mechanism to assure that the password is correctly typed.
- **Name:** is the full name of the user. It will be displayed on the right top part of the screen once the user logs in.

- **Privileges:** is the level of privilege assigned to the user. There are 5 levels of privilege:
  - **User management:** is the highest level of privilege. This user can do everything with the system, including creating and deleting new users or change the privilege of other users.
  - **Alarm config.:** Can access to all the functions of Miranda except managing users.
  - **Device config.:** Has the same functionality of the previous level, except that cannot configure alarms, alarms groups or system alarms.
  - **Alarms and graphs:** it is a quite restricted level that can only access to alarms and graphs, both individually for one variable or through the general icon.
  - **Basic:** is the most restricted level of privilege. It can only visualize the actual state of the system, without access to the recorded data.
- **Demo:** clicking on demo, the user will not be able to save the changes that are made on the system. It is intended to create users that can "see" but not change anything.
- **Phone:** this is the phone number that the system will use to send alarm messages (SMS) to the user.
- **Email:** is the email address that the system will use to send alarm messages by email.
- **S. T. Alerts:** is the start time for sending alerts. Intended to restrict the hours when the system sends messages to a user or not.
- **E. F. Alerts:** is the end time for sending alerts. If the user wants to receive alerts everytime, it should be selected 0:00 as start time and 23:59 as end time.

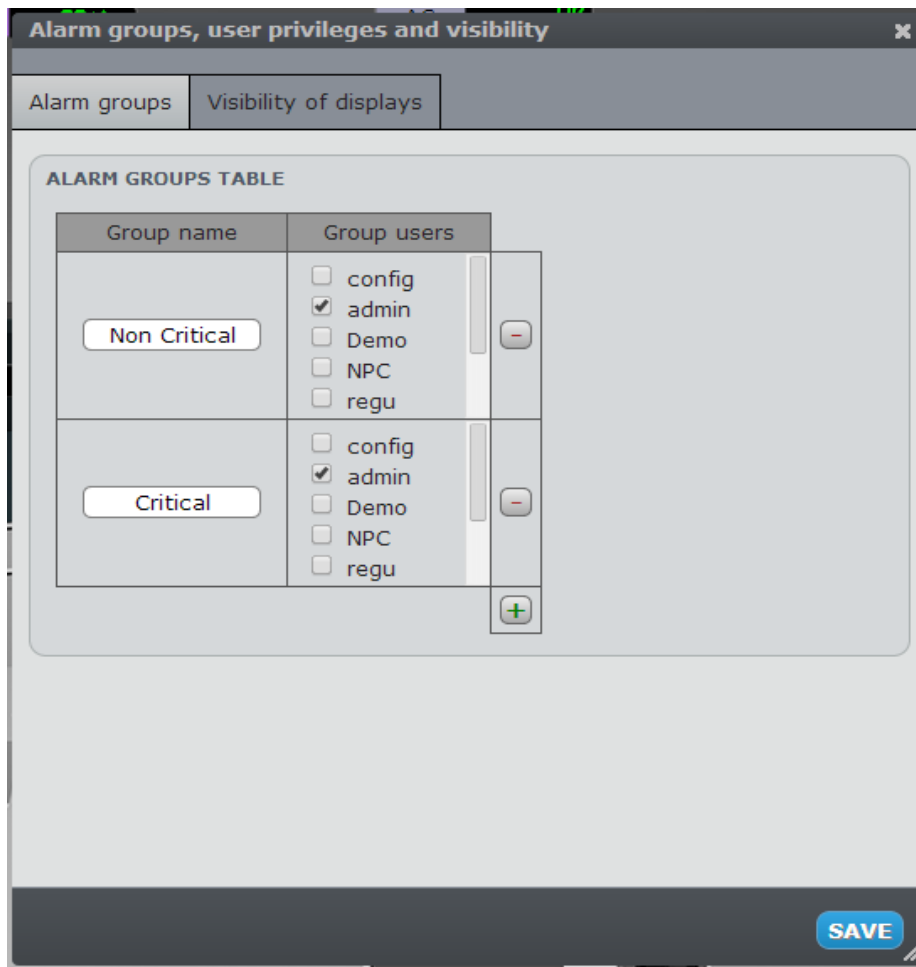
#### 1.6.6.- Alert groups, privileges and visibility.

