



# User manual

## AuviTran Audio ToolBox AxC-AES67



User manual version	Date	Owners	Firmware version
1.0.0	Mai 2026	SBT / OPT	From 3.0 / 4.016

# PRECAUTIONS

- Do not apply excessive pressure on connectors or any other part of the board. Do not touch the metallic sharp parts (pins) of the product.
- This product is electrostatic sensitive; this must be checked before it is touched or used.
- The disconnect devices of the Audio ToolBox unit are the appliance inlet of the auxiliary power supply and the appliance inlet on the rear side of the unit. These must be easily reachable.
- To prevent electric shock, unplug the unit before handling. The achievement of other operations not mentioned in this document is prohibited. Repairs can be performed only by a technician trained and qualified.
- Each connection must be Safety Extra Low Voltage kind (SELV), and must stay inside buildings.

# LIMITATION OF LIABILITY

In no case and in no way, the provider of this Product (Auvitrans, the distributor or reseller, or any other party acting as provider) shall be liable and sued to court for damage, either direct or indirect, caused by and to the user of the board and which would result from an improper installation or misuse of the Product. "Misuse" and "improper installation" mean installation and use not corresponding to the instructions of this manual.

Please note that graphics given in this manual (drawings and schemes) are only examples and shall not be taken for a real vision of all the equipment configuration.

Auvitrans is constantly working on the improvement of the products. For that purpose, the products functionalities are bound to change and be upgraded without notice. Please read carefully the User's manual as the new functionalities will be described therein.

# TRADEMARKS

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# COPYRIGHT

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# 1. OVERVIEW

AES67/Ravenna technology provides high performance digital media networking that meets the quality and performance requirements of the professional audio market, offering high quality (16 bit/48 kHz and higher), high capacity, and low latency of less than 10 milliseconds.

AES67/Ravenna is built on Internet Protocols, providing an interoperability standard for high-performance professional digital audio-over-IP networking.

Using standard IP over Ethernet, AES67/Ravenna is able to run on inexpensive off-the-shelf computer networking hardware, and with use of standard QoS, can share installed networks with other data and computing traffic.

AES67 provides sample-accurate synchronization by defining a common clock system and media clocks, delivering the very low latency required by professional audio. Its network-centric approach to synchronization allows synchronized playback across different audio channels, devices, and networks, ensuring interoperability between various IP-based systems.

AxC-AES67 card provides to the AuviTran Audio ToolBox platform a cost-effective gateway to AES67 connected devices.

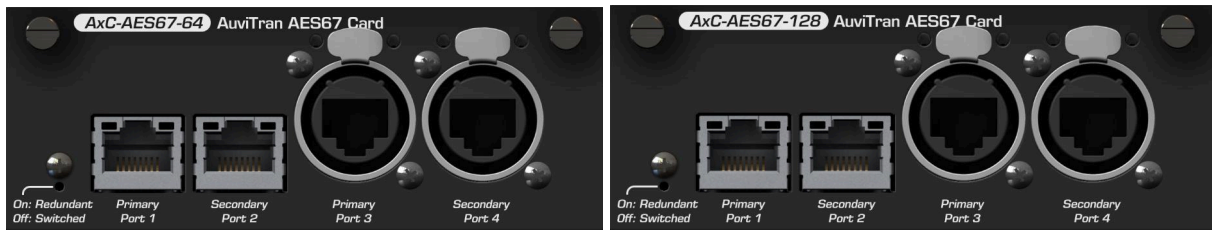
Exciting possibilities for professional audio systems are opened by the AxC-AES67 card, when combined with other AuviTran Audio ToolBox cards. AES67/Ravenna bridges are enabled in combination with other network AxC cards such as MADI, Dante, and AVB MILAN, providing unique connectivity possibilities (dynamic patching solution, remote control, ASIO recording/playback, etc.)

## 2. TECHNICAL SPECIFICATIONS

AxC-AES67: AES67 card for the AuviTran Audio ToolBox platform	
<b>Size</b>	200 mm x 100 mm x 40 mm – 7.9"x3.9"x1.6" Format AuviTran Audio ToolBox platform cards
<b>Power supply</b>	+12V / +3.3V - Through AuviTran Audio ToolBox backplane
<b>Storage: Temp/Humidity</b>	- 5°C to 70°C / 0% to 95% (non-condensing)
<b>Operating: Temp/Humidity</b>	0 °C to 45°C / 5% to 90% (non-condensing)
<b>Connectors</b>	<ul style="list-style-type: none"> <li>• 2 x Neutrik EtherCon RJ45-XLR female connectors</li> <li>• 2 x RJ45 connectors</li> </ul>
<b>AES67 Operation modes</b>	<ul style="list-style-type: none"> <li>• Switch – Integrated Gigabit switch</li> <li>• Redundant with Primary and Secondary ports, replicated on ports 1 and 2</li> </ul>
<b>Audio Outputs</b>	64 or 128channels at 48 kHz
<b>Audio Inputs</b>	64 or 128channels at 48 kHz
<b>Sample format</b>	24 bit
<b>Sample rate</b>	44.1 kHz and 48kHz; 96kHz
<b>Synchronization</b>	Automatic from AES67 network

Control and monitoring Environment	
<b>AVS-Monitor</b>	AVS-Monitor enables to remotely set, control and monitor a AES67 network and provides enhanced control pages to manage the specific parameters of cards inserted in the different slots
<b>Web base control (from AVS-Monitor)</b>	For audio patch of any AES67/Ravenna device, and additional features: multicast/unicast; redundant mode, switch mode or OOB (Out Of Band)...
<b>Merging AES67 Virtual Sound Card</b>	The optional AES67 Virtual Soundcard software allows the PC/Mac to connect to an AES67 audio network. lien

## 3. FRONT PANEL / WIRING



AxC-AES67 front panels

AxC-AES67 card provides 4 Giga-Ethernet ports that allow various architecture possibilities.

