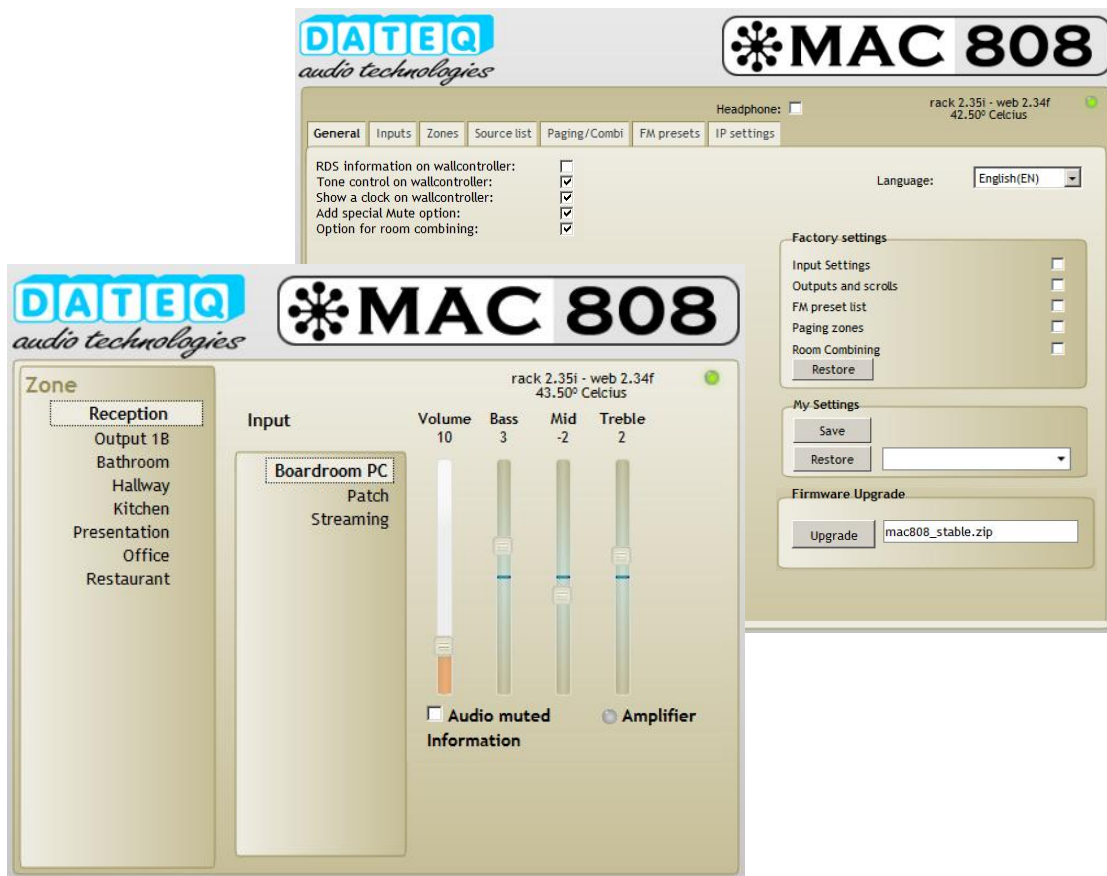


MAC808

Manual User/Installation



Safety instructions

- 1 All safety instructions, warnings and operating instructions must be read first.
- 2 All warnings on the equipment must be heeded.
- 3 The operating instructions must be followed.
- 4 Keep the operating instructions for future reference.
- 5 The equipment may never be used in the immediate vicinity of water; make sure that water and damp cannot get into the equipment.
- 6 The equipment may only be installed or fitted in accordance with the manufacturer's recommendations.
- 7 The equipment must be installed or fitted such that good ventilation is not obstructed in any way.
- 8 The equipment may never be installed in the immediate vicinity of sources of heat, such as parts of heating units, boilers, and other equipment which generates heat (including amplifiers).
- 9 Connect the equipment to a power supply of the correct voltage, using only the cables recommended by the manufacturer, as specified in the operating instructions and/or shown on the connection side of the equipment.
- 10 The equipment may only be connected to a legally approved earthed mains power supply.
- 11 The power cable or power cord must be positioned such that it cannot be walked on in normal use, and objects which might damage the cable or cord cannot be placed on it or against it. Special attention must be paid to the point at which the cable is attached to the equipment and where the cable is connected to the power supply.
- 12 Ensure that foreign objects and liquids cannot get into the equipment.
- 13 The equipment must be cleaned using the method recommended by the manufacturer.
- 14 If the equipment is not being used for a prolonged period, the power cable or power cord should be disconnected from the power supply.
- 15 In all cases where there is a risk, following an incident, that the equipment could be unsafe, such as:
 - if the power cable or power cord has been damaged
 - if foreign objects or liquids (including water) have entered the equipment
 - if the equipment has suffered a fall or the casing has been damaged
 - if a change in the performance of the equipment is noticedit must be checked by appropriately qualified technical staff.
- 16 The user may not carry out any work on the equipment other than that specified in the operating instructions.

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Introduction

MAC808 central unit



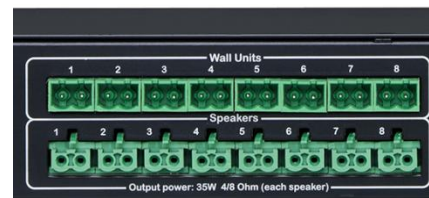
The MAC808 is an audio distribution system that can control up to eight audio sources, four FM-tuners and distribute it over up to eight amplified zones. Using the MRC wall controllers every zone can be controlled from the room, selecting the audio level and source.

Various audio sources, like MP3 players or CD changers can be connected on to the central unit. All inputs can be set to mono or stereo. This way combinations of mono and stereo sources are possible.



The audio outputs are standard line level. The outputs 5 till 8 can be used to connect external amplifiers. By using 100V amplifiers an easy setup can be made connecting multiple speakers to a single amplifier.

Each zone has his own high efficiency class D amplifier with a maximum output of 35 watt. This way making it an energy efficient system in use. On each amplified output a 4 or 8 ohm speaker can be connected. Like all inputs, the outputs can be set to stereo or mono.



To control each zone MRC wall units can be connected onto the MAC808. Using these wall units, each user can set the audio source and control the local volume. The wall units are powered by the MAC808, this way a local power supply is obsolete.

The MAC808 can be remotely controlled using a PC or laptop by connecting the MAC808 to a local network. Using the internal webserver the MAC808 can be fully configured. It is also possible for users to fully control their own zone by selecting the audio source or setting the output volume.



Using the two GPIO contacts, selected zones can be paged or muted by connecting a fire alert system. It is also possible to combine specific zones using the room combining option. This way multiple zones can be combined to a single zone and controlled from a single (master) wall unit.

Controlling

Wall unit

MRC3
MRC4



The wall units are mounted in each room (zone) and can be connected using a two wire cable to the MAC808. The MRC3 wall unit fits inside a standard electric mounting box and the MRC4 can be mounted directly onto a wall without the use of mounting boxes.

Using the wall unit, the user can control the audio source and the audio level for that specific room or zone.

Controlling the volume is done using the '*volume +*' and '*volume -*' buttons. By holding the button pressed, the volume will increase or decrease. When pressing both '+' and '-' buttons at the same time, the output will be muted. Paging however will override this muted state.



The audio source in a room or zone can be changed using the '*channel +*' and '*channel -*' buttons. The number of sources and sequence depends on the configuration of the MAC808.



Besides volume and source control there is also the menu option on the wall unit. By pressing the buttons '*channel -*' and '*volume +*' buttons similar, the menu will appear. Here you can set the following options:

- ✓ Audio source
- ✓ Volume level
- ✓ Tone adjustment)(Low, Mid, High)
- ✓ Amplifier on/off

With the '*channel +*' and '*channel -*' buttons it is possible to scroll between the several options. '*volume +*' and '*volume -*' can change the value on the selected option.



- When the room combining is activated, the '*channel +*' and '*channel -*' buttons in the 'slave' zones will be disabled. Only the master room has the option to select the audio source. Volume control is possible in every separate room.
- When the line 'can not use setup mode' is displayed, the configuration page is opened on a PC.
- When tone control on the wall unit is not available, the option in the configuration page is disabled. This option, same as the RDS and clock options are valid for all zones.
- Be careful activating the menu on the wall controller. If possible, let this only be used by qualified staff to prevent a change in the sound quality getting worse.

Controlling the front panel

The headphone connector on the front panel allows to listen to the four tuners. The active tuner will be displayed on the screen. To switch between the different tuners the buttons '+' and '-' are used.



Selecting presets

To select a preset, the button 'preset' can be pressed. The screen will display the current tuner, selected preset and frequency. By pressing the '+' and '-' buttons at this point, it is possible to scroll between the different presets. By pressing the 'preset' button again, the main screen will appear again.

Changing presets

By pressing the 'freq' button when a preset is selected, the frequency of the selected preset can be changed. The screen will display the actual preset number and frequency. By pressing the '+' or '-' buttons, the frequency can be changed. To store the new frequency, press the 'freq' button again. When the 'freq' button is not pressed, the display will return to the main screen after a time delay. The current changed frequency can still be heard, but will not be stored. After a power cycle or a change in preset, the changed frequency will be discarded.

Power switch

The power switch will power up the MAC808 for usage or can set the MAC808 in a standby state to save power use.



Important! The standby state will not kill the power supply. All voltages will still be available. Do not use the power switch to turn the system completely off.

USB connector

The USB connector can be used only on instruction from Dateq B.V.



PC control

Webserver

The MAC808 can be controlled using an internet browser. By entering the link <http://mac808/> the user page will open up.

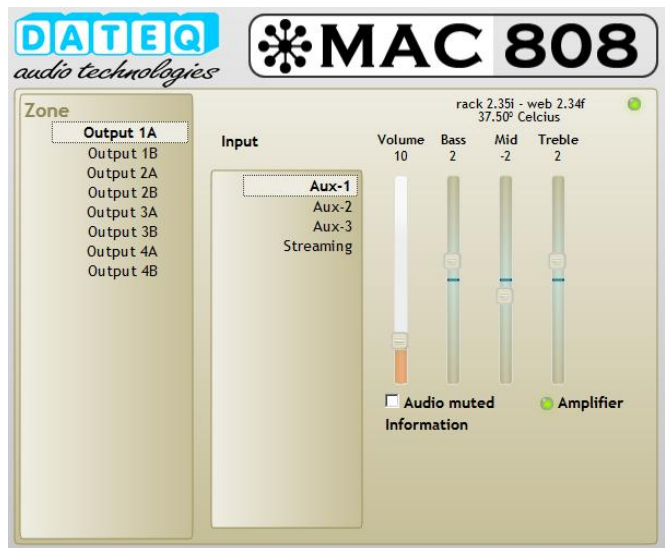


- Note that in some networks do not support this link. In that case use the IP address to access the user page. For example: <http://192.168.1.14> .
- The MAC808 has been tested with the following browsers:
 - ✓ Internet Explorer 9 and up
 - ✓ FireFox 10.0.2 and up
 - ✓ Google Chrome 17 and up

The zone can be selected in the left column. Move the pointer to that column and select an output that needs to be controlled by clicking on the name with the left Mouse button.

The audio source can be changed in the Input column. By clicking on the preferred source the audio signal will change to the selected source.

Volume control for each output can be done by selecting the slider and moving it up or down to the preferred level. When selecting the Audio Muted, the output will mute. Paging however will over rule this mute.



Tone adjustment can be done in the same easy way as volume control. Select the preferred level and it will instantly change to the new value. These changes are not permanent. On a system restart the configuration default values are loaded.



rack 2.32m - web 2.32n
42.00 Celcius

In the upper right corner the connection state to the MAC808 is displayed together with the current firmware and webserver versions. The indicator can vary colour in three states:

- ✓ Green: communication okay.
- ✓ Orange: communication delayed, but can be worked with.
- ✓ Red: no communication.

Amplifier This indicator shows the current state on the amplifier. When green the output amplifier is running. Tip: when there is no audio on an output always check the amplifier state.

Wiring the system



Audio inputs

The audio inputs are available for external devices that produce a standard line level signal. All inputs can be set to stereo, giving 4 stereo inputs, or mono, giving up to 8 mono inputs. In case of different output levels on the external audio sources, the individual input level for each input can be adjusted. This will further be explained in the configuration chapter.



FM Antenna

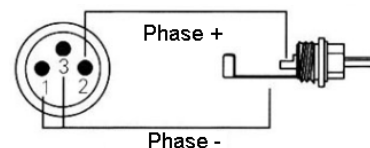
The external tuner antenna can be connected onto the F-connector. To prevent distortion, the ground shield on the antenna is separated from the MAC808 ground shield.

Audio outputs

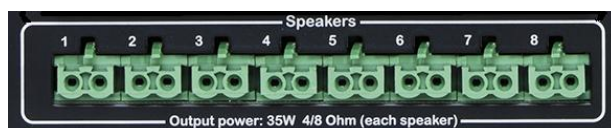
For the use of external power amplifiers it is possible to connect output 5 till 8 on line level. When using only these RCA outputs, it is advisable to disable the internal amplifiers. This option can be found in the configuration chapter.



Devices using a balanced in or output can be connected using a standard XLR to RCA cable.



Speaker outputs



Speakers are connected to the green female connectors. Each zone is supplied with his own class-D power amplifier. The connected speaker impedance can vary between 4 and 8 ohm. When wiring the speakers, use speaker cable with a minimum thickness of 1.5mm². All speaker outputs are equipped with a short circuit, thermal and DC protection with an auto restore function. The speakers should be connected like: pin1 (left) signal minus: black wire. pin2 (right) signal positive: red wire.

Network

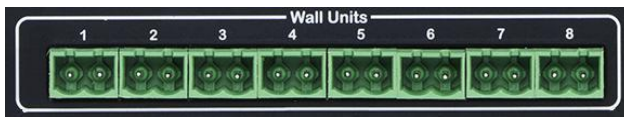


The network port is fit to use for 10Base-T and 100Base-T networking. To ensure a stable connection always use CAT5 UTP network cable to connect the MAC808 to an existing network. The MAC808 supports Auto MDIX thus making it possible to connect a normal straight patch cable or a crossed link cable. When the MAC808 is properly connected to the network, the LED indicators will light up. The MAC808 supports DHCP and DNS, thus making a connection with a DHCP router pretty easy. Factory default the internal pages can be reached using the links:

- ✓ User webserver - <http://mac808/>
- ✓ Configuration webserver - <http://mac808/config.html>

If needed, the MAC808 supports a static IP address. More information can be found in the configuration chapter.

Wall unit



For connecting the wall units a standard paired cable like telephone, UTP or speaker cable can be used. The two wires are both power and data, making a local power supply obsolete.



When using standard UTP cable to connect the MRC wall units, it is advisable to connect multiple pairs.

The wall units are connected to the 'male' connectors on the backside of the MAC808. Each output can be provided with it's own wall unit. It is also possible not to connect a wall unit and control the output using the internal webserver. When an output is selected as stereo, it is possible to control the output using two separate wall units. In this state each wall unit acts as master and slave. When changing the audio source or volume on the first wall unit, the second wall unit will display these changes.

General inputs



Two general inputs are available on the MAC808. These inputs are configurable in the configuration page to act as paging input or general mute for fire alert systems. Both contacts are closure to ground.

Pin assignment:
 0 – Common mass
 1 – Close contact 1
 2 – Close contact 2

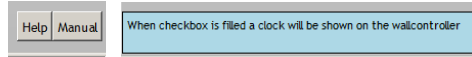
To activate a general input, the input must be closed to ground. Note that input 2 can be set in the configuration page to normal open or normal closed. More information about the IO options can be found in the configuration chapter.

Configuration

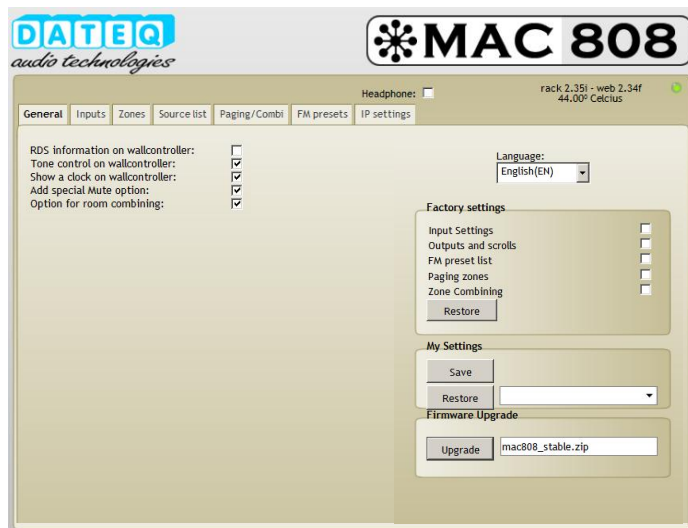
Configuring the MAC808 can be done using the internal webserver. To access the configuration part of this server enter: <http://mac808/config.html>.



In the configuration left down two buttons are displayed. The Manual button opens up the online manual in PDF form. The Help button opens up the help screen, giving hints about the selected function. Use the mouse pointer to select the desired function.

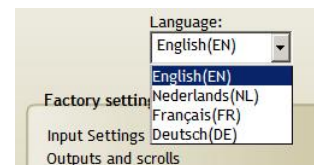


General

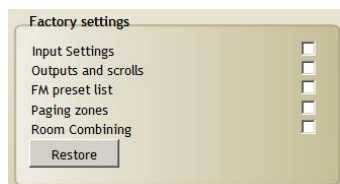


This page allows the installer so set the general system settings. The MAC808 supports the following languages:

- ✓ Dutch
- ✓ English
- ✓ German
- ✓ French



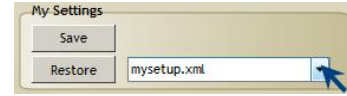
To change the overall system language, select the desired language from the dropdown box and the MAC808 will reload the system without a reboot.



The MAC808 supports a partly or a full factory restore. To restore a part of the system select the desired settings and press the restore button. The system will now restore only the selected parts and leave the unselected untouched.

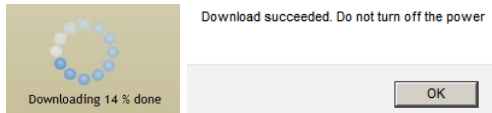


A backup of the MAC808 settings can be saved to a computer. By pressing the save button a popup will appear allowing the installer to save the current MAC808 settings to the selected location. To restore a previous saved configuration click on the arrow and select the saved configuration. When pressing restore, the MAC808 will load the selected file and reboot to the saved configuration.



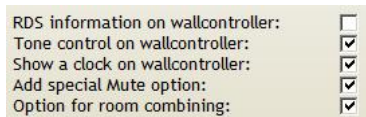
Upgrading the firmware is possible when the MAC808 is connected to the public internet. On clicking the upgrade button, the MAC808 will connect the Musical server and download the latest firmware release.

The webserver will show the download progress:



When updating the MAC808, the system will display [*** Updating Now! ***]. Do not switch off the MAC808 during the update.

Wall unit options



RDS information

RDS information can be made available on all wall units that have a tuner selected in the audio source list. Enabling this checkbox will show the station's RDS information if a radio source is selected.

Tone control

Tone control allows the user to adjust the sound colour. By pressing 'channel -' and 'volume +' at the same time, the menu will appear. More about this option is explained in the chapter 'Wall unit' on page 4.

Clock

This enables the clock on the wall unit. The clock shows the current internet time GMT+1 (Amsterdam time zone). Where RDS time is available, it will overrule the NTP time. No settings have to be made. Note that it can take some time to sync correctly to the RDS signal.

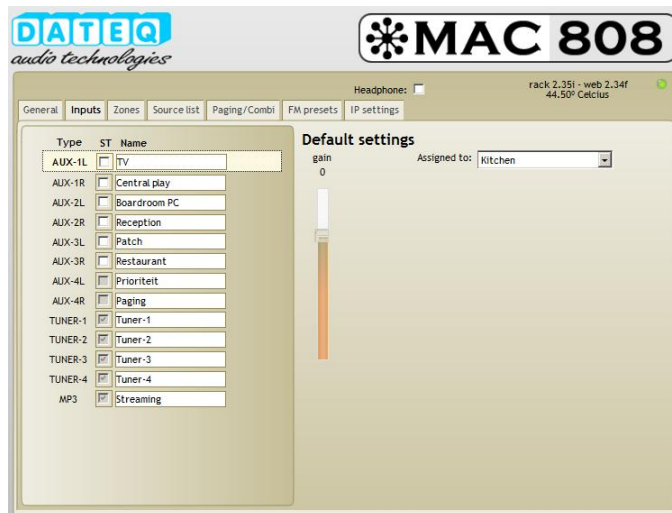
Mute option

The mute option enables 'mute' as audio source in the user part of the webserver.

Room combining

This option enables to set room combining on or off in the user part of the webserver.

Audio inputs



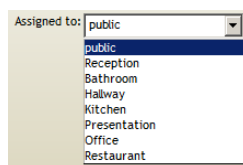
Each audio input can be provided with its own name. This is the name that will be displayed on the wall unit and the user webpage.

Aux-3

By selecting the input the name of this input can be changed (12 characters maximum).

Type	ST
AUX-1	<input checked="" type="checkbox"/>
AUX-2L	<input type="checkbox"/>
AUX-2R	<input type="checkbox"/>
AUX-3	<input checked="" type="checkbox"/>

Each input can be selected Mono or Stereo. By deselecting the checkbox ST behind the input, the input will change from standard stereo to dual mono. This way two mono inputs are created. The names like AUX-2L correspond to the name on the backside of the MAC808.



Each input can be directly assigned to an output. Using this, the input will be privately owned by the output and be removed as source from all other scroll lists. By default all inputs are public selectable. More information about the scroll list can be found on page 14.



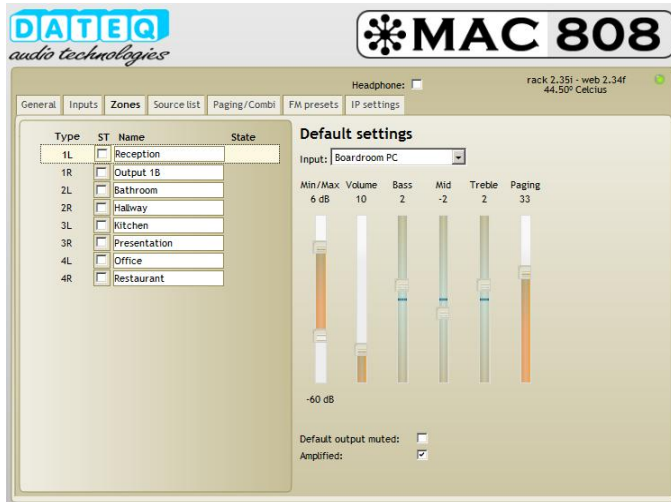
By default all input levels are set to 0dB (0.775 volt). In case of a too low or loud source (like an MP3 player), the input gain can be adjusted from -33dB up to +12dB.

Using the mouse the installer can set the input gain by clicking on the slider, moving the slider to its desired value.

Headphone:

By selecting the headphone checkbox, the outputs 7 and 8 can be used to monitor all inputs and setting its gain.

Outputs / Zones



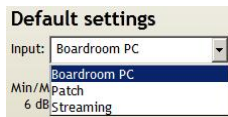
Each audio output can be provided with its own name. This is the name that will be displayed on the wall unit and the user webpage.



By selecting the output the name of this input can be changed (12 characters maximum).

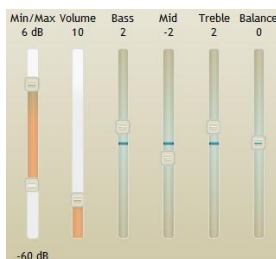
Type	ST	Name	State
1	<input checked="" type="checkbox"/>	Reception	
2L	<input type="checkbox"/>	Bathroom	
2R	<input type="checkbox"/>	Hallway	

Each output can be selected Mono or Stereo. By deselecting the checkbox ST behind the output, the output will change from standard stereo to dual mono. This way two separated mono zones are created.



This option allows to set the start up default source for each output. The sources in this list can be selected in input list that will be explained in the following chapter.

A volume range can be set for each output. This way the minimum and maximum volume are divided for the user into 50 volume steps. These steps can be controlled using the wall unit or the user part of internal webserver. The maximum level also allows to protect the speaker system overshooting its maximum power.



Like the default input also the default volume level, sound colour and balance can be set for each output. These are the default start up values after a power cycle or system standby. The balance option is only available for stereo outputs.

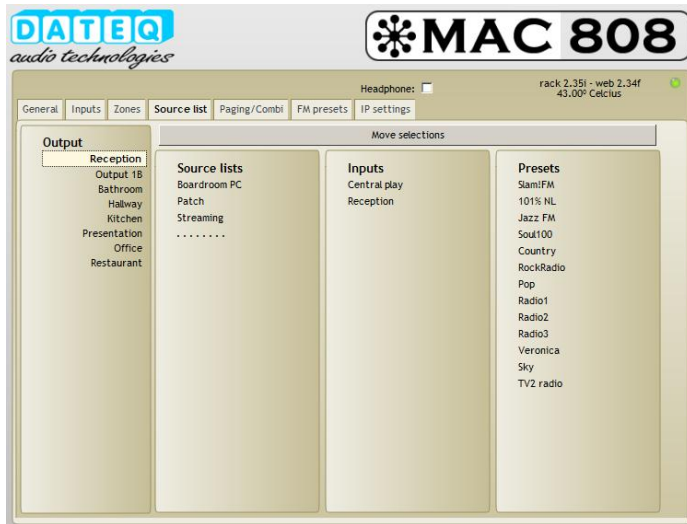


The paging volume can be set for each independent output. This is the sound level that will be used when a paging call is active. This level overrides the user settings, even when an output is set to mute. The paging settings can be adjusted in the paging tab of the webserver that can be found on page 15.

Default output muted: This option sets the output default to mute after a power cycle or system standby. After a pressing '*volume +*' or '*volume -*', the default volume settings will be activated.

Amplified: When an output is not used or only the non amplified output is used the internal amplifiers can be turned off to save power.

Source list



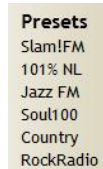
For each output a list of user selectable audio sources can be made. Each output uses it's own list.



Select an output to adjust the sourcelist



Select the desired inputs to move and click on the move button to add them to the sourcelist. 'Drag and drop' also works.



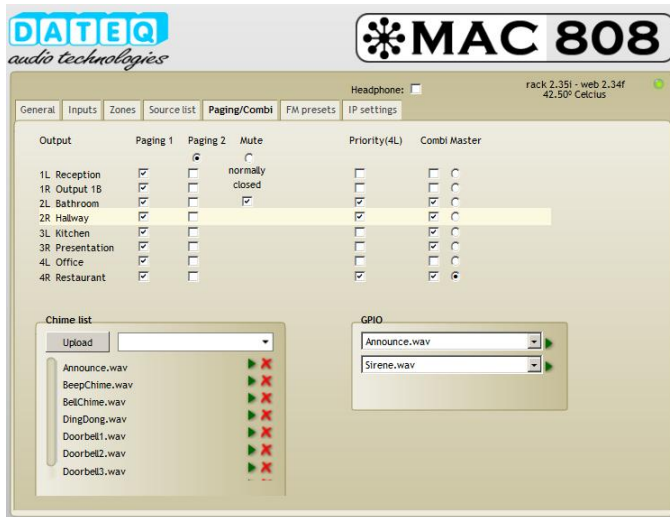
When a tuner is fixed to an output it is possible to add frequency presets to the sourcelist. Adding these presets is done in the same way as an input by selecting or 'drag and drop'.

Removing a single source is done in the same way as adding them. Select the source that needs to be removed and click on move. 'Drag and drop' also works.

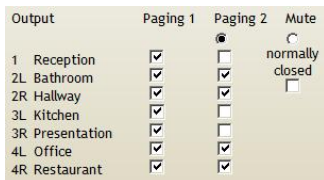


When a tuner is fixed to an output it is possible to add frequency presets to a sourcelist. Then a tuner is selected as public source the tuner works on a single frequency. This frequency can be changed in the configuration webserver.

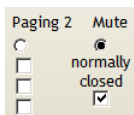
Paging / Room combining



The MAC808 has the options to page separate outputs and combine independent outputs to a single zone.



The MAC808 supports two paging groups. Select the checkbox behind the output to add it to a paging group. To add audio to a page call, input AUX-4R is reserved as soon as paging is enabled. This input will be blocked for usage in the sourcelist.

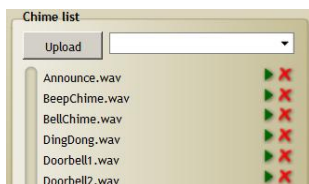


Besides the paging option on GPI-2, it can also be used to mute all the audio outputs. This allows a link with fire alert and evacuation systems. GPI-2 can be selected to Normal Open or Normal Closed.

The paging option includes a play out of a recorded file like a 'ding-dong'. This short audio file will be played after closing the GPI contact. After the file has finished playing the AUX-4R audio input will be switched to all selected outputs.



To enable the 'Ding-Dong' play out, select the desired file in the drop down box. The upper for GPI1 / Page1 and the lower for GPI2 / Page2.



It is possible to upload user custom audio files. Supported file formats are: MP3, WAV and FLAC.

- Press to listen to the file.
- Press to remove the file.

Combi Master



Using room combining a master room must be selected. This enables the master room to control the audio source on the slave rooms when room combining is active. Room combining can be enabled on the master room wall unit and can be found in the scroll list as look a like 'audio source'. When selecting room combining in the list it can be enabled by pressing the '*volume +*' button. Room combining can be disabled by pressing the '*volume -*' button.

Priority(4L)



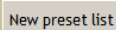
The priority input is used to let an external audio source over rule the user chosen source. Audio sources like commercial play out or alarm signalling can be activated on to the selected outputs. The priority channel is activated on a -36dB audio signal. The original chosen source will return when the priority signal drops below -40dB. When the priority option is used, AUX-4L is automatically reserved an removed from the sourcelist.

Tuner presets



The MAC808 can store up to 50 tuner presets. These presets are used for all four tuners. Adding, removing or editing the names and frequencies can be done in the FM preset tab.

In the left colomb all the available FM presets are displayed.

 New preset list

To renew the complete preset list, press the 'new preset list' button. Note that all existing presets will be over written.

 Radio 1

For each preset the name of the preset can be changed. This name will be shown in the sourcelist on the wall unit and webserver interface. The MAC808 also supports PI listing. By default this PI list is empty. Contact the local supplier to add the country specific list.

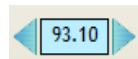
Besides the 'new preset list' option, it is possible to manually add a single preset.



Frequency tuning up/down by 100kHz.



Search next or previous FM station



Current tuner frequency. Click twice in the text field do manually change the value.

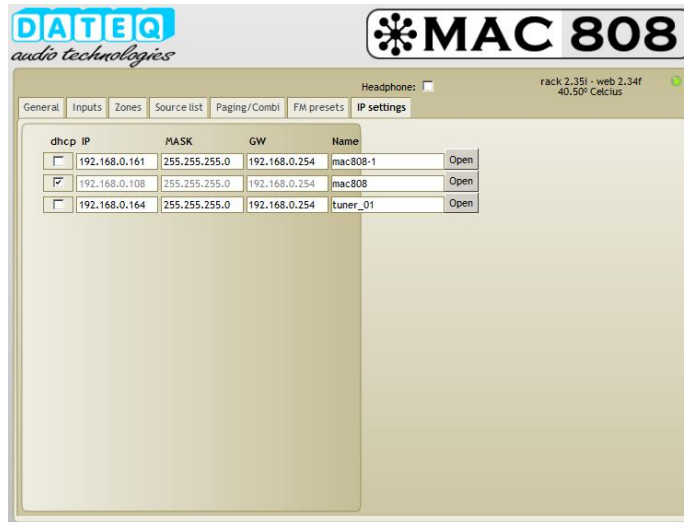
 Add to list

The button 'add to list' ads the selected frequency to the presetlist.



Select a preset frequency and drag the preset to the bin to remove it from the list.

IP settings



By default the MAC808 is set to DHCP*. In a regular DHCP network that supports DNS** the MAC808 can be reached through:

- ✓ Webserver user interface: <http://mac808/>
- ✓ Webserver configuration interface: <http://mac808/config.html>

Where needed, the DHCP client can be deactivated and a static address can be entered.

dhcp	IP	MASK	GW	Name	
<input type="checkbox"/>	192.168.0.161	255.255.255.0	192.168.0.254	mac808	Open

In a network that holds more than one MAC808 or Musicall system, each system will be displayed in the IP tab. To access these systems, click 'open' and the internal webserver will be accessed.

dhcp	IP	MASK	GW	Name	
<input type="checkbox"/>	192.168.0.161	255.255.255.0	192.168.0.254	Main office	Open
<input checked="" type="checkbox"/>	192.168.0.108	255.255.255.0	192.168.0.254	building A	Open
<input type="checkbox"/>	192.168.0.164	255.255.255.0	192.168.0.254	C-Tower	Open

*DHCP: protocol to supply IP addresses. DHCP offers an automatic network configuration.

**DNS: Resolves an IP address from a domain name. example: <http://mac808> is resolved to 192.168.0.101

Technical specifications

AUDIO INPUT 1...8

Signal level.....	0 dBu
Impedance.....	100k Ohm
Input noise.....	< -100 dB (A-weight)
Channel crosstalk.....	< -100 dB @ 1kHz
Input range.....	-33dB/+12dB (1dB steps)
Detect level priority ON.....	-36dB
Detect level priority OFF.....	-40dB

FM TUNERS

Frequency range.....	87.5MHz-108.0MHz
Channel spacing.....	100kHz
RSSI seek threshold.....	10 dB μ V

AUDIO LINE OUTPUT 5...8

Signal level.....	0 dBu
Impedance.....	330 Ohm
THD+N.....	0.004% (A-weight) @ 0dBu
SNR.....	< -100dB (A-weight) @ 0dBu
Output range.....	-61dB/+6dB (1dB steps)
Frequency range.....	25Hz-25kHz (+/- 1dB)

AMPLIFIED OUTPUTS 1...8

Frequency range.....	25Hz-25kHz (+/- 1dB)
THD+N.....	0.1% (A-weight) @ 0dBu
SNR.....	< -70dB (A-weight) @ 0dBu
Channel spacing.....	< -70 dB @ 1kHz

TONE ADJUSTMENT ZONE

Low.....	-12dB/+12dB @ 80Hz
Mid.....	-12dB/+12dB @ 1kHz
High.....	-12dB/+12dB @ 10kHz

WALL UNIT

Output voltage.....	24V
Maximum current.....	110mA, automatic fuse

COMMUNICATION

Output voltage.....	24V
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MAIN

Input voltage.....	85-230Vac 50/60Hz
Power consumption.....	250W

SIZE AND WEIGHT

Front.....	483 x 44 mm (B x H) = 19", 1HE
Depth.....	182mm
Weight.....	2.65 kg Nett

Product support

For questions, product support and add-ons about the MAC808 system or other Musically products, please contact your local dealer or:

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