The configuration for alarms groups, privileges and visibility is managed by



clicking the icon:

On the following screen it could be configured:



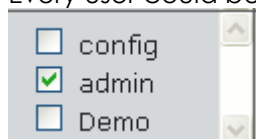
It has two tabs:

- **Alarm groups:** in this tab the user can create or delete alarm groups that can be freely configured and assign users to groups. On the right part of the screen, new groups can be created or existing groups can be deleted.



With the red button (-) the group is deleted and with the green button (+) a new group is created. User should assign a name to the new group when created.

Every user could be assigned to every group by just clicking on it.



- **Visibility of the displays:** the following screen shows the tab:

	<input checked="" type="checkbox"/> config	admin	<input checked="" type="checkbox"/> Demo	<input checked="" type="checkbox"/> NPC	<input checked="" type="checkbox"/> regu	<input checked="" type="checkbox"/> juan	JM	<input checked="" type="checkbox"/> Paul
<input checked="" type="checkbox"/> W1-Water Temperature	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> W1-Air Temperature	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> W1-Equalization Level	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> W1-Biological Level	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> W1-UV Irradiation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> W1-Oxygen from RAS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> W1-Oxygen to Biological Filter	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

In this table the users are shown by columns and all the displays by rows. In this table the user manager can decide whether each user can see or not each display corresponding to each variable. If a display is not selected for a user, when this user logs in, the display will not be visible and, as a consequence, no information could be retrieved, neither in real time or historic.

By selecting the user, this user will access to all the displays of the system

☒ config

In the same way, if a display is selected, all the users will see it

☒ W1-Water Temperature

By default, all the displays are visible for all users.

### 1.6.7.- General Configuration.

The network configuration parameters, email accounts and SMSs sending, can

be managed clicking the icon:



The following screen is reached:

**General Configuration**

Network Connections | Emails and SMSs

**LOCAL NETWORK**

☐ DHCP enabled

IP Address: 192.168.0.5

Subnet mask: 255.255.255.0

Gateway: 192.168.0.1

**DOMAIN SERVERS**

DNS Server 1: 8.8.8.8

DNS Server 2: 8.8.4.4

**INTERNET**

☒ Internet enabled

Availability: Yes

External IP: 217.136.40.175

SAVE

It has two taps:

**Network Connections:** under it, network parameters can be configured, such as DHCP server, IP address, Subnet Mask, Gateway or DNS servers. User can also check if the system is connected to Internet and the public IP address for remote access. If the system is not connected to Internet the user can disable it so it will no longer try to connect.

**Emails and SMSs:** the user can configure whether the system should try to send email or SMS alarms. Email accounts can be configured according to the user parameters. These accounts will be used by **Miranda** when sending alarm email or exporting data:

**General Configuration**

Network Connections | Emails and SMSs

**MEDIUMS ENABLING**

- ☒ Send emails
- ☒ Send SMSs

**EMAIL DATA EXPORT**

SMTP Server:

SMTP User:

SMTP Passwords:

Email Sender:

☐ SSL Authentication

**EMAIL ALERTS**

SMTP Server:

SMTP User:

SMTP Passwords:

Email Sender:

☐ SSL Authentication

**SAVE**

#### 1.6.7.- Backup restoring

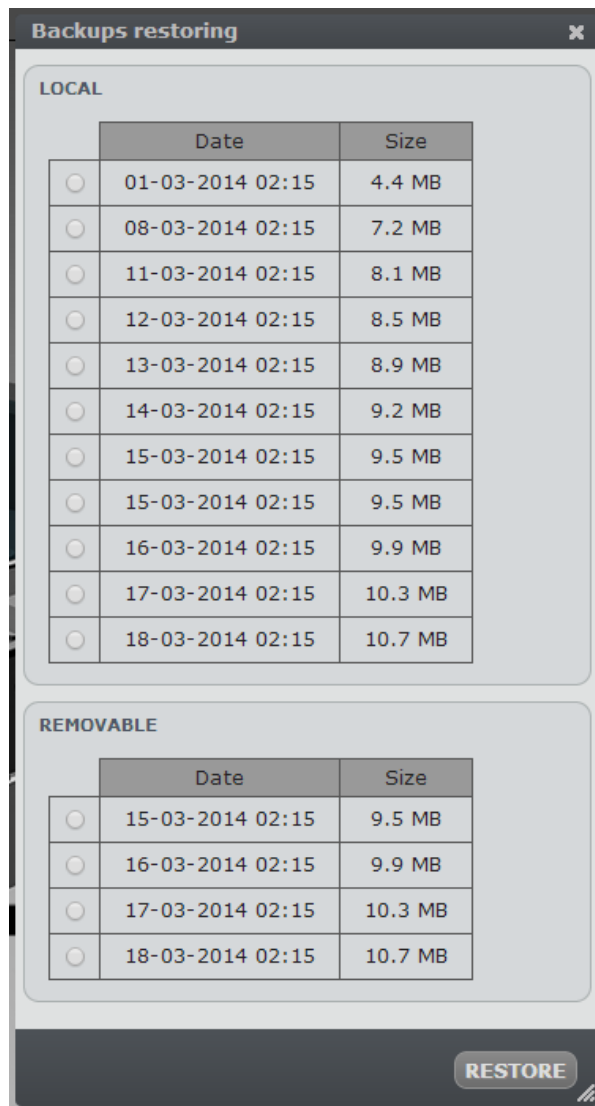
**Miranda** system includes an automated recovery system. By means of this system, a periodic backup of the database is being created at 0:00 every day. The backup is created in two different locations:

- On the local hard disk drive. In a dedicated partition.
- If the system has a SD card on the front slot, which is highly recommended, the backups will also be created on the SD card.

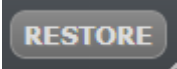
In case of system failure or if the current database is damaged, by clicking on



the icon the restoring backup window is displayed:



In this window all the backups existing at the system are displayed sorted by date, both local (HDD) and removable (SD) media.

To restore the system from a backup copy of the database, just select the desired backup and click on restore .

**WARNING:** after a backup recovery, the current database will be permanently deleted from the system and it will not be possible to recover it.

After a backup recovery, the system will automatically stop for some seconds and start. It is recommended that the system is rebooted after a backup recovery.

#### [1.6.8.- Help](#)



Clicking on  user can access to this help file.

If the system is being operated from the local console, the file is automatically opened. To close it and go back to the main screen, right click with the mouse and click on "back".

In remote mode, the help file could be opened or saved to the client HDD.

## 2.- MIRAFEEED FEEDERS MODULE

In this software module, the calculation of the amount of feed to be dispensed is automatically calculated from the temperature, biomass and average weight in the culture tank. The following figure shows the configuration window:

**Comedero 12**

Administración Configuración

DISPONIBLE  
☒ Habilitado

INICIAR TANQUE  
**INICIAR TANQUE ESTÁNDAR**

RANGO DE REPRESENTACIÓN GRÁFICA

**ALIMENTO**  
☒ Automático ☐ Manual  
Máximo:  g  
Mínimo:  g

**IND RESTANTES**  
☒ Automático ☐ Manual  
Máximo:   
Mínimo:

**PESO MEDIO**  
☒ Automático ☐ Manual  
Máximo:  g  
Mínimo:  g

**BAJAS EXTRAS**  
☒ Automático ☐ Manual  
Máximo:   
Mínimo:

ESTÁNDAR

Fecha Llenado	Nº Inicial	PM Inicial	Curva de Crecimiento	Tasa de mortalidad
22-05-2013	148	137.0 g	crecPROGENSA	0 %/d

☐ Muestra de bajas extras

Fecha	Cantidad
22-05-2013	0

☐ Muestra de peso medio

Fecha	Cantidad	Ind restantes	PM Esperado	Alim. corregido
22-05-2013	137.0 g	148	150.4 g	345.1 g

CALIBRACIÓN  
Tipo de calibración: 1.63  PiensoPROGENSA Número de comederos: 1  1

