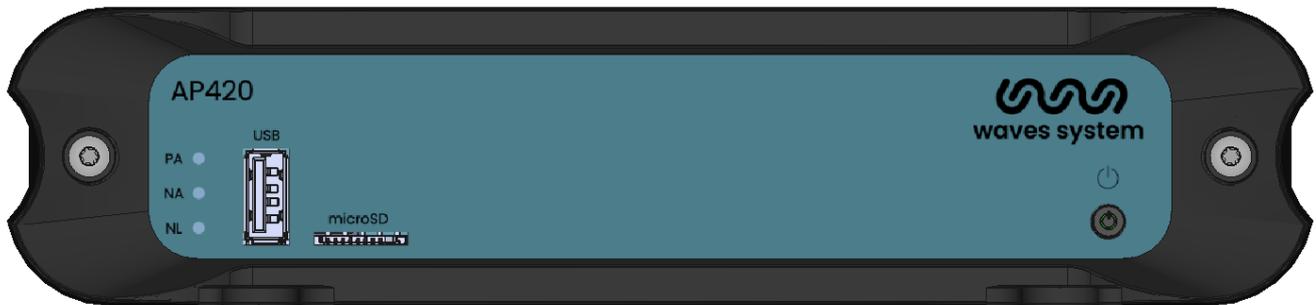




AP420

User guide



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Licence



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Welcome

AP420 is the most advanced audio player designed by Waves System. The player can broadcast tracks, playlists, webradio and messages. Media are stored either on a USB stick, a microSD/SDHC/SDXC card or an internal flash memory (4 Go available).

User can easily import its media in the internal media library and program several layers of audio in a calendar.

Your player AP420 is ideal for public address installation, background music in retail, airports and theme parks.



★ Refer to the user guide

- From a web browser: <https://waves-system.com/support>.

⚠ Safety

Refer to chapter [📖](#) [🔗](#) Safety instructions ^[p.5] of **AP420** user guide.

1. Safety instructions

Warning

CAUTION! DO NOT EXPOSE THE PRODUCT TO HUMIDITY NOR DUST!

Unplug the power supply cable before any servicing

FOR YOUR SAFETY, PLEASE READ CAREFULLY THE USER'S GUIDE BEFORE OPERATING YOUR PLAYER AP420.

CE marking

The CE marking is placed on the label, at the bottom side of the device. It attests to compliance of the device with low voltage CE directive according to EN 55022 standard, and the Electromagnetic Compatibility Directive 61000-4-x.

Overview

- The user manual is an integral part of the product. It must always be kept handy & close by. Proper usage involves strict compliance with the instructions given in this manual. In the event of return of the equipment, the user manual should be handed over to the new purchaser. The staff should receive instructions concerning the proper usage of the device.
- Only the use of genuine parts ensures perfect safety for the user and correct operation of the device. Moreover, only accessories mentioned in the technical documentation or explicitly approved by the manufacturer must be used. If accessories or consumable products from other brands are used, the manufacturer cannot stand guarantee for the correct and safe operation of the device.
- Damages caused through the use of accessories or consumable products from other brands will not entail right to any benefit under the terms of warranty.
- The manufacturer will be liable for the safety, reliability and functioning of the product as long as the assembly, settings, modifications, extensions and repairs have been carried out by the manufacturer or a company approved by the manufacturer, and if the device is used in accordance with the instructions mentioned in this manual.
- The player complies with the technical safety standards in force at the date of print of this manual. All rights reserved for the electrical diagrams, procedures, names and devices mentioned herein.
- Any reproduction of the technical documentation, even partially, without the written authorization from Waves System is prohibited.

General safety instructions

This device has been shipped out from our facilities in perfect working condition. In order to preserve these conditions, for safety and to avoid any risk of accidental bodily injury, the user must imperatively follow the safety instructions and read the 'Caution!' messages included in this manual.