Two modes are available, with their own wiring restrictions. Please read carefully the following lines to avoid any mistakes and network errors when building an AES67 network.

### 3.1. Switch Mode

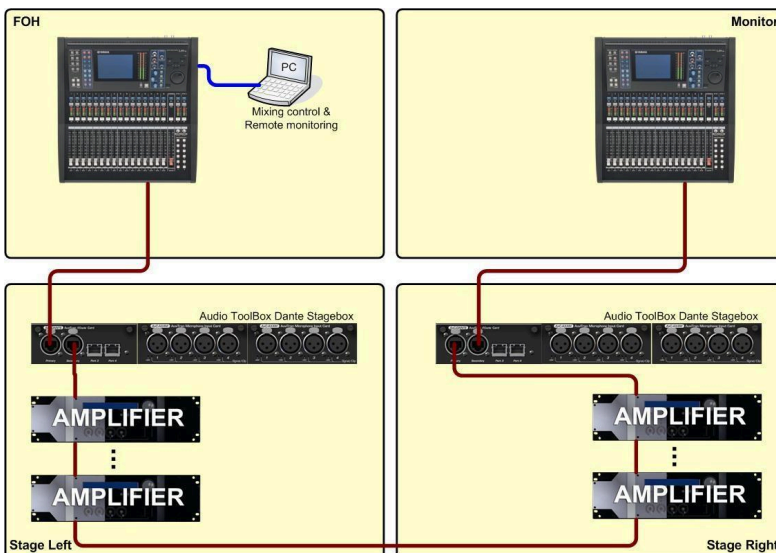
#### NOTE

When powered up for the first time, the AxC-AES67 card starts in Switch mode.

In Switch mode, all 4 ports are switched together and behave the same way. No “Primary” or “Secondary” capability is present. The AxC-AES67 card can be viewed as a regular 4-port Giga-Ethernet switch.

Daisy-chained and/or star architecture can easily be built using this mode. In some small architectures, the need for an external Gigabit Ethernet switch can be reduced or even suppressed.

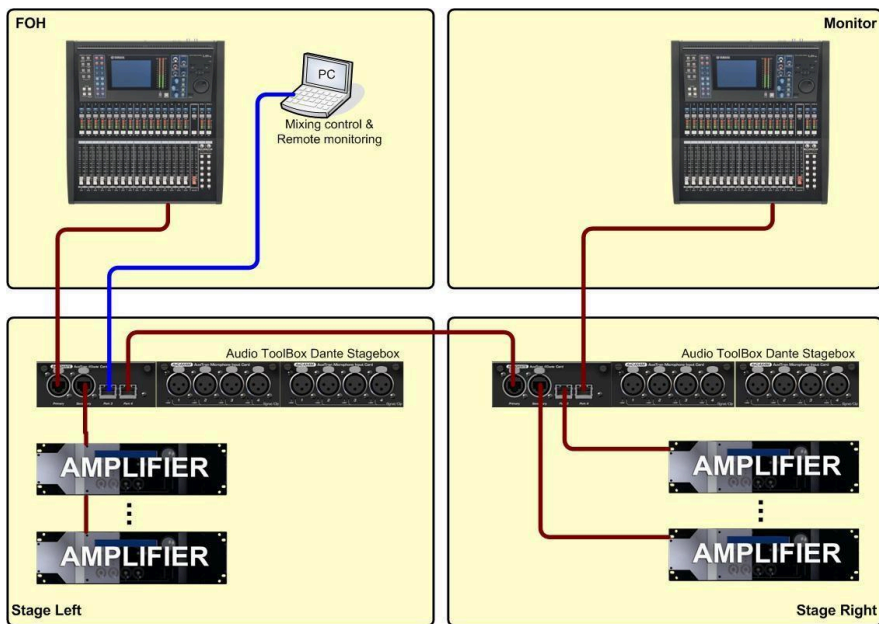
#### 3.1.1. Daisy-Chain architecture



This wiring is the simplest, for the lowest cost. All devices are daisy-chained using a single Ethernet cable. Please note that in this case, failure can have serious drawbacks. If a single cable is broken, or if a device fails, the whole network behind this failure point will be unavailable.

Please also be aware that each new device chained will add latency to the network (a switch “hop”). In this example, if many amplifiers are daisy-chained, latency can raise-up dramatically.

