R2

User Manual

AUDAC

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Introduction

Multi–Zone Audio Matrix System

The R2 is a Multi–Zone audio distribution system which is a truly polyvalent solution for commercial and residential applications, with the flexibility of a multizone router. It delivers a comprehensive and expandable powerful solution for nearly every situation. With its large number of extension modules and configuration modes, it provides a solution for an uncountable amount of installations – large or small, simple or complex.

In general, it is an 8 x 8 digital audio matrix system, which is based on a powerful DSP processor. It is fully digitally controllable, and the built–in digital matrix makes it possible to patch any of the input signals to any of the output signals.

It is standard equipped with 8 analog line inputs and 8 analog line outputs, but the flexible structure of the device makes it easy to extend this number to an appropriate solution for each specific situation.

If desired, it is easy to cascade multiple R2's with the fiber interconnection modules. This makes it possible to transfer up to 8 stereo channels and to extend to an nearly unlimited number of zones.

But it is much more than that, due to the extremely powerful DSP processor, it provides greater flexibility, higher reliability and lower latency than any other amplifier of its kind. Moreover, it 's capable of doing complex calculations on the digital audio signals, which makes it possible to integrate digital filters into the system and generate complex audio signals.

In addition, a real–time clock is provided which makes it possible to create time schedules with up to 256 pre–programmed events, single and recurring.

Every R2 is standard equipped with an integrated Ethernet control interface which makes it possible to configure and control the R2 from any PC, laptop or PDA which is connected to the internet. Just use your browser, go to the appropriate website and you have complete control of the R2.

An optional touchscreen can be installed in the front of the amplifier and there are optional wall control panels whereby the desired music source and volume can be selected for a specific zone.

An RS232 interface is provided for configuration and control with peripherals from other manufacturers which make use of an RS232 connection, like AMX, Crestron,… the control commands are freely available which makes it easy to develop specific applications that work in combination with the R2.

Environment

Do not place this unit in an enclosed environment such as a bookshelf or closet. Ensure there is adequate ventilation to cool the unit. Do not block the ventilation openings.

Do not place the unit in environments which contain high levels of dust, heat, moisture or vibration.

Do not use the unit near water or other liquids. Make sure no water or other liquids can be spilled, dripped or splashed on the unit.

The unit is developed for indoor use only. Do not use it outdoors.

Do not place objects (books, vases, …) on top of the unit.

Place the unit on a stable base or mount it in a stable rack.

Safety requirements

Always handle the unit with care.

Only use a grounded socket outlet and a power cord with grounding plug to plug in the unit.

This unit is not a toy. It should not be operated by children.

Do not stick objects through the ventilation openings of the R2.

Do not open the unit. (risk for electrical shock)

The R2 contains several 'jumpers' which can be set. These settings may only be done by qualified people.

CAUTION – SERVICING

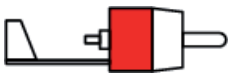
This unit contains no user serviceable parts. Refer all servicing to qualified service personnel. Do not perform any servicing unless you are qualified to do so.

NOTE

This product conforms to the following European Standards: EN 50081–1: 1992, EN 50082–1: 1992, EN 60065: 1994

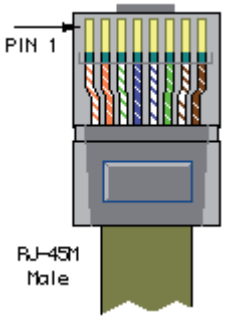
Chapter 1
Pin connections and connectors

Cinch (RCA):
For line input connections



Tip =	Signal	**Sleeve** =	Ground
White =	Left	**Red** =	Right

RJ45 (RS485, Digital Audio, +24V DC):
For connection to Wall Panels



Pin 1	White–Orange	AUDIO TX A
Pin 2	Orange	AUDIO TX B
Pin 3	White–Green	+24V DC
Pin 4	Blue	RS485 A
Pin 5	White–Blue	RS485 B
Pin 6	Green	GND
Pin 7	White–Brown	AUDIO RX A
Pin 8	Brown	AUDIO RX B

ATTENTION

The twisted pair cabling must always be 'straight'. In case of self made cabling, it must be wired as described above, to make the system work properly.

RS232 (serial connection interface):
For connection with home automation systems, or other remote control equipment

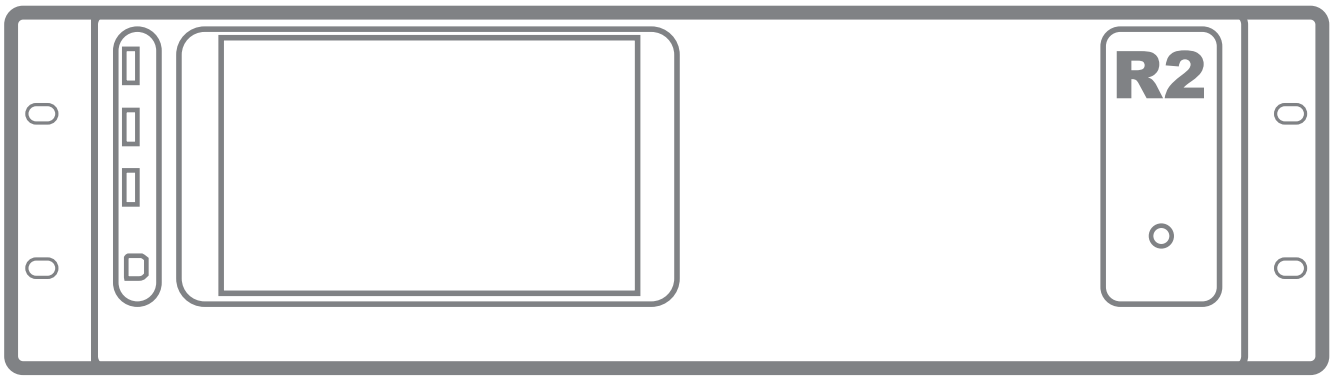
Connection	Standard RS232
PIN 2	R2 TX
PIN 3	R2 RX
PIN 5	GND
Settings	19200 Baud
	8 Bit
	1 Stop bit
	No parity
	No Handshaking

RS232 / RS485 / TCP/IP

The R2 amplifier has RS232, RS485 and TCP/IP ports which all accept the same commands. The complete command set to control the R2 amplifier is available in the R2 commands user manual which is freely available on www.audac.eu/download.

Chapter 2
Overview front & rear panel

Front



On the front of the R2 amplifier are a power button, four USB connection ports space for an optional touchscreen (R2DIS) provided.

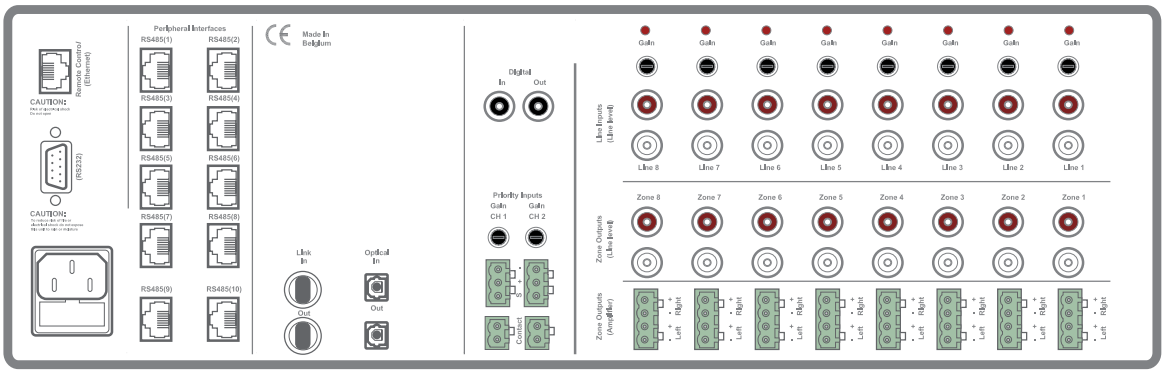
The power button is a latching type and should be used for powering–up the system. When the power button is pressed, the R2 will startup. When the startup procedure is taking place, the LED on front of the amplifier will blink blue. After the startup procedure is completed, the LED will light–up blue, and the R2 will be ready for operation.

The rectangular area on the front of the amplifier is the location where the optional touchscreen should be installed (R2DIS). This touchscreen can be used for controlling and configuring all the functions of the R2 amplifier. This unit consists of a 7” touchscreen with a format of 16/9 and a resolution of 800 x 480 px. A small integrated computer controls the functions of the touchscreen.

The lower USB connection port on front of the amplifier is dedicated for software updates. When the touchscreen is installed, the other three USB connections can be used to connect several peripherals to the amplifier like an USB keyboard or mouse.

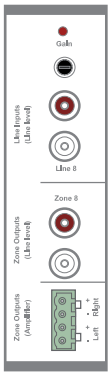
When the optional touchscreen is not installed and the lower usb connection is connected to your pc, the other three USB ports act as a hub to your computer. The peripherals connected to the USB ports will be connected to your PC.

Rear



Audio in– and outputs

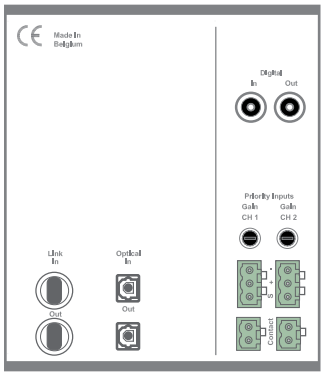
8 line level in– and outputs are provided in its standard configuration. Each line input is fitted with stereo RCA input connectors and a clipping LED which illuminates when the signal reaches the clipping level. By means of the gain control potentiometers, the level of the input signals can be controlled.



Each zone output is fitted with RCA stereo connectors for the connection of external amplifiers. When the optional power amplifier kit is installed (R2POW), each output zone has an amplified stereo with a power of 2 x 40 Watt @ 4 Ohm or 2 x 20 Watt @ 8 Ohm. The amplified zone outputs can be bridged in the graphical user interface to obtain a power of 80 Watt @ 8 Ohm for each output zone.

Priority, S/PDIF & Fiber

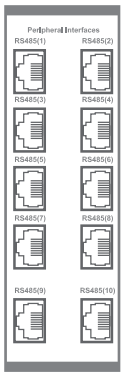
Two audio priority inputs and two priority contact inputs provided. Depending of the configuration, 4 priority signals can be used. The actions that need to happen when a priority signal occurs can be freely programmed. There can be automatically switched to the priority audio inputs when a audio signal is applied, or the internal routing can be adapted when a signal is available on the contact inputs.



A digital S/PDIF in– and output connection is provided, which is both coaxial and optical implemented. The digital input signals can be routed just like the analog inputs to the desired output zone. The digital outputs can be programmed in a way that there is a freely selectable zone output available on this channel, without a volume control. This can be useful for making lossless recordings.

The link in– and outputs are optical fiber connectors which can be used for cascading multiple R2's. For this feature, the optional fiber interconnection module has to be installed.

Peripheral interfaces



10 RJ45 connectors for expansion with additional wall panels and in– and output modules are provided. All these connectors carry RS485 signals. This allows the control of the amplifier from 10 different locations.

8 of these connectors are able to carry digital audio signals (PI1 to PI8) for expansion with additional wall line input units.

Control ports

The RJ45 remote control input should be connected to a LAN network. This makes it possible to control the R2 system over Ethernet, by means of a web–browser or any other device supporting Ethernet.

The RS232 connection can be used to control the R2 with external control equipment supporting RS232. This allows to couple the R2 with your home automation system, and control it through hardware of other manufacturers, like AMX, Crestron, ….

Chapter 3
Wire up the system

The wiring of the system must be done according to the following rules, to guarantee a proper functioning of the system in all circumstances.

1. Speaker cable for amplified zone outputs: minimum 2 x 1.5 mm²
   (distance > 15m: 2 x 2.5 mm²)

2. Wall Mounted Input & Control units:

DW3018/4018	UTP/FTP Cat5 cable or better
DW5065	UTP/FTP Cat6 cable or better
APM	UTP/FTP Cat6 cable or better

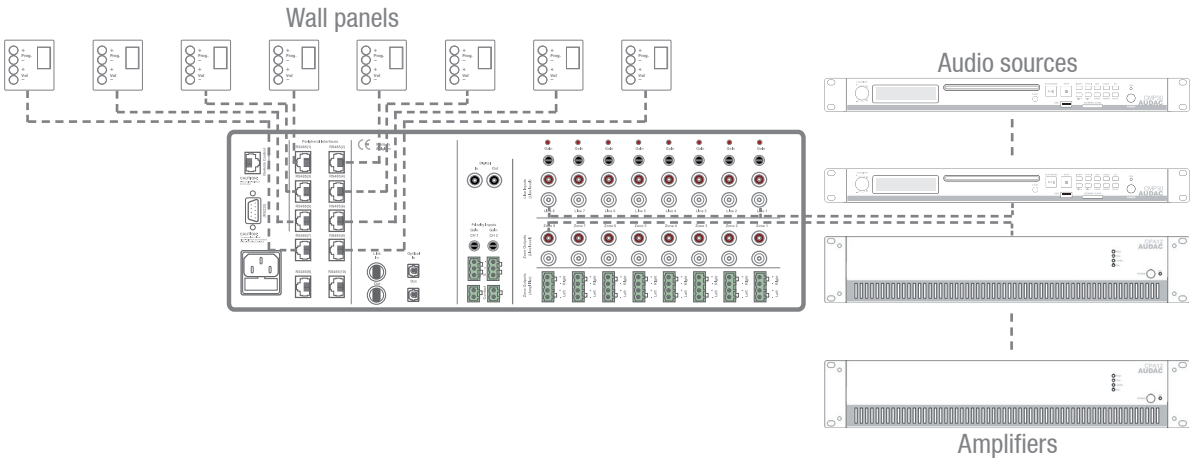
3. Music sources and line level zone outputs: must be connected with high quality audio cable and connectors.

4. Ethernet connection: UTP/FTP Cat5 cable or better

Chapter 4

R2 Quick start guide

This chapter guides you through the setup process of a basic project with one R2 audio matrix and 8 standard DW3018/4018 wall panels.



Overview of the R2 setup

Connecting the R2

1) Connecting audio sources
Connect all your audio sources (CD–players, tuners, ...) to the line inputs (RCA connectors) on the rear panel of the R2. Adjust all input gains to the appropriate level so no clipping occurs.

2) Connecting amplifiers and/or speakers
Connect amplifiers (100V or low impedance) to the line outputs (RCA connectors) on the rear panel of the R2. When the optional power amplifier kit is installed, low impedance loudspeakers can be connected to the loudspeaker outputs (Euro–Terminal block connectors) on the rear side of the R2.

3) Connecting wall panels
Connect the DW3018/4018 wall panels to the PI (Peripheral Interface) inputs (RJ45 connectors) on rear panel of the R2. Multiple DW3018/4018 wall panels can be connected to one single PI input by using bus cabling (connecting all the wall panels in parallel), or each wall panel can be connected to an PI input by a separate cable. It doesn't matter which PI port is used for which zone, the settings for which wall panel should control which zone can be made in the user interface.

4) Connecting a computer
A computer can be connected to the R2 through true ethernet. If the computer is directly connected to the R2, a crossed network cable is necessary. If the R2 is connected to a local LAN network (connected to a router / switch / hub) a straight network cable is necessary. Ask your IT administrator for help.
To get access to the user interface, enter the following address in your internet browser address bar: "http://192.168.0.191" (This is the factory default IP address of the R2, can be changed in the user interface). The default administrator password (gives you access to all functions) is "R2" and the default user password (gives you only access to the basic functions) is "user". If you want to make any changes to the settings, you should log–in with the administrator password.

Configuring the R2

1) Changing the IP address
You can skip this step when the default IP address “192.168.0.191” is not used by another device in your network, and is OK for you. If you like to change the IP address, go to the “Setup” menu (click the icon in the upper right corner of the main screen) and click “Network Settings”. Now you can change the IP address, and click “OK” to apply the changes and save. Afterwards, your browser will be automatically redirected to the new IP address of the R2, and the default IP address is not longer valid.

2) Changing the password
You can skip this step if the default password “R2” for administrator and “user” for users is OK for you, buy we always recommend to change these passwords, especially when your R2 is connected to a public network where external users have access to. If you like to change the password, go to the “Setup” menu and click “Password settings”. Here you can change the passwords. First, the old password needs to be entered, and subsequently the new password needs to be entered twice (Max 10 characters). Press the “OK” button to save the new password. Now, you always need to log–in with the new passwords and the default passwords are not longer valid.

3) Configuring wall panels and sources
Go to the “Setup” menu and click “System configuration”. Now you have the possibility to choose between “Paging”, “DW5065” and “DW3018/4018”. To configure the settings for the DW3018/4018 wall panels, click the corresponding button. By the dropdown list on the left side, you can choose for which zone you want to configure a wall panel. After the desired zone is selected, you can assign one of the connected wall panels with that particular zone by clicking “Set Address”. The displays on all wall panels will start blinking with the selected zone number. Push the “Program +” button on the wall panel if you want to assign that particular wall panel with the selected zone. After the “Program +” button is pressed, the wall panel will be linked with the selected zone, and the display will stop blinking.

The R2 contains many different inputs which can be selected to link with a zone. 8 of those inputs are accessible through the “Quick menu” (dropdown list on the main page). The same inputs which are available in the “Quick menu” can be selected on the DW3018/4018 wall panels. The other inputs are accessible through the settings menu if you are logged–in as administrator.
You can choose the inputs which are selectable in the “Quick menu” and with the DW3018/4018 wall panels through the “Input selection” menu in the “Zone Settings” window (Standard are line inputs 1 to 8 selected). Simply select the desired input signals by the dropdown lists on the corresponding location. After the desired input channels are selected, click the “Set inputs” button to save the changes. The selected inputs are now selectable in the “Quick menu” and by means of the wall panel.

Ready

Your system is now ready for use with the wall panels.

Chapter 5

User interface & configuration

To get access to the control and configuration settings, the R2 should be connected to a computer or an Ethernet LAN network. For more information about network connections and settings, see IP basics in chapter 8.

The standard (factory default) IP address of the R2 is 192.168.0.191, make sure this address is within the IP range of the connected Ethernet LAN network (subnetmask 255.255.255.0). If the default network address is not within range of your LAN network, contact your network specialist. The network address can be changed with the Standard Web Based User Interface but therefore a network connection has to be made first!

Any device (PC, Laptop, PDA or even a Smartphone) with a web browser and the Macromedia Flash 8.0 plug–in (or higher) installed, can be used to control the web based user interface.

For mobile devices, such as PDA's, smartphones or even iPhones or iPads, special applications are developed to control the standard functions of the R2 Matrix.

Open the user interface

Start your default web browser and enter in the address bar the IP address of the embedded web server of the R2. (The factory default IP address is http://192.168.0.191).

If multiple R2's are cascased with each other through the fiber interconnection interface, first a selection screen will be displayed whereby the R2 should be selected which you want to control.

Login screen

First the login screen will be displayed.
A password should be entered to get access to the web interface of the R2 amplifier.
There are two different access levels, **administrator** level and **user** level.

If you log–in using the **administrator** password, you get access to all functions and configuration options of the R2 Amplifier (The factory default password for administrator acces is "R2").

When you log–in using the **user** password, you only get access to the basic functions of the R2 Amplifier, such as changing the volume and changing the routing for a particular output zone. (The factory default password for user acces is "user").

After the right password is entered, click the "OK" button, and you will be redirected to the main screen of the R2 interface.

NOTE
The passwords can be changed in the Configuration >> Password settings menu (Only administrator)

Main screen

The main screen displays all 8 output zones of the R2 with fader volume controls.

Volume control
The volume of each channel can be set by moving the fader of the corresponding channel up or down. At the top and bottom side of each fader is a button with an arrow displayed whereby the volume can be raised or lowered in steps of 1 dB. At the bottom is a “Mute” button provided which mutes the volume of the corresponding output channel in one click. After the volume is muted, this mute button will become Red, and the volume can be unmuted after clicking it again.

Assign zone names
For a better overview of all output channels, every fader can be assigned by a specific zone name as shown in the example below. The name of the zone can be changed by double clicking on the name which is displayed above the corresponding fader (indicated in the picture below with “Zone Name”). When a cursor comes up, remove the existing name with the backspace key, and just change the name in the desired name. Click on the “Save Zone Settings” button and confirm to save the changed zone settings. The name of the corresponding zone will be changed, and next time you log in to the web based user interface of the R2 the same zone name will be displayed.

Connection status
In the top left corner of the window is the “Connection Status” displayed. To have communication with the R2, the connection status must be “ONLINE”.

Input channel selection
The desired input signal for a particular zone can be selected by using the dropdown list box below the zone name. This dropdown list shows 8 audio input signals which are selected as standard inputs in the “System Configuration” menu, together with then options “Off” and “Other”. When no input signal is selected, the option “Off” will appear. When a special input need to be selected which is not selected as one of the 8 standard inputs in the “System Configuration” menu, this should be done by means of the “Settings” menu, which can be obtained by clicking the “Settings” button below the “Input Selection” dropdown list. In this case, the option “Other” will appear. In the “Settings” menu, other settings such as tone control or digital filter settings can be made too.

Configuration menu
In the top right corner is a “Setup” button displayed. After clicking this button, you will be redirected to the general configuration menu of the R2.

Main screen

Zone settings

After clicking on a “Settings” button, displayed by a fader of a specific zone, you will be redirected to the “Zone Settings” window. This window gives an overview of all the settings that can be applied to one specific zone.

Input channel selection
The first window gives an overview of all input channels which can be patched to that particular output zone. The first displayed option is ‘No Input”, which means when this option is selected, no input signal will be routed to that particular output zone. At the same level is the S/PDIF selection button displayed. When this button is selected, the digital S/PDIF input which is both optical and coaxial provided, will be routed to that particular output zone. (The selection between the optical or coaxial input should be made in the “Setup Menu” under “Digital Input Settings”)

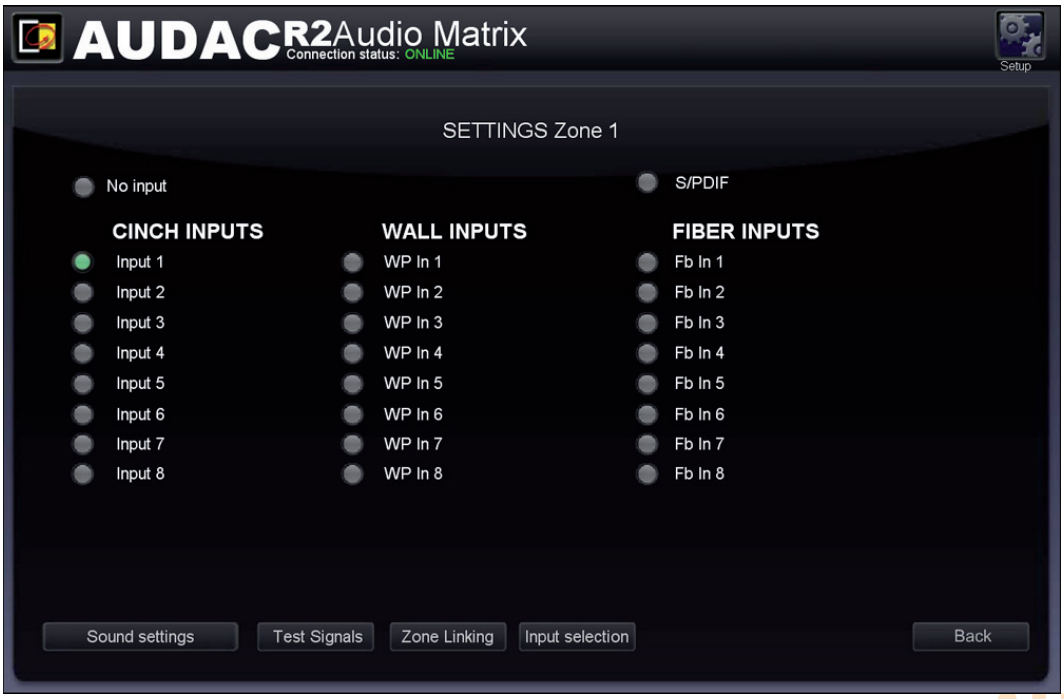
Below are from left to right the “Cinch inputs”, the “Wall inputs” and the “Fiber inputs” displayed.
The “Cinch Inputs” are the direct line inputs which are provided on the rear panel of the R2 by means of RCA connectors. In the second table are the “Wall Inputs” displayed. These are all additional input signals (Line or Microphone) which are connected to an optional wall input unit by means of the peripheral RJ45 inputs on the rear side of the R2. In the third table are the “Fiber Inputs” displayed (Only functional when the optional R2OPT module is installed). These are the digital audio channels which are transferred over the fiber interconnection interface, and can be patched to the selected output zone.

To select the desired audio input source which has to be patched with the selected output channel, simply click the button next to the desired input source. The selected input signal will be indicated in Green.

At the bottom of this window, four additional selection buttons “Sound Settings”, “Test Signals”, “Zone Linking” and “Input selection” are displayed. In the “Sound Settings” menu, specific configuration settings such as applying a digital filter or tone control can be made. In the “Test Signals” menu can be selected which kind of test signal should be patched to the particular output zone. In the “Zone linking” menu can be set which zones should be linked with each other and in the “Input selection” menu can be selected which input signals should be shown in the input preset menu.

Back
Click the “Back” button to go back to the main window.

Save zone settings
To make sure the changed zone settings are still effective after shutdown and restart of the R2, the “Save” button on the main screen of the R2 need to be pressed. At the same time, the volume and routing settings will be saved.



Zone settings

Zone settings >> Sound settings

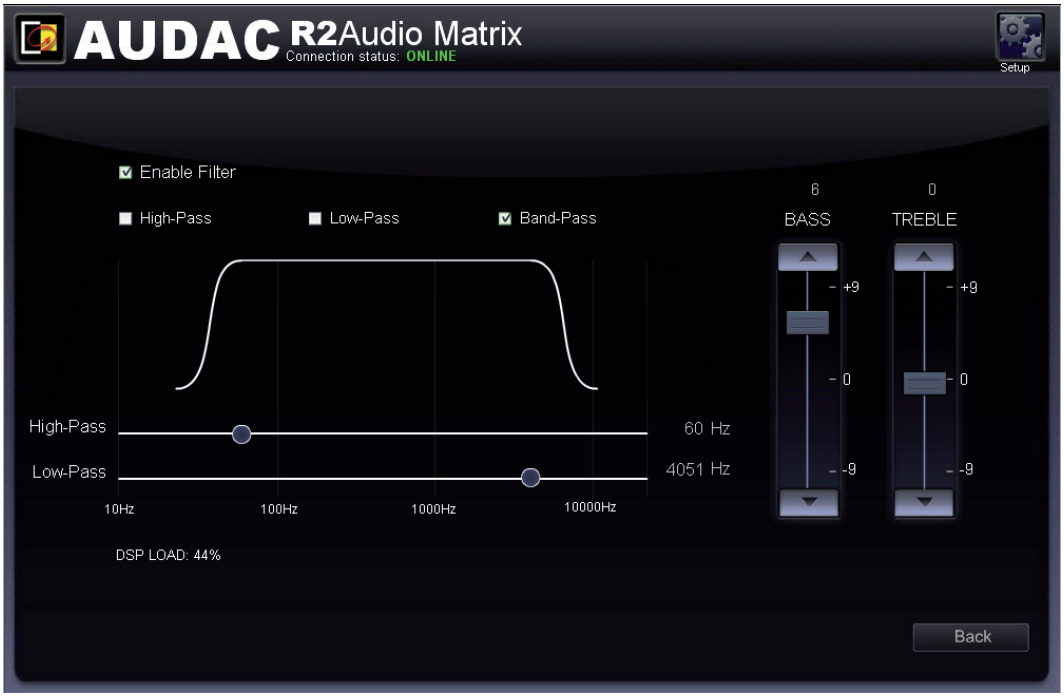
The “Sound Settings” window offers the possibility to apply a digital filter to the selected output zone, and to adjust the sound settings by means of the two–band tone control.

Digital Filter
To apply a filter to the selected output zone, tick the “Enable Filter” checkbox and select the desired filter type between High–Pass, Low–Pass and Band–Pass. With a High–Pass filter, the frequencies below the crossover frequency will be supressed, with a Low–Pass filter, the frequencies above the crossover frequency will be supressed, and with a Band–Pass filter, the frequencies higher than the upper crossover point, and below the lower crossover point will be supressed.

After the desired filter type is selected, the slide–bars to adjust the crossover frequencies will be displayed. The crossover frequency can be adjusted by sliding the button on the slider scale to the left and the right. The frequency can be set between 10Hz and 22kHz, and the exact set crossover frequency is displayed on the right side of the slider scale.

Two band tone control
Along the filter setings, two faders displayed on the right side which are meant to adjust the sound settings through two–band tone control. The leftmost fader indicated with “Bass” offers the possibility to adjust the level of the low frequencies, while the rightmost fader indicated with “Treble” offers the possibility to adjust the level of the high frequencies. The sound level level for both low and high tones can amplified or attenuated between +9 dB and –9 dB. This can be easily done by sliding the faders up and down in the same way as the volume control on the main screen.

Back
Click the “Back” button to go back to the previous window.



Sound settings

Zone settings >> Test signals

The test signals window gives an overview of all special input signals which can be patched to the selected output zone. The R2 has an internal digital signal generator which can generate white noise, pink noise and sinusoidal signals with a selectable frequency.
Each of those signals can be patched to any output zone.

Signal Selection
For patching those signals to the selected output zone, simply click the button which is displayed next to the desired signal, and the selection button will become green when the signal is selected.

When the “Sine Generator” is selected, the output frequency of the generator can be adjusted by clicking the up and down arrows displayed next to the selected frequency.

When one of the test signals is selected, “Other” will appear in the ‘Input Selection” box on the main screen.

Back
Click the “Back” button to go back to the previous window.

Test signals

Zone settings >> Zone linking

The “Zone Linking” window offers the possibility to link several zones with each other, making the zone settings like volume and routing coupled with each other. There is the possibility to make a permanent linking or a linking under certain conditions (priority contact) between the different zones.

Linking
All zones which can be linked to the selected output zone are shown in a list underneath each other. Next to each zone name, a dropdown list is shown whereby the linking can be selected. The standard setting is set to “Not linked”, and the linking method can be selected between “Linked by Prio contact 1”, “Linked by Prio contact 2”, and “Fixed Linked”.

When several zones are linked with each other and any change is made to the volume or routing settings from one of the linked zones, the other linked zones will automatically follow the same changes made to the settings.

Linked by priority contact
When the “Linked by Prio contact 1” or “Linked by prio contact 2” options are selected, the zones will be linked with each other when a connection is made between the priority contacts which are provided on the rear side of the R2. The linking between the zones will remain as long as the contact is established. For example, this can be done by means of a switch or relay.

Fixed Linked
When the ‘Fixed Linked” option is selected, the linking between the zones will be permanently present.

Slave
When a zone already is linked with another zone, the linked zone will be called the “Slave” from the “Master” zone and the linking settings for this zone will be unavailable. When selecting the “Zone Linking” for this zone, the message “Zone is already slave of another zone” will appear.

Back
Click the “Back” button to go back to the previous window.

Zone linking

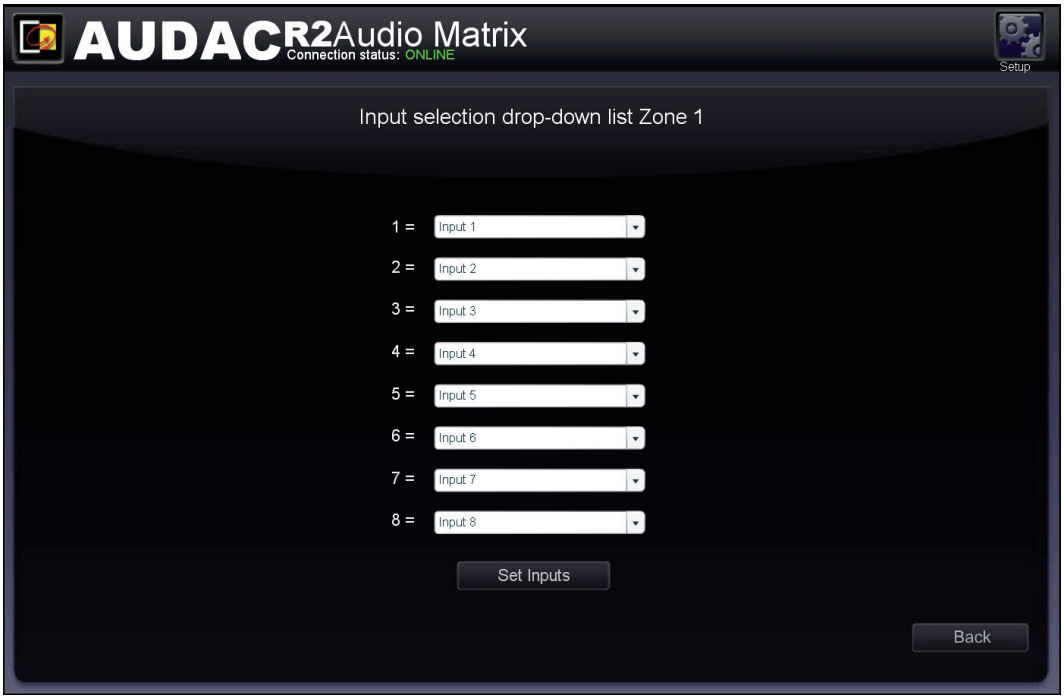
Zone settings >> Input selection

The “Input Selection” window allows you to make a selection out of all available input signals for the “Quick Selection Menu”. This is displayed on the main screen just below the zone name. It is convenient to add the 8 common used and most important input signals to the “Quick Selection Menu”.

Moreover, the input signals selected in this menu are also the 8 signals which are selectable by the DW3018/4018 wall panels linked with this zone.

Selection
This window gives an overview of 8 listboxes, each corresponding with a number from 1 to 8. When clicking this listbox, all input signal possibilities will be shown, ranging from the direct line inputs to the fiber and wall panel inputs as well as the internal test signals. After the 8 inputs are selected, click the ‘Set inputs’ button and the selected inputs will be assigned with this zone.

Back
Click the “Back” button to go back to the previous window.



Input selection

Configuration settings screen

The configuration settings control panel comes up after clicking the “Setup” button. This button is always shown in the upper right corner of every window. (Only on Administrator level)

In this window, all the settings of the R2 can be made, such as selecting the desired digital input source, changing the time settings, configuring the built–in timer, adjusting the network settings, adjusting the paging volume, changing the priority settings, making the system configuration for external connected devices, making the fiber settings, setting the address, bridging the output channels, changing the password, and restoring the settings to factory default.

If you want to change some settings, just click on the corresponding icon.

Save configuration
All configuration settings changes made in this window will be saved automatically and are still effective after shutdown of the device.

Back
Click the “Back” button to go back to the main screen.

Settings

Settings >> Digital input selection

The desired digital S/PDIF audio input can be selected in this window.

The S/PDIF input is both co–axial implemented with an RCA connector as well as optical implemented with a Toslink connector.

The selected input signal will be patched to the digital audio interface, and will be patched to an output zone when it is selected in the “Extra Inputs” menu of the output channel settings.

Back
Click the “Back” button to go back to the configuration screen.DD *R2 Digital Input Settings*

Digital Input Settings

Settings >> Timer Settings

Up to 256 pre–programmed timer presets can be made in the “Timer Settings” window. There can be chosen for both changing the signal routing, or adjusting of the signal volume at pre–programmed moments. The action which needs to be performed should be selected by means of the “ACTION” dropdown list. To set an event at a pre–programmed moment, you need to pass through the “Timer Settings” window.

Change Routing
To change the routing of a signal at a pre–programmed moment, select “Routing” in the “ACTION” dropdown list, and select the input signal in the “INPUT” dropdown list. The input dropdown list shows all the direct “CINCH INPUTS” as well as the additional “WALL INPUTS”, (optional) “FIBER INPUTS” and special “TEST INPUTS”. By means of the selection buttons next to the dropdown list, the output channels which should be affected by the action can be selected. The output channels can be selected through clicking the selection buttons. Their color will change to green when they are selected.

Change Volume
For changing the output volume of a zone at pre–programmed moments, select “Volume” in the “ACTION” dropdown list. The amount of dB’s whereby the volume should be reduced can be selected. The zone output where the volume adjust needs to take effect on can be selected by clicking them on and off by the “OUTPUTS” section.

Single and recurring
There can be programmed single events that only happen once, but there can also be programmed recurring events that repeat on a weekly basis. This can be selected by toggling the selection box between “Day” and “Date”. For single events we choose “Date”, and then select the desired time and date by the dropdown lists. For recurring events, click on the checkboxes for the days of the week when the event has to take place, and fill the desired time in the dropdown lists.

To add the set actions to the time schedule, click the “Add” button and the programmed action will appear in the “ACTIONS” window below.

For changing the events, click on the event which should be adjusted in the “ACTIONS” window. After the desired action is selected, click the “Edit” button on the right side of the window, and the action can be changed.

Back
Click the “Back” button to go back to the configuration screen.

Timer settings

Settings >> Time settings

The actual time and date of the R2 can be set in this window.

This can be done on two different ways, the clock settings can be made manually by selecting the right values from a dropdown list, or when connected to the internet, the current time and date can be retrieved from a time server. Just select the time zone in which you are located, and the current time and date is automatically updated by the time server.

Click the “OK” button to confirm the time settings.

Time Settings

Settings >> Network settings

In this window, the network settings of the R2 can be adjusted. The IP address can be set manually or can be automatically assigned by a DHCP server.

The IP address is standard set to 192.168.0.191 and the subnetmask is standard set to 255.255.255.0.

Be aware:
When a DHCP server is used in the network, and the DHCP function of the R2 is enabled, the DHCP server automatically assigns an IP address to the R2.

In some cases this can cause problems because the IP address is not always known for the user, and the IP address is required to access the web based user interface. If you don't know the IP address, the R2 will be lost in your network.

One additional problem is that, when the R2 boots the next time, the IP address that the DHCP server assigns can be different.

Click the "OK" button to confirm the network settings.

Network Settings

Settings >> Paging settings

In this window, the paging volume for each individual zone can be set by means of the dropdown boxes displayed next to the zone names. The paging volume can be set in steps of –1 dB, starting by 0 dB, going to –∞. When the volume is set to 0 dB, announcements for the corresponding zones will be made on maxium volume.

Back
Click the "Back" button to go back to the configuration screen.

Paging Settings

Settings >> Priority settings

The priority settings menu makes it possible to configure the priority channels. On top of this window, all priority inputs are displayed ranging from Priority 1 to Priority 4.

Priority input selection
You can select the desired priority channel by clicking on the corresponding button on top of the window, and switching them on and off can be done by clicking the “Enabled” button. When the priority is enabled, this button will turn green.

On the left side of this window, there are a “Trigger” and a “Input” dropdown list displayed. In the “Trigger” dropdown list are all the inputs shown on which the priority can be triggered. This ranges from the direct line inputs to the fiber and wall panel inputs as well as the internal test signals. In addition to these input signals four priority inputs are displayed (two priority signal inputs and two priority contact inputs). Here you can select on which input signal the priority needs to be triggered. When an priority audio input is selected, there will be switched to priority when an audio signal is present on these inputs. When a contact input is selected, there will be switched to priority when a contact is made between those two pins.

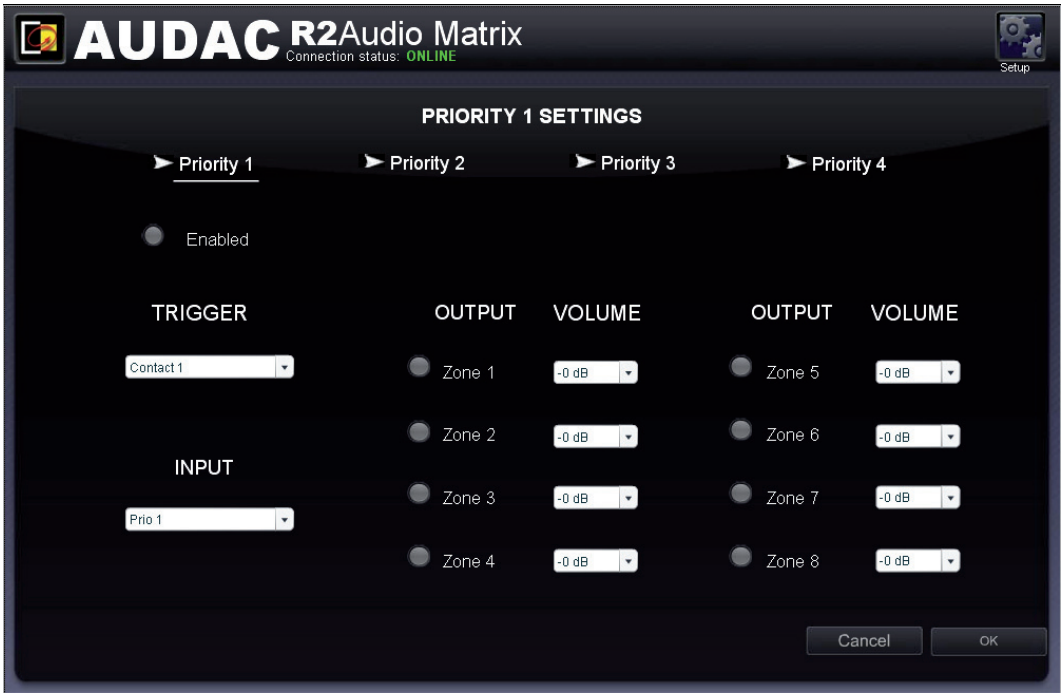
In the “Input” dropdown list below, there can be selected which input signal has to be patched when a priority situation occurs. In this list, the two direct priority audio inputs, the regular direct RCA inputs, the Wall panel inputs, the Fiber inputs, but also the DSP and other input signals are displayed.

On the right side of the window is a list of all output channels displayed. In this list can be selected to which output zones the priority channel needs to be patched. This can be done by simply clicking the button next to the channel. When the priority signal for this zone is enabled, the button will turn green.

Next to every output zone is a dropdown list displayed whereby the volume can be selected in steps of –1dB.

The switching to and from a priority signal is done according to the **HARDIN – FADEOUT** principle. This means when a priority situation occurs (signal present on the priority audio inputs or connection between priority input contacts) , immediately will be switched to the selected priority action. When the priority situation is over (no more signal present on the priority audio inputs or no more connection between the priority input contacts), the status of the R2 will return to the previous status by fading the sound in.

Click the “OK” button to confirm the priority settings.



Priority Settings

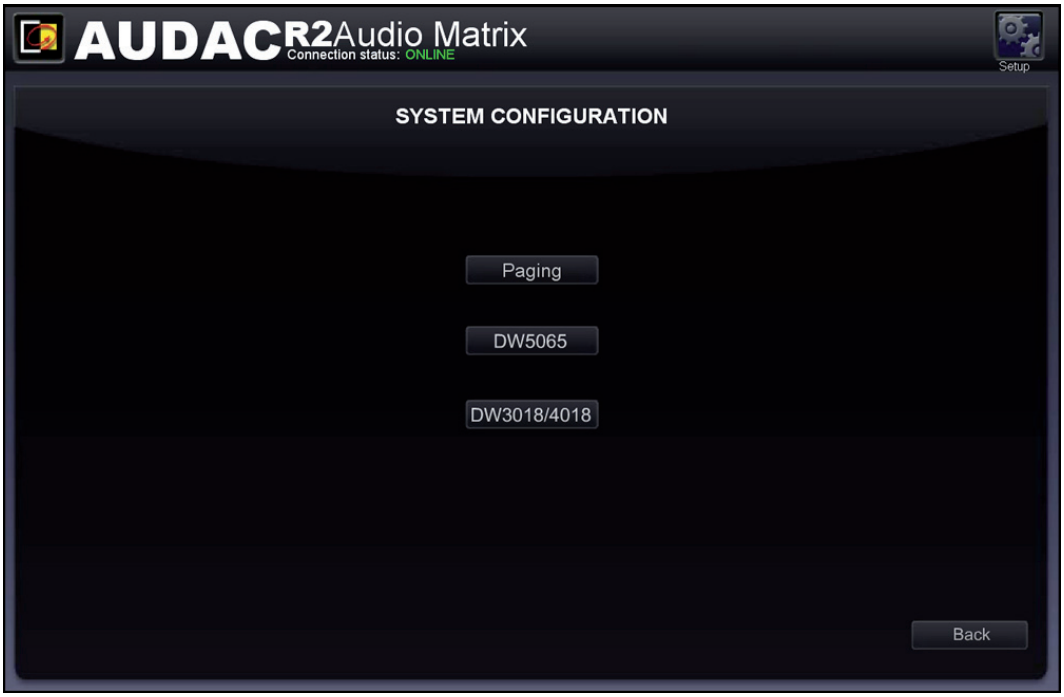
Settings >> System configuration

In this window, the configuration settings for external connected devices such as paging consoles and wall panels can be made. This window shows three buttons, each of them for configuring one kind of external connected devices. Click the 'Paging' button when the configuration for the APM1xx paging consoles has to be made, while the 'DW5065' button enables to configure the settings for the All–in–one wall panels, and the 'DW3018/4018' enables you to configure the settings for the basic wall panels.

Just click the corresponding button to proceed to the settings menu.

For more infiormation about the connection and configuration possibilities for external connected devices, refer to **Chapter 6: Peripheral Interfaces** of this user manual. In this chapter is extensively described how the connection and configuration for peripheral equipment should be done.

Back
Click the "Back" button to go back to the configuration screen.



System configuration

Settings >> R2 Address settings

In this menu, the address of the R2 can be set. This address is factory default set on “001” and is selectable between “001” and “999”. When only one R2 is available, the default address can be left to its default value.

When more R2’s are cascaded through the fiber interconnection bus, there needs to be assigned a unique address for every R2. The first R2 starts with address “001”, and every subsequent R2 should be assigned an address with a higher value.

Click the “OK” button to confirm the address settings

Address Settings

Settings >> Fiber settings

In this window can be set which audio signals of the R2 should be transmitted over the fiber interconnection interface.

NOTE
The fiber interconnection interface is an optional module for the R2. (R2OPT) The settings which are made in this window will only affect when the internal fiber interconnection interface of the R2 is installed.

The software of the R2 amplifier supports to transfer up to 8 stereo channels over the fiber interconnection interface.

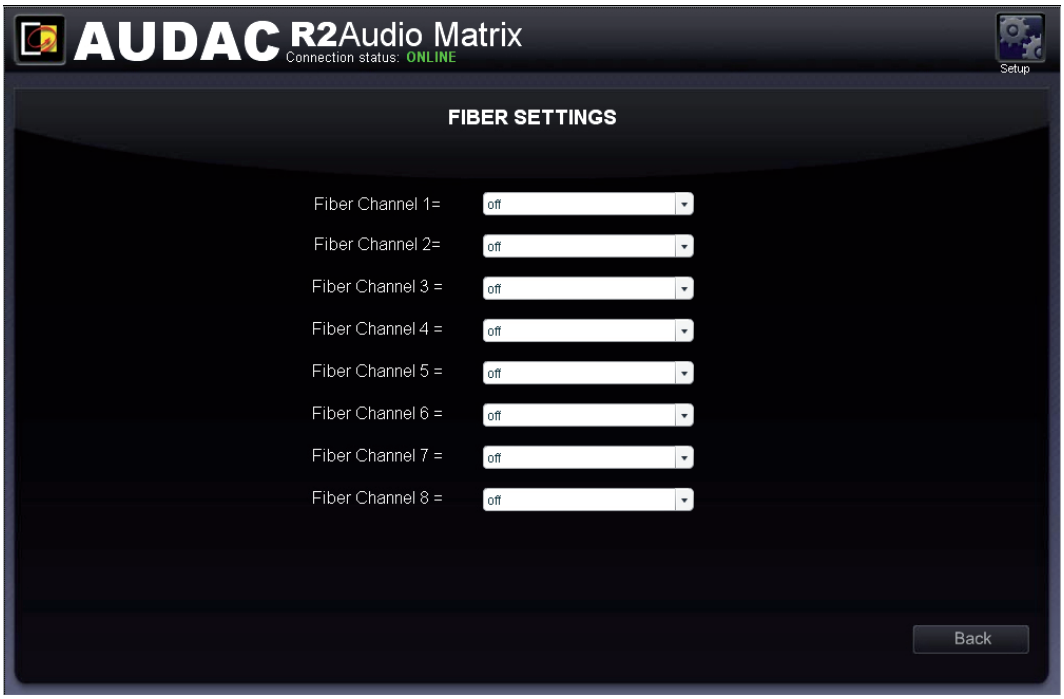
In the “Fiber Settings” window of the web based user interface is an overview given of all the channels which can be transmitted over the fiber interconnection interface, numbered from “Fiber Channel 1” to “Fiber Channel 8”. Next to each channel is a dropdown list displayed where can be selected which of the audio channels should be transmitted over the corresponding fiber bus channel.

In this dropdown list are all direct line inputs, all wall panel inputs, all priority inputs and all additional DSP generated signals displayed.

When an audio channel should be transmitted over a fiber channel, simply click the audio channel in the dropdown list of the desired fiber channel.

Click the “Back” button to go back to the configuration screen.

For more information about cascading the R2 and the fiber interconnection interface, refer to **Chapter 8: Cascading the R2** of this user manual.



Fiber Settings

Settings >> Amplifier bridging

In this window the amplifier outputs of the R2 can be bridged.

Just click on the button corresponding with the zone which you want to bridge, and the amplified Left and Right output channels of the output zone will be bridged, becoming a power of 80Watt @ 8 ohm instead of 2 x 40 Watt @ 4 Ohm or 2 x 20 Watt @ 8 Ohm. (Only when the R2POW power amplifier kit is installed).

When the bridging function is turned on, the “LEFT” input signal will used for both left and right output signals. The loudspeaker should be connected between the + terminal of the right channel and the – terminal of the left channel.

Click the “Back” button to go back to the configuration screen.

Amplifier Bridging

Settings >> Password settings

In this window the passwords for the R2 can be changed. There are two different password levels. Administrator level which has full access to all functions and User level, which has only access to the basic functions.

On the left side of the window the settings for the Administrator password can be changed, while on the right side the settings for the User password can be changed.

For changing the password, enter the old password in the provided field, and enter the new password twice in the provided fields. After this all is completed, push the “OK” button.

When the old password is correct, and the new password filled in both fields match, the old password will be changed into the new password.

The factory default password for **Administrator** level is “**R2**” and for **User** is “**User**”.

R2 Password Settings

Settings >> Factory settings

ATTENTION
BE CAREFULL to press this button. It really will recall the ORIGINAL factory settings !!!

It does not recall the previously saved settings, but it recalls the original factory setting and the previously made settings will be lost.

Click the “OK” button to reset the settings to factory default.

Restore Factory Settings

Lite User Interface

The Small web based user interface of the R2 is especially designed to have access to all basic functions of the R2 with any mobile device with a small screen, such as Smartphones, PDA's, iPod / iPhone, ..
To access the Lite Web interface, a device with a web browser and Flash player 8 of higher is required.

The Lite Web Based interface can be accessed by typing "/small.htm" after the IP address of the R2. If the IP address is the factory default IP address, you can access the Lite Web Based User interface by typing http://192.168.0.191/small.htm in your web browsers address bar.

Lite User Interface >> Login screen

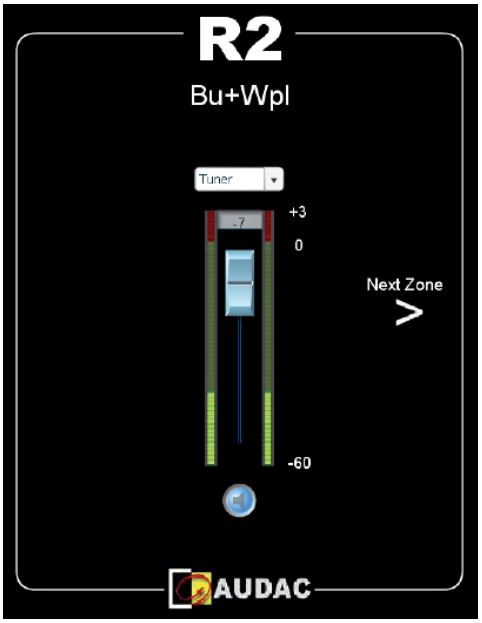
First the login screen will be displayed. Enter the password to get access to the lite web interface of the R2 amplifier. After the password is entered, click the "OK" button, and if the entered password is correct, you will proceed to the main screen of the R2.

Lite User Interface >> Main screen

On the Main screen of the "Lite" web based user interface is always only one output zone displayed at a time. The configured name of the corresponding output zone is always displayed on top. The volume can be adjusted by moving the fader up and down, and the desired input signal can be selected in the dropdown list located above the fader. The input signals displayed in this dropdown list are those which are configured in the "Wall Panel Settings" menu for that corresponding output zone.

Below the fader is a button provided whereby the output signal can be muted by simply one click.

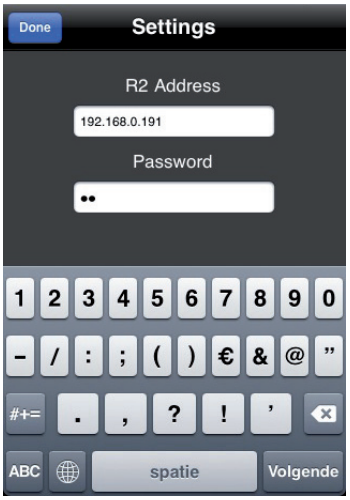
To proceed to the next output channel, simply click on the arrows shown on the side of the window. With the right arrow you can go one zone further, and with the left arrow you can go one zone back.



Small user interface for mobile devices

iPhone + iPad

The application which is available from the app store turns your iPhone or iPad into a fully fledged audio matrix controller when using it in combination with with the R2 Matrix. Simply connect it to your LAN network by using a wireless access point, and after installing the app on your mobile device, it is ready to be used.



To install the app on your mobile device, just tap the app store button and download the ‘R2 Remote’ app by AUDAC on your mobile device, or download the application from iTunes®. (If it’s downloaded by iTunes, you first need to synchronise it before the ‘R2 Remote’ logo will appear on your display)

After the app is installed, make sure your mobile device is connected to your wireless network and run the app by tapping the ‘R2 Remote’ app button. When starting–up, it will ask for the IP address of the device where it should be connected to and the password should be entered. The mobile applications only offers you the possibility to change basic configuration settings like volume and routing control, so the ‘Administrator’ and ‘User’ password both offer you the same rights here.

After the password is entered, you will be redirected to the main screen of the app, showing one fader for one specific zone. The volume for this specific zone can be set by moving the fader up and downwards and the input signal can be selected by tapping on the input signals name. Then a list will be shown whereout the desired input signal can be selected. The green button on the bottom can be used to mute the volume for the corresponding zone, and will turn red when the volume is muted. To switch between several output zones, just sweep over your display from left to right, or right to left.

The iPad app is working similar and very intuitive just as the iPod and iPhone app, the only difference is that multiple faders will be shown besides or above each other. In horizontal position, all 8 faders will be shown next to each other, while in vertical position two rows of four faders will be shown above each other.

Chapter 6
Peripheral interfaces

The R2 offers the possibility to connect many additional input and control units in addition to the standard direct line inputs.
To connect those additional units, peripheral interface ports are provided on the rear side of the R2. In the further explanations of this user manual, we will refer to the peripheral interface ports with the letters “PI”, followed by a number ranging from 1 to 10, each representing one PI port on the rear side of the R2. As this already suggests, there are 10 PI ports available on the rear side of the R2, each of them performed with an RJ45 connector. 8 of these PI ports are capable of transporting bi–directional audio and data (ports PI 1–8), while the remaining two ports are only capable of transporting data (ports PI 9–10).

Devices possible to connect to the PI ports:

DW3018/4018 Basic wall panel with routing and volume control
Mutliple DW3018/4018 wall panels can be connected in a bus structure. This wall panel is only using digital data transfer and no audio transfer, so it can be connected to all peripheral interface ports from PI1 to PI10. The assignment of the wall panel with a zone should be done in the user interface.

DW5065 Advanced wall panel with graphic display stereo line input and microphone input
This wall panel can control multiple zones and has a direct digital audio link to the R2. Only one DW5065 wall panel can be connected on one PI port, and only PI1 to PI8 can be used for connecting DW5065 wall panels.

APM Paging system
The APM paging system can be used to page to different paging zones of the R2. Paging to zones on other R2’s is also possible when multiple R2’s are linked with each–other through the (optional) fiber interface. APM paging consoles can only be connected to PI ports PI1 to PI8. Multiple APM paging consoles can be connected to one PI port, using a bus structure with ARJ03 junction boxes. When multiple APM paging consoles are connected to one PI port, only one APM console can announce messages at a time, so the paging is priority based. Paging with different APM consoles in different zones is possible when the APM’s are connected to separate PI inputs.

Connection possibilities

Working connections:
– Multiple DW3018/4018’s on one PI input (PI1 to PI10)
– One DW5065 and multiple DW3018/4018’s to one PI input (PI1 to PI8)
– One APM and multiple DW3018/4018’s to one PI input (PI1 to PI8)
– Multiple APM’s (priority) and multiple DW3018/4018’s to one PI input (PI1 to PI8)

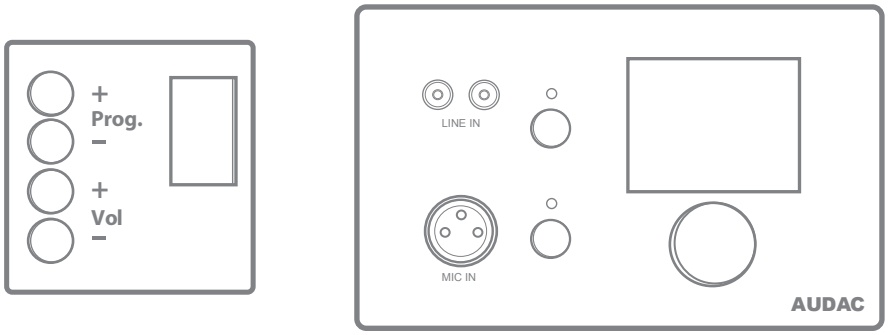
Connections that don’t work:
– DW5065 and APM to one PI input
– DW5065 to PI9 or PI10
– APM to PI9 or PI10
– Multiple DW5065 to one PI input

Important

Always make sure the R2 is powered off when connecting or disconnecting devices to the PI ports.
When an audio signal is transmitted to the peripheral inputs from an external input device (e.g. DW5065 wall panel or APM paging console) the used cabling should always be UTP/FTP CAT6 cable or better.

Wall mounted control panels

The R2 installation can be expanded with additional wall control panels. There are two kinds of wall panels available, one standard wall panel (DW3018/4018) which allows to adjust the routing and volume for a particular output zone, and one All–In–One wall panel (DW5065), which provides the possibility to connect an additional Line of Microphone signal source in a specific zone.



DW3018/4018 (Left) & DW5065 (Right) Wall panels

The wall panels should be connected with the peripheral ports on the rear side of the R2, by means of Twisted pair UTP/FTP CAT5 (or better) cabling for DW3018/4018 and UTP/FTP CAT6 (or better) cabling for DW5065. It is possible to connect multiple standard (DW3018/4018) wall panels on one single peripheral port (Up to 32 wall panels according to RS485 specification). Only one All–In–One wall panel with audio inputs (DW5065) can be connected to each peripheral port.

DW3018/4018 Basic wall panel

Functions
The DW3018/4018 is the basic wall panel which allows to control the routing and the volume of the R2. A selection out of up to 8 input signals can be made by means of the DW3018/4018 wall panel. The inputs which are selectable by means of the wall panel can be configured in the user interface under 'Zone settings' and 'Input Selection'. How this works is extensively described in an earlier chapter of this user manual.First read the PI connection principles in the beginning of this chapter before making any connections.

Change routing
In normal conditions, the DW3018 display will show the routing by indicating the number of the selected input signal which is routed to the related zone. If the "Prog +" button is pressed, the next pre–defined input will be selected, if the "Prog –" button is pressed, the previous pre–defined input will be selected.

Change volume
The volume in the corresponding output zone can be changed by pressing the "Vol +" and "Vol –" buttons. Logically, the volume will be increased after pressing the "Vol +" button will be decreased after pressing the "Vol –" button. When the volume is changed, the display will show the volume level for two seconds, and after those two seconds, the routing will be displayed again.

Configuration
Before the DW3018/4018 wall panels can be used, the wall panels needs to be assigned to one particular zone. Perform the procedure described below to make sure this is done correctly.

Go to the "Setup" menu and click "System configuration". Now you have the possibility to choose between "Paging", "DW5065" and "DW3018/4018". To configure the settings for the DW3018/4018 wall panels, click the corresponding button. Now a window with a dropdown list is shown, displaying all the available zone names. Select the zone whereto a wall panel should be assigned, and click the 'Set Address' button. All connected wall panels will start blinking, and after pressing the upper button on the desired wall panel, it will be linked to the selected output zone. If multiple wall panels should be assigned to one zone, simply repeat this action.

Maximum cable length
The maximum cable length depends of the number of connected wall panel. When only one wall panel is connected, a maximum cable length of 600 meters can be reached. The table below gives an overview of the maximum cable length, depending of the connected wall panels.

No. of DW3018/4018 Wall panels	Maximum cable length
1	600 meter
2	600 meter
3	400 meter
4	300 meter
5	200 meter
6	150 meter
7	120 meter
8	100 meter

DW5065 All–in–one wall panel

Functions
The DW5065 is the advanced All–in–one wall panel for the R2. This wall panel has a grahic display and can control the routing, volume, bass, treble and mute for multiple zones (up to 8) on one R2. Besides those control functions, it also provides the possibility to connect a microphone and a stereo line input source. The DW5065 wall panel should be connected to the R2 by means of a UTP/FTP Cat6 (or better) cable. First read the PI connection principles in the beginning of this chapter before making any connections.

The following functions of multiple zones of the R2 can be controlled:
- Volume within a range of 0dB to –70 dB
- All inputs can be selected
- Mute can be activated
- Bass within a range from –9dB to +9dB
- Treble within a range from –9dB to +9dB

Configuration
Before the DW5065 can operate, the configurations should be made. First of all, an address need to be assigned and the available inputs need to be defined.

Follow these steps to configure:
1) Go to the “Setup” menu and click “System configuration”. Now you have the possibility to choose between “Paging”, “DW5065” and “DW3018/4018”. To configure the settings for the DW5065 wall panels, click the corresponding button. Now a window is displayed which provides all the configuration possibilities for the DW5065. On the left side, a dropdown list is displayed whereby the address for the DW5065 can be selected. The address can be selected between “W001” and “W008”. Logically, you start with address “W001” for the first wall panel, and increases for every additional wall panel. After the desired address is selected, click the “Set address” button. After this button is pressed, the DW5065 will start blinking. To confirm the selected address with the wall panel, click the big rotary button on the front of the wall panel. When this button is pressed, the address will be assigned to the selected wall panel.

2) The zones which you want to control with the selected wall panel can be selected by means of the “Controlled zones” dropdown list. When selecting a zone in this dropdown list, the zone name will appear in the listbox below. The zones can be removed again from this listbox by selecting them, and clicking the “Remove Zone” button.

3) The inputs which are selectable with the selected wall panel can be selected by means of the “Selectable inputs” dropdown list. All inputs which available on the R2 can be selected in this dropdown list, such as the direct line inputs, the peripheral inputs, the fiber inputs, the priority inputs and the integrated DSP signals. When selecting an input signal in this list, the signal name will appear in listbox below. The input signals can be removed again from this listbox by selecting them, and clicking the “Remove Input” button. A maximum of 24 signal inputs can be selected. The inputs which are selected in this listbox, are available for all zones which can be controlled by this DW5065 wall panel. Those inputs are not linked with the quick menu like the inputs on the DW3018/4018 are.

4) Certain actions such as Volume change, Input change, Mute change, Tone control change and settings change can be blocked by checking the checkboxes.

5) The microphone input has the possibility to provide +15V phantom power for powering condenser microphones. The pantom power can be switched ON and OFF by clicking the “Enable Mic Phantom” checkbox. This setting can also be changed in the DW5065 settings menu. (If “Block settings menu” is not checked)

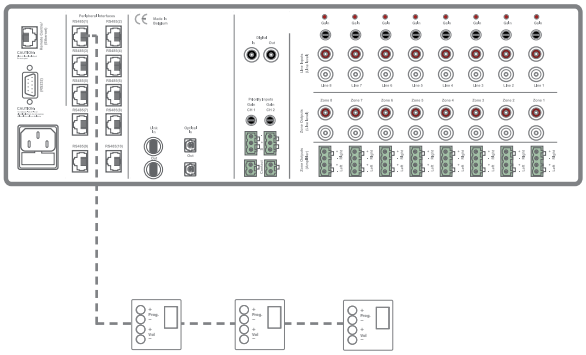
6) The Backlight level, screensaver and screensaver delay can be set by means of three dropdown boxes.This setting can also be changed in the DW5065 settings menu. (If “Block settings menu” is not checked)

7) When the settings are made, press the “Save to Wallpanel” button and the settings will be send to the selected DW5065 wall panel.

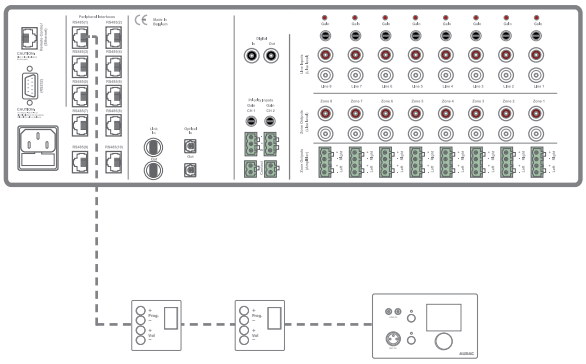
Previously made settings can be retrieved from the wall panel by clicking the “Load from Wallpanel” button. Hereby, the settings which are stored in the wall panel will be displayed in this window, making it possible to make any changes to the current settings.

Maximum cable length for DW5065
The maximum cable length for the DW5065 wall panel is 300 meter.

Connection possibilities



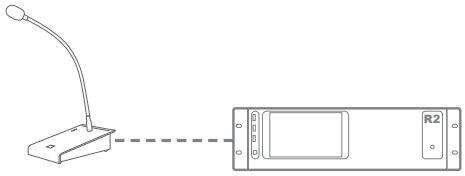
Multiple DW3018/4018 Wall panels on one PI Port (PI1 to PI10)



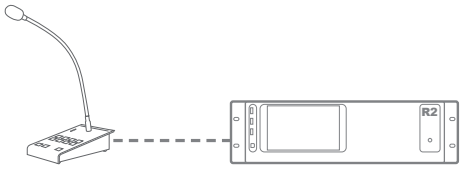
Multiple DW3018/4018 and one DW5065 Wall panel on one PI Port (PI1 to PI8)

Chapter 7
Paging

1 Zone paging example
The most basic example of an R2 paging system is an R2 audio matrix, in combination with an APM101 paging console. This setup makes it possible to announce messages in 1 or more pre–defined zones, and with a pre–defined volume for every zone.



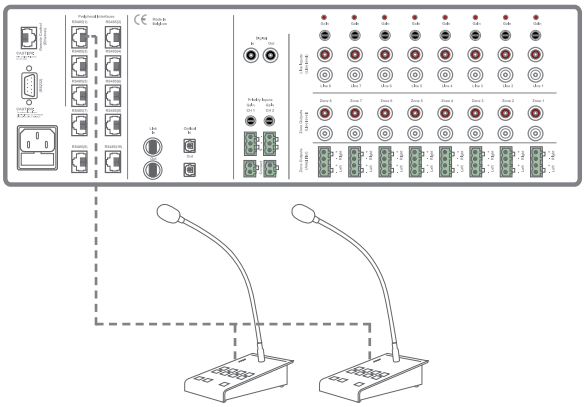
8 Zone paging example
A second paging example of an R2 paging system is an R2 audio matrix, in combination with an APM108 paging console. The difference between the previous example (with APM101) are the amount of paging zones. The APM108 console contains 8 zone selection buttons, which makes it possible to page separately to all zones, or to page to multiple zones at a time.



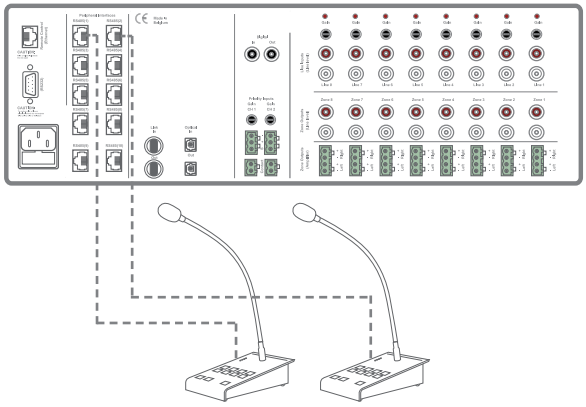
Priority
Paging is always priority based. When multiple APM consoles are connected to one R2, and multiple APM's give a command to announce a message at the same time, it depends of the priority settings which message will be announced. The priority level is related to the address of the APM table, which is unique. The APM with the lowest address has the highest priority. This means, when two APM's are connected and APM with address "002" is announcing a message, while at the same time APM with address "001" wants to announce a message, the message from APM "002" will be interrupted, and the message from APM "001" will be audible.
For voice files and messages which are stored inside the APM memory, the priority works different.
A priority number can be assigned to each stored message, making it possible to give emergency messages a higher priority.

Connection possibilities
Two different connection methods are possible for connecting multiple APM's to one R2.

1) Bus structure
Multiple APM's can be connected in a bus structure, on the same PI Input. Only one APM paging console



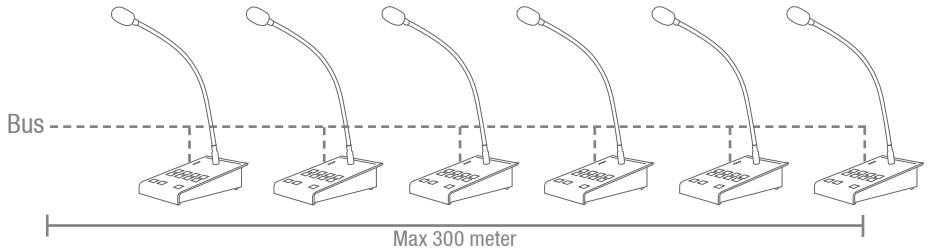
2) Separate PI input
Multiple APM's can be connected to the R2, each of them using a separate PI Input. If the selected paging zones are different, paging to different zones can be done at the same time. If multiple APM's are trying to page to the same zone at the same time, then paging is priority based, and only the message coming from the APM with the highest priority (lowest address) will be announced.



Paging over fiber
When multiple R2's are cascaded with each other through the fiber interconnection interface, paging messages can be transferred over the fiber conductor, making paging possible in multiple zones of multiple R2's. When this option is enabled, audio channel one (FB1) is dedicated for paging purposes, whereby this channel can't be used for other purposes.
Paging over fiber is always priority based, and only one APM can page to multiple R2's at the same time.

Limits
When multiple APM's are connected on one PI port using a bus structure, a maximum of 6 APM's can be connected to one PI port, with a maximum cable distance of 300 meter for the total APM bus.

Connection limits summary
– Maximum 6 APM's on one PI port – Maximum 100m when Cat 5 cable is used – Maximum 300m when Cat 6 cable is used – Always use ARJ03P junction boxes with external power supply when multiple APM's are connected using Bus structure. – Use ARJ03P with external power supply when the cable length for one APM exceeds 133 meter.



Configuration
To make the entire paging system work acording to the needs of your project, a configuration procedure should must be followed.

Paging volume
The paging volume can be different for every zone, and should be configured individual for each specific zone. To configure the paging volume, go to the “Setup” menu, and click the “Paging volume” button. By means of dropdown boxes, the paging volume for every specific zone can be set.

APM configuration
The paging settings are stored inside the APM’s internal memory. For confiiguration, the APM should be connected to the R2, and the configuration should be done through the web based user interface of the R2. You can find the paging configuration settings in the “Setup” menu, under “System configuration”, and “Paging”. On the left side of the window are the settings for configuration of ARU’s shown, while on the right side the settings for configuration of the APM’s are shown. Follow the procedure below to make your paging system work successfull.

1) Select the address which you want to assign to your paging console.
Select the address by the dropdown box, and click the “Set Address” button. Now, the lights on all connected APM’s will start blinking. After pushing the “PTT” (Push to talk) button the address will be assigned to the selected APM. For more information regarding the APM address, see “Priority”.
When multiple APM’s are connected to one R2, it’s better to assign an unique address to every APM, before continuing with the configuration produre.

2) Select the APM and the amount of layers for your configuration.
Press “New Configuration”. After pressing this button, you will be redirected to a new window where you can select which APM you want to configure. Two dropdown boxes are shown, by means of the upper one the R2 whereto the APM is connected should be selected. When only one R2 is used, only “R001” will be shown. By the lower dropdown list, the peripheral port on which the APM is connected can be selected, ranging from RS485(1) to RS485(8). When APM108 or APM116 are connected, the number of layers for your APM configuration can be determined by means of the dropdown list on the right side of this window.

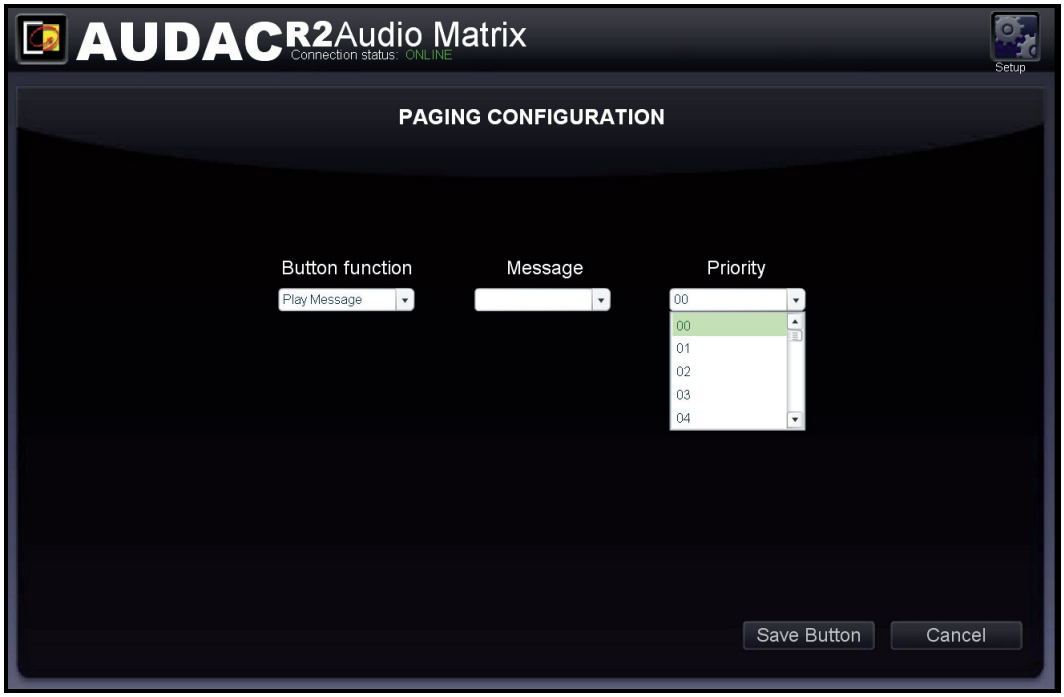
When the desired APM (and the amount of layers) is selected, click the save button, and you can proceed to the next window.

3) Configure the APM buttons
This window gives an overview of your APM keypad. The number of buttons displayed in this window depends of the type of APM which is connected to your system. On the left side, a dropdown list allows you to browse between the layers (when available).
Just click the button to which you want to assign a function.

After this button is clicked, a windows comes up allowing you to select the function which should be performed after pressing this button. The available functions shown in the dropdown list on the left side are “Zone Select” and “Play Message”.

Zone Select:
This function should be selected when the button is meant for paging purposes. The zones where the message should be audible after pressing the button are displayed in the “Selected Zones” listbox. Zones can be added to this listbox by selecting them in the two dropdown lists on the right side followed by clicking the “Add”’ button. Zones can be removed from this listbox by selecting them, and clicking the “Remove” button. Up to 40 zones, from 5 cascaded R2’s can be programmed under one button.
The priority of paging is based on the APM address configuration.

Play message:
By means of this function, messages stored in the APM memory, such as emergency or commercial announcements can be announced. The stored messages are shown in the “Message” dropdown list whereout the desired message can be selected. The priority of the message is based on the priority number which can be set in the “Priority” dropdown list, and is not related with the APM address. This way, high–priority emergency messages can be played with a low–priority APM.
The lower the priority number is, the higher the priority of the related message.

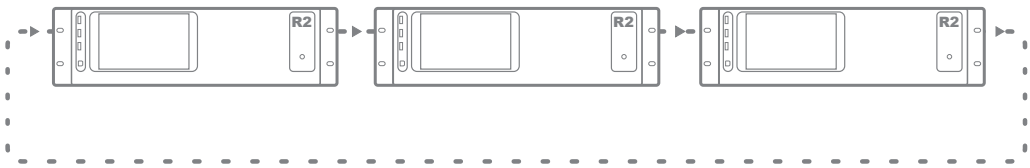


Chapter 8
Cascading the R2

This chapter explains the fiber interconnection possibilities between several R2 amplifiers, and guides you through a setup process of a project with 5 R2's cascaded with each other by means of the fiber interconnection interface.

Principle
The (optional) fiber interconnection interface makes it possible to transfer 8 stereo audio signals and one data channel over one single fiber optic conductor. The data channel is transmitted automatically and can't be configured by the user. The 8 stereo audio channels which should be transfered over the fiber conductor can be configured by the user.

The fiber interconnection interface of the R2 works like a ring network. This means that every R2 has one fiber input and one fiber output. This ring must be closed in all cases and this can be done by connecting the output of the first R2 with the input of the second R2. The output of the second R2 should be connected with the input of the third R2, and so on. At the end, the output of the last R2 has to be connected with the input of the first R2. This way, a ring is closed and the network is completed.



To control all the functions of all the R2's in one network, only one connection with the ethernet network of one R2 in the ring network is required. When multiple R2's are connected in a ring network, first a selection box will be displayed whereby can be selected which R2 you want to control.

Each R2 can transfer one or multiple of his input channels through the fiber ring network. This can be any input of the R2 (Line input, PI audio input, Digital input, ...). The selection of which input signal should be transfered over the fiber ring network can be selected in the "Setup" menu, after selecting the "Fiber settings" window.

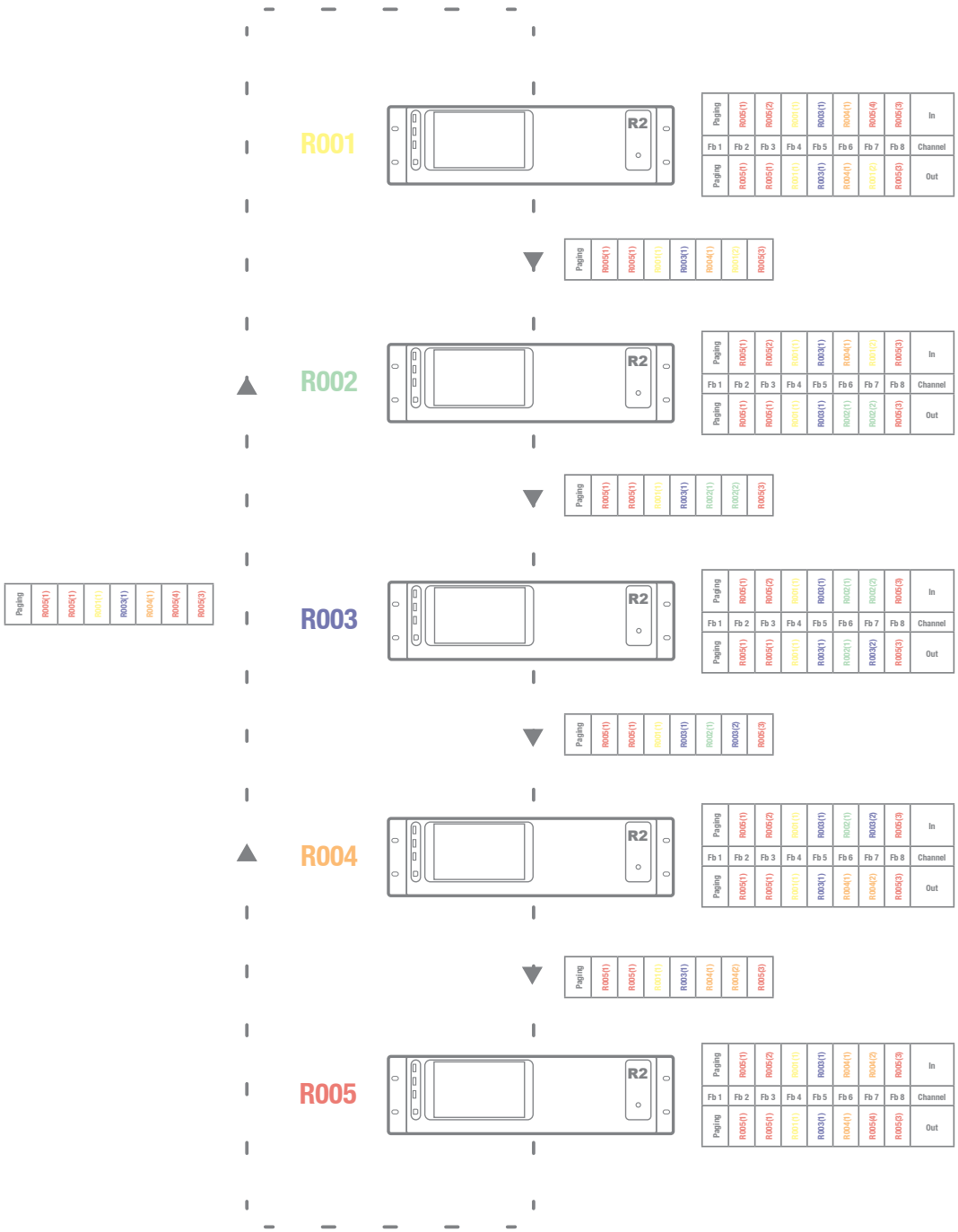
Every signal which is received through the fiber ring network can be used as a regular input just as all the other inputs, can be selected through the wall panels, and can be patched to any of the output zones.

When an R2 transfers an audio signal over the fiber ring network, there is the possibility to transfer the signal to all R2's in the same ring network, or to transfer the signal only to the next R2 in the ring network. If the signal is only needed for the next R2 in the ring network, the second R2 can use this channel to transfer another signal to the third R2, and so on...

Fiber audio flow

The diagram shown below shows an audio flow of an example project with 5 R2's cascaded through the fiber interconnection interface where every R2 has an address going from "R001" to "R005". Next to every R2 are shown which signals are received and transmitted over the fiber, while next to the connection line is shown which signals the fiber is carrying at this point.

Diagram



Fiber audio flow

Diagram explanation

Every R2 is indicated with a different colour, and next to every R2 is a table shown with 8 incoming fiber audio channels and 8 outgoing fiber audio channels. Between two devices, a connection line is shown representing the fiber conductor, and next to this connection line is always a table shown which indicates the audio channels the fiber conductor is carrying at this point. The audio channels between the output from the previous device and the input of the next device are always unchanged. This is clearly displayed by means of the text colour inside the tables. When APM paging consoles are connected and paging over fiber enabled, then channel “Fb 1” is dedicated for paging use and can’t be used to exchange other audio channels. For this reason, channel “Fb 1” is always marked with “Paging”.

An overview of the audio signals transmitted over the fiber interface:

– **Fiber channel 1 (Fb 1):** This channel is dedicated for paging purposes

– **Fiber channel 2 (Fb 2):** The Red R2 (R005) transmits an audio signal over fiber channel “Fb 2”. This signal reaches all devices and can be used by all devices.

– **Fiber channel 3 (Fb 3)**: Same as channel “Fb 2”, the Red R2 (R005) transmits an audio signal over fiber channel “Fb 3”. This signal reaches all devices and can be used by all devices.

– **Fiber channel 4 (Fb 4):** The Yellow R2 (R001) transmits an audio signal over fiber channel “Fb 4”. This signal reaches all devices and can be used by all devices.

– **Fiber channel 5 (Fb 5):** The Blue R2 (R003) transmits an audio signal over fiber channel “Fb 5”. This signal reaches all devices and can be used by all devices.

– **Fiber channel 6 (Fb 6):** Channel 6 is used by two R2’s. The Orange R2 (R004) transmits an audio signal over fiber channel 6 “Fb 6”, and this signal reaches the Red R2 (R005), the Yellow R2 (R001) and the Green R2 (R002). The Green R2 (R002) replaces the signal on fiber channel “Fb 6” by another audio signal, and this audio signal reaches the Blue R2 (R003) and the Orange R2 (R004).

–**Fiber channel 7 (Fb 7):** Fiber channel 7 (Fb 7) is used by all R2’s. Every R2 receives and transmits an audio signal over this channel. This way, every R2 can use a source of the previous R2 and replace it by another signal which can be received by the next R2 in the ring network.

– **Fiber channel 8 (Fb 8)**: Same as channels “Fb 2” and “Fb 3”, the Red R2 (R005) transmits an audio signal over fiber channel “Fb 8”. This signal reaches all devices and can be used by all devices.

Setting up the project

This chapter describes a step by step setup procedure which teaches you how to configure an R2 setup with multiple devices as shown on the previous pages.

NOTE
Don't make any ethernet or fiber connections until this point. The setup should be configured in the same sequence as described in this step by step guide.

1) Configuration of R2 Address

The first thing which should be done, is configuring the IP and bus addresses of all devices used in your setup. When devices are cascaded through fiber, the control can be done in two different ways:

Method 1:
Connect one device to Ethernet, and control the other devices in your setup through the same IP address. The data will be transferred between the devices over the fiber conductor. The advantage of this method is: Only one Ethernet connection is necessary. The disadvantage of this method is: you can only see the VU meters in the user interface of the R2 which is direcltly connected to the Ethernet network. (All other settings can me made, except the VU meter bar graph which is only visible for the direct connected R2)

To configure your system according to Method 1, proceed with the following procedure:

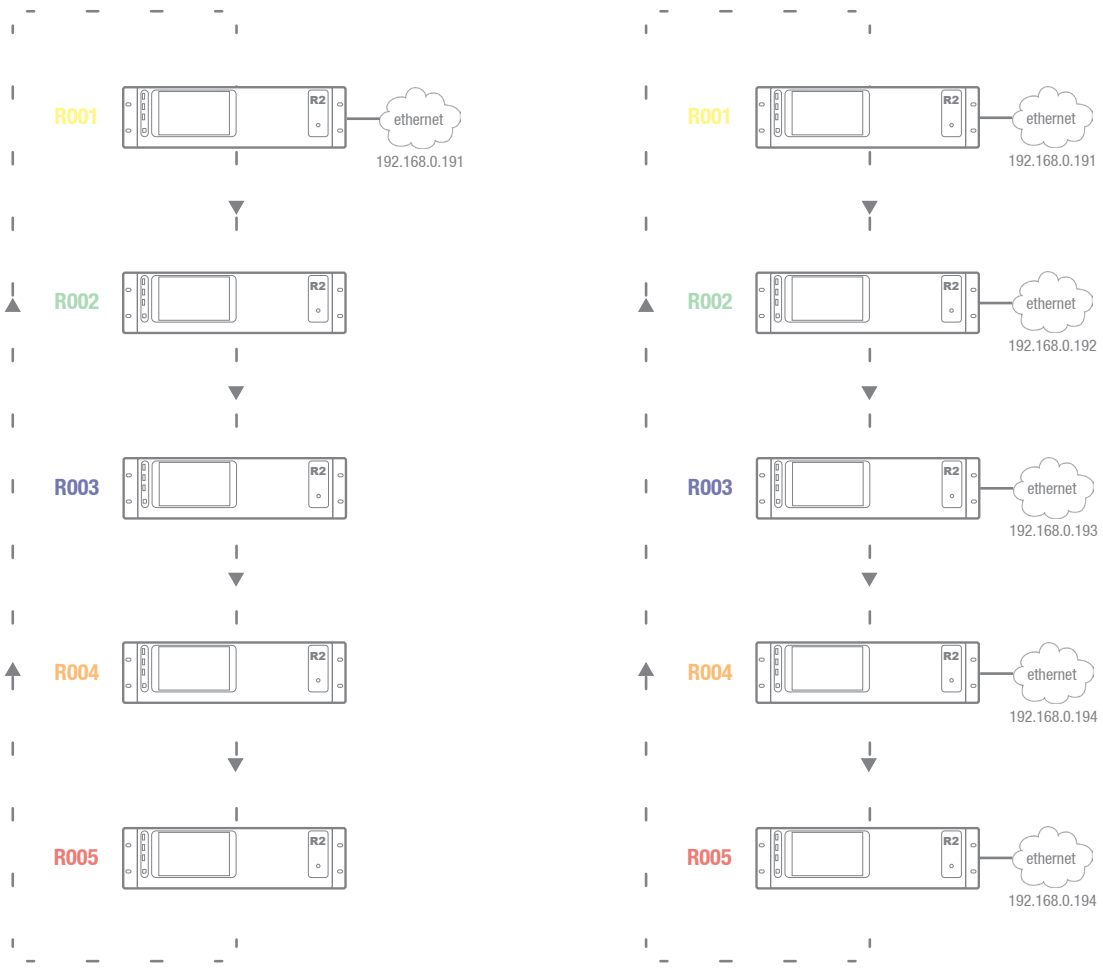
1) Connect the first R2 of your setup to your Ethernet network
2) Set the address for the first R2 to "R001", this can be done in the "Setup" menu, under "R2 Address Settings".
3) Disconnect the first R2 of your setup from the Ethernet network
4) Connect the second R2 of your setup to your Ethernet network
5) Set the address for the second R2 to "R002", this can be done in the "Setup" menu, under "R2 Address Settings".
6) Disconnect the second R2 of your setup from the Ethernet network
7) Repeat this procedure for all R2's in your setup, and assign an unique bus address to every R2 in your setup.
8) After this is done, all R2's should have an unique bus address, and no R2 is longer connected to the Ethernet network.
9) Connect one of the R2's in your setup to the Ethernet network. (It doesn't matter which one you connect to the Ethernet network, but mind you can only see the VU meter bar graph moving of the connected R2)
10) Connect the R2's with each other through fiber conductors, using the loop principle as shown in Figure 1.
11) Restart all R2's
12) All R2's should display now "Fiber OK" on top of their main page, next to the connection status.

Method 2:
Connect all devices to Ethernet, and control them by their own IP address. The advantage of this method is: you can see the VU meters of all connected R2's. The disadvantage of this method is: every device needs his own Ethernet connection and IP address.

To configure your system according to Method 2, proceed with the following procedure:

1) Connect the first R2 of your setup to your Ethernet network
2) Set the address for the first R2 to "R001", this can be done in the "Setup" menu, under "R2 Address Settings".
3) Change the IP address for the first device to one which is available in your ethernet network (For example 192.168.0.191). This can be done in the "Setup" menu, under "Network Settings".
4) Disconnect the first R2 of your setup from the Ethernet network
5) Connect the second R2 of your setup to your Ethernet network
6) Set the address for the second R2 to "R002", this can be done in the "Setup" menu, under "R2 Address Settings".

7) Change the IP address for the second device to one which is available in your ethernet network (For example 192.168.0.192). This can be done in the “Setup” menu, under “Network Settings”. Make sure this IP address is different from the first device’s IP address.
8) Disconnect the second R2 of your setup from the Ethernet network
9) Give all the R2’s in your setup an unique bus and IP address. This can be done by repeating step 5 to 8 of this procedure. Make sure every device has an unique bus and IP address.
10) Now, all devices have an unique bus and IP address, and no device is connected to the Ethernet network.
11) Connect all devices to your ethernet network
12) Connect the R2’s with each other through fiber conductors, using the loop principle as shown in Figure 1.
13) Restart all R2’s
14) All R2’s should display now “Fiber OK” on top of their main page, next to the connection status.



Example setup with 5 R2’s, on the left side with only one Ethernet connection (Method 1) while on the right side every R2 has a separate ethernet connection (Method 2)

2) Configuration of Fiber channels

The next step is the configuration of the audio channels transmitted over the fiber conductor. This can be done in the “Setup” menu, under “Fiber ettings”. Below, we’ll give a step by step guide about the fiber configuration for one device in your setup. Let’s start with the first R2 with address “R001” (indicated in Yellow) in your setup.

1) Open the user interface of the selected R2 “R001”.
2) Open the “Settings” menu and click the “Fiber Settings” button.
3) As shown in figure 1, “R001” transmits audio signals over fiber channel “Fb 4” and “Fb 7”. For all the other fiber channels, “R001” just send the incoming data to the next R2. So a source signal should be selected for fiber channels “Fb 4” and “Fb 7”. All signals available on the R2 can be selected by means of the dropdown list. For all other channels where the incoming data is just send to the next R2, status “off” should be selected in the dropdown list.

4) Repeat this procedure for all R2’s in your setup
5) After this is done, all selected audio signals are transmitted over the fiber conductor, and can be used by other R2’s in your setup.

3) Set passwords

You can skip this step if the default password “R2” for administrator and “user” for users is OK for you, but we always recommend to change the passwords. A detailled description how the passwords can be changed can be found inside an earlier chapter of this user manual. It’s convenient to give all the R2’s in your setup the same administrator password, making it possible to swap between R2’s without constantly reentering the password. At user level, it’s always necessary to reenter the password after swapping between R2’s.

4) Connecting sources

Connect all your audio sources (CD–players, Tuners, ...) to the line inputs on the back of the R2. Adjust all input gains so there is no clipping. More information about connecting source is extensively described in an ealier chapter of this user manual.

5) Connecting wallpanels

Connect all your wallpanels to the Peripheral inputs on the rear of the R2. A detailed description about connecting wallpanels is extensively described in an earlier chapter of this user manual.

6) Ready

Your project is now ready for use.

Chapter 9
Additional information

IP Basics

Many AUDAC products are controllable by Ethernet. The Ethernet connection which is used on the AUDAC products is TCP/IP based like 99% of the computer networks. There are some basics which you need to know to successfully make a TCP/IP Ethernet connection.

The data in TCP/IP networks is always send in packages, all these packages must be delivered at an unique address, just like the mailman delivers mail at your home mailbox. In TCP/IP networks, this address is called the “IP address”. The IP address is always a number in the following format “192.168.000.001”. As you can see, this address consists of 4 separate numbers ranging from “000” to “255”.

In simple terms, only the latest number of an IP address can be different within a network, so there is a maximum of 256 unique addresses within a network, ranging from “xxx.xxx.xxx.000” to “xxx.xxx.xxx.255”. The first three numbers must be the same to make communication between several devices possible, else the devices can not communicate with each other.

Example:

Device 1:	IP address:	**192.168.000.001**
Device 2:	IP address:	**192.168.000.002**
Device 3:	IP address:	**192.168.001.003**

In this example, Device 1 can communicate with Device 2, but not with Device 3, because the first three numbers must be the same. These first three parts are called the “IP range”, so the devices must be in the same “IP range” to communicate with each other.

The “IP range” of home and office networks are defined by the network administrator, this means that the IP range of your home or office network can be different from another network.
AUDAC products have the following IP address as default: “192.168.0.xxx”, this means the standard IP range of AUDAC products is “192.168.000.xxx”. If your network is using a different IP range, the AUDAC products will not be accessible from your network. You can change the IP address of the AUDAC products to make them work properly in your network. This can be done in the settings menu, and is described extensively in the “Settings” chapter of this user manual.

Of course, to make changes to the settings menu of the AUDAC products, you must have access to the user interface on the products webpage. This can be done by temporarily giving your computer an IP address within the IP range of the AUDAC product, for example “192.168.0.200”. After the IP address of your computer is within the IP range of the product, the user interface is accessible and the IP address of the product can be changed to an IP address within the IP range of your network. If the IP address of the product is within the IP range of your network, you can change the IP address of your computer again to it’s former IP address and the product should work properly in your home or office network.
Ask your network administrator for help if you are not familiar with networks.

Summary

– All devices must have an unique IP address
– All devices must be within the same IP range

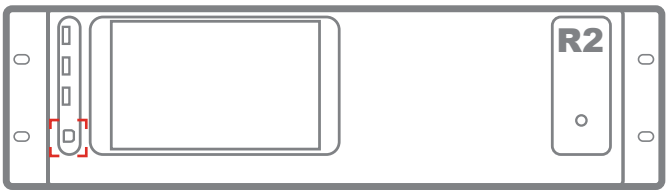
Updating the R2

Overview
The R2 update consists of three steps:

1) DSP update
2) FPGA update
3) Website update

Required software
All the required software to accomplish a software update is available in the zip archive which can be downloaded from the website.

Step 1: DSP update
1) Turn the R2 power on
2) Connect a computer with the lower USB port (USB B) on the front of the R2 amplifier



3) If the driver is requested, then install the supplied driver from the zip archive
4) Run “DSP2.exe” from map “DSP&FPGA”
5) Press “F6”
6) Enter “R2S33H1.ldr” as filename
7) Wait for finish, don’t close the application

Step 2: FPGA update
8) Press “F9”
9) Enter “R2F11H1.rpd” as filename
10) Wait for finish
11) Press “Esc” to close the application
12) Disconnect the USB cable
13) R2 power off –> power on

Step 3: Website update
14) Connect the R2 network cable
15) Run “MPFS2.exe” from map “Website”
16) In point 1 select map “1.7” in map “Website”
17) In point 2 selecy “BIN”
18) Press “settings” in point 4 and enter the R2 IP address in the box “Device Address”. If you do’t know the IP address use “Microchip Ethernet Discover” in the map “Website” to find the IP address of the R2.
19) Press “Generate and Upload” to start uploading the new website
20) Clear your internet browser cache. If you don’t do this, your browser will load the old website from his cache.
21) Finished

Technical specifications

Sensitivity Line input	–20/+4 dB 25k Ohm
Frequency response	20 Hz – 20 kHz
THD+N at 1 kHz	less than 0.02%
Signal to Noise ratio	100 dB @ 1kHz
Slew rate	+/– 13V/µsec
Digital control	RS–232
Remote zone control	RS–485
Web based control	Ethernet
Zone outputs 1–8	+3dB 100 Ohm unbalanced
Power Supply	240V AC, 50–60Hz
Weight	10 kg
Dimensions (W x H x D)	482 x 132 x 350 mm
Unit height	3HE

Notes

Notes

Notes