This device, made by Waves System, has been designed in a way that practically eliminates any risk if it

is used in accordance with its intended purpose. Nevertheless, for the sake of safety, we would like to draw your attention to the following instructions:

- When using the device, comply with all local rules and regulations in force. Any modification or conversion of the device automatically entails loss of the certification. The operation of a modified device is liable to a penalty. In the interests of occupational safety, the operator and the user are held responsible for complying with the regulations.
- Keep the original packing for a possible product reshipment. Also ensure that the packing material is kept out of the reach of children. Only this original packing ensures optimal protection for the product during transportation. If a product reshipment appears to be necessary during the guarantee period, Waves System is not liable for any ensuing damages arising during the transportation and attributable to a defective packing.
- This device should be used only by persons whose training or knowledge ensures proper handling.
- Before each use, the operator must check that the device is in perfect working condition.
- This product must not be used in places where there is a potential explosion risk. Besides, it must neither be used in an environment favoring combustion nor in a humid or excessively hot or cold location.
- Maximal temperature of use: +45°C
- Storage temperature: from 0°C up to +60°C

Safety instructions against risks due to electric currents

- The device must be connected to a grounded AC power outlet or a European standard outlet installed as per good professional practices.
- Disconnecting means of primary supply: Power outlet is used as the disconnecting means of primary supply, it shall remain accessible.
- Power supply: 12V DC - 2 A
- Before connecting the device, check that the mains voltage and frequency match the specifications indicated on the mains adapter.
- Before powering, check that the device and cables are not damaged. Damaged cables and connections must immediately be replaced.
- Never allow the power cords to come in contact with other cables. Handle the mains adapter cable as well as all other cables connected to the mains with extreme care.
- Always connect the power cord to the device first, then to the mains. The power outlet must remain accessible after the installation.
- Check the device and its mains adapter cable from time to time. Disconnect the device from the mains when it is no longer used or for the purpose of maintenance.
- Handle the power cord by using only the plug. Never remove the plug by pulling the power cord.
- Electrical connections, repairs, and maintenance must be carried out by qualified personnel.
- Do not switch the device on or off within a short period of time as this reduces its lifespan.

	THE LIGHTNING FLASH WITH ARROWHEAD SYMBOL, WITHIN AN EQUILATERAL TRIANGLE, IS INTENDED TO ALERT THE USER TO THE PRESENCE OF UNINSULATED "DANGEROUS VOLTAGE" WITHIN THE PRODUCT'S ENCLOSURE THAT MAY BE OF SUFFICIENT MAGNITUDE TO CONSTITUTE A RISK OF ELECTRIC SHOCK TO PERSONS
	THE EXCLAMATION POINT WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE USER TO THE PRESENCE OF IMPORTANT OPERATING AND MAINTENANCE (SERVICING) INSTRUCTIONS IN THE LITERATURE ACCOMPANYING THE APPLIANCE. Warning, the user's guide must be red each time the symbol is written.
	Direct current
	WEEE
	User's guide must be red each time this symbol is written.
	Positive electric polarity

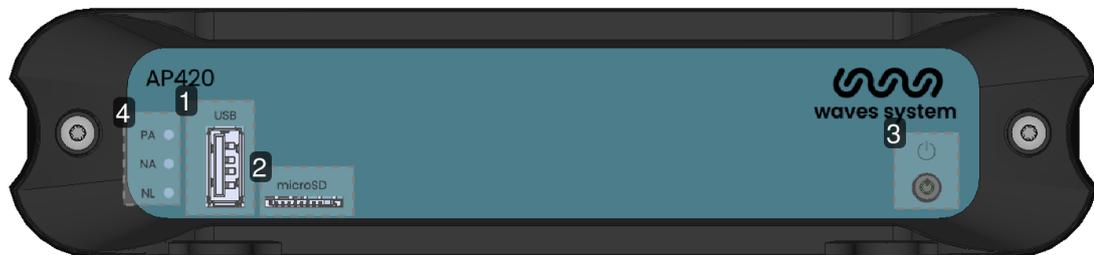
Terms of use

- This product has been designed for indoor use only.
- The device must be attached under 2m high from the ground.
- If this device has been exposed to very high temperature fluctuations (e.g.: after transportation), do not connect it immediately. The condensation formed inside the device could damage it. Allow the device to reach ambient temperature before connecting it.
- Do not shake the device. Avoid sudden movements during its installation or handling.
- When selecting the spot for installation of the player, ensure that it is not exposed to a high source of heat, moisture, or dust. There should not be any cables lying around as they might jeopardize your and others' safety.

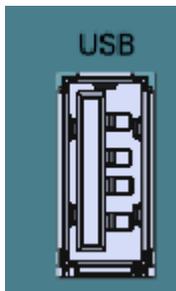
2. Description of the player

Front panel of the player AP420

Introduction of player AP420

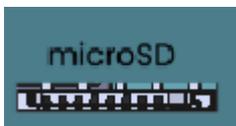


1 Front USB Port



Connect you USB storage media to provide extended memory to the player.