UMBRAL DE OXIGENO  
Habilitado No ☐ Si ☒ No Valor mínimo:  ppm

PERIODOS

Fecha	Hora 1ª dosis	Hora Uª dosis	Pulsos	Nº dosis	Temperatura (°C)	Alimento (g)	Corrección (%)
23-05-2013	08:30	16:30	PROGENSA	4	Manual 0.0	PROGENSA II Mayo13 345.1	0

**GUARDAR**

Miranda 30 de mayo de 2013

This window has the following fields:

### RANGE OF GRAPHIC REPRESENTATION

The scales when representing the data in the graphics could be defined:

### STANTARDS

It has the following fields:

**Fill Date:** is the date when the tank is filled and begins to be fed.

**Initial nº:** is the number of individuals in the tank the date when it is filled.

**Initial AW:** is the initial average weight.

**Growth Curve:** A drop-down menu will appear to choose the growth curve that will be applied to the culture. These curves has to be defined by the user previously.



**Death rate:** a standard death rate can be defined so the system can estimate the population accordingly.

**Sample of extra downs:** the number of death individuals can be set manually for automatic adjust of the biomass.

**Sample of average weight:** the growing curve can be manually adjusted for automatic calculation of the biomass.

**Remaining ind.:** is the number of remaining individuals calculated by the system.

**Expected AW:** is the average weight that the system is automatically calculating.

**Food corrected:** is the amount of feed that will be dispensed today.

#### CALIBRATION

**Calibration Type:** a drop-down menu is shown with the calibration that has been previously introduced in the system to choose the appropriate one.

**Number of feeders:** the number of feeders for the same tank has to be set so the system can distribute the feed accordingly.

#### PERIODS

The parameters to be considered for feeding are set here:

**Date:** the date from which this configuration will be applied on.

**Time 1st. dose:** the time when the 1<sup>st</sup>. dose will be dispensed.

**Time Lst. Dose:** the time when the last dose will be executed.

**Pulses:** A drop-down menu will be shown to choose between the pulses that has been previously configured.

**No doses:** is the total number of doses to be distributed between the first and last dose. The interval will be automatically calculated by the system.

**Temperature:** if the food is dispensed according to a feed table, the temperature to be considered can be introduced manually or, in case a probe is installed, automatically from the probe.

**Food:** a drop-down menu allows to choose between the previously defined food tables. It can also be set the amount of feed manually selecting the "manual" option.

**Correction (%):** a percentage can be introduced to correct the amount of feed calculated by the system.

### 2.1.- OTHER CONFIGURATIONS:

If a temperature probe is installed, it can be selected so the temperature for feed calculation is automatically considered.

If a dissolved oxygen probe is installed, user can set a minimum value of oxygen concentration below which the feed will not be dispensed.

## 2.2.- FEEDING TABLES.

The percentage of average weight in terms of feed to be dispensed can be configured in this tables depending on the temperature and average weight.

**Tables feeders**

Larval tanks Standards tanks Growth Curve Pulses Calibrations

(Units: Bio-mass percent)

SBream Perla Plus

		Temperature (°C)									
		12	14	16	18	20	22	24	26		28
AW (Grams)	1.5	1	1.2	1.8	2.4	2.9	3.4	4	3.2	2.3	
	3	0.8	1.1	1.6	2.1	2.5	3	3.5	2.8	2	
	9	0.6	1	1.4	2	2.3	2.6	3	2.7	2	
	20	0.4	.9	1.2	1.9	2.1	2.2	2.5	2.6	1.9	

+ Create table

SAVE

## 2.3.- GROWING CURVE.

The Standard Growth Rate (SGR) can be set in these tables according to the specie, temperature and age of the culture.

**Tables feeders**

Larval tanks Standards tanks Growth Curve Pulses Calibrations

(Units:  $SGR([\ln(\text{Final Weigh}) - \ln(\text{Initial Weigh})] / \text{Days} \times 100))$ )

SBream 21

		Temperature (°C)					
		18	20	23	25	28	
AW (Grams)	1	5	6	6.5	7	6	
	5	4	5	5.5	6	5	
	10	3	4	4.5	5	4	
	20	2	3	3.5	4	3	

+ Create table

SAVE

## 2.4.- PULSES PER DOSE.

A single dose can be as well divided in regular pulses using this configuration table.