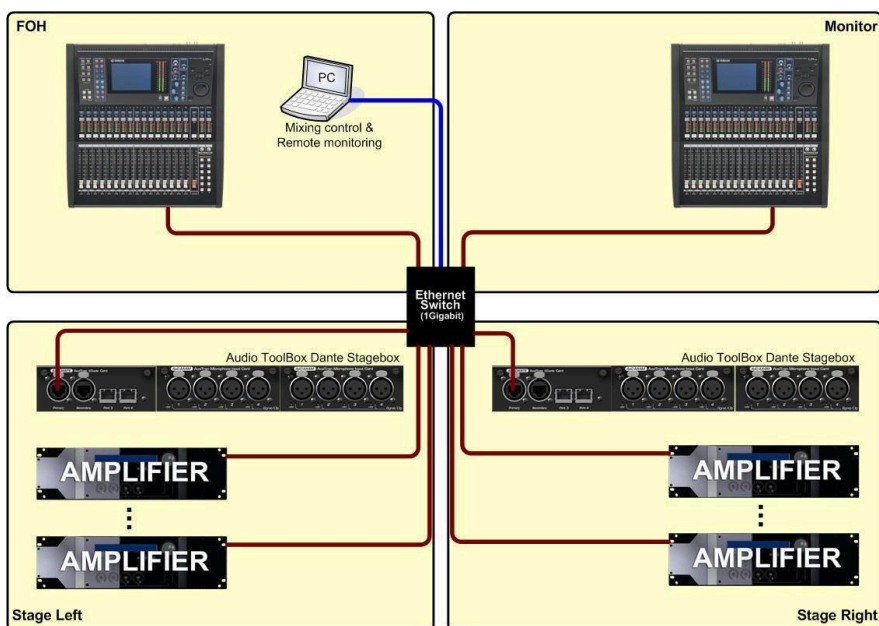
### 3.1.2. Star architecture with no switch



Thanks to the 4 ports of the AxC-AES67 card, the previous example can be improved using a star architecture without the need of an external switch. Please have a look to the following:

The AxC-AES67 card is acting as a regular switch. Multiple amplifiers can be dispatched on AxC-AES67 remaining ports, reducing switch hops, and thus, overall latency. Security is also slightly improved, as an amplifier failure in a branch will not impact others branches.

### 3.1.3. Star architecture with external switch

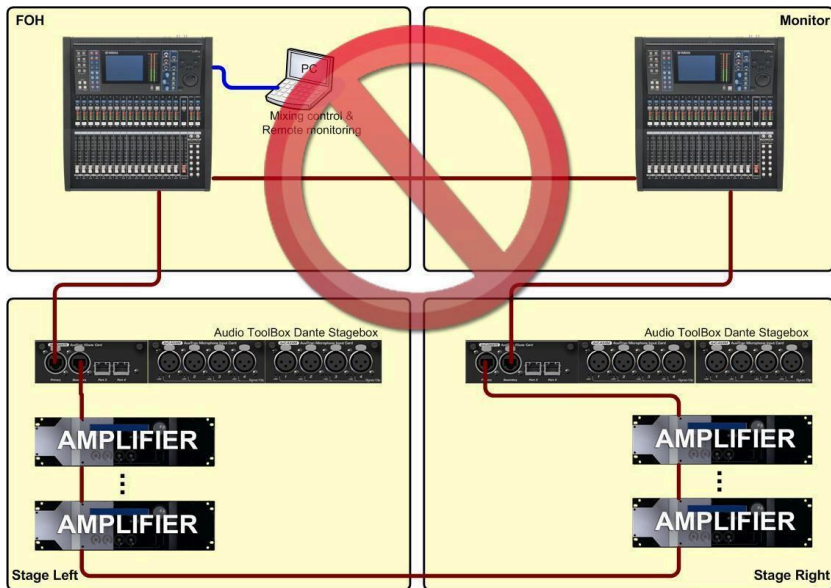


The previous example is a great solution for small networks, and mainly signal broadcasting on amplifiers. Security is not at its best, as if an AxC-AES67 card fails, the whole network will fall down. The usual way to wire a switched AES67 network with maximum security is to add an external Gigabit Ethernet switch.

In this case, failure of a device will have no impact on others devices. Please note that in this example, the control computer can be plugged anywhere in the network, on any device (not necessarily on the switch itself).

### 3.1.4. Switch mode and loop architecture

The devices are truly treated as regular Ethernet switches. Therefore, a loop must NEVER be created with the devices, as the entire network will be caused to fail immediately!



## 3.2. Redundant Mode

An AES67 device can also be operated in a redundant mode. When this mode is enabled, two separated AES67 networks are created. These networks are usually called "Primary" and "Secondary" networks. The maximum security in an AES67 network is achieved through the use of this mode.

### IMPORTANT

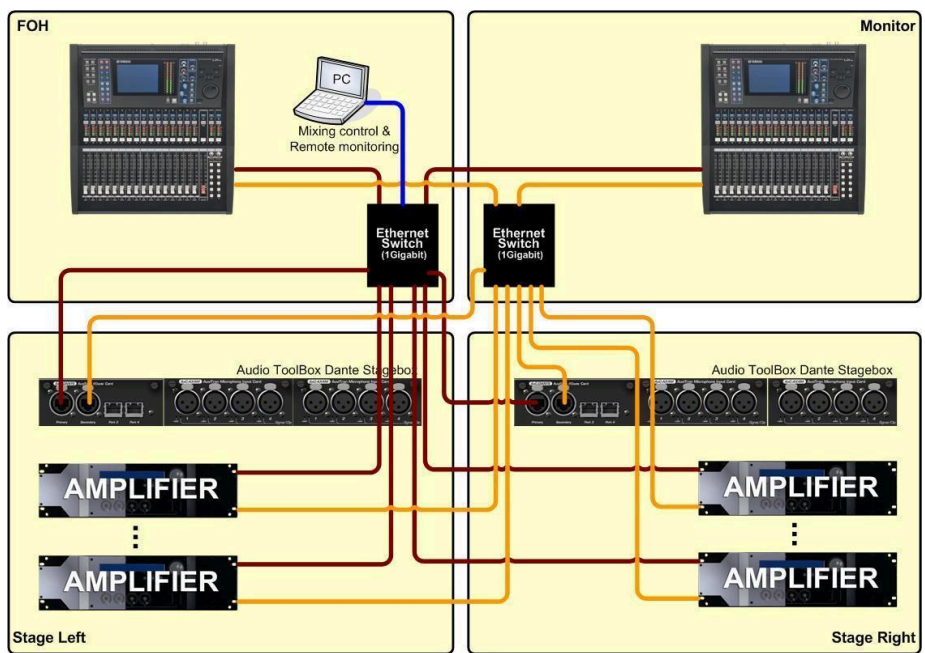
Primary and Secondary networks should NEVER be connected together when redundant mode is used. The whole network will be caused to fail if this occurs. It should always be ensured that the right mode is selected and devices are properly wired before they are added to the network.

