W-AIR

Quick Start Guide

Version updated on: 30.08.2013
WMS version: 2.8.X or later

Wildix

This guide allows you to set up your W-AIR Network and connect your cordless phones.

W-AIR SYSTEM

W-AIR is a Wildix cordless solution. The system supports auto-provisioning enabling instant connection to the Wildix PBX. Due to high scalability, new components are quickly and easily integrated to guarantee the better performance.

Wildix W-AIR system uses new wireless technology CAT-iq (Cordless Advanced Technology – Internet quality). It combines telephony and Internet offering a great variety of new features.

The architecture consists of three simple components:

Wildix W-AIR Base station

Wildix W-AIR Repeater

Wildix W-AIR CAT-iq cordless phone

Wildix W-AIR Base station

It's a basic component to create a wireless network. It's possible to register up to 200 cordless phones (only Wildix W-AIR phones). Base station allows up to 8 concurrent calls. Connecting other Base stations increases the number of calls (up to 40). Base station has a built-in radio antenna that covers a radius of circa 50 meters indoors and up to 300 meters outdoors. By connecting Repeater you can increase the network range. It's possible to connect up to 3 Repeaters to every Base station, in their turn they can be connected to each other in chain of maximum 3 Repeaters. Up to five users can communicate concurrently within the coverage range of every Repeater.

System features
200 users registered
40 bases (maximum 39 slave bases registered to the master)
30 handsets registered to one base station
3 Repeaters per base
100 Repeaters registered to one system
up to 8 concurrent calls per base
Handover through the base station (max. 8 simultaneous handovers)
10 narrow band audio channels per base
Max. RTP=18 on one base station

4 CAT-iq wideband audio channels per base
G.729 narrow band codec
G.722 wideband codec
Power over Ethernet (PoE): IEEE 802.3af Class 2
2 omnidirectional inbuilt antennas
Indoor range: 50 m; outdoor range: 300m

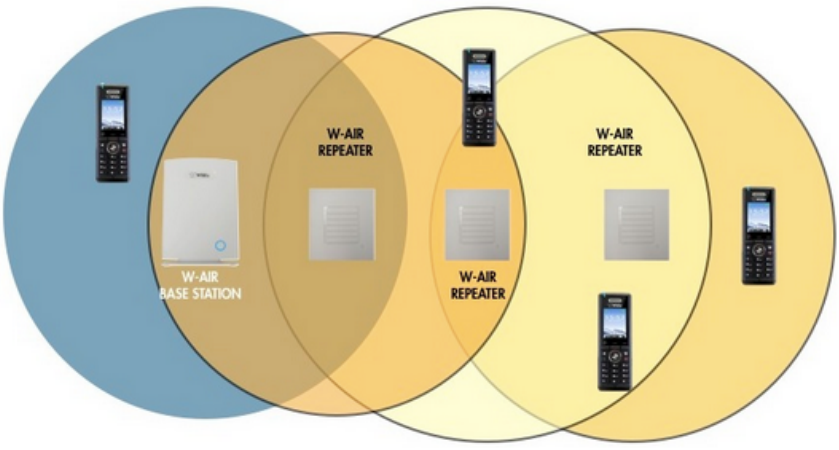
Wildix W-AIR Repeater

This component increases the coverage range of the Base station (W-AIR Base station)
Up to 3 Repeaters per Base Station
Up to 5 concurrent calls
Up to 3 Repeaters connected in chain