**Tables feeders**

Larval tanks Standards tanks Growth Curve **Pulses** Calibrations

**PULSES**

Name	N Pulses	Wait (s)	
Sea Bream slow 1	1	0	-
Sea Bream slow 3	3	15	-
Sea Bream slow 5	5	15	-
Sea Bream medium 1	1	0	-
Sea Bream medium 3	3	10	-
Sea Bream medium 5	5	10	-
Sea Bream fast 1	1	0	-
Sea Bream fast 3	3	5	-
Sea Bream fast 5	5	5	-
			+

**SAVE**

## 2.5.- FEEDER CALIBRATION.

The user can save the calibration of different combinations of feed and feeders.

**Tables feeders**

Larval tanks Standards tanks Growth Curve Pulses **Calibrations**

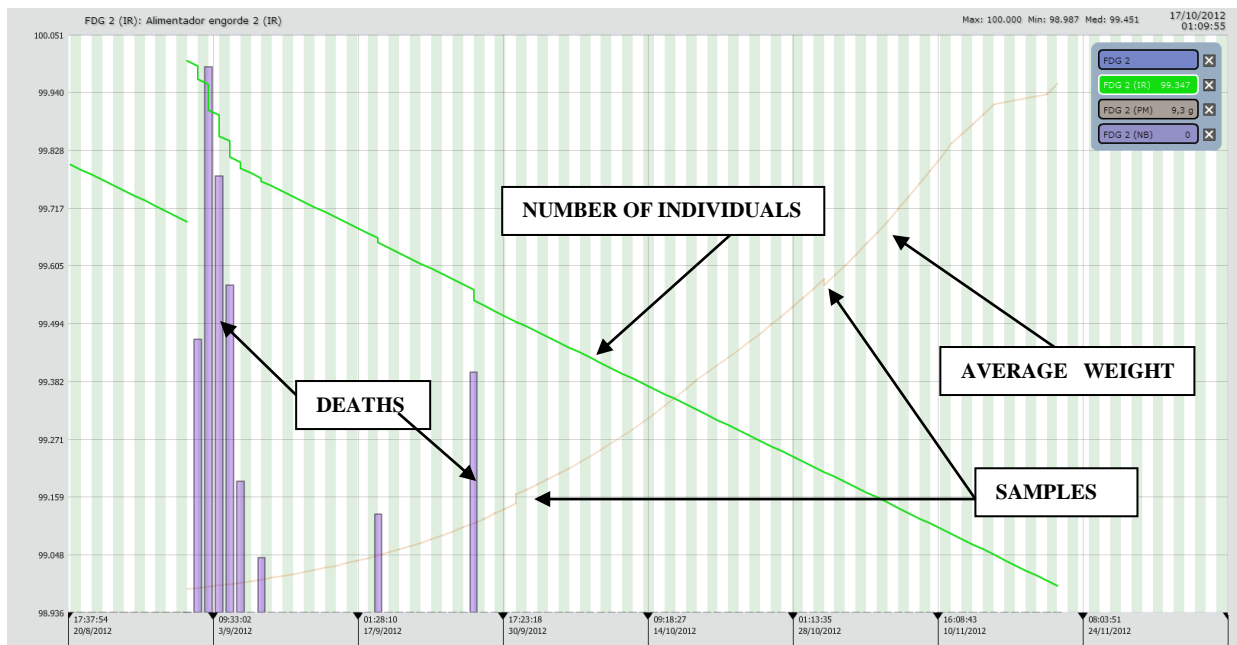
**CALIBRATIONS**

Name	Value (g/s)	
Arvotec 0.1	0.1	-
Arvotec 0.3	0.3	-
Arvotec 1	1	-
Arvotec 5	5	-
Arvotec 20	20	-
Innovaqua 1	1	-
Innovaqua 5	5	-
Innovaqua 10	10	-
Vibrator 2	2	-
Vibrator 5	5	-
Prueba 200	200	-
		+

**SAVE**

## 2.6.- GRAPHS

The information of the feeding system can be represented in trends in a graphic window.



In the above graph, a growing curve with 2 manual samples and 8 entries for extra deaths is represented.