



Sonifex
Presenter Mixer System

HANDBOOK



Manufacturers of audio & video
products for radio & TV broadcasters

SONIFEX

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This handbook is for use with the following product:

Sonifex Presenter Mixer System, consisting of the **AVN-PX8x4C** Mix Engine Rack, **AVN-MPPR** Presenter Remote Unit & **AVN-MPTR** Technician Remote Unit

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SONIFEX

Register Online for an Extended 2 Year Warranty

As standard, Sonifex products are supplied with a 1 year back to base warranty.

If you register the product online, you can increase your product warranty to 2 years and we can also keep you informed of any product design improvements or modifications.

Product: _____

Serial No: _____

To register your product, please go online to www.sonifex.co.uk/register

Product Warranty - 2 Year Extended

As standard, Sonifex products are supplied with a 1 year back to base warranty. In order to register the date of purchase and so that we can keep you informed of any product design improvements or modifications, it is important to complete the warranty registration online. Additionally, if you register the product on the Sonifex website, you can increase your product warranty to 2 years. Go to the Sonifex website at: www.sonifex.co.uk/register to apply for your 2 year warranty.

Note: For your own records the product serial number is recorded on the CE certification page of this handbook.

Sonifex Warranty & Liability Terms & Conditions

1. Definitions

‘the Company’ means Sonifex Ltd and where relevant includes companies within the same group of companies as Sonifex Limited.

‘the Goods’ means the goods or any part thereof supplied by the Company and where relevant includes: work carried out by the Company on items supplied by the Purchaser; services supplied by the Company; and software supplied by the Company.

‘the Purchaser’ means the person or organisation who buys or has agreed to buy the Goods.

‘the Price’ means the Price of the Goods and any other charges incurred by the Company in the supply of the Goods.

‘the Warranty Term’ is the length of the product warranty which is usually 12 months from the date of despatch; except when the product has been registered at the Sonifex website when the Warranty Term is 24 months from the date of despatch.

‘the Contract’ means the quotation, these Conditions of Sale and any other document incorporated in a contract between the Company and the Purchaser.

This is the entire Contract between the parties relating to the subject matter hereof and may not be changed or terminated except in writing in accordance with the provisions of this Contract. A reference to the consent, acknowledgement, authority or agreement of the Company means in writing and only by a director of the Company.

2. Warranty

- a. The Company agrees to repair or (at its discretion) replace Goods which are found to be defective (fair wear and tear excepted) and which are returned to the Company within the Warranty Term provided that each of the following are satisfied:
 - i. notification of any defect is given to the Company immediately upon its becoming apparent to the Purchaser;
 - ii. the Goods have only been operated under normal operating conditions and have only been subject to normal use (and in particular the Goods must have been correctly connected and must not have been subject to high voltage or to ionising radiation and must not have been used contrary to the Company’s technical recommendations);
 - iii. the Goods are returned to the Company’s premises at the Purchaser’s expense;
 - iv. any Goods or parts of Goods replaced shall become the property of the Company;
 - v. no work whatsoever (other than normal and proper maintenance) has been carried out to the Goods or any part of the Goods without the Company’s prior written consent;

- vi. the defect has not arisen from a design made, furnished or specified by the Purchaser;
 - vii. the Goods have been assembled or incorporated into other goods only in accordance with any instructions issued by the Company;
 - viii. the defect has not arisen from a design modified by the Purchaser;
 - ix. the defect has not arisen from an item manufactured by a person other than the Company. In respect of any item manufactured by a person other than the Company, the Purchaser shall only be entitled to the benefit of any warranty or guarantee provided by such manufacturer to the Company.
- b. In respect of computer software supplied by the Company the Company does not warrant that the use of the software will be uninterrupted or error free.
- c. The Company accepts liability:
- i. for death or personal injury to the extent that it results from the negligence of the Company, its employees (whilst in the course of their employment) or its agents (in the course of the agency);
 - ii. for any breach by the Company of any statutory undertaking as to title, quiet possession and freedom from encumbrance.
- d. Subject to conditions (a) and (c) from the time of despatch of the Goods from the Company's premises the Purchaser shall be responsible for any defect in the Goods or loss, damage, nuisance or interference whatsoever consequential economic or otherwise or wastage of material resulting from or caused by or to the Goods. In particular the Company shall not be liable for any loss of profits or other economic losses. The Company accordingly excludes all liability for the same.
- e. At the request and expense of the Purchaser the Company will test the Goods to ascertain performance levels and provide a report of the results of that test. The report will be accurate at the time of the test, to the best of the belief and knowledge of the Company, and the Company accepts no liability in respect of its accuracy beyond that set out in Condition (a).
- f. Subject to Condition (e) no representation, condition, warranty or other term, express or implied (by statute or otherwise) is given by the Company that the Goods are of any particular quality or standard or will enable the Purchaser to attain any particular performance or result, or will be suitable for any particular purpose or use under specific conditions or will provide any particular capacity, notwithstanding that the requirement for such performance, result or capacity or that such particular purpose or conditions may have been known (or ought to have been known) to the Company, its employees or agents.
- g. (i) To the extent that the Company is held legally liable to the Purchaser for any single breach of contract, tort, representation or other act or default, the Company's liability for the same shall not exceed the price of the Goods.
- (ii) The restriction of liability in Condition (g)(i) shall not apply to any liability accepted by the Seller in Condition (c).
- h. Where the Goods are sold under a consumer transaction (as defined by the Consumer Transactions (Restrictions on Statements) Order 1976) the statutory rights of the Purchaser are not affected by these Conditions of Sale.

Unpacking Your Product

Each product is shipped in protective packaging and should be inspected for damage before use. If there is any transit damage take pictures of the product packaging and notify the carrier immediately with all the relevant

details of the shipment. Packing materials should be kept for inspection and also for if the product needs to be returned.

The product is shipped with the following equipment so please check to ensure that you have all of the items below. If anything is missing, please contact the supplier of your equipment immediately.

Item	Quantity
Product unit	1
IEC mains lead fitted with moulded mains plug	1

If you require a different power lead, please let us know when ordering the product.

Repairs & Returns

Please contact Sonifex or your supplier if you have any problems with your Sonifex product. Email technical.support@sonifex.co.uk for the repair/upgrade/returns procedure, or for support & questions regarding the product operation.

CE Conformity

The products in this manual comply with the essential requirements of the relevant European health, safety and environmental protection legislation.

The technical justification file for this product is available at Sonifex Ltd.

The declaration of conformity can be found at:
<http://www.sonifex.co.uk/declarations>

Safety & Installation of Mains Operated Equipment

There are no user serviceable parts inside the equipment. If you should ever need to look inside the unit, always disconnect the mains supply before removing the equipment covers. The cover is connected to earth by means of the fixing screws. It is essential to maintain this earth/ground connection to ensure a safe operating environment and provide electromagnetic shielding.

Voltage Setting Checks

Ensure that the machine operating voltage is correct for your mains power supply by checking the box in which your product was supplied. The voltage is shown on the box label. The available voltage settings are 115V, or 230V. Please note that all products are either switchable between 115V and 230V, or have a universal power supply.

Fuse Rating

The product is supplied with a single fuse in the live conducting path of the mains power input. For reasons of safety it is important that the correct rating and type of fuse is used. Incorrectly rated fuses could present a possible fire hazard, under equipment fault conditions. The active fuse is fitted on the outside rear panel of the unit.

Power Cable & Connection

An IEC power connector is supplied with the product which has a moulded plug attached.

The mains plug or IEC power connector is used as the disconnect device. The mains plug and IEC power connector shall remain readily operable to disconnect the apparatus in case of a fault or emergency.

The mains lead is automatically configured for the country that the product is being sent to, from one of:

Territory	Voltage	IEC Lead Type	Image
UK & Middle East	230V	UK 3 pin to IEC lead	
Europe	230V	European Schuko round 2 pin to IEC lead	
USA, Canada and South America	115V	3 flat pin to IEC lead	
Australia & New Zealand	230V	Australasian 3 flat pin to IEC lead	

Connect the equipment in accordance with the connection details and before applying power to the unit, check that the machine has the correct operating voltage for your mains power supply.

This apparatus is of a class I construction. It must be connected to a mains socket outlet with a protective earthing connection.

Important note: If there is an earth/ground terminal on the rear panel of the product then it must be connected to Earth.