When in redundant mode, AxC-AES67 connectors act as follow:

- Primary: Control network
- Secondary: Control network (switched with Primary port)
- Port3: Primary network
- Port4: Secondary network

① In following examples, Primary network is represented in Dark-Red, and Secondary network in Orange.

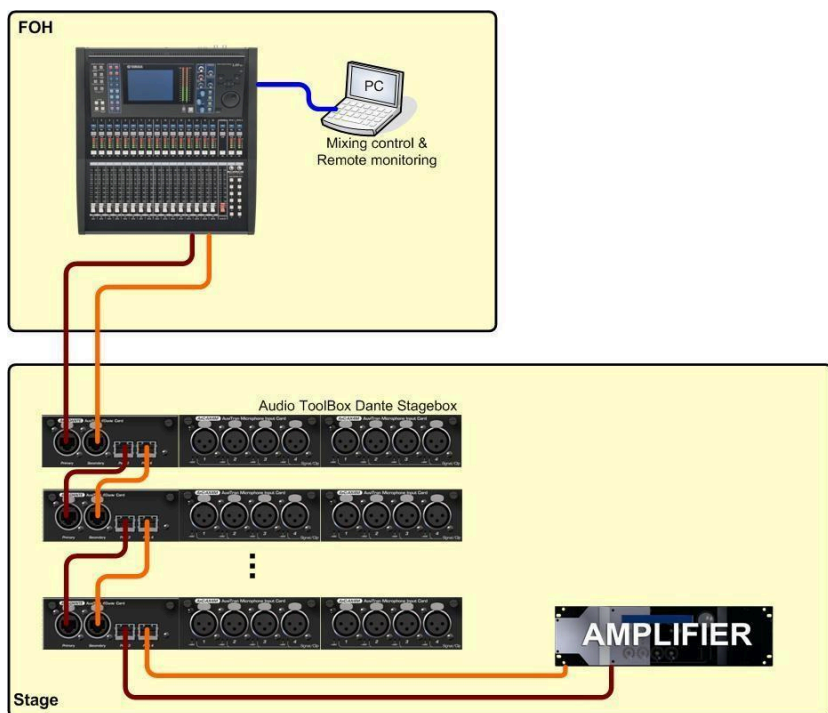
### 3.2.1. Redundant mode with external switch



A redundant AES67 network is typically wired this way. All devices should be configured as **Redundant BEFORE wiring.**

Two external switches are needed in this case: one for the Primary network and the other for the Secondary network. As mentioned before, these two switches should NEVER be connected together.

### 3.2.2. Redundant mode without external switch



Thanks to the AxC-AES67's 4 Ethernet ports, small redundant networks can be built without the need for any external switch. Costs may be saved when only cable-redundancy is needed.

Cable reliability of the network will be improved by this solution at no extra cost. But as devices are daisy-chained, redundancy is not as powerful as a regular redundant network with external switches.

### 3.3. OOB Mode

An AES67 device can also be operated in a redundant OOB (Out-of-Band) management mode. When this mode is enabled, **two entirely separate network infrastructures are simultaneously created**. These networks are dedicated to isolating different traffic types, usually functioning as a **"Media"** network ( Primary & Secondary network ) for real-time audio streams and a **"OOB"** network (Control network) strictly reserved for control and signaling data - such as device discovery, clock synchronization telemetry, and connection management (SDP).

#### IMPORTANT

The Media network and the OOB (Out-of-Band) management network should **NEVER** be connected together when this mode is used. The whole network infrastructure will be caused to fail due to critical routing loops and packet collisions if this occurs. It should always be ensured that the right OOB isolation mode is selected and devices are properly wired before they are added to the active network.

When in OOB mode, AxC-AES67 connectors act as follow:

- Primary: Control network
- Secondary: Control network
- Port3: Primary network
- Port4: Secondary network

## 4. CARD INSERTION / EXTRACTION

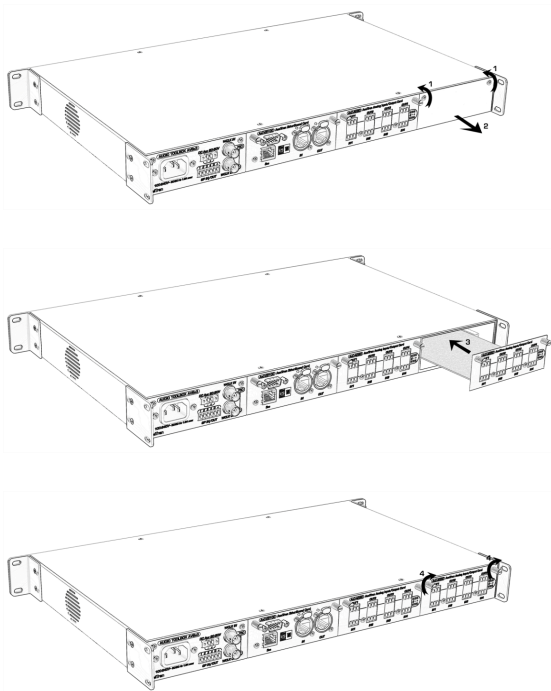
### WARNING

- The cards are electrostatic sensitive; this must be checked before they are touched or handled.
- The Toolbox must be powered off before inserting any AxC card. (unplug the power cable).



