WaveManager

Version 2.12.0.1

- User Manual-

ACKSYS
COMMUNICATIONS & SYSTEMS

DTUS074 rev A8 – February 5th 2021

ACKSYS
COMMUNICATIONS & SYSTEMS

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1. DESCRIPTION

WaveManager is a Windows-based software designed to manage and control an entire equipment fleet of ACKSYS Wi-Fi products running WaveOS firmware version 3.18.0.1 or higher.

WaveManager offers the following functionalities:

- ✓ **Automatic product detection**
  All the products detected are registered in a local database. A validation procedure (manual or automatic) records them permanently, memorizing their configuration checksum.

- ✓ **Regular monitoring of registered product accessibility**
  WaveManager will identify the products that no longer respond.

- ✓ **Regular monitoring of registered product configuration**
  WaveManager will identify products whose configuration has changed since they were last validated.

- ✓ **Assistance with product update**
  - → IP address
  - → RADIO channel
  - → SSID
  - → Web Server
  - → Firmware
  - → Whole Acksys MIB (Version 3.14.0.1)

- ✓ **Effective maintenance**
  - → The possibility to restore a previous configuration or to set up a new one for each product;
  - → The possibility to assign a reference configuration file to one or several products in the same series;
  - → Firmware update for one or several products in delayed or real time;
  - → Export of product logs and product inventory;
  - → Product group management to ease monitoring and tracking;
  - → Real-time status indication of products in the dashboard and in the product list (e.g. IP conflict, unreachable...).

- ✓ **Analysis of the Wi-Fi signals** of each client associated with an access point.
  - → Ability to monitor association details about each client in real time

- ✓ **Analysis of the RSSI signal** from an associated client.
  - → Ability to restore real time Wi-Fi signals by background task
  - → Ability to generate the live trace graph
  - → Ability to generate the history trace graph immediately
  - → Ability to export trace data

- ✓ **Analysis of the Roaming data** from a client in roaming mode.
  - → Ability to restore real time roaming data by the background task
  - → Ability to generate the roaming graph immediately
  - → Ability to save as an image

- ✓ **Analysis of the network coverage**
  - → Ability to scan Wi-Fi environment around the desired product

Warning: products located outside the local network will be detected only if the user searches on a specific IP range.
(*see 7.1 → Discover/Refresh*).

Wi-Fi products not running under WaveOS may be recognized by WaveManager but will not benefit from all the software's features.

Installing and running the software:

WaveManager software is available for download at https://www.acksys.fr/en

(*Support/Download Center/Softwares and drivers downloads / Administration tools & utilities*)

WaveManager only works on Windows-based computers.

→ Run the installation program in a directory.

→ Find WaveManager executable shortcut.

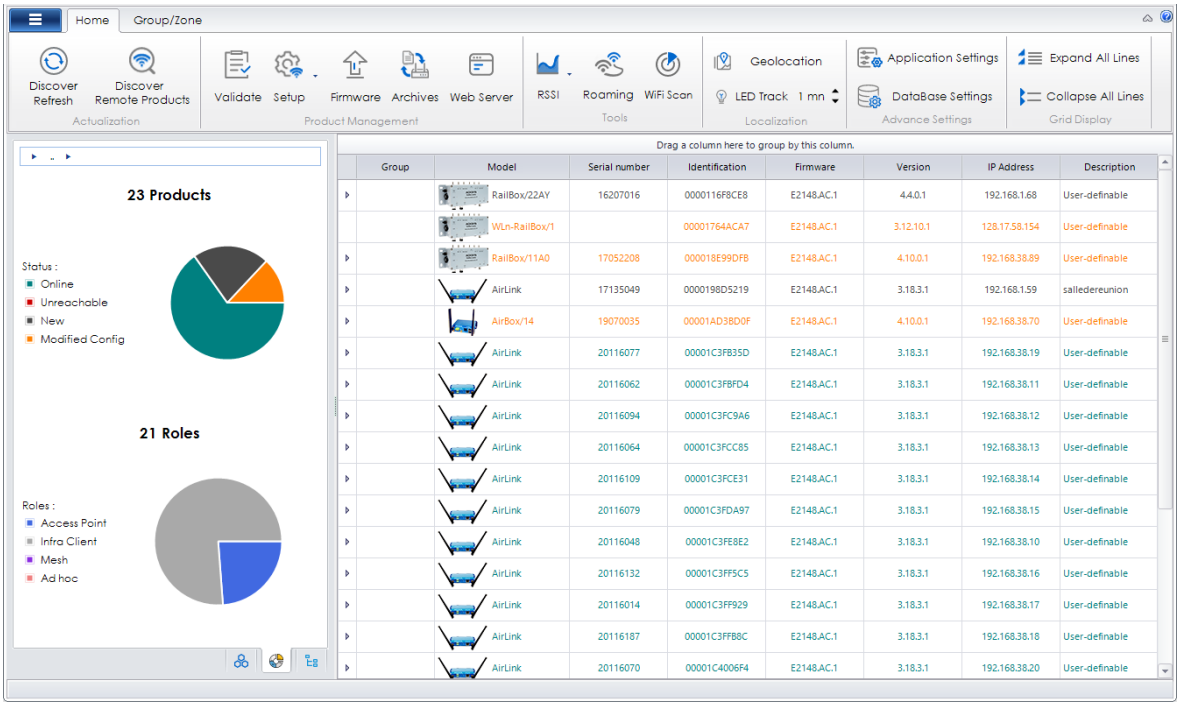
→ Double-click on it:

When launching the software, the screen will display the details of the initialization process:

2. WAVEMANAGER INTERFACE ACCESS

By default, there is no need to login to access the software interface.

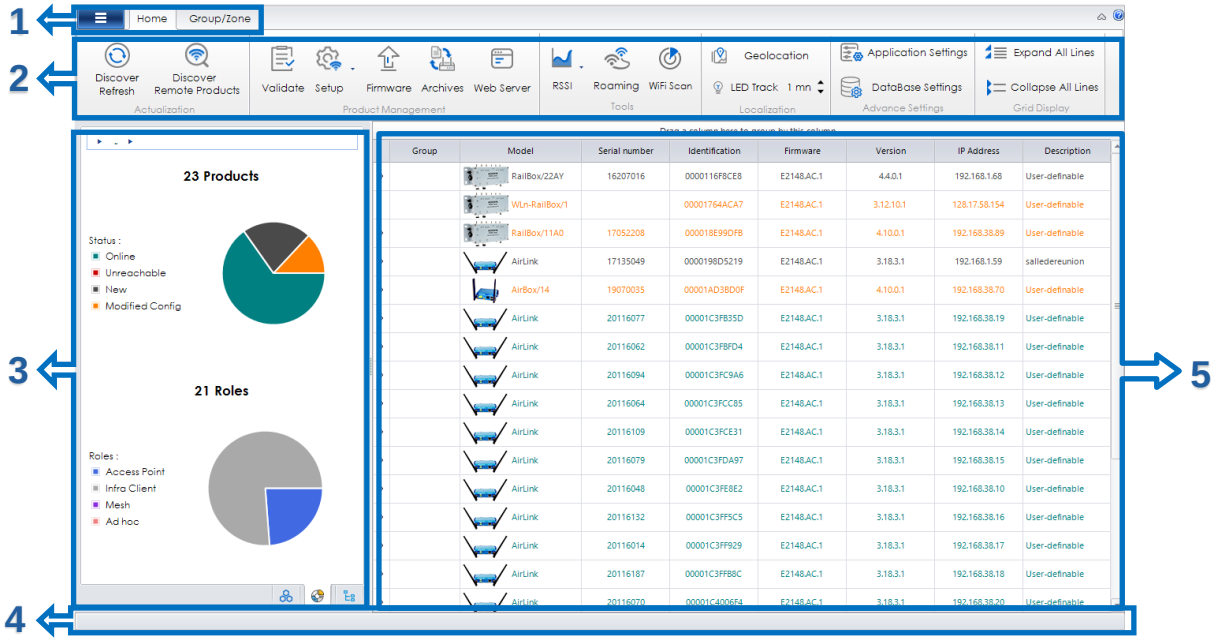
The user has all access rights to the menus.



For security reasons, it is strongly recommended to protect access to WaveManager by creating user accounts (*see Identification section)*.

3. MAIN WINDOW

WaveManager main window has five areas:



Structure description:

1. Main navigation tabs:
   - → Information
   - → Home
   - → Group/Zone*
2. The toolbar that applies for one or several products.
3. The dashboard, including:
   - → The global inventory of registered products according to their operating status, their Wi-Fi role and their assignment to groups/zones.
   - → Navigation between the Group/Zone Explorer and the two types of inventories.
4. The footer, including;
   - → User information and access to WaveManager account settings**.
   - → Warning message
   - → Log history***
   - → Upgrade task management****
5. Product display.

* The **Group** tab only appears if the "**Managing Product Groups**" option has been checked in the **Application Settings** (*see General*).

** The user account settings only appear if the "**User Management**" option has been checked in the **Application Settings** (*see User Settings*).

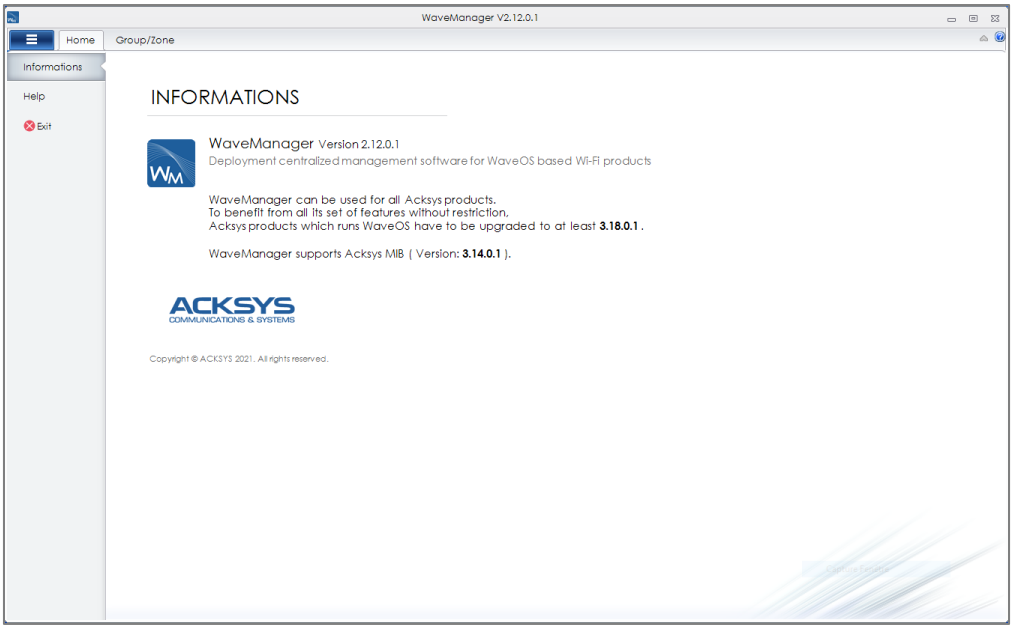
*** The log history only appears if the "**Log Server**" option has been checked in the **Application Settings** (*see Log server section)*.

**** The Upgrade task management only appears if at least one delayed update task is programmed (see *Delayed Update*).

4. TAB DESCRIPTION

4.1. Information tab

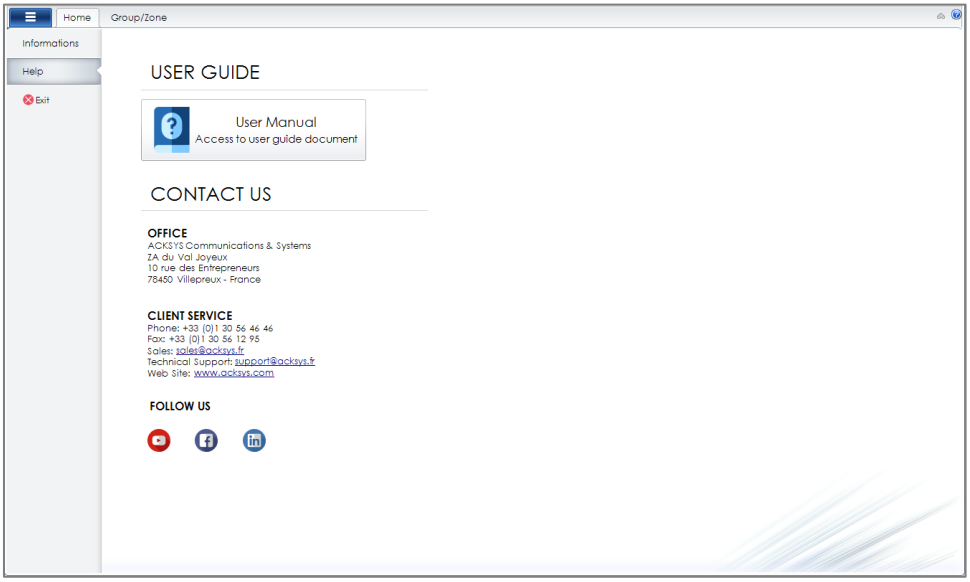
This reminds WaveManager terms of use.



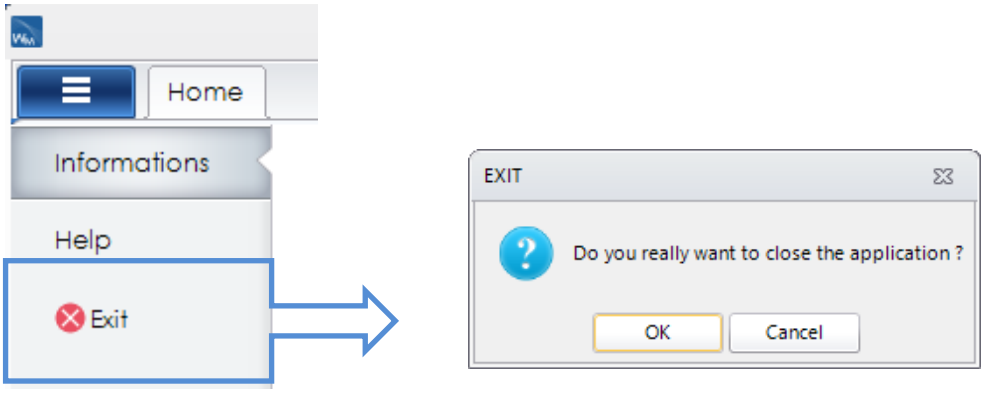
Hence, to benefit, your ACKSYS products must run under at least **WaveOS version 3.18.0.1.**

4.2. Help tab

It provides access to ACKSYS technical support contact information if needed.

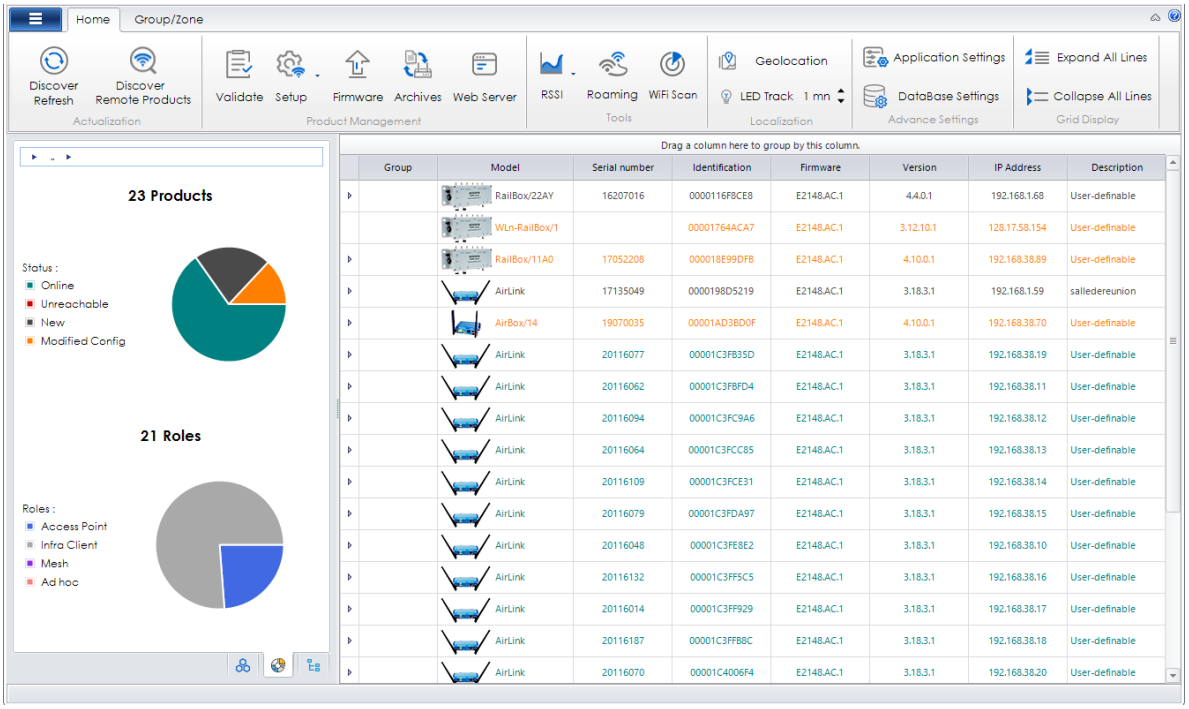


The "**Exit**" button closes WaveManager**.**



4.3. Home tab

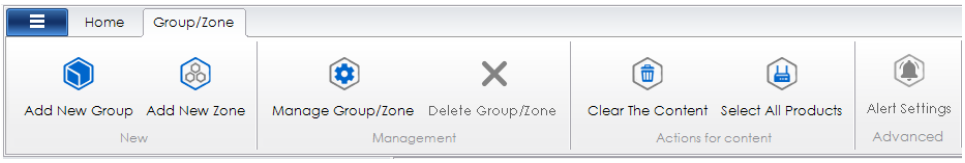
It gives access to all the features: the dashboard and the product inventories supported by WaveManager.



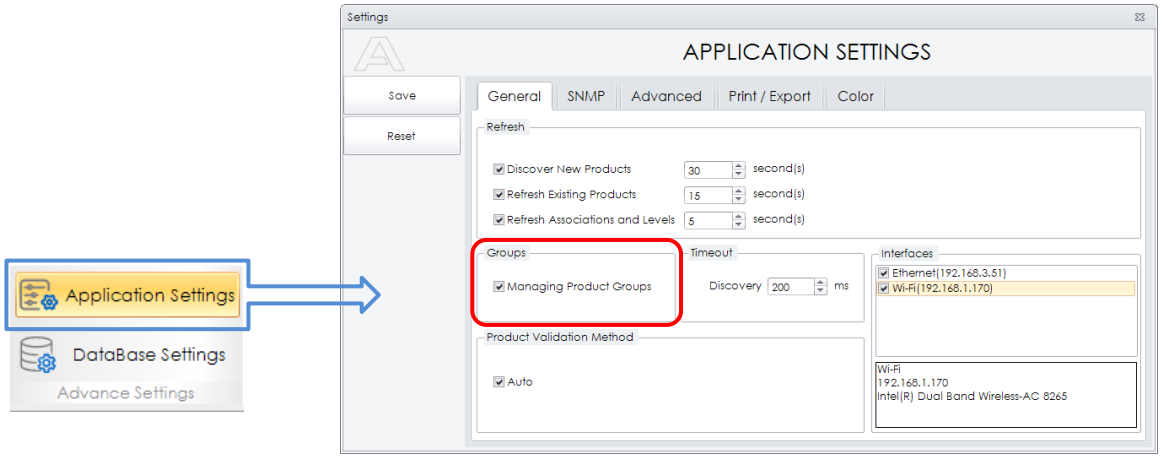
4.4. Group/Zone tab

It gives access to group management to **classify and sort products** in parent groups called “zones”.

As a result, products are easily findable and referenced in the infrastructure and their display in the inventories is simplified.

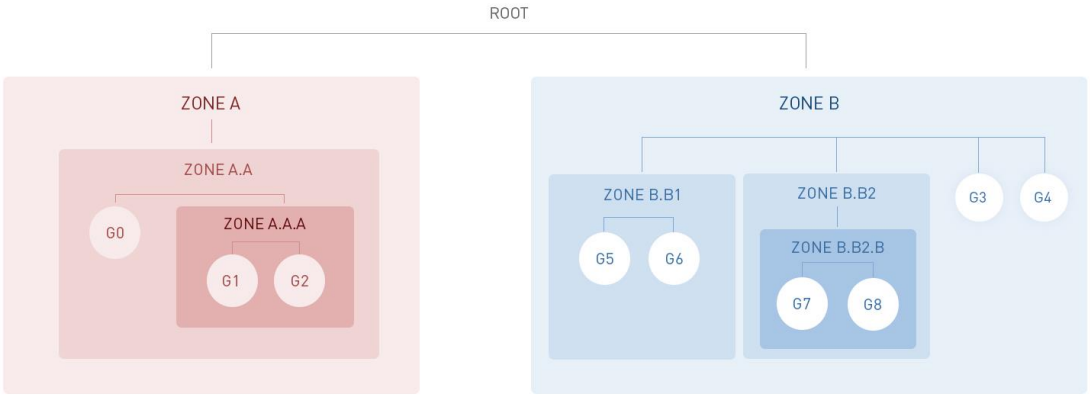


This tab **is not available by default**. The group management has to be enabled in the “Application Settings”. (*see General*).



Use of group/zone

Considering two zones named A and B, at the root of the tree structure, each of these zones may contain an unlimited number of subzones and groups:



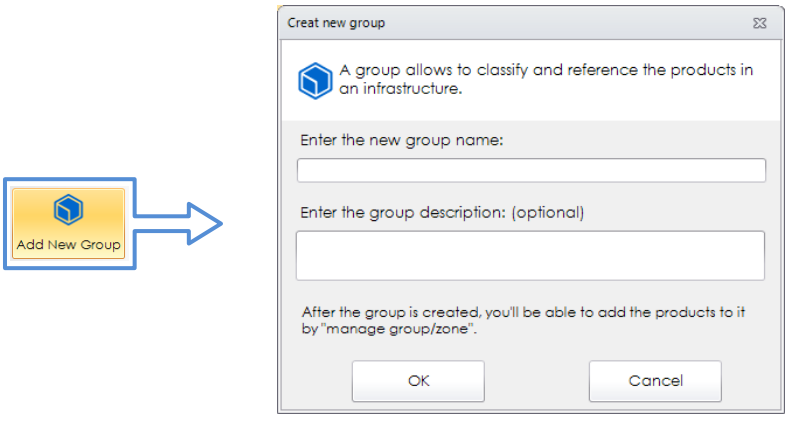
The product groups (here named G0 to G8) are assignable to any level of the tree structure.

A zone may content an unlimited number of subzones and groups while a group can only contain products.

Creating a new group or zone

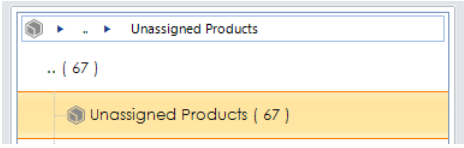
To create a new group or zone:

1. Click on "**Add New Group**" or "**Add New Zone**"



2. Enter the name of the group (*e. g. G0*).
3. Enter the group description.
4. Click on "**OK**" to confirm.

WaveManager will then display the group or zone (empty). Click on "*Unassigned Products*" to return to the main product list.



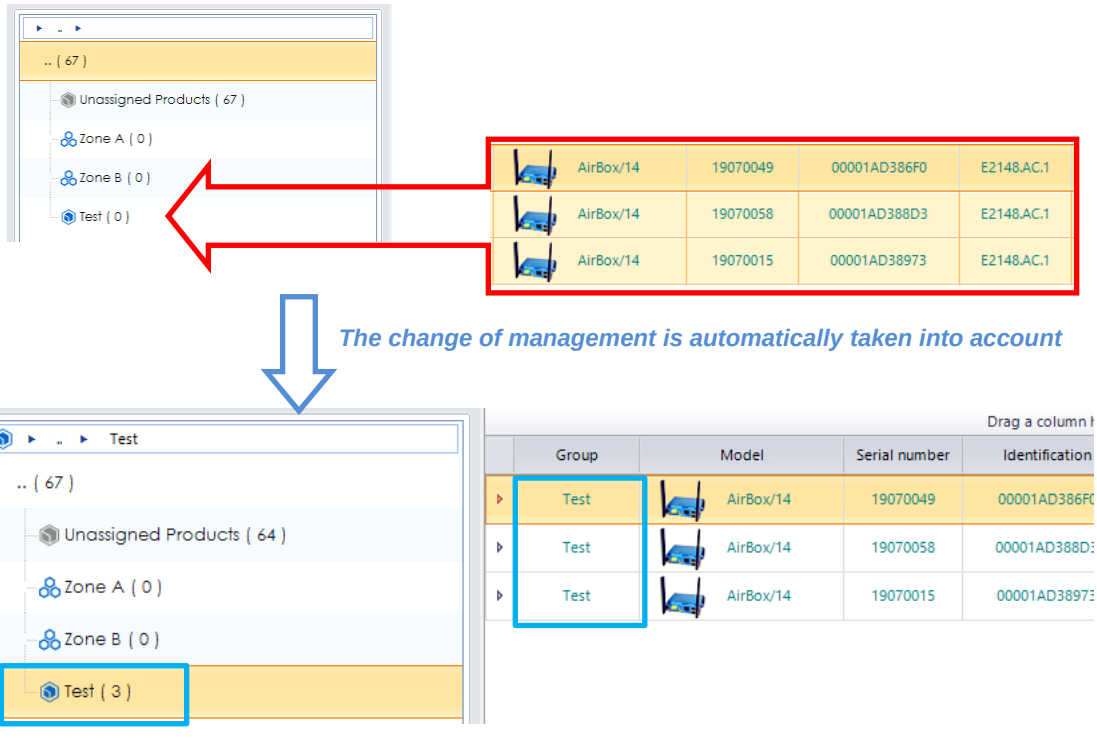
By making a right-click on a group or a zone name, you can edit, rename or delete it from the context menu.

Managing a group

To manage a group by drag and drop:

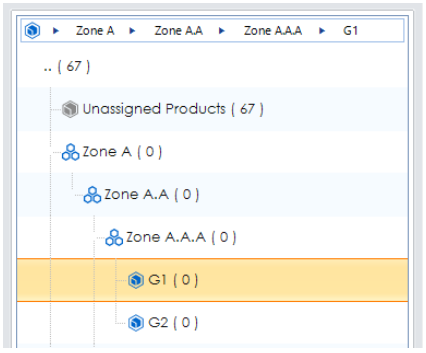
1. Select several products (shift or ctrl) from the main list
2. Drag them into the desired group

Keep the "shift" or "ctrl" key as well as the mouse key pressed until the products are moved into the group

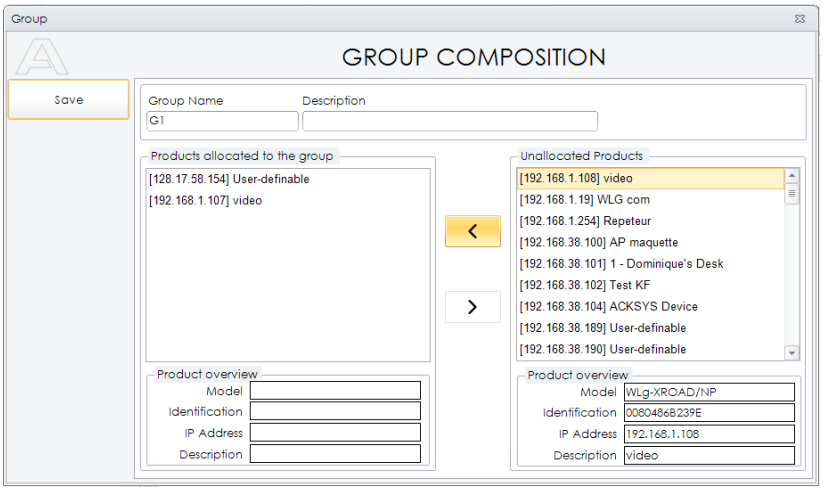


To manage a group from the group composition window:

1. Select the group in the Group/Zone Explorer:



2. Then Click on "**Manage Group/Zone**" in the toolbar or right-click > Manage Group/Zone.
3. To add a product to a group, select it from the "Unallocated Products" list and click on the "**<**" button or double click on the selected product.
4. Likewise, to remove a product from a group, select it from the product list in the group and click on the "**>**" button or double-click on the selected product.



You can move a group from the Group/Zone Explorer by dragging and dropping it onto the name of the requested zone.

Managing a zone

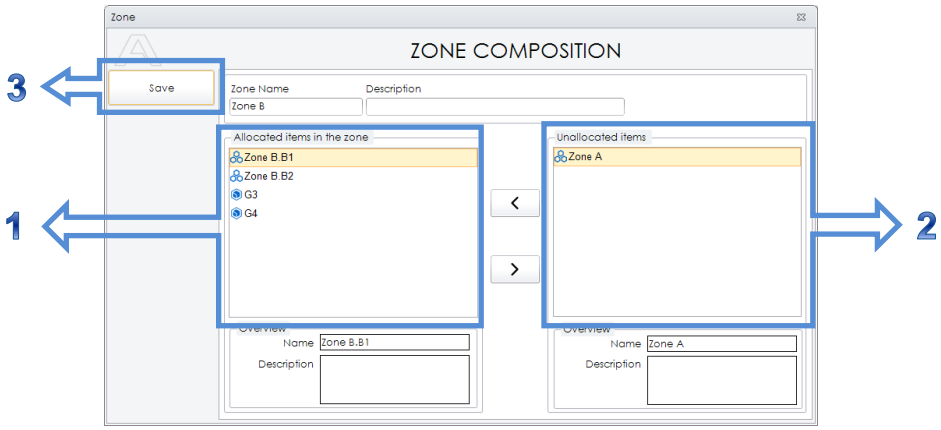
To move a zone from the Group/Zone Explorer:

1. Select a zone in the Group/Zone Explorer.
2. Drag and drop it onto another zone.

To move a zone from the Zone Managing window:

1. Select a zone in the Group/Zone Explorer.
2. Then click on "**Manage Group/Zone**" in the toolbar or right-click > Manage Group/Zone.
3. The Unallocated items list will only display the elements located at the **root of the tree structure** while the list of the elements assigned to the zone will show the elements included in the zone **without their sub-elements**.

Example: *Managing Zone B.*



4. The items allocated to Zone B appear without their sub-items.
5. The only available item at the root, Zone A, appears.
6. "Save" button to confirm changes.

By moving an allocated item into the unallocated items list, that item will end up at the root of the tree structure.

Selecting products from a zone or group

To select all products assigned to a zone or group:

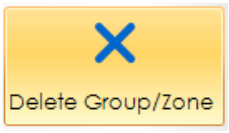
1. Click on a desired zone.
2. Then click on "**Select All Products**" in the toolbar or right-click > **Select All Products**.

3. All the products assigned to the zone or group will be selected.

Deleting a group or zone

To delete a zone or group:

1. Select the group or zone to be deleted.
2. Click on "**Delete Group/Zone**" or right-click > **Delete**.



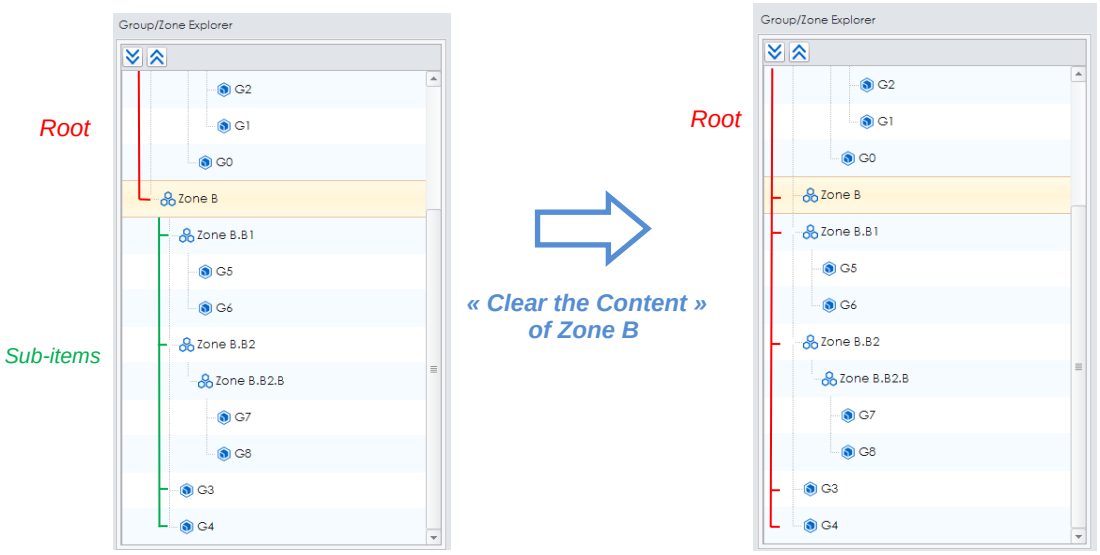
Deleting a zone will move its assigned items to the root.
Deleting a group will move the products it contains into the "*Unassigned Products*" list.

To remove elements allocated to a zone:

1. Select a desired zone.
2. Click on "**Clear The content**" in the toolbar or right-click > Clear the content

3. The removed elements of the zone will end up at the root of the tree structure.

Example: *By clearing the content of Zone B, all its included items will be moved to the root while keeping their related sub hierarchies.*

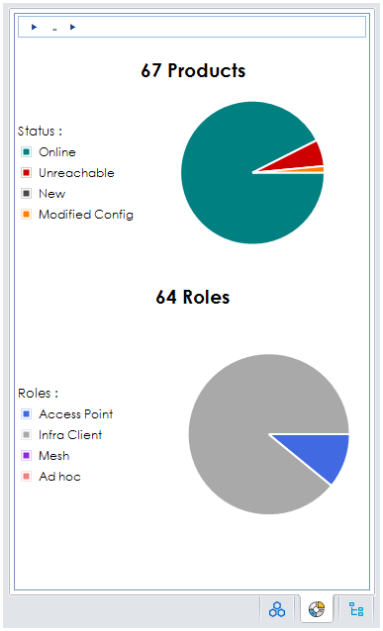


5. PRODUCT INVENTORIES

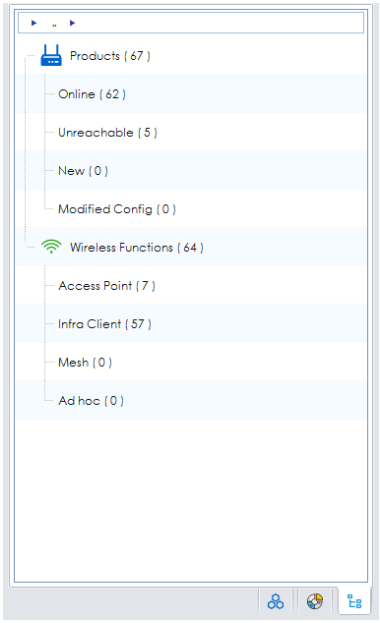
There are two display modes available for inventories, chart and tree view.

Inventories provide a synthetic overview of products and roles. The result is immediate visibility on the network status and the opportunity to view the list in two display modes.

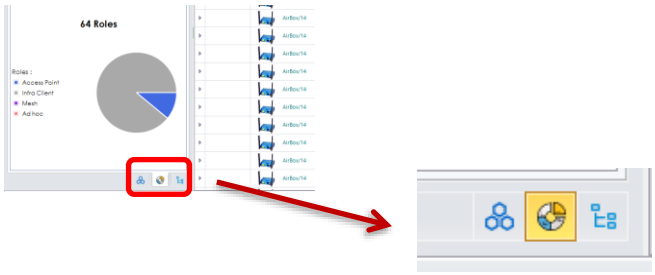
Chart display



Tree view display



To switch from one view to another, click on one of the three icons at the bottom of the inventory, the first one being the Group/Zone Explorer.



5.1. Inventory status details

There are five statuses:

1. New

It refers to a product that has never been detected by WaveManager and needs to be “validated”. A product can be validated as soon as it is detected automatically or manually (*see. Application Settings*). If a new product is no longer detected by WaveManager, it will be removed from the database.

It is important to note that its configuration is validated at the same time.

2. Online

It refers to a validated product that responds to WaveManager queries.

3. Unreachable

It refers to a product that has been online and has not responded to WaveManager last query.

4. Modified Config.

It refers to an online (validated) product that has changed its configuration since its last validation.

When the product changes to the Modified config status, the new configuration must be manually validated by right clicking on the product (Validate configuration) or by clicking on the “**Validate**” button in the toolbar.

5. IP Conflict

It refers to a product that has an IP address already used by another one.

Products with *IP conflict* status must be deleted or refresh **manually** by the user as soon as the conflict is fixed.

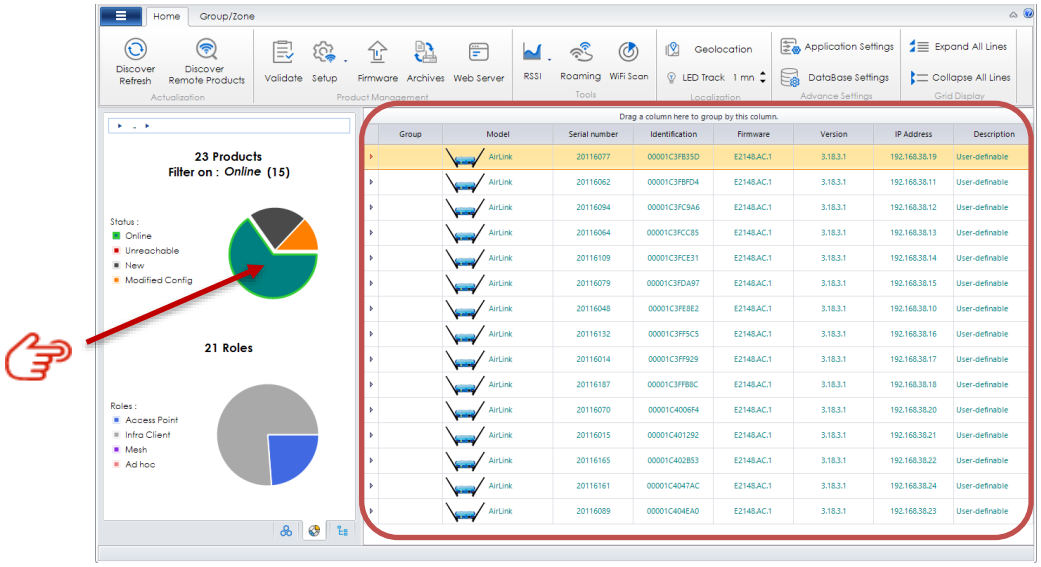
6. PRODUCT DISPLAY

The dashboard displays products according to the filtering performed in terms of the inventory and/or the Group/Zone Explorer.

Filtered product display according to the inventory

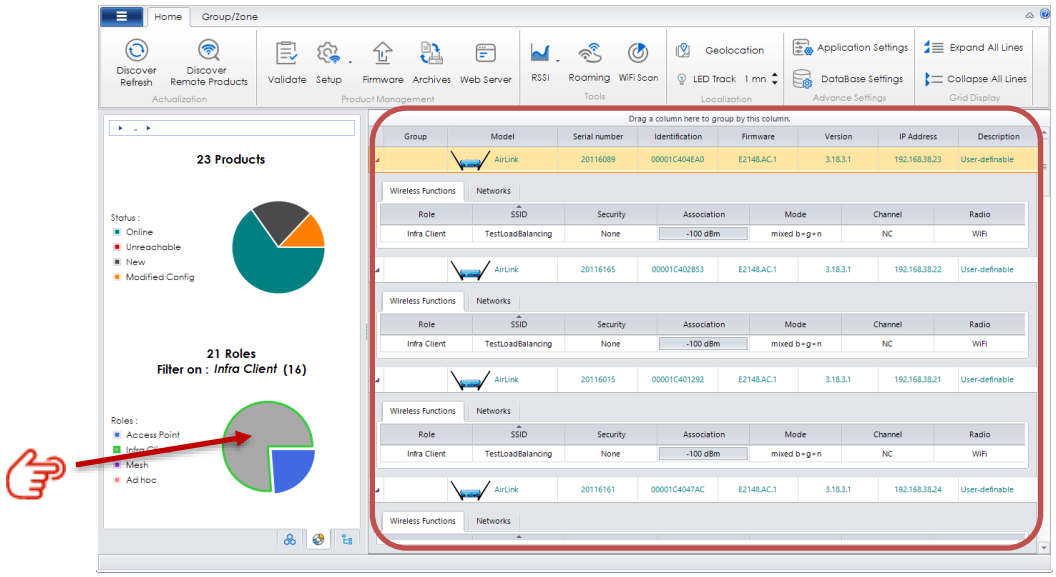
1st example:

*If you wish to display **online** products, click on the **corresponding portion** (green part) of the graphical inventory. The dashboard will then display the matching products.*



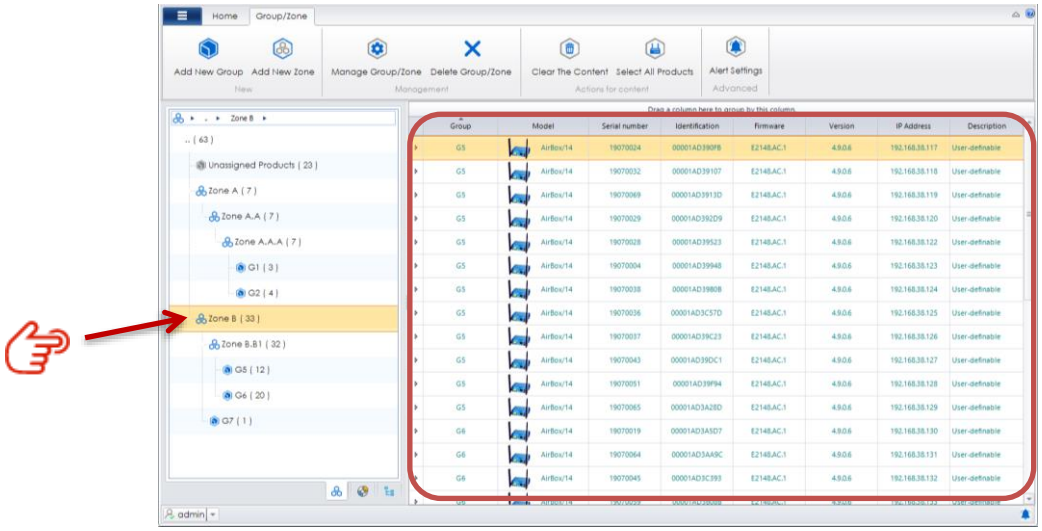
2nd example:

*If you wish to display products configured as **Infra Client**, click on the **corresponding portion** (grey part) in the graphical inventory. The dashboard will then display the matching products.*



Filtered product display according to groups/zones

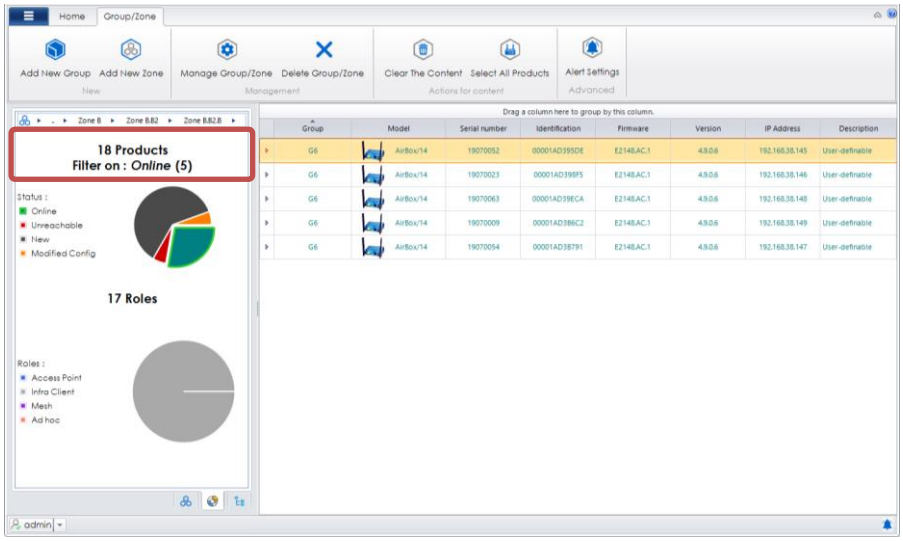
*If you wish to display products assigned to a **Group/Zone**, click on the **corresponding group or zone** (Zone B here) in the "Group/Zone Explorer". The dashboard will then display the matching products.*



Filtered product display according to the inventory and the groups/zones

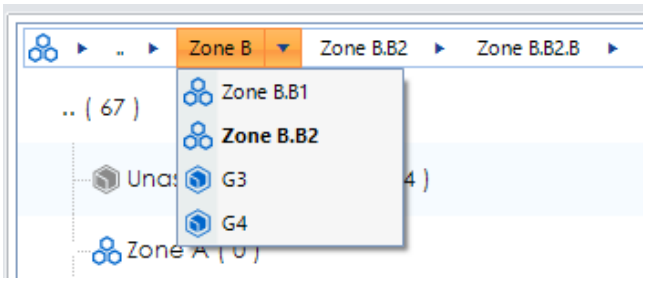
*If you wish to display products assigned to a **zone or group according to the inventory**:*

1. *Click on the desired group in the Group/Zone Explorer (Zone B.B2.B here).*
2. *Switch to one of the two inventory display modes (chart display here).*
3. *Click on the desired portion of the graphical inventory (orange part here).*



The path navigator including the parent zones to B.B2.B (Zone B.B2 and Zone B) will be displayed above the inventory as selectors.

You can select other zones or groups to show from these selectors:



6.1. Product list

The product list can be organized according to several criteria:

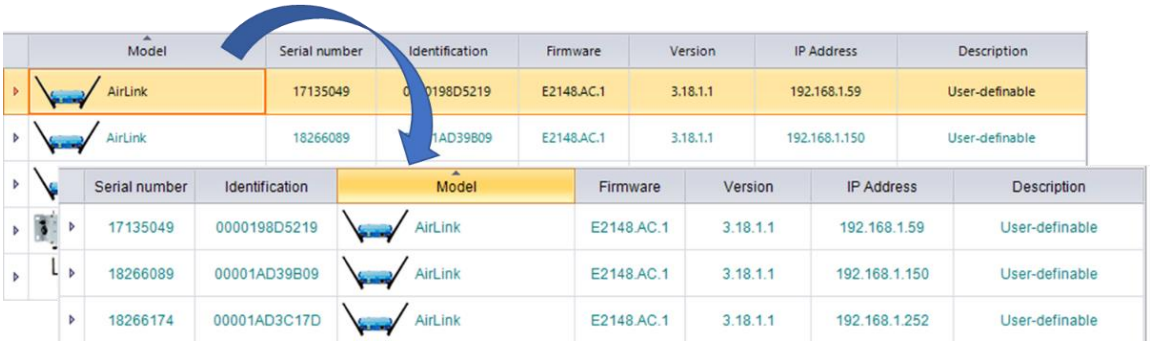
- ✓ Choice of columns to display
- ✓ Order of display of columns
- ✓ Sorting up or down on a given column
- ✓ Product classification by dragging and dropping the header of the column you wish

By clicking on the column header, you can update the list sorting order:

- → One click for increasing sorting
- → A second click for descending sorting
- → One last click to cancel the sorting

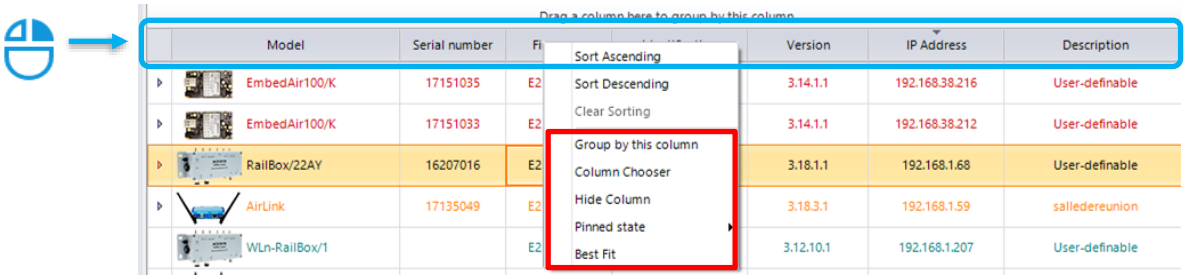
6.2. Column modularity

The order of display of the columns is customizable according to your preferences by dragging a column header to the right or left.



Customizing the column display

By right-clicking on a column header, you can bring up a context menu allowing you to customize their display:

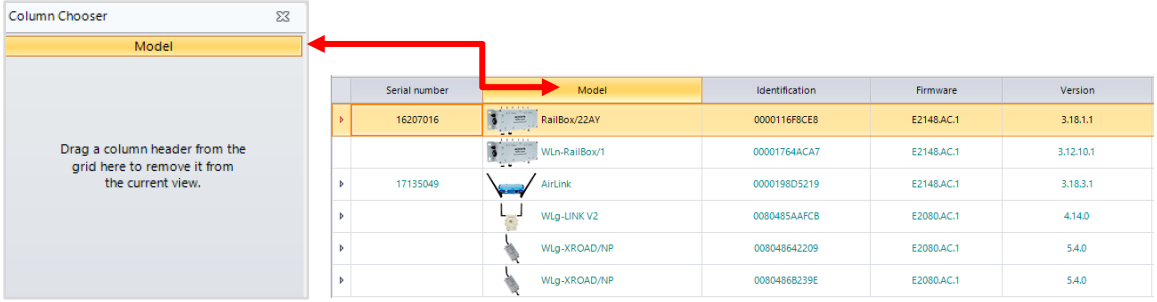


→ **"Group by this column":** *See "Group" display*.

→ **Column Chooser:** allows you to hide or re-display one or several columns.

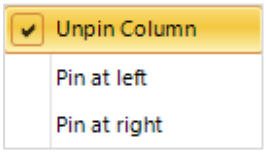
To hide a column: select it and drag and drop it into the column selector.

To display a column again: select the requested column in the selector and drag and drop it onto one of the column headers.



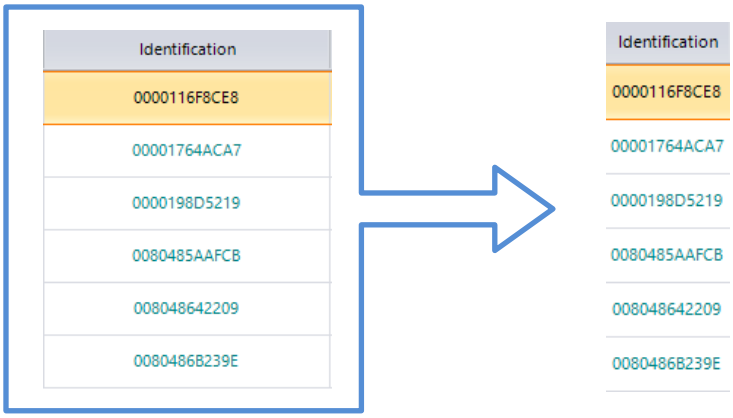
→ **Hide Column:** This option allows you to hide a column. To cancel the action, use the column selector.

→ **Pinned state:** permits pinning a column to the left or right of the table.



To cancel the action, select the default value which is **Unpin Column**.

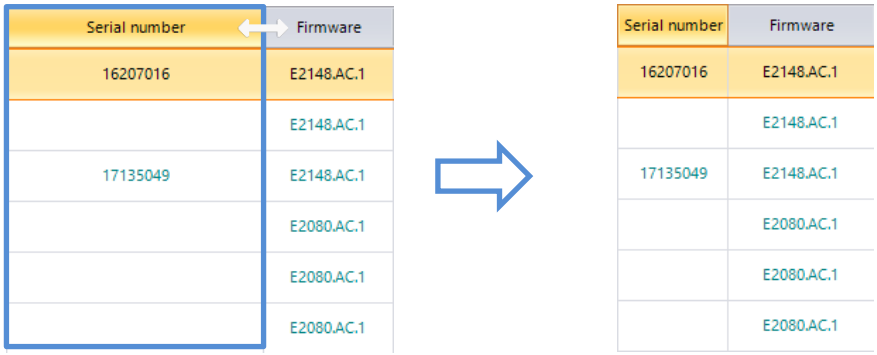
→ **Best fit:** This option allows fitting the selected column width for optimal viewing of its cells.



Column widths may also be set manually by:

→ hovering over the separation of two column headers until the resizing cursor appears (↔)
→ then by clicking and dragging the mouse to the right or left.

Double-clicking on a column header separation also acts as the “best fit” option (as described above) :



6.3. "Group" display

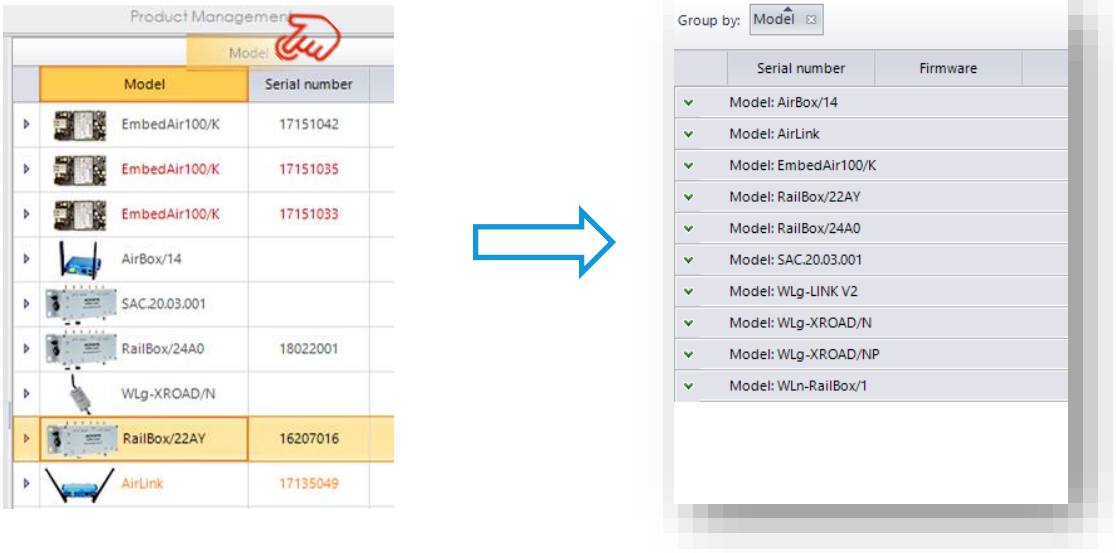
For an organized view, WaveManager makes it possible to classify products by column **except** with the **Serial number** and **Identifier** columns which are **unique**.

To achieve this, drag and drop a column header into the specific area at the top of the product list to group with it.

> It is possible to create groups and display the product list according to these groups.

1st example: *Product display according to the* ***Model***

Drag and drop the ***Model*** *column into "Drag a column here to group by this column"*

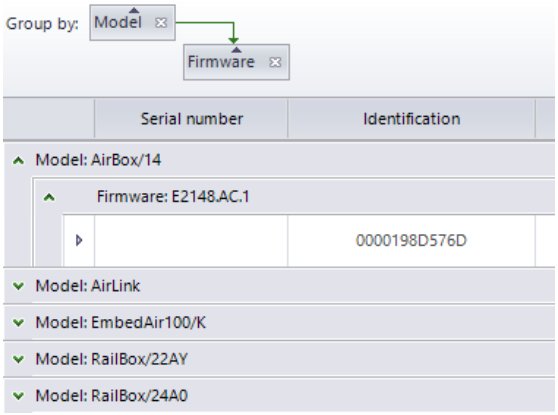


2nd example: *Product classification according to* ***several*** *columns:*

→ *Sorted classification*

1. *Click on a column of your choice; in this example, it is still the* ***Model*** *column*
2. *Drag and drop the column into "Drag a column here to group by this column"*
3. *Click on another column of your choice; in this case, it is the* ***Firmware*** *column*
4. *Drag and drop it to the right of the* ***Model*** *classification*

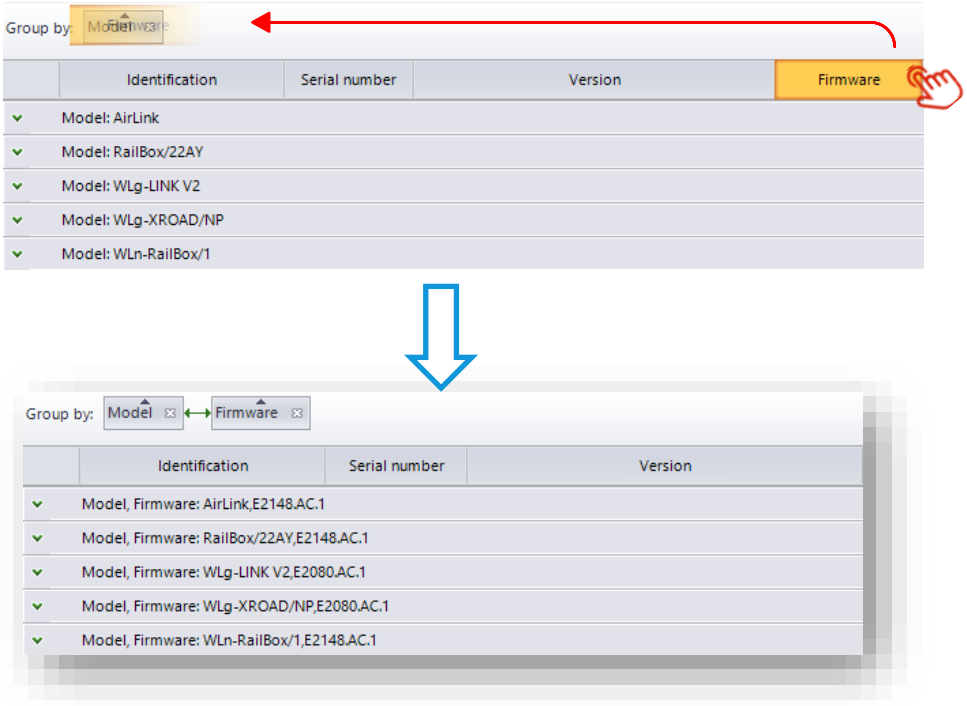
The product list will be firstly classified by the models and then by the matching firmware:



→ *Combined classification*

*To display product models and their firmware all at once, drag and drop the Firmware column, **into the same spot** as the Model column.*

The product model and firmware are then displayed at the same level:



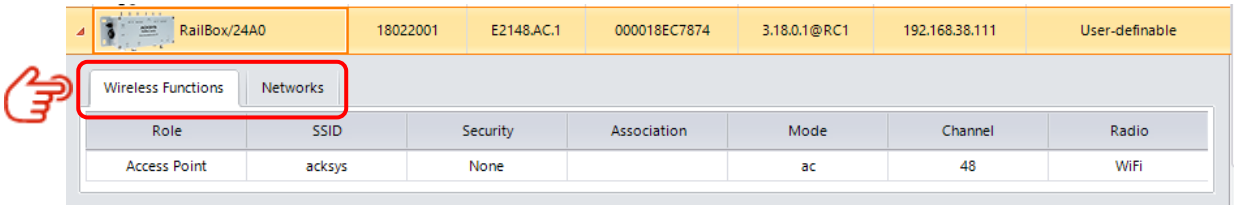
6.4. Hierarchical display

For a detailed view of a product in the list, click on the left corner arrow of the selected product line. A second click will hide the view.

***Example**:*

Click on the left corner arrow of the RailBox/24A0 line. Two tabs are then available:

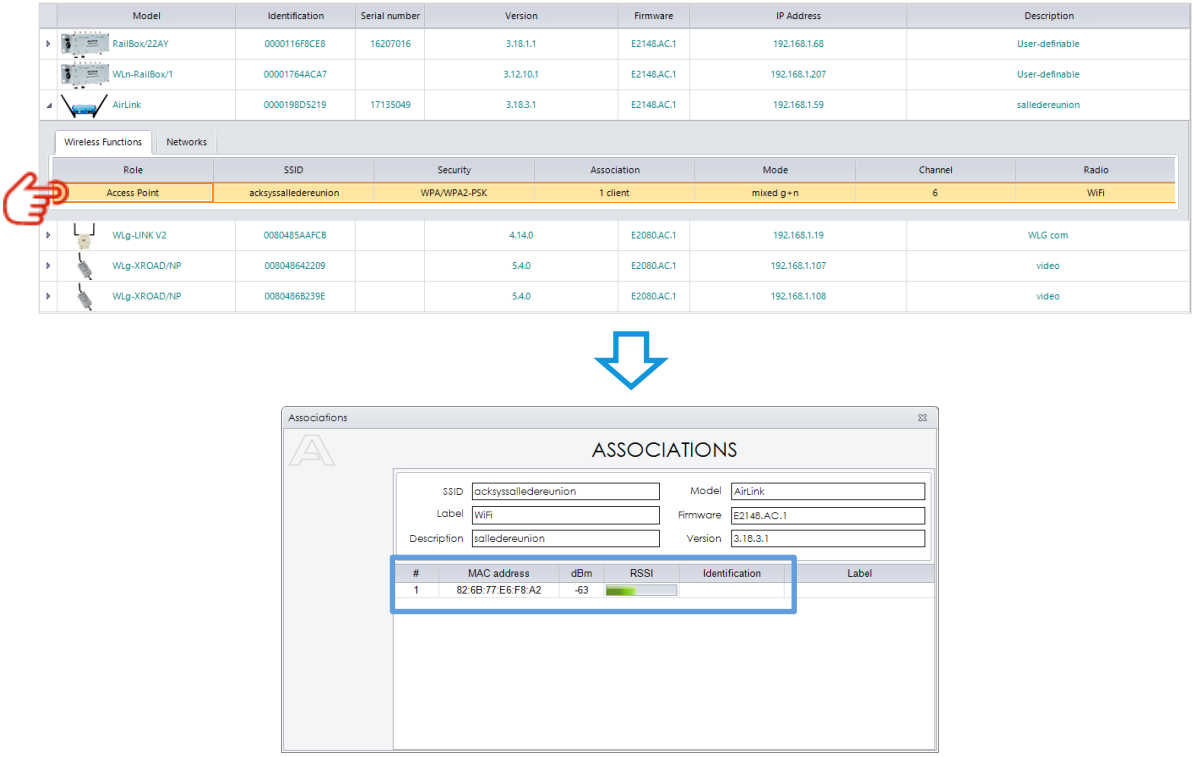
- ✓ *The **Wireless Functions** tab lists all Wi-Fi roles*
- ✓ *The **Networks** tab lists all networks*



To display clients associated with an access point (or to view a mesh point neighbors), double-click on the line of the selected access point.

By double-clicking on the line of an infra client (or *ad-hoc*), the RSSI History Monitoring will be launched (*see RSSI Trace*).

The screenshot shows clients associated with the selected access point:

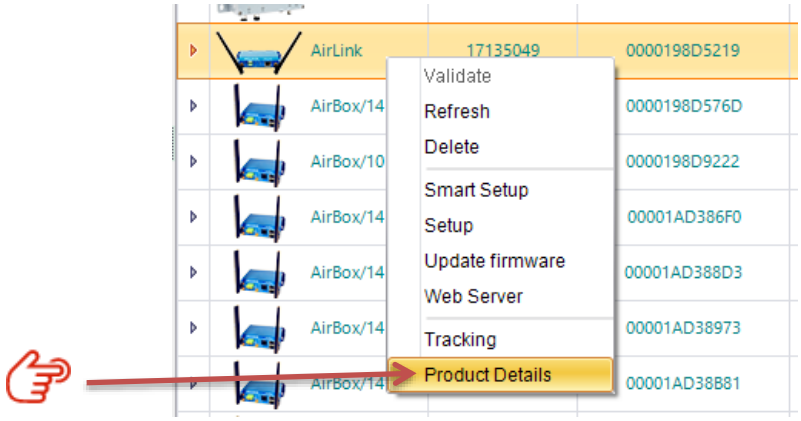


6.5. Product details

View product details

There are two ways to access the **Product Details** window:

1. Right-click on the selected product then click on **Details** in the menu that appears.

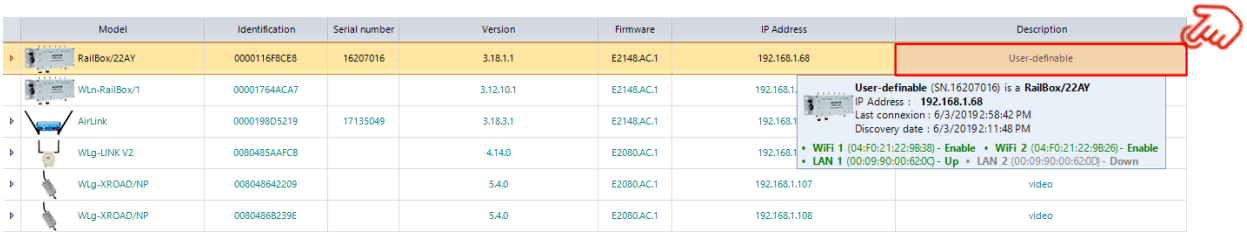


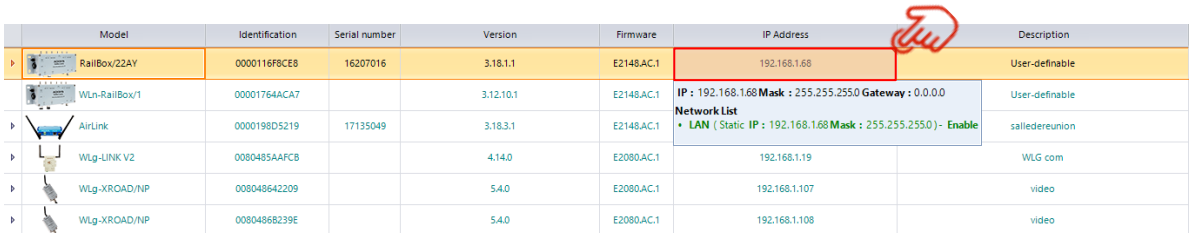
2. Double-click on the line of the selected product.

Some details are accessible by hovering the cursor over the **IP Address** or **Description** cell of the selected product.

Example:

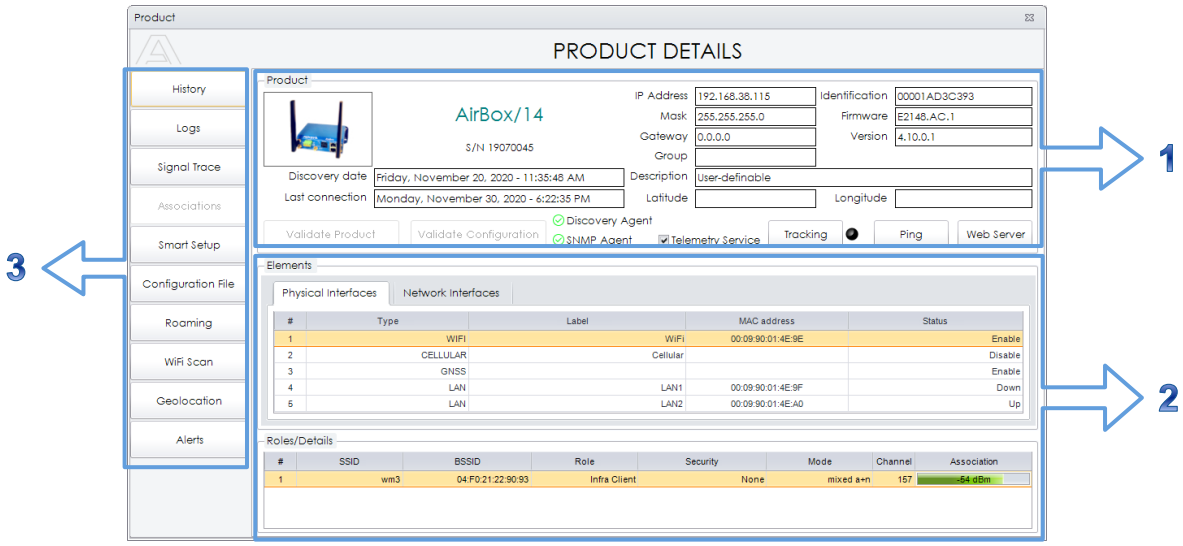
1. *The RailBox product has been selected from the list.*
2. *By hovering the cursor over its "Description" or "IP Address" cell, WaveManager displays pop-up tip information:*



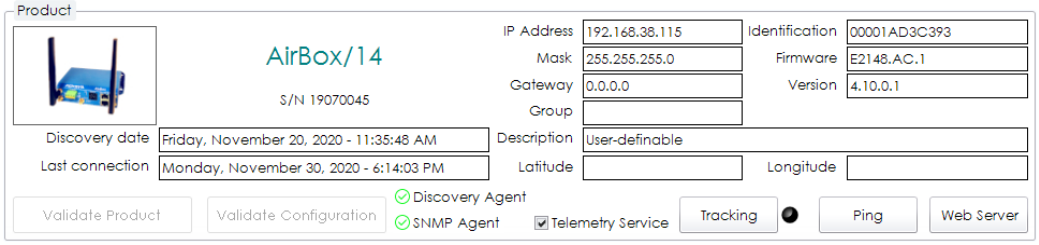


Product details window

The **Product details** window has three sections:



1. The "Product" section which includes:



- ✓ The product picture;
- ✓ The product model name and its serial number;
- ✓ The discovery date of the product and the time of its last appearance;
- ✓ The IP addressing (address, subnet mask and gateway);
- ✓ The location information;
- ✓ The firmware ID and version;
- ✓ Service status indicators for the discovery service, SNMP service and Telemetry service.

→ The **Validate Product** button is active if the product is "New". To validate a new product, click on that button.

→ The **Validate Configuration** button is active when the product has the "Modified Config" status. To validate the configuration, click on that button.

→ The **Tracking** button triggers the product diagnostic LED flash to spot it. A second click on the button will stop the flashing (*see LED* Tracking).

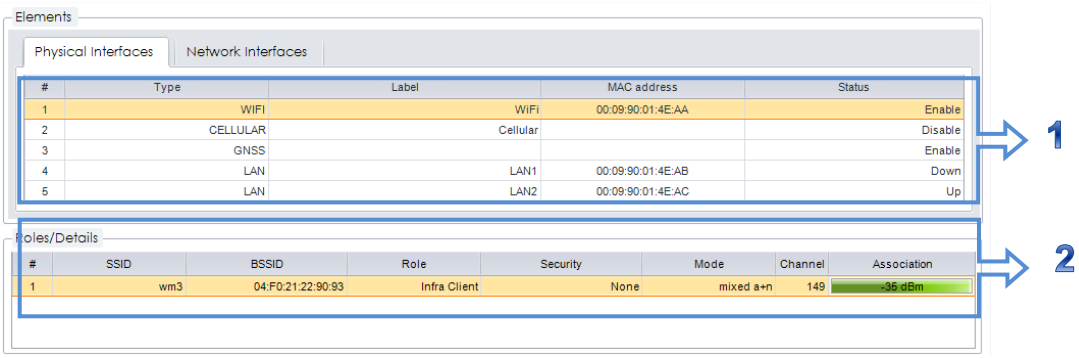
→ The **Ping** button tests the product accessibility by sending it a request in which a response is expected.

→ The last button, **Web Interface**, allows accessing a product web interface if it is reachable with the *HTTP* protocol.

2. *"Elements" section:*

→ Physical Interfaces tab:

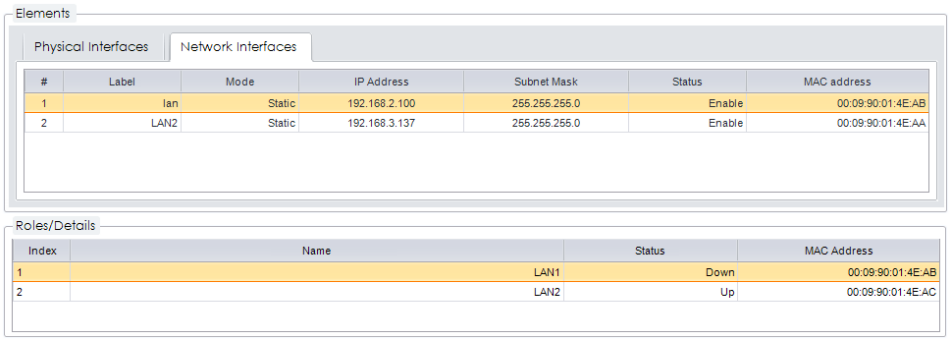
This tab lists the physical LAN (Ethernet) and Wi-Fi (radio) interfaces of the product.



1. By selecting one line, WaveManager will show the list of roles configured as Wi-Fi or LAN interface.
2. The list should appear below in **Roles/Details**

→ Network Interfaces tab

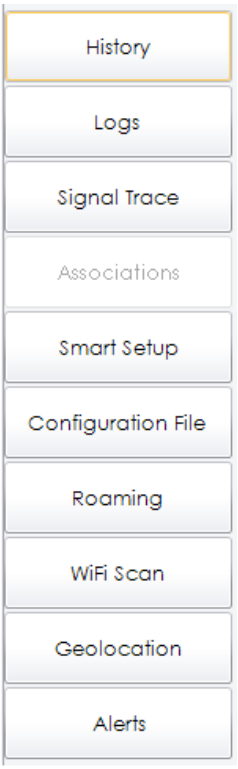
It provides a list of IP network interfaces configured on the product.



By selecting one line, WaveManager will show the list of LAN or WLAN roles, granting access to that IP interface. The list appears below in **Roles/Details**.

3. *Product details menu*

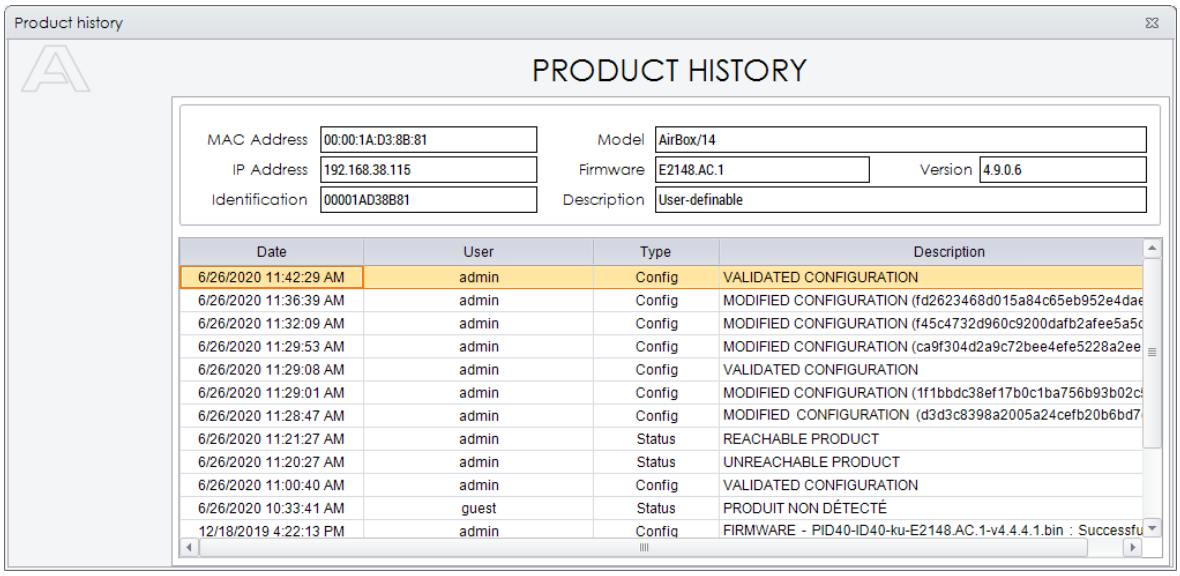
It gives access to:



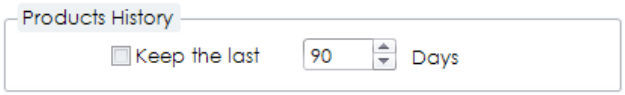
- → **History**, to consult all the changes observed by WaveManager according to the date.
- → **Logs**, to consult all WaveOS logs of the product.
- → **Signal Trace,** to display the RSSI trace of the product (*see RSSI Trace*).
- → **Associations,** to display, for product in access point mode, the details of associated clients.
- → **Smart Setup**, to configure all OIDs from Acksys MIB by SNMP for one or a set of ACKSYS products. (See *Smart Setup*)
- → **Configuration file**, to import or export the whole product configuration (*see Archives button*).
- → **WiFi Scan**, statistical tool to scan and display all the access points around the product (*see WiFi Scan*).
- → **Roaming**, statistical tool to generate a roaming graph over a given period. s*ee Roaming Monitor*).
- → **Geolocation**, to find a product via its GPS coordinates (*see*
- → Geolocation).
- → **Alerts** (*see Notifications*)

Product history

This screen displays all the operations performed on the product observed by WaveManager since its discovery.



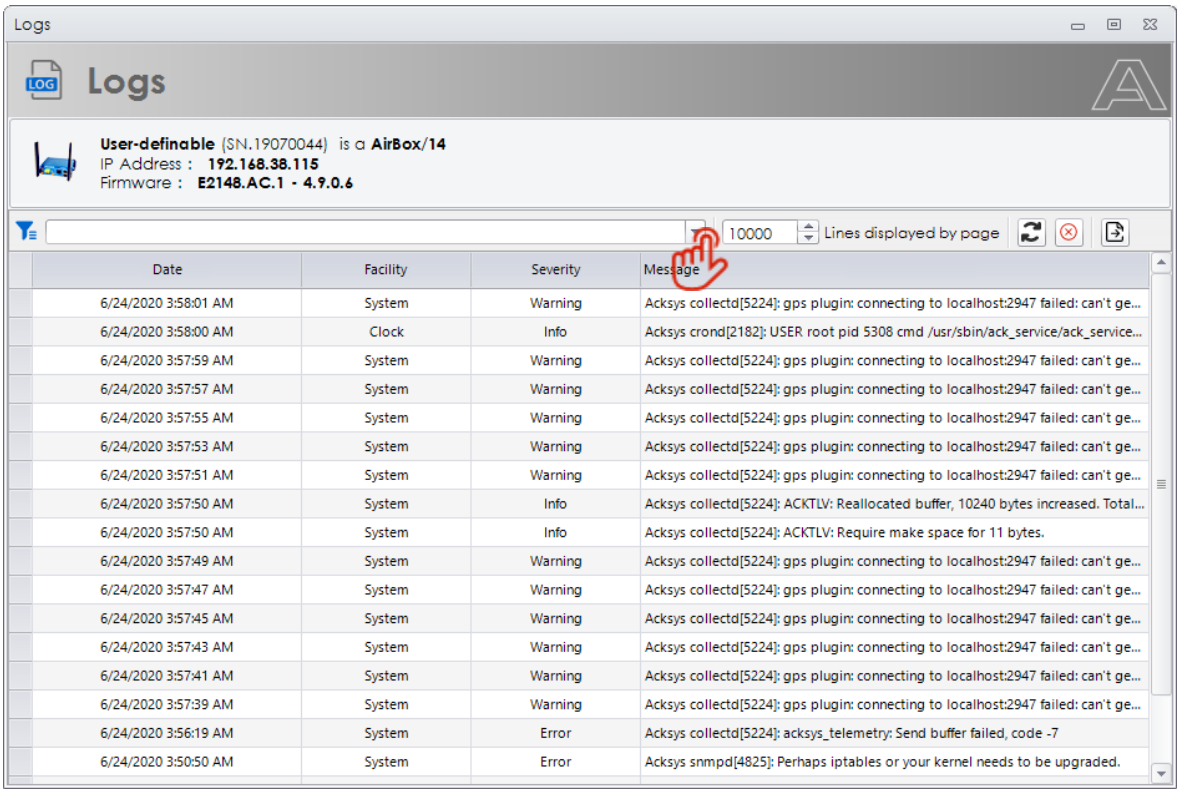
However, the time range may vary according to the value selected in: *Database > Compact section > Products History*.



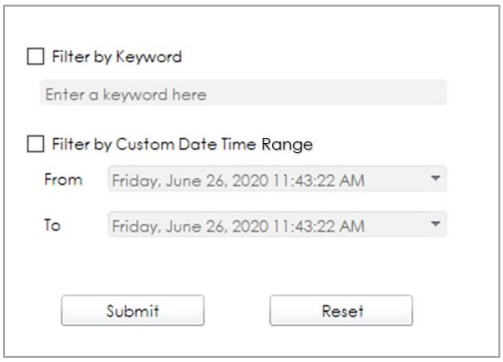
Logs

An internal log server has been integrated into WaveManager. It can record WaveOS logs for one or a set of products using the syslog protocol.

This screen displays all the WaveOS logs received by the WaveManager internal log server.

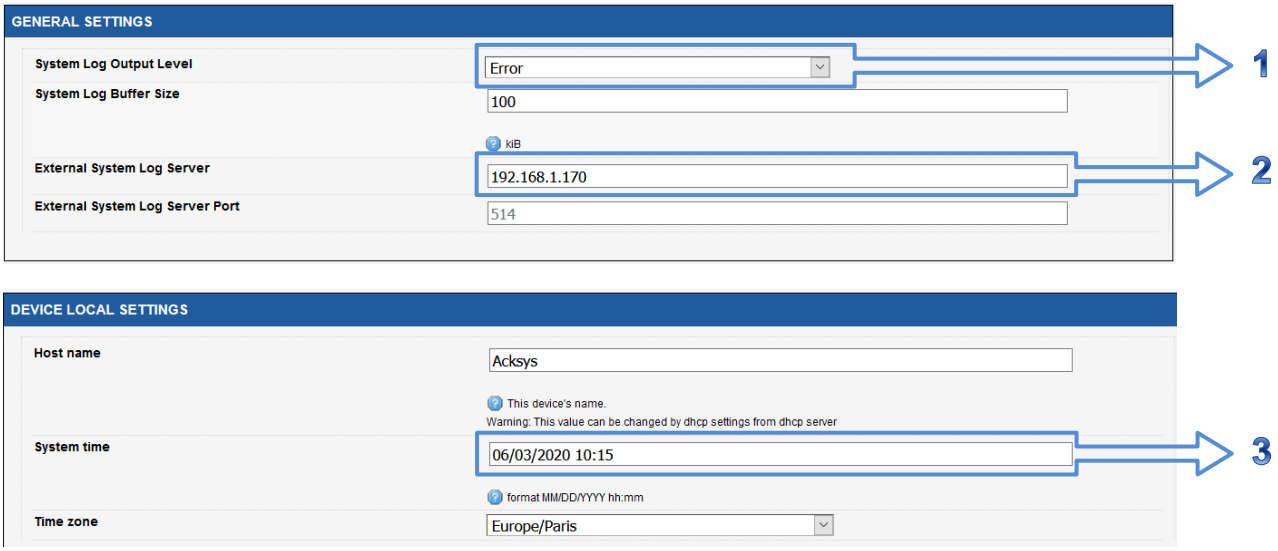


You can refresh, delete or export the log data by clicking the buttons. You can also filter the logs by keyword or by custom date time range:



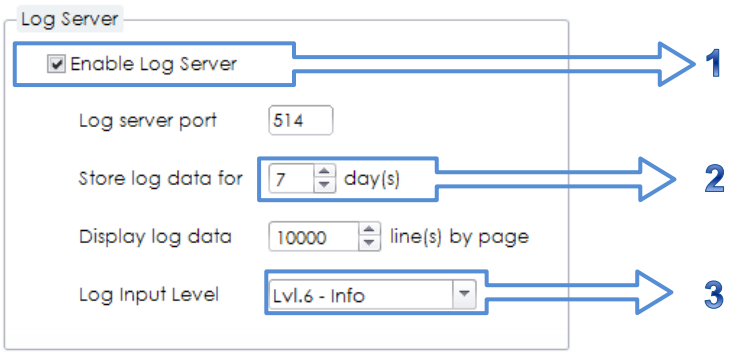
SETUP THE AUTOMATIC EMISSION & RECEPTION OF LOGS

→ *Emission: In the product web interface*



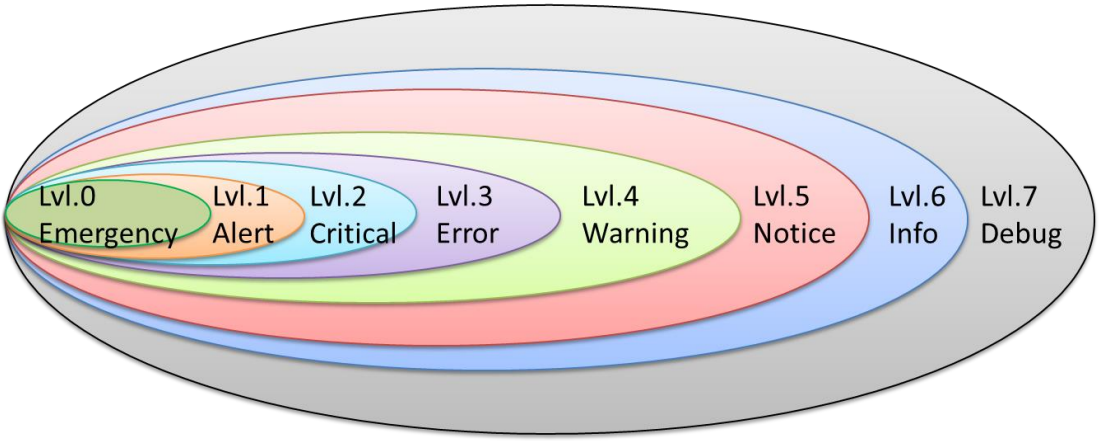
1. Configure the desired log level (Tools> Log settings> General settings)
2. Configure the computer IP where WaveManager is installed
3. Configure the system time on the product
4. Save & Apply

→ *Reception: In WaveManager*



1. Enable the log server in WaveManager (Software settings> Advanced)
2. Set the logs retention period
3. Set the input log level (Higher priority logs will be ignored → Avoids congestion of the database in the event that the logs were set too high on the product side. Ref. *Log priority level*)

- Log Priority Levels -

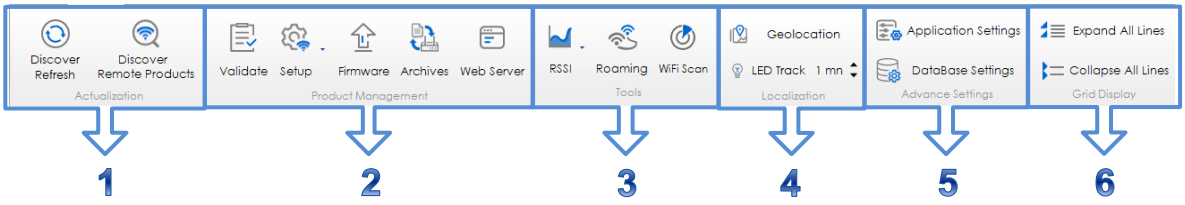


The capacity of WaveManager database is 10G.

- Make sure that WaveManager can reach the target product (Product displayed in green in the product list) by IP address. If the product is on a different network, add the product route to WaveManager on the router.
- Allow WaveManager on the computer firewall (where WaveManager is running).

7. THE TOOLBAR

The toolbar is divided into six very distinct parts:



1. Actualization: product integration and refresh
2. Product management: Product validation and configuration
3. Tools: Data statistical tools
4. Localization: GPS or local track
5. Advanced Settings: WaveManager settings and internal database settings
6. Grid Display: Options to change the product list display

7.1. Actualization

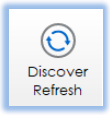
This part has two buttons:

→ Discover / Refresh

→ Discover Remote Products

Discover/Refresh

This function allows to discover or refresh manually products in the inventory.

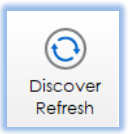


The refreshing delay of a product is editable in the application settings *(see Application Settings)*.

Several cases:

1. If the product discovery and the refreshments are enabled:

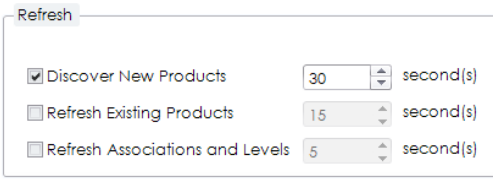
→ WaveManager will propose to discover new products in the local network or to refresh the status of the products in the database.



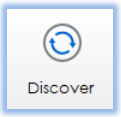
2. If only the refreshments are enabled:

→ WaveManager will only propose to refresh the status of the products in the database

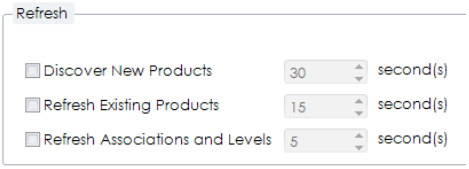
3. If only the product discovery is enabled:



→ WaveManager will only propose to discover new products in the local network.



4. If nothing is enabled:



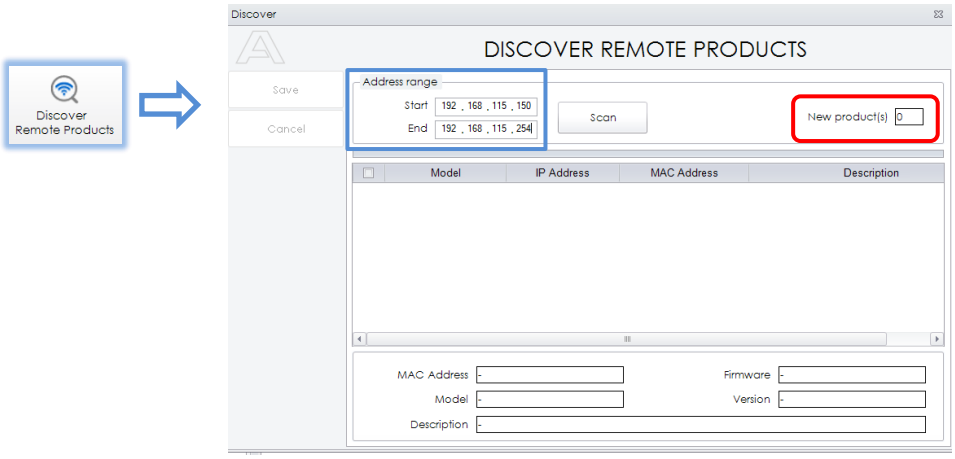
→ WaveManager will neither propose the product discovery nor the product refreshment. The button will be disabled.

By clicking on the discover/refresh button, WaveManager will send a refresh request **immediately**, according to the specific case.

Discover Remote Products

This function allows detecting remote products manually. This mode should be used to detect products outside the local network.

It requires entering the range of IP addresses to scan.



WaveManager displays all the products found except those already registered in the WaveManager.

The search delay depends on the address range and the network topology.

At the end of the search, the “New products” counter indicates the number of products discovered in that address range.

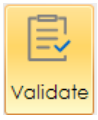
→ To save the displayed products, select them and click on “**Save**”. Those products will be registered in the **WaveManager database**.

If you have several networks and/or IP address ranges to explore, repeat the operation for each case.

7.2. Product management

Validate button

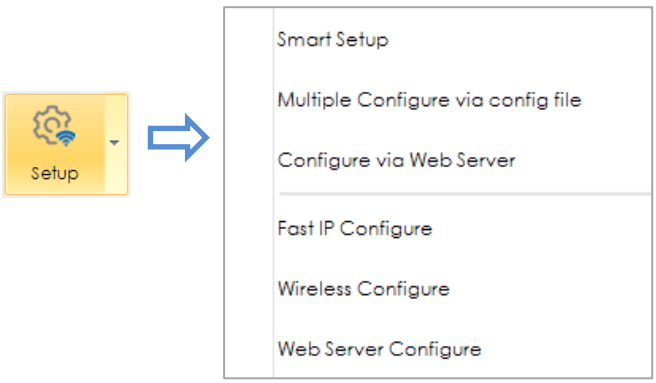
This button validates the products detected in the database:



1. Select one or several products from the list
2. Click on Validate
   You may also right-click on the selected product, then click on "**Validate product**" or "**Validate configuration**" in the context menu

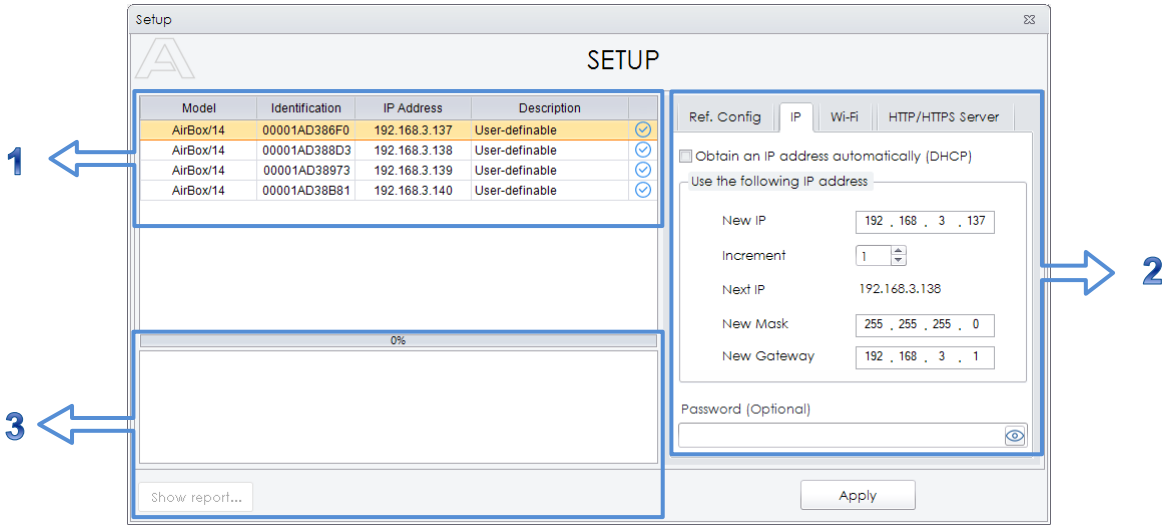
Setup button

This option allows changing the settings of the selected product(s). By clicking on this button, several options are available:

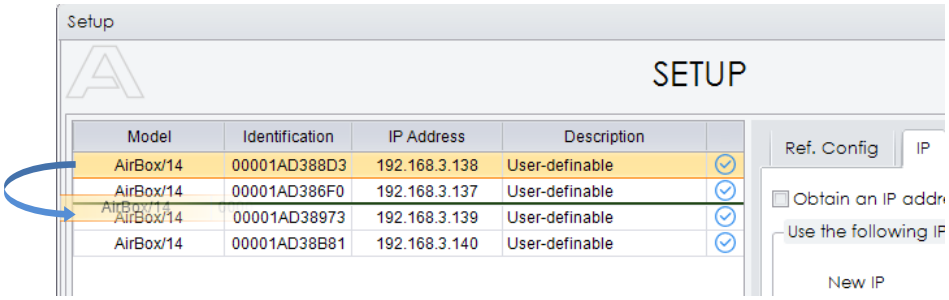


→ "**Smart Setup**" to configure all OIDs from Acksys MIB by SNMP for one or a set of ACKSYS products. (See *Smart Setup*)
→ "**Multiple Configure via config file**" allows to assign a reference configuration file to the selected products;
→ "**Configure via Web Server**" allows to access whole settings of the selected product(s) in the web interface (*see Web server button*);
→ **The "Fast IP Configure**", "**Wireless Configure**" and "**Web Server Configure**" options give access to the corresponding tab in the "Setup" window.

The “Setup” Window is divided into 3 sections:



1. The top left section displays the inventory of the product(s) which the changes are being made. All the columns (Model, ID, IP address and description) are used to sort the products. You might organize the product list manually by dragging and dropping **if there is no existed sorting**.

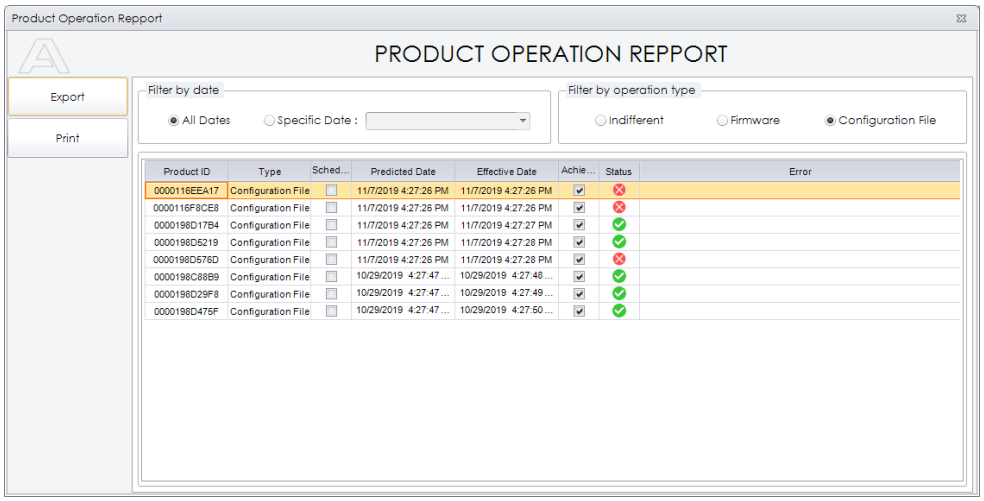


An icon on the right of the list displays the status of the product to be edited. By hovering over it, a small information as tooltip will appear:

- Means the product is available and compatible with the operation to be performed.
- Means the compatibility between the reference configuration and the product cannot be verified yet the operation may be affected by the selected configuration.
- Means the product is incompatible or unavailable. Such product will not be operated.
- Means the operation was successful.
- Means the operation has failed.

2. The right section with the tabs allows managing the product configuration reference file and changing IP address, Wi-Fi and web server.

3. Operation progress and the operation report. To consult, export or print all the operations performed results, click on the "**Show report…**" button:



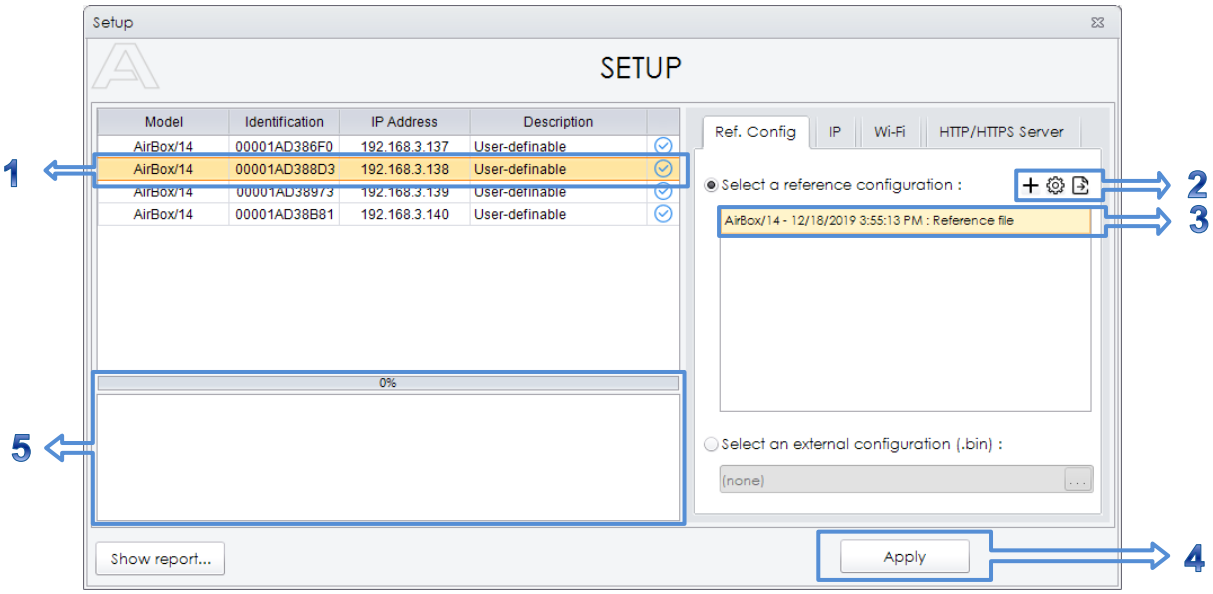
"Ref. Config" tab:

This tab makes it possible to assign a reference configuration file to one or several products.
A reference configuration file is a file listing whole parameters of the reference product (of a given model).

> The assignment of a reference configuration file only works on the same brand products.

→ *Assigning a configuration file from a product in the list:*

It is possible to generate a reference configuration file for a product in the list by using the current window or by using the "Archives" menu in the toolbar (*see Archives button*).



1. After selecting some products in the main interface and clicking on the "**Configure**" button > Multiple Configure via config file;
2. Click on the requested product then click on the + icon to generate its reference configuration file;

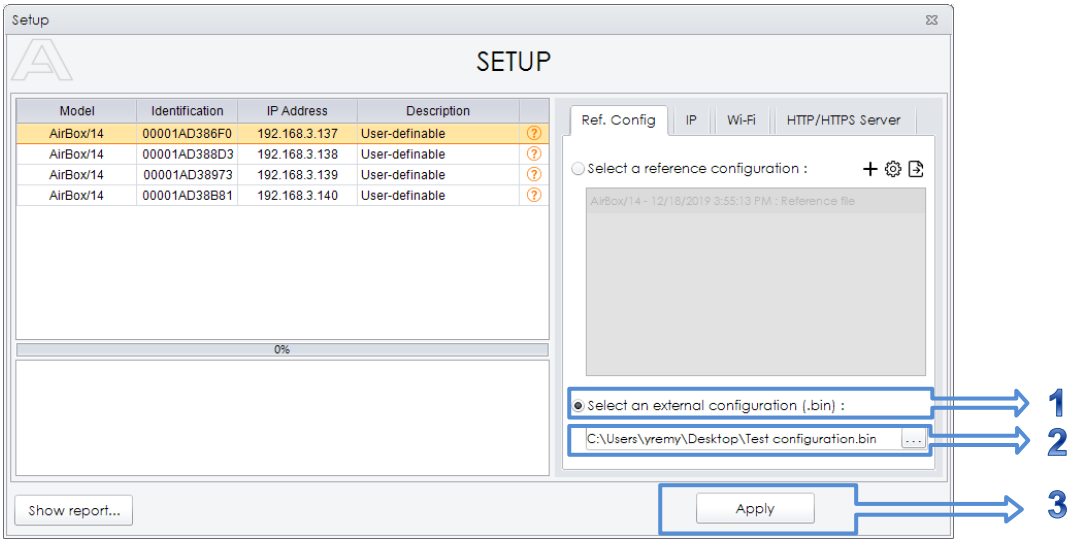
   ⚙ Manage all the reference configuration files available (*see Archives button*).

   Export the reference configuration file selected in the list.

3. A reference configuration file is then generated. That file is also available in the product's archives window (*see Archives button*). Generating various versions of a reference configuration file is also possible.

4. Click on “**Apply**” to assign the configuration to all products in the list.
5. The operation details will be displayed.

Assigning a configuration from an external file:



1. Choose “Select an external configuration (.bin)”.
2. Import the external configuration file.
3. Click on “**Apply**” to assign the imported configuration to all products in the list.

It is important to note that the reference configuration file to be assigned to the products should be set to **Automatic IP.** Otherwise, the products will end up in “IP conflict” (s*ee “IP” tab below*).

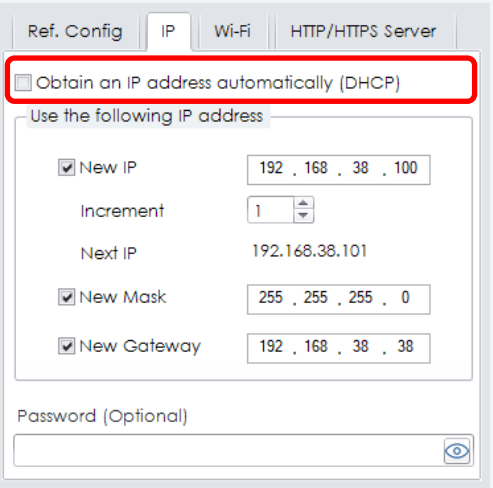
"IP" tab:

This tab allows changing the IP configuration of the selected devices.

> IP configuration is only possible if the product discovery agent is enabled (*see Product details window*). **That feature only works on a local network.**

On this tab, you can:

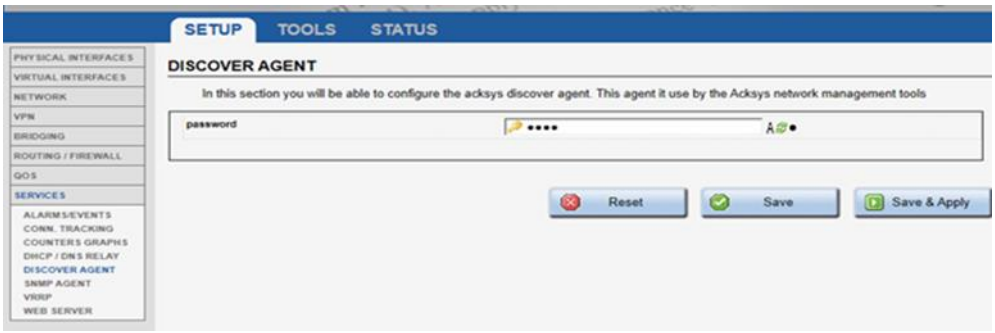
- Enable or disable the automatic IP mode (DHCP);
- Set a new fixed IP (if DHCP disabled);
- Set a new subnet mask;
- Set the gateway address.



You can change the IP address for several products by specifying the address increment value.

If you have set a **Discover AGENT password** in the product web interface (*see Overview of the WEB interface below*), fill in the field "**Password"** to allow changes

→ **Overview of the Web Interface:**

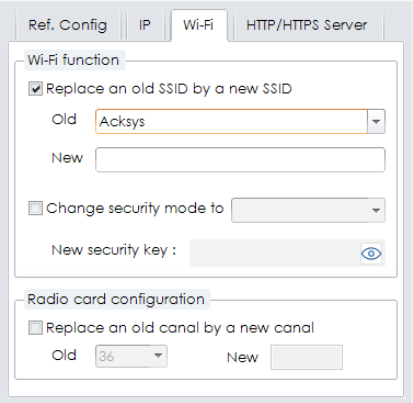


> **In case of "IP Conflict", the recommended IP setting is DHCP:**
> In the main interface, select the products concerned, then go to Configuration > Fast IP Configure.
> Check the box "Obtain an IP address automatically".
> Save the changes.
> Please note that a DHCP server must be available on the local network.

WaveManager is not a DHCP server, it only facilitates the IP configuration for the products to allow their integration into your infrastructure.

"Wi-Fi" tab

This tab allows changing the SSID, security mode and channel for the products in the left list.

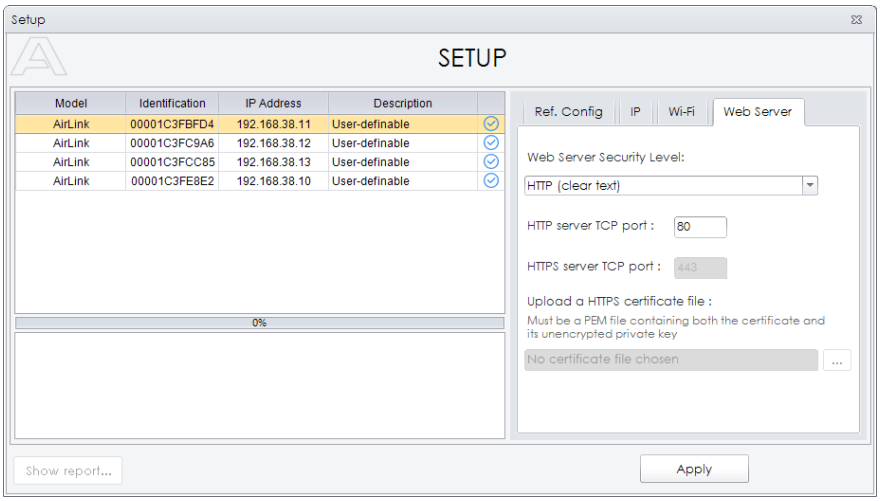


A product may have **several roles** (and therefore several SSIDs and channels), it will be necessary to enter the values of *SSID* and *channel* to be changed in the "Old" field.

"Web Server" tab

In this tab, you can edit the web server configuration for the products in the list by:

- ✓ Configuring the HTTP server: activation and port
- ✓ Configuring the HTTPS server: activation, port and certificate

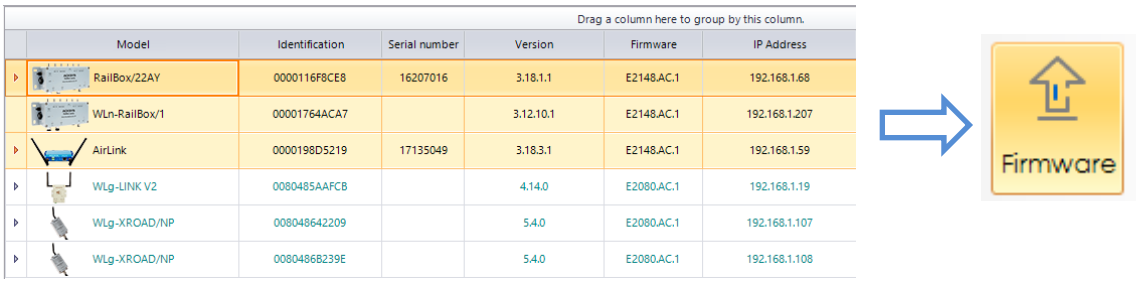


If you wish to enable HTTPS server, it is strongly recommended to upload a web certificate file (PEM format). A default low security self-signed certificate is used if you do not provide one.

Firmware button

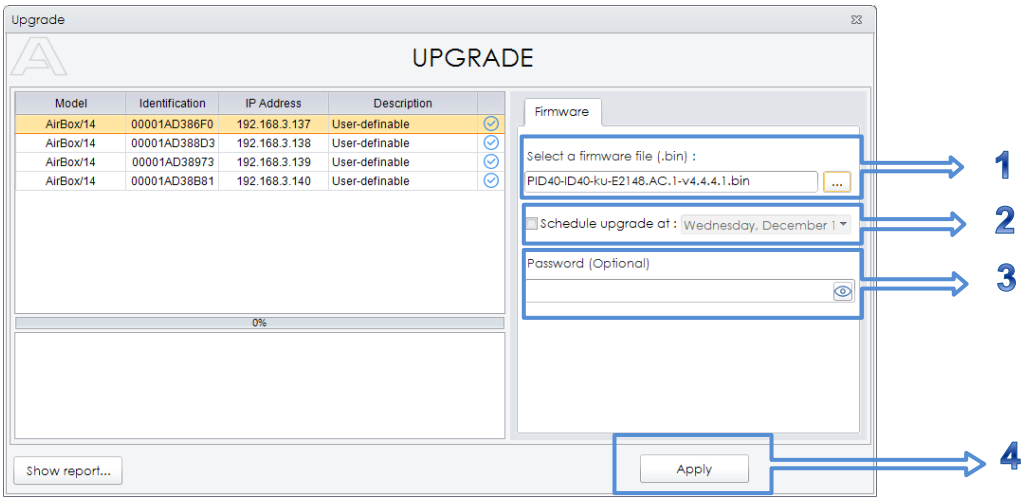
It updates the firmware for the selected products.

1. Select the product(s) with the “Ctrl or shift” key.
2. Click on **Firmware** or right-click > Update firmware.



WaveManager partially supports WaveOS products with versions prior to the one specified in the ***Information*** tab.

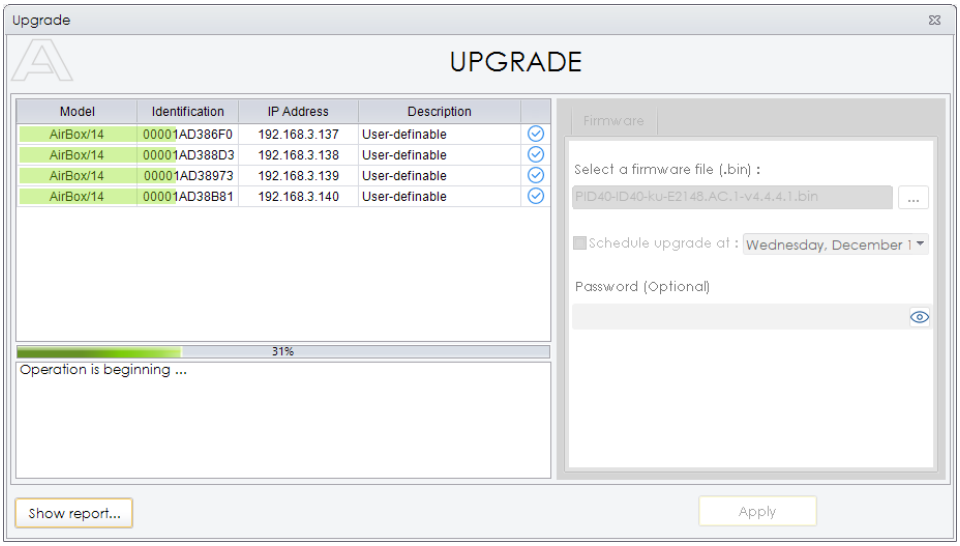
It is strongly advised to update your WaveOS products to the last version of the firmware for the optimal support of whole WaveManager functionalities.



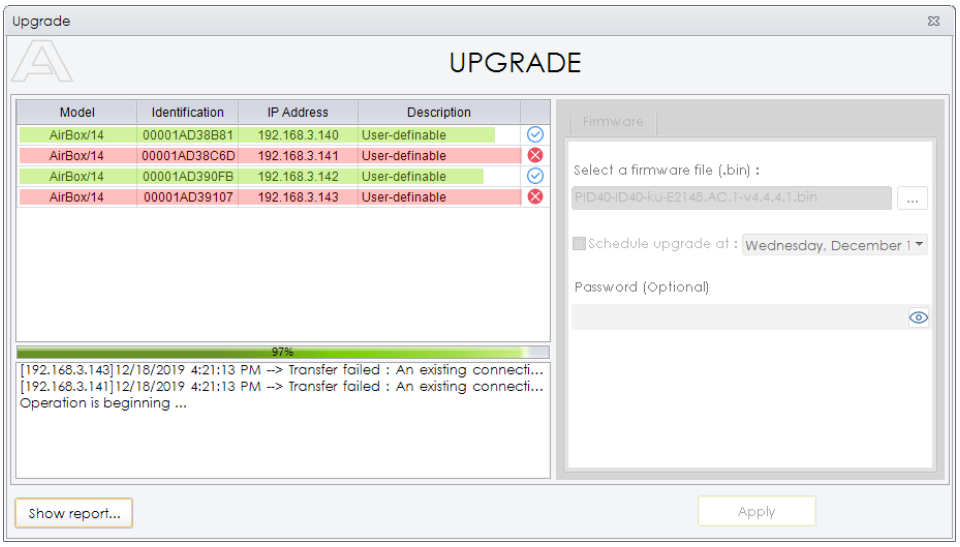
1. Upload the new firmware version from your computer.

WaveOS firmware is available for download at:
https://www.acksys.fr/en/support/download-center/softwares-and-drivers-downloads/

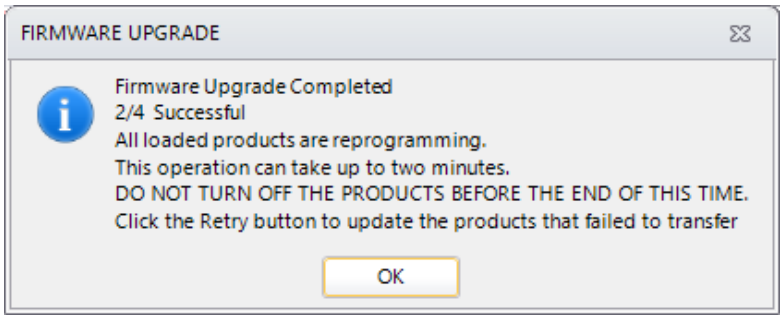
2. Since the update procedure can be long, it is possible to schedule it by choosing the time and date of it (*See To make a delayed update*)
3. The password is defined in the product web interface at *SNMP > Discover AGENT* (see *SNMP*).
4. Click on "**Apply**".



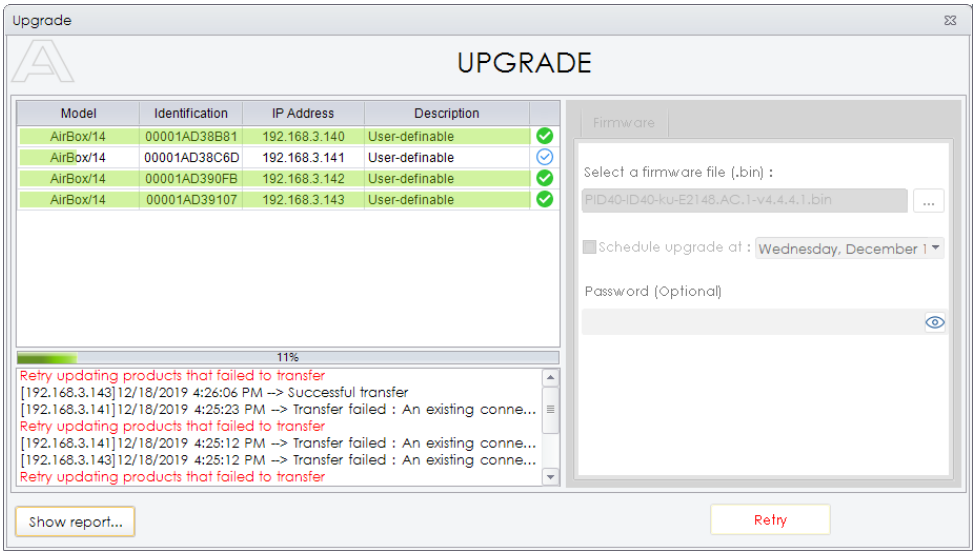
The products will be updated simultaneously.

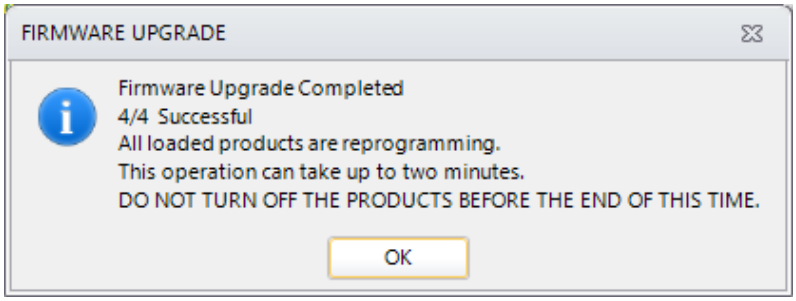


A message will appear when the updates are made and will inform you about the restart of the products.



In case of failure on one or several products, you will have the possibility to relaunch the update exclusively for the failed ones.

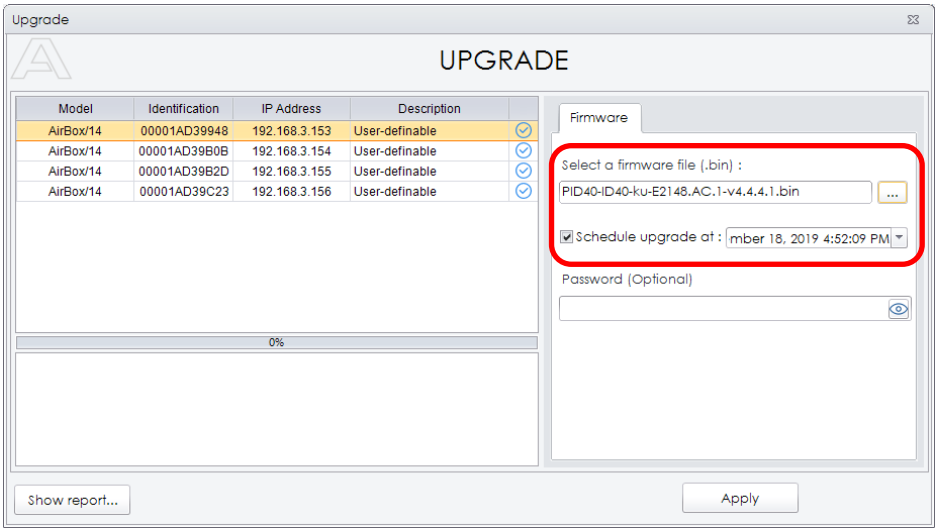




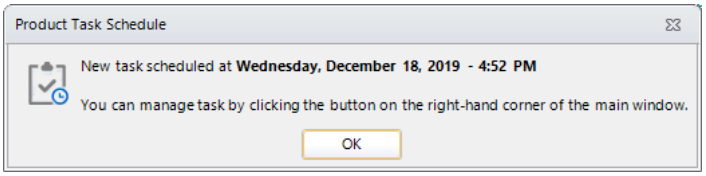
Warning: The firmware must be **compatible** to all the products in the update list.
Simultaneous product update takes up a lot of bandwidth.

To make a delayed update:

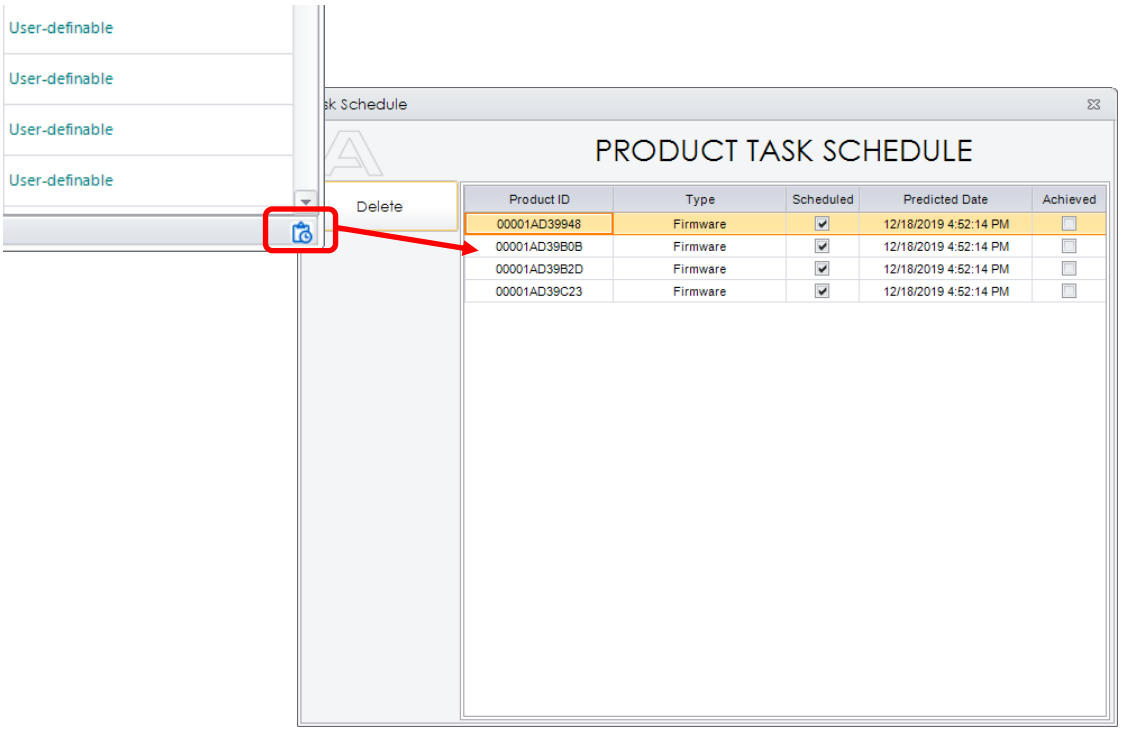
Choose the firmware to update on your computer as well as the desired date and time of the update.



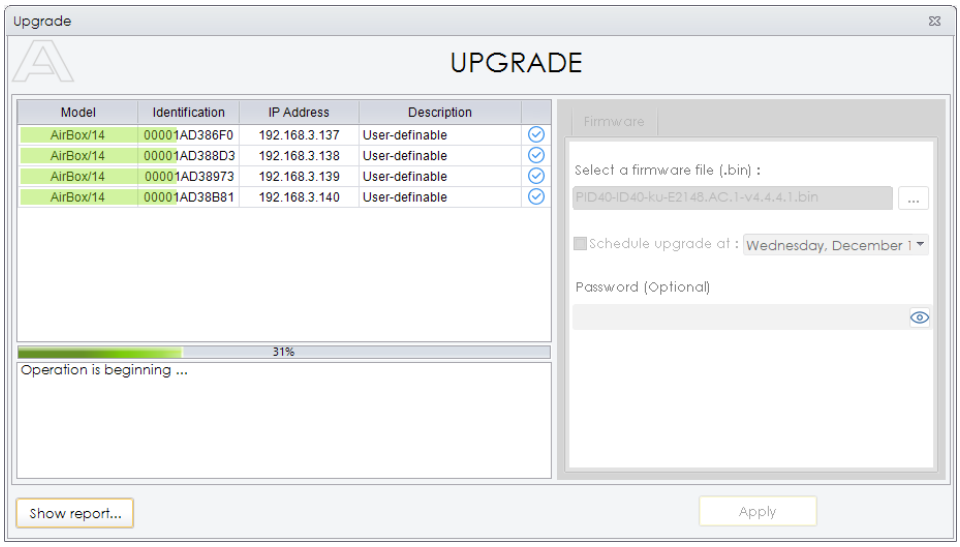
A message will appear to inform you of the task schedule.



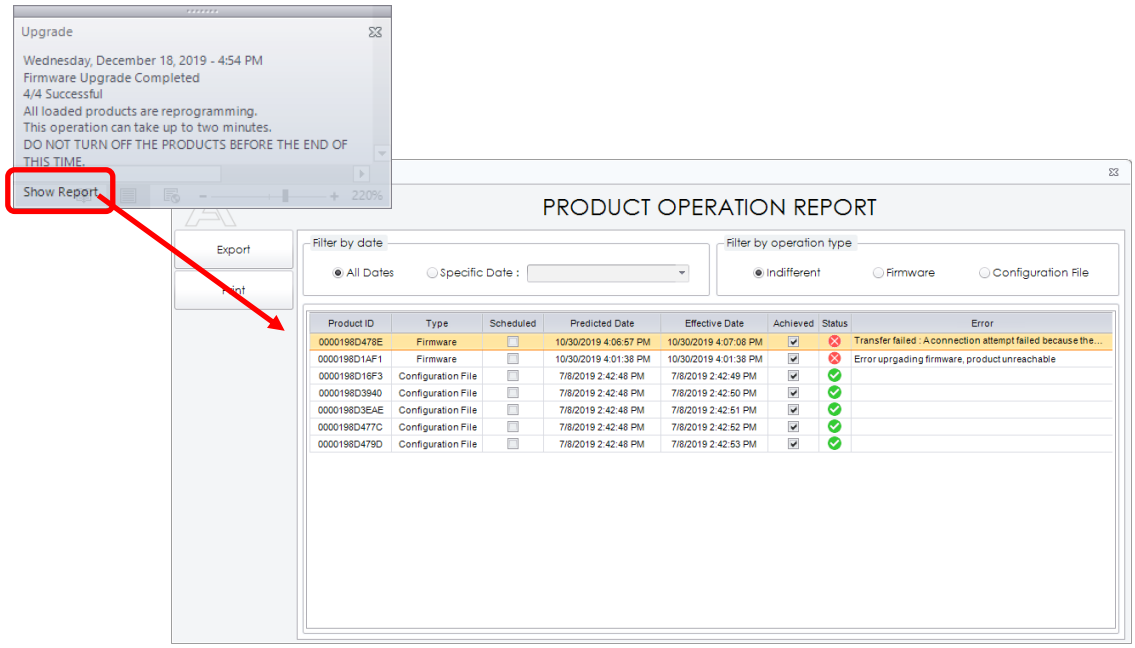
You can manage your tasks by clicking on the icon at the bottom right (You can for example delete a scheduled task before its execution).



The update will start automatically on the date and time set.



A message will appear when the updates are made and will inform you about the reprogramming of the products. For more details on the status of the products, click on “Show report”.



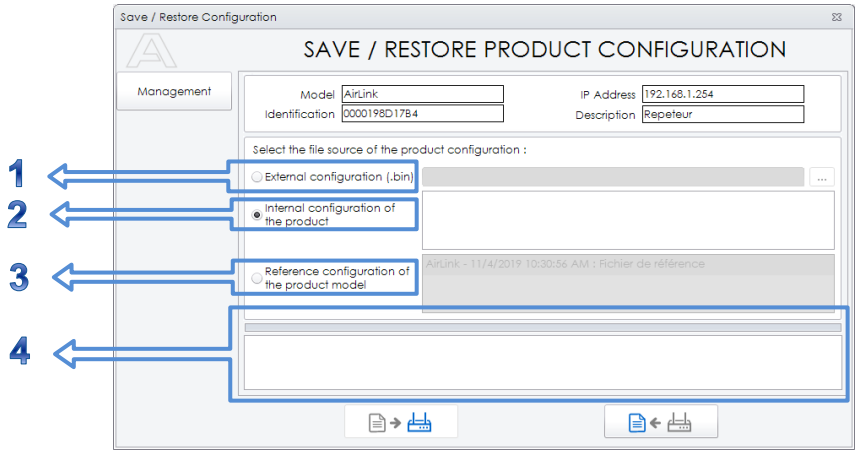
In case of failure on one or more products, WaveManager will automatically restart the update once.

Archives button

It allows managing the settings of a product via a configuration file.

The main window, **Save/Restore product configuration**, allows you to:

1. Assign an external configuration file (*.bin*) to the product.
2. **Archive** configuration file into the WaveManager database**.**



3. Generate a reference configuration file from a product to make it assignable to the products in the same model (*see Setup button → "Ref. Config" tab*).

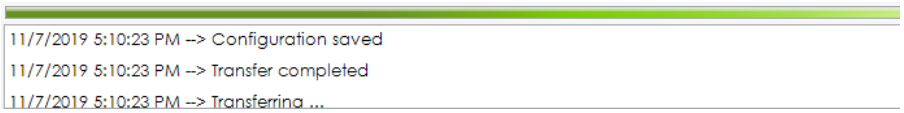
   The name of the configuration file is automatically saved in "*Date-Time-Configuration File"* format.

   You can rename or delete it by clicking on the "**Management**" button.

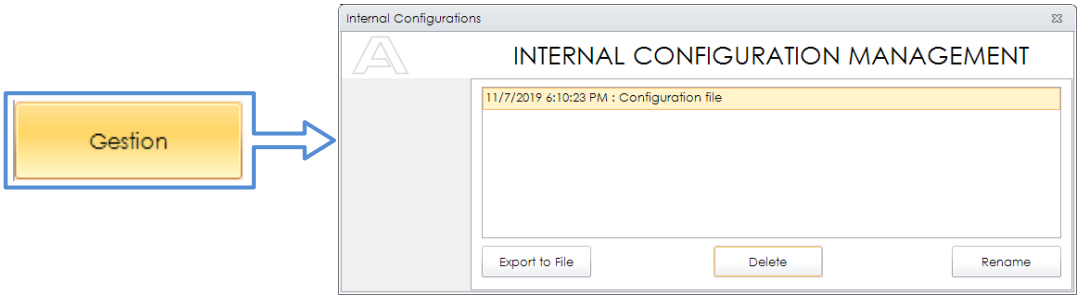
→ After importing an external configuration file, click on the following button to apply the settings into the product:

→ After selecting the internal configuration file option or the reference configuration file option, click on the following button to generate the archive from the product:

4. The lower part of the window displays the logs of the archiving operation.



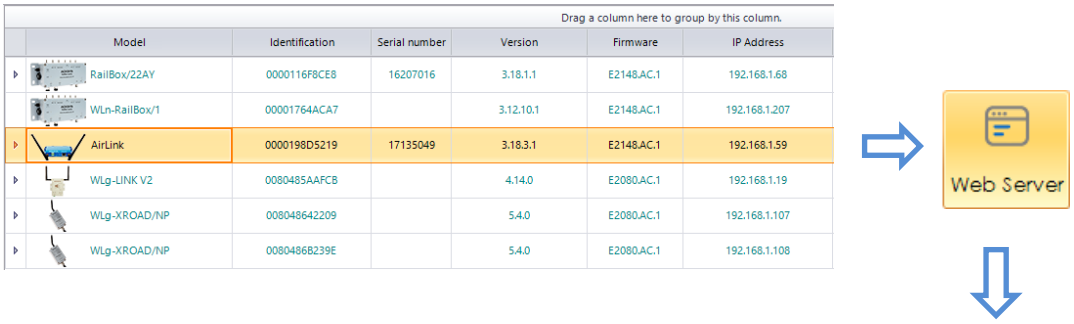
→ To manage an internal archive file, click on the "**Management**" button:

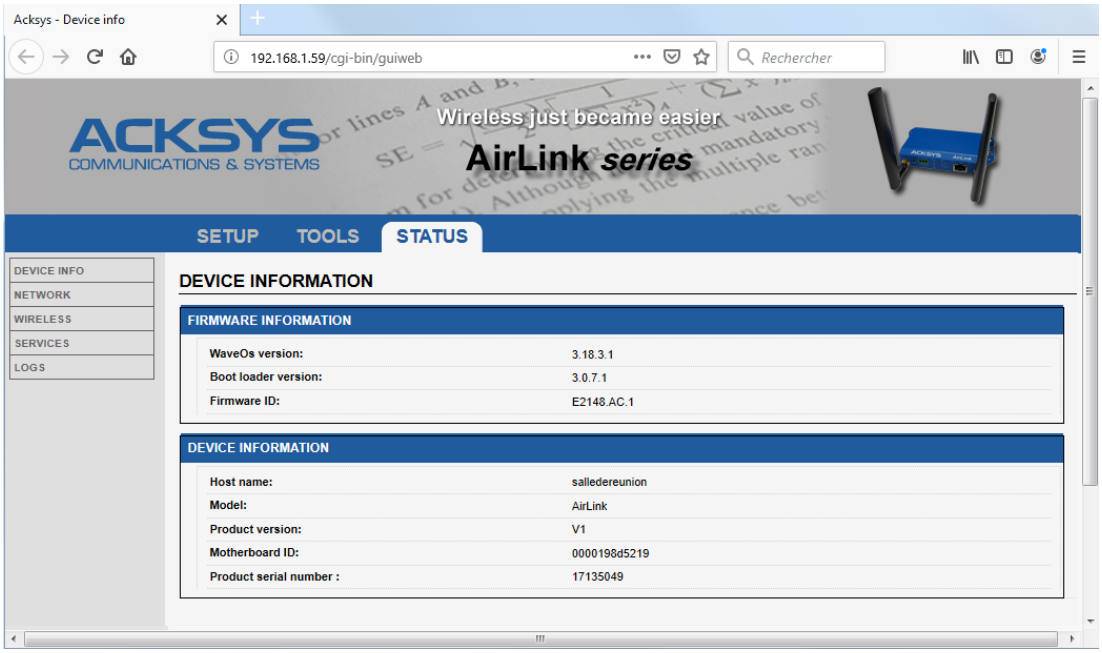


The **Internal Configuration Management** window gives access to all the archives stored in the database. It allows you to export, delete or rename them.

Web server button

The **Web Server** button gives access to all the product settings on the web interface.





7.3. Smart Setup

Overview

Smart Setup allows you to configure all Acksys MIB OIDs by SNMP for one or a set of ACKSYS products. The user can consult the ACKSYS MIB in a hierarchical form (tree view) in the HMI of WaveManager. **Smart Setup** contains an intelligent engine to distinguish exploitable OIDs and their properties.

WaveOS products can benefit from all the features of Smart Setup. Read-only OIDs and those which only support WLg series, are not displayed in Smart Setup.

Smart Setup is accessible by:

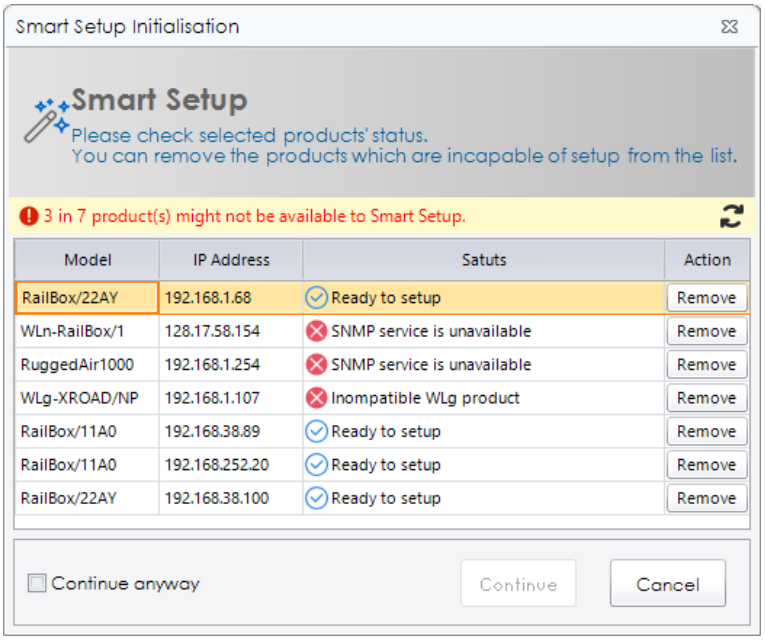
- → An option in the setup button on the toolbar of the main window
- → a button in the "Product details" window
- → a contextual menu by right-clicking on a product selection in the main window

After selecting one or several products in the main page, and launching Smart Setup, it will first check the status of the selected products.

Status to check	Possible answers
✓ Are the products reachable by SNMP? ✓ Are these WaveOS products? ✓ Do they have any unapplied changes?	✓ Ready to setup ✓ SNMP service is unavailable ✓ Incompatible WLg product ✓ Submitted parameters waiting for apply* ✓ Unknown apply status* ✓ Unknown error

** Product protection mode required (See Product Protection)*

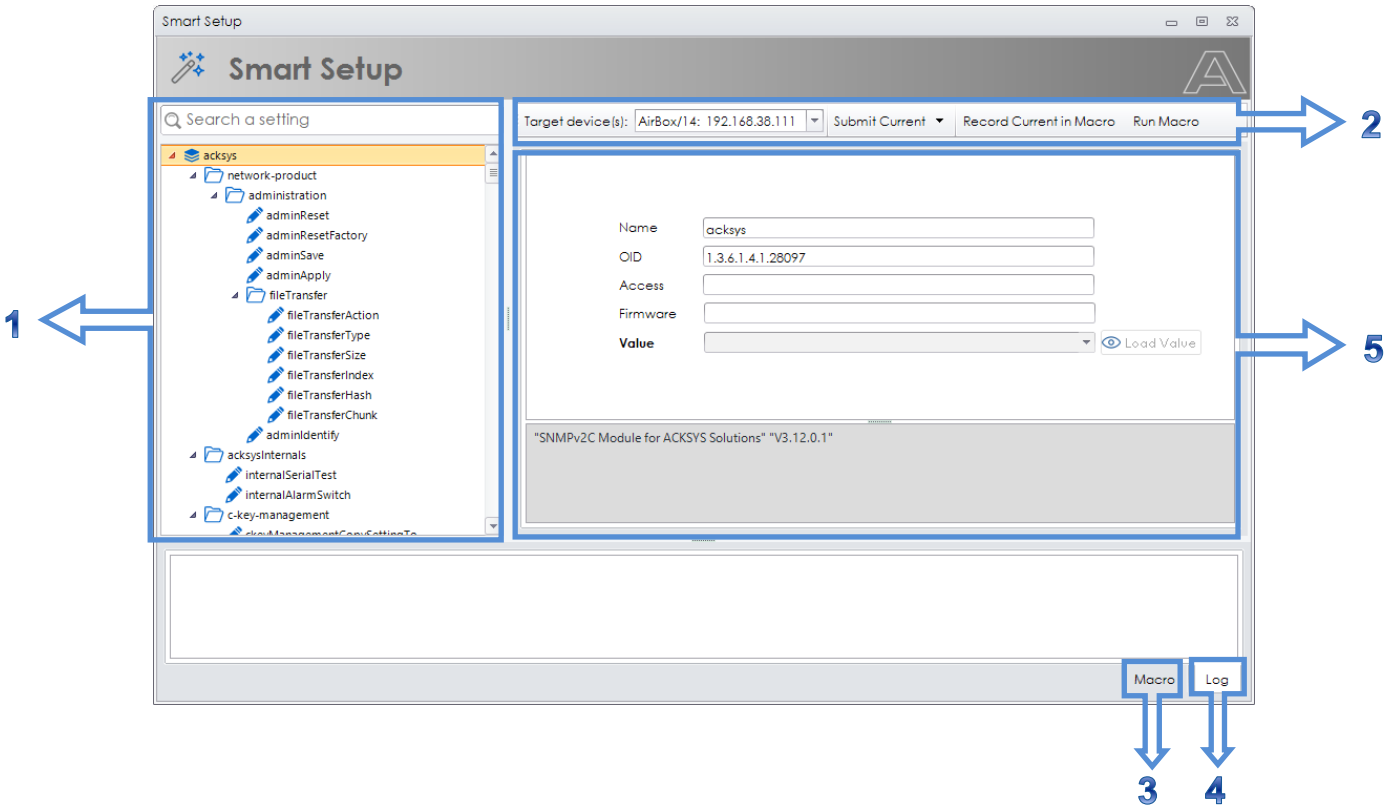
If at least 1 product does not pass the verification, the window below will appear.



You can remove the wrong products or return to the main page, or continue by keeping your choice.

If all products have passed the verification without concern, this window will not appear.

Smart Setup window details



1. The MIB tree is used to display the Acksys MIB in hierarchical form. The search bar at the top allows you to find an OID quickly.

2. The button bar with :
   - → The list of selected products: allows you to see or modify the target product according to the different operations
   - → The "**Set Current**" button: used to submit the current configuration to the target product(s)
   - → The "**Save All**" button: sends the "Save" command to the target product(s). It allows the products to save the current configurations.
   - → The "**Save All & Apply**" button: sends the "Save" command and then "Apply" to the target product (s). This allows the products to apply the saved configurations.
   - → The "**Record Current in Macro**" button: used to save the current configuration in the macro list.
   - → The "**Run Macro**" button: used to send all the configurations saved in the macro list to the target product(s).

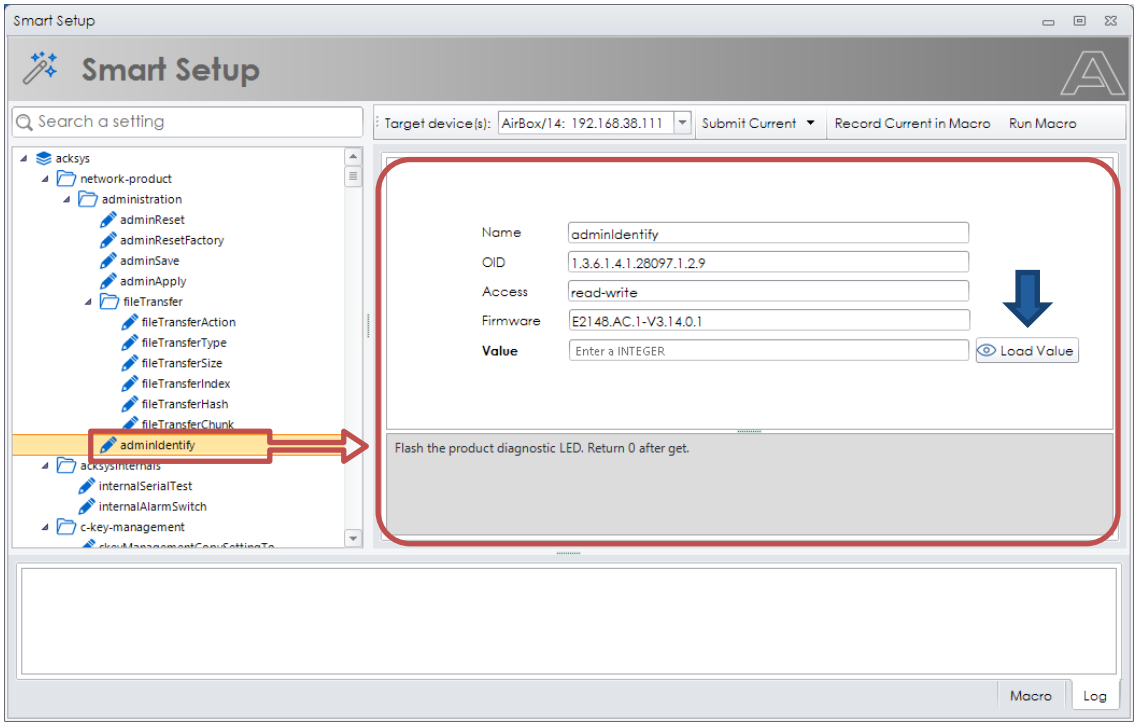
3. The "**Macro**" page allows you to display the configurations added by "Record Value in Macro".

> The macro is an action or a set of actions that you can perform as many times as you want. The user can build his own "configuration script" in the macro list by adding the configurations among all the OIDs in the ACKSYS MIB, and then apply them in the desired order to the target products

4. The "**Log**" page allows you to display processing result.

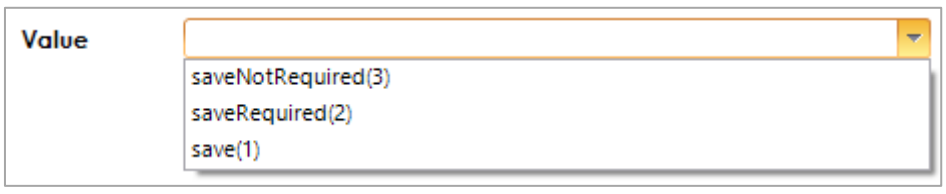
5. The OID detail area :

Click on a scalar OID, its properties are displayed there. In the "Value" field, you can enter a value and then send it to the target product(s). If the target is 1 product, you can read the current value from that product by pressing the "**Load Value**" button. This button is only accessible for 1 target product.

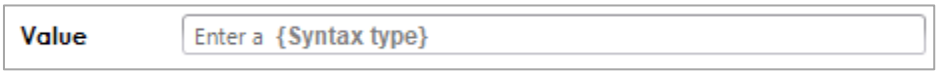


The "Value" field is displayed differently depending on the syntax of the OID:

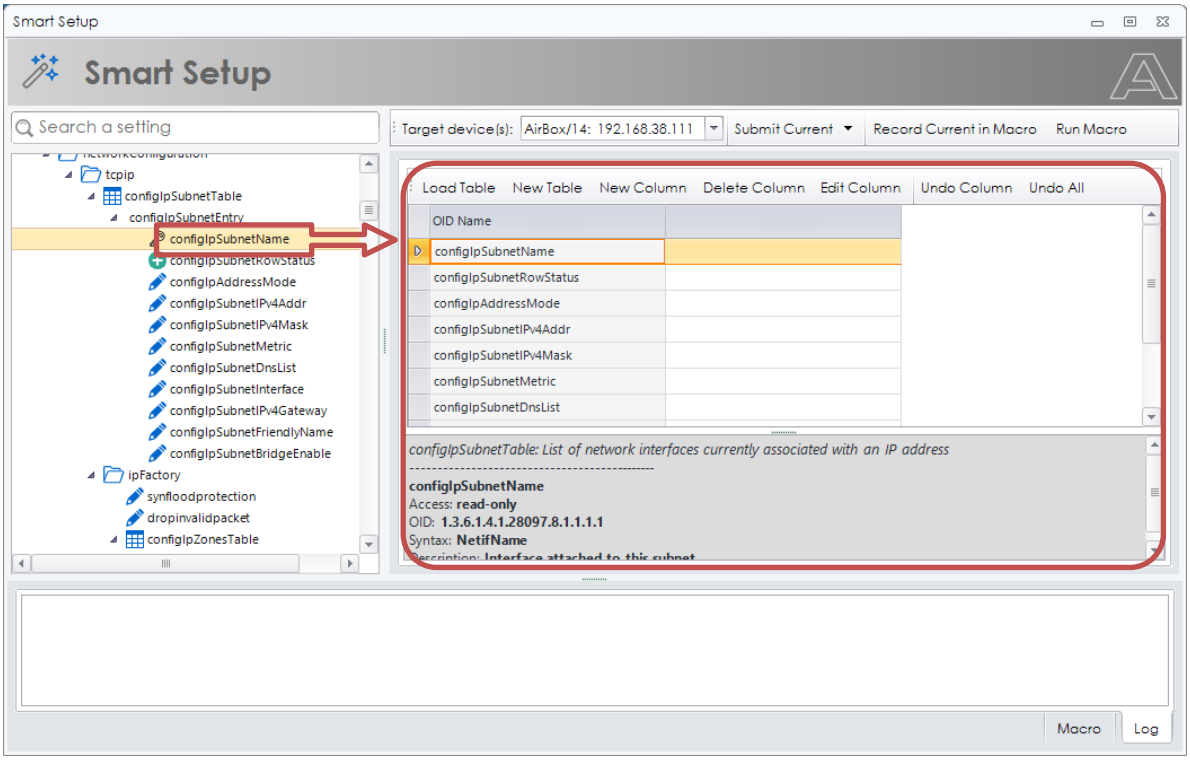
→ If the syntax is of the enumerated type: the "Value" field is a drop-down list.



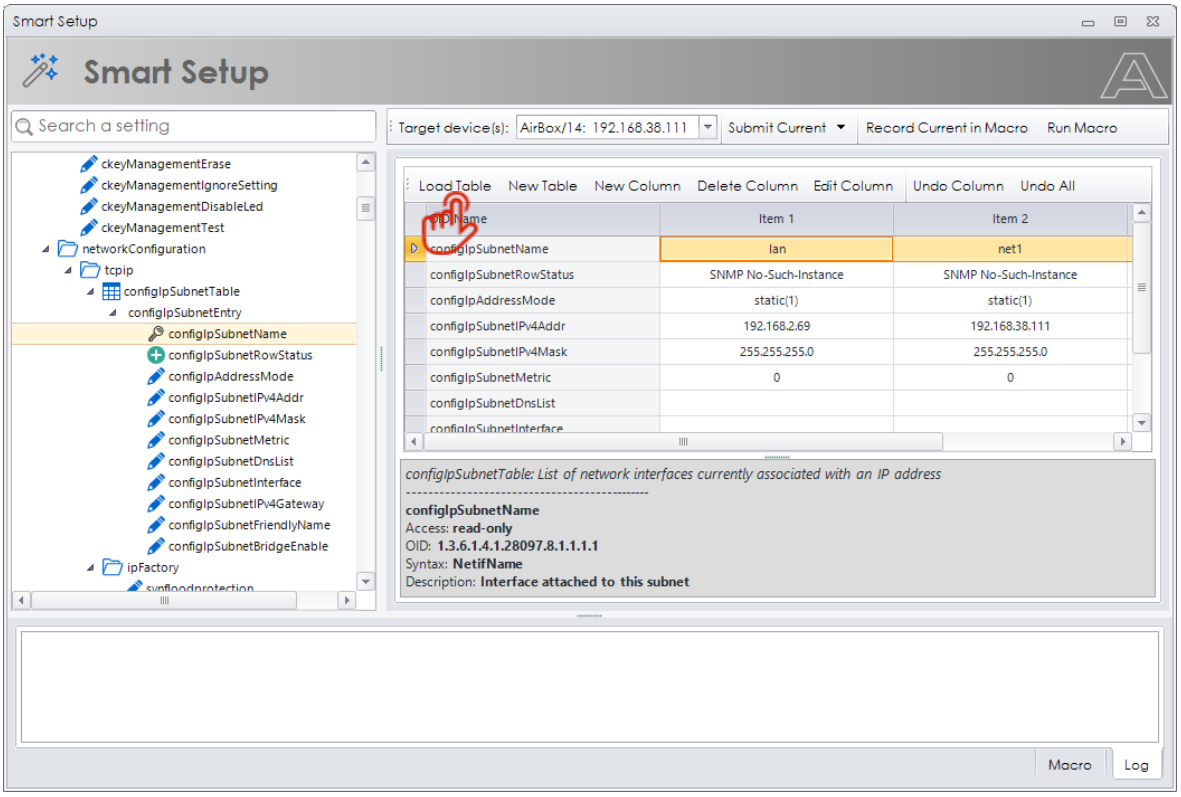
→ If the syntax is standard or specific: the "Value" field is a text field with the index "Enter an {syntax type}".



Clicking on an OID in an OID table will make it appear in table form on the right. The user can add, delete and edit columns by pressing the buttons.



When the target is 1 single product, you can read the current data table from that product by pressing the "**Load Table**" button. This button is only accessible for 1 target product.



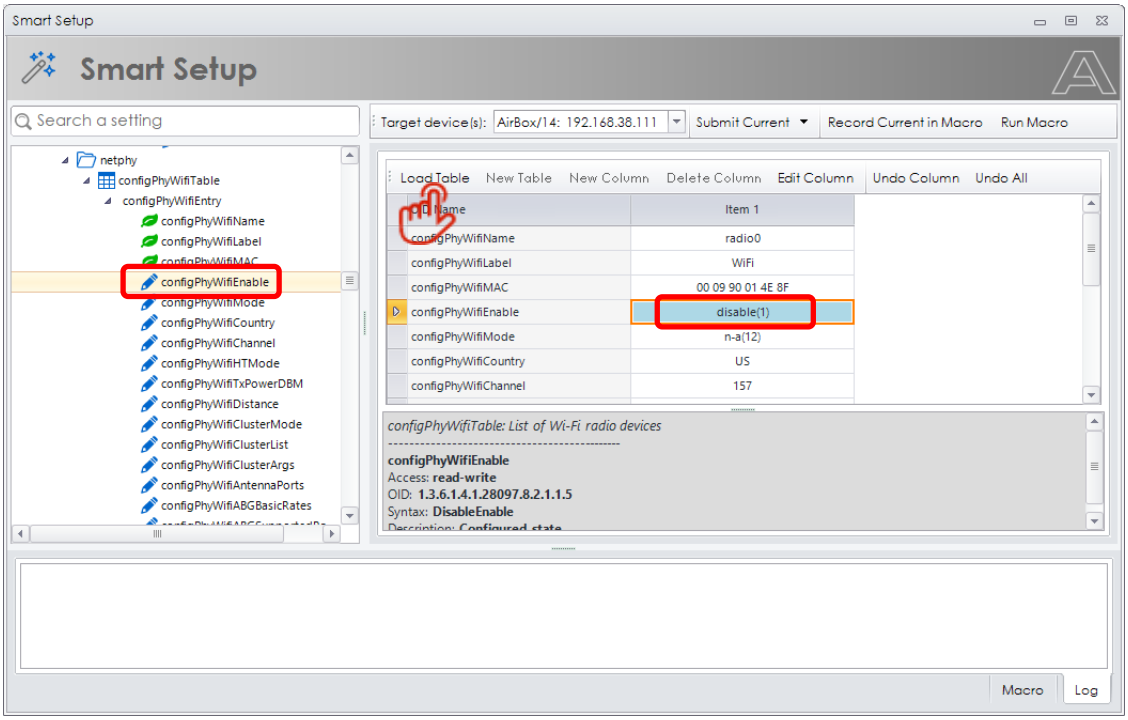
How To

CONFIGURE A SCALAR OID

1. Select a scalar OID to configure
2. Enter a value in the “Value” field
3. Click on the “**Set Current**” button
4. Click on the “**Save All**” button to save this modification in the target product without applying to the concerned services. This allows continuing modifying the product without affecting the processes in service.
5. If you wish to save and apply this modification in the target product, click on the “**Save All & Apply**” button.
   → The operation result is in the log area.

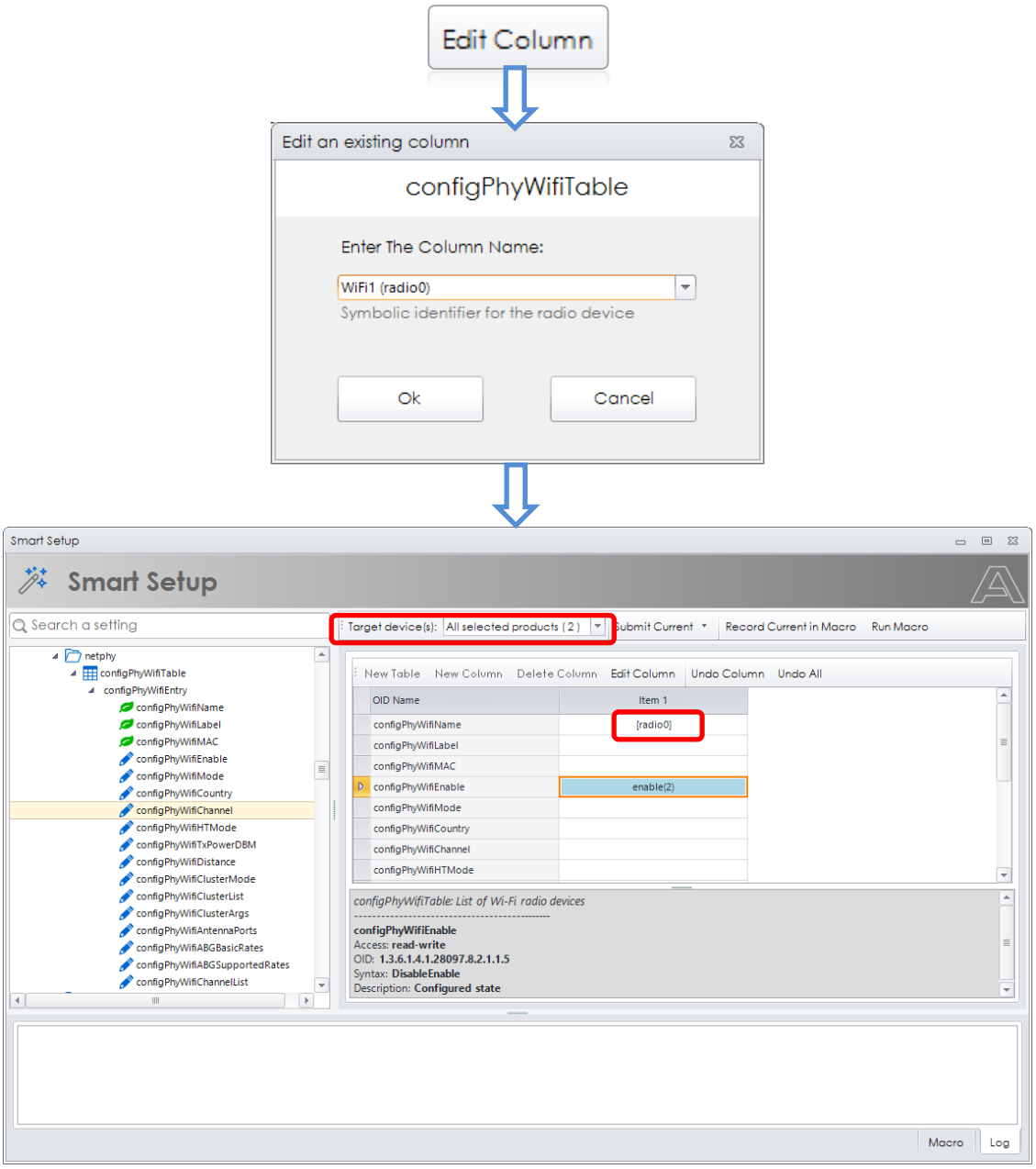
MODIFY A VALUE IN AN OID TABLE

1. Select an OID table to configure. It will be displayed in the table on the right.An OID table can contain multiple data columns. You must indicate the existing column that you want to modify.
   1.1 If the target is a single product, you can load the data from the table by pressing “**Load Table**”, and then double clicking on the value to modify. The background color on the modified field will turn blue.



1.2 If the target is a set of products, you can click on the "Edit Column" button from an empty table, and then enter (or choose) the name of the

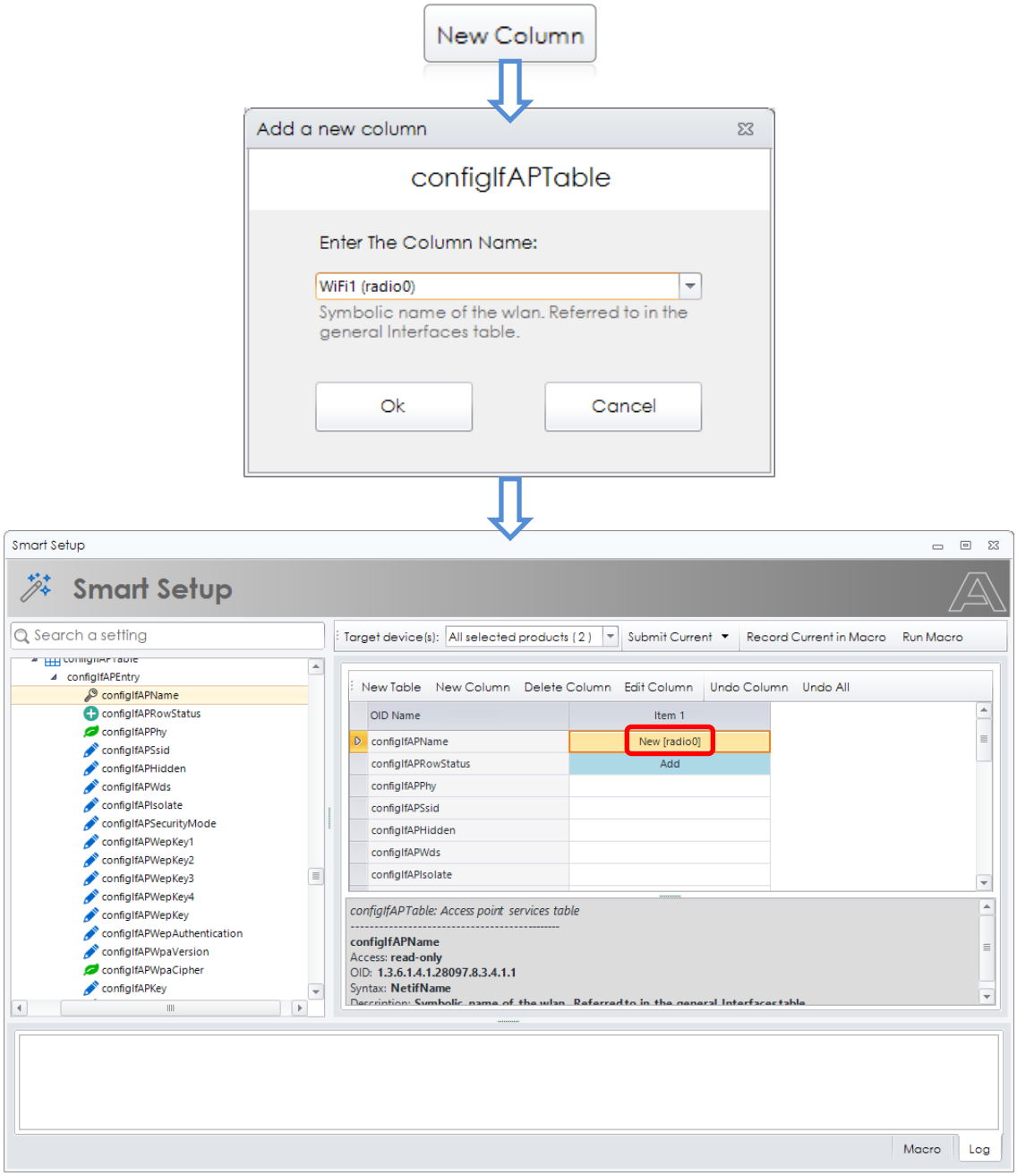
existing column to modify. A new column with the name of the chosen column will be displayed in the table. Then you can enter your configuration there.



2. Click on the “Set Current” button
3. Click on the “Save All” or “Save All & Apply” button to finish
   → The operation result is in the log area

CREATE A NEW COLUMN IN AN OID TABLE

1. Select an OID table to configure.
2. Click on the “New Column” button. You can enter the name or select a column to create according to the different tables. A new column will be created. You can customize the settings in this column by entering the values.
3. Click on the “Set Current” button.
4. Click on the “Save All” or “Save All & Apply” button to finish.
   → The operation result is in the log area.

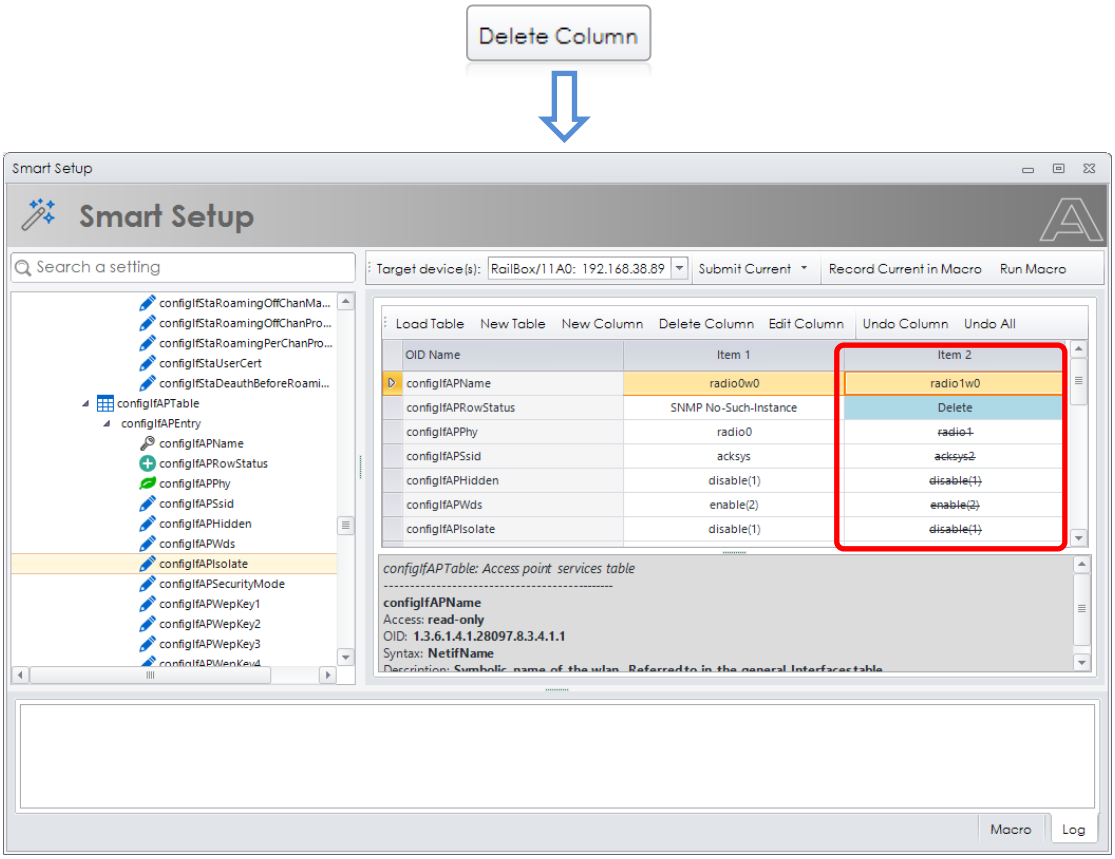


CREATE A NEW TABLE IN AN OID TABLE

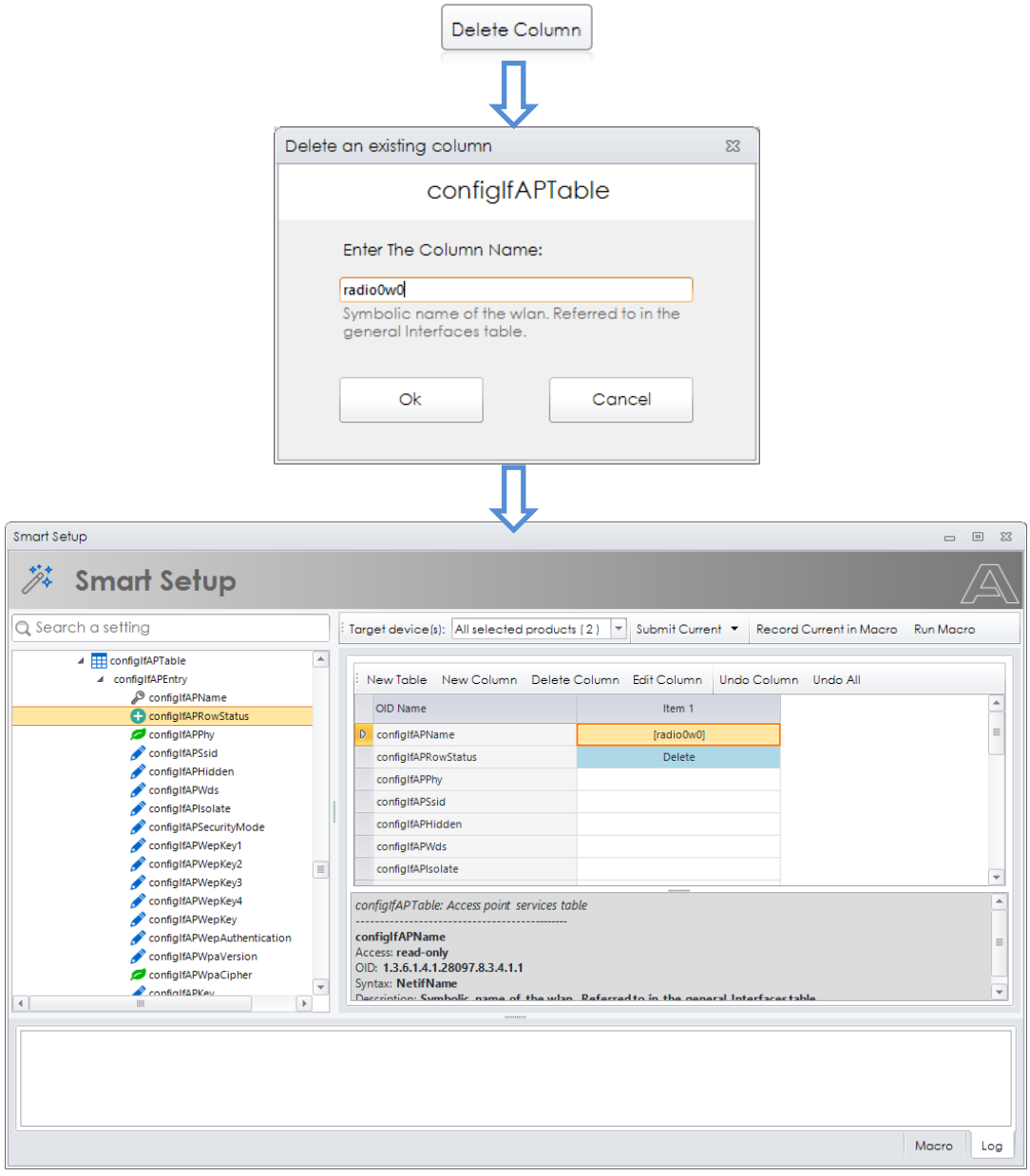
1. Select an OID table to configure.
2. Click on the “New Table” button. When the table is created, the existing data in this table will be deleted. New columns will be added from an empty table. But the effect of creating a new column without creating a new table will not erase existing data in the target product.
3. Refer to the chapter "Create a new column in an OID table" to add the new columns.
4. Click on the “Set Current” button
5. Click on the “Save All” or “Save All & Apply” button to finish.

DELETE AN EXISTING COLUMN IN AN OID TABLE

1. Select an OID table to configure.
2. An OID table can contain multiple data columns. You must indicate the existing column that you want to delete.
   2.1 If the target is a single product, you can load the data from the table by pressing “Load Table”, select the column you want to delete and then click on the “Delete column” button. The data in this column will be crossed out and not editable.



2.2 If the target is a set of products, you can click the "Delete column" button from an empty table, and then enter (or choose) the name of the existing column to delete. A new “existing” column will be created. Obviously, you cannot customize the values there.

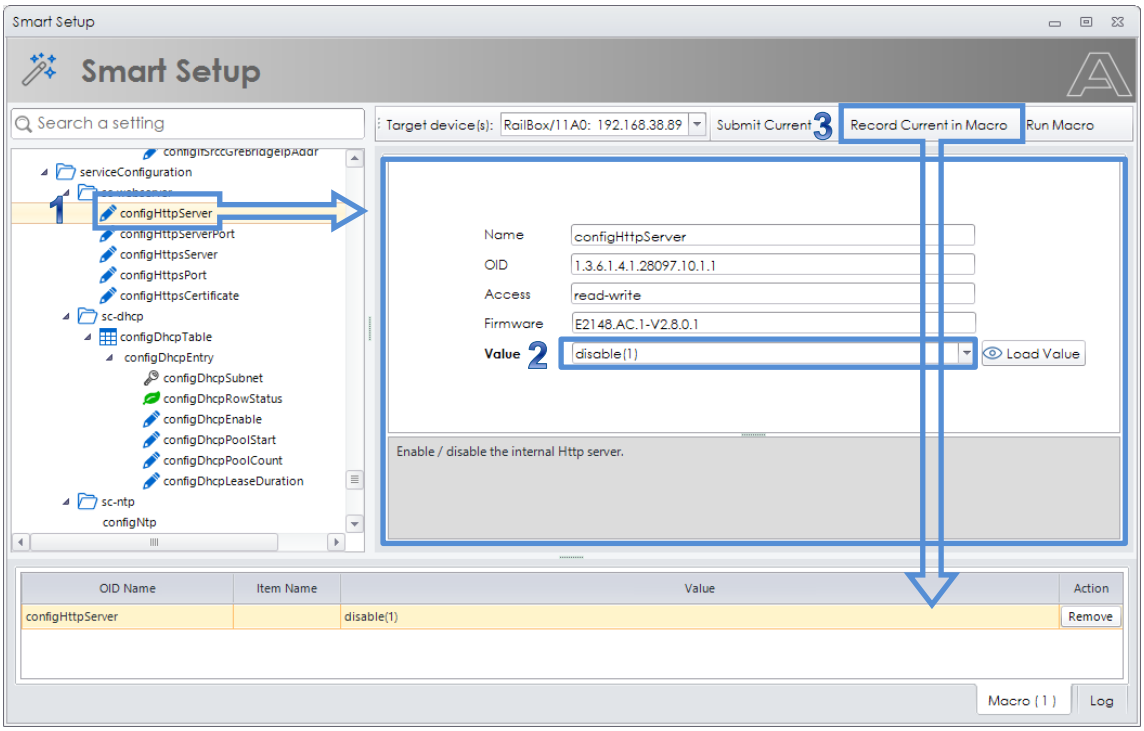


3. Click on the “Set Current” button
4. Click on the “Save All” or “Save All & Apply” button to finish.

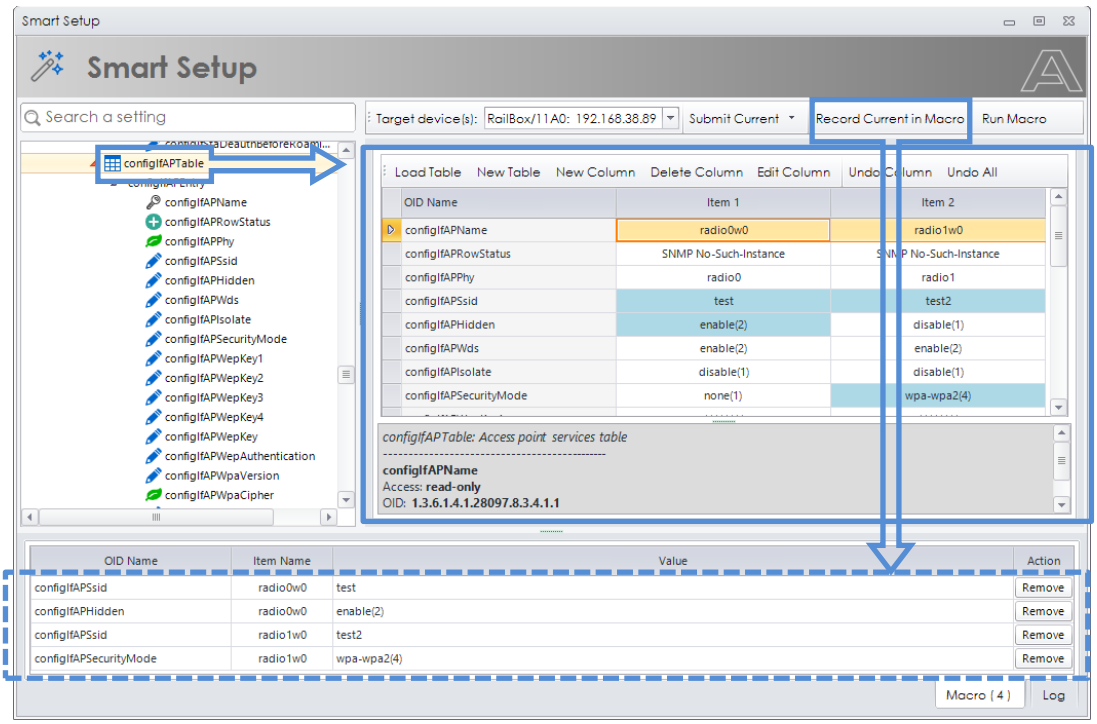
ADD CHANGES TO THE MACRO LIST

1. Edit an OID (scalar or table): step 1 & step 2 (see the following image)
2. Click on the “Record Value in Macro” button: step 3
   The modification will be transformed into an order and saved in the macro list.

Example on a scalar OID

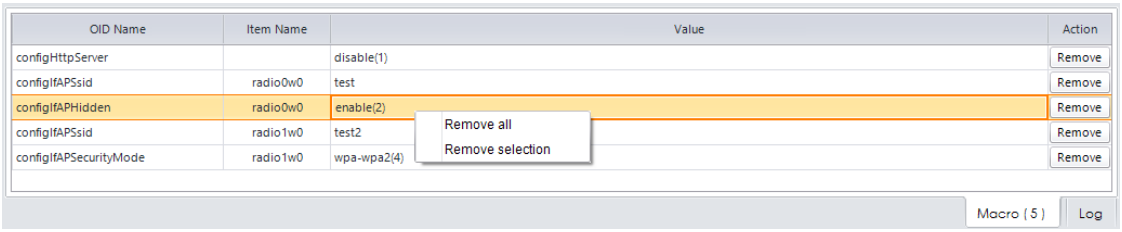


Example on an OID table



DELETE A COMMAND IN THE MACRO LIST

1. Select a command
2. Click on the “Remove” button on the right or “Remove selection” button in the contextual menu by right-clicking.
   When a column creation command is deleted, all changes following that column will be deleted automatically.

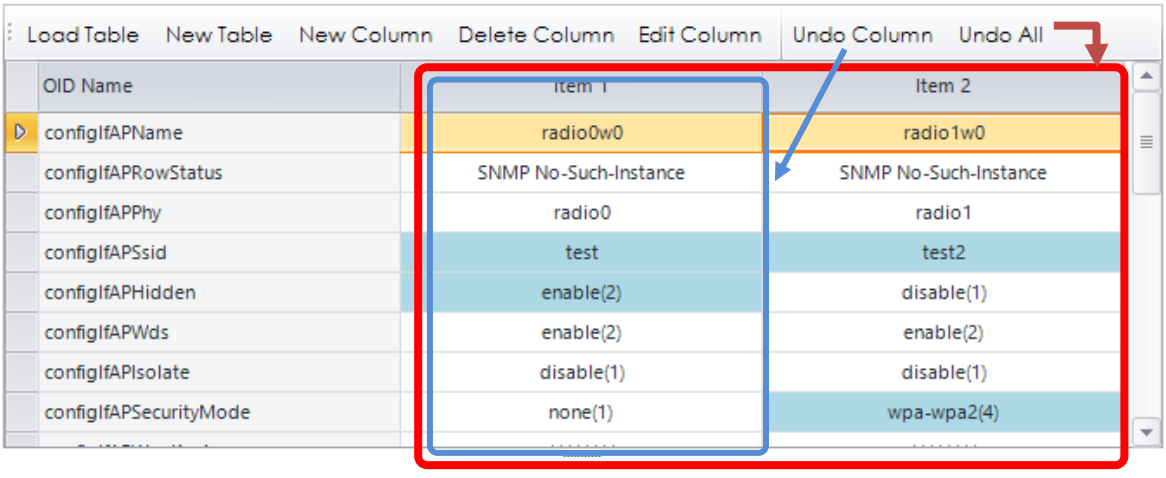


RUN MACRO

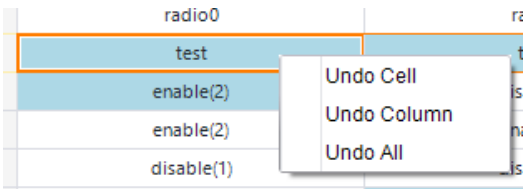
Click on the “Run Macro” button to execute the orders in Macro list to the target product(s).

CANCELLATION OF CURRENT CHANGES

1. "Undo Column" cancels all changes on the selected column
2. "Undo All" allows you to undo all the modifications on the whole table and to empty the loaded data of the table.



By right-clicking on a cell, you can bring up a context menu allowing you to undo the selected cell or the selected column or the whole table.



7.4. Tools

RSSI Trace

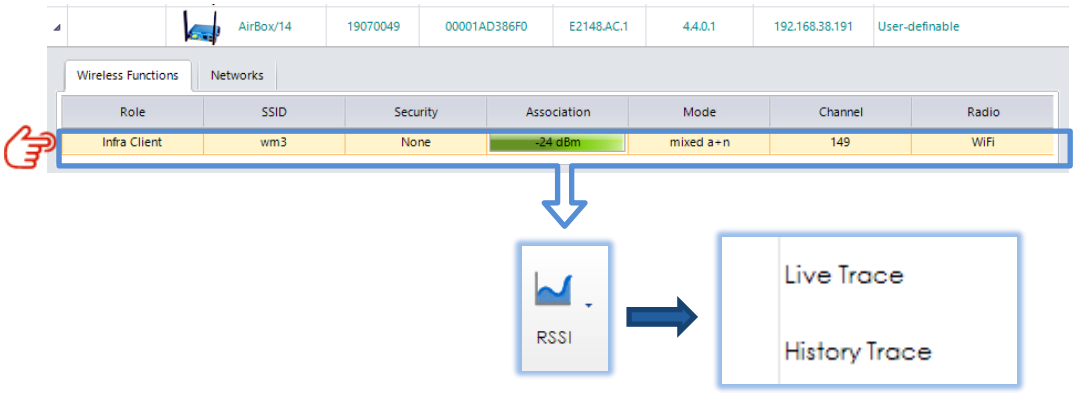
The **RSSI** (**R**eceived **S**ignal **S**trength **I**ndicator) is an estimated indicator of the signal quality received by a client.

The RSSI trace provides 2 modes :

→ **Live Trace**: It can trace RSSI in real time with a sample frequency and a sampling depth. The trace starts from scratch. The sample frequency and the depth of sample can be modified as you need. The RSSI live data is supplied by SNMP service.

→ **History Trace**: It can display immediately the RSSI history data graph with a given period. The RSSI history data is supplied by Telemetry service or by the SNMP service. In the case of both services available in the product, WaveManager use Telemetry priority.

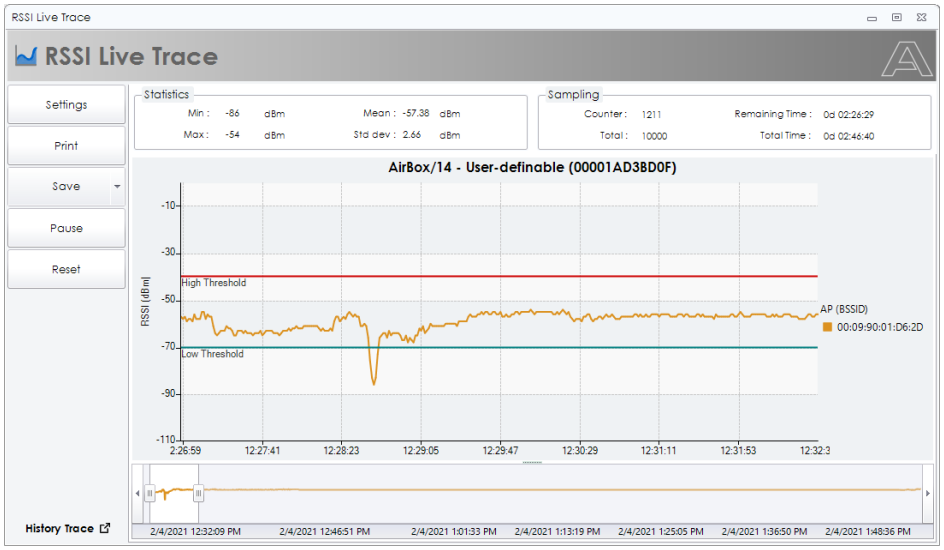
To display and analyze the signal quality of a Wi-Fi client associated with an access point, select the client to examine and click on the **RSSI menu**. And then chose a trace mode to launch.



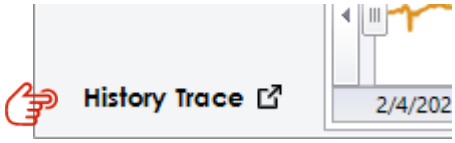
You can also double click on a client to launch a History Trace. Otherwise, you can select a **produit** which has only **one** client and then launch the RSSI trace.

1. *RSSI Live Signal Monitoring*

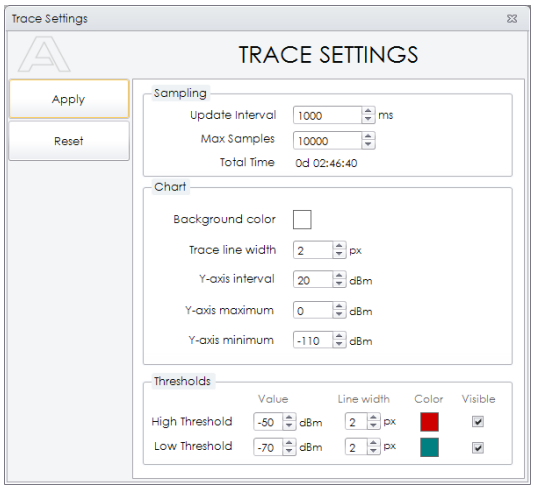
The RSSI trace window displays the signal level change over a set time frame which depends on the graphic asset. At the bottom of the window, you can use the sliding section to zoom or move the signal graphic for a specific period. The sampling interval is configurable in the "**Settings**" menu.



By using "**History Trace**" shortcut at the bottom right of the window, you can launch a new History Trace or find the existing History Trace window for the same client.



By clicking on "**Settings**" button, you can customize the sampling interval, the depth of samples and the tracing graph display in the following window.



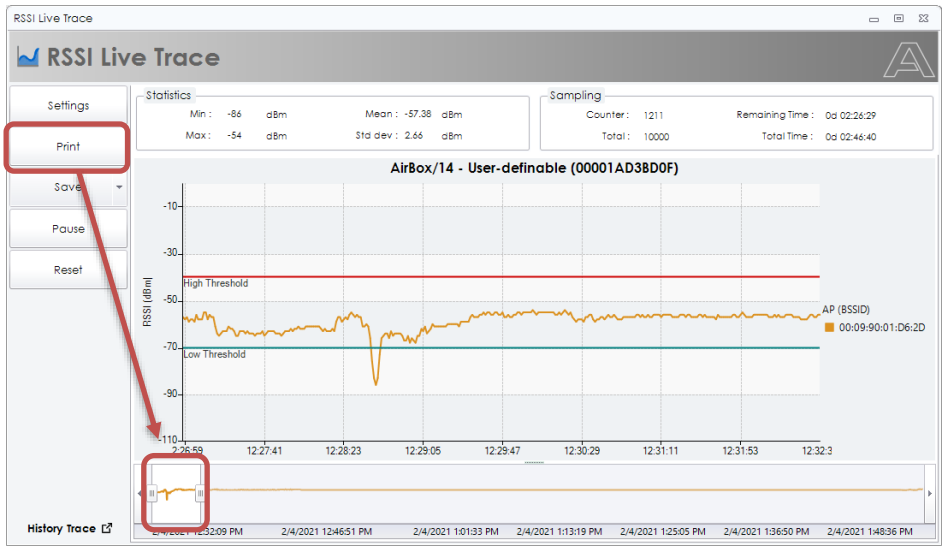
→ Sampling rate (ms, one sample per second):

Min.	250 ms
Max.	60000 ms
Default	1000 ms

→ Sampling depth:

Min.	1000 samples
Max.	20000 samples
Default	10000 samples

The “**Print**” button allows you to print the RSSI signal matching the time range of the current zoom section.



The "**Save**" button allows you to export the RSSI trace data in ".txt" or ".csv" format. To create a new data file, click on "**Save as**".

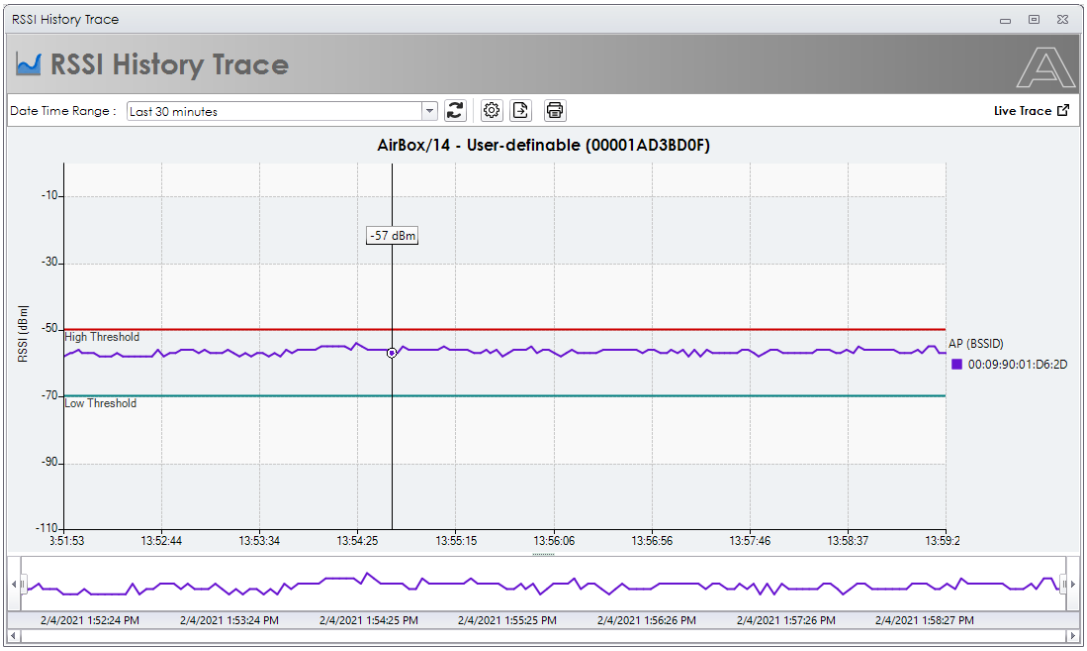
Warning: "**Save**" saves the history of (previous) data and not those to come.

The "**Pause**" button temporarily stops the scrolling of the RSSI trace. Just click on "**Resume**" to restart it.

The "**Reset**" button allows you to erase all previous data and create a new RSSI trace.

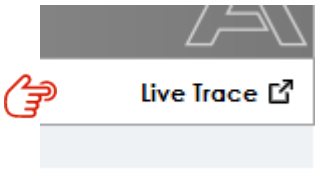
2. *RSSI History Signal monitoring*

The *RSSI History Trace* window displays the signal level change over a personalized date time range. At the bottom of the window, you can use the sliding section to zoom or move the signal graphic for a specific period.



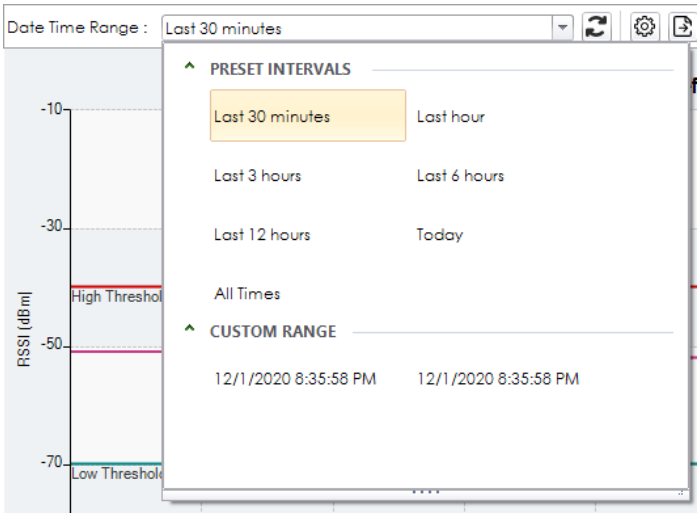
The sampling interval is the association and RSSI refreshing frequency in the “Application Settings”.

Like Live Trace, the History Trace has also a “**Live Trace**” shortcut in the top right corner to launch a new Live Trace or find the existing Live Trace window for the same client.

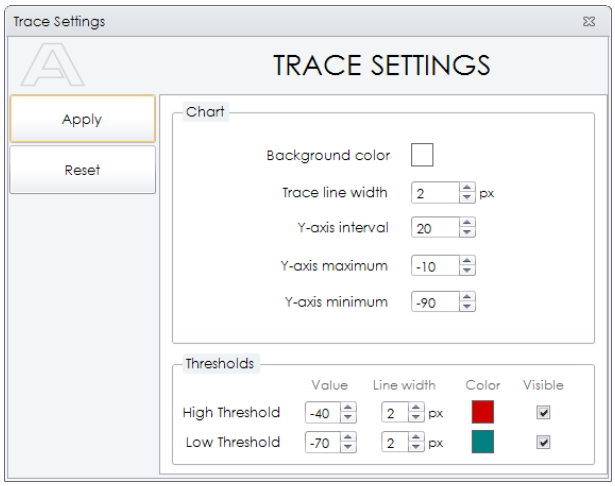


The RSSI Trace provides various features in the button bar

You can display your RSSI trace by preset range or by custom range: Clicking on "**Refresh**" button or **F5** to refresh the trace.



By clicking on "**Settings**" button, you can customize the sampling interval, the depth of samples and the tracing graph display in the following window.



The "**Export**" button allows you to export the RSSI trace data in ".txt" or ".csv" format.

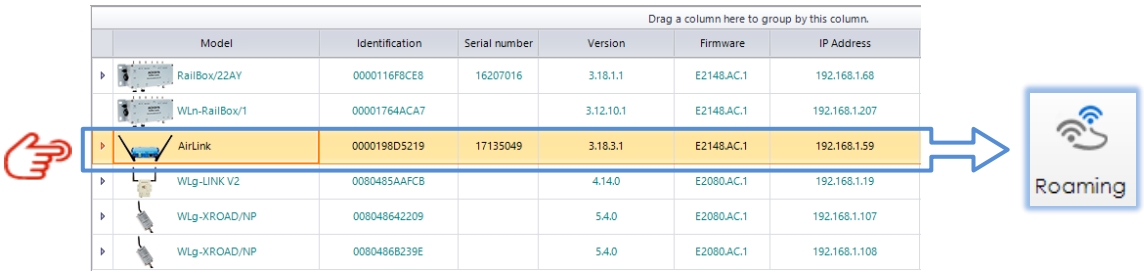
Warning: "**Save**" saves the history of (previous) data and not those to come.

The “**Print**” button allows you to print the RSSI signal matching the time range of the current zoom section.

Roaming Monitor

This feature allows you to generate a tracking graph from the roaming log received over a given period.

To display and analyze a roaming graph, select the product to examine (configured in roaming mode) and click on the **Roaming** button.



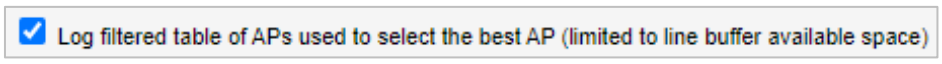
The roaming data is supplied by Telemetry service or by the log service.

In the case of both services available in the product, WaveManager use Telemetry priority.

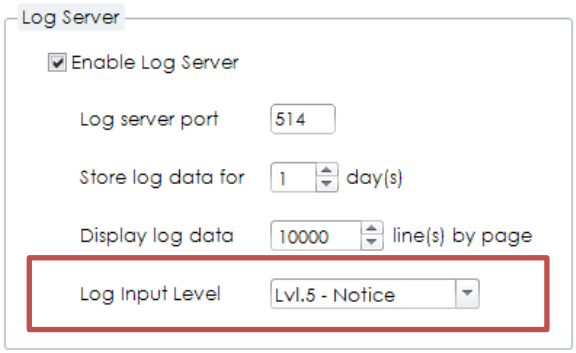
See *Telemetry*, to setup Telemetry service.

See *Setup the automatic emission & reception* of logs, to configure log server.

To send roaming data by log service, the following option must be checked in the product Web server. The option is located at: Setup >WIRELESS SETTINGS >INTERFACE CONFIGURATION > “Advanced Roaming” Tab > “**Roaming log info**” Section.



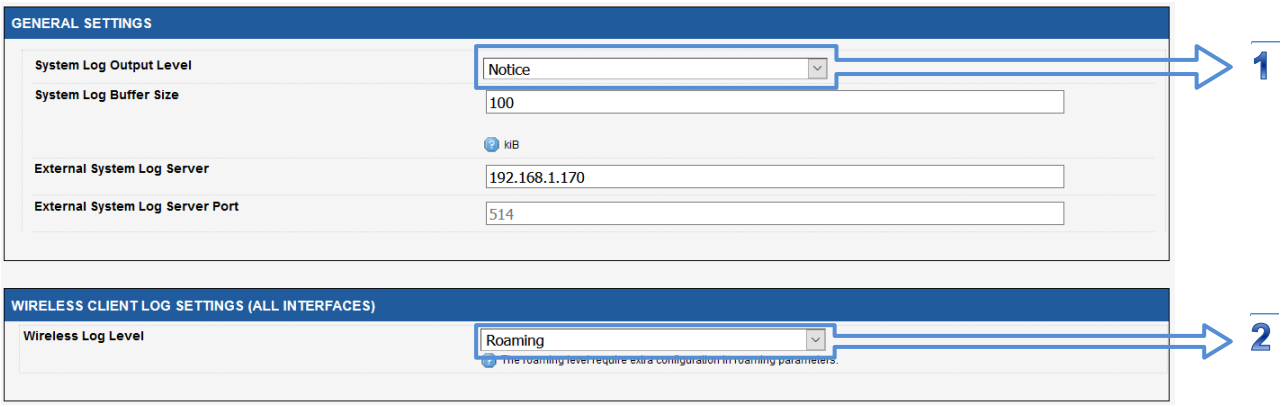
The **minimum** input log levels to receive the roaming data in **WaveManager** is: **Notice**



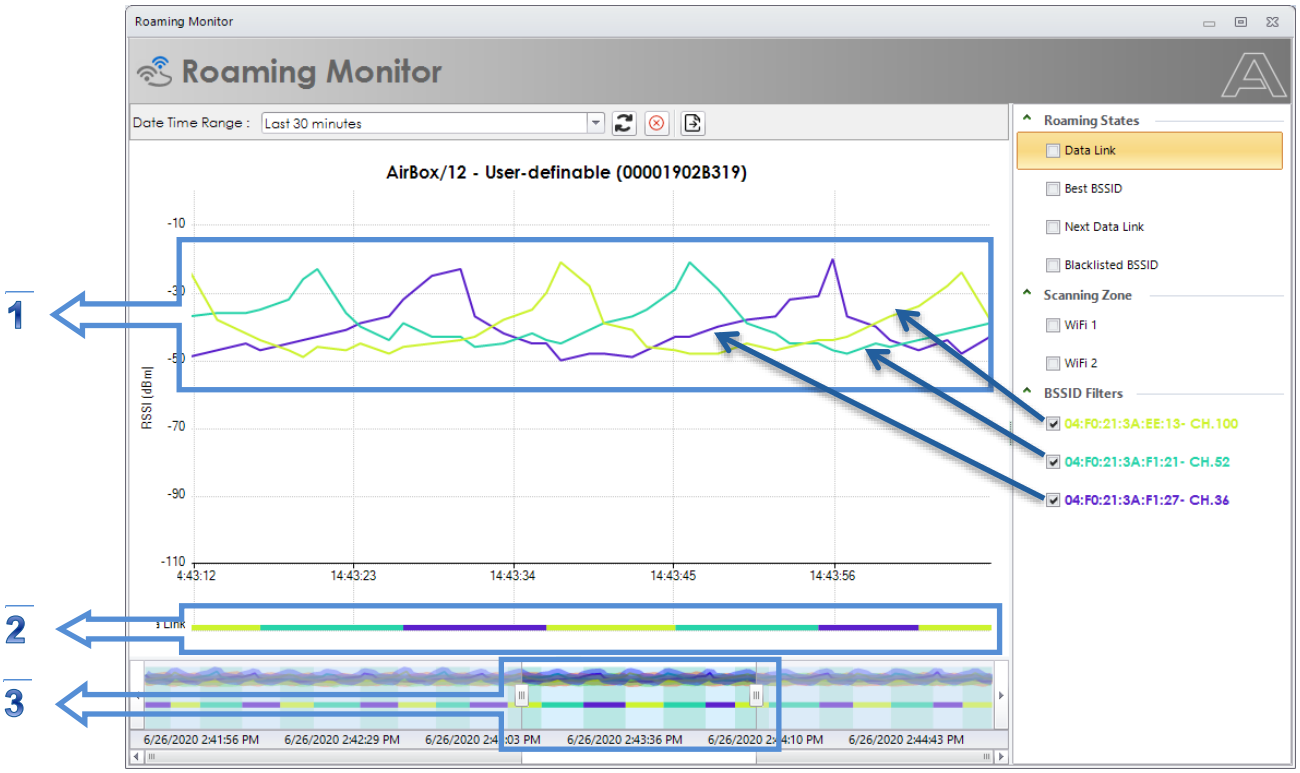
The **minimum** log levels to receive the roaming data in **WaveOS** are:

1. Tools menu> Log settings> General Setting: **Notice**

2. Tools menu> Log settings> Wireless client log settings: **Roaming**

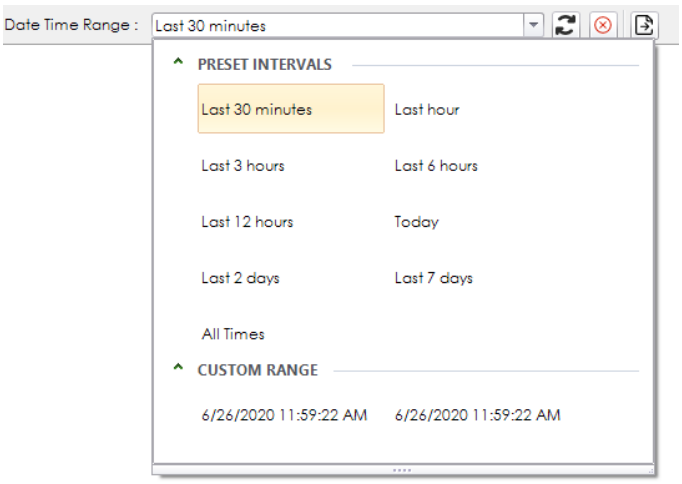


The *Roaming Monitor* window displays the signal level change over a personalized date time range.



1. Each signal graph represents the RSSI evaluation received from an AP.
2. Data link graph indicates the data itinerary among the associated APs.
3. At the bottom of the window, you can use the sliding section to zoom or move the signal graphic for a specific period.

You can display your roaming data by preset range or by custom range:



The roaming monitor provides a filterable legend on the right. You can display or hide a graph by checking or unchecking a legend.

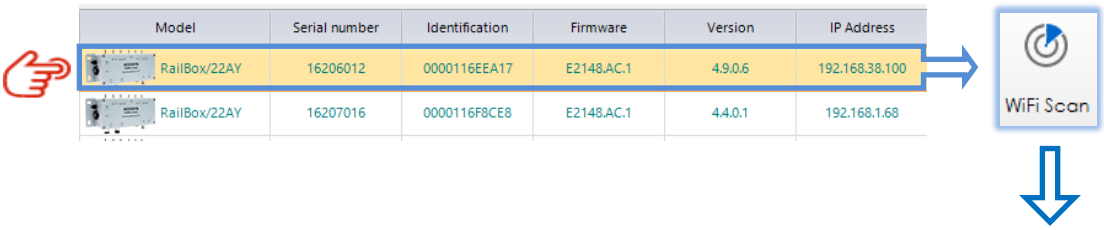
1. Highlighting the signal flow according to the selected roaming states
2. Scan radio zone (WiFi 1 : green zone, WiFi 2 : blue zone).

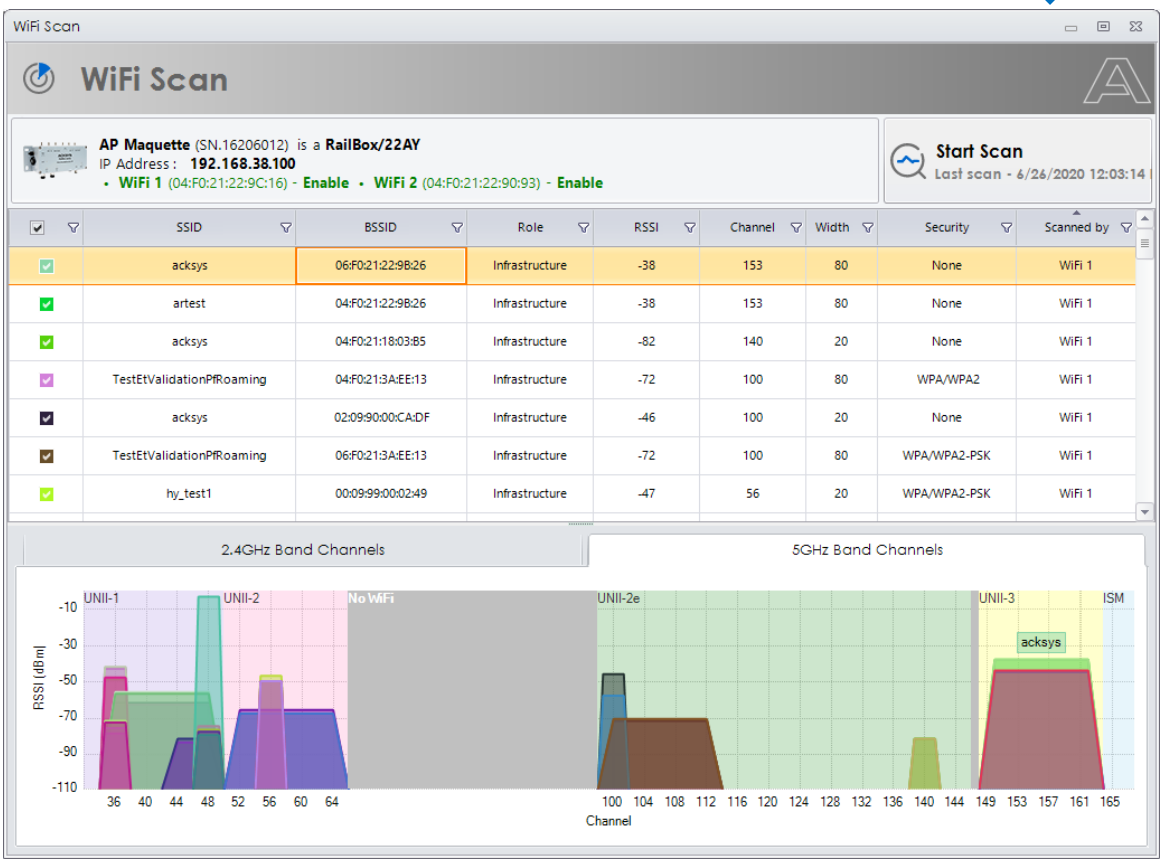
> Scan radio zone is only available for the **dual WiFi** product configured in roaming **before break** mode.

3. The RSSI evaluation graph received from an AP (with a BSSID)

WiFi Scan

This feature allows you to scan and display all the access points around a product: select a product in WaveManager, and then click on the "**WiFi Scan**" button.





The scan is done on all the radios of the product. Those deactivated are activated in automatic mode during the scan, and then deactivated again.

If a radio is configured on certain channels in client mode, only the configured channels will be scanned. Otherwise the product will scan on all channels.

When the radio card is in access point mode, the scan will disconnect associated clients. On DFS channels, CAC will be re-performed if required. When the radio card is in 802.11s mesh mode, peers seldom appear because their beacon interval is large per the protocol definition.

The product to scan must be reachable by SNMP.

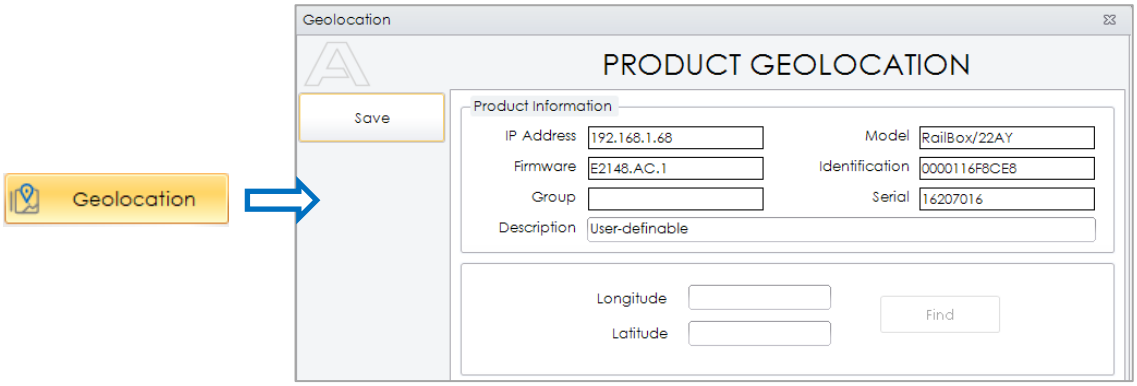
7.5. Geolocation

Geolocation is used to edit a product **Description** field and to enter or find the GPS coordinates of the latter product.

→ If you know the product coordinates, you can enter them directly in the fields and click on save. They will thus be saved in the WaveManager database.

Automatic geolocation ("**Search**" button) is only possible on LTE products.

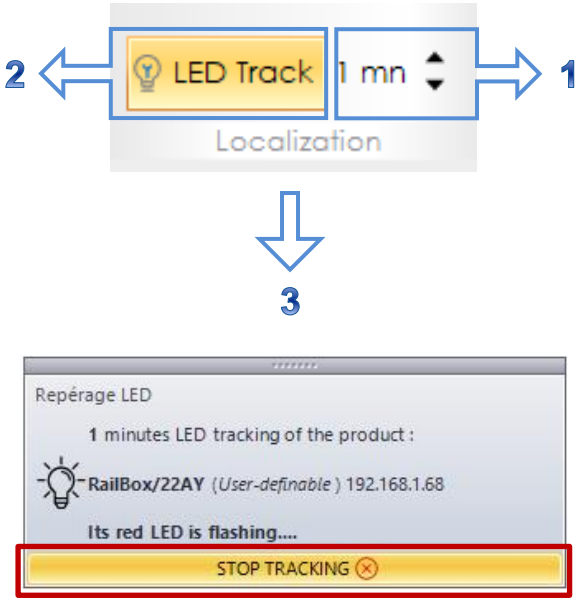
To locate an LTE device, select it from the product list and click on the "**Geolocation**" button in the toolbar.



→ Click on "**Find**". The "Longitude" and "Latitude" fields will be filled in automatically.
→ Add a description if necessary.
→ Save the coordinates and the description by clicking on "**Save**".

7.6. LED Tracking

This option allows you to “physically” locate a product by flashing its diagnostic LED within a given time.



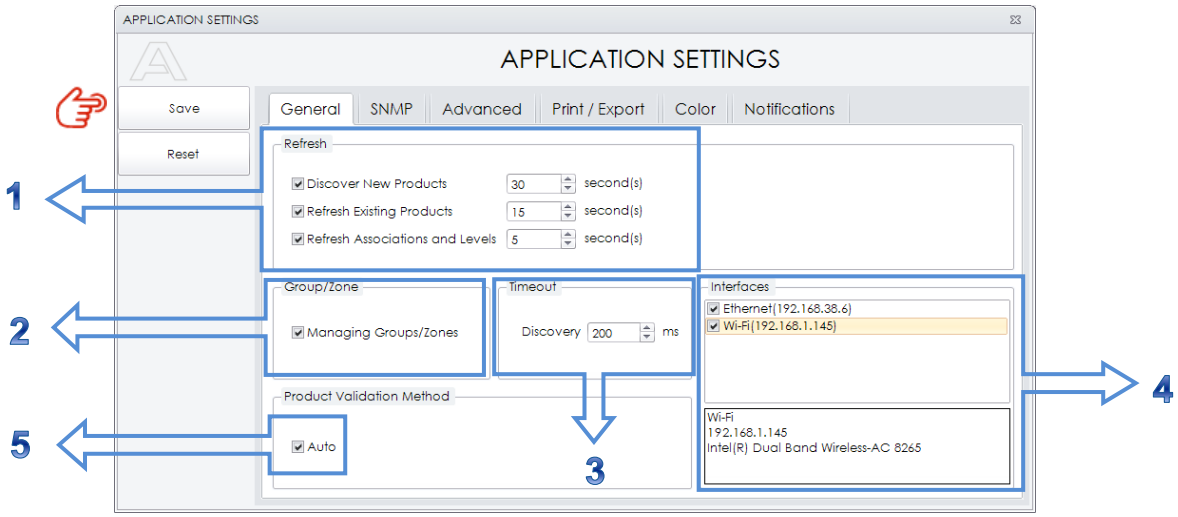
1. After selecting the product to be tracked, you can customize the flashing duration (in minutes) by using the ▲ and ▼ arrows.
2. Click on “**LED Track**” to trigger the flashing.
3. A new pop-up window will appear. You can stop the process before the expiry time by clicking on “**Stop Tracking**”.

The product to track cannot be **Unreachable** or **IP conflict** status.

7.7. Application Settings

This menu allows you to configure and customize WaveManager through various tabs:

General



1. Refresh section

Discover New Products:

Enables the automatic detection mode and defines its frequency. This mode only allows the detection of products located on the local network.

Min.	1 sec
Max.	3600 sec
Default	30 sec

Refresh Existing Products:

Queries the database on the products it contains to retrieve their configuration information and update their status (“Online”, “Unreachable” ...) according to a query frequency.

Min.	1 sec
Max.	3600 sec
Default	15 sec

Refresh Associations and Levels:

Updates the *Access point / Client* association information, the signal level recorded in the database and defines the update frequency.

Min.	1 sec
Max.	3600 sec
Default	5 sec

2. Groups section

Enables group management and displays the “Group/Zone” tab on the main screen (*see* Group/*Zone* tab) and the “Group” column in the product list.

3. Timeout section

Sets the timeout of the automatic detection process.

Min.	5 ms
Max.	5000 ms
Default	300 ms

4. Interfaces section

Allows you to select which network interfaces (found on the computer) will be used in the automatic detection process. You must select at least one interface, otherwise no product will be detected.

Warning: Whenever the network configuration of your PC changes, you must restart WaveManager and check the selection of WaveManager interfaces in this section.

5. Product validation method section

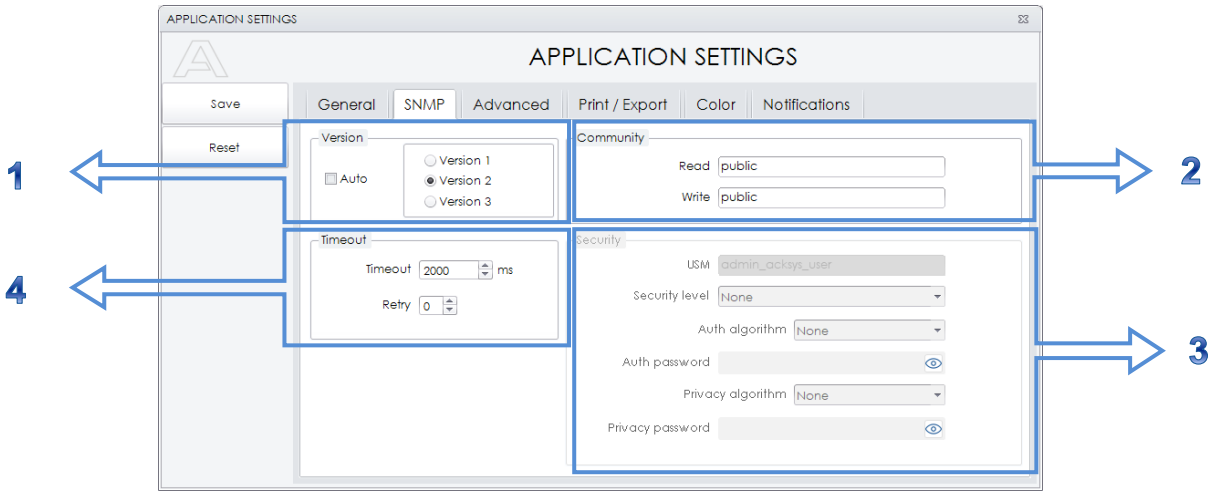
If the “**Auto**” option is checked, a new detected product will be validated automatically to **Online** status.

Its configuration will also be validated at the same time.

SNMP

To give the administrator an overview of the ACKSYS SNMP equipment, WaveManager supports the SNMP protocol.

SNMP makes it easier to manage and detect the deployed products.



1. Version section

→ Sets the SNMP version used for manual product search and the configuration information collection.

Warning: The SNMP service must, therefore, be activated in the product, and its WaveOS version must match the one specified in **WaveManager information** tab.

2. Community section

→ Access settings for SNMP V2.

3. Security section

→ Settings of access and security for SNMP V3.

4. Timeout section

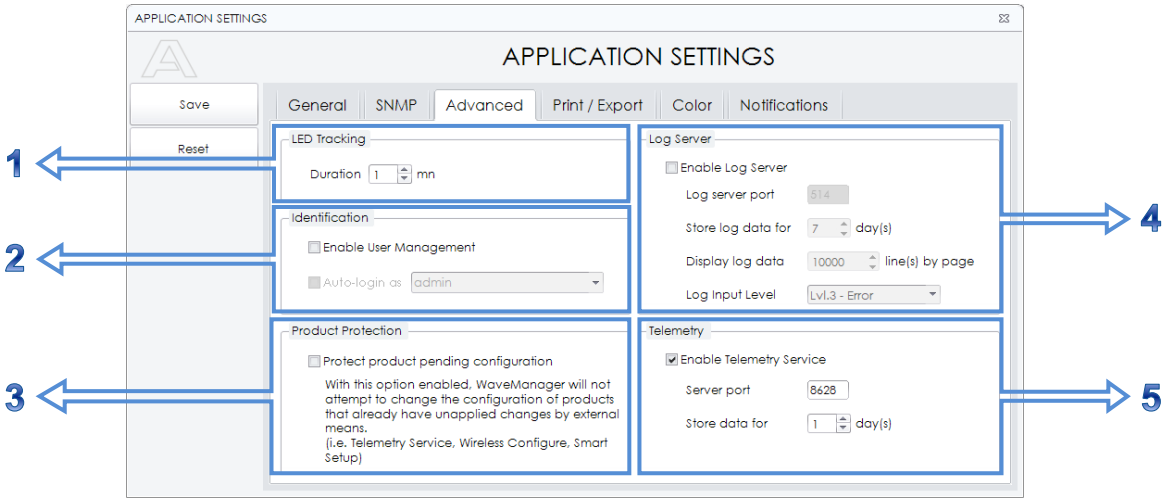
→ Sets the SNMP timeout:

Min.	5 ms
Max.	5000 ms
Default	2000 ms

→ Sets the SNMP retry counter:

Min. retry number	0
Max. retry number	10
Default retry number	0

Advanced



1. LED Tracking section

→ Setting of the flashing time of a product **DIAG** LED when requesting a LED tracking. (*See LED Tracking*)

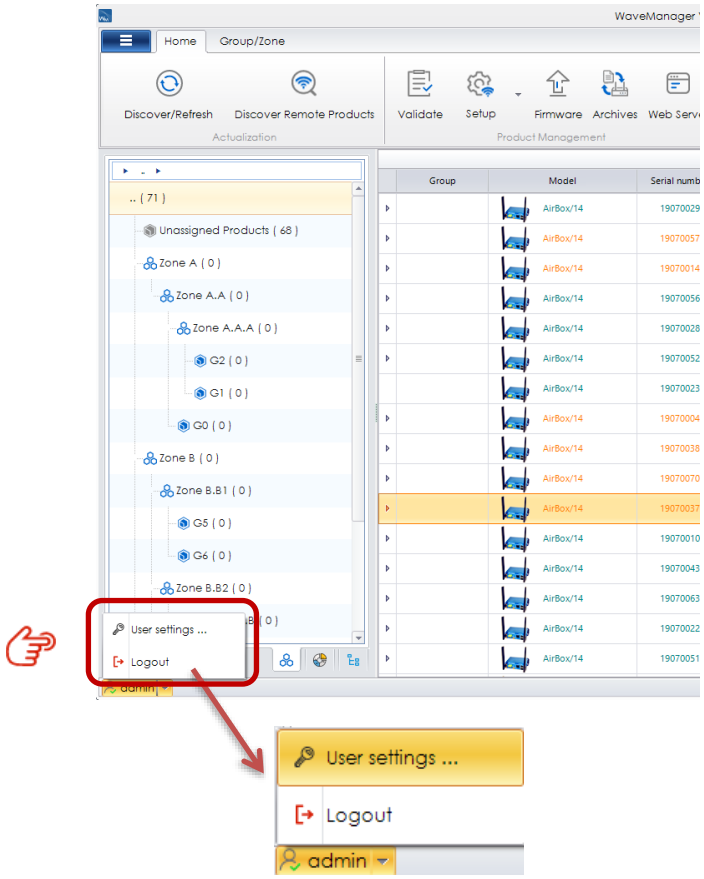
Min.	1 min
Max.	60 min
Default	1 min

2. Identification section

→ This section makes it possible to limit WaveManager access by a **login request**.

→ As soon as the option is checked and saved for the first time, the “admin” user, with all rights, will be enabled by default and a new button will appear at the bottom of the main screen.

By clicking on that button, you can access the **User Settings**.



The **default** login details for the *admin* account are:

Username: *admin*

Password: *admin*

3. Product protection section

With this option enabled, WaveManager will not attempt to change the configuration of products that already have unapplied changes by external means. If you are setting your product via its Web server, this option can stop all attempts to modify this product by WaveManager.

However, this option may prevent such products from using some functionalities, like Telemetry service, Smart Setup or Wireless Configure.

4. Log server section

In this section you can :

→ Enable the log server in WaveManager

→ Set the logs retention period

→ Set the input log level (Higher priority logs will be ignored. It avoids congestion of the database in the event that the logs were set too high on the product side)

For more information, *see Logs*.

5. Telemetry section

The Telemetry protocol allows WaveOS to spontaneously send historical data to one or several clients (WaveManager). *See Telemetry.*

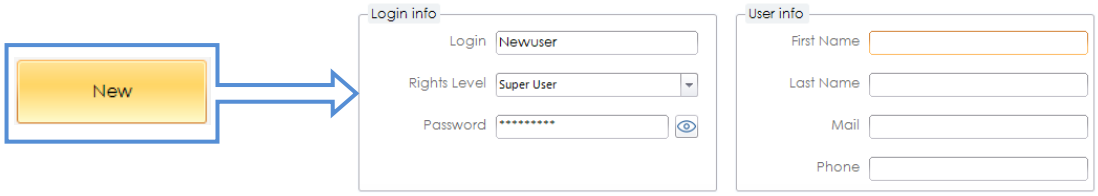
User Settings

This menu allows defining users according to their rights level and editing their information.

Adding a user:

To add a user:

1. Click on "**New**".



2. Enter the requested information:
   - → **Login:** which must only contain alphanumeric characters
   - → **Rights Level:** 3 types of users are available:
     - ✓ ***Administrator*** who has all the configuration rights on WaveManager
     - ✓ ***Super User*** who has all the configuration rights **except** the one to edit users
     - ✓ ***User*** who has no configuration rights.

The "User" role may be useful for creating a **guest** account.

   - → **Password:** must contain **at least 8 alphanumeric characters**.
   - → The "User Info" section fields are optional.

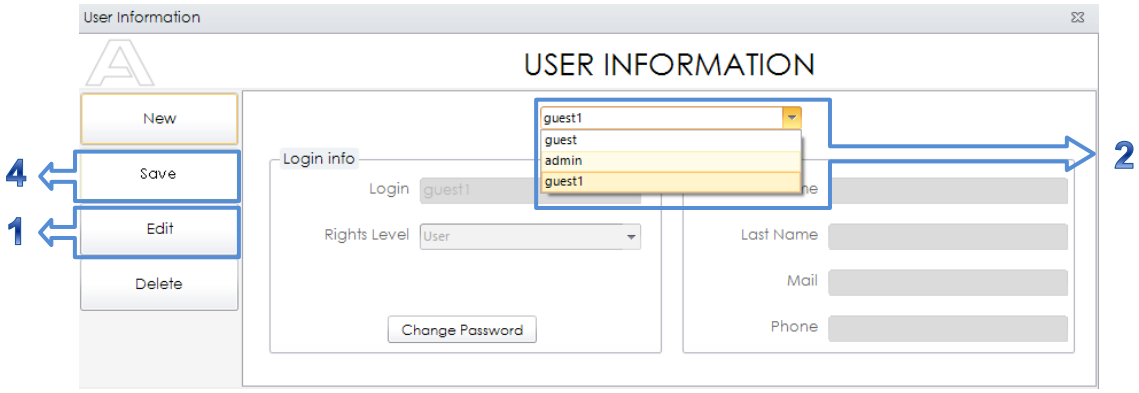
3. Click on "**Save**" to create the user.

For security reasons, only users with "*Administrator*" right level can add new users.

Editing a user:

To edit a user or the logged-in account:

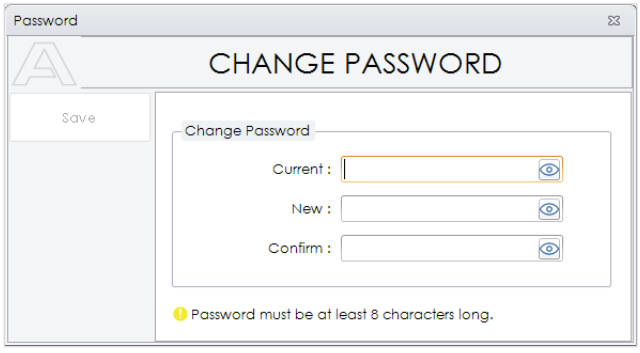
3.1.1.1.1.1. Click on "**Edit**"
3.1.1.1.1.2. In the case of an "admin" session, choose the user to edit from the list.
3.1.1.1.1.3. Update the fields.
3.1.1.1.1.4. Click on "**Save**"



For security reasons, all the users (except ***administrators***) can only edit their own profile. ***Administrators*** can edit any user.

To change a user password:

→ Still in the "Edit" menu, click on "**Change password**".
→ A new window appears:



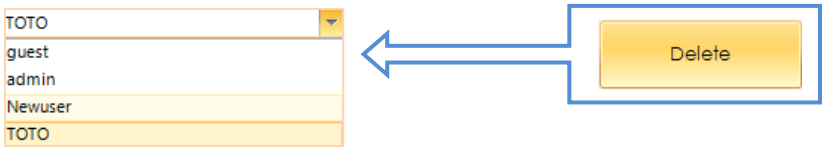
→ Enter the current password in the "Current" field.
→ Enter the new password in the next two fields.
→ Click on "**Save**".

The "Save" button becomes active when the two new passwords entered are identical and the current password is correct.

Deleting a user:

To delete a user (as an *administrator*):

1. Select the requested user from the drop-down list:

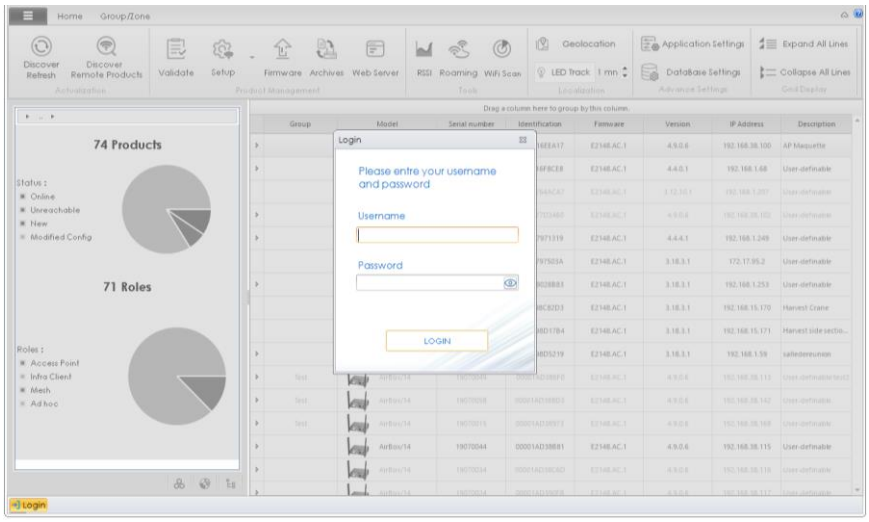


→ Click on "**Delete**".

For security reasons, only ***administrators*** can delete users.

Login / Logout:

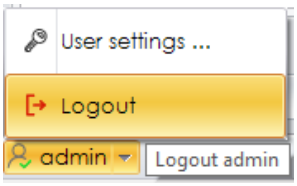
→ From now on, as the user management is activated, WaveManager starts with a frozen window:



1. Click on "**Login**" at the bottom of the window.
2. Fill in the login name and password.
3. Click on the "**Login**" button.

→ In case “**Auto Login**” has been checked in the application settings, WaveManager will automatically start a session with the defined user. You will then have to log out to change user.

→ To log out from any session: click on the logged-in user name, and then click on “**Logout**”.



Telemetry

The **Telemetry protocol** allows WaveOS to spontaneously send historical data to one or several clients (WaveManager).

Telemetry data will be sent over TCP. Once WaveManager connects with an ACKSYS product in Telemetry, WaveManager will watch out to receive data.

The big advantage compared to SNMP refresh is that WaveManager no longer sends a frame to request data. The bandwidth will be less polluted by the communications frames.

Likewise, roaming monitoring no longer need to activate log server when telemetry is activated and when the product supports Telemetry.

WaveManager replaces SNMP with Telemetry for association refresh:

- ✓ Receipt of RSSI data in case of client
- ✓ Receipt of the list of associated customers in case of AP
- ✓ Receipt of the list of mesh survey in case of mesh
- ✓ Receipt of roaming data in case of roaming client
- ✓ Receipt of GPS data in case of product equipped with a cellular card

Product conditions required:

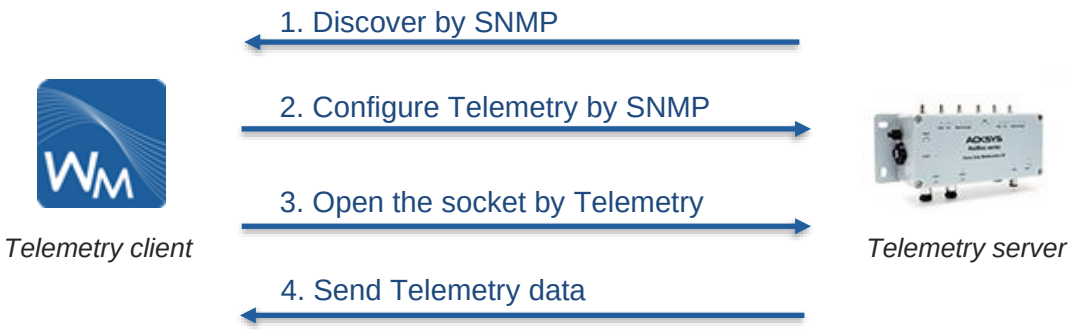
- ✓ Product OS: WaveOS
- ✓ Minimum WaveOS version: 4.10.0.1
- ✓ Reachable by SNMP
- ✓ Reachable by TCP

In order to be compatible with all ACKSYS products on the market, WaveManager alternately usess SNMP and Telemetry. This means that WaveManager refreshes products that do not support Telemetry by SNMP and those support Telemetry by Telemetry.

There is no security encryption in Telemetry protocol. For security reasons, SNMP V3 is recommended for security sensitive areas.

1. Overview

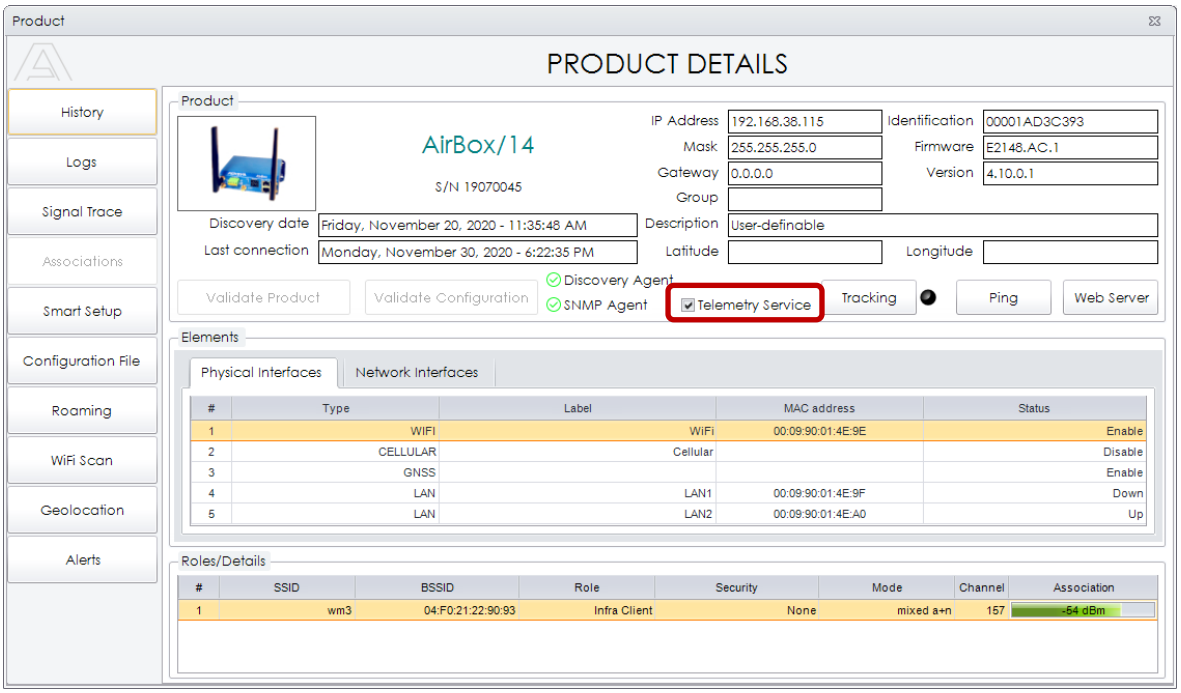
The Telemetry service is **disabled** by default. By enabling the Telemetry service, WaveManager will configure Telemetry (enable, configure the port and sending frequency) over SNMP to all products that are reachable and support Telemetry, and then connect them with Telemetry sockets. Also, WaveManager performs automatically Telemetry initialization for newly discovered products.



Telemetry settings can be found in the Telemetry section of "Application settings"/"Advanced". The settings are applicable for all products in the WaveManager database. You can customize the activation of the Telemetry service, the Telemetry server port and the storage depth in the WaveManager database.

In order to make the Telemetry service as transparent as possible to the user, the sending frequency and sampling frequency are configured with the same value as the association and RSSI refreshing frequency.

You can cut or reconnect the Telemetry socket for a specific product by unchecking or checking this option in its details window. The unavailable option means that the Telemetry service is not available or supported in this product.



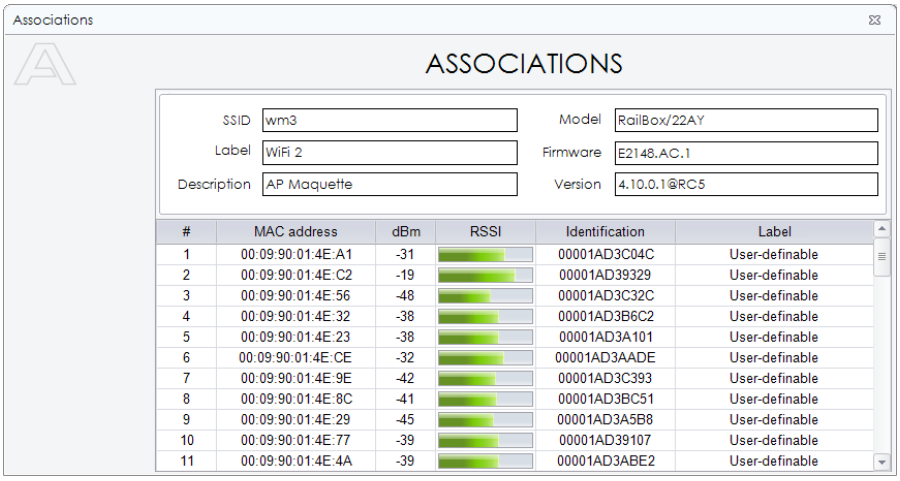
2. Telemetry data display

Display of historical data from RSSI in case of client

WaveManager saves historical RSSI data received by Telemetry into the database during refresh. The user can see the RSSI trace over a period of time when the "RSSI" window opens. (see *RSSI Trace*)

Display of the list of associated customers in case of Access Point

To display the clients associated with an access point (or display the neighbors with a mesh point), double-click on the row of the selected access point, or click on the "**Association**" button in the "Product Details" window. The data is refreshed in real time. No user-level difference between SNMP and Telemetry feed.



Same to display the list of mesh surveys in case of mesh.

Roaming data display in case of roaming client

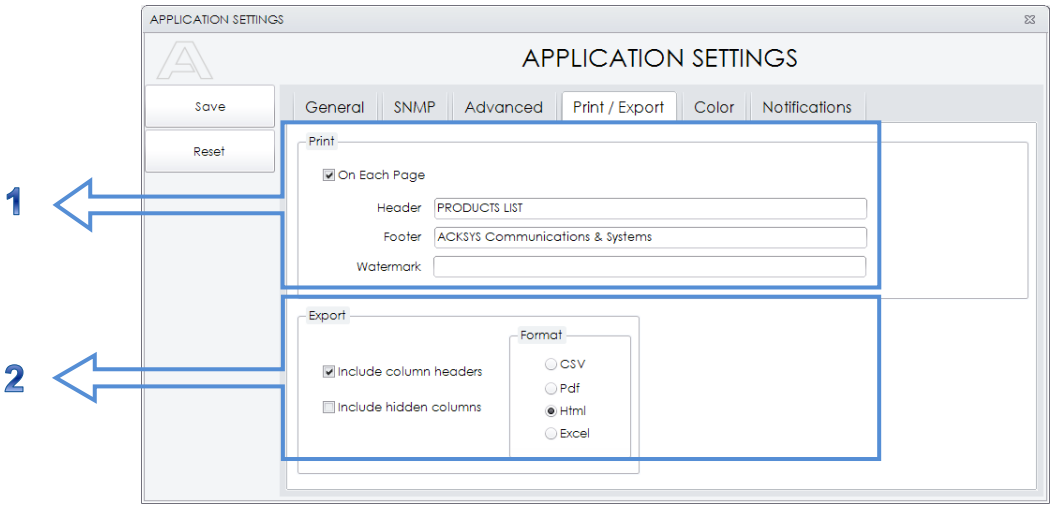
Select a product (configured in roaming mode) in the main list and click on the "**Roaming**" button in the toolbar or in the "Product Details" window.

If the product supports Telemetry, the graph will be displayed correctly. Otherwise, you will have to use the syslog service. (see *Roaming Monitor*)

Display of GPS data in case of product equipped with an activated cellular card

To geolocate an LTE product, select a product in the main list and click on the "**Geolocation**" button in the toolbar. And then click on "**Find**" button to retrieve GPS data by Telemetry. Telemetry is transparent at the user level. (see *Geolocation*)

Print/Export



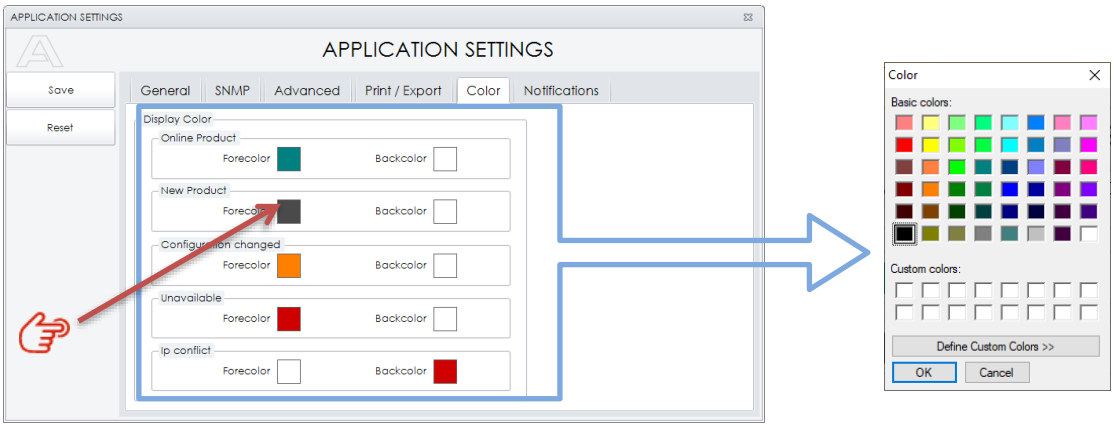
1. Print

This section allows you to customize the printing and export of the database report by adding a header, footer and/or watermark (*see Database*).

2. Export

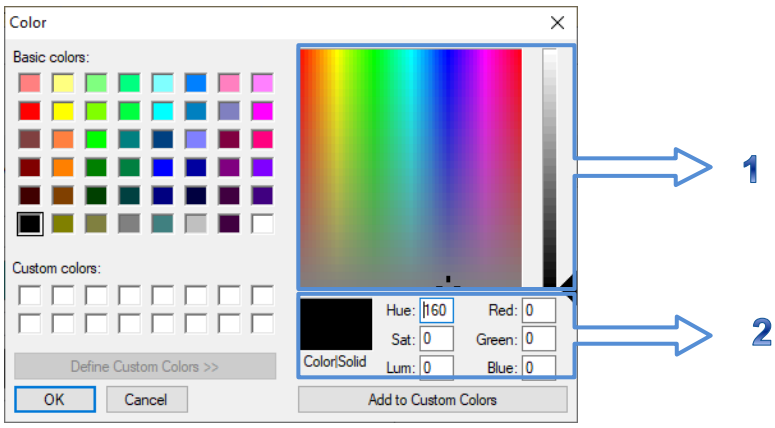
This section sets the report format of the database to be exported (CSV, HTML, Xlsx or PDF) containing the product list and the column options (*see Database*).

Colors



This tab allows customizing the colors of the status of the products displayed in the inventory.

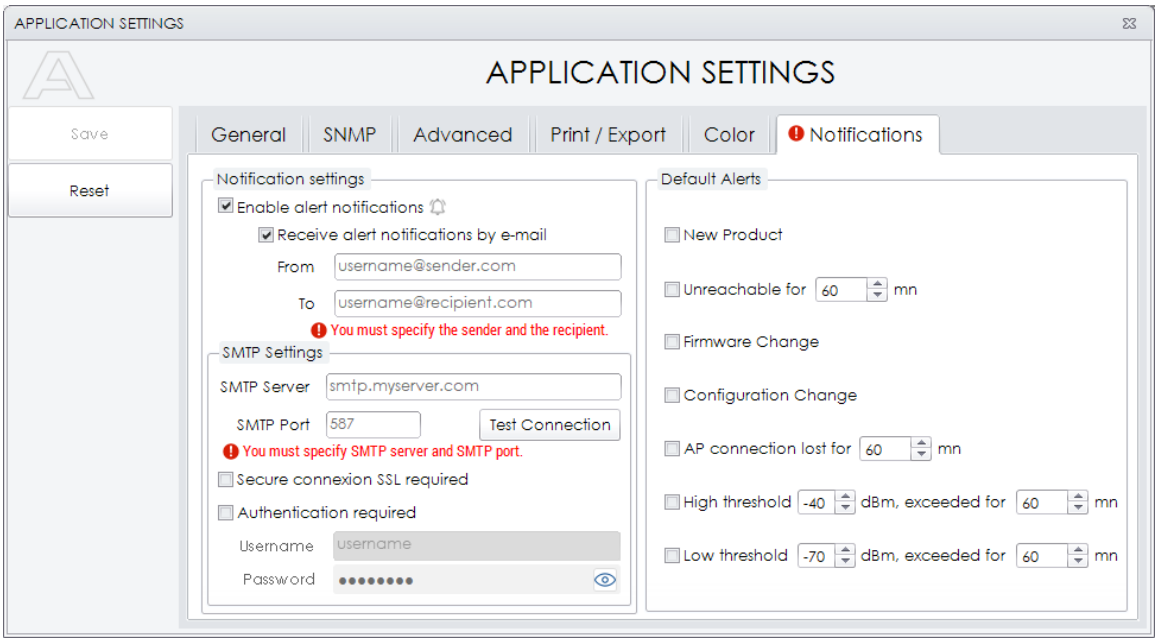
Adding Custom Colors: *You can add up to 16 custom colors by clicking on "**Define Custom Colors**"*



1. *Select the color using both selectors.*
2. *You can also manually enter the HSB (hue, saturation and brightness) or RGB (red, blue and green) values of the requested color.*
3. *Click on "**Add to Custom Colors**".*
4. *Confirm the changes by clicking on "**OK**".*

Notifications

This feature allows you to generate notifications related to various configurable alerts.

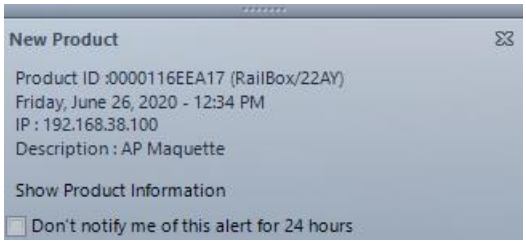


These notifications are displayed by pop-up messages on the screen and/or sent by email.

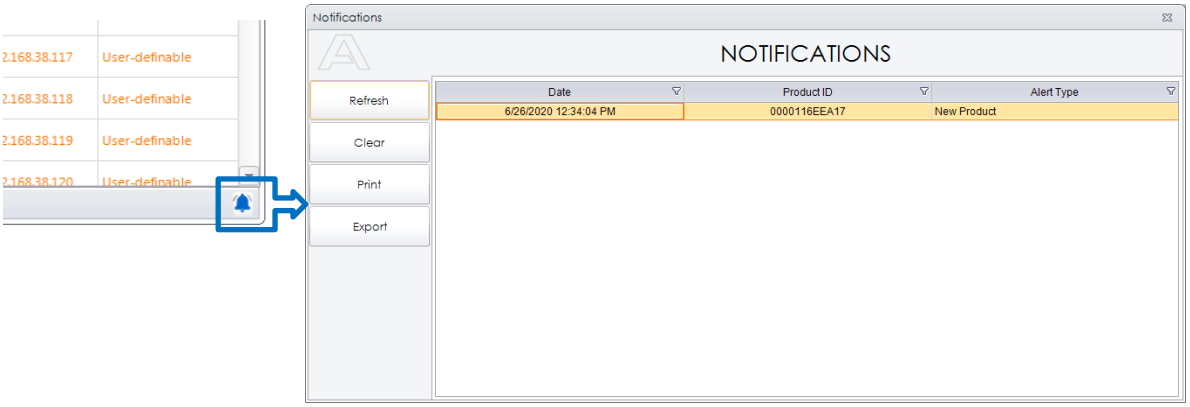
To receive email notifications, you will need to configure an SMTP server and an SMTP port (you can refer to your IT department to fill in the fields).

When an event is triggered, WaveManager generates a notification and saves a report (with date and time) that can be viewed by the user.

The detailed information is shown in a pop-up message window.



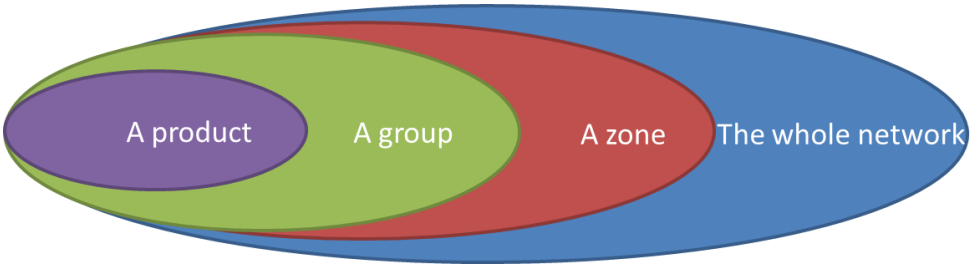
You can consult and manage the past notifications by clicking on the icon at the bottom right. And then you can refresh, clear, print, or export the notification history.



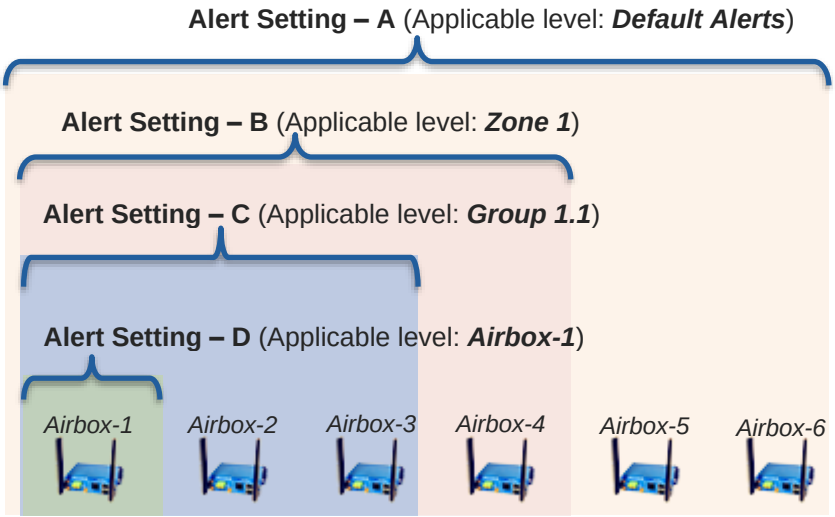
ALERT HIERARCHY

The alerts can be defined for a product, a group, a zone or to all products. Only the alerts on the highest priority level will be triggered.

- The hierarchy of alert parameters -



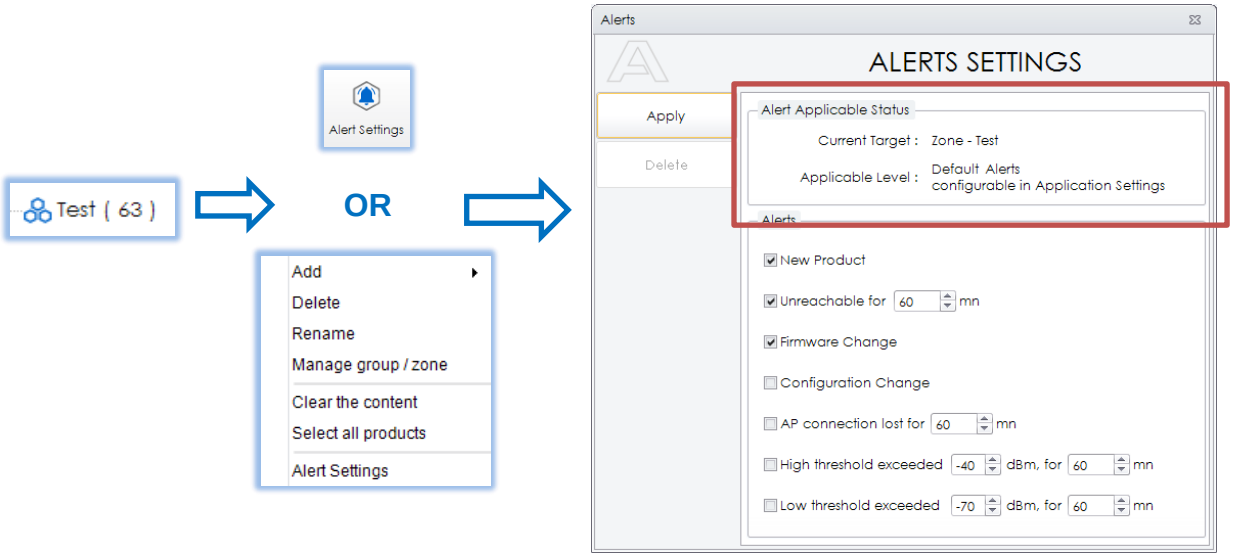
For example, there is a network including 6 Airboxs. 4 alert settings are configured in the network. The group 1.1 which contains Airbox-1, Airbox-2 and Airbox-3 can trigger the alert setting – C, except the Airbox-1. The Airbox-1 can only trigger the alert setting-D. Likewise, The Airbox-4 can trigger the alert setting - B. The Airbox-5 and the Airbox-6 can trigger the alert setting - A.



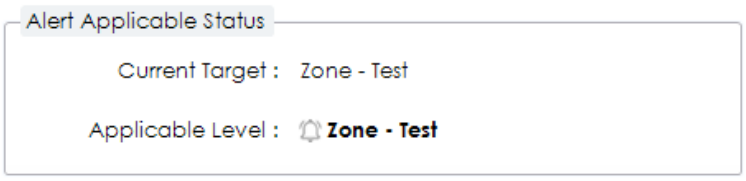
DEFINE THE ALERTS FOR A ZONE/GROUP

To personalize the alerts for a zone/group, select the desired zone/group and click on the **Alert** button.

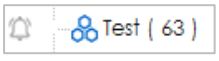
Otherwise, by making a right-click on a group or a zone name, you can click on the "Alert Settings" from the context menu.



The applicable level (see the red block) indicates the hierarchical level of the following alerts. For example, the following photo shows the alerts are applicable within the Test zone.



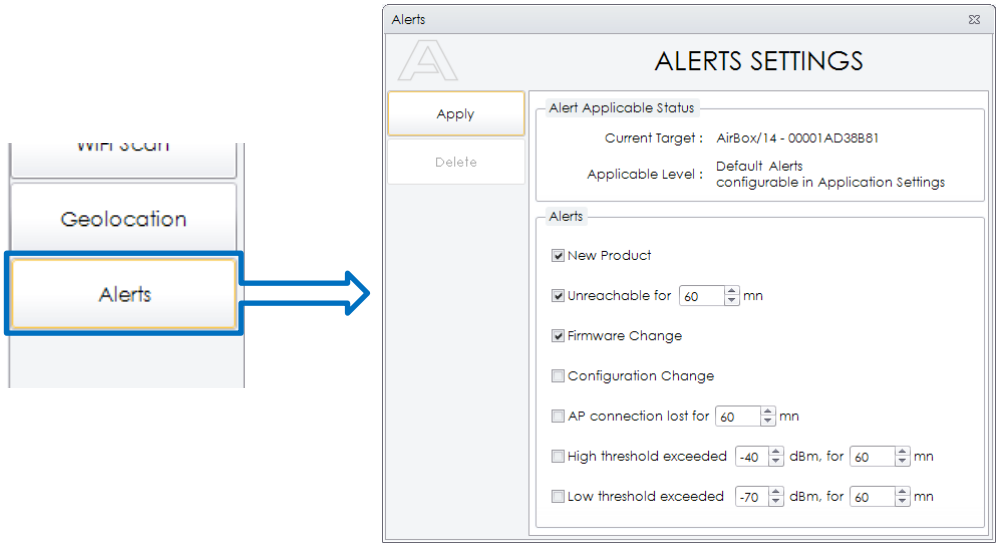
In the group/zone tree, a zone/group which has its own alerts can be recognized by a bell icon beside (see the following picture).



In order to go back the last alert level, click the "**Delete**" button that is under the "**Apply**" button.

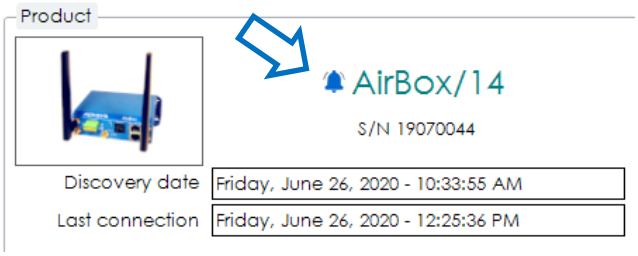
DEFINE THE ALERTS FOR A PRODUCT

To personalize the alerts for a product, click on the "**Alerts**" button in the product details window.



The applicable level indicates the hierarchical level of the following alerts. For example, the following photo shows the alerts are only applicable for AirBox/14 (ID.00001AD39B2D).

In the product detail window, a blue bell icon means that the product has its own alerts. (See the following example)



Applying the settings

The Save button validates the changes made.

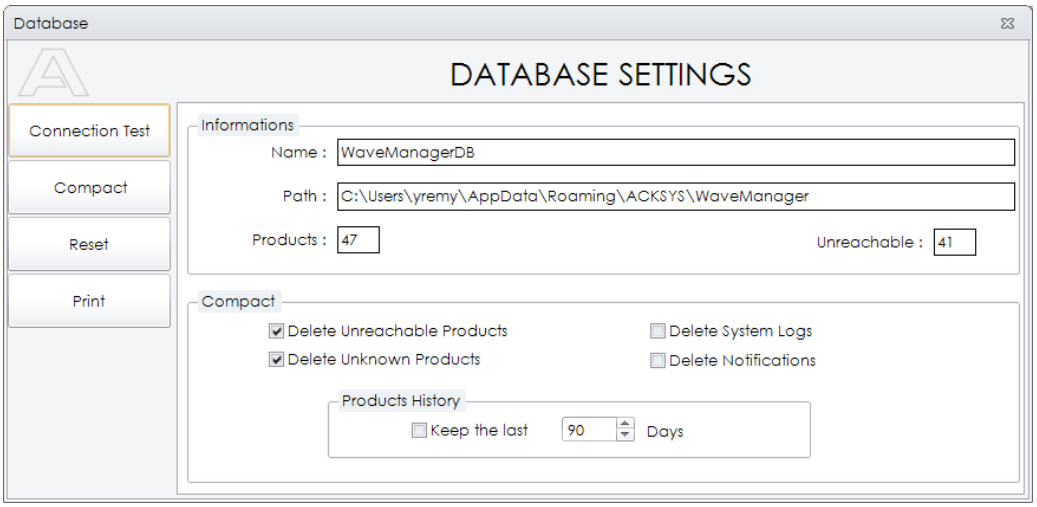
The Reset button restores the default values of the software settings including that all alerts configured in all hierarchy levels will be deleted. Click on **Save** button to validate Reset operation.

7.8. Database

WaveManager backs up the information about all registered products in its database.

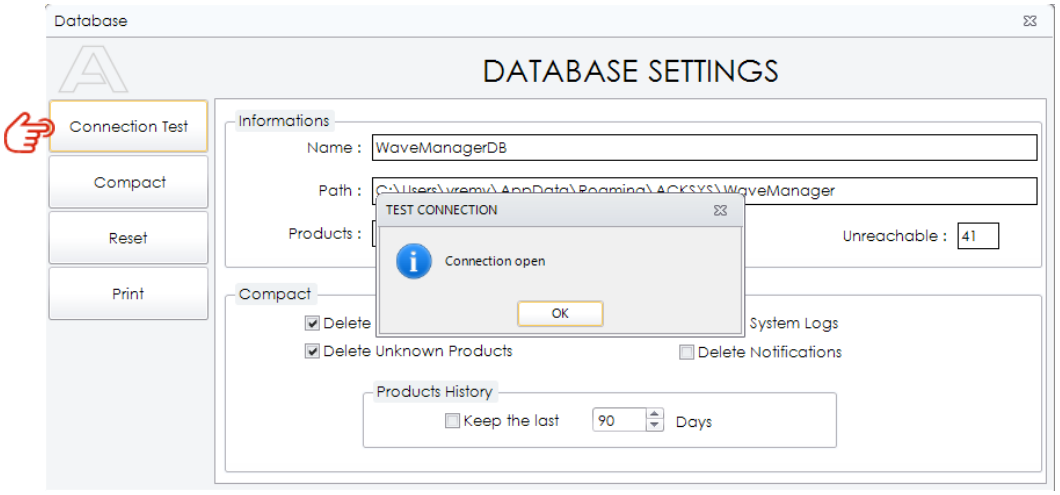
The screen below shows:

- ✓ The name of the database
- ✓ The database location
- ✓ The number of products registered in the database
- ✓ The number of undetected products (in “Unreachable” status) at the time of consultation



Besides, you can perform some maintenance operations such as:

→ **Connection Test** to check the database connection status.



→ **Compact**, which acts according to the options selected in the “Compact” section:

- ✓ **Delete Unreachable products** (“Unreachable” status);
- ✓ **Delete Unknown products** refers to all the products not supported by WaveManager;
- ✓ **Delete product logs**;
- ✓ **Delete notification history**.

If the product is still on the network, it will **reappear in the list** at the next detection.

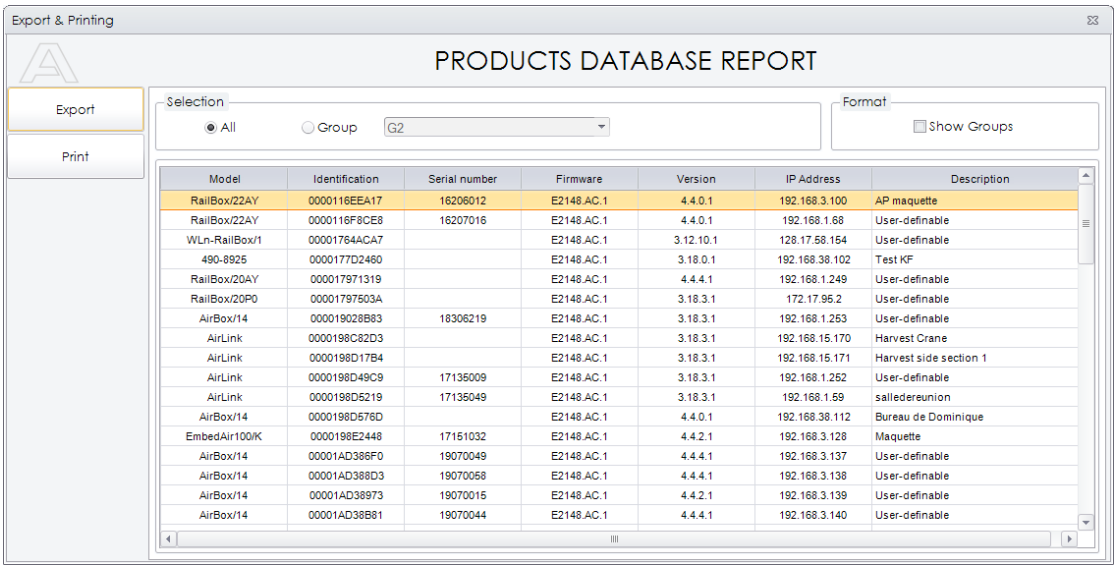
- ✓ **Product history**: sets the duration of the backup history in days.

Min.	0 d.
Max.	365 d.
Default	90 d.

→ **Reset**, removes all products including related data from the database.

→ **Print** allows printing and exporting all or some of the product list. That list can be printed or exported with the group names and the products it contains.

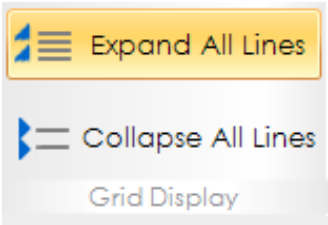
The database report is printed out with a header, footer and/or a custom watermark (*see Print/Export*).



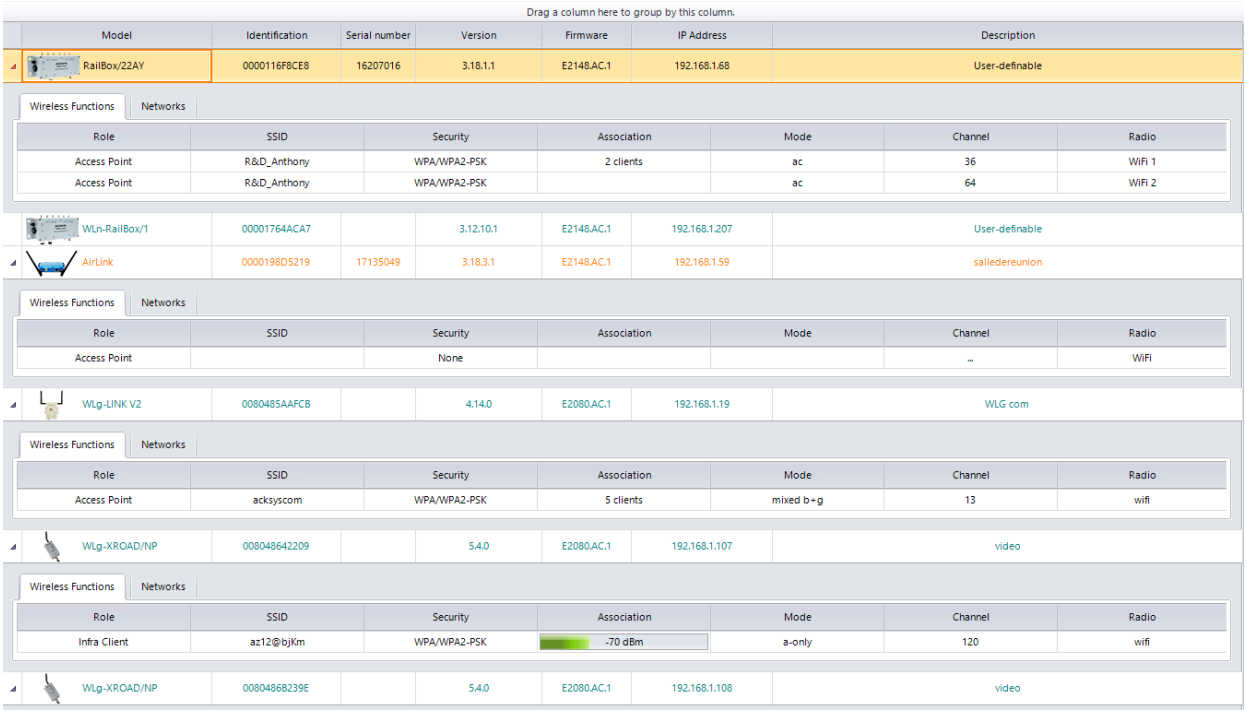
7.9. Grid Display

For a detailed view of the products discovered by WaveManager, click on the "**Expand All Lines**" button.

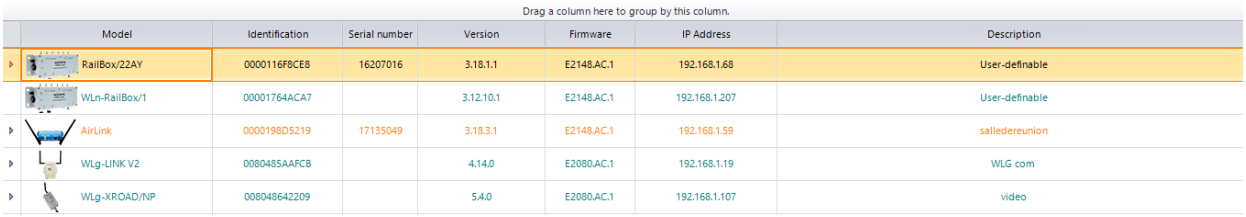
For a reduced view, click on "**Collapse All Lines**".



→ **Example of an expanded view:**



→ **Example of a collapsed view:**



8. CHARACTERISTICS

8.1. Hardware configuration

- ✓ At least Windows 7 (Windows 10 recommended)
- ✓ 32- or 64-bit version (64-bit recommended)
- ✓ NET Framework 4.5.2 at least
- ✓ GB Memory (8 GB recommended)
- ✓ Hard disk (512 GB recommended)
- ✓ A network interface of at least 100 Mbps (1 Gbps recommended)

8.2. Supported language

- ✓ English Only

8.3. Protocols and ports

UDP

- ✓ Used by UDAP, SNMP and TFTP protocols
  Port 17

UDAP

- ✓ Automatic detection of products available by broadcast
- ✓ Reading and editing the IP address of a product
- ✓ Port 17784 and port range: 11000 to 11999

SNMP

- ✓ Product monitoring
- ✓ Reading and writing a product configuration
- ✓ Ports 161 and 162

TFTP

- ✓ Downloading a firmware
- ✓ Reading and writing a configuration file
- ✓ Port 69

ICMP

- ✓ Used to search for the product(s) within a given address range.
- ✓ Port 1

Syslog

- ✓ Used to receive WaveOS logs from the product(s).
- ✓ Port 514

Telemety

- ✓ Use to receive historical association data from the prod
- ✓ Port 8628