2 microSD slot



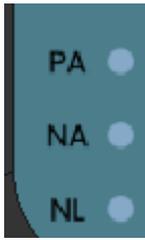
Connect you microSD storage media to provide extended memory to the player.

3 Power button



This button enables to power off and power on the product. It can also activate rescue modes.

4 Activity LED



Interaction	Function
Red	Steady red: ready, not playing Blinking red: reading
Orange	Network activity
Green	Network link

Rear panel of the player AP420



1 Analog audio output to connect an amplifier

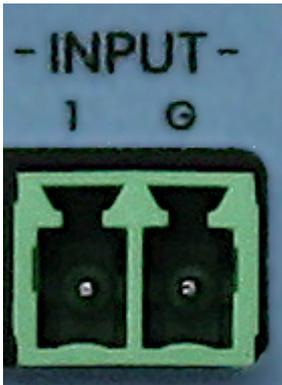


2 Back USB port 1



Connect you USB storage media to provide extended memory to the player.

3 Input contact



Connect a push button to generate events detected by the player

4 Output relays



Connect an tier equipment that can be controlled from its GPI.

5 Ethernet connector 10/100 Mbit/s



Connect your ethernet cable to the player on your local network.

6 Back USB port 2



Connect you USB storage media to provide extended memory to the player.

7 Power supply



Connect the power supply delivered with the player.

2.1. Input contacts

The player has one input contact. The current firmware does not manage this entry.

2.2. Output contacts

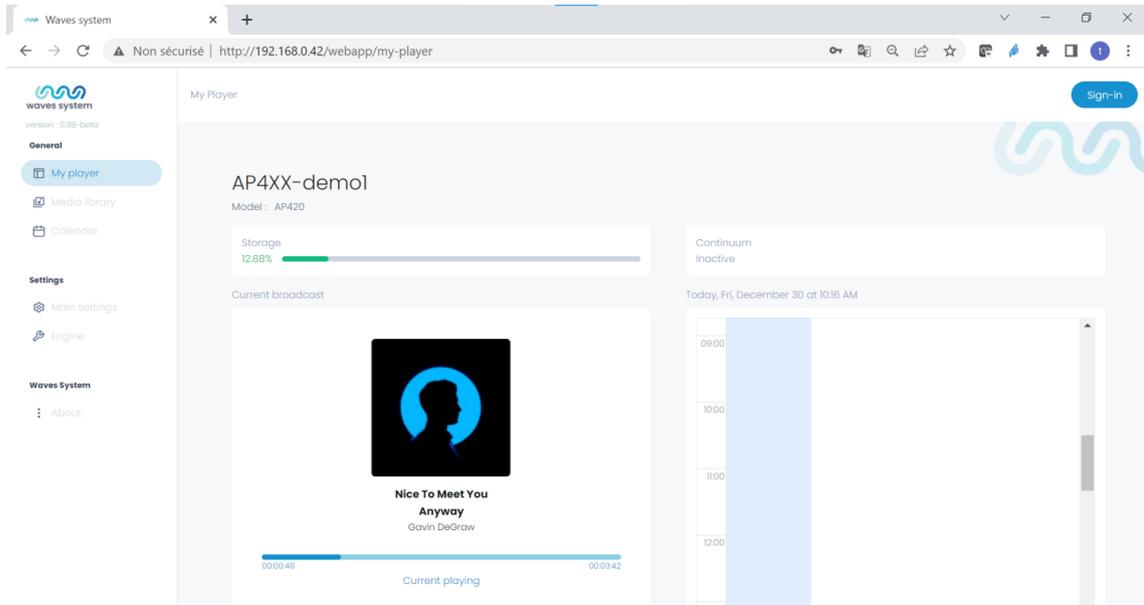
The player AP420 has two output contacts.

2.3. Web interface

When you connect to the player with a web browser, the web interface appears and gives some key information :

- content being played
- preview of the calendar for the next 3 hours of the day
- size of the storage used
- status of the fallback of the stream (continuum can be inactive, backup broadcast or online broadcast)

To access all features of the player, you have to sign-in with the upper right button.