### 4.1. AxC-Card Insertion

The following procedure applies to all the Audio Toolbox models.



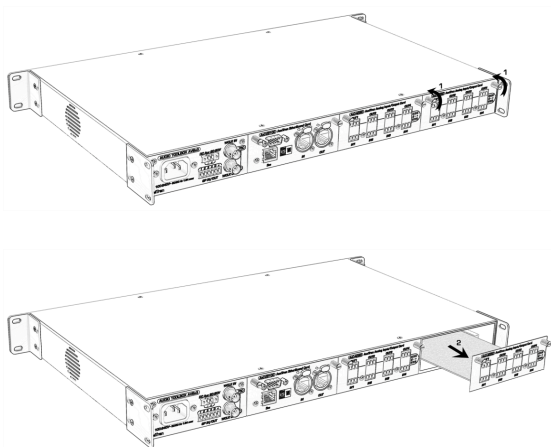
**1.** Unscrew and remove the plate blocking the AxC card slot location.

**2.** Insert the AxC card by carefully sliding it into the two side rails of the slot.

**3.** Tighten the two screws of the AxC card.

### 4.2. AxC-Card Extraction

The following procedure applies to all the Audio Toolbox models.



**1.** Unscrew the AxC card that has to be removed.  
The two screws remain attached to the AxC card.

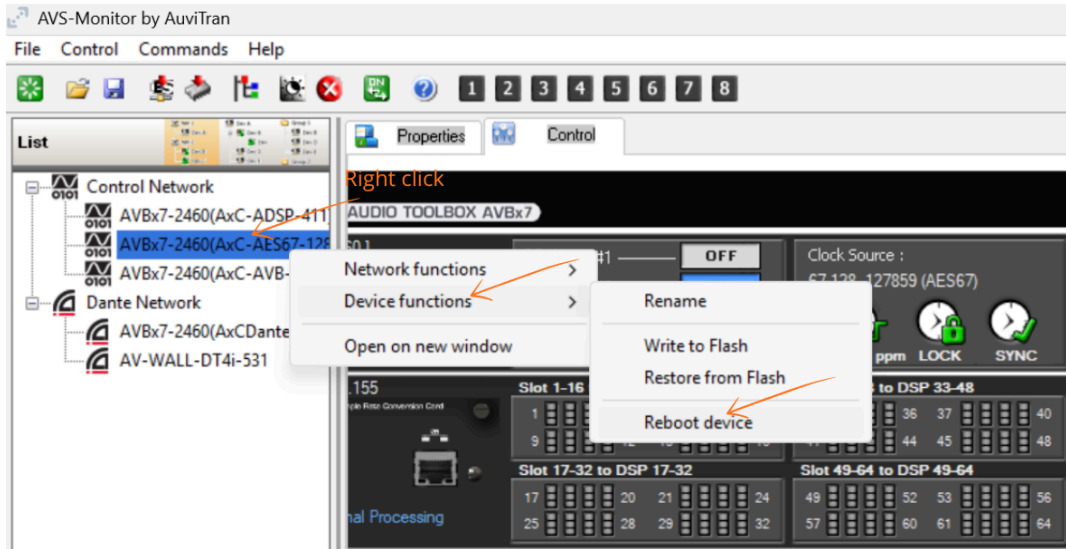
**2.** Pull the AxC card to withdraw it from the chassis.

# 5. SOFTWARE REMOTE CONTROL

## 5.1. Useful things

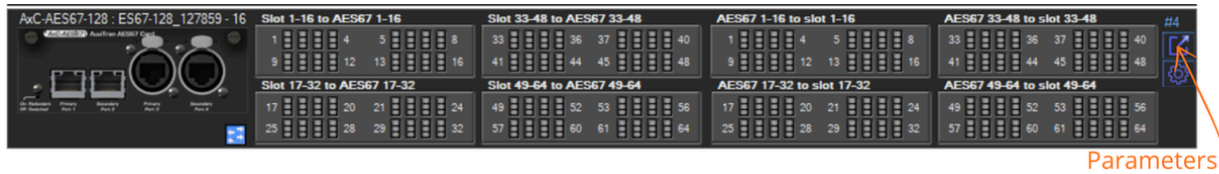
### 5.1.1. Rebooting a device

To reboot a device, the following steps must be performed: the device is right-clicked in the 'List', 'Device Function' is selected, and 'Reboot device' is clicked. (Only the card will be rebooted) :



### 5.1.2. Parameters

To gain access to the AxC-AES67 parameters, the share button located on the right side of the card in AVS-Monitor is to be clicked :



Screenshot	Explanation
	<p>Monitoring input channels of the card.</p>

	<p>Monitoring output channels of the card.</p>
	<p>Monitoring all input and output channels of the card</p>
	<p>General settings to:</p> <ul style="list-style-type: none"> <li>• Revert to factory the settings</li> <li>• Save or restore the settings of the card</li> </ul>
	<p>Audio settings to:</p> <ul style="list-style-type: none"> <li>• Mute all inputs of the card</li> <li>• Mute all output of the card</li> </ul>
	<p>Properties of the card to find :</p> <ul style="list-style-type: none"> <li>• Serial Number</li> <li>• Firmware version</li> <li>• Software version</li> <li>• IP of the card</li> </ul>
	<p>GUI settings to choose :</p> <ul style="list-style-type: none"> <li>• Themes of the UI</li> <li>• Slice name position</li> <li>• Slice range</li> <li>• Layers select</li> <li>• QOS</li> <li>• Double click to init faders</li> <li>• Vu meters width</li> </ul>
	<p>Network settings to activate redundancy mode of the card.</p>

## 5.2. Switch / Redundant Mode / OOB

Switched mode is started by the card when it is powered up for the first time.