WEEE Directive



The Waste Electrical and Electronic Equipment (WEEE) Directive was agreed on 13 February 2003, along with the related Directive 2002/95/EC on Restrictions of the use of certain Hazardous Substances in electrical and electronic equipment (RoHS). The Waste Electrical and Electronic Equipment Directive (WEEE) aims to minimise the impacts of electrical and electronic equipment on the environment during their life times and when they become waste. All products manufactured by Sonifex Ltd have the WEEE directive label placed on the case. Sonifex Ltd will be happy to give you information about local organisations that can reprocess the product when it reaches its “end of use”, or alternatively all products that have reached “end of use” can be returned to Sonifex and will be reprocessed correctly free of charge.

Atmosphere/Environment

This apparatus should be installed in an area that is not subject to excessive temperature variation (<0°C, >50°C), moisture, dust or vibration.

This apparatus shall not be exposed to dripping or splashing, and no objects filled with water, such as vases shall be placed on the apparatus.

1. Sonifex Presenter Mixer System Manual

Overview

The presenter mixer system allows on-air presenters to adjust the audio levels fed to their radio or wired IEM systems, whilst also allowing Sound Control Room operators to adjust the levels remotely. The system consists of 3 types of unit all connected on a common Ravenna Audio over IP (AoIP) network with added audio sources derived from Ravenna based AoIP mixers or input portals. Setup and control can be provided via webpages and/or 3rd party applications. The system uses mono audio throughout.

The 3 units are:

- AVN-PX8x4C - a 2U rack mounted Mix Engine Rack.
- AVN-MPPR - a small desk, or microphone stand, mounted Presenters' Remote Unit – aka PRU.
- AVN-MPTR - a 1U rack mounted Technicians' Remote Unit – aka TRU.

2. AVN-PX8x4C Mix Engine Rack



Power Button used to indicate power status, switch action can be disabled in software

AVN-PX8x4C 8x4 mixer with 24 audio inputs & 16 audio outputs
Inputs & outputs provided on D-Types in AES59 format

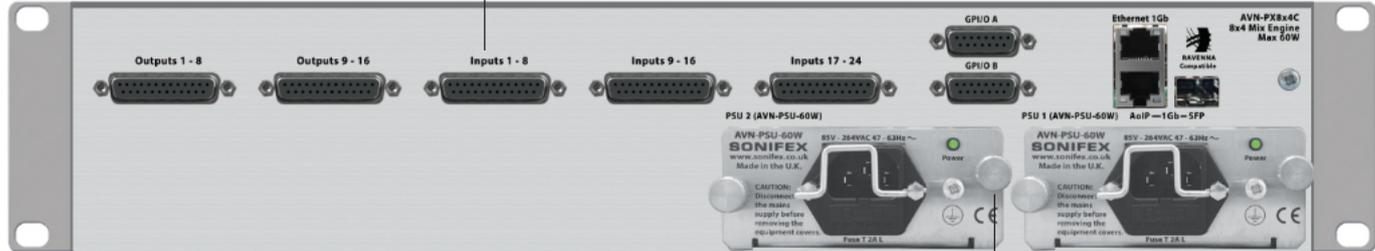


Fig 2-1: AVN-PX8x4C Front and Rear

Power supplies with knurled thumb screws for easy removal

The Mix Engine, as well as using AES67 audio streams, accepts 24 analogue mono input channels on 3 x DB25 connectors and output 16 analogue mono channels on 2 x DB25 connectors. Each mixer unit is able to create and control 8 virtual mixers, each capable of mixing any 4 sources (analogue or AoIP) to a single mixed output that is available locally at an output and via an AoIP stream (to the Presenter Unit and other destinations). The analogue audio line-up level will default to +18dBu = 0dBFS.

A built-in webserver is used for configuration settings, input/output routing and for defining which Presenter and Technician Remote Units are assigned to the particular Mix Engine and Virtual Mixers. Up to 4 MPPRs can be assigned to each Virtual Mixer on a first-come first-served basis. It's also

possible that both MPTRs could also select the same VM so a maximum of 6 devices can control the mix levels of a VM.

The Mix Engine will allow a maximum of 32 audio over IP input streams (each stream can be up to 8 channels). There are 8 virtual mixer outputs available. Each Virtual Mixer has 4 sources and 1 mixed output. There are also 2 more monitor outputs which play out the audio of the VM selection made on each of the 2 connected Technician Remote Units.

The Mix Engine has dual universal AC power supplies which are hot-swappable in the event of failure and have a green LED to indicate within spec operation. The front panel has LED indications and GPOs to warn of power supply failure. There are also front panel LEDs for network and sync/clock failure.

Front Panel Controls

Status LEDs

On the left side of the panel, there are a number of status LEDs which are used to provide a basic overview of various system parameters such as power supply failure, network and sync/clock failures.

Each of these LEDs can be illuminated in different combinations of colours and flashing or non-flashing states. The table below provides an overview of what each LED state signifies.

Led Name	State	Description
AoIP	Red	No network connection on AoIP network port
	Green	AoIP network port connected.
Ethernet	Red	No network connection on control network port
	Green	Control network port connected.
Auth	Off	Auth LED not currently used.
Clock	Red	PTP master offset clock is greater than 10000ns.
	Yellow	PTP master offset is less than 10000ns but greater than 1000ns.
	Green	PTP master offset is less than 1000ns. Or this unit is the master clock.
	Flash Yellow	PTP in listening state – master clock negotiation taking place.
PSU1/ PSU2	Red	Power state error
	Yellow	Power state warning
	Green	Power state is OK

OLED Display

The OLED display allows the user to view system info such as the IP address, serial number etc. It also allows the user to name the unit, check or change the network settings, set brightness of the LEDs or contrast of the OLED, and to change the mixer sources used for the selected Virtual Mixer. These menus are selected by pressing the menu fast key (see below) or holding down the centre button on the selector spinwheel for around half a second, and they can be set to require a password before access is granted.

Menu fast keys

There are 4 menu fast keys available to help jump to the corresponding menu on the OLED display.

- “Menu” jumps to the Main menu.
- “Assign” jumps to the VM assign menu where the user can assign a VM to a particular group of MPPRs.
- “Release” jumps to the release menu which allows the user to release a particular group of MPPRs.
- “Grab” jumps to the grab menu which allows user to grab a particular group of MPPRs.

Power button

The Front Panel on/off button is configured to power up the unit from Standby mode and can be enabled to provide a power off function. The function will always default to power off disabled - the user would need to enter the system menu to enable this function. When the power off function is enabled, pressing and holding the power button for 2 seconds will power down the unit.

Reset button

The recessed reset button at the bottom left corner of the front panel triggers a hardware reset of the unit.

Rear Panel Connections

Network Ports

The Mix Engine has 2 network ports; the primary port is the AoIP port and is mainly used for the transport of audio - between the Mix Engine and the MPPRs, and between the Mix Engine and the Main Studio Mixing Desk. This network will also provide connection for discovery of devices and Ember+ control, status and metering information.

The control port will provide webserver access to settings. This port is intended to run on a physically different network, so engineers/operators can interrogate/set device parameters on the system without their network overhead impacting on the AoIP network. The webserver can also be accessed via the AoIP port.

Standard GPIO Connector

This is a 15-way female 'D'-type connector which has 10 ports with user assignable direction & function, and a voltage free relay switched output with normally open and normally closed contacts. The Technician and Presenter Units have a single connector, and the Mix Engine has two of these connectors, allowing 20 x GPIO and 2 x relay closures.

Pin Number	Description
Pin 1	GPIO 1
Pin 2	GPIO 2
Pin 3	GPIO 3
Pin 4	GPIO 4
Pin 5	GPIO 5
Pin 6	Relay - Normally open contact
Pin 7	Relay - Normally closed contact
Pin 8	Relay - common
Pin 9	GPIO 6
Pin 10	GPIO 7
Pin 11	GPIO 8
Pin 12	GPIO 9
Pin 13	GPIO 10
Pin 14	Fused (200mA) +12V DC supply
Pin 15	Ground

When the pin is defined as an input then the pin should be pulled to ground to activate it. When the pin is defined as an output then when the output is active the pin will be pulled to ground – and is capable of sinking 20mA.

Analogue Audio Inputs & Outputs

The audio inputs and outputs on the mix engine are all on 25-way female 'D'-type connectors. (Note the same connector type for both inputs and outputs) so that standard Tascam analogue (AES59) cables can be used.

Pin Number	Analogue Input Description	Analogue Output Description
Pin 1	In 8 + (Phase)	Out 8 + (Phase)
Pin 2	In 8 GND	Out 8 GND
Pin 3	In 7 - (Non Phase)	Out 7 - (Non Phase)
Pin 4	In 6 + (Phase)	Out 6 + (Phase)
Pin 5	In 6 GND	Out 6 GND
Pin 6	In 5 - (Non Phase)	Out 5 - (Non Phase)
Pin 7	In 4 + (Phase)	Out 4 + (Phase)
Pin 8	In 4 GND	Out 4 GND
Pin 9	In 3 - (Non Phase)	Out 3 - (Non Phase)
Pin 10	In 2 + (Phase)	Out 2 + (Phase)
Pin 11	In 2 GND	Out 2 GND
Pin 12	In 1 - (Non Phase)	Out 1 - (Non Phase)
Pin 13	N/C	N/C

Pin Number	Analogue Input Description	Analogue Output Description
Pin 14	In 8 - (Non Phase)	Out 8 - (Non Phase)
Pin 15	In 7 + (Phase)	Out 7 + (Phase)
Pin 16	In 7 GND	Out 7 GND
Pin 17	In 6 - (Non Phase)	Out 6 - (Non Phase)
Pin 18	In 5 + (Phase)	Out 5 + (Phase)
Pin 19	In 5 GND	Out 5 GND
Pin 20	In 4 - (Non Phase)	Out 4 - (Non Phase)
Pin 21	In 3 + (Phase)	Out 3 + (Phase)
Pin 22	In 3 GND	Out 3 GND
Pin 23	In 2 - (Non Phase)	Out 2 - (Non Phase)
Pin 24	In 1 + (Phase)	Out 1 + (Phase)
Pin 25	In 1 GND	Out 1 GND

Audio Levels and dBFS equivalences

Each of the analogue inputs and outputs can be configured to set the desired 0dBFS line-up level. By default, this setting is 0dBFS = +18dBu, for operation in most European countries, however this can be modified to one of the following values: +12dBu, +15dBu, +18dBu, +20dBu, +22dBu or +24dBu, to match global requirements. This setting is changed via the web browser, by clicking Configuration > Audio Config > Physical Audio Setup (see section 7 Audio Config -> Physical Audio Setup Web Page)

3. AVN-MPPR Presenter Remote Unit



Mixer being controlled indicator LEDs. Green = connected mixer, Red = mixer waiting for "approval". These LEDs are hidden until lit, to prevent confusion with meter LEDs.

Mute button can be labelled as required: Mute, Cough, etc.

Main PoE plus network audio & data connection



Fig 3-1: AVN-MPPR Front and Rear

The MPPR Presenter Remote Unit - also known as the PRU, will provide control levels to the virtual mixer, and display the status information and data generated by the mixer. The virtual mixer audio output will be available on the rear panel Mix Output or via headphone outputs on the front panel.

Front Panel Controls

Status and Mixer ID LEDs

On the left side of the panel, there are a number of status LEDs and above the word “Mixer” there is also an indication of the virtual mixer being controlled. When the unit has been grabbed by a mix engine and assigned to a virtual mixer, the appropriate LED will be illuminated to indicate the virtual mixer currently under control. If the unit is not currently assigned to a virtual mixer, the Mixer ID LEDs will all flash red to indicate that this is the case.

There are also a number of status LEDs which are used to provide a basic overview of various system parameters. A software enabled limiter on the Virtual Mixer output is configured to prevent audio over-hitting. When the limiter is operational, the front panel Limit LED illuminates red. The front panel also has LED indication to warn of power supply failure, network and sync/clock failures.

Each of these LEDs can be illuminated in different combinations of colours and flashing or non-flashing states. The table on the next page provides and what each LED state signifies.

Led Name	State	Description
AoIP	Off	Unit has not joined an audio multicast group.
	Red	Unit has joined an audio multicast group but no audio data is being received
	Green	Unit has joined an audio multicast group and audio data is being received.
Ethernet	Red	No network connection
	Green	Network connected
Limit	Off	Audio level for the virtual mixer that is under control is OK
	Red	Audio level for the virtual mixer that is under control is limiting.
Auth	Flash Yellow	Unit has not yet been grabbed by a mix engine.
	Green	Unit has been grabbed by a mix engine
Clock	Red	PTP master offset clock is greater than 10000ns.
	Yellow	PTP master offset is less than 10000ns but greater than 1000ns.
	Green	PTP master offset is less than 1000ns. Or this unit is the master clock.
	Flash Yellow	PTP in listening state – master clock negotiation taking place.
Power	Red	Power state error
	Yellow	Power state warning
	Green	Power state is OK

Rotary Controls

The rotary encoders on the front panel act as level controls for the 4 audio sources assigned to the virtual mixer that the unit is currently controlling. Turning the encoder will increase/decrease the mix level by 4dB per step from Mute, then -80dB up to -60dB, switching to 2dB per step up to between -60dB and a maximum of +10dB gain. The total number of steps is 41 which represents just under 2 complete rotations and will be shown in the level display by the 21 LEDs. This level is shown on the scale by a 1-2-1 LED pattern, so that initially LED 1 will be lit then LEDs 1 & 2, then LED 2 only then LEDs 2&3 etc, so we have a total of 42 states between mute and maximum.

It is possible for a technician unit to lock out presenter units from controlling the signal levels for a virtual mixer. In this case, the rotary controls will be illuminated blue with the level or metering displayed by the LEDs around the control (depending on the display mode that is set – see below). If the user of the unit attempts to adjust a level by turning an encoder, the encoders will all flash blue to indicate that the user input was received but no level change will actually take place – the technician unit will have to reinstate control to the presenter unit to allow it to control the levels again.

There are 2 selectable display modes that allow the user to select what is displayed by the LEDs around the rotary encoders. The “Display Mode” can be set from the “Misc Settings” section in the web pages for the unit. In the web page menu, the modes are called “Level” and “Metering”.

Level Mode

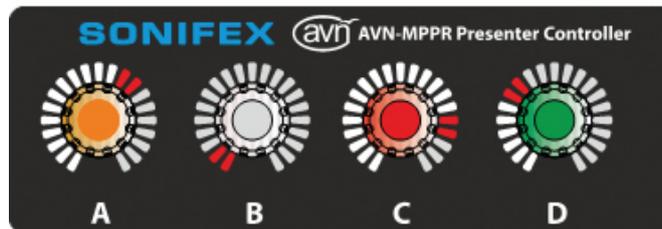


Fig 3-2A: AVN-MPPR Front Panel Illumination In Normal Operation

The default display mode is “Level”. In this mode, the level of each channel is shown by the LEDs around the rotary controls. The rotary controls are illuminated to show the signal presence of the assigned audio channel and will be off when no audio is present. The controls will be illuminated green, yellow or red when the audio input level is within certain thresholds; green being low/normal, yellow high and red the overload state.

Pressing the control will activate the metering display around the rotary control, with a system wide scale showing signal level in green, yellow and red sections. The metering will be displayed until a configurable timeout has expired or until the control is pressed or turned again. The timeout is configurable in the “Misc Settings “ section of the web page using the “Alternate Display Duration” setting. The default duration is 20 seconds.

Metering Mode

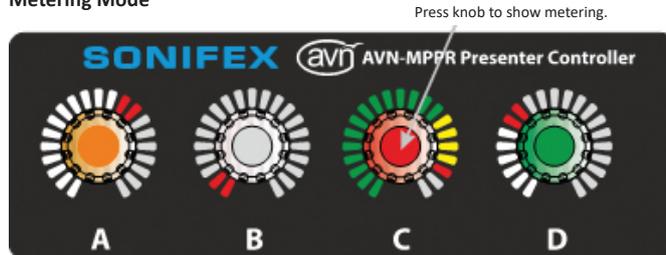


Fig 3-2B: AVN-MPPR Front Panel Illumination With Knob Pressed

The second display mode is “Metering”. In this mode, the metering data of each channel is shown by the LEDs around the rotary controls. The rotary controls are not normally illuminated in this mode.

Pressing or turning the control will activate the displaying of the current level for the channel. The level is displayed until the configured “Alternate Display Duration” timeout expired or until the control is pressed again.

Virtual Mixer Assignment

It is possible to reassign the virtual mixer (VM) for the MPPR via the front panel rotary controls. This is only possible if the unit is grabbed by a mix engine – this is indicated by the Auth led being illuminated green. To enter VM assignment mode, press and hold rotary controls A and B simultaneously for 3 seconds. Once the unit enters VM selection mode, rotary control D will be illuminated blue. Turning rotary control D will cycle through the VMs as indicated by the Mixer LEDs. Once the Mixer LED that corresponds to the desired VM selection is illuminated, press rotary control D to confirm the new selection. <TODO: Add more details here if the newly requested VM is unavailable>

Headphone sockets

XLR Mute

By default, the audio on the XLR output on the rear of the unit is not muted when headphones are connected to one of the sockets on the front of the unit. However, there is a “Headphone XLR Mute” configuration setting in the “Misc Settings” section of the webpages to enable the muting of the XLR output on headphone connection if required.

Attenuation

The headphones will have an additional software-configurable output level control (one for each headphone output) to set the attenuation of the signal to the headphone driver for comfortable levels at normal signal level from the output. At present we know of 3 headphone types - 120 Ohm (default), 2 kOhm (high impedance), and 8 Ohm (low impedance). The maximum output of the headphone drivers is +12dBu so the minimum attenuation parameter is 6db, which is present for all headphone types. The attenuation parameter will act as a second attenuation and will have a range from 0 to 24dB – the latter value will be chosen to provide sufficient range to easily cater for the lowest impedance headphones. The “6.35mm Att.” and “3.5mm Att.” attenuation settings can be set via the web pages in the “Misc Settings” section.

GPO button

The button between the Mixer LEDs and the rotary controls provides a virtual GPO from the unit that can be used on the Mix Engine to trigger a GPO on its remote port. This button will illuminate red when it has been selected by this MPPR and will be yellow when initiated by a paralleled MPPR or MPTR. A MPPR can only de-assert a GPO that it has originally asserted. However, the GPO can always be de-asserted by a MPTR. The pin selection of the GPO is determined by the VM that the MPPR is currently connected – VM1 maps to GPO1 and so on to VM8, which maps to GPO8. The text on the button is a plastic insert so can be changed to suit your particular application.

Reset button

The recessed reset button at the bottom left corner of the front panel triggers a hardware reset of the unit

IP address reset

As well as being able to set the IP address of the unit via the web pages, it is also possible to reset the IP address of the unit from the front panel to a factory default. To carry out the reset, press and hold the GPO button and rotary control D while the unit is booting up. This will take roughly 10 seconds. When the IP address is reset, the Ethernet LED will be illuminated Yellow and all 4 encoders and the GPO button will flash yellow for around 5 seconds. The unit will then reboot. The IP address of the unit will then be reset to the factory default of 192.168.0.100.

Rear Panel

The rear panel of the Presenter Unit has three connectors and two controls:

Network Connector

This is a Neutrik etherCON RJ45 CAT5e connector with latching lock with PoE plus for unit power

Mix Output Mono Analogue Output

The mix output is a XLR 3 pin XLR male output which is electronically balanced, which has the following connections:

Pin Number	Description
Pin 1	Screen
Pin 2	Phase
Pin 3	Non-phase

Standard GPIO Connector

This is a 15-way female 'D'-type connector with the same pin connects as for the AVN-PX8x4C Mix Engine.

Hardware ID Settings

These are two 16 position rotary switches, currently labelled ID1 Group and ID2. ID1 (Group) rotary switch selects the group assignment for the MPPR and is used by the Mix Engine when determining which MPPRs to grab and authorise. Currently ID 2 is unused, but it may be necessary to use this selection to extend the ID1 allocation if the number of group selections exceeds 16.

Mounting the AVN-MPPR Presenter Remote Unit

There are two mounting methods:

The AVN-MPDB Presenter controller desk mount bracket allows the Unit to be mounted either way up on the underside or top side of a desk.

The AVN-MPMB Presenter controller desk mount is a bracket that mounts to the underside of the Unit and allows it to be fixed to the top of a 3/8" Whitworth microphone stand screw socket. It has adjustments in various planes to allow it to be suitably positioned in front of, or to the side of, a Presenter.



Fig 3-3: AVN-MPDB Presenter Controller Desk Mount Bracket

4. AVN-MPTR Technician Remote Unit



Fig 4-1: AVN-MPTR Front and Rear

The MPTR Technician Remote Unit – also known as the TRU - allows a technician to have control of a Virtual Mixer, paralleling the Presenter Remote Unit controls. The MPTRs are assigned to a gallery and hence are normally tied to a Mix Engine. Note that no audio is present on the Technician’s Remote Unit – the monitor audio for this is provided by an output on the Mix Engine routed to the technician’s area, but this product has similar connectivity to the MPPR and we can supply audio enabled versions of the MPTR if required.

Front Panel Controls

Status LEDs

On the left side of the panel, there are a number of status LEDs which are used to provide a basic overview of various system parameters. A software enabled limiter on the Virtual Mixer output is configured to prevent audio over-hitting. When the limiter is operational, the front panel Limit LED illuminates red. The front panel also has LED indication to warn of power supply failure, network and sync/clock failures.

Each of these LEDs can be illuminated in different combinations of colours and flashing or non-flashing states. The table below provides an overview of what each of the LED states signifies.

Led Name	State	Description
AoIP	Off	AoIP LED not currently used.
Ethernet	Red	No network connection
	Green	Network connected
Limit	Off	Audio level for the virtual mixer that is under control is OK
	Red	Audio level for the virtual mixer that is under control is limiting.
Auth	Flash Yellow	Unit has not yet been grabbed by a mix engine.
	Green	Unit has been grabbed by a mix engine
Clock	Off	Clock LED not currently used.
Power	Red	Power state error
	Yellow	Power state warning
	Green	Power state is OK

Mixer Selection buttons

The Virtual Mixer (VM) to be controlled is selectable using the Virtual Mixer buttons labelled Pres 1 – Pres 8 on the front panel. (Note that key cap buttons are used so labels can be produced for different virtual mixer names). The mixer selection buttons are only active when the MPTR is grabbed by a mix engine (as indicated by a green Auth LED). When a VM is selected, the corresponding button will be illuminated green (or blue if MPPR lock out is set for that VM – see below). If no VM is selected, then all the mixer select button LEDs will be off. Once a VM has been selected, the rotary encoders act in the same way as on the Presenter Unit. (See section 3, Rotary Controls – note that the VM assignment mode detailed in section 3, Metering Mode, is not present on the MPTR)

The MPTR is able to stop MPPRs that are assigned to a particular VM from controlling the source levels (see section 3, Rotary Controls, for details on the MPPR lock out behaviour). To initiate the MPPR lockout, press and hold the corresponding mixer select button for 2 seconds. The Mixer select button will be illuminated blue to indicate that the MPPR lock out is set for that VM. To clear the MPPR lockout and allow MPPRs to control the levels again, press and hold the mixer select button for 2 seconds. The LED will turn green to indicate normal operation.

GPO and Enable button

In normal operation, the GPO (or user selected text) button shows only whether the GPO has been activated by a Presenter Unit and pushing it does nothing. When the Enable button is selected (which is shown when the Enable button is illuminated green), the GPO button then acts in the same way as on the Presenter Unit, i.e. the Enable button acts as a latch enabling the operation of the GPO button. The GPO button will illuminate red when it has been selected by this MPTR and will be yellow when initiated by a paralleled MPPR or MPTR. A MPTR can de-assert any GPO regardless of the original device that asserted it.

OLED Display

The OLED display allows the technician to view system info such as the IP address, serial number etc. It also allows the user to name the unit, check or change the network settings, set brightness of the LEDs or contrast of the OLED, and to change the mixer sources used for the selected Virtual Mixer. These technician menus are selected by pressing the menu fast key (see below) or holding down the centre button on the selector spinwheel for around half a second, and they can be set to require a password before access is granted.

Menu fast keys

There are 4 menu fast keys available to help jump to the corresponding menu on the OLED display.

- “Menu” jumps to the Main menu.
- “Assign” jumps to the VM assignment menu which allows the MPTR to assign a VM to a particular group of MPPRs
- “Release” jumps to the release menu which allows the MPTR to tell the mix engine to release a particular group of MPPRs.
- “Grab” jumps to the grab menu which allows the MPTR to tell the mix engine to grab a particular group of MPPRs.

Reset button

The recessed reset button at the bottom left corner of the front panel triggers a hardware reset of the unit.

Power button

The Front Panel on/off button is configured to power up the unit from Standby mode and can be enabled to provide a power off function. The function will always default to power off disabled - the user would need to enter the system menu to enable this function. When the power off function is enabled, pressing and holding the power button for 2 seconds will power down the unit.

Rear Panel

The rear panel of the Technicians Unit has two connectors:

Network Connector

This is a Neutrik etherCON RJ45 CAT5e connector with latching lock with PoE plus for unit power.

Standard GPIO Connector

This is a 15-way female 'D'-type connector with the same pin connection details as for the AVN-PX8x4C Mix Engine Rack.

5. Third Party API

We are using a protocol called Ember+ for the IP control so all control and status messages are available to third parties using Ember+.

There is a simple app (EmberPlusViewer) for a Windows PC that can be invoked to show this functionality and Ember+ is a freely usable protocol. We will publish relevant schemas as we develop them, with full specifications of the parameters used.

We also have available a simple PC application that will use Bonjour (mDNS-SD) to show devices available on the network and to provide basic device info about them.

6. Operational Specification

Startup

All units will have a unique ID since each unit will need 1 MAC address for each Ethernet port. The serial number of the unit will also be embedded into the device, which is accessible via Ember+ and is used in the default naming of the device.

By default, the units' IP addresses will be provided statically from an internally stored value in Flash, but this can be changed, though it is not recommended, to use a Dynamic Addressing Mode. This will attempt to connect to a DHCP server on the network to gain an IP address from it. If this fails, then the unit will fall-back to an AutoIP address range by trying to connect to a series of IP addresses in a defined range.

All units have a built in recovery system, that has minimal operating firmware and an update web page that is accessed at a fixed static IP address of 192.168.0.100 on the Ethernet port and 192.168.1.100 on the AoIP port. This recovery system is designed to repair a system that is failing due to a bad firmware upgrade and will start automatically if the current firmware – that is stored on the embedded SD card – fails to start correctly on 3 tries. In extremis, the recovery system will allow a system to be rebuilt on a brand new SD card, though this would also require the system setup to be re-entered.

The Virtual Mixers in the Mix Engine are controlled by settings from an Ember+ interface that are sent via the AoIP network from the assigned Presenter or Technician units. The metering levels are sent from the Mix Engine and received by the appropriate Presenter or Technician units.

The Mix Engine has a webserver that is used to access the system settings for the Virtual Mixers and for the associated Remote Units. When a Remote Unit comes online and is authorised then it will advertise itself as being available to the network using mDNS messages. The Mix Engine will receive these messages and determine if the device 'belongs' to a Virtual Mixer

that it controls. This association will be driven by either the Hardware ID settings on the back of the PPRs, or by internal & front panel selection on the MPTRs.

Authorisation

When a MPPR advertises itself to the network, it also reports the value set by the ID1 Group selector switch on the rear of the unit. When the mix engine receives the advertisement, it checks whether the MPPR is in its list of allowed devices. If the MPPR is in the list and if the mix engine is set to grab the group reported by the MPPR, the MPPR will be grabbed by the mix engine (the Auth led will turn green to show this) and it will be assigned to the virtual mixer stored in the allowed devices. The virtual mixer LEDs (numbers) will all flash amber together to indicate that no virtual mixer allocation has been made.

If the MPPR is not listed in the allowed devices list on the mix engine, it will not be grabbed by the mix engine and the Auth LED on the MPPR will remain in the flashing yellow state. The MPPR can be added to the allowed devices list on the Mix Engine or any MPTR via their webpages, or even their front panels.

Once a MPPR is authorised, it will fetch the settings from the Mix Engine and allow the presenter full control of the levels and receive audio from the mixer output.

Control Precedence

The normal operation is expected to be a single MPPR controlling a Virtual Mixer, but when other units, either Presenter or Technician, are connected and are controlling the same Virtual Mixer then all units connected to a Virtual Mixer will share the control, i.e. level controls are paralleled. However it may be that MPTRs will want to take away the level control from MPPRs, (see sections 3, Rotary Controls, and 4, Mixer Selection Buttons)

Group/Studio Assignment

The MPPRs are normally assigned as a studio to a group and that studio is closely aligned with a gallery which contains a Mix Engine and 1 or 2 MPTRs. To 'move' a studio from one gallery to another, the user will need to de-allocate the group from one Mix Engine and assign it to another. The Grab function does this automatically, though in a managed system it would be good practice to release a group from one Mix Engine before grabbing it in another.

To do this Mix Engine that has current ownership of the group will need to relinquish that control by entering the menu or web page on a MPTR (or Mix Engine) and going to the Assignment. Select the group to be released and allow it to be de-assigned. Now the other gallery MPTR (or Mix Engine) can perform a similar function, but this time select the group and grab it.

Configuration

The normal configuration is done via a webserver on the Mix Engine. This will allow the user to define everything about the Mix Engine, its Virtual Mixers and the Remote Units connected to it, with the following settings:

- Network Settings.
- Connectivity.
 - * Number of Virtual Mixers and their associated ID.
 - * Incoming audio channels by connector and port.
 - * Outgoing audio channels by connector and port.
 - * Selected AoIP input channels.
 - * Creation of outgoing AoIP output sources.
- Naming.
 - * The unit itself with ID number.
 - * The Virtual Mixers.
 - * The analogue input sources.
 - * The AoIP sources if the Ravenna name is not sufficiently informative.
- Virtual Mixer Setups by Number (1-8).
 - * The 4 input sources used.
 - * Output routing.
 - * GPIO port setup.
 - * Controls enabled/disabled at individual control level.
 - * Sharing settings for other Presenter and Technician Units.
- GPIO Interconnection Map.
- Unit Parameters.
 - * MPPR headphone attenuation x 2
 - * LED brightness settings
- System Parameters.
 - * Button actions and timeout for metering/level on remote level controls.
 - * Headphone attenuation settings.
 - * Authorisation and its requirements.

System Parameters should be the same for all Mix Engines, so changing the setting on one Mix Engine will cause the parameters on all Mix Engines to be altered, and as new Mix Engines are connected to the system, they will fetch the current settings from an active Mix Engine. Equally as new MPPRs and MPTRs are connected they will fetch the appropriate info from their connected Mix Engine and update global parameter values used by them.

The webserver pages will also allow firmware updating of local and remote units either on connection or on webpage command.

Finally, there will be 2 configuration file options.

1. To save and recall the complete setup, as above, to or from local memory on a PC. This is so that if a Mix Engine unit is replaced, we can immediately upload the settings to a new unit which should include the network settings.
2. A partial load for system wide parameters to ensure that changes can be uploaded from other Mix Engine units within an installed system, but without changing the local network settings.

7. Webpages & Local Display Settings (Mix Engine)

Some of the generic webpages – Information, Network Settings, PTP Settings are covered in the AVN Overview document. The specific pages for the presenter mixer products are explained here.

Mix Engine web page menu structure

Main Page

-	Information	Information about the device and firmware
-	Configuration	Configuration top level menu
	- Network	Network Settings (for both ports)
	- PTP Profiles	PTP Settings
	- Audio Config	
	- VM Sources	Setup each VM with 1-4 audio sources
	- VM Metering	Set multicast addresses for metering info
	- AoIP Output Streams	Setup AoIP streams created by the mixer
	- Physical Audio Setup	Settings for Audio Ins and Outs on rear panel
	- Group Config	
	- Allowed Devices	Enable and disable various discovered devices
	- VM Assignments	Settings for devices VM used in each group
	- Group Assignments	Selection of the 4 available Groups
	- Group Aliases	Aliases for the 16 possible Groups
	- Misc Settings	Miscellaneous settings page
-	System	Firmware and configuration file update page

Information Web Page

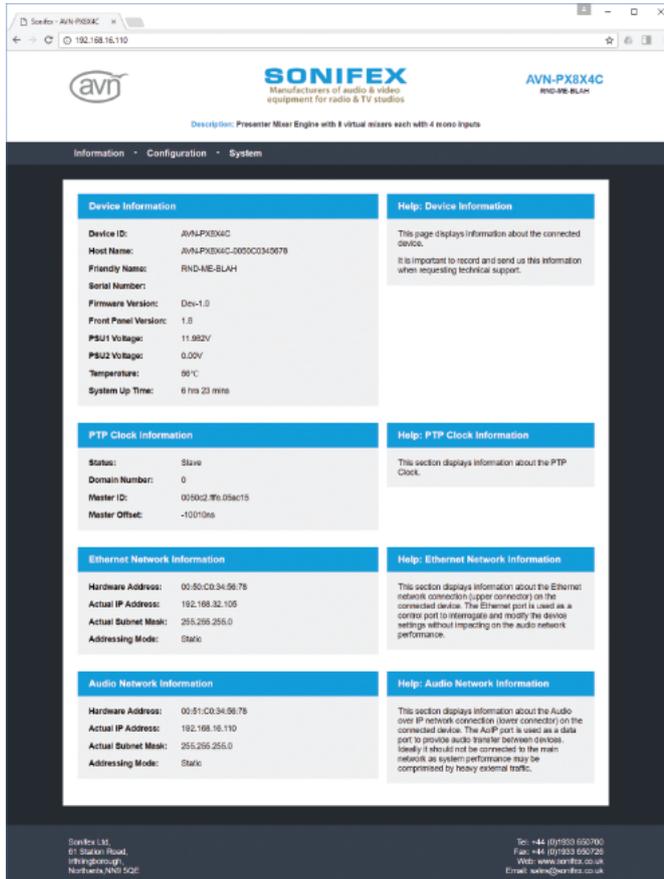


Fig 7-1: Information Web Page

Audio Config -> VM Sources Web Page

This web page allows the user to setup the 8 virtual mixers on a mix engine. Select the VM you wish to change from the VM Select: dropdown list, and then press the edit button associated with the source you wish to setup. This will open a dialog, where you can select the input source and the various parameters that may be associated with it.

These 3 dialogs show the 3 different source selections available. The first is pretty self-explanatory as the VM source is unused and will contain no audio. Levels will continue to be indicated on the MPPR and MPTR but will obviously have no effect on the mixed output.

The second dialog will choose a physical analogue audio input from the back of the mix engine. There are 3 connectors each with 8 audio inputs to choose from – these are imaginatively numbered 1-24. The actual text here can be changed in the Physical Audio Setup web page to reflect the actual connection

Finally, there is the ability to select AoIP sources. This lists all the streams that are available on the network and that have been authorised as valid. It is then necessary to select the actual channel that you wish to use from that stream. Most of the time the streams will have a channel count of 2 or 8.

Fig 7-2: Audio Config -> VM Sources Web Page

Fig 7-3: Source Dialog

Fig 7-4: Physical Input Dialog

Fig 7-5: AoIP Input Dialog

Audio Config -> VM Metering Web Page

This web page allows the user to designate the Multicast address to be used for the metering streams that are used by the MPPR and MPTR to show the level information on each VM input. The address should be a unique address across the whole AVN system

Virtual Mixer Metering Setup		Help: Virtual Mixer Metering Setup	
VM1 Multicast IP Address:	<input type="text" value="239.1.128.0"/>	The metering information that is provided to the MPPR and MPTR units is sent via IPv4 multicast and is sent separately for each VM. This page allows the user to designate which addresses are used.	
VM2 Multicast IP Address:	<input type="text" value="239.2.128.0"/>	VM1 - 8 Multicast IP Address: This sets the IPv4 multicast destination address for the metering data on the corresponding virtual mixer.	
VM3 Multicast IP Address:	<input type="text" value="239.3.128.0"/>	Press submit to save the changes to the device.	
VM4 Multicast IP Address:	<input type="text" value="239.4.128.0"/>	NOTE: Currently, any changes made here will only take effect after the system has restarted.	
VM5 Multicast IP Address:	<input type="text" value="239.5.128.0"/>		
VM6 Multicast IP Address:	<input type="text" value="239.6.128.0"/>		
VM7 Multicast IP Address:	<input type="text" value="239.7.128.0"/>		
VM8 Multicast IP Address:	<input type="text" value="239.8.128.0"/>		
<input type="button" value="SUBMIT"/>			

Fig 7-6: Audio Config -> VM Metering Web Page

Audio Config -> AoIP Output Streams Web Page

The AoIP Output Streams web page allows the user to specify the type and multicast IP address of the stream outputs generated by the Mix Engine.

There are just 2 streams, the first contains 8 channels and consists of the 8 VM mix outputs (VM1 output is channel 1 etc). and the 2 channel stream with the VM outputs selected by the MPTRs. The MPTRs are assigned a device number and channel 1 contains the audio stream being used by device 1 and channel 2 contains stream for device 2. Once again each multicast address should be unique throughout the AVN system.

AoIP Output Streams

Source Select:

DSCP:

Multicast IP Address:

Stream Name:

SUBMIT

Help: AoIP Output Streams

Source Select: Selects the AoIP source to view and change settings. There are 2 output streams. An 8 channel stream containing the mono output of each VM and a 2 channel stream containing the monitored VM channel for each MPTR.

DSCP: The Differentiated Services Code Point value is used by Diffserv to control the precedence of outgoing AoIP packets for the selected source.

Multicast IP Address: This is the IPv4 multicast destination address for the selected source.

Stream Name: This is the stream name for the selected source that will be visible to other devices on the network. This is currently fixed.

Press submit to save the changes to the device.

Fig 7-7: Audio Config -> AoIP Output Streams Web Page

Audio Config -> Physical Audio Setup Web Page

The Physical Audio Setup web page allows the user to change the settings for the audio inputs and outputs on the rear panel of the Mix Engine.

Audio Input Settings

Input Channel Select:

Input Name:

Input Enable:

Audio Line Up:

Help: Audio Input settings

Input Channel Select: Selects the physical input channel to view and change settings. There are a total of 24 inputs with 8 inputs on each connector.

Input Name: This is the name assigned to the selected input and is used when selecting a source for a particular VM input.

Input Enable: This enables the selected input. Only enabled inputs will be available for VM source selection.

Audio Line Up: Each input has a variable line up which sets the analogue audio level that corresponds to full scale digits in digital levels.

Audio Output Settings

Output Channel Select:

Output Audio Source:

Audio Line Up:

SUBMIT

Help: Audio Output Settings

Output Channel Select: Selects the output channel to view and change settings.

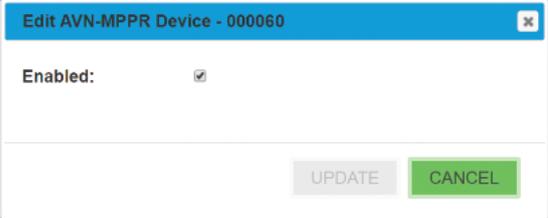
Output Audio Source: This selects the audio source for the selected output.

Audio Line Up: Each output has a variable line up which sets the analogue audio level that corresponds to full scale digits in digital levels.

Press submit to save the changes to the device.

Fig 7-8: Audio Config -> Physical Audio Setup Web Page

Adding a device will give a dialog with 2 ways of choosing a new device – either by entering the serial number of the part if you know it. The serial number can be read on the back of the unit and is entered as all 7 digits but without the TL prefix. Alternatively new devices can be discovered, where a list of available connected devices is shown and the user can select the appropriate one. In both cases the device can be enabled or disabled after selection and for the MPTR the unit ID can be selected.

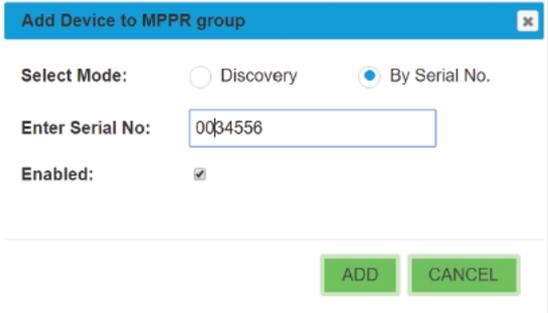


Edit AVN-MPPR Device - 000060 [X]

Enabled:

UPDATE CANCEL

Fig 7-10: Group Config -> Editing a device



Add Device to MPPR group [X]

Select Mode: Discovery By Serial No.

Enter Serial No:

Enabled:

ADD CANCEL

Fig 7-11: Group Config -> Adding a device

Group Config ->VM Assignment Web Page

The Group Authorisation web page allows the user to select a group and then to assign the VM that will be used for devices in that group. There are a maximum of 128 MPPR devices available and for each of 16 groups in each mix engine they can be assigned a Virtual Mixer – or of course remain unassigned. Once a group is controlled or grabbed by a mix engine then then assignment is used to route the virtual mixer audio as long as the MPPR is set to be a member of that group on the group selector switch on the MPPR rear panel. To edit a VM used by a device, first select the group to be edited in the dropdown selection at the top of the page, then scroll or page through the device list to the desired MPPR.

VM Assignments

Group Select: Studio 3 ▼

Edit

Presenter Devices	Serial	Online	G	VM
AVN-MPPR-000054	000054			0
GROUP2_1	000058			0
AVN-MPPR-0083523	0083523			0
GROUP4_1	000057			0
GROUP4_0	000050			0
AVN-MPPR-000053	000053	192.168.16.140	5	4
GROUP3_1	000053			0
GROUP2_0	000056			0

Page 1 of 1 1 to 8 of 8

Help: VM Assignments

Group Select: Selects the group to show the authorised devices.

VM Assignment Table: The table shows the list of devices that are authorised for the selected group.

To change the settings of an existing device, select the entry in the table and press the edit button in the table toolbar. After making the required changes in the edit dialog, press the Update button to implement the changes.

Fig 7-12: Group Config ->VM Assignment Web Page

Edit Record 6 on Group 3 ✕

VM Number: VM5 ▼

UPDATE
CANCEL

Group Config ->Group Assignments Web Page

The Group Assignment web page allows the user to select the 4 active groups to be assigned to the Mix Engine from the 16 groups available.

Using both Grab – to add a group to an unused slot and release to free a group from an assigned slot will cause a double confirmation dialog with the second dialog swapping the Yes No positions to absolutely ensure that the new group assignment is what the user wants. In later software there will be information about groups that are assigned elsewhere as the grab function will automatically remove the group from other mix engines as it is grabbed locally.

If another Mix Engine is already assigned to a group it normally is forced to release it when the user selects a group here, but if the Mix Engine is disconnected from the network or de-powered then this cannot happen. Consequently when this other Mix Engine is connected there will be a clash as both Mix Engines will want to have control of the group. In this case the newest Mix Engine will fail to gain control and a message will be shown on its front panel and the above screen will show RESOLVE instead of RELEASE. Pressing this will allow the user to relinquish control of the group or grab the group and force the other Mix Engine to relinquish control.

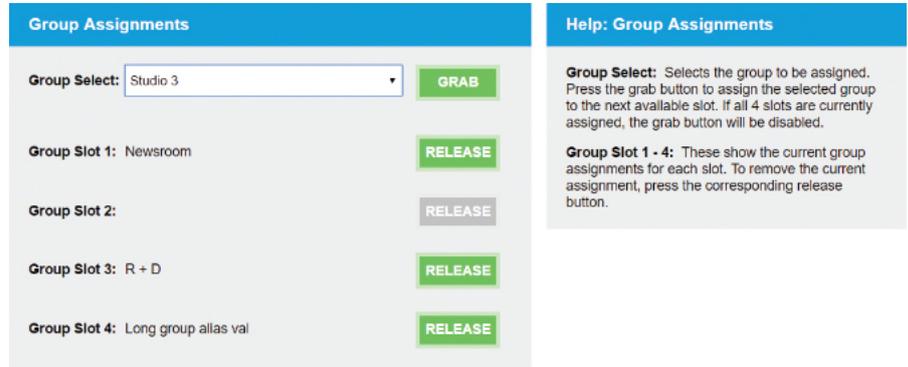


Fig 7-13: Group Config ->Group Assignments Web Page

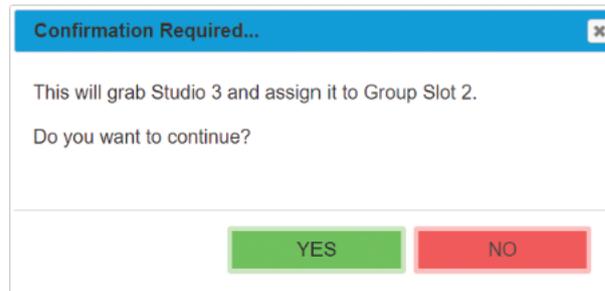


Fig 7-14: Confirmation Dialog

Group Config ->Group Aliases Web Page

The Group Aliases web page allows the user to rename the groups for more easy recognition in group selection dialogs. The group selected is referenced by the MPPR back panel ID 2 Group select rotary switch.

Group Aliases

Group Select: Group 6

Group Alias: Newsroom2

Group 0: Zero
Group 1: 1
Group 2: R + D
Group 3: Studio 3
Group 4: Long group alias val
Group 5: Newsroom
Group 6: Group 6
Group 7: Group 7
Group 8: Group 8
Group 9: Group 9
Group A: Group A
Group B: Group B
Group C: Group C
Group D: Group D
Group E: Group E
Group F: Group F

SUBMIT

Help: Group Aliases

Group Select: Selects the group to view and change settings.

Group Alias: This assigns an alias name to the selected group.

Group 0 - F: These show the current group aliases for each group.

Press submit to save the changes to the device.

Fig 7-15: Group Config ->Group Aliases Web Page

Misc Settings Web Page

The Misc Setting web page is used to change the brightness of the front panel LEDs

Front Panel Settings

Brightness: - 254 +

SUBMIT

Help: Front Panel Settings

Brightness: Sets the LED brightness.

Fig 7-16: Misc Settings Web Page

System Web Page

The system web page allows the user to update the firmware ; to save and load complete configurations from saved files; and to save the system log to a file for examination of fault and conditions. The new firmware will have to be available on the connected PC. These files are downloadable from the Sonifex website – www.sonifex.co.uk and will have an .swu suffix. The upgrade will take around a minute to complete. If the upgrade fails, then there is a fallback recovery system that is permanently available to the unit, which will cause the unit to enter a default IP state which can be accessed from a browser at a URL of <http://192.168.0.100:8080> Again select the .swu file and click the upgrade button.

The front panel has its own firmware, and this is embedded into the main code above. If the unit starts up and recognises that the front panel code in the firmware is a different version to that currently stored in the front panel then the main board will perform an update on the front panel. It does this by restarting the front panel in a bootstrap mode where the status LEDs 1&2 and 3&4 will flash alternately and where the display will show a progress bar for the update of around 30 seconds. The front panel can be forced into bootstrap mode by holding down the centre ok button and the bottom arrow on the roundel navigation control during a power or reset cycle.

The screenshot displays the System Web Page interface with four primary sections, each with a corresponding help sidebar:

- Update Firmware:** The main area contains the text "Please visit our [software downloads](#) page for firmware updates." and "Current Firmware Version: D1.1.539". Below this is a "Choose File" button (disabled, showing "No file chosen") and an "UPDATE" button. The help sidebar states: "The current firmware version on this unit is shown. Click on the link to visit the Sonifex website to check for new firmware updates. If an update is available, download the latest file. The file will have the '.SWU' extension. Click the select button to locate the new firmware file and then click Update."
- Save Configuration To A File:** The main area features a "SAVE CONFIG" button. The help sidebar states: "The current configuration can be written to a local file by clicking the Save Config button."
- Load Configuration From A File:** The main area includes "Overwrite Network Settings:" with a radio button, a "Choose File" button (disabled, showing "No file chosen"), and a "LOAD CONFIG" button. The help sidebar states: "The current configuration can be overwritten from a previously saved file. Click Choose file to select the required configuration file and then click the Load Config button."
- Save System Log To A File:** The main area features a "SAVE LOG" button. The help sidebar states: "The System Log records system events which may be useful for resolving configuration issues."

Fig 7-17: System Web Page

Mix Engine local screen menu structure

Main Page

-	Sys Info	Information about the device and firmware
-	Network	Network Settings (for both ports)
	-	Friendly Name
		Set Friendly Name for unit
	-	Ethernet
		-
		Set Mode
		Select Dynamic or Static IP Usage
		-
		Set Static IP Address
		Static IP Address setting
		-
		Set Static Subnet Mask
		Static Subnet Mask
	-	AoIP
		-
		Set Mode
		Select Dynamic or Static IP Usage
		-
		Set Static IP Address
		Static IP Address setting
		-
		Set Static Subnet Mask
		Static Subnet Mask
-	Display	
	-	Contrast
		Set Contrast of OLED display
	-	Brightness
		Set Brightness of LED indicators
-	Group Config	
	-	Release Group
		Select a group to be released from the device
	-	Grab Group
		Select a group to be added to the device
	-	VM Assign
		Selections to change the VM of a device in a group
-	Close	Close the menu and return to main screen

The display and roundel on the front page allows the user to perform a subset of the functions available on the web pages. It is a little more cumbersome than the web pages as data entry is not as simple without a keyboard, but for an occasional, or emergency change to the setup it is quite usable. The table above shows the structure of the menu screens. The menu is entered by pressing and holding down the roundel centre button – which can be also considered as the enter button – or by pressing the MENU fast key. Use the up and down buttons, or the spinwheel to move to the desired menu selection and then press the enter button. At this level the left button acts like a back key and will move back through the menu structure. And the MENU fast key will exit the menu or sys info and return to the main screen.

Eventually the user will enter either a list of options – with the active option ticked, or will enter a dialog where a parameter can be changed. In a list move the selection to the new choice and press the enter button, followed by moving to the back or close option to exit the list or use the left button to step back along the menu structure. In dialogs the user will have exit options – usually YES/NO or OK/CANCEL use the left and right keys to move between these actions and then press the enter button. If there is a parameter to be changed use the up and down buttons to move between the parameter and the exit options. In the parameter the spinwheel allows the user to change the highlighted element until the setting is correct when a down key followed by the YES or OK option will update the parameter.

The three group config menu selections can be entered directly by pressing the appropriate fast key when the main screen is shown.

8. Webpages (Presenter Remote)

MPPR web page menu structure

Main Page		
-	Information	Information about the device and firmware
-	Configuration	Configuration top level menu
	-	Network
	-	PTP Profiles
	-	Misc Settings
-	System	Firmware and configuration file update page

All but the Misc Settings web page on the MPPR have similar functions and controls to the Mix Engine as shown above.

Misc Settings Web Page

The Misc Settings web page allows the user to set the brightness and LED knob display options and to set the audio attenuation to be applied to the 2 types of jack socket (1/4inch and 3.5mm) on the front panel.

The screenshot displays two sections of the web page: 'Front Panel Settings' and 'Audio Settings'. Each section includes a 'Help' panel on the right side.

Front Panel Settings:

- Brightness:** A numeric input field with a red minus button on the left and a green plus button on the right. The value is 128.
- Display Mode:** A dropdown menu currently set to 'Level'.
- Alternate Display Duration:** A dropdown menu currently set to '30 Seconds'.

Help: Front Panel Settings:

- Brightness:** Sets the LED brightness.
- Display Mode:** Sets the default mode of the LEDs around the rotary controls.
- Alternate Display Duration:** This sets the period the metering is shown in level display mode, or the volume level is shown in metering display mode, when a control is clicked.

Audio Settings:

- 6.35mm Att. (dB):** A numeric input field with a red minus button on the left and a green plus button on the right. The value is 6.
- 3.5mm Att. (dB):** A numeric input field with a red minus button on the left and a green plus button on the right. The value is 6.
- Headphone XLR Mute:** A radio button that is currently unselected.

Help: Audio Settings:

- 6.35mm Att. (dB):** Sets the attenuation of the 6.35mm jack on the front of the unit. Value is an integer between 0 and 24 dB.
- 3.5mm Att. (dB):** Sets the attenuation of the 3.5mm jack on the front of the unit. Value is an integer between 0 and 24 dB.
- Headphone XLR Mute:** Sets whether to mute the rear panel XLR output, when headphones are connected to one of the front panel sockets. Press submit to save the changes to the device.

At the bottom of the Audio Settings section, there is a grey 'SUBMIT' button.

Fig 7-18: Misc Settings Web Page

System Web Page

The system web page allows the user to update the firmware ; to save and load complete configurations from saved files; and to save the system log to a file for examination of fault and conditions. The new firmware will have to be available on the connected PC. These files are downloadable from the Sonifex website – www.sonifex.co.uk and will have an .swu suffix. The upgrade will take around a minute to complete. If the upgrade fails, then there is a fallback recovery system that is permanently available to the unit, which will cause the unit to enter a default IP state which can be accessed from a browser at a URL of <http://192.168.0.100:8080> Again select the .swu file and click the upgrade button.

The front panel has its own firmware, and this is embedded into the main code above. If the unit starts up and recognises that the front panel code in the firmware is a different version to that currently stored in the front panel then the main board will perform an update on the front panel. It does this by restarting the front panel in a bootstrap mode where the encoder knobs 1&2 and 3&4 will flash alternately and where the VM select LEDs will show the progress for the update of around 30 seconds. The front panel can be forced into bootstrap mode by holding down the encoder knobs 1 & 3 during a power or reset cycle.

9. Webpages & Local Display Settings (Technician Remote)

MPTR web page menu structure

Main Page		
-	Information	Information about the device and firmware
-	Configuration	Configuration top level menu
	- Network	Network Settings (for both ports)
	- Misc Settings	Miscellaneous settings
-	System	Firmware and configuration file update page

All but the Misc Settings web page on the MPTR have similar functions and controls to the Mix Engine as shown above.

Misc Settings Web Page

The Misc Settings web page allows the user to set the brightness and LED knob display options on the front panel

Front Panel Settings

Brightness: - 255 +

Display Mode: Level ▾

Alternate Display Duration: 30 Seconds ▾

SUBMIT

Help: Front Panel Settings

Brightness: Sets the LED brightness.

Display Mode: Sets the default mode of the LEDs around the rotary controls.

Alternate Display Duration: This sets the period the metering is shown in level display mode, or the volume level is shown in metering display mode, when a control is clicked.

Press submit to save the changes to the device.

Fig 7-19: Misc Settings Web Page

System Web Page

The system web page allows the user to update the firmware ; to save and load complete configurations from saved files; and to save the system log to a file for examination of fault and conditions. The new firmware will have to be available on the connected PC. These files are downloadable from the Sonifex website – www.sonifex.co.uk and will have an .swu suffix. The upgrade will take around a minute to complete. If the upgrade fails, then there is a fallback recovery system that is permanently available to the unit, which will cause the unit to enter a default IP state which can be accessed from a browser at a URL of <http://192.168.0.100:8080> Again select the .swu file and click the upgrade button.

The front panel has its own firmware, and this is embedded into the main code above. If the unit starts up and recognises that the front panel code in the firmware is a different version to that currently stored in the front panel then the main board will perform an update on the front panel. It does this by restarting the front panel in a bootstrap mode where the encoder knobs 1&2 and 3&4 will flash alternately and where the VM select buttons and the display will show a progress bar for the update of around 30 seconds. The front panel can be forced into bootstrap mode by holding down the encoder knobs 1 & 3 during a power or reset cycle.

MPTR local screen menu structure

Main Page

-	Sys Info	Information about the device and firmware
-	Network	Network Settings (for both ports)
	- Friendly Name	Set Friendly Name for unit
	- Ethernet	
	- Set Mode	Select Dynamic or Static IP Usage
	- Set Static IP Address	Static IP Address setting
	- Set Static Subnet Mask	Static Subnet Mask
-	Display	
	- Contrast	Set Contrast of OLED display
	- Brightness	Set Brightness of LED indicators
-	Group Config	
	- Release Group	Select a group to be released from the device
	- Grab Group	Select a group to be added to the device
	- VM Assign	Selections to change the VM of a device in a group
-	Close	Close the menu and return to main screen

The MPTR menu options have similar functions and identical controls to the Mix Engine as shown above.

10. Technical Specifications

AVN-PX8x4C Audio Inputs – Gain setting 0dBFS = +18dBu unless otherwise stated

Parameter	Line Input
Input Impedance	>20kΩ balanced
0dBFS line-up	+15/+18/+20/+22/+24dBu Balanced*
Frequency Response	20Hz to 20kHz, +0/-0.2dB
THD+N	<-110dBFS, -30dBFS, 20Hz to 20kHz, All input gain settings, 20kHz BW
Noise	-110dBFS, 20kHz BW, Rs=200Ω
Crosstalk	<-100dB
Common Mode Rejection	>70dB @ 1kHz, All input gain settings

AVN-PX8x4C Audio Outputs – Gain setting 0dBFS = +18dBu unless otherwise stated

Parameter	Line Output
Output Impedance	<50Ω balanced
0dBFS line-up	+15/+18/+20/+22/+24dBu Balanced*
Frequency Response	20Hz to 20kHz, +0/-0.5dB
THD+N	<-110dBFS, -30dBFS, 20Hz to 20kHz, All input gain settings, 20kHz BW
Noise	-110dBFS, 20kHz BW, Rs=200Ω

AVN-MPPR Audio Output – Gain setting 0dBFS = +18dBu unless otherwise stated

Parameter	Line Output	Headphone Output
Output Impedance	<50Ω balanced	Drives 150mW into 8Ω to 600Ω headphones
0dBFS line-up	+15/+18/+20/+22/+24dBu Balanced*	+20dBu Maximum when no attenuation factor applied.
Frequency Response	20Hz to 20kHz, +0/-0.5dB	20Hz to 20kHz, +0/-0.2dB
THD+N	<-110dBFS, -30dBFS, 20Hz to 20kHz, All input gain settings, 20kHz BW	<-108dBFS, -30dBFS, 20Hz to 20kHz, unity gain, 20kHz BW
Noise	-110dBFS, 20kHz BW, Rs=200Ω	-110dBFS, 20kHz BW

*+18dB, +22dB and +24dB are handled in hardware, +15dB and +20dB in DSP

AVN-PX8x4C Power – Dual redundant IEC 85 - 264VAC 47 – 63Hz Max 60W 2Amp Fused type T 2A L

AVN-MPPR PoE Power- Standard 802.3af, Class 3, PD Power Range 6.49W to 12.95W, Typical PSE Power Usage 14W, Max PSE Power Usage 15.4W

AVN-MPTR PoE Power - Standard 802.3af, Class 3, PD Power Range 0.44W to 12.94W, Typical PSE Power Usage 7W, Max PSE Power Usage 15.4W

Network Capability - 10/100/1000BASE-T IEEE 802.3 compliant, Automatic MDI/MDIX crossover

SFP Type - SGMII, 1000BASE-X & 100BASE-FX Media support for both Copper and fibre SFP modules

Network Requirements - IEEE1588-2008, IGMP, QoS (DiffServ)

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