3. Connect to your player on a DHCP network

This procedure explains how to connect to your player AP420 for the first time.

- 1 Get the serial number on the sticker located at the bottom of the player. It is labelled as per example: AP4xx-123456.
- 2 Connect the player to the network.
- 3 Connect your computer to the same network.
- 4 Power on the player.
- 5 When the player is completely started, open a web browser and enter the following URL in the address bar as per the example: `http://ap4xx-123456`. Do not use the HTTPS prefix, use only the HTTP prefix.
- 6 The first connexion page appears.
- 7 Follow "first login" section.

Résultat

Your player AP420 is now ready to be used.

4. Connect to your player with a static IP

This procedure explains how to connect to your player AP420 with a static IP.

- 1 Get the serial number on the sticker located at the bottom of the player. It is labelled as per example: AP4xx-123456.
- 2 Connect the player directly to the Ethernet interface of your computer.
- 3 Setup the Ethernet interface of your computer with the following parameters:
 - IPv4 address = 169.254.0.1
 - gateway = erase figures and leave it empty
 - IPv4 mask = 255.255.0.0 (or 16)
- 4 Power on the player.
- 5 When the player is completely started, open a web browser and enter the following URL in the address bar: `http://169.254.128.1`. Do not use the HTTPS prefix, use only the HTTP prefix.
 - Note : The AP420 uses a DHCP fallback feature to attribute its IPv4 address. If the first IP is not available, another IP will be attributed to the player, from 169.254.128.1 to 169.254.128.254. To find it, please use a IP scanner software like "Angry IP Scanner".
- 6 The first connexion page appears.
- 7 Follow "first login" section.

Résultat

Your player AP420 is now ready to be used, and you can now configure the network parameters according to the specifications of your installation.

5. First login

This procedure explains how to login to your player AP420 for the first time. To connect to the web interface of the player, please refer to "network connexion".

- 1 Enter your new password and confirm it a second time before click on "connexion".
- 2 The dashboard page of the player "My Player" is displayed. Click on "connexion" on the upper right side of the page. In the login page, enter the login "admin" followed by your password and click on "connexion" button.

Résultat

Your player AP420 is now ready to be programmed.

6. First steps with your player AP420

Introduction

Use the application embedded in the player to create your audio project.

6.1. Select your storage support

The first step is to select the support of storage you want to use for your project. the internal storage (3.7 GB) is selected by default. This is the storage where media and program are recorded. If your project requires more space, insert a microSD card or a USB key and select the right device in **Main** **settings>storage>storage device**. If you need to copy or export your project, please use also removable memories. Thus you can copy past the archive with your computer.



When you select an external storage device, the player suggests to format the memory. We strongly recommend to format the memory. the player will format in Ext4 format which offers the best reliability. Other format have more risk to corrupt the content during updates.



The archive can not be edited with your computer. Projects can only be created and updated through the player web interface.

6.2. Media library

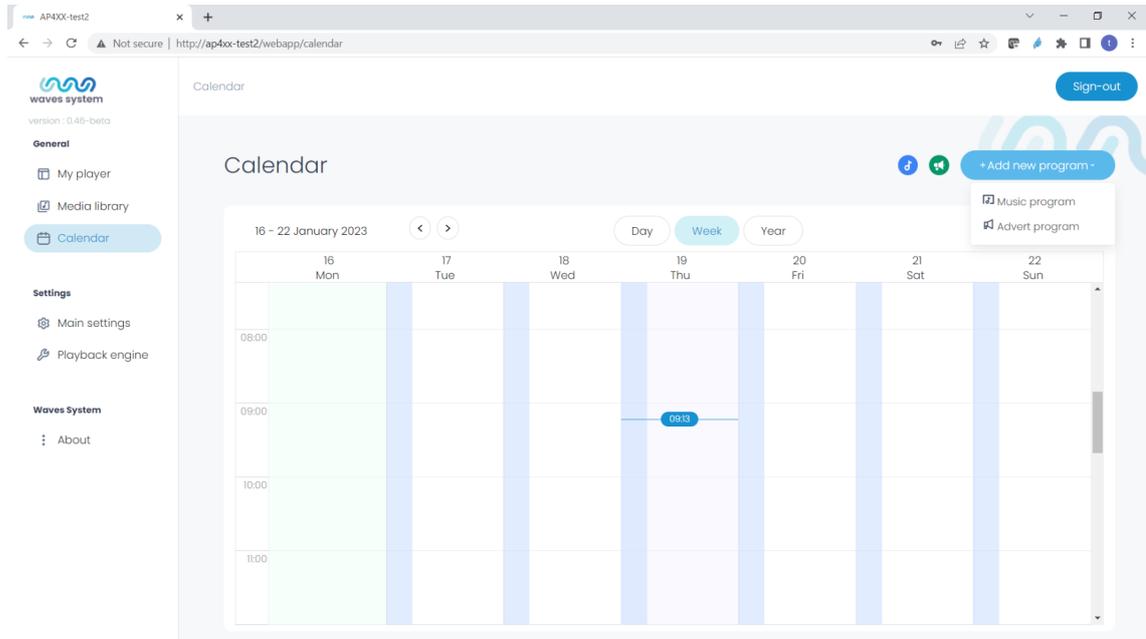
The media library is an internal database that organizes tracks, playlists and webradios. You can import your media in the media library, create playlists and declare webradios.

6.3. Calendar

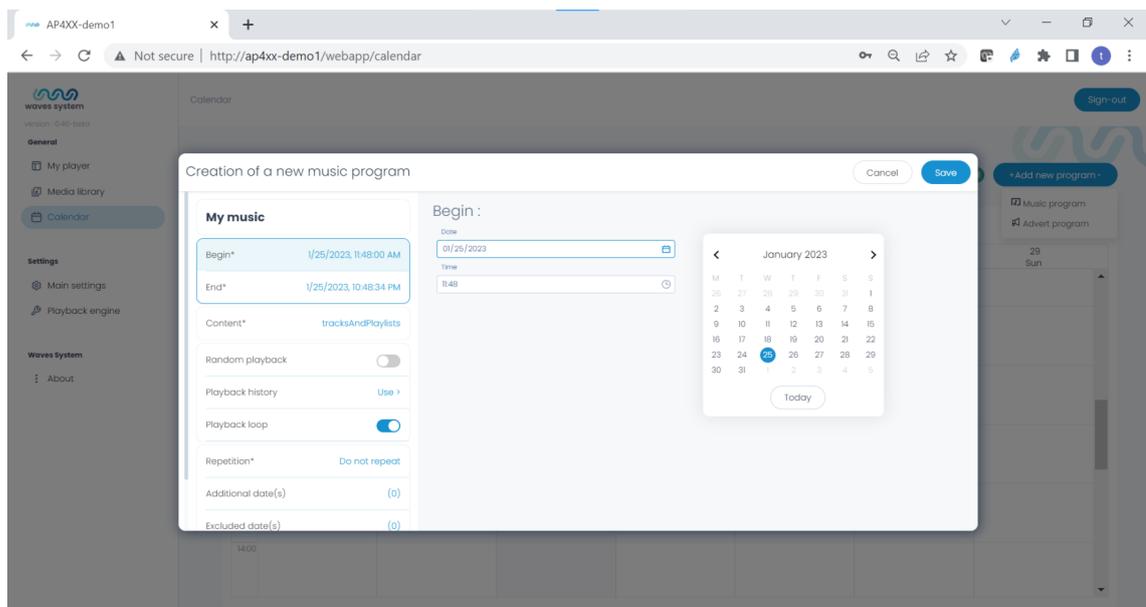
The calendar menu allows you to :

- create one or several music program,
- create one or several advert program,
- visualize your different programs on a daily, weekly or yearly view.

To help the visualization, it is possible to filter only music program or advert program by using blue icon and green icon.



6.3.1. Create a music program



 Use this menu to schedule the background music that will be broadcasted.

- 1 Give a name to the program.
- 2 Select the start date of the program.
- 3 Select the duration of the program.

..... Duration is limited to 23h59. We recommend to limit duration within a day.

- 4 Select the content.

..... You can select several tracks or several playlists together with tracks. Alternatively, you can select a webradio.

5 Select the playback option :

Playback is done sequentially by default. You can select random playback.

Playback is looped by default.

Activate the playback history if you want to memorize the tracks played by this program. This function shows interest when the program is resumed after a stop. History is cleared each time you modify the program.

6 Configure the state of the output relays

Configure the state of the player relays during program execution here:

Open: the relay is opened during program execution

Closed: the relay is closed during the program execution

Ignored: the control of the relay is delegated to concurrently running programs or left open if none are active.

When the program execution ends, the relay state is defined by other running programs or left open if none are active.

Repetition of the music program in the calendar

You have created a music program, preferably on a daily base and you want to populate your calendar. Use repetition functions to organize your broadcast.

You can select weekly, monthly or annually repetitions with an end. You can also add or exclude additional dates.

Example

For example your music program plays randomly in a loop tracks A, B and C on Monday. It ends with B and C at the end of the day. The next day, the player will start with any track of the program's content (A or B or C) if you ignore the playback history, it will start with track A if you use the playback history.

Comment zone

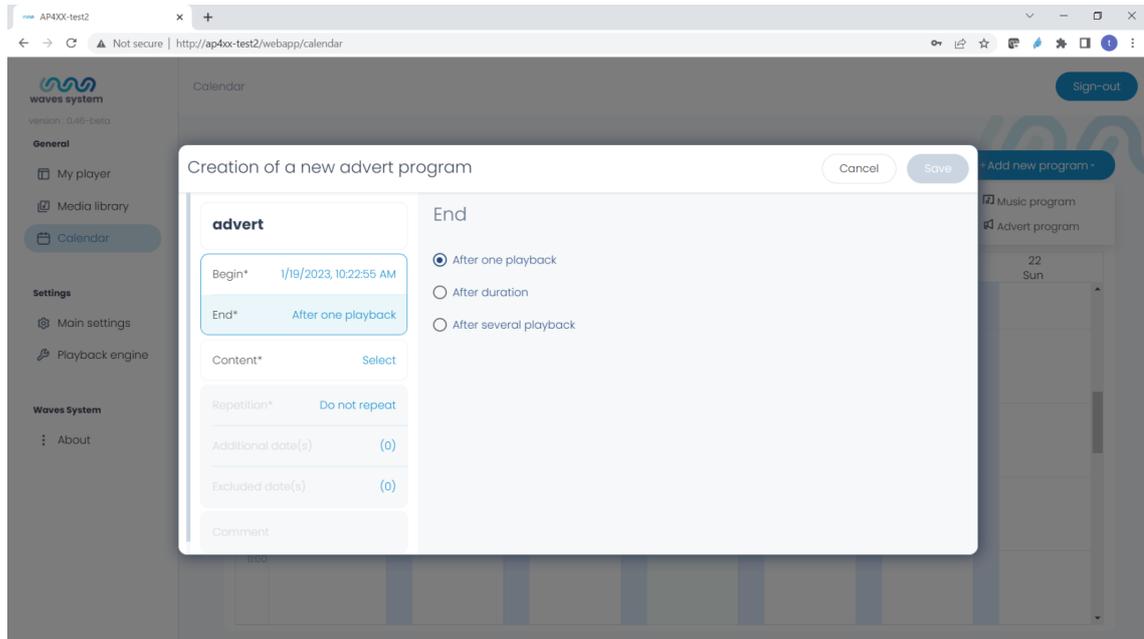
You can add comments in this zone.

Display in the calendar

Save your program, it is displayed in your calendar.

6.3.2. Create an advert program

An advert program allows you to schedule the messages and the announcements that will be broadcasted in your installation over the background music. It is defined by a repetition or not within a broadcast range, a selection of content from the media library, playback properties, with or without scheduled recurrences.



Proceed as follows :

- 1 Give a name to the program.
- 2 Select the start of the program.
- 3 Select the end of the program.

The program can end "After one playback" of all content.

The program can also be splitted into portions according to two patterns.

The "After duration" pattern configures a timeslot and a period of playback.

The "After several playbacks" configures a number and a period of playbacks. For each individual portion, all the content is played.

- 4 Select the content.

You can select several tracks or several playlists together with tracks. The whole content is played by the program.

Repetition of the advert program in the calendar

You have created an advert program you want to populate your calendar. Use repetition functions to organize your broadcast.

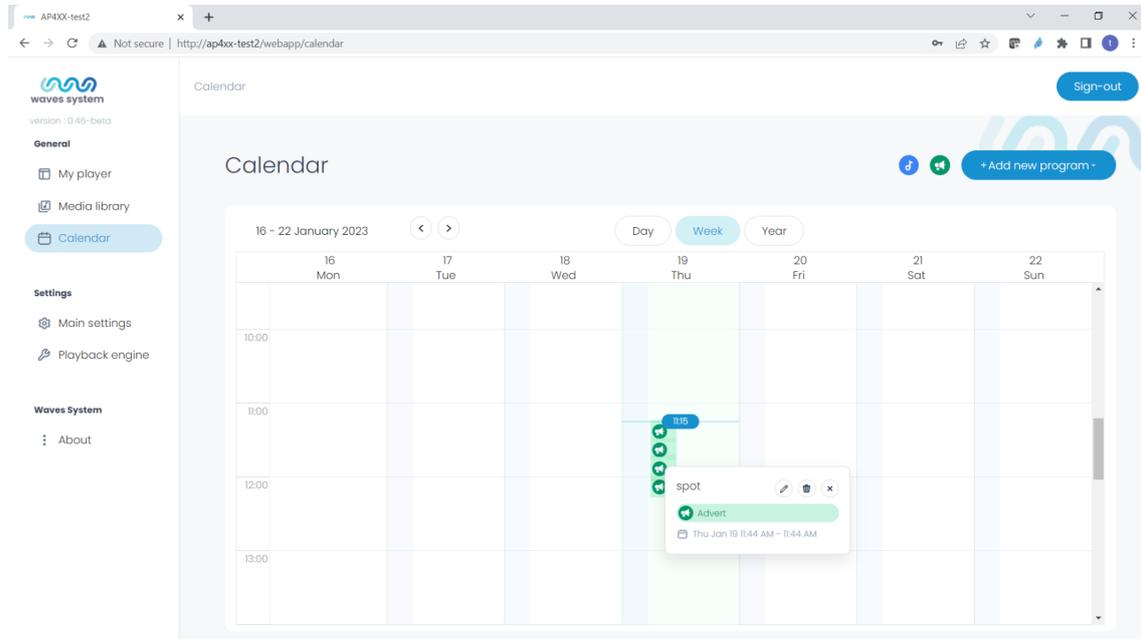
You can select weekly, monthly or annually repetitions with an end. You can also add or exclude additional dates.

Comment zone

You can add comments in this zone.

6.3.3. Edit a program

Click on your program to open the popup and select edit, delete or close the popup.



Once you have performed modifications, select save. Alternatively, if you want to abort select cancel. A window appear to ask if your want to cancel the modification of your program. The changes will be lost.

7. Settings Menu

Settings menu is operated from the web interface embedded in the player.

7.1. Main settings

This menu gives access to player main settings:

- Network,
- Date and time,
- Storage,
- System,
- User,
- Wavespark

Access to Wavespark is currently limited. Player can display a pin code for pairing but a new version of the firmware will be required together with the official release of Wavespark to be fully operational.

7.1.1. Network

the player is configured at the factory with DHCP setting. The AP420 uses a DHCP fallback feature to attribute its IPv4 address. If the first IP is not available, another IP will be attributed to the player, from 169.245.128.1 to 169.245.128.254. To find it, please use a IP scanner software like "Angry IP Scanner".

You can also select a static address and describe its parameters.

This menu also displays the MAC address.

7.1.2. Date and time

When connected to internet, the player updates its current hour using NTP protocol. This is the setting by default.

With this menu, select your time zone.

The date and time defined in this menu is propagated in every interface of the player. The calendar and the programs never rely on your computer time nor browser time but on the player time.

When player is offline, it keeps its internal clock using an embedded RTC (Real Time Clock) module. RTC stability is 5 ppm on the T° range [-40°C ; +85°C] giving a maximum drift of 2'30" per year. This module is powered by an internal soldered rechargeable battery. this battery is reloaded when the player is connected to the power and powered on.

7.1.3. Storage

The player embeds a 4Gb internal memory. This memory is the default storage when you use the player the first time. Alternatively, you can choose to use a removable storage such as microSD or USB

memory. In this case, you need to select the proper storage support between microSD / USB front / USB back 1 and USB back 2. Once the support is selected, some relevant information about the storage are displayed. Click and Save to validate this storage and to update the web interface with the content, calendar and storage. You can also format the storage use button "format".



You get following advantages when using removable support :

- bigger memory size
- the complete audio project is stored in the removable storage, thus you can unplug the storage and plug it on another player to use it straight away.



Only Sandisk and Samsung removable storages must be used with our range of players to guarantee the best reliability.

7.1.4. System

Select this menu to perform following actions :

- reboot,
- Shut down
- System update,
- Calendar cleanup.

For system update, please refer to [firmware update](#) ^[p.24]

Calendar cleanup is a procedure to remove all music and advert programs from the calendar. this procedure does not affect the media library.

7.2. Playback engine

7.2.1. Volume and line levels

Set the general volume of the player between 0 and 100%.

Select the audio line levels between -10dBV, 0dBu, 0 dBv and +4dBu

Adjust the volume gain of adverts relative to music

8. Firmware update (Online mode)

This procedure explains how to update the firmware of AP420. This procedure must be used by default.

- 1 Click on System update and select Online.
- 2 Select the version you want to install. We recommend to install the latest version available. You can read the release notes to learn more about the update.
- 3 Click on Update.
- 4 The firmware is being uploaded.
- 5 At the end of the upload, the power button blinks green for success update or red for failed update.
- 6 The player restarts by itself.
- 7 Wait for 2 minutes, the web interface updates. If some artefact appear on the web interface, then cleanup your cache using Ctrl+Shift+R.

Résultat

Your player AP420 is now updated.

9. Firmware update (USB mode)

This procedure explains how to update the firmware of AP420. This procedure must be used by default.

- 1 Remove all USB sticks and microSD that were inserted for the playback.
- 2 Insert a USB stick on the front panel with the firmware ap4xx-update.swu copied at the root of the USB stick.
- 3 Go to  Main settings>System>System update>Update
- 4 The firmware is being uploaded.
- 5 At the end of the upload, the power button blinks green for success update or red for failed update.
- 6 The player restarts by itself.
- 7 Wait for 2 minutes, the web interface updates. If some artefact appear on the web interface, then cleanup your cache using Ctrl+Shift+R

Résultat

Your player AP420 is now updated.

10. Firmware update (rescue mode)

This procedure explains how to update the firmware of AP420 when the player interface is not accessible anymore. This procedure must be used only in exceptional cases.

- 1 Power off the player.
- 2 Remove USB sticks and microSD that were inserted.
- 3 Insert a USB stick on the front panel with the firmware ap4xx-update.swu copied at the root of the USB stick.
- 4 Press and hold the power button while powering on the player.
- 5 Keep power button hold for more than 10 seconds until the 3 led green (NL), orange (NA) and red (PA) are fixed together.
- 6 Release the power button.
- 7 To select firmware update process, push the power button one time (or four times ...) to get only the green led (NL) fixed.
- 8 Hold the power button for 3s, the power button blinks white.
- 9 The firmware is being uploaded.
- 10 At the end of the upload, the power button blinks green for success update or red for failed update.
- 11 Press the power button to restart the player.
- 12 Log to the web interface and cleanup your cache using Ctrl+Shift+R
- 13 If you do not succeed to log in, start a second time and then a last time the complete procedure. We have noticed that 3 consecutive updates can be required on some players to be fully operational.

Résultat

Your player AP420 is now updated.

11. Reset factory for player configuration

This procedure explains how to reset configuration of the player AP420.

- 1 Power off the player.
- 2 Press and hold the power button while powering on the player.
- 3 Keep power button hold for more than 10 seconds until the 3 leds green (NL), orange (NA)and red (PA) are fixed.
- 4 Release the power button.
- 5 To select reset factory process of player configuration, push the power button two times to get only the orange led (NA) fixed.
- 6 Hold the power button for 3s, the power button blinks white.
- 7 The reset factory is being done.
- 8 A the end of the reset factory, the power button blinks green for success.
- 9 Press the power button to restart the player.

Résultat

Your player AP420 is now updated.

12. Reset factory for player configuration and data

This procedure explains how to reset configuration and data (media library + calendar) of the player AP420.

- 1 Power off the player.
- 2 Press and hold the power button while powering on the player.
- 3 Keep power button hold for more than 10 seconds until the 3 leds green (NL), orange (NA) and red (PA) are fixed.
- 4 Release the power button.
- 5 To select reset factory process of player configuration and data, push the power button three times to get only the red led (PA) fixed.
- 6 Hold the power button for 3s, the power button blinks white.
- 7 The reset factory is being done.
- 8 A the end of the reset factory, the power button blinks green for success.
- 9 Press the power button to restart the player.

Résultat

Your player AP420 is now updated.