### WARNING

- Network architecture is seriously impacted by switching between modes. If the mode is adjusted without checking the RJ45 cable plugging, a dead loop may be created.
- All cables are always to be unplugged (except the one allowing card access) before the network mode is altered.

### 5.2.1. Mode selection using AVS-Monitor software

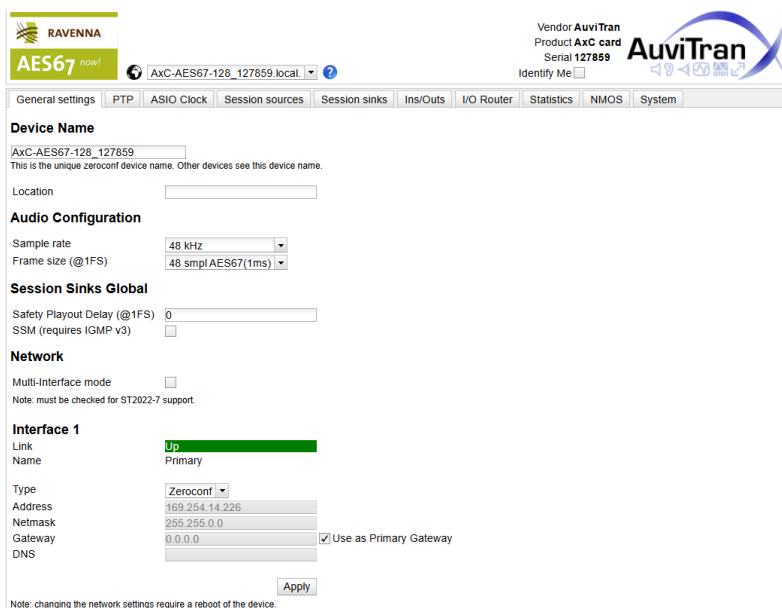
On the Toolbox device control page, the following information is shown for the slot where the AxC-AES67 card is connected:



### WARNING

- The 'specific parameters' button will appear only when the AxC-AES67 card and AVS-Monitor are connected to the same network.

To open the AxC-AES67 setup page, simply click on the front panel picture on the left. The setup page looks like following:



Whether the card will work in switched, redundant, or OOB mode can be chosen via Network Setup. The current working mode is displayed, and it cannot be modified.

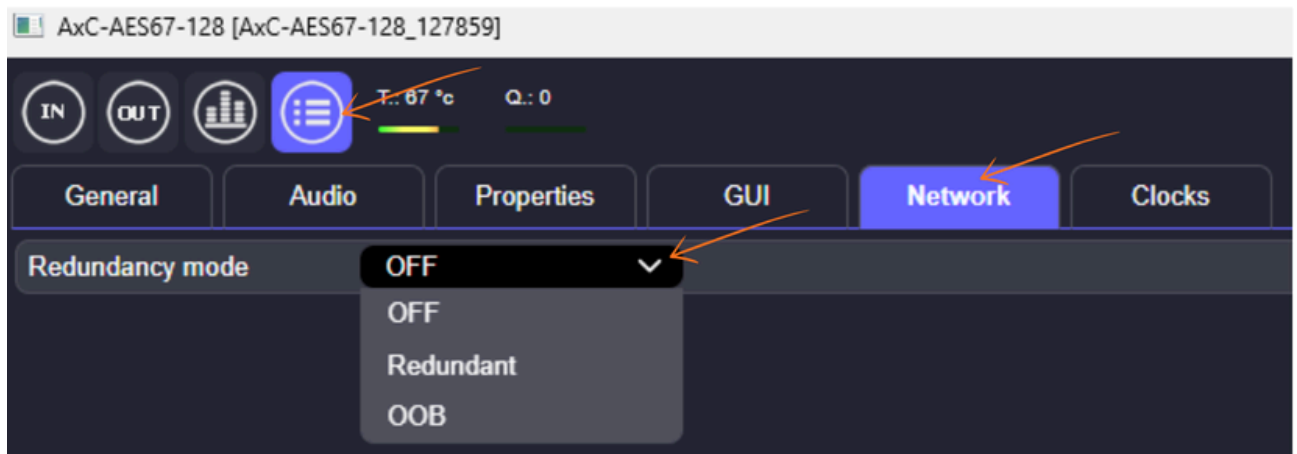
In order for the working mode to be changed, the following actions must be taken:

the parameters are accessed,

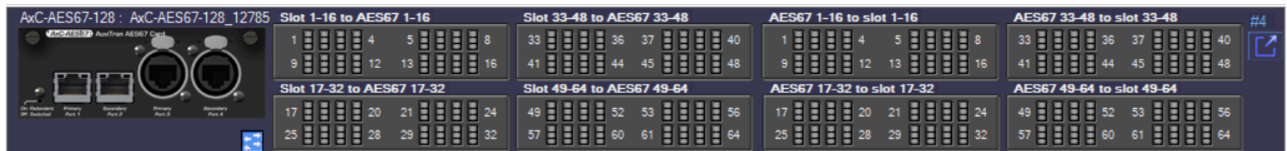
'Networks' is clicked within the fourth button on top,

The 'Redundancy mode' is selected between 'OFF (switched)' and 'Redundant' before 'Apply' is clicked.

