

# WaveManager

Version 3.6.0.1

- User Manual -



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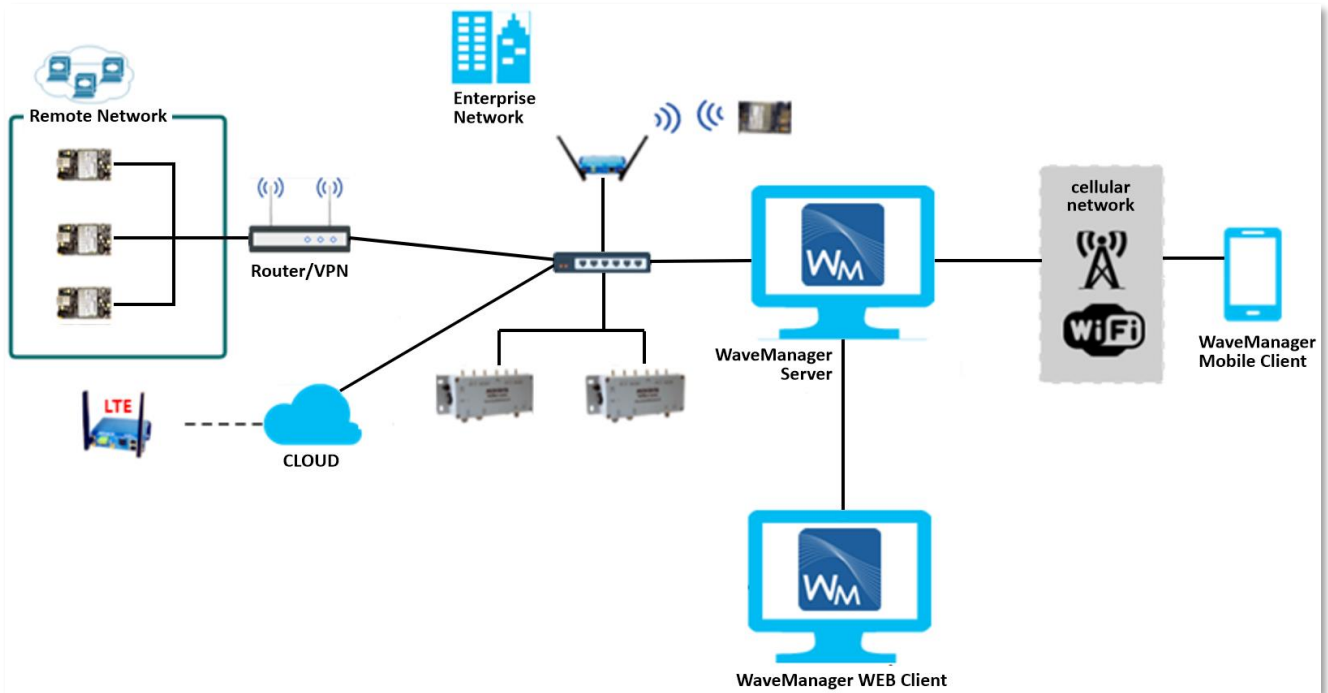
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## 1. DESCRIPTION

WaveManager is a software for Windows and Linux designed to manage and control an entire equipment fleet of ACKSYS Wi-Fi and LTE products running WaveOS firmware version 3.12.0.1 or higher.

The application is based on a Client/Server architecture:

- A single server for the entire Wi-Fi network
- All clients share the same data



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**
  - IPV4 address
  - RADIO channel
  - SSID
  - Web Server HTTPS certificate
  - Firmware update
  - Telemetry settings
  - Support the whole Acksys MIB (since version 3.12.0.1)

- ✓ **Effective maintenance**
  - Possibility to record a configuration, restore a previous configuration or to set up a new one for each product
  - 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 generate the live trace graph
  
- ✓ **Analysis of the Roaming data** from a client in roaming mode.
  - Ability to generate the roaming graph immediately
  
- ✓ **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 [Distant discovery](#)).



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

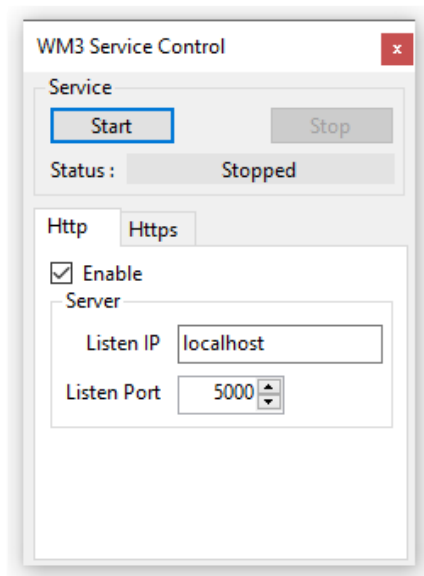
## 2. WINDOWS INSTALLATION

WaveManager is compatible with Windows 10 and higher. You will need an internet connection for installation.

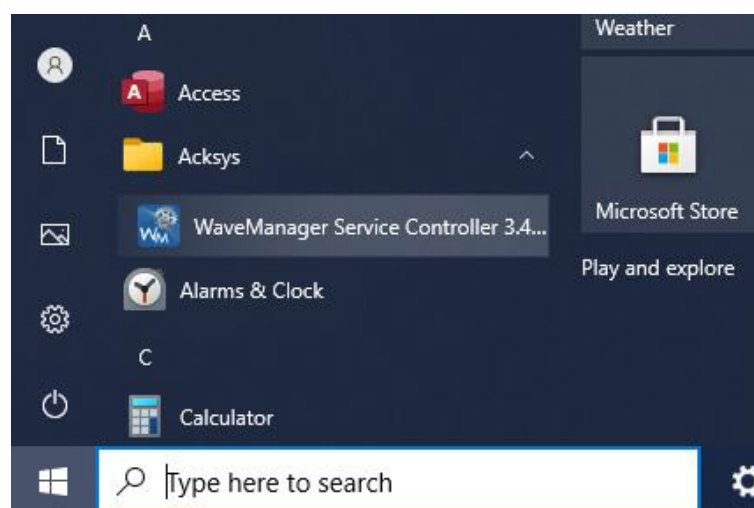
WaveManager installation package is available for download from Acksys Website:

[Support/download-center/software-and-drivers-downloads/Administration tools & utilities](#)

- Run the installation program in a directory
- Follow the instructions of the installer. Unless there is a particular need, use the default configurations offered for the application and SQL server 2019
- It may be necessary to reboot the PC during the installation, or to finalize it
- After rebooting the PC, the WM3 Service Control dialog box should be opened



- Otherwise, you can launch the service from the Acksys folder in the *Windows start menu*: click **WaveManager Service Controller**



- You can now start the service by clicking **Start**

## 3. LINUX INSTALLATION

### Prerequisites:

- A PC with Ubuntu 20.4 or higher, with internet access during the first install
  - 4 GB RAM
  - 100 GB (or more) hard drive
  - 100 Mbps (or more) ethernet interface

### Installation steps

Download the linux WaveManager packet from Acksys WEB site.

We will use **dpkg installer** tool to install WaveManager

```
fch@fch-VirtualBox: ~/dev/wavemanager-v3/Acksys.WaveManager
fch@fch-VirtualBox:~/dev/wavemanager-v3/Acksys.WaveManager$ sudo dpkg -i acksys-wavemanager_3.4.0.1_amd64.deb
(Lecture de la base de données... 205964 fichiers et répertoires déjà installés.)
Préparation du dépaquetage de acksys-wavemanager_3.4.0.1_amd64.deb ...
Removed /etc/systemd/system/multi-user.target.wants/acksys-wavemanager.service.
Dépaquetage de acksys-wavemanager (3.4.0.1) sur (3.4.0.1) ...
Paramétrage de acksys-wavemanager (3.4.0.1) ...
Enter the Sql Server SA Password : this will be used to connect to the Sql Server for all applications
Password: Configuring SQL Server...
Vous trouverez les termes du contrat de licence de ce produit dans
/usr/share/doc/mssql-server ou vous pouvez les télécharger à partir de :
https://go.microsoft.com/fwlink/?LinkId=2104294&clcid=0x40c

Vous pouvez consulter la déclaration de confidentialité à l'adresse :
https://go.microsoft.com/fwlink/?LinkId=853010&clcid=0x40c

Configuration de SQL Server...

ForceFlush is enabled for this instance.
ForceFlush feature is enabled for log durability.
Le programme d'installation s'est correctement effectué. SQL Server démarre.
Configuring UFW to allow traffic on port 1433...
Omission de l'ajout de la règle existante
Omission de l'ajout de la règle existante (v6)
Pare-feu inactif (rechargement ignoré)
Restarting SQL Server...
WaveManager Database Creation : This Operation Will Take A Few Seconds.
Creating WaveManager database. (Unix operating system)
Created symlink /etc/systemd/system/multi-user.target.wants/acksys-wavemanager.service → /etc/systemd/system/acksys-wavemanager.service.
fch@fch-VirtualBox:~/dev/wavemanager-v3/Acksys.WaveManager$
```

The password to **mysql server** will be requested during installation.

If **SQL Server** is not installed beforehand on the PC, WaveManager installation is stopped, and SQL Server installation is requested.

To install SQL Server on Ubuntu, execute the following command:

```
sudo apt-get update
sudo apt-get -y upgrade
sudo wget -qO- https://packages.microsoft.com/keys/microsoft.asc | sudo apt-key add -
sudo add-apt-repository "$ (wget -qO- -https://packages.microsoft.com/config/ubuntu/20.04/mssql-server-2019.list) "
sudo apt update
sudo apt install mssql-server
```

WaveManager 3.6.0.1 is installed in a specific repository:

```
fch@fch-VirtualBox: ~/dev/wavemanager-v3/Acksys.WaveManager
fch@fch-VirtualBox:~/dev/wavemanager-v3/Acksys.WaveManager$ ll /opt/acksys/
total 16
drwxr-xr-x 4 root root 4096 avril 21 16:18 ./
drwxr-xr-x 5 root root 4096 avril 21 16:19 ../
drwxr-xr-x 5 root root 4096 avril 27 16:15 bin/
drwxr-xr-x 2 root root 4096 avril 27 16:14 etc/
fch@fch-VirtualBox:~/dev/wavemanager-v3/Acksys.WaveManager$ ll /opt/acksys/bin/
total 127096
drwxr-xr-x 5 root root 4096 avril 27 16:15 ./
drwxr-xr-x 4 root root 4096 avril 21 16:18 ../
-rw-r--r-- 1 root root 475980 mars 24 15:00 Acksys.WaveManager.Client.pdb
-rwxr-xr-x 1 root root 128024350 mars 24 15:00 Acksys.WaveManager.Server*
-rw-r--r-- 1 root root 285592 mars 24 15:00 Acksys.WaveManager.Server.pdb
-rw-r--r-- 1 root root 48388 mars 24 15:00 Acksys.WaveManager.Shared.pdb
-rw-r--r-- 1 root root 110 mars 24 15:00 appsettings.Development.json
-rw-r--r-- 1 root root 1097 avril 27 16:15 appsettings.json
-rw----- 1 root root 1097 avril 27 16:15 appsettings_mssql.json
-rw-r--r-- 1 root root 108 mars 24 15:00 appsettings.Production.json
drwxr-xr-x 2 root root 4096 avril 27 16:14 BlazorDebugProxy/
-rw-r--r-- 1 root root 1195200 mars 24 15:00 libe_sqlite3.so
-rw-r--r-- 1 root root 178 mars 24 15:00 libman.json
drwxr-xr-x 3 root root 4096 avril 21 16:18 Services/
-rw-r--r-- 1 root root 65856 mars 24 15:00 SnmpSharpNetStandard.pdb
drwxr-xr-x 10 root root 4096 avril 27 16:14 wwwroot/
fch@fch-VirtualBox:~/dev/wavemanager-v3/Acksys.WaveManager$ ll /opt/acksys/etc/
total 16
drwxr-xr-x 2 root root 4096 avril 27 16:14 ./
drwxr-xr-x 4 root root 4096 avril 21 16:18 ../
-rw-r--r-- 1 root root 314 mars 24 15:00 acksys-wavemanager.service
-rwxr-xr-x 1 root root 2079 mars 24 15:00 configure-mssql-server-connection.sh*
fch@fch-VirtualBox:~/dev/wavemanager-v3/Acksys.WaveManager$
```

## WaveManager Service

A WaveManager service `acksys-wavemanager.service` is added and launched after installation.

The service status can be checked using the following command:

```
fch@fch-VirtualBox: ~/dev/wavemanager-v3/Acksys.WaveManager
fch@fch-VirtualBox:~/dev/wavemanager-v3/Acksys.WaveManager$ sudo systemctl status acksys-wavemanager.service
[sudo] Mot de passe de fch :
● acksys-wavemanager.service - Acksys WaveManager server.
   Loaded: loaded (/etc/systemd/system/acksys-wavemanager.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2022-04-27 16:15:26 CEST; 21min ago
     Main PID: 154882 (Acksys.WaveMana)
        Tasks: 30 (limit: 3421)
       Memory: 118.9M
      CGroup: /system.slice/acksys-wavemanager.service
              └─154882 /opt/acksys/bin/Acksys.WaveManager.Server

avril 27 16:36:58 fch-VirtualBox acksys-wavemanager.service[154882]: Request has reached maximum retries.
avril 27 16:36:58 fch-VirtualBox acksys-wavemanager.service[154882]: Request has reached maximum retries.
avril 27 16:36:58 fch-VirtualBox acksys-wavemanager.service[154882]: Request has reached maximum retries.
avril 27 16:36:58 fch-VirtualBox acksys-wavemanager.service[154882]: Request has reached maximum retries.
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avril 27 16:36:58 fch-VirtualBox acksys-wavemanager.service[154882]: Request has reached maximum retries.
avril 27 16:36:58 fch-VirtualBox acksys-wavemanager.service[154882]: Request has reached maximum retries.
fch@fch-VirtualBox:~/dev/wavemanager-v3/Acksys.WaveManager$
```



The service can be stopped using this command:

```
fch@fch-VirtualBox: ~/dev/wavemanager-v3/Acksys.WaveManager
fch@fch-VirtualBox:~/dev/wavemanager-v3/Acksys.WaveManager$ sudo systemctl stop acksys-wavemanager.service
fch@fch-VirtualBox:~/dev/wavemanager-v3/Acksys.WaveManager$ sudo systemctl status acksys-wavemanager.service
● acksys-wavemanager.service - Acksys WaveManager server.
   Loaded: loaded (/etc/systemd/system/acksys-wavemanager.service; enabled; vendor preset: enabled)
   Active: inactive (dead) since Wed 2022-04-27 16:37:59 CEST; 3s ago
     Process: 154882 ExecStart=/opt/acksys/bin/Acksys.WaveManager.Server (code=exited, status=0/SUCCESS)
    Main PID: 154882 (code=exited, status=0/SUCCESS)

avril 27 16:37:52 fch-VirtualBox acksys-wavemanager.service[154882]: Request has reached maximum retries.
avril 27 16:37:54 fch-VirtualBox acksys-wavemanager.service[154882]: Request has reached maximum retries.
avril 27 16:37:54 fch-VirtualBox acksys-wavemanager.service[154882]: Request has reached maximum retries.
avril 27 16:37:54 fch-VirtualBox acksys-wavemanager.service[154882]: Request has reached maximum retries.
avril 27 16:37:54 fch-VirtualBox acksys-wavemanager.service[154882]: Request has reached maximum retries.
avril 27 16:37:58 fch-VirtualBox systemd[1]: Stopping Acksys WaveManager server...
avril 27 16:37:59 fch-VirtualBox acksys-wavemanager.service[154882]: Microsoft.Hosting.Lifetime[0] Application shutting down...
avril 27 16:37:59 fch-VirtualBox systemd[1]: acksys-wavemanager.service: Succeeded.
avril 27 16:37:59 fch-VirtualBox systemd[1]: Stopped Acksys WaveManager server..
fch@fch-VirtualBox:~/dev/wavemanager-v3/Acksys.WaveManager$
```

The service can be started using this command:

```
fch@fch-VirtualBox: ~/dev/wavemanager-v3/Acksys.WaveManager
fch@fch-VirtualBox:~/dev/wavemanager-v3/Acksys.WaveManager$ sudo systemctl start acksys-wavemanager.service
fch@fch-VirtualBox:~/dev/wavemanager-v3/Acksys.WaveManager$ sudo systemctl status acksys-wavemanager.service
● acksys-wavemanager.service - Acksys WaveManager server.
   Loaded: loaded (/etc/systemd/system/acksys-wavemanager.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2022-04-27 16:38:36 CEST; 9s ago
     Main PID: 155652 (Acksys.WaveMana)
       Tasks: 20 (limit: 3421)
      Memory: 57.1M
     CGroup: /system.slice/acksys-wavemanager.service
            └─155652 /opt/acksys/bin/Acksys.WaveManager.Server

avril 27 16:38:39 fch-VirtualBox acksys-wavemanager.service[155652]: Acksys.WaveManager.Server.Services.OperationalServices.Ala>
avril 27 16:38:39 fch-VirtualBox acksys-wavemanager.service[155652]: Acksys.WaveManager.Server.Services.OperationalServices.Ala>
avril 27 16:38:39 fch-VirtualBox acksys-wavemanager.service[155652]: Acksys.WaveManager.Server.Services.OperationalServices.Not>
avril 27 16:38:39 fch-VirtualBox acksys-wavemanager.service[155652]: Acksys.WaveManager.Server.Services.OperationalServices.Not>
avril 27 16:38:39 fch-VirtualBox acksys-wavemanager.service[155652]: Acksys.WaveManager.Server.Services.OperationalServices.Sys>
avril 27 16:38:39 fch-VirtualBox acksys-wavemanager.service[155652]: Acksys.WaveManager.Server.Services.OperationalServices.Sys>
avril 27 16:38:39 fch-VirtualBox acksys-wavemanager.service[155652]: Acksys.WaveManager.Server.Services.OperationalServices.Sys>
avril 27 16:38:39 fch-VirtualBox acksys-wavemanager.service[155652]: Microsoft.Hosting.Lifetime[0] Application started. Hosting>
avril 27 16:38:44 fch-VirtualBox acksys-wavemanager.service[155652]: Acksys.WaveManager.Server.Services.Jobs.Fetching.LocalDisc>
avril 27 16:38:44 fch-VirtualBox acksys-wavemanager.service[155652]: Acksys.WaveManager.Server.Services.Jobs.Fetching.LocalDisc>
lines 1-19/19 (END)
```

The service can be restarted using the following command:

```
fch@fch-VirtualBox: ~/dev/wavemanager-v3/Acksys.WaveManager
fch@fch-VirtualBox:~/dev/wavemanager-v3/Acksys.WaveManager$ sudo systemctl restart acksys-wavemanager.service
fch@fch-VirtualBox:~/dev/wavemanager-v3/Acksys.WaveManager$ sudo systemctl status acksys-wavemanager.service
● acksys-wavemanager.service - Acksys WaveManager server.
   Loaded: loaded (/etc/systemd/system/acksys-wavemanager.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2022-04-27 16:39:38 CEST; 4s ago
     Main PID: 155748 (Acksys.WaveMana)
       Tasks: 17 (limit: 3421)
      Memory: 55.5M
     CGroup: /system.slice/acksys-wavemanager.service
            └─155748 /opt/acksys/bin/Acksys.WaveManager.Server

avril 27 16:39:41 fch-VirtualBox acksys-wavemanager.service[155748]: Acksys.WaveManager.Server.Services.OperationalServices.Upd>
avril 27 16:39:41 fch-VirtualBox acksys-wavemanager.service[155748]: Acksys.WaveManager.Server.Services.OperationalServices.Upd>
avril 27 16:39:41 fch-VirtualBox acksys-wavemanager.service[155748]: Acksys.WaveManager.Server.Services.OperationalServices.Ala>
avril 27 16:39:41 fch-VirtualBox acksys-wavemanager.service[155748]: Acksys.WaveManager.Server.Services.OperationalServices.Ala>
avril 27 16:39:41 fch-VirtualBox acksys-wavemanager.service[155748]: Acksys.WaveManager.Server.Services.OperationalServices.Not>
avril 27 16:39:41 fch-VirtualBox acksys-wavemanager.service[155748]: Acksys.WaveManager.Server.Services.OperationalServices.Not>
avril 27 16:39:41 fch-VirtualBox acksys-wavemanager.service[155748]: Acksys.WaveManager.Server.Services.OperationalServices.Sys>
avril 27 16:39:41 fch-VirtualBox acksys-wavemanager.service[155748]: Acksys.WaveManager.Server.Services.OperationalServices.Sys>
avril 27 16:39:41 fch-VirtualBox acksys-wavemanager.service[155748]: Acksys.WaveManager.Server.Services.OperationalServices.Sys>
avril 27 16:39:41 fch-VirtualBox acksys-wavemanager.service[155748]: Microsoft.Hosting.Lifetime[0] Application started. Hosting>
lines 1-19/19 (END)
```

## 4. WAVEMANAGER INTERFACE ACCESS

To launch the application, type **localhost:5000** in your browser's URL bar. At the first launch, you will have to register by creating an admin account for users' management and product management included. Please make sure to write down the password, since there is no way to get it back if you forget it and this password should meet the security measure implemented on this product by including the combination of letters, numbers and characters.

**Update user data** [x]

**WaveManager**

**Username**  
support [person icon]

**Firstname (optional)**  
Firstname [person icon]

**Lastname (optional)**  
Lastname [person icon]

**Email (optional)**  
support@acksys.fr [envelope icon]

**Phone number (optional)**  
Phone number [phone icon]

**Company name (optional)**  
Acksys [calendar icon]

**Update user data**

**WM3 Service Control** [x]

**Service**  
Start Stop  
Status : Running

**Http** **Https**

Enable

**Server**  
Listen IP localhost  
Listen Port 5000

The URL can be **http** or **https** in case of certificate: <http://localhost:5000> or <https://@IP:5000>

The default port used by WaveManager Server is **5000** and can be changed.

For subsequent launches, you will just need to enter your email address and password

WaveManager 3 [x] [y] [z]

localhost:5000 [info] [star] [user]

**WaveManager**

**LOGIN**

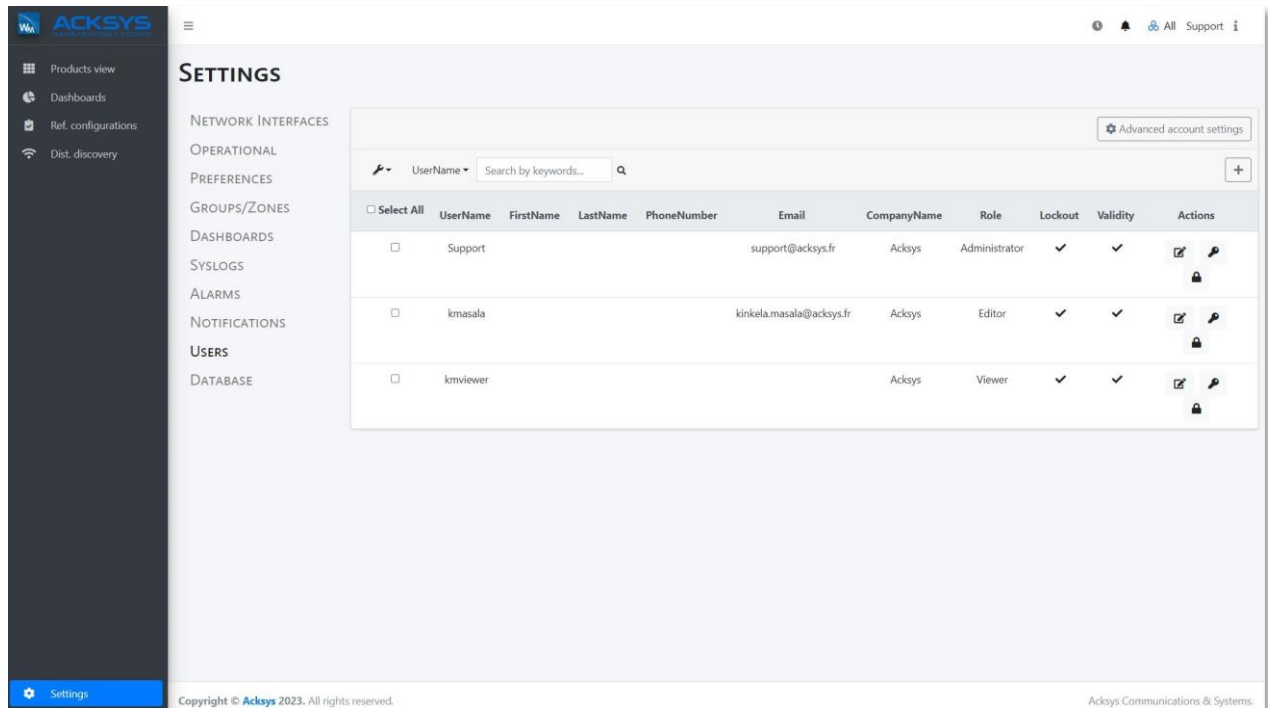
support@acksys.fr [envelope icon]

..... [lock icon]

**LOGIN**

## 4.1. Multi-user

WaveManager 3.6.0.1 has three major users management: the admin user, the editor user and viewer user.



The users you have added are displayed in this interface for users' management.

### Admin-user

You can only have one admin account, which is created at first launch of the tool. With administration role for managing other users and product configuration. The admin user name cannot be changed once created. However, you might update other functionalities and set the account details and advanced config via advanced account settings. The advanced account settings are only reserved for the admin user to perform the list of actions as screened below.

The 'Update user data' dialog box contains the following fields:

- Username:** support
- Firstname (optional):** Firstname
- Lastname (optional):** Lastname
- Email (optional):** support@acksys.fr
- Phone number (optional):** Phone number
- Company name (optional):** Acksys

At the bottom is a blue button labeled 'Update user data'.

The 'Advanced account settings' dialog box contains the following sections:

- Password expiration:**
  - Enable expiration
  - Expiration every 30 day(s)
- Password requirements:**
  - Minimum length 6
  - Must contain a lower case ASCII character
  - Must contain an upper case ASCII character
  - Must contain a non-alphanumeric character
  - Must contain a digit
- Lockout settings:**
  - Maximum failed access attempts 3
  - Lockout duration 2 minute(s)
- Session settings:**
  - Maximum authorization token duration 5 minute(s)
  - Maximum session duration 144 minute(s)

At the bottom is a blue button labeled 'Update account setting'.

## Editor-user

The Editor user has limited settings with no control on users. The editor role has complete products management included in Products view. No user's management is assigned to this role except changing its password. At first login, the editor has to update the password.

The screenshot shows a modal window titled "Update user data" with a close button (x) in the top right corner. The WaveManager logo is at the top left. The form contains several input fields, each with a user icon on the right: "Username" (pre-filled with "kmasala"), "Firstname (optional)", "Lastname (optional)", "Email (optional)", "Phone number (optional)", and "Company name (optional)". A blue "Update user data" button is at the bottom.

The screenshot shows a modal window titled "Update user password" with a close button (x) in the top right corner. The WaveManager logo is at the top left. The form contains: "Username" (pre-filled with "kmasala"), "Old password", "New password", and "Confirm new password" fields, each with a lock icon on the right. A blue "Update user password" button is at the bottom.

## Viewer-user

The viewer role is simply as stated, having a simple view on the product, no settings can be changed on products. However, the viewer user can launch the product to the browser for configuration. At first login, it is mandatory to update the password.

The screenshot shows a modal window titled "Update user data" with a close button (x) in the top right corner. The WaveManager logo is at the top left. The form contains several input fields, each with a user icon on the right: "Username" (pre-filled with "kmviewer"), "Firstname (optional)", "Lastname (optional)", "Email (optional)", "Phone number (optional)", and "Company name (optional)" (pre-filled with "Acksys"). A blue "Update user data" button is at the bottom.

The screenshot shows a modal window titled "Update user password" with a close button (x) in the top right corner. The WaveManager logo is at the top left. The form contains: "Username" (pre-filled with "kmviewer"), "Old password", "New password", and "Confirm new password" fields, each with a lock icon on the right. A blue "Update user password" button is at the bottom.

## Users' role

WaveManager provides the following roles per user on the below chart:

Functionnality	Role		
	Viewer	Editor	Administrator
Global display and product detail	X	X	X
Dashboard display	X	X	X
RSSI and Roaming graphics display	X	X	X
Syslog and product history display	X	X	X
Led Tracking activation and deactivation	X	X	X
Product access test (Ping)	X	X	X
Product validation		X	X
Remot discovery		X	X
Wifi-Scan		X	X
Product configuration management		X	X
Alarm management		X	X
Operational configuration update: general interfaces configuration, data collect, advanced configuration, colors and printing configuration, alarm and notifications configuration		X	X
Database configuration: catalog update and database reset			X
Users management			X

## 5. PRODUCT VIEW

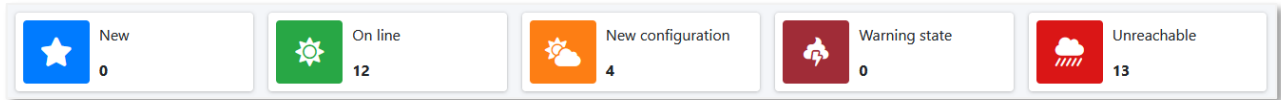
After launching WaveManager via your browser and entering the login details, you may click **Product view** tab to display products in your network as followed:

The screenshot displays the 'Product view' section of the WaveManager web interface. The interface includes a sidebar with navigation options like 'Products view', 'Dashboards', 'Ref. configurations', and 'Remote discovery'. The main content area shows a summary of device status (New, On line, New configuration, Warning state, Unreachable) and a table of products. The table has the following columns: Model, Serial, Product Id, Firmware, Version, IP Address, Description, and Roles. The table lists several devices including AirBox/12, AirLink, AirWan-M12/17, RailBox/22AY, WaveOS Emergency Upgrade, and RailBox/DRA0.

Model	Serial	Product Id	Firmware	Version	IP Address	Description	Roles
AirBox/12	22118036	00001094D1B0	E2148.AC.1	4.18.5.1	192.168.1.112	User-definable	
AirLink		00001094E32D	E2148.AC.1	4.16.9.1	192.168.1.253	User-definable	
AirWan-M12/17		000010978DCA	E2148.AC.1	4.18.8.1	192.168.1.253	User-definable	
RailBox/22AY		0000116EEA17	E2148.AC.1	4.18.4.1	192.168.1.90	LAB Router	
RailBox/22AY	16207016	0000116F8CEB	E2148.AC.1	4.18.4.1	192.168.1.68	AP R&D	
WaveOS Emergency Upgrade		000011778A8C	E2158.AC.0	4.1.0.1	192.168.1.123	WaveOS Emergency Upgrade	
ACKSYS product		000011778DB8	E2148.AC.2	4.20.4.1	192.168.1.151	User-definable	
RailBox/DRA0		00001178881A	E2148.AC.2	4.22.0.1@RC3	192.168.1.137	User-definable	
RailBox/DDA0		00001178C2DD	E2148.AC.2	4.22.0.1@RC3	192.168.55.27	User-definable	

Acksys products detected on the different enabled interfaces in Settings are listed in this page, as well as the registered products. At the first launch, a discovery period is necessary before any detected product can be displayed. If nothing appears, check if the concerned network interfaces are correctly defined Settings (**see 10. SETTINGS – Interface tab**).

On the top of the page, you will find the *Inventory status* icon bar.



The number of products of each category is displayed.



**New product:** product responding but not registered in the database



**On line:** product responding and registered in the database



**New configuration:** the unit configuration doesn't match the configuration registered in the database



**Warning state:** anomalies have been detected (specified in the product info window)



**Unreachable:** this unit is registered in the database but not responding (disconnected or rebooting)

### Notes on registering products in the database

The recording of a product in the database is carried out when this product is "validated". In the default WaveManager configuration, new product validation is automatic (Settings menu, see chapter [General tab](#)). In this case you will never see a device with the **New product** status.

"Validated" products will always be visible in the list, with a status corresponding to their state, and the signature of their configuration will be recorded in the database, which makes it possible to detect configuration changes (to display the **New Configuration** status).

If you disable automatic validation, WaveManager will not be able to detect configuration changes for newly detected products until they have been validated. If a **New product** is no longer detected by WaveManager, it disappears from the list.

You can validate a **New product** at any time from the WaveManager interface: please see chapter [Product info menu bar](#).

When the configuration of a validated product is modified, its status changes to **New configuration**. You can manually validate it again to save the new signature in the database.

Please note that validating a product only saves the signature of the configuration and not the complete configuration. To save the complete configuration in the database, please refer to the chapter [Product info menu bar](#)

Below is the list of products. In this list, we find the status icon in the left column. Please note that the color of the line matches the color of the status icon

<input type="checkbox"/>	Model	Serial	Product ID	Firmware	Version	IP Address	Description	Role
<input type="checkbox"/>	AirBox/14	18131021	0000198D93B7	E2148.AC.1	4.16.9.1	10.1.1.20	User-definable	1
<input type="checkbox"/>	AirXroad	20086014	00001C58A5D7	E2148.AC.1	4.16.9.1	10.1.1.28	User-definable	1
<input type="checkbox"/>	RailBox/66AY	22009001	00001CE04476	E2148.AC.1	4.16.9.1	10.1.1.140	User-definable	



We find also:

- The model of the product
- The serial number
- The product ID
- The firmware ID
- The version of WaveOS
- The IP address of the product
- The Description (**Device location** field of the TOOLS/System page)
- The roles

**Model:** The product reference

**Serial:** This is the serial number of the unit, also displayed in the *Device Info* Status page from the product WEB server. Please note that the serial number may be missing on some older products.

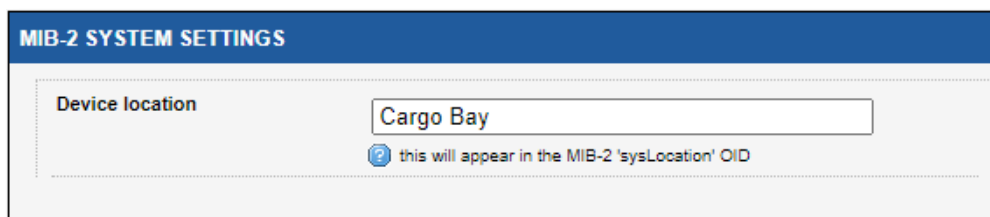
**Product ID:** The product ID is an identification number that can also be found on the *Device Info* status page of the product WEB server, under the name *Motherboard ID*.

**Firmware:** The WaveOS identification code (the standard ID is E2148.AC.1).

**Version:** The version of WaveOS installed on this unit.

**IP Address:** The IP address of this unit. Please note that if the product is configured as a router, the address that appears here is the one that is visible from the selected network interface.

**Description:** This is the **Device location** caption, defined in the product WEB server



Tools/SYSTEM/MIB-2 System Settings

**Role:** here you will find the different roles programmed on the product, represented by icons, the meaning of which is as follows



Role ACCESS POINT or ISOLATED ACCESS POINT



Role CLIENT or TRANSPARENT CLIENT



Role MESH

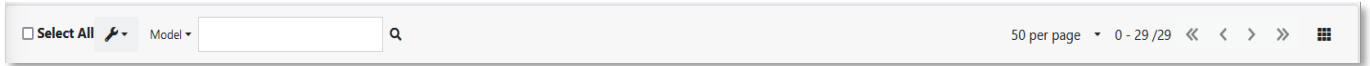


Role AD-HOC (no more implemented in our new products)

There is no icon for Monitor and SRCC modes.

The list can be sorted by any of these criteria, except role: simply click on the column header to update the list sorting order, or toggle between increasing and descending sorting. You can also sort by clicking on one of the **Inventory status** icons.

## 5.1. The menu toolbar

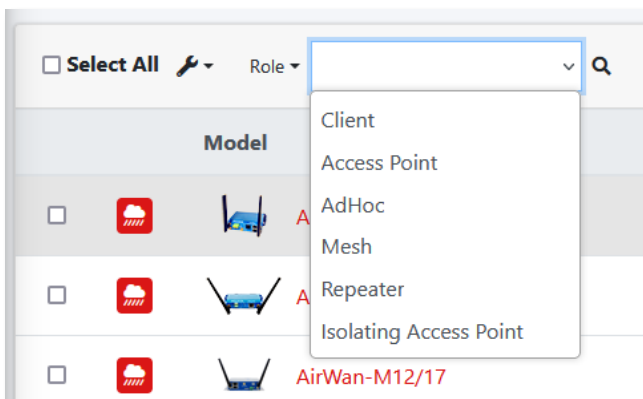
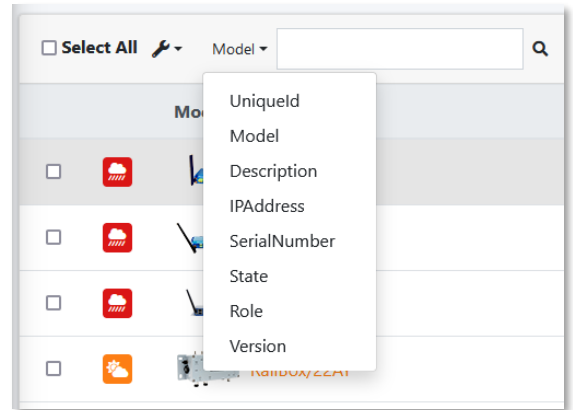


### Multi-criteria search

You can search for products according to these criteria:

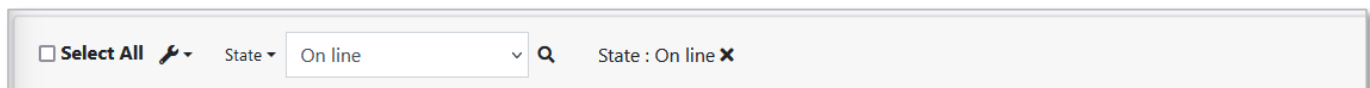
Please note that the values researched are case sensitive and must correspond exactly to the wording of the lines displayed.

For the status and role criteria, the authorized values are proposed:



Please note that you can also search via the status icon bar from the top of the page: just click on a Status icon to initiate the search

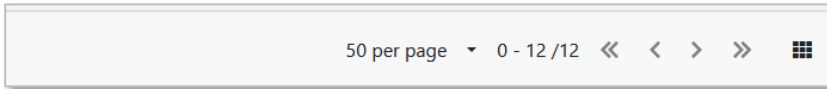
To remove a search criterion, simply click on the x:





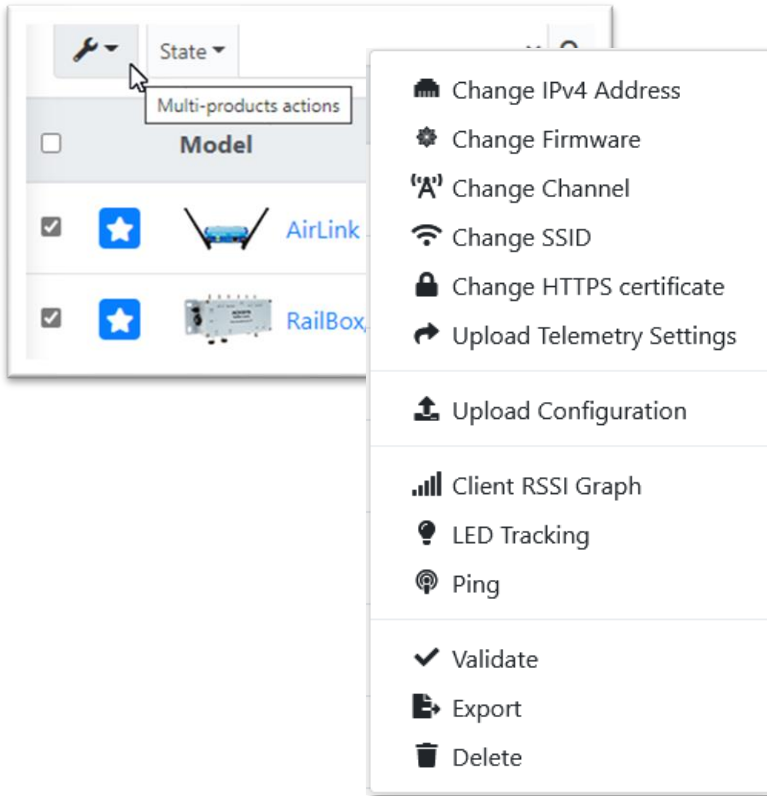
## Navigation page

Allows to define the number of lines on each page, and to navigate between pages





## Multi-product actions

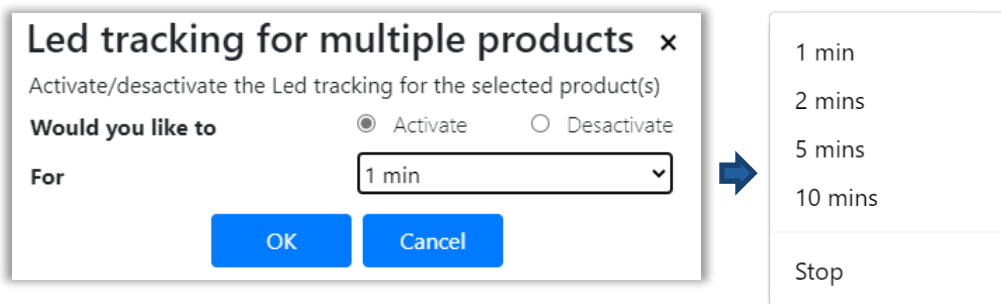
This icon allows you to perform different actions on the selected products



**Change actions** have the effect of altering the configuration of the selected products. These actions are detailed in chapter [Change actions](#)

 **client RSSI Graph:** display a graph of the evolution of the signal level received by the selected WiFi clients. This functionality is detailed in chapter [RSSI Monitor](#)

 **LED Tracking:** triggers or stop the selected products diagnostic LED flash for the selected duration, to facilitate the localization of the products





**Ping:** a click on the Ping icon sends a ping request to the selected units. WaveManager indicates whether each unit has responded to the Ping with a success or failure message:



When an online product doesn't respond to the ping, it's usually because it's not on the same subnet as the PC.



**Validate:** validating a group of products means that these units will be registered in the WaveManager database. Each validated product will therefore pass from the **New** status to the **On line** status, and may later pass to the **Unreachable** state, if it's no longer reachable, or to the **New configuration** state if its configuration has changed.



**Delete:** Deletes the product from the database, along with all recorded information pertaining to that product. Please note that, if the product is still accessible, it will be visible again after the next scan cycle, and if automatic validation is enabled, it will be saved again in the database.



**Export:** Export a summary of selected product information in CSV or HTML format

Model	Identifiant	SerialNumber	Firmware	Version	IPv4 address	Description
AirLink	0000198C9C7F	18045311	E2148.AC.1	4.18.3.1	10.1.1.51	User-definable
AirLink	000019B71D12	18213556	E2148.AC.1	4.18.3.1	10.1.1.122	User-definable
RailBox/66AY	00001CE04476	22009001	E2148.AC.1	4.16.9.1	10.1.1.253	User-definable

ACKSYS Communications & Systems

## Display mode



The Mosaic display icon allows to switch from default list display mode to mosaic display mode

The screenshot shows the WaveManager interface in mosaic display mode. At the top, there is a search bar with 'State' and a magnifying glass icon, and a pagination control showing '50 per page' and '0 - 6 / 6'. Below the search bar, there are four product cards arranged in a 2x2 grid. Each card contains a star icon, a product image, and the following details:

- Card 1 (Top Left):** Model: AirXroad/4P, Firmware: E2148.AC.1, IP Address: 192.168.42.120, Description: User-definable. Status: Unreachable (red star).
- Card 2 (Top Right):** Model: AirXroad, Firmware: E2148.AC.1, IP Address: 10.1.1.28, Serial: 20086014, Description: User-definable. Status: Online (green star).
- Card 3 (Bottom Left):** Model: RailBox/22A0, Firmware: E2148.AC.1, IP Address: 10.1.1.110, Serial: 18251034, Description: User-definable. Status: Unreachable (red star).
- Card 4 (Bottom Right):** Model: AirLink, Firmware: E2148.AC.1, IP Address: 10.1.1.103, Serial: , Description: STATION 1. Status: Online (blue star).

Of course, in this mode there is no sorting option.

You can switch back to list mode by clicking on the list icon



## 5.2. Product info window

Clicking on one of the displayed product lines brings up a detailed product information window on the right:

AirBox/12
✕

S/N 22118036

🔧
🌐
📷
📄
💡
☰
📍
✓
🗑️

▼ **DESCRIPTION**

Discovery date	11/04/2023 12:33
Last connection	11/04/2023 14:07
IP Address	192.168.1.112
Mask	255.255.255.0
Gateway	0.0.0.0
Product Id	00001094D1B0
Firmware	E2148.AC.1
Version	4.18.5.1
Latitude	
Longitude	
Description	User-definable

▼ **ROLES LIST**

N°	BSSID	SSID	Role	Seci
1	00:09:90:01:4C:CA	support	Access Point	NO

▼ **NETWORK INTERFACES**

N°	Label	Mode	IP Address	Mask	Status	MAC
1	lan	Static	192.168.1.112	255.255.255.0	Enabled	00:09:90:01:4C:CA
2	wlan	Static	192.168.2.2	255.255.255.0	Enabled	00:09:90:02:B8:20

▼ **PHYSICAL INTERFACES**

N°	Type	Label	MAC Address	Status
1	WIFI	WIFI 1	00:09:90:02:B8:20	Enable
2	WIFI	WIFI 2	00:09:90:02:B8:21	Disable
3	LAN	LAN1	00:09:90:02:B8:22	Up
4	LAN	LAN2	00:09:90:02:B8:23	Down

- The product model name
- Serial number
  
- Menu bar
  
- Discovery date of the product
- Time of its last appearance
- IP address
- Net Mask
- Gateway
- The product ID
- The Firmware ID
- The firmware revision
- Position latitude (LTE products only)
- Position longitude (LTE products only)
- Description
  
- List of roles defined on this product  
Please note that for a wireless link, the BSSID is always the MAC address of the Access Point
  
- List of existing physical interfaces on this product. Very useful to easily find the MAC addresses of the physical interfaces of your product
  
- List of existing logical interfaces on this product

When the product is in the **Warning state**, there is an additional entry at the bottom of the table, which gives details of the anomalies justifying the Warning state.

▼ **WARNING STATES**

- Has incompatible telemetry setting : please check the telemetry status or the telemetry port.
- Has inactive telemetry session

In the case above, this means that telemetry is not activated on the product, or that the parameters defined in the SETUP/Statistics page of this unit are not consistent with the settings of WaveManager.

Please note that you can configure WaveManager so that it automatically performs telemetry setup with the appropriate parameters on all detected products (c.f. chapter [Data Collect tab](#))

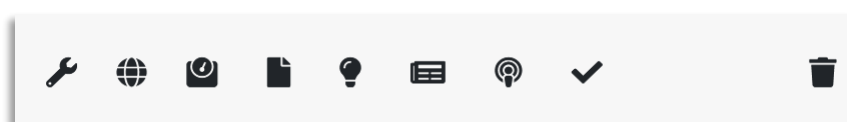
Other anomalies can cause the transition to the Warning state, such as:

- **IP conflict**      In most cases, this means that several products have the same IP address (they must all appear in the **Warning state** in the Products View). However, this can also reflect an anomaly in the dialogue by SNMP with the product

WaveManager partially supports WaveOS products with versions prior to the one specified in the **Erreur ! Source du renvoi introuvable..**

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

### Product info menu bar



- Change actions:** this icon allows you to perform different actions on the selected products. These actions are detailed in **Change Action**
- WEB server:** open the product Web server using your default browser, if the unit is reachable with the HTTP protocol.
- WiFi Scan and Roaming:** allows to perform a WiFi scan (Site Survey), or to display the roaming information.
- Product reference configuration:** clicking **Download** allows to record the product configuration file in the database. Clicking **Configuration File** will upload the **configuration** file into the product. Please note that this option appears only after a download of the configuration from this unit.

- Wi-Fi scan
- Roaming

- Download the current reference configuration
- Add an existing reference configuration
- Manage reference configurations



**LED Tracking:** triggers the product diagnostic LED flash for the selected duration (1, 2, 5 or 10 minutes) to facilitate the localization of the product. You can stop flashing at any time by clicking **Stop**

- 1 min
- 2 mins
- 5 mins
- 10 mins
- Stop



**Ping:** a click on the Ping icon sends a ping request to the unit. WaveManager indicates whether the product responded to the Ping with a success or failure message:



When an online product doesn't respond to the ping, it's usually because it's not on the same subnet as the PC.



**Validate:** validating a product means that the unit will be registered in the WaveManager database. The product will therefore pass from the **New** status to the **On line** status, and may later pass to the **Unreachable** state, if it is no longer reachable, or to the **New configuration** state if its configuration has changed.



**Logs:** The **Logs** icon gives access to the WaveManager logs and to the System logs.

- WaveManager logs
- System logs

**WaveManager log** displays all the operations performed on the product that have been observed by WaveManager since the unit discovery

WAVEMANAGER LOGS		
Date	Type	Description
11/04/2023 16:20:17	Configuration	End of IP Conflict : UniqueID : 00001094D1B0, IP : 192.168.1.112, Firmware Name : AirBox/12
11/04/2023 16:17:45	Configuration	IP Conflict : UniqueID : 00001094D1B0, IP : 192.168.1.112, Firmware Name : AirBox/12
11/04/2023 16:10:12	Configuration	Product disconnected : UniqueID : 00001094D1B0, IP : 192.168.1.112, Firmware Name : AirBox/12
11/04/2023 16:07:39	Configuration	Configuration Update : UniqueID : 00001094D1B0, IP : 192.168.1.112, Firmware Name : AirBox/12, Old Configuration Hash : f294e6c599e5d7e4f7896b3e0250eba, New Configuration Hash : 16e0e60da0c1f1d926528abb043eec
11/04/2023 16:05:36	Configuration	Configuration Update : UniqueID : 00001094D1B0, IP : 192.168.1.112, Firmware Name : AirBox/12, Old Configuration Hash : b51d6c839ae03a0df35b9f745df639c9, New Configuration Hash : f294e6c599e5d7e4f7896b3e0250eba
11/04/2023 14:41:37	Configuration	Configuration Update : UniqueID : 00001094D1B0, IP : 192.168.1.112, Firmware Name : AirBox/12, Old Configuration Hash : cd012367b50338beedbafe1df536491, New Configuration Hash : b51d6c839ae03a0df35b9f745df639c9
11/04/2023 14:41:37	Configuration	Product connected : UniqueID : 00001094D1B0, IP : 192.168.1.112, Firmware Name : AirBox/12
11/04/2023 14:41:30	Configuration	Product disconnected : UniqueID : 00001094D1B0, IP : 192.168.1.112, Firmware Name : AirBox/12
11/04/2023 14:33:56	Configuration	New product validation

The **System logs** displays all the system messages sent by a product, or a set of products, when WaveManager is used as a SYSLOG 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:

Please refer to chapter [Advanced tab](#) for the details of WaveManager setting as log sever

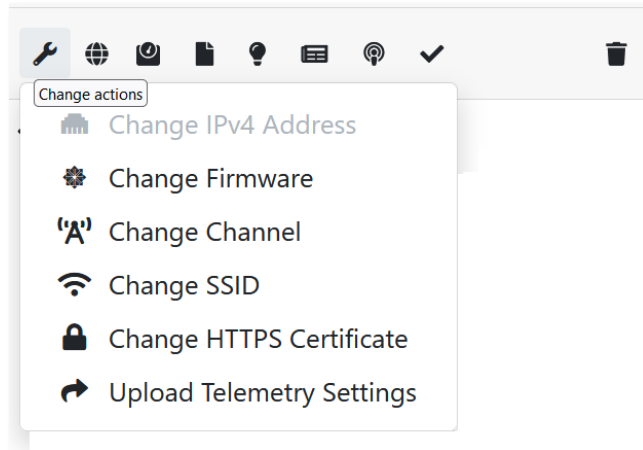


**Delete:** Deletes the product from the database, along with all recorded information pertaining to that product. Please note, if the product is still accessible, it will be visible again from the next scan cycle, and if automatic validation is enabled, it will be saved again in the database.

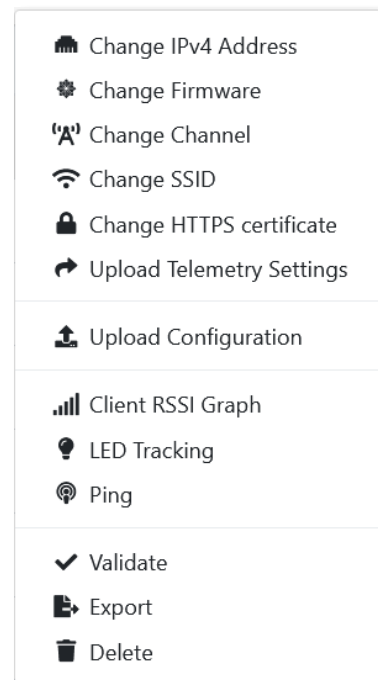
## 6. CHANGE ACTION

This section lists the actions leading to a modification of the product configuration. They can be launched either from the **Product information** window, and will act in this case on the product concerned, or from the **multi-products action's** icon of the main **Product View** window, and will then act on all the selected products

### Product information Window



### Product View window



### Changing IPV4 address

You just need to enter the desired IP **New IP** address, **New mask**, **New gateway**, and **Password** if required, then click **Start**. As soon as the process begins, the **Result** column displays **In progress...** Then, after successful completion of the process, **Success...** is displayed.

If several products are selected, the **increment** parameter gives the value to add to the IP address for each product. For example, if the address of the first product is 192.168.1.100 and the increment of 10, the address of the second product will be 192.168.1.110, 192.168.1.120, etc.

Please note that you don't need to wait for the completion of the process to close the window.

### IP Address configuration ✕

Update the IP address of the selected products

**Automatic (by DHCP)**

**New IP address**

**Increment**

**New mask**

**New gateway**

**Password**

Model	Product Id	Old IP address	New IP Address	Firmware	Description	Result
<input checked="" type="checkbox"/> AirLink	0000198D396D	192.168.1.9		4.18.4.1	User-definable	

Start

## Changing the firmware



Updates the firmware for the selected products. The latest firmware versions can be downloaded from the Acksys website (<https://www.acksys.fr/en/support/download-center/software-and-drivers-downloads/>)

Select the product(s) to upgrade, and click **Change Firmware**

<input type="checkbox"/>	Model	Serial	Product ID	Firmware	Version	IP Address	Description	Role
<input checked="" type="checkbox"/>	AirLink	18004023	0000198D5F88	E2148.AC.1	4.16.9.1	10.1.1.30	User-definable	
<input checked="" type="checkbox"/>	AirLink	17223128	0000198D6A7B	E2148.AC.1	3.18.1.1	10.1.1.34	User-definable	
<input checked="" type="checkbox"/>	AirLink	18213556	000019871D12	E2148.AC.1	3.14.3.1	10.1.1.38	User-definable	
<input checked="" type="checkbox"/>	AirLink		000019B78CA6	E2148.AC.1	4.12.1.1	10.1.1.42	User-definable	



**Warning:** All units selected for the upgrade must of course use the same type of firmware.

**Select All** Model

- Change IPv4 Address
- Change Firmware
- Change Channel

**Product Id**

### Firmware ✕

Change the firmware of the selected products

**Select a firmware file (.bin)**

 Browse

**Password**

 🔒

**Delayed** > **Update Date**  **Update Time**

Model	Product ID	Description	IPV4 Address	Firmware	Result
<input checked="" type="checkbox"/> AirLink	000019B78CA6	User-definable	10.1.1.42	4.12.1.1	
<input checked="" type="checkbox"/> AirLink	0000198D5F88	User-definable	10.1.1.30	4.16.9.1	
<input checked="" type="checkbox"/> AirLink	000019B71D12	User-definable	10.1.1.38	3.14.3.1	
<input checked="" type="checkbox"/> AirLink	0000198D6A7B	User-definable	10.1.1.34	3.18.1.1	

Start

**Browse** to find the firmware binary file on your disk, enter the **Password** if required.

The password is defined in the product WEB interface (**SETUP/SERVICES/DISCOVER AGENT**). Of course, if a password is defined, it must be common to all the selected products.

Click **Start** to launch the upgrade.

When the update starts, a warning message is displayed and the status of each line changes to **In progress...** in the **Result** column. All selected units will be updated simultaneously.

Model	Product ID	Description	IPV4 Address	Firmware	Result
<input checked="" type="checkbox"/> AirLink	000019B78CA6	User-definable	10.1.1.42	4.12.1.1	In progress...
<input checked="" type="checkbox"/> AirLink	0000198D5F88	User-definable	10.1.1.30	4.16.9.1	In progress...
<input checked="" type="checkbox"/> AirLink	000019B71D12	User-definable	10.1.1.38	3.14.3.1	In progress...
<input checked="" type="checkbox"/> AirLink	0000198D6A7B	User-definable	10.1.1.34	3.18.1.1	In progress...

**WARNING** ✕

Firmware command has been sent ! This operation can take up to two minutes. DO NOT TURN OFF THE PRODUCTS BEFORE THE END OF THIS TIME.

If the programming of the new firmware was successful, the message **Success...** is displayed in the Result column. Beware of the fact that at this stage, the product is still in the restart phase and is not immediately accessible. Monitor the DIAG LED to know precisely when the product will be operational. **Never turn off the product's power supply if the DIAG LED is still lit red.**

If an anomaly has prevented the programming of a product, an explicit message is displayed. You will be able to restart the programming of the products concerned after correction of the anomalies indicated.

Please note that since the update procedure can be long, you have the possibility to schedule the update for a later date:

**Delayed** > **Update Date**  📅 **Update Time**  🕒

In this case, when you click on **start**, the message **Scheduled** is displayed in the result column, and the **Product Operation Report** icon at the top right indicates that a new element has been added.





You can then close the **Firmware Change** window; the update will start automatically on the date and time set.

You can cancel this operation or view its status by clicking on the **Product Operation Report** icon

### Changing the channel

Please note that changing the channel number is only authorized for products configured on a single channel number. To change the channel number, you must indicate the current channel number and indicate the desired channel number.

#### Replace channel ×

Update the channel of the selected products

Old channel  New channel

Model	Product Id	IP Address	Firmware	Description	Result
<input checked="" type="checkbox"/> AirLink	00001B8E681F	192.168.1.30	4.18.5.1	User-definable	

Be aware that changing the channel number on a WiFi client configured for roaming will have no effect, since the channels actually used are defined in the roaming configuration.

### Changing the SSID

As for the channel number, you must indicate the current SSID to be able to define a new one. Optionally, you can also change the security mode and security pre shared key.

#### Replace SSID ×

Update the SSID of the selected products

Old Ssid  New Ssid

Modify security key

Security key mode  Security Key

Model	Product Id	IPV4 Address	Firmware	Description	Result
<input checked="" type="checkbox"/> AirLink	00001B8E681F	192.168.1.30	4.18.5.1	User-definable	

## Changing HTTPS Certificate

This option allows you to change the HTTPS certificate which authorizes secure access to the WEB server. The certificate must be in PEM format. It is also possible to change the port used.

### HTTPS certificate modification ×

Change the HTTPS certificate for the selected products

Upload a certificate (.pem)      Tcps port for HTTPS server

Disable internal HTTP server

Model	Product Id	IPV4 Address	Firmware	Description	Result
<input checked="" type="checkbox"/> AirLink	00001B8E681F	192.168.1.30	4.18.5.1	User-definable	

## Upload telemetry Settings

The Telemetry protocol allows WaveOS to spontaneously send historical data to the WaveManager clients. This option allows to set the telemetry configuration of each of the selected products in accordance with WaveManager configuration (see chapter [Data Collect tab](#)).

### Upload telemetry settings ×

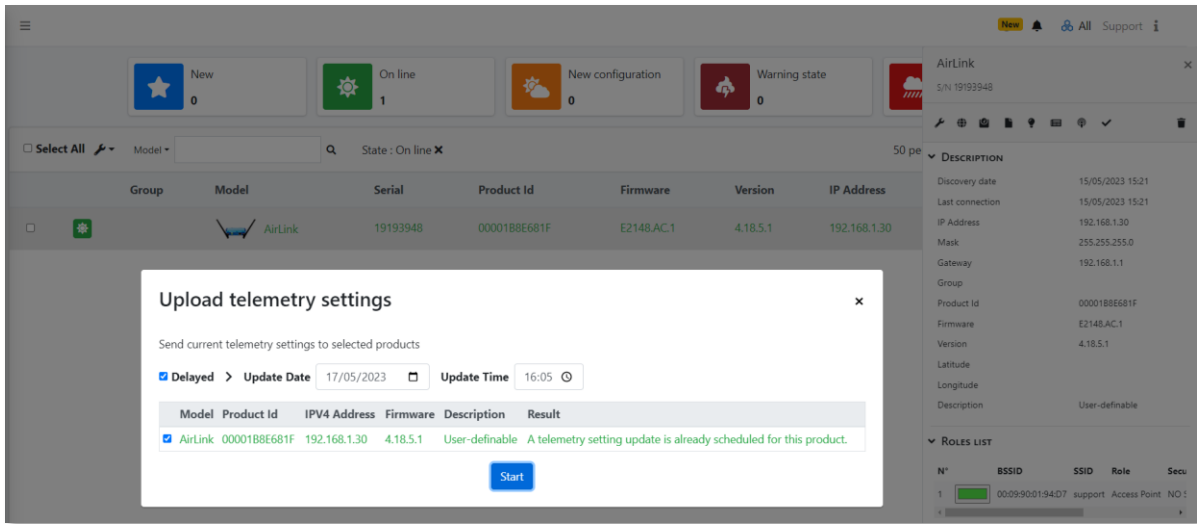
Send current telemetry settings to selected products

Delayed > Update Date     Update Time

Model	Product Id	IPV4 Address	Firmware	Description	Result
<input checked="" type="checkbox"/> AirLink	00001B8E681F	192.168.1.30	4.18.5.1	User-definable	

Telemetry settings upload can be performed instantly, or scheduled for a later date

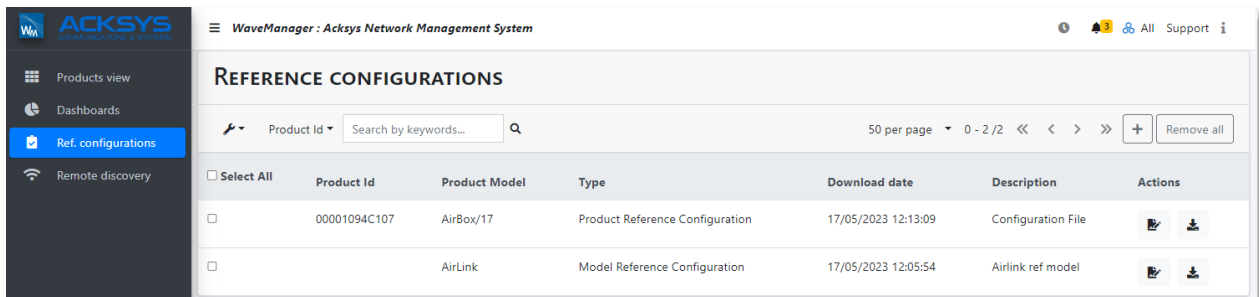
In this case you can follow the progress of the operation in the *updated reports* by clicking 



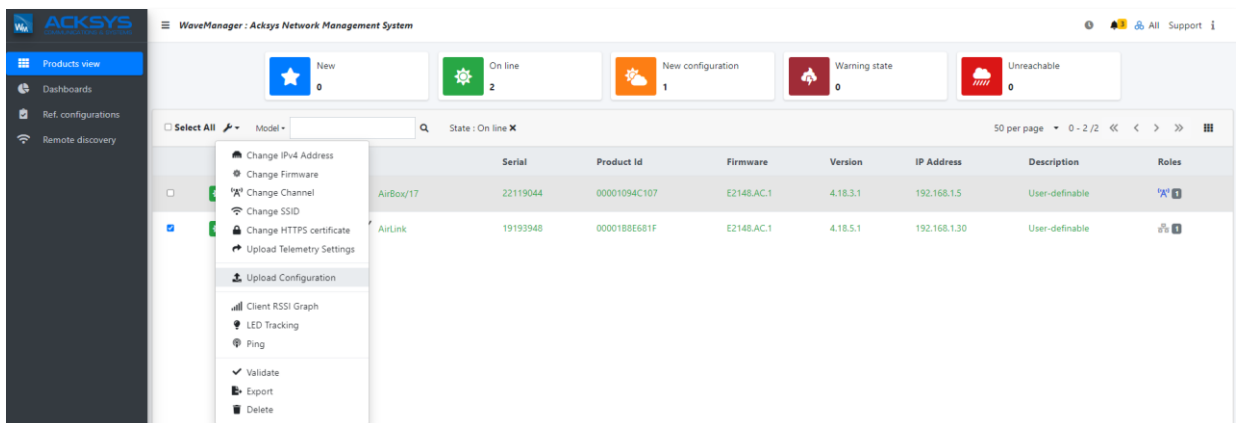
## Upload Configuration

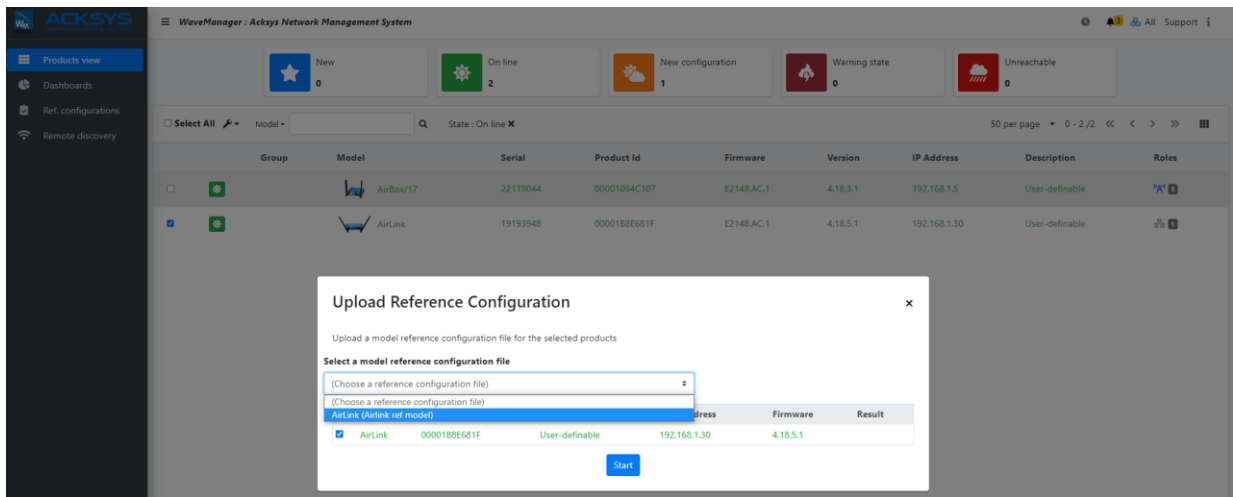
To upload an existing configuration file located in your computer to your product, you must first of all create a reference model configuration or the reference model can be created from the existing configuration product (see 8. REFERENCE CONFIGURATION).

You should have them referenced in the reference configurations as in the below example:



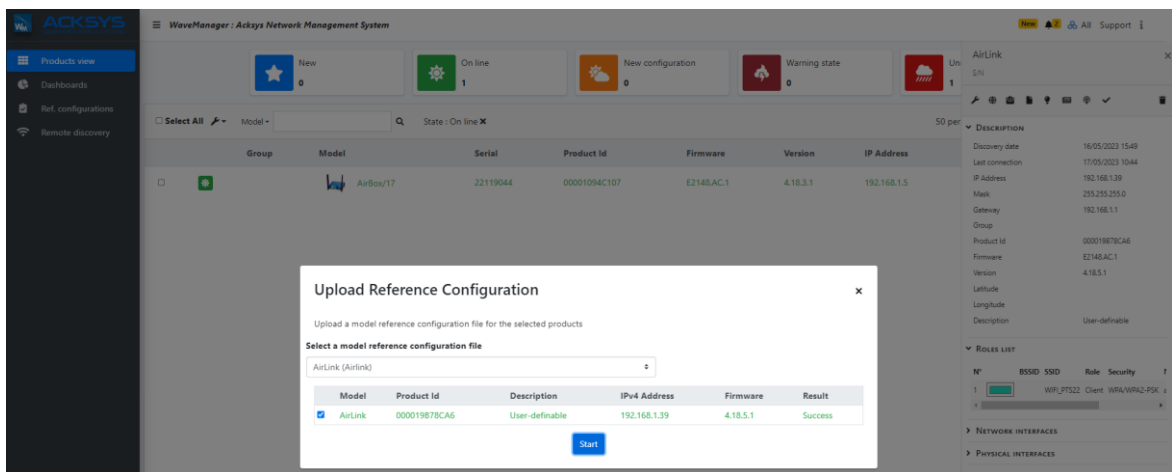
You may upload this configuration file to one selected product or on multiple selected products within the same model in Products view by doing as follow:





You can click **Start** to upload the configuration on your product. Please note the IP address recorded in the reference configuration file will be applied to all selected products. As a result of uploading the configuration file, all these products will have an IP conflict: it will then be necessary to assign them a unique IP address manually.

After uploading the configuration file, the message **Success** is displayed in the Result column. If an anomaly has prevented the uploading the configuration file, an explicit message is displayed. You will be able to restart the programming of the products concerned after correction of the anomalies indicated.



## 6.1. Graph Monitoring

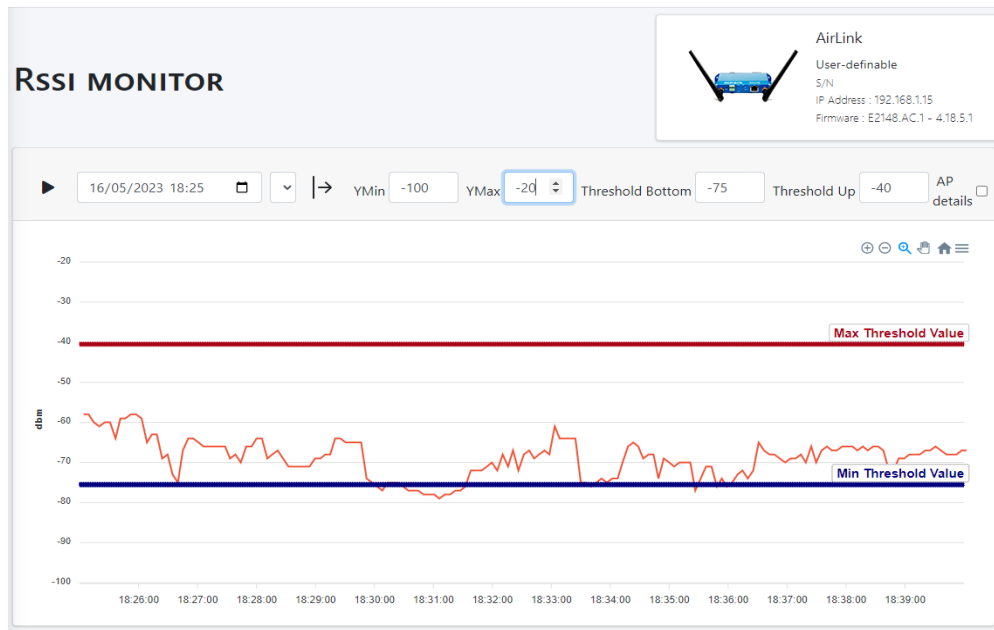
### RSSI Monitor

The RSSI monitor allows the customer to do the analysis of the radio signal behavior in given time and real time (live RSSI monitoring). This graph displaying the RSSI level is only available on WiFi interface in client mode.

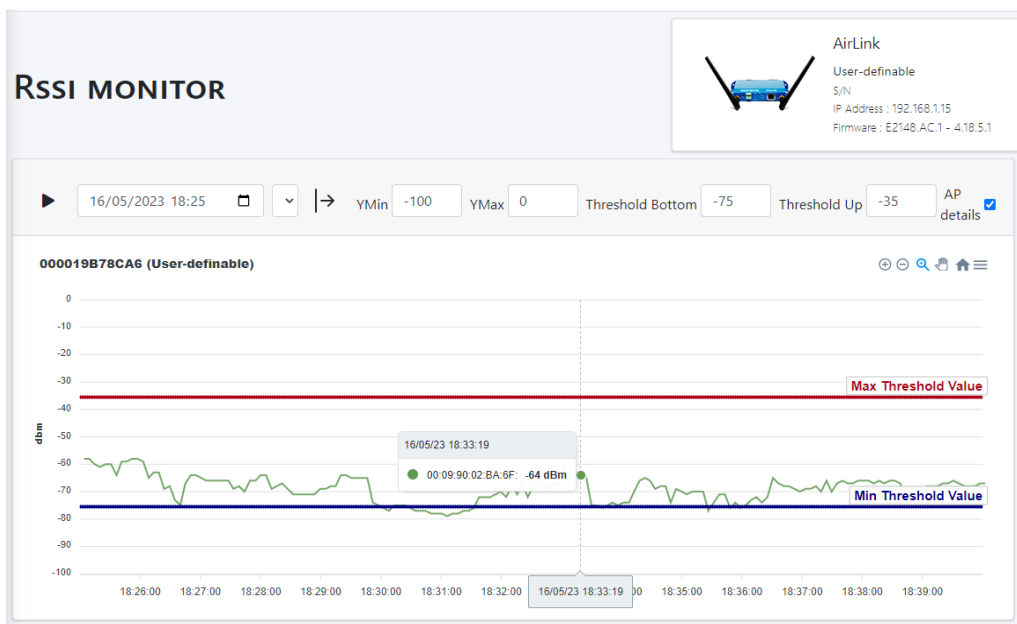
We have two cases are possible:

- The WiFi client is fixed: the purpose is to know if the radio link doesn't degrade
- The WiFi client is mobile: the purpose is to check if the signal is enough for communication and the client is connected to the right AP; feature available in roaming.

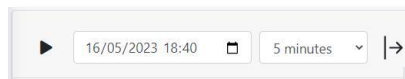
The customer can set Max threshold and mix threshold value in which RSSI signal level of your product must be observed. From this graph, we can see how good or bad is the signal performance in your wireless communication.



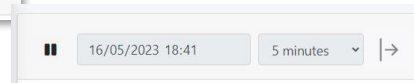
We can display below the graph details of the AP where this client is associated with:



To have RSSI monitoring in given time

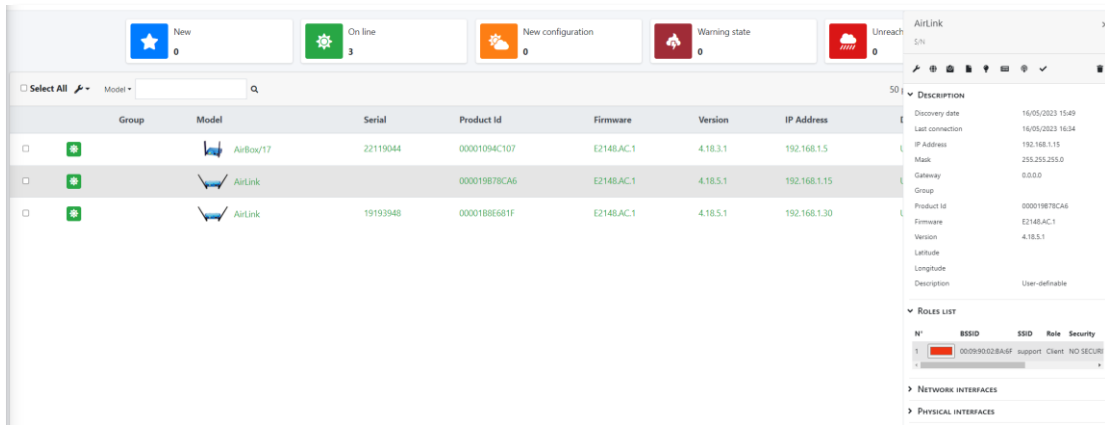


To have monitoring in real time press play when time interval is selected



The client RSSI monitoring can be launched from the Product view in two ways:

- Select or click on the client role product and click on any gray space in ROLES LIST:

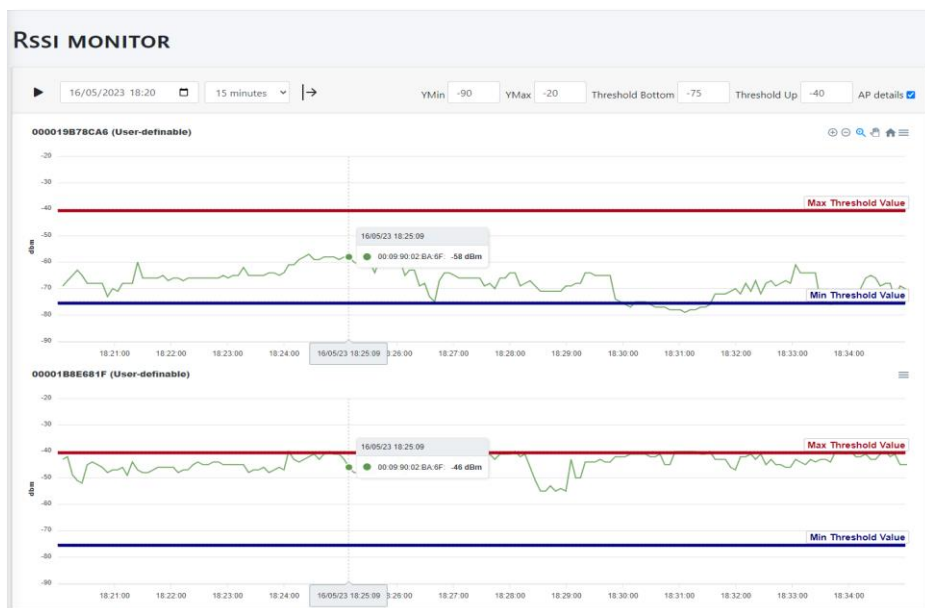


- Select the product and click Client RSSI Graph as for multiple product selection shown in below for multiple products.

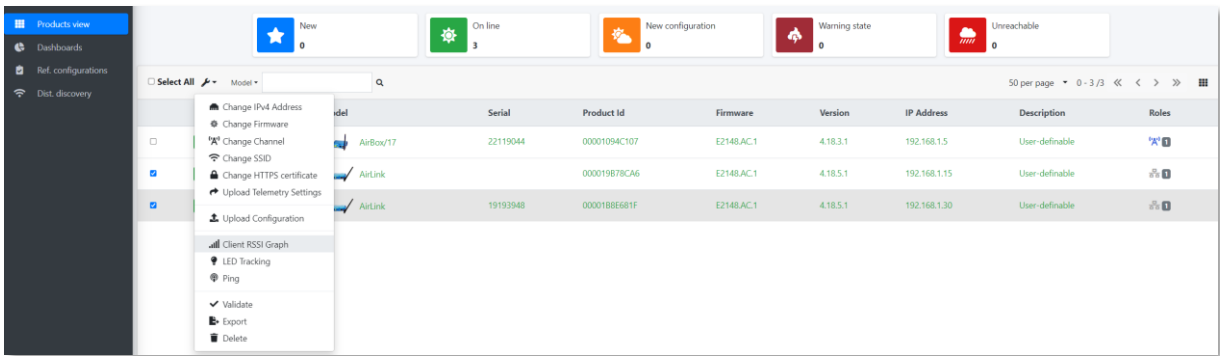
To launch the RSSI Monitor from the multi-products, you can display RSSI graphs of all selected product as in the screenshot: two products are selected.



The below graphs display the AP details for each client:



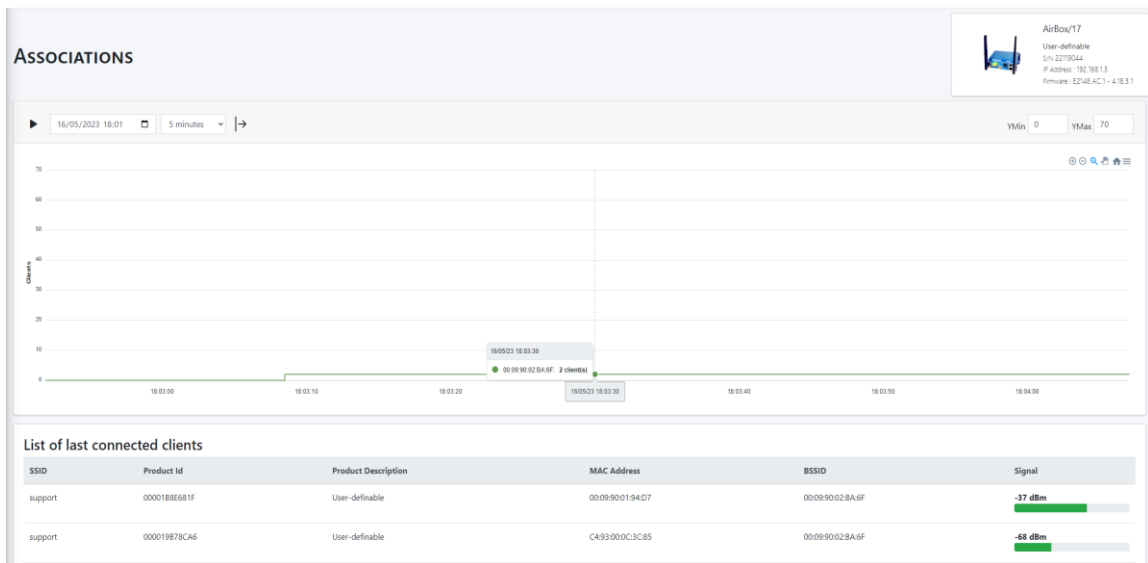
To display RSSI monitor for multiple products, in Products view select the clients you want to display graphs and do Client RSSI Graph as shown below:



## Association

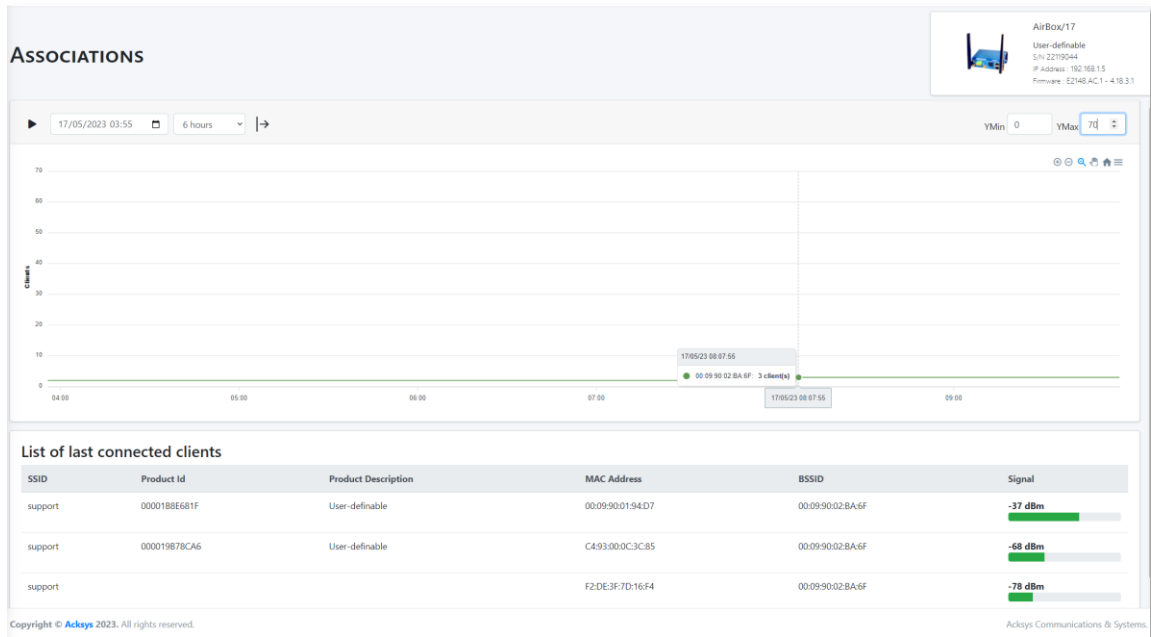
If you select an Access Point in the **Product View** window role, and then click on ROLES LIST in Product information window, you can view the list of clients associated with this Access Point.

N°	BSSID	SSID	Role	Secu
1	00:09:90:02:B8:20	support	Access Point	NO S



The MAC address column gives the MAC address of the clients connected to the AP, the BSSID column gives the MAC address of the Access Point.

Below you can also see when a new client associated to the AP, the number of clients moved from two to three clients on the graph.

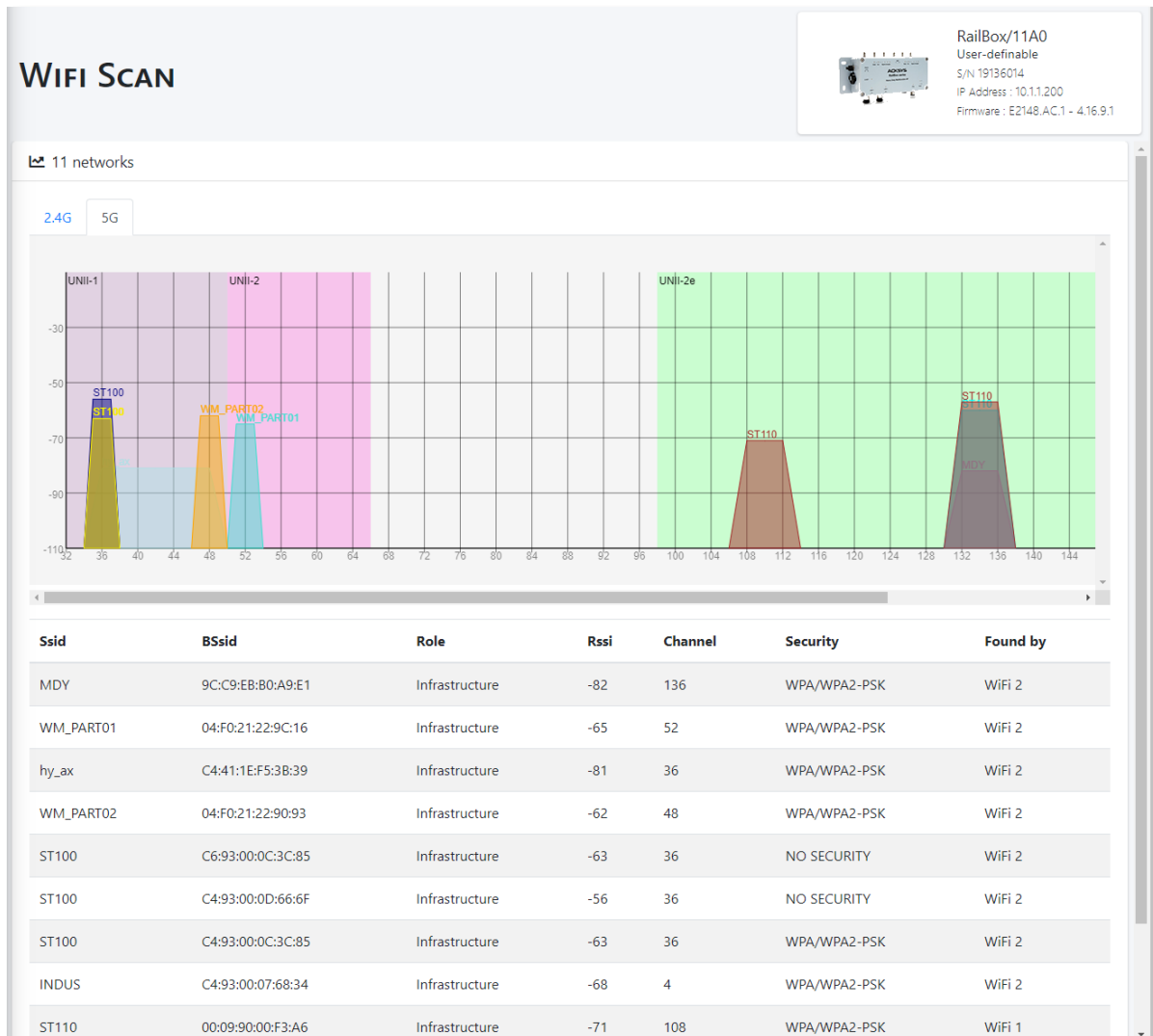
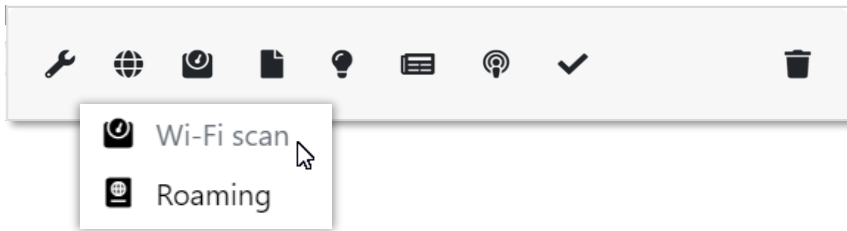


To see the clients associated to the AP in this graph, positionne the cursor at any given time to check association.



## WiFi Scan

This feature allows you to scan and display all the access points around an Acksys product: select the product to examine in the **Product View** Window, and click on **Wi-Fi scan** button in the menu bar of **Product information**



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 products to scan must be reachable by SNMP.**

When the scan is complete, the result is displayed graphically at the top of the screen. You can switch between the two frequency bands by clicking on the 5G or 2.4G tabs. The channel is displayed on the abscissa and the perceived signal level on the ordinate.

In the lower part of the screen, there is a list of all the access points that could be detected.

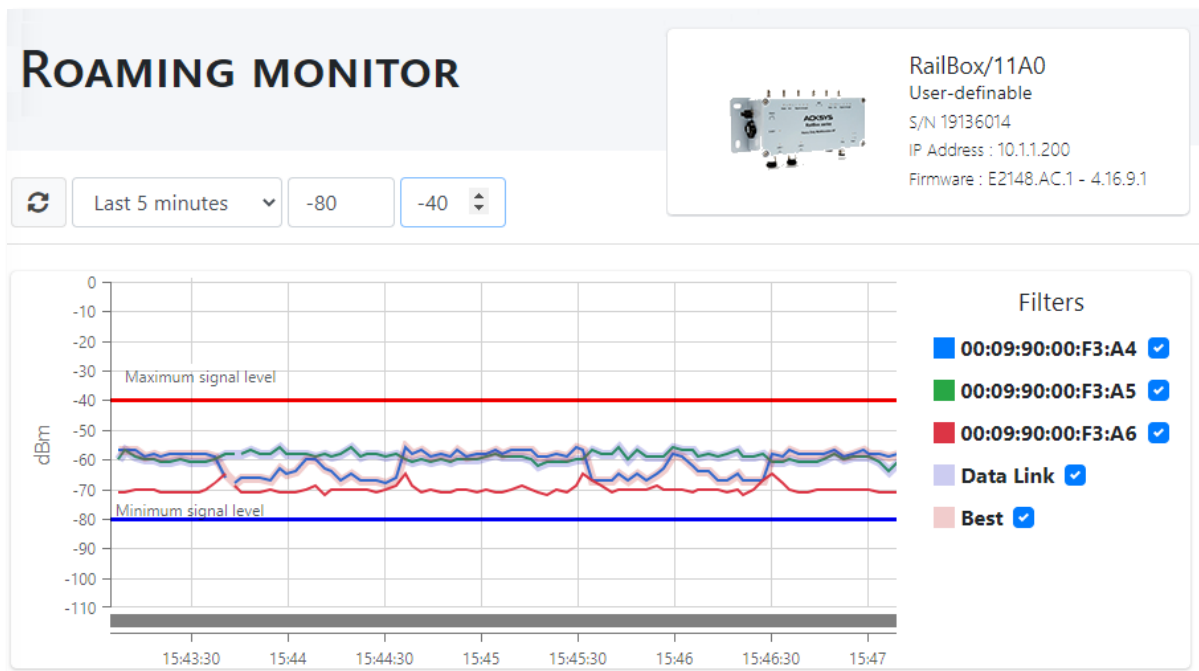
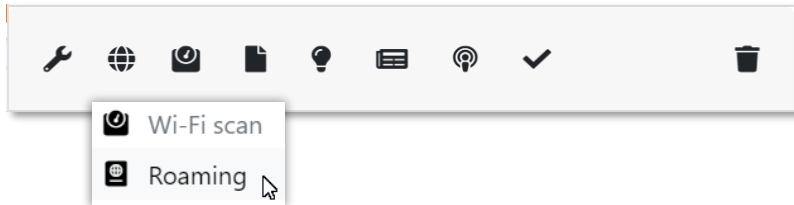
From left to right, the different columns indicate:

- the SSID (name of the broadcast network)
- the BSSID (MAC address of the AP)
- The role (Infrastructure or MESH)
- The RSSI (perceived signal level in dBm)
- The canal
- Security mode
- The index of the radio card that detected the AP

## Roaming Monitor

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

To display and analyze a roaming graph, select the WiFi Client to examine in the **Product View** Window and click on the Roaming button in the menu bar of the **Product information**.



You can set the window time span to monitor your roaming, as well as an upper and a lower limit. These limits are only informative, for ease of reading.

A color is assigned to each AP, whose MAC address is displayed on the right. You can make the different curves appear or disappear using the checkboxes

You can also highlight the current AP (**Data link**) and the best candidate AP for roaming (**Best**)

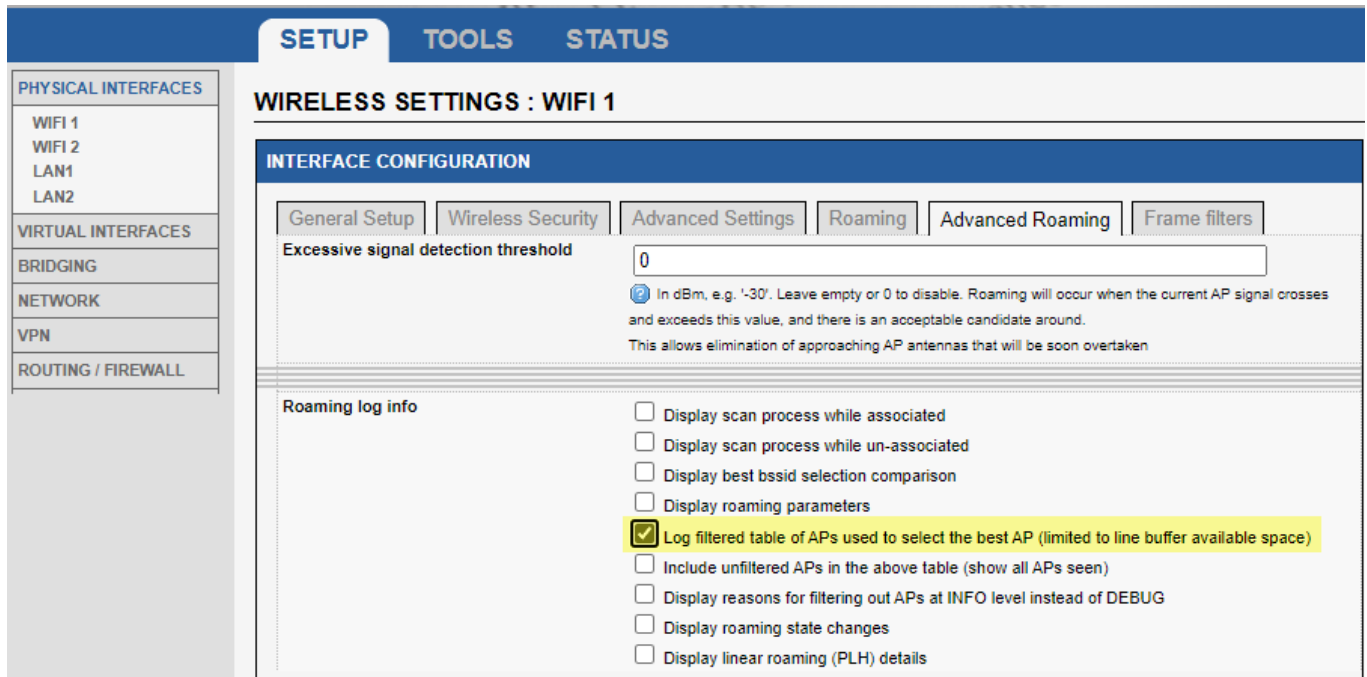
Note that the graph is not refreshed in real time, you must click on the refresh button to get an update

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

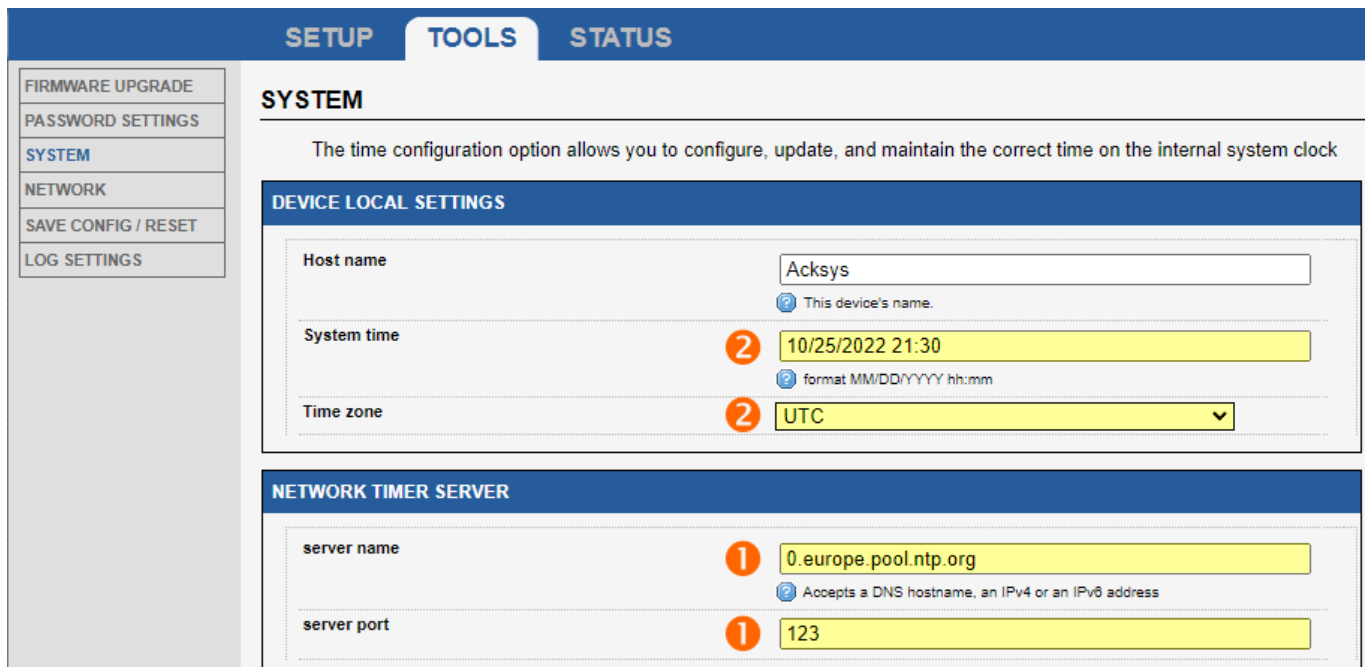
In the case of both services available in the product, WaveManager use Telemetry priority.

To setup the telemetry service, please see chapter [Data Collect tab](#)

To send roaming data by log service, the **Proactive Roaming** must be enabled in the WiFi Client configuration, and you must check at least the **Log filtered table of AP** option in the **Roaming log info** of the **Advanced Roaming** tab

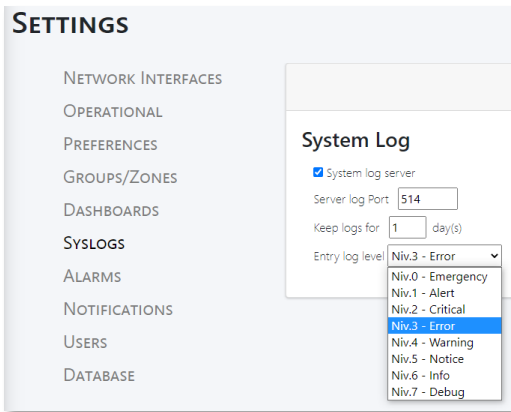


It is also imperative that the product to be analyzed be on time. If possible, specify the address of an accessible NTP server **1**, and failing that, manually enter the current time and date **2**



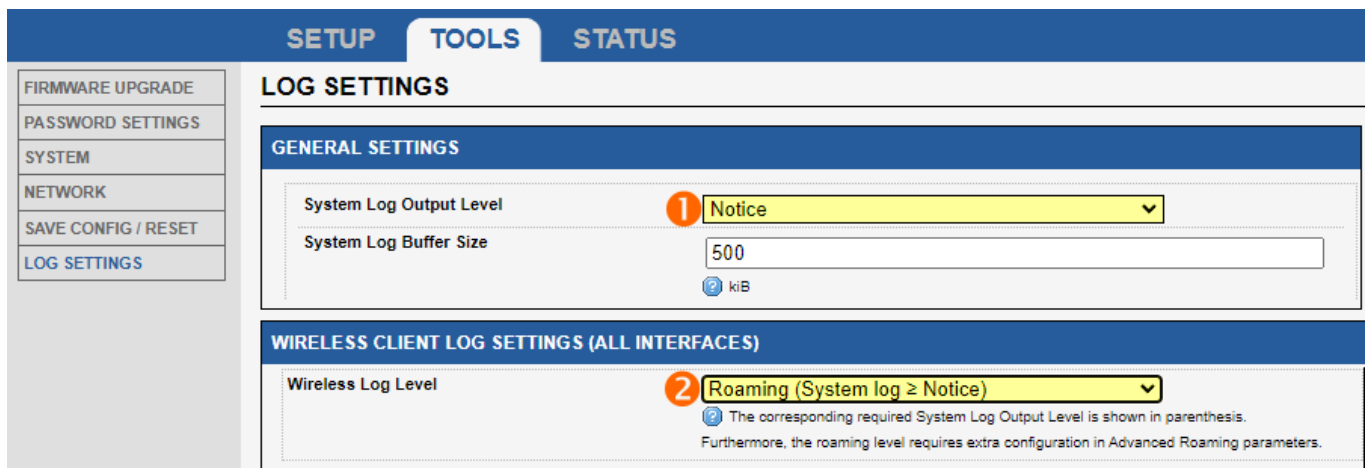
The System log server must be enabled in WaveManager Advanced settings

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



In the configuration of the product to monitor, the **minimum** log levels to receive the roaming data are:

- 1 General Setting: **Notice**
- 2 Wireless client log settings: **Roaming**



Please see [ANNEXES](#)

[Setup the automatic emission & reception of logs](#), to configure log server.

## 7. DASHBOARD

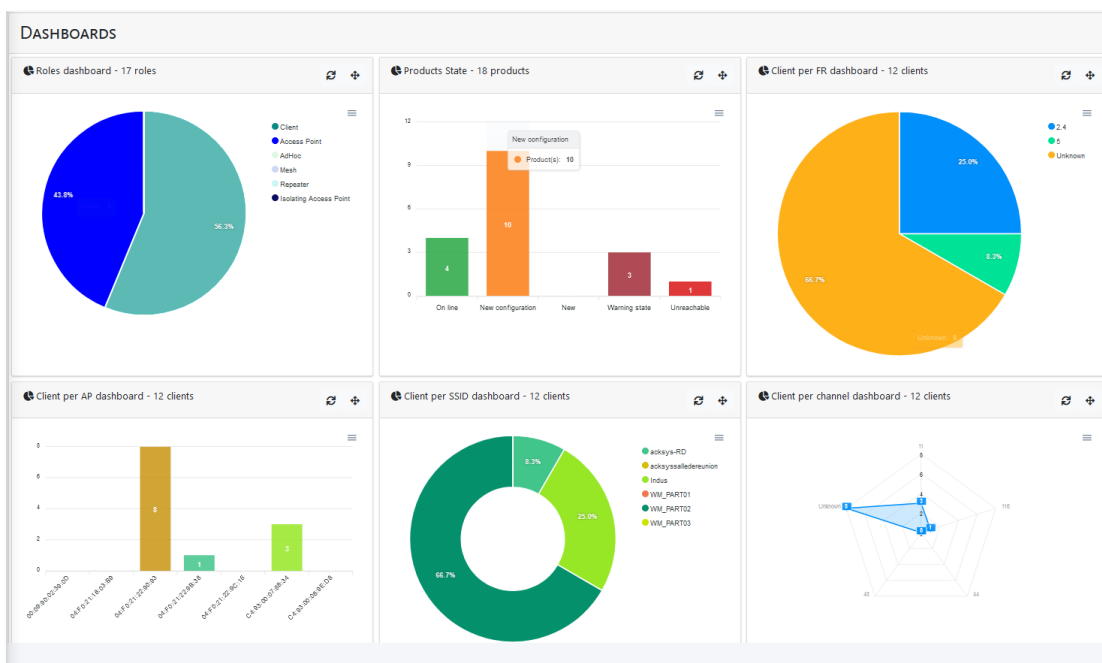
The Dashboard page provide a synthetic overview of products and functions. A well custom dashboard provides an easy way of monitoring products in your network.

From settings tab you can access Dashboard and create a new customized dashboard based on the below functionalities:

Four different chart type can also be chosen and provide a Title to your dashboard created:

After creating a dashboard, your only can update the chart type and the Title.

The different dashboard types can be viewed via Dashboard tab as below:



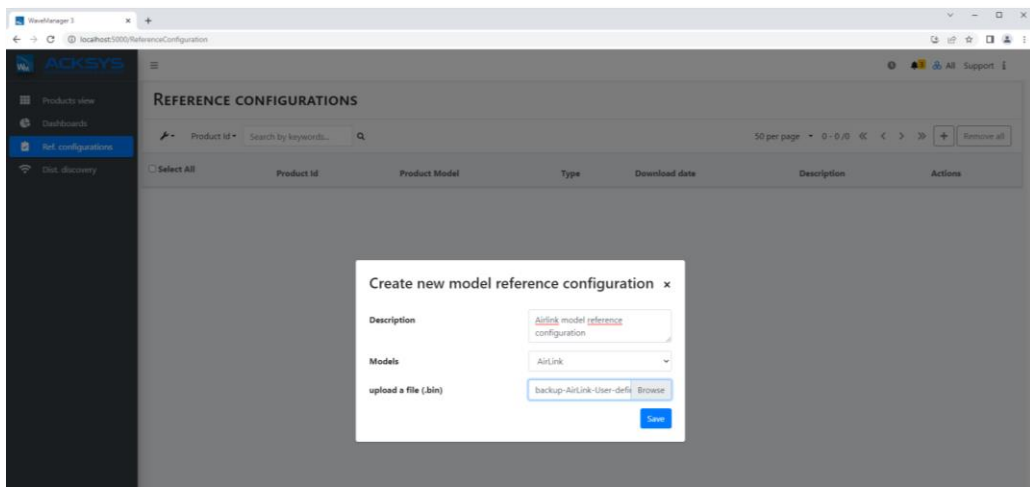
Clicking on one of the areas of the chart allows to switch to the Product view, with the selected status or function as a sorting criterion.

## 8. REFERENCE CONFIGURATION

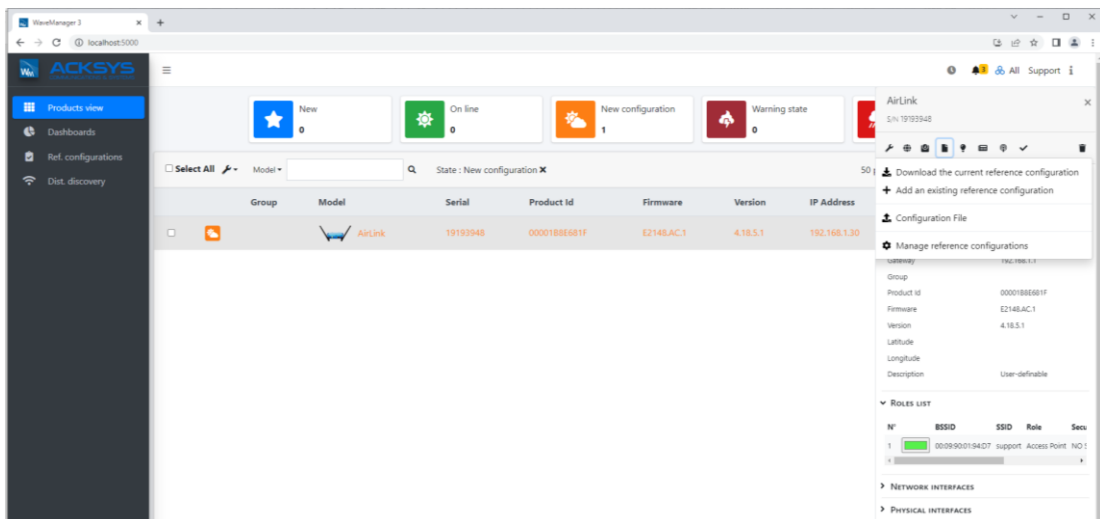
Your reference configuration file is the binary file of your product configuration. This file can be generated directly from the web interface of the reference product (page TOOLS/Save config), or it can be saved on computer and hard drive.

A reference configuration file is a file listing all the parameters of the reference product (of a given model). The reference configuration can be configured per products or modes and this will allow you to manage the configuration files saved in the database.

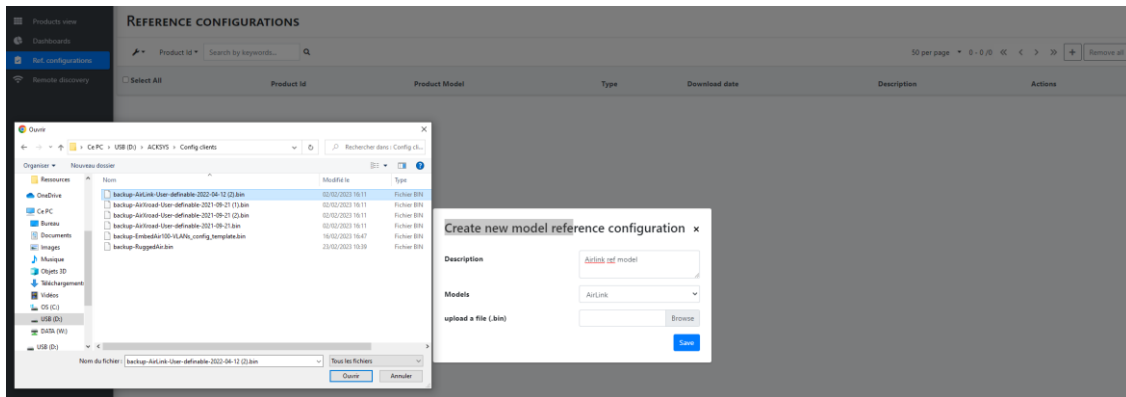
The reference configuration file should configuration as follows, the Models AirBox/10 is selected in this example. You should browse your computer to select the .bin file and go saved.



In Products View, select the product and click Product reference configuration then Download the current reference configuration to have Configuration File then select to load it on your product as below:

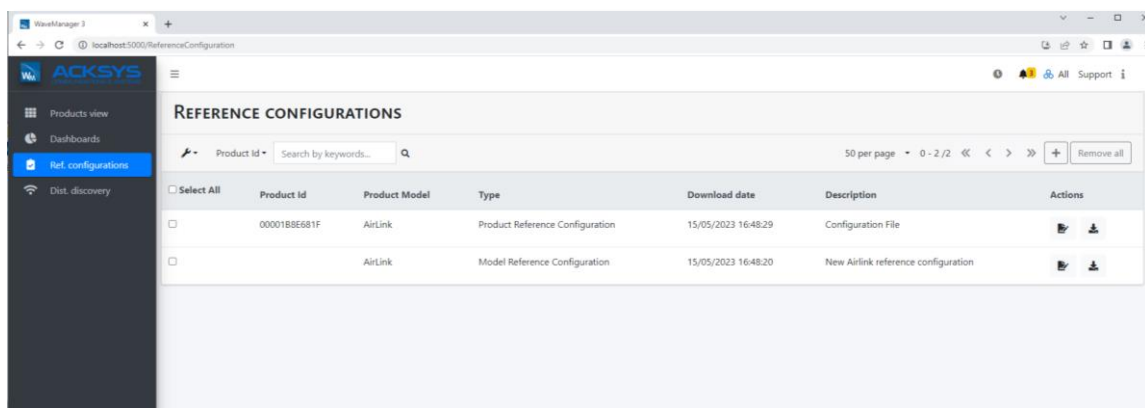


You may also take it upload it from your computer as below:



Select the .bin file and then Save, you will see the reference model for Airlink in the screenshot as reference configuration.

We can see the applied configuration listed in reference configuration:



In the list of **configurations per product**, you will find:

### Product ID

This is the product identification number that you find in the Product view page of WaveManager, or in the Status/Device info page of the product's WEB server.

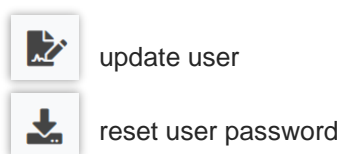
### Download date

The date this configuration file was saved in the database

### Description

The summary description given at the time of registration in the database

**Actions** are:



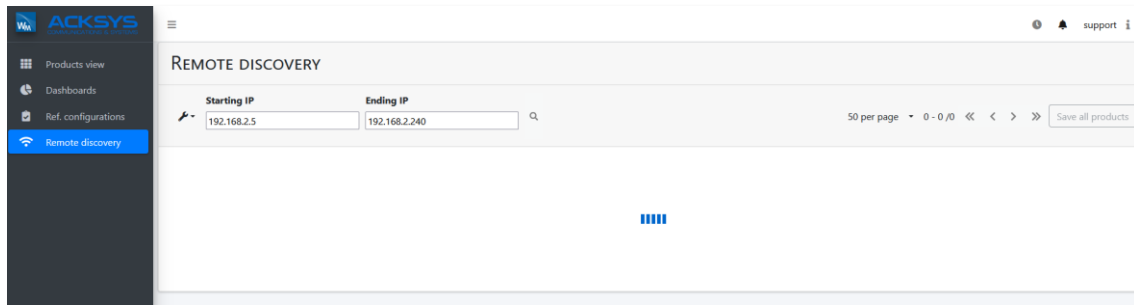
Configurations by product are closely linked to the product from which they come. They can only be uploaded in this very unit, through the **Product View** window, in the same way as they were saved. If a product is deleted from the database, either by an individual deletion, or following a reset of the database, the record of its configuration also disappears.



To upload a configuration to one or more products of the same model, it is necessary to create a reference configuration as shown.

## 9. REMOTE DISCOVERY

Remote discovery detects remote products manually, it serves to discover products outside the local network and it requires entering a range of IP addresses to scan from which we need to access. Products to be remotely discovered should be connected to any local product with a route configured to that IP range.



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 **Number of new products** counters indicates the number of products discovered in that address range.

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

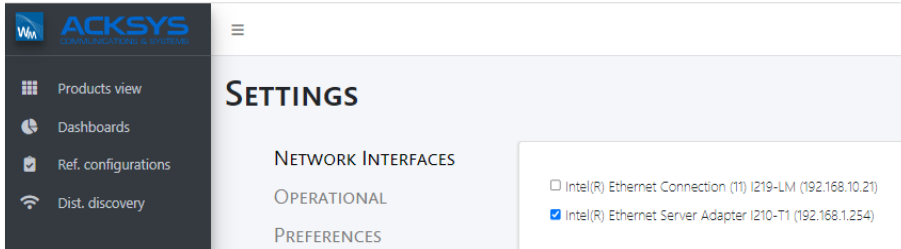


If you have several networks and/or IP address ranges to explore, repeat the operation for each case.

## 10. SETTINGS

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

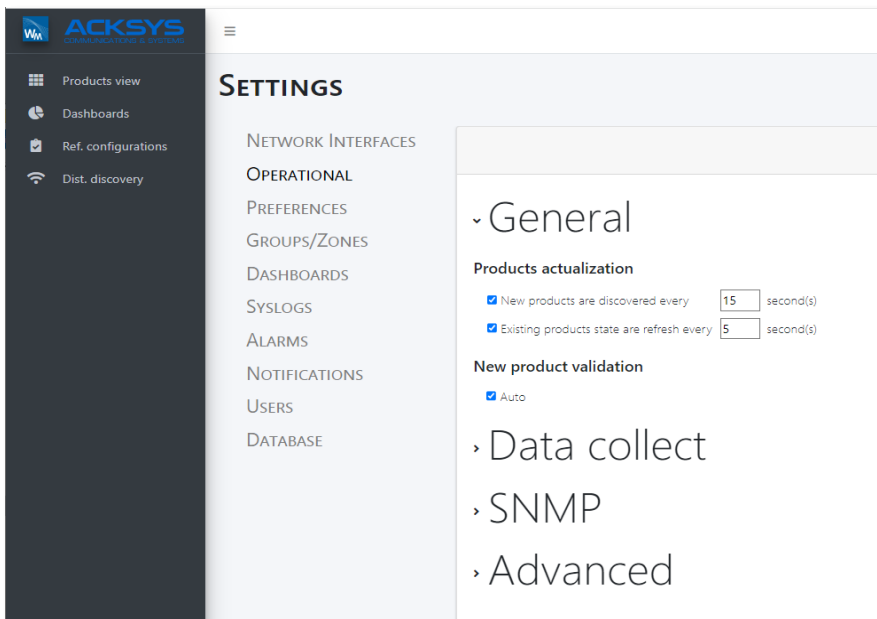
### Interface tab



Allows to select which network interfaces of 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 check the selection of WaveManager interfaces in this section.

### Operational tab



### General tab

#### Products actualization

The first parameter defines the frequency at which WaveManager analyzes the network for the discovery of new products. The default value is 15 seconds.

The second parameter defines the frequency at which WaveManager queries the database on the products it contains, to retrieve their configuration information and update their status (**Online**, **New configuration**, etc.)

The third parameter allows to validate the new products automatically. 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 (the signature of the configuration is recorded in the database).

## Data Collect tab

### ~ Data collect

**Collect settings**

Enable data collect

Data acquisition every  second(s)

Keep data for  day(s)

**Telemetry**

Enable telemetry

Telemetry port

Data transfer every  acquisition(s)

Enable product telemetry settings

Setting time

### Collect Settings

**Enable data collect:** this option authorizes WaveManager to use the telemetry protocol to obtain information relating to the connected products. The Telemetry protocol allows WaveOS to spontaneously send historical data to one or several clients (WaveManager). See Telemetry.

The acquisition frequency must correspond to the **Sample interval** parameter defined in the **Setup/Statistics** page of the products. If the value is different, the status of the product changes to **Warning state**

The time during which the received values are kept is also indicated here. This is useful in particular to control the maximum duration of recording of roaming information, or even the signal level values for the trace of the variations.

### Telemetry

Here we define the port used by the telemetry protocol. The default value is 8628, and it must correspond to the **Acksys telemetry server port** parameter programmed in the **Setup/Statistics** page of the product. If the value is different, the status of the product in WaveManager will change in **Warning state**

We also specify the periodicity of data transfer relative to the frequency of acquisition: if for example there is a data acquisition every 5 seconds and we authorize the data transfer every 2 acquisitions, WaveOS will send the data to WaveManager every 10 seconds. The **Output interval** parameter defined in the **Setup/Statistics** page of the products must be, in this case, set to 10; if the value is different, the status of the product will change to **Warning state**

When you check **Enable product telemetry settings**, WaveManager will be able to send the telemetry parameters of this page to all online products. this operation can be **Delayed**, in which case it will be carried out at the specified time, or **Automatic**, and in this case carried out at the next refresh of the status of the products (according to the parameter defined in Products actualization)

## SNMP tab

√ SNMP

**Version**

Version 1  
 Version 2  
 Version 3

**Community**

Read:

Write:

**Timeout**

Timeout:  ms

Retry number:

**Security**

User:

Security model:

Authentication:

Authentication key:

Encryption:

Encryption key:

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.

### Version

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**.

### Community

Access settings from SNMP V2.

### Time out

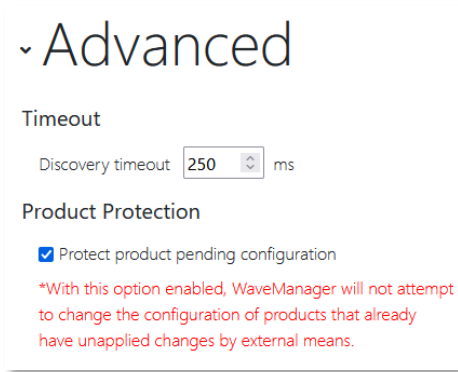
Sets the SNMP timeout:

Timeout	2000 ms
Retry number	0

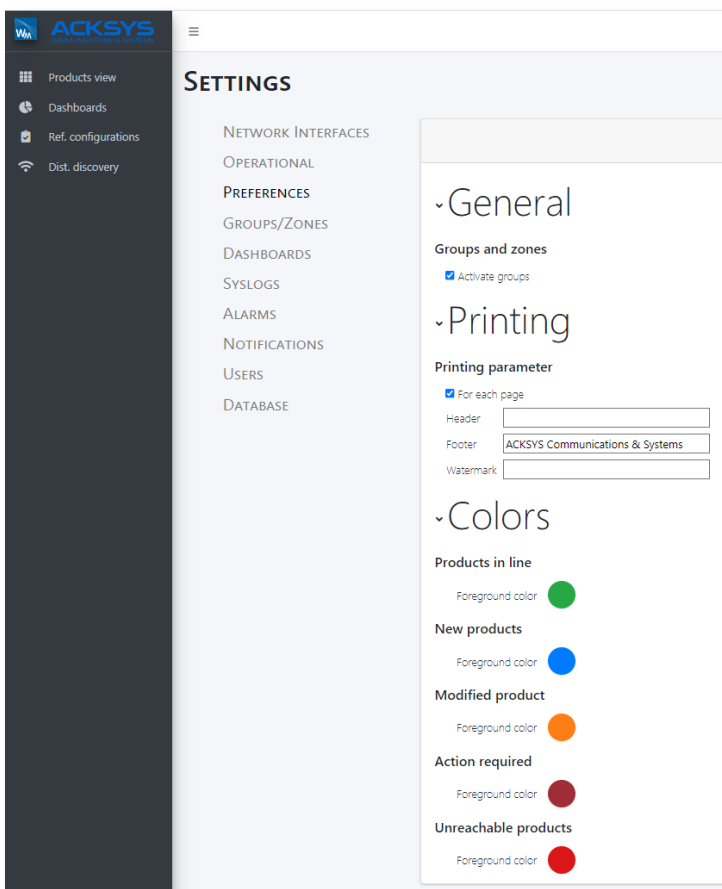
### Security

Settings of access and security for SNMP V3 only.

## Advanced tab



## Preferences tab



### General tab

#### Groups and zones

Groups and zones can be activated or deactivated. Enables group management. The **Groups/Zones** tab only appears in the menu when this option is checked.

#### Printing parameters

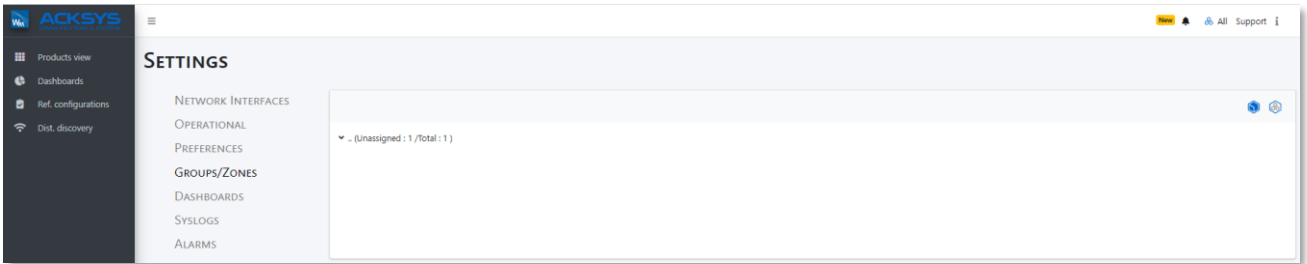
This section allows to customize the printing of the database report by adding a header, footer and watermark.

#### Colors

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

Use the palette or dropper to select a color. You can also manually enter the RGB (red, blue and green) values of the desired color

## Groups/Zones tab

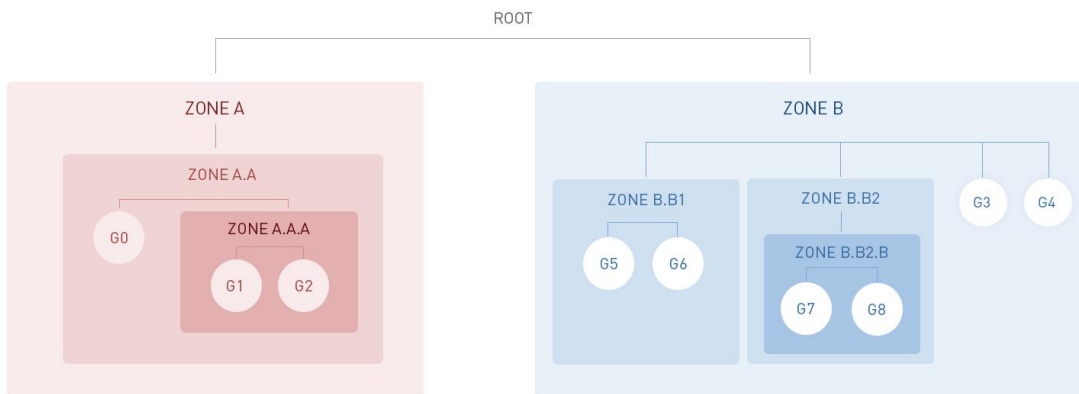


Before using this feature, the Groups and zones must be activated in Preferences tab as explained above.

Groups/zones allows group management, to classify and sort products in groups and zone will gather groups together. As a result, products are easily findable and referenced in the infrastructure and their display in the product view.

## Group overview and monitoring

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.



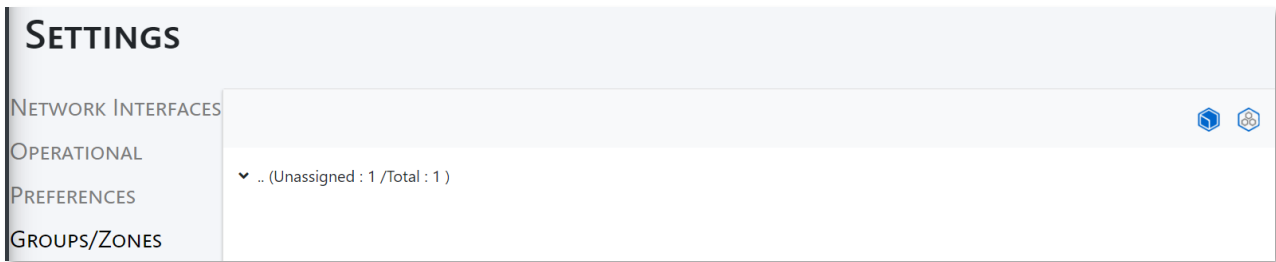
A zone may content an unlimited number of subzones and groups while a group can only contain products.

## Creating new zones and groups

To create a new zone, simply click on the **Create a zone** icon



Please note that if you don't need any zones, this is optional



Enter the name of the zone, zone description and click **Create** to confirm:

### Add a new zone

×

A zone makes it possible to classify and reference groups and zones in an infrastructure.

Zone name :

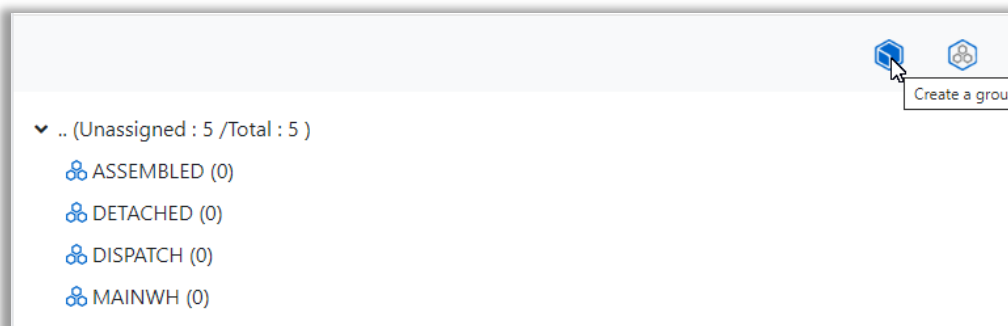
Zone description : (optional)

Create

After creating all required zones, click the **Create a group** icon



to add the required groups:



Enter the name of the group, group description and click **Create** to confirm:

### Add a new group

×

A group allows to classify and reference products in an infrastructure.

Group name :

Group description : (optional)

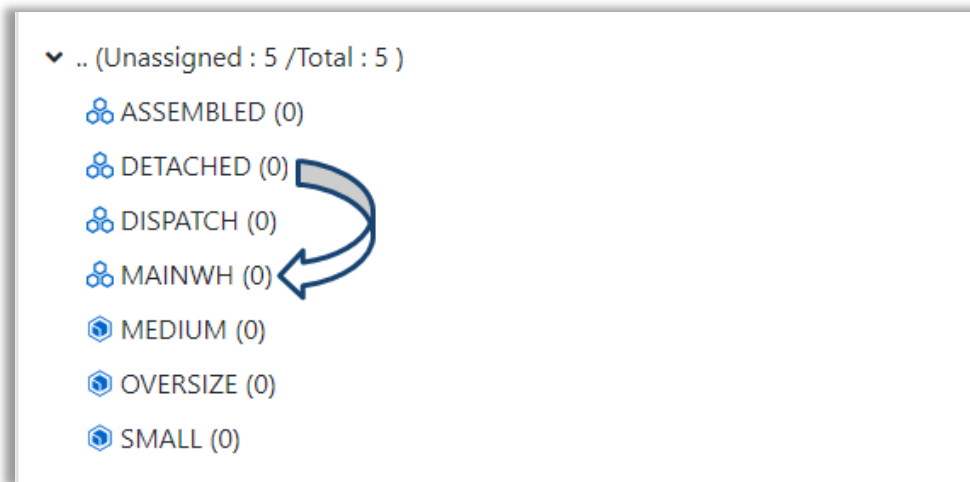
Once the group is created, you can add products using "Manage".

Create

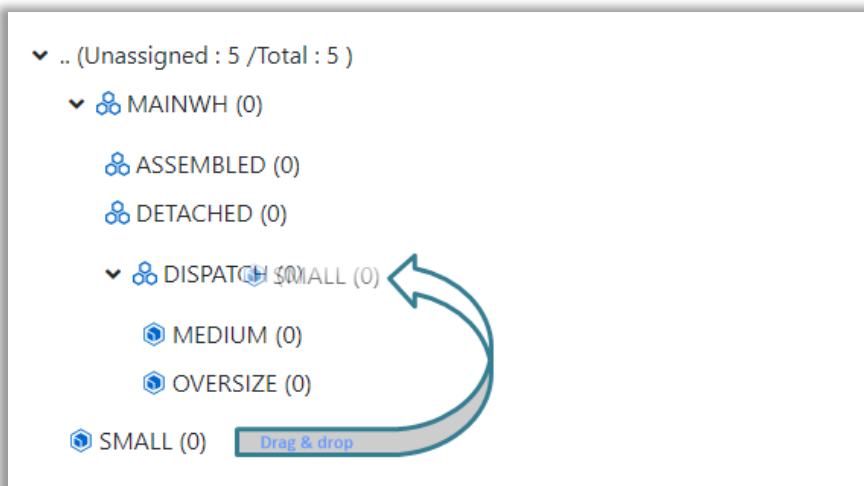
Repeat this operation for all required groups



You can, if you wish, define a tree structure by drag and drop: move the sub-zones into the primary zones

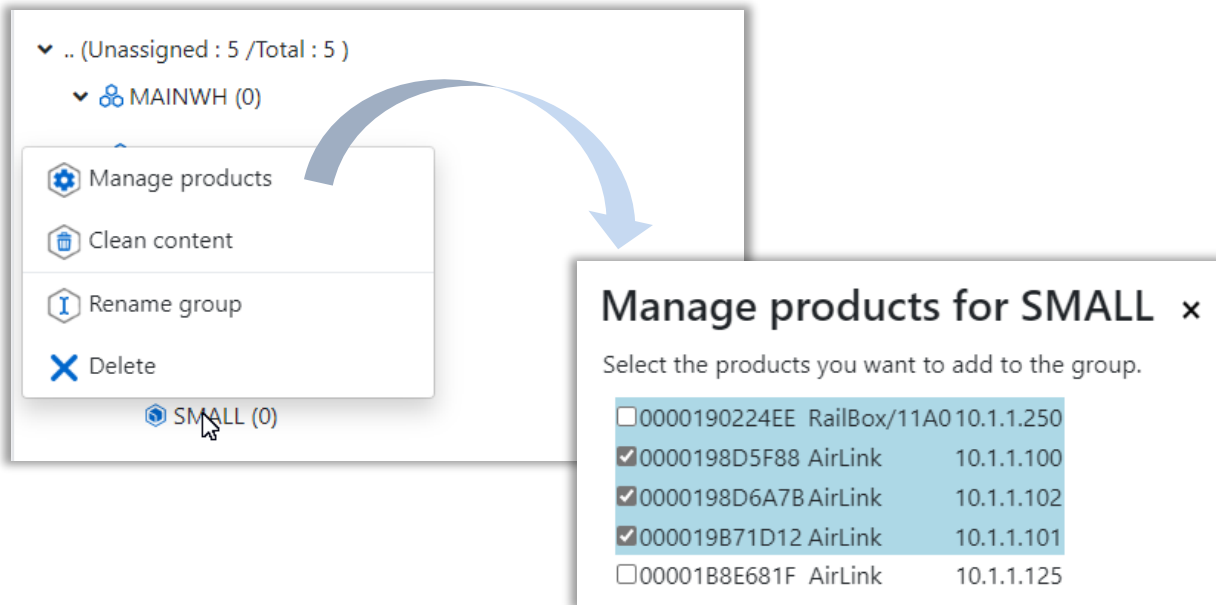


In the same way, you can, if you wish, move the groups to the appropriate areas. Please note that a group can only contain products, it cannot contain another group.



You can now populate the groups with the products visible in the products view window: right click on the host group, then **Manage products**. Please note that you can also **Clean content** of this group (delete all products associated), **Rename** or **Delete** the group.





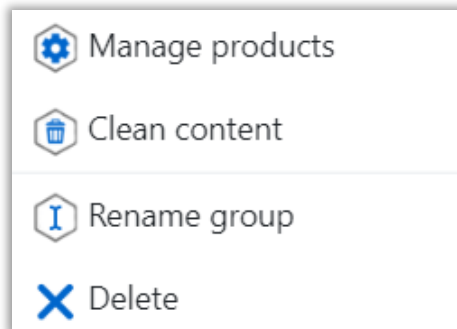
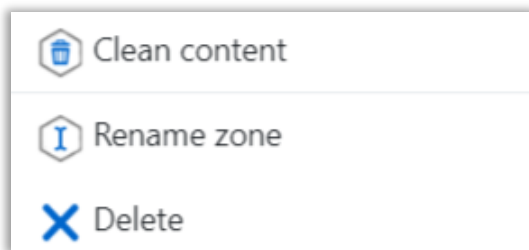
Check all the products that must belong to this group, then **Save**

Please note that the products on a white background are already assigned to a group: if you select one of these products for this new group, it will be automatically detached from the old one.

Products not yet assigned are on a blue background.

### Clean, delete or rename a zone or group

Click on the zone or group to pop up the menu of possible actions



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.

## Dashboard tab

Type	ChartType	Title	Percent	Active	
AP	Pie	Clients	<input type="checkbox"/>	<input checked="" type="checkbox"/>	...
Function	Donut	AP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	...

In this section you can create or remove all existed dashboard or updated an existing dashboard. This tab displays the statistics of the product in graphical form.

Type	ChartType	Title	Percent	Active	
AP	Pie	Clients	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> <li>Update</li> <li>Delete</li> </ul>
Function	Donut	AP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	...

Please note you can change the display order of dashboard elements by doing drag and drop. You can do it by click one element and move the cursor to the desired place, the selected element will be position to the chosen destination and this order will be saved automatically.

## Syslog tab

**System Log**

System log server

Server log Port

Keep logs for  day(s)

Entry log level

- Niv.0 - Emergency
- Niv.1 - Alert
- Niv.2 - Critical
- Niv.3 - Error**
- Niv.4 - Warning
- Niv.5 - Notice
- Niv.6 - Info
- Niv.7 - Debug

### System Log

In this section you can:

- Enable the System log server in WaveManager
- Set the Server log Port (default is 514)

- Set the logs retention period (default is one day)
- 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)

## Alarm tab

**SETTINGS**

NETWORK INTERFACES

OPERATIONAL

PREFERENCES

GROUPS/ZONES

DASHBOARDS

SYSLOGS

ALARMS

Applied To	Type	Value	Active
All	Configuration change		<input checked="" type="checkbox"/>

Create Remove All

Update Delete

This tab allows you to manage alarms. You can create, update, delete or remove all existing alarms. The list of existing alarms is displayed here.

Alarm can be set per all product, zone/group or one product

**Create a new alarm setting** ×

Create a new alarm setting

Applied to : All products

Type : No a

Save

Alarms are categorized per below actions

**Create a new alarm setting** ×

Create a new alarm setting

Applied to : All products

Type : No access point

No access point

Not reachable

High threshold

Low threshold

Roaming

Configuration change

Firmware change

New product

Telemetry down

## Notification tab

**SETTINGS**

- NETWORK INTERFACES
- OPERATIONAL
- PREFERENCES
- GROUPS/ZONES
- DASHBOARDS
- SYSLOGS
- ALARMS
- NOTIFICATIONS**
- USERS
- DATABASE

**Alarm notifications**

- Enable desktop alarm notifications
- Enable receipt of email alarm notifications
- From:
- To:

**Smtp Configuration**

- Smtp Server:
- Smtp Port:
- 
- Use a secure SSL connection
- Require authentication
- Username:
- Password:

This feature allows WaveManager to display notifications when certain events defined in the Alarms tab occur (see chapter [Alarms](#)). 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).

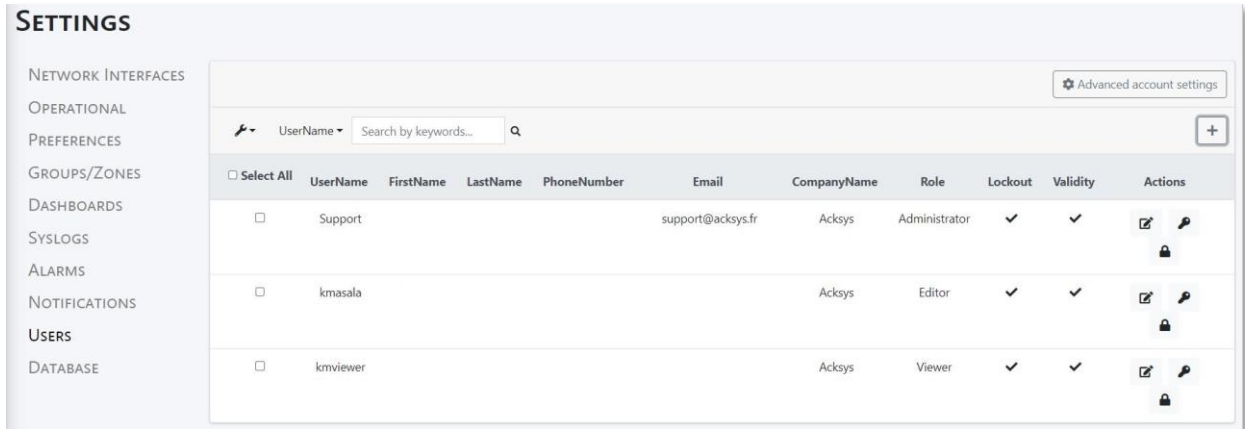
When an event is triggered, WaveManager generates a notification and saves a report (with date and time) that can be viewed by the user. The detailed information is shown in a pop-up message window.

**NOT REACHABLE** ✕  
The product AirLink - 10.1.1.110 is not reachable for more than 1 min

**TELEMETRY DOWN** ✕  
Telemetry is down for the product AirLink - 10.1.1.110 for more than 1 min

**CONFIGURATION CHANGE** ✕  
The configuration of the product RailBox/11A0 - 10.1.1.120 has changed

## Users tab



As previously explained, this tab is only accessible when logged in as admin; you might lock or unlocks selected users, update user, reset user password, create new user and advanced account settings provides more information about account settings.

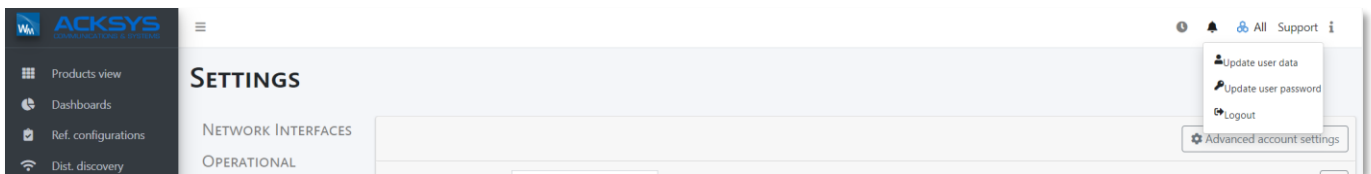
To update information of the selected user, we click on the button

For password reset of the selected user, we click on the button

Deleting a user is not possible because the user data are saved for actions done. However, you can lock any selected user by clicking on the button

Selected users can be locked or unlocked by clicking on

WaveManager provides shortcut to update connected user's information:

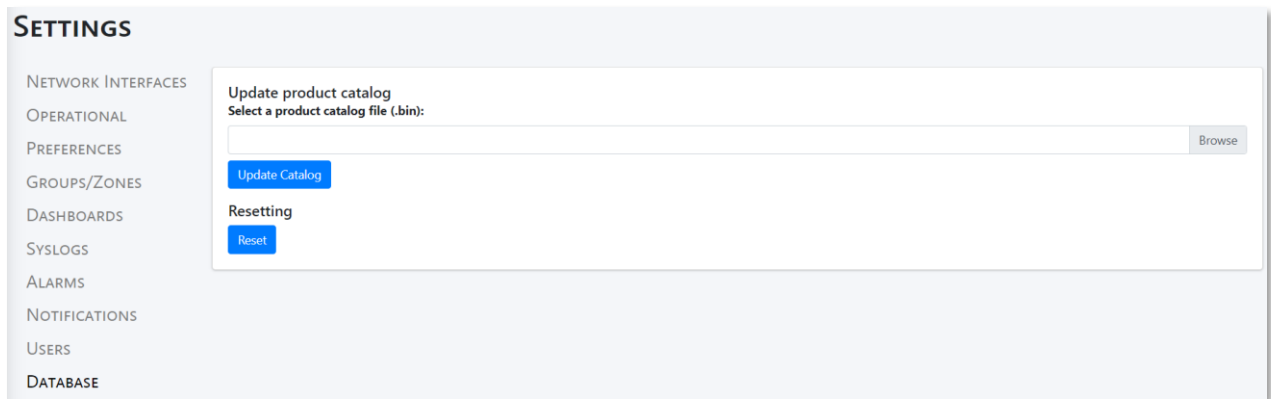


Basic information for the connected user can be updated by clicking

The connected user password can be updated by clicking

To logout the connected user, click on

## Database tab





Acksys list of products supported by WaveManager 3 grows daily and you can update the new product through WaveManager without installing a new version of the application.

The recent catalog file will be available on Acksys website to the disposal of the customers when a new product is supported by WaveManager. You might download this file on your local computer and update the catalog.

The Reset button will reset your complete database after upgrading the new catalog file.

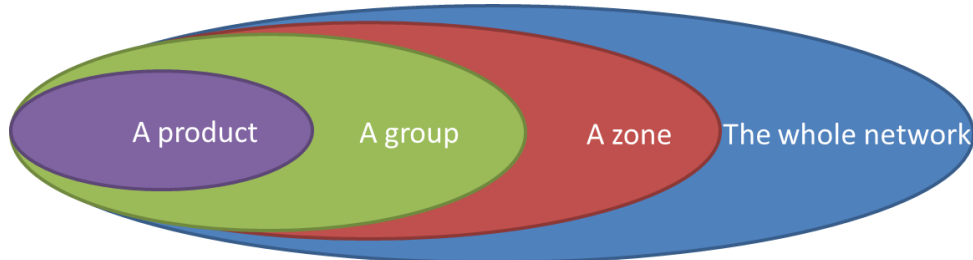
Please note that the catalog file is a Zip file .bin named **Catalog.bin**; this file contains a Json file with product catalogue and all photos of Acksys products.

Nom	Modifié le	Type	Taille
 assets	15/04/2022 08:47	Dossier de fichiers	
 Catalog_Acksys.json	04/04/2022 17:30	Fichier JSON	32 Ko

## 11. 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 -



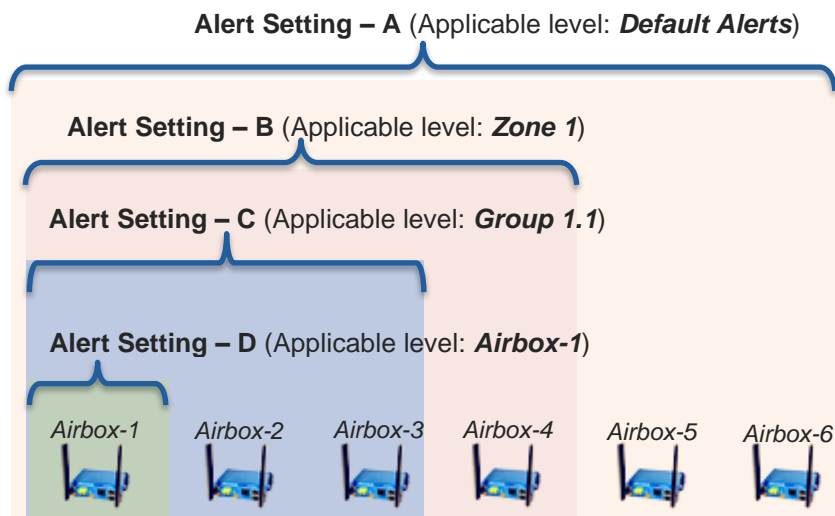
For example, there is a network including 6 Airboxes. 4 alert settings are configured in the network.

**Group 1.1** which contains *Airbox-1*, *Airbox-2* and *Airbox-3* can trigger the alert setting - **C**, except *Airbox-1*

*Airbox-1* can only trigger **alert setting - D**

*Airbox-4* can trigger **alert setting - B**

*Airbox-5* and *Airbox-6* can trigger **alert setting - A**



## 12. ANNEXES

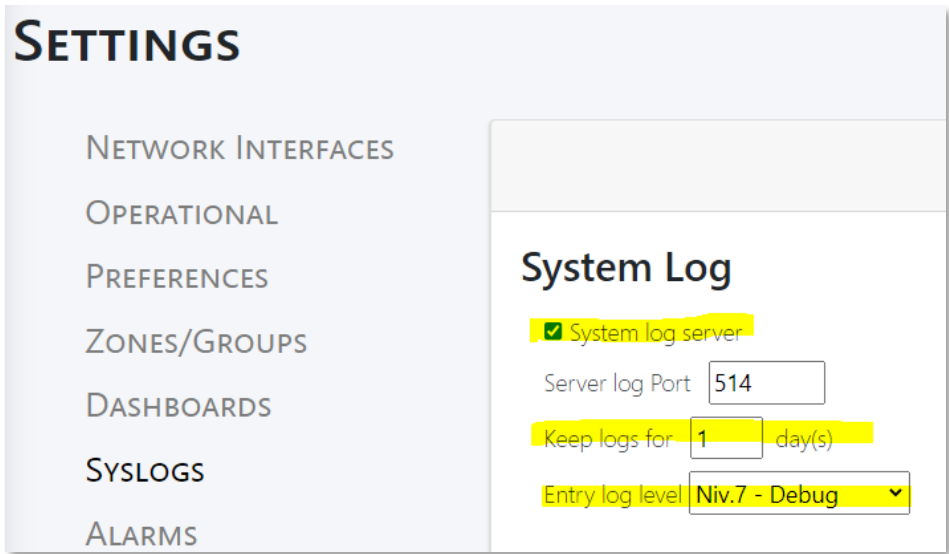
### SETUP THE AUTOMATIC EMISSION & RECEPTION OF LOGS

→ *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. Check the Syslog Server Port (default port 514 should normally not be changed)
4. Configure the system time on the product
5. Save & Apply

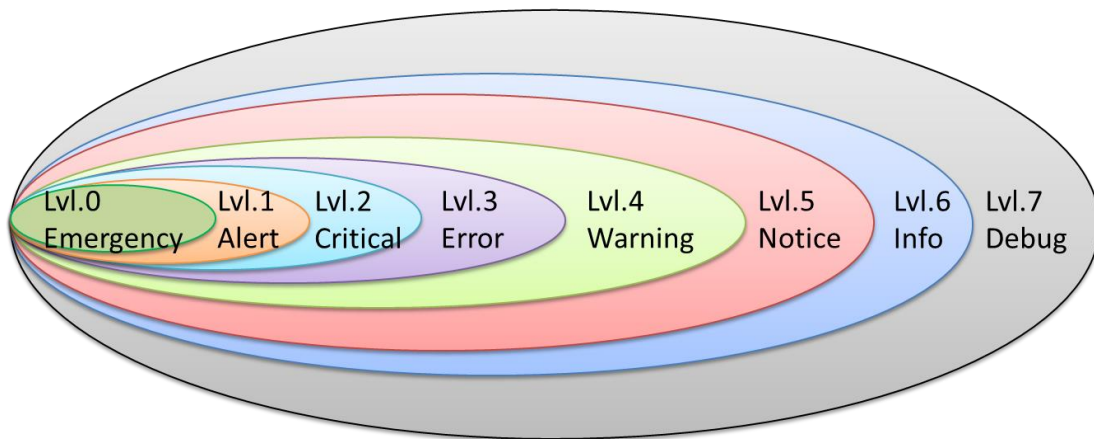


→ *Reception: In WaveManager*



1. Enable the log server in WaveManager (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.



Allow WaveManager on the computer firewall (where WaveManager is running).

## 13. 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

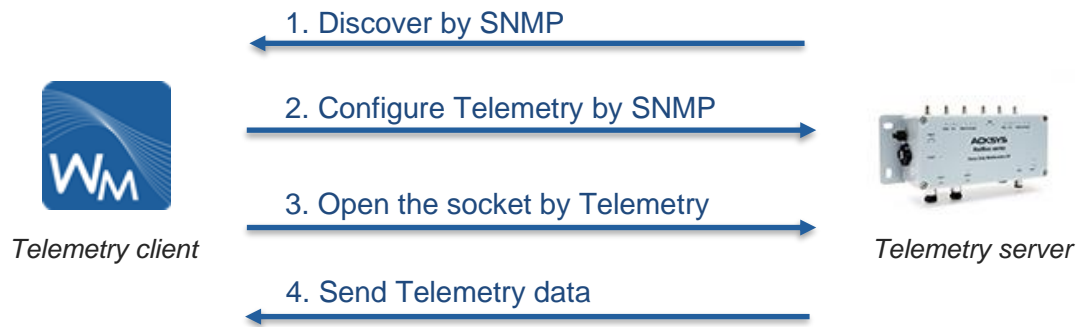
In order to be compatible with all ACKSYS products on the market, WaveManager alternately uses SNMP and Telemetry. This means that WaveManager refreshes products that do not support Telemetry by SNMP and those support Telemetry by Telemetry.



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 "Settings/Data Collect". 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 data transfer rate.

**Telemetry**

Enable telemetry

Telemetry port

Data transfer every  acquisition(s)

Enable product telemetry settings

Setting time

You can also check **Enable product telemetry settings**: this will allow Wavemanager to send the telemetry parameters to the products on line.

## 14. CHARACTERISTICS

### Hardware configuration

- ✓ At least Windows 10
- ✓ 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)

### Supported language

- ✓ English Only

### Protocols and ports

#### UDP

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

#### 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

#### Telemetry

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

## 15. WARNING

In some specific case, WaveManager .DLL files can be blocked by some by Antivirus software therefore WaveManager server will not be reachable and will show below error. The network administrator needs to add an exception to authorize .DLL files.

```
localhost:1 Unknown error occurred while trying to verify integrity. :5000/ framework/Sys...y.Permissions.dll:1
Failed to load resource: the server responded with a status of 403 (Forbidden)
localhost:1 Failed to find a valid digest in the 'integrity' attribute for resource
'http://localhost:5000/ framework/System.Security.Permissions.dll' with computed SHA-256 integrity
'+fCWBj9A2NhnHCFifr9se8Wt2GVAaLeS4fkRxBpwFY='. The resource has been blocked.
```