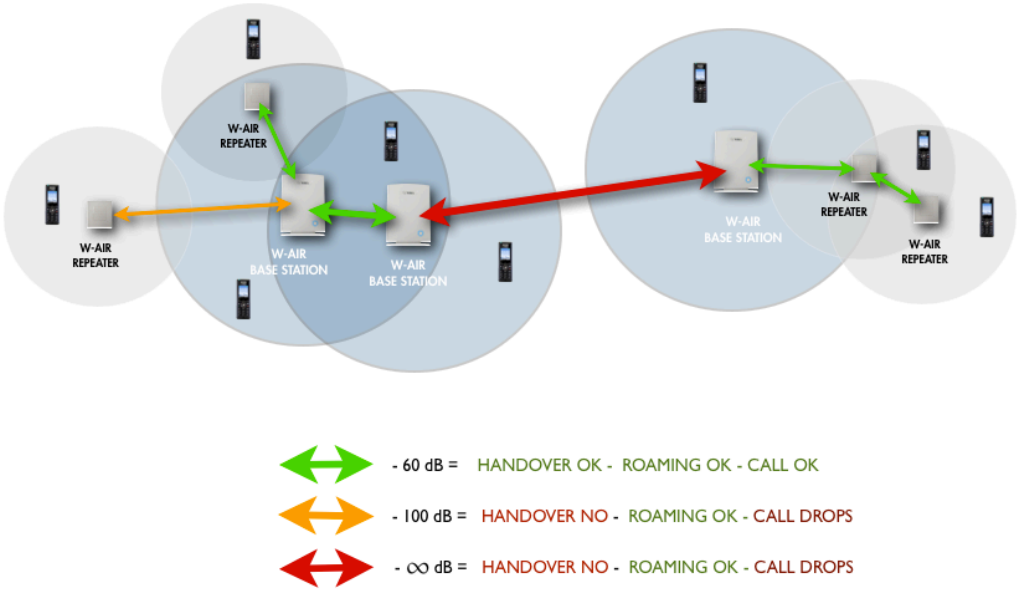
Wildix W-AIR cordless phone

XML phonebook
Synchronization of the settings with the CTIconnect (DND etc)
2'' TFT display with graphic interface 176 x 220 pixel 262K color
Polyphonic ringtones
Intercom/Paging
Automatic SW upgrade
Wideband two-way speaker phone mode
Vibration
Conversation: > 18 hours
Standby: > 200 hours

Connecting 3 Repeaters in a chain



Example of Base Station and Repeater positioning



Note: **For a good conversation and a correct handover between bases and Repeaters the dBm value must be between -75 and 0. Base stations cannot be connected with the help of repeater.**

Installation

Requirements

- WMS release 2.8.X or later
- PoE switches
- DHCP server

If you are using a WMS integrated DHCP Server, go to *Settings* → *System* → *DHCP Server* and search for the device among the DHCP leases.

IMPORTANT: Site Survey

Before getting started make sure the cordless phone is fully charged, then follow the steps below:

- place the W-AIR base station exactly at the desired position and power on the base.
- use the building plan drawing and check the base station coverage using the phone and the Site survey mode of the phone. Mark up the acceptable and unacceptable spots on the plan drawing. Take a note of the RSSI level of the base. Acceptable spots are the ones where the phone shows **RSSI levels better than -75 dBm**

Typically, when the system is installed in the office buildings, hotels or hospitals, there should be both base stations and Repeaters on several floors to create uniform and complete radio coverage. Open areas can be covered by wide network of Base stations. In these applications, the base stations and/or Repeaters cover an extended range due to the extended line-of-sight radio propagation capability.

Check the Radio Coverage

Cordless phone

- Press the **Settings** key
- Type *service* (*7378423*).
- Select the line **Site survey mode** on the administrator menu
- The phone will show up to 5 bases (RPN) and the coverage value.
- Check PP and FP values, they indicate the transmission errors. Empty value or a low number indicates a correct behavior (100 value = the worst behavior)

dBm value

For a good conversation and a correct handover between bases and Repeaters the dBm value should be between -75 and 0.

Bases

Go to the device's web interface of a base station and click on Multi Cell to see the status and the coverage values of every connected base, check the column DECT sync source to know the value.

	ID	RPN	Version	MAC-Address	IP-Address	IP Status	DECT sync source	DECT property	Base Station Name
☐	0	00	200.5	9C:75:14:34:00:69	192.168.222.108	This Unit	Select as primary	Primary	W-AIR Base Station
☐	1	04	200.5	9C:75:14:34:00:14	192.168.222.106	Connected	Primary:RPN00 (-35dBm)	Locked	W-AIR Base Station

Repeaters

Go to the device's web interface of a base station and click on **Repeaters** to see the status and the coverage values of every connected Repeater, check the column **DECT sync source** to know the value.

	Idx	RPN	IPEI	DECT sync source	DECT sync mode	State	FW Info	FWU Progress
☐	0	RPN06	01:5A:DA:1A:A8	RPN04 (-75dBm)	Local Automatical	Present@RPN04	16	
☐	1	RPN05	01:5A:DA:0F:78	RPN04 (-58dBm)	Local Automatical	Present@RPN04	16	

Plan an installation

Deployment Issues

The following radio related issues should be considered before deploying a typical WILDIX W-AIR VoIP System:

- **Building Penetration:** when a signal strikes on a building it is diffracted or absorbed; therefore the signal can be reduced. The amount of absorption depends on the building and its environment, the amount of solid structure.

- **Interference Sources:** other signals can create interferences and weaken the signals of the receiving antennas. These interferences can come from the same network or from the outside. For choosing the optimal position of the Base station and Repeaters, these potential interference sources should be considered before installing a Wildix W-AIR system.

- **Radio/Cell Range**: a suggested distance between two base stations depends on the physical path between them. If the path loss is lessened, e.g. by minimizing the amount of walls/obstacles on the path, then the signals of the base stations cover more distance. In a typical office building a suggested distance between two base stations is 30-40 m.

The purpose of this section is to shortly describe how to plan the base position and the phone coverage. The maximum quantity of calls is indicated in the list below:

- **Base stations:** up to 8 simultaneous calls
- **Repeaters:** up to 5 simultaneous calls

Notes:

- *The total coverage capacity of a base station and one or more Repeaters, is always limited to the capacities of a base station.*
- *A W-AIR network uses an auto-balancing model to increase the number of simultaneous calls, distributing the calls to 2 or more adjacent Base stations*
- *Simulate the worst environmental conditions (close the doors, turn on the equipment, etc) to perform a realistic test of configuration*
- *Use 98 code (conference) on your W-AIR Handset to listen to the music on hold, to test an audio reception quality.*
  Use 76 code (echo) on your W-AIR Handset to test the voice quality

Base station/Repeater Placement Strategy

The antennas of the base stations are close to omnidirectional, thus it is not important how the base stations are directed and how they face each other. There is no single strategy for deploying base stations, but there are some recommendations:

- **In the Corridors:** base stations/Repeater should be deployed vertically, preferably in the corridor intersections so that the propagation follows the corridor patterns/curves. If there are high objects in the area, the base station/Repeater should be installed above them.

- **Multistory Buildings**: base stations and Repeaters can be installed on the opposite sides of the floors to cover the area floor-to-floor. The coverage design cannot rely entirely on floor-to-floor propagation; each case should be verified due to variations in local attenuation patterns

- **Large Halls:** base stations and Repeaters can be deployed in large halls that contain a central open space area with windows leading to other areas. This provides a good coverage for the rooms in the inner circle on all floors (e.g. hotels). In large halls, Base stations/Repeaters should be installed vertically in the middle of the space below the drop ceiling.

- **Mounting Positions:** when Base stations and Repeaters are mounted vertically on a wall, the radio coverage in front of these devices is twice as large as the coverage behind them. The base stations should always be mounted higher than the obstructive objects in the area – e.g. minimally 2m above the floor. Repeaters should be installed in the middle of the corridors and small rooms.

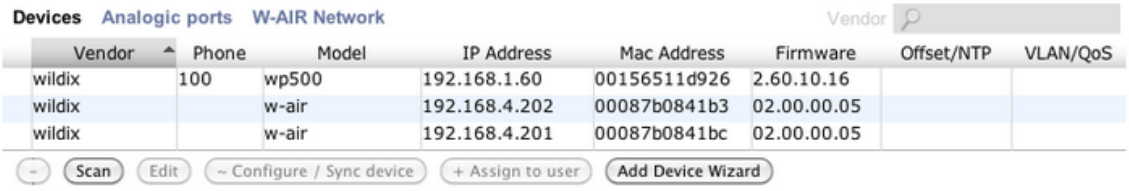
- **Metallic Structures/Objects:** base stations and Repeaters should not be deployed near large metallic objects

- **Reinforced Concrete Structures:** these structures create a high attenuation factor inside the building. They reduce the radio coverage range of the Base stations and Repeaters thus a higher number of base stations or Repeaters are required in the building. Lighter types of construction materials require fewer base stations since attenuation figures are considerably lower.

W-AIR Network configuration

Detect a gateway

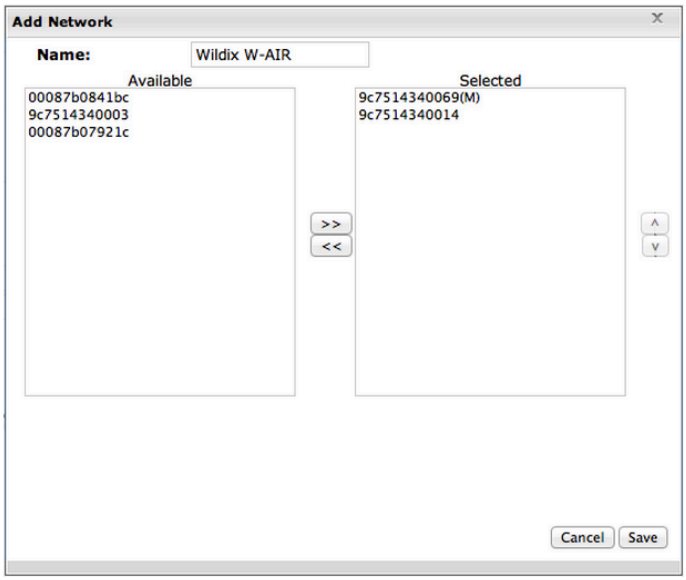
Go to to the WMS → **Devices**, find the network to which W-AIR is connected and make a Scan to search for devices. An unconfigured device appears in grey → select it and press **Configure / Sync device** button to associate it with the system.



Create a W-AIR Network

W-AIR Network consists of one or more gateways that should belong to the same LAN. A gateway can be a part of a W-AIR Network only if it can reach other devices.

- Go to menu **Devices → W-AIR Networks → add Network** (+)
- Choose a **Name** for your W-AIR Network
- **Select** the gateways and **add** them to the W-AIR Network
- **Save** your Network
- Go back to the **Devices Menu**, select your base/bases and press **Configure / Sync device** button



*Note: The first devices becomes the Master of the network **(M)**. The gateways make Radio sync with each other automatically to extend the work range if possible.*

LEDs of the bases

- LED blinks purple when a base is rebooting
- LED blinks red when a base reports a configuration error
- LED remains solid blue if a base is configured and registered to the Wildix PBX

Configure the cordless phone

- switch on your phone and wait till the system assigns you an "unknown account" and the coverage indicator turns active
- dial "99"
- enter an extension number configured on the WMS and a user password

The phones can be registered manually
(e.g. if a phone belongs to another network)

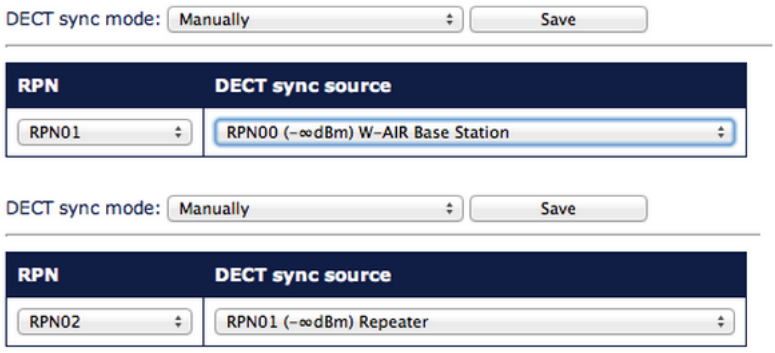
- Verify that there is only one active W-AIR Network
- Press the Settings key
- Select Connectivity
- Select Deregister, enter 0000 as PIN then press Yes
- Select Register, enter 0000 as Access code then press OK
- The cordless phone is ready for a new login procedure

Notes:

- *you can assign a new user any time you need by repeating the login procedure*
- ***Currently after this operation you should turn off the phone and then turn it on again for the gateway to activate a new account.***
- ***Currently the base can reboot at any login/logout.***
- ***Currently in order to perform a login/logout on a phone connected to a Slave gateway, at least a phone should be connected to the Master gateway.***
- ***Currently share phonebook can load up to 200 contacts.***

Set up Repeaters

- find the IP of the base station that you want to repeat (on the WMS devices list)
- access the http interface from your browser, enter a username "admin" and a password "wildix"
- select **Repeaters** in the menu and click on **Add Repeater**
- select **Manually** from the drop-down menu if it is present, then choose the Station ID (*DECT sync source*) where you want to connect the Repeater and confirm by pressing the Save button
- remove the power cable from the Base station (PoE) and after the system reboots, go back to the http interface of the Base station
- select **Repeaters** in the menu
- select a Repeater(s) you want to add to the chain and click on **Register Repeater(s)**
- now you have 5 minutes to turn on the Repeater(s)
- LED of the Repeater should turn solid green in several seconds, if it fails (solid RED) please repeat the steps after the reboot of the base station



Note:

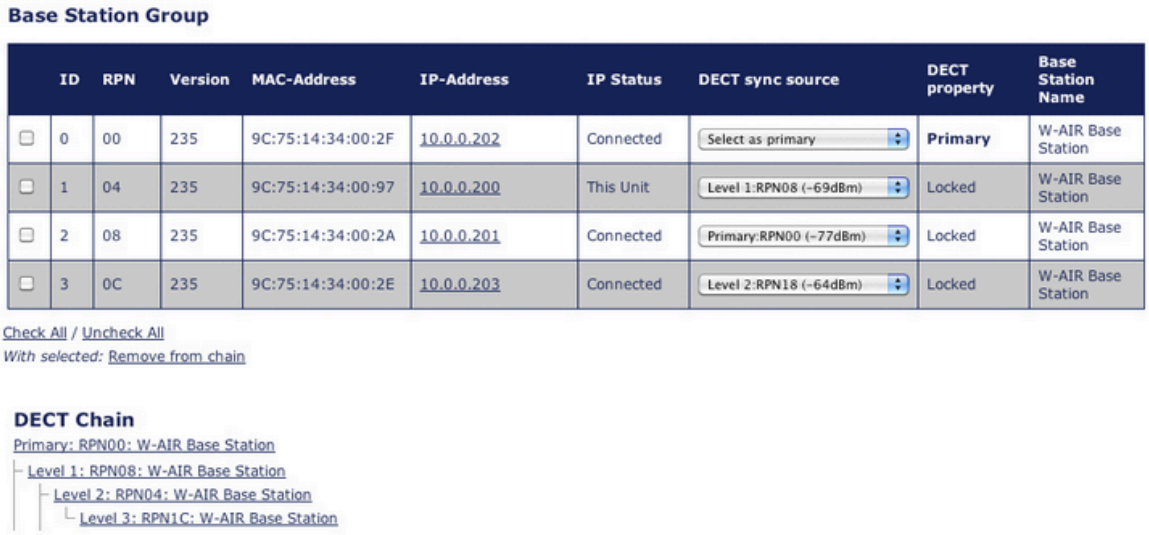
- If you have any problems with registering Repeater(s) you can reset it by pressing the reset button on the back side. While the Repeater is off, turn on the repeater, LED becomes solid RED and then GREEN with a double pulsation. You can start the registration procedure again by following the last three points above.
- **The Repeater should be placed on a distance not less than 10 meters from its Base station.**

LEDs of the Repeaters

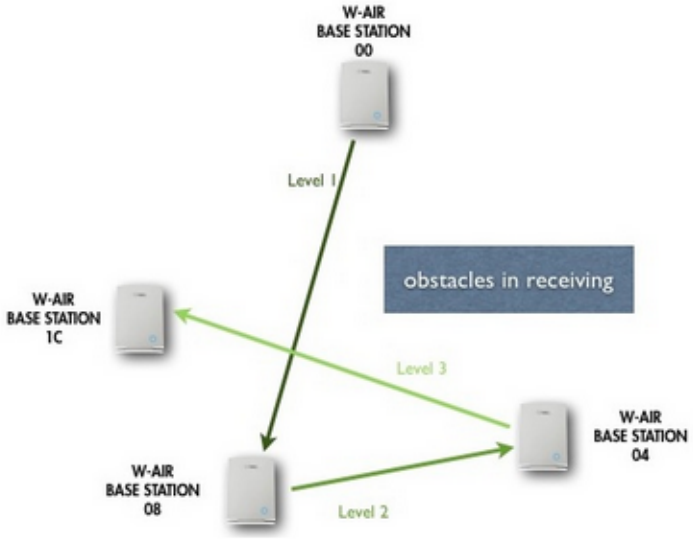
- LED blinks green with a double pulse during the first registration process
- LED blinks green during the connection process
- LED remains solid green when it is registered to a base station
- LED blinks green with a fast pulse when a phone connected to the Repeater starts a new call, during the conversation it blinks red
- LED becomes solid red if the Repeater fails to connect to the base station

Installation analysis:

Look at the DECT Chain Tree to check the solution you have decided to set up.



The DECT Chain Tree should correspond to the real Bases deployment (as in the following example)



The value shown in the "DECT sync source" field indicates the real dBm value.
Based on this value you can choose the best connection solution for your system, taking into consideration any obstacles present in the environment.

Note:

- *When you modify the DECT Chain Tree, you have to start the System Sync. This operation can take up to 10 minutes.*

Technical Notes

Handover functions

To make it possible for the cordless phone to move between the gateways without dropping ongoing calls, good radio coverage between the adjacent gateways is required.

DND, Call Forward and other settings

You can set them by dialing feature codes of WMS, the status is notified in real time on the device.

Upgrade Procedure of W-AIR

Requirements

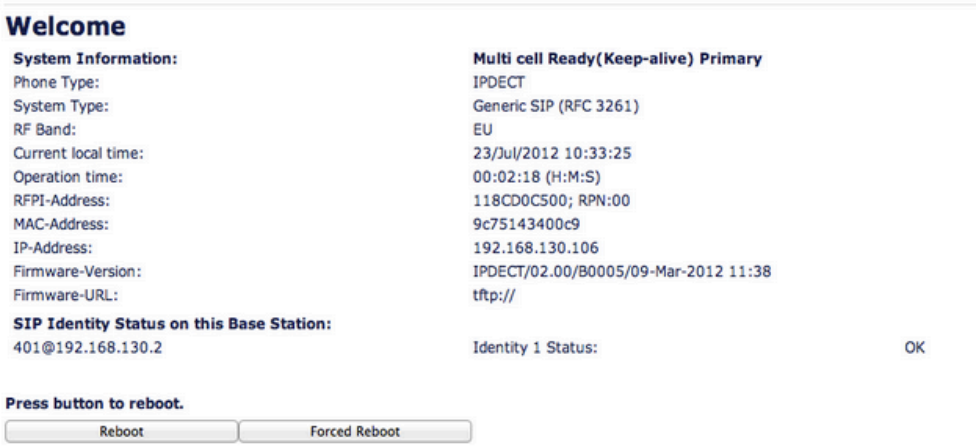
WMS version 2.12.20859.1 or higher

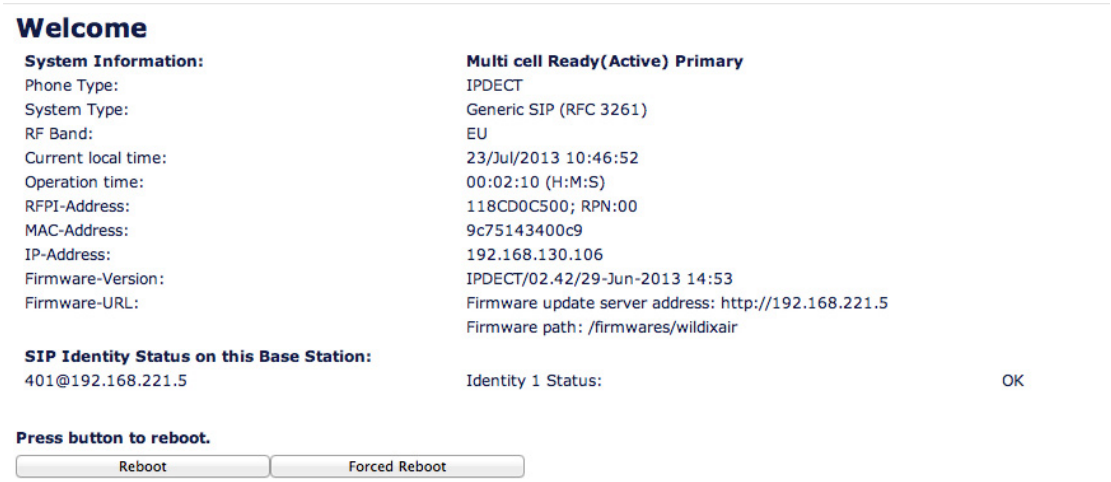
Upgrade procedure

Base stations

Upgrade should be done, if the current FW version is less than **2.42 for WMS2.0** or **2.90 for WMS3.0**

- Go to WMS → Devices → select all the base stations to be upgraded → press "Configure / Sync device" and wait for several minutes. After the reboot of the base station the new version appears on the WMS devices page



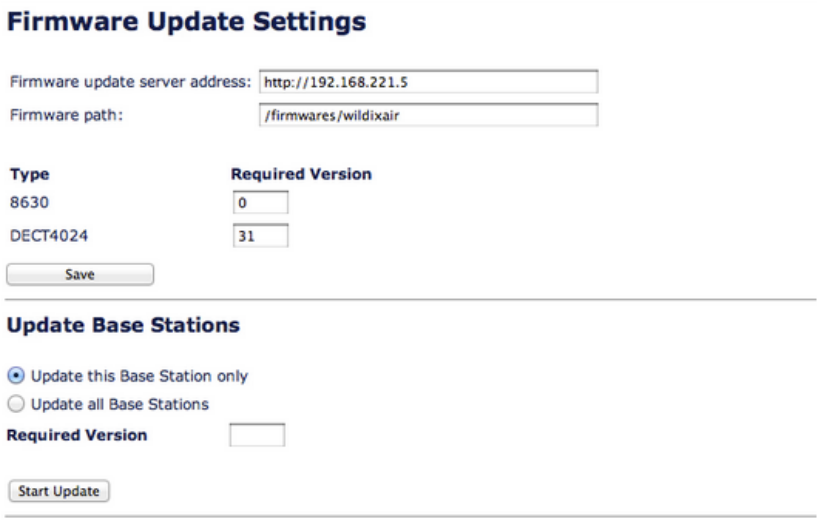


After the upgrade of the base stations, proceed to the upgrade of the repeaters

Repeaters

You should have the repeaters connected in order to make the upgrade

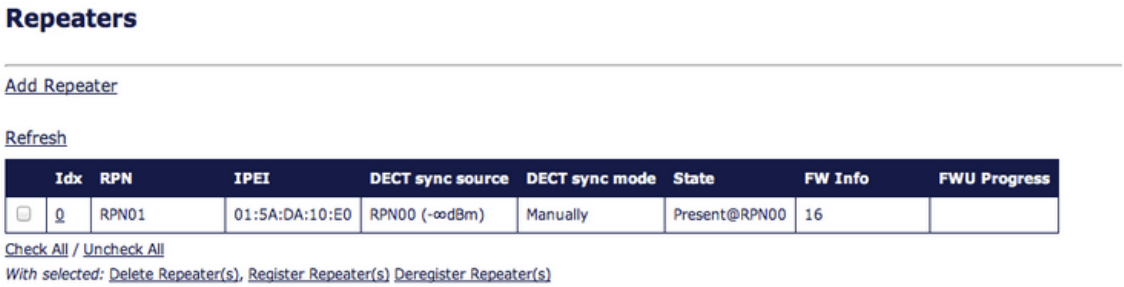
- Access the base station interface and move to the page "Firmware Update" → insert the value 31 into the field "DECT4024" → press "Save" → reboot the base station



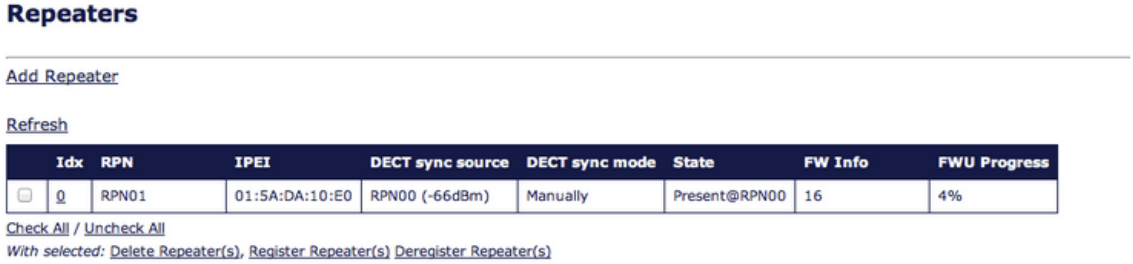
During the reboot you can see the status of the upgrade of the repeaters, the procedure takes about 25 min

Do not turn off or reboot repeaters manually during the upgrade: they restart automatically. The upgrade procedure is over only when the base station interface indicates the version "31"

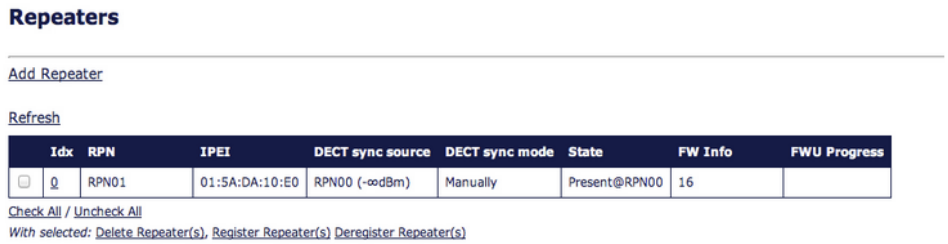
Before:



During:

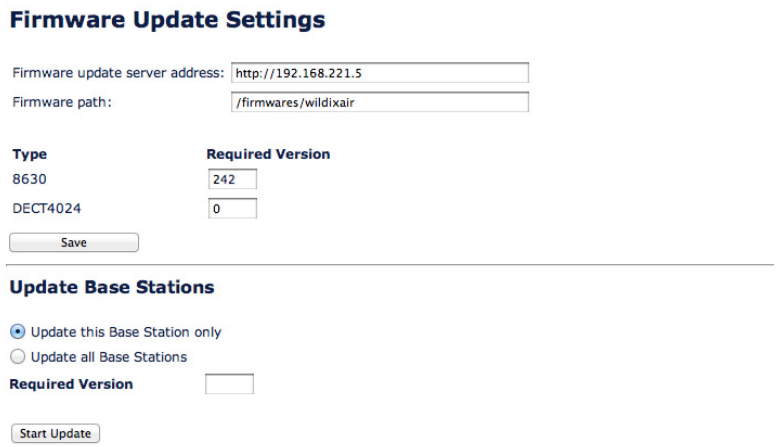


After:



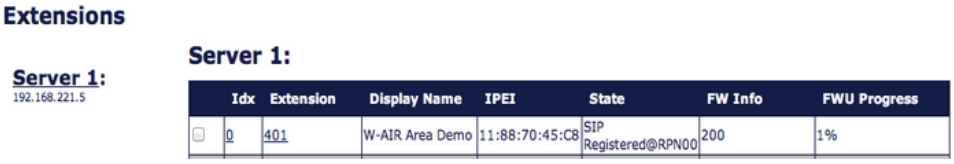
- Access the base station interface and move to the page "Firmware Update" → insert the value 0 into the field "DECT4024" and the value **"242" for WMS2.0** or **"290" for WMS3.0** into the field "8630" → press "Save"

During the upgrade of W-AIR phones, the phones should be placed into the charger

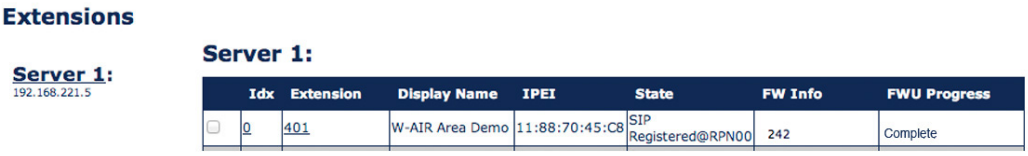


During the procedure you can see the status of the upgrade of the phones, the procedure takes about 3 hours

During:



After:



- At the end of the upgrade procedure of the whole W-AIR system move to the page "Firmware Update" and insert the value 0 into the fields "8630" and "DECT4024" → press "Save"
- Make sure that the DECT Chain scheme remained correct

Contacts

Italy: +39 0461.1715112 support@wildix.com	**France:** +33 176 747 980 support@wildix.fr