As a result of this being completed in AVS-Monitor, a card reboot is automatically triggered.



The background behind the map turns blue and the specific parameters disappears if the Redundancy mode is "Redundant" or "OOB":



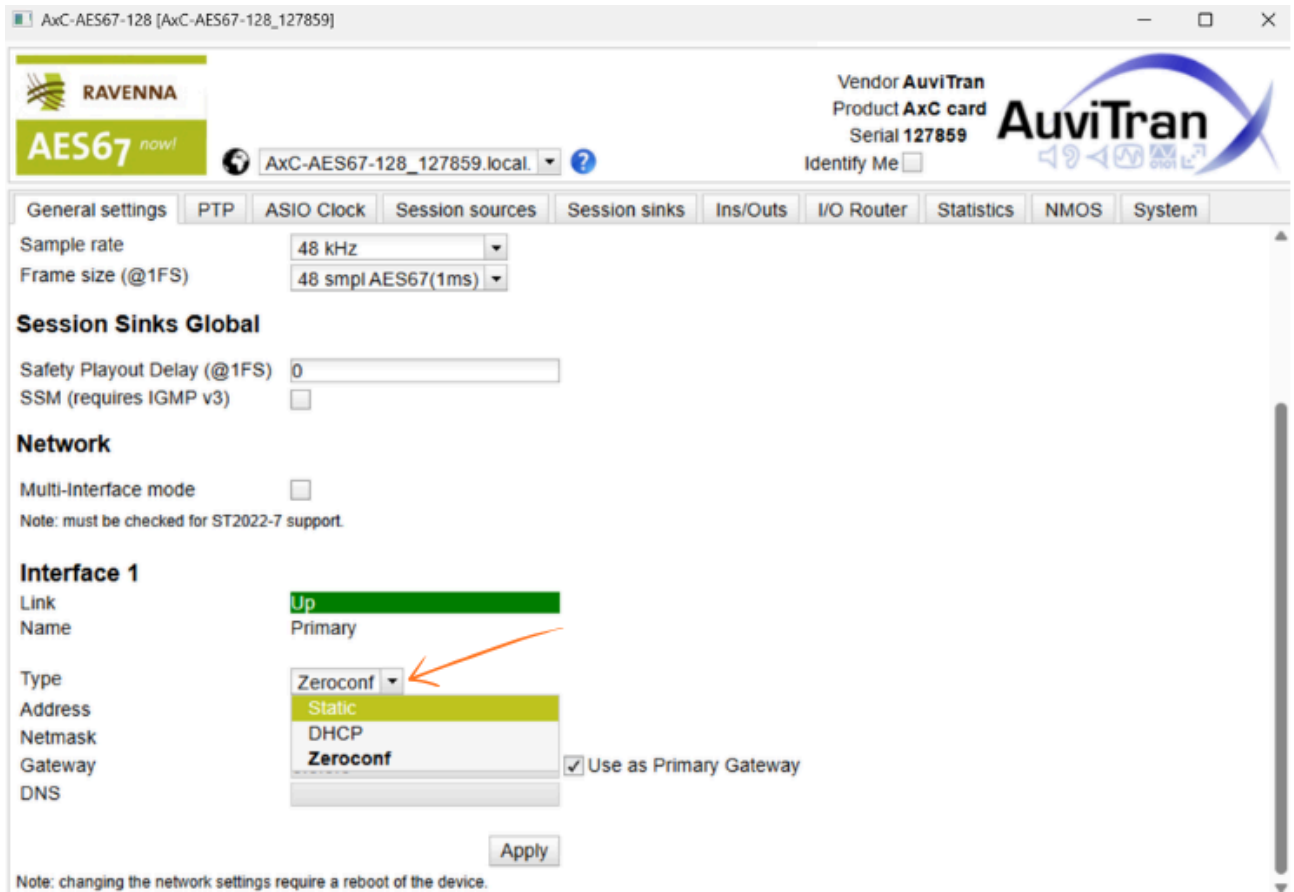
## 5.3. Fixed / Dynamic IP configuration

### 5.3.1. Dynamic IP

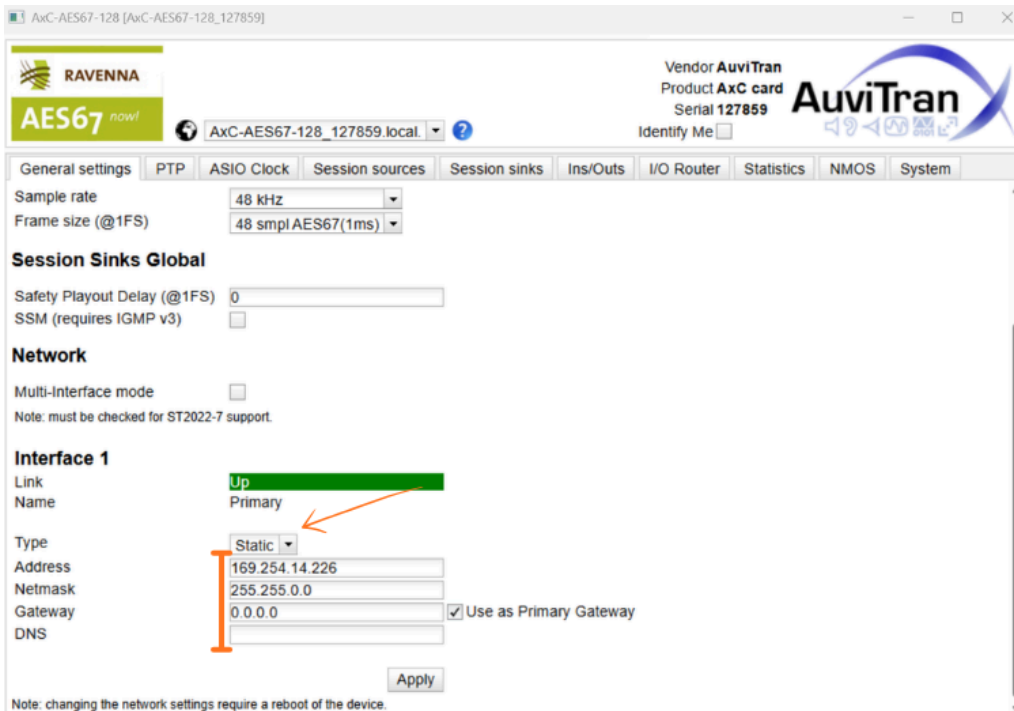
An IP address is automatically assigned to an AES67 device by the network. For this process, a DHCP server MUST be active within the network, through which an IP address is automatically distributed to every device.

If no DHCP server is operating on the network, a default IP address is allocated to AES67 devices at startup (typically "169.254.x.y", with netmask "255.255.0.0" - Zeroconf). Care should be taken to ensure the computer's network interface card is configured to allow access to this address range.

Within the same configuration tab as before, the required "Type" is to be selected.



### 5.3.2. Fixed IP address



If a DHCP server is not available on the network, or if all IP addresses must be manually configured according to network requirements, the device can be set to a 'fixed' IP address mode:

Once the blanks have been completed according to system requirements, the configuration must be applied. A request will be generated to reboot the module so that the changes can take effect.

## 5.4. Clock Setup

There are two ways to configure audio clock inside the Audio Toolbox:

- Audio Toolbox is slave, and receive audio clock from AES67 network
- Audio Toolbox is master, and will feed the clock to the AES67 network

### 5.4.1. AES67 Master – ToolBox Slave

The AES67 network is established as the clock master, and the ToolBox is synchronized with the Ax-C-AES67 card by proceeding as follows: The ToolBox clock setup page is opened in the AVS-Monitor software, where the clock source is configured to the Ax-C-AES67 card.



### 5.4.2. AES67 Slave – ToolBox Master

To force the AES67 network to be synchronised with the Toolbox clock, the following procedure should be followed. In the AVS-Monitor Software, open the ToolBox clock setup page, and select the clock source:



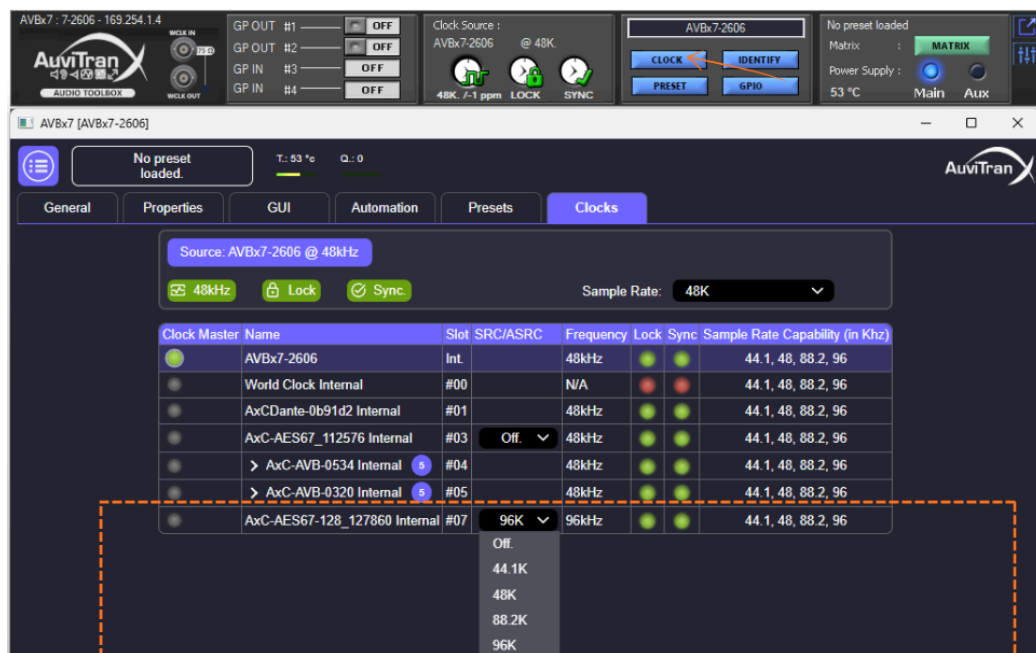
### 5.4.3. embedded ASRC mode

Maximize performances with the ultra-low latency AuvitrAn embedded ASRC feature: when two digital interfaces operate in different clock domains, this eASRC delivers swift and reliable sample rate conversion with a less than 0.1 ms latency compared to nominal card usage. The card ensures fast and uncompromised audio quality, regardless of the overall infrastructure.

The show must go on, and it will - without missing a beat, as eASRC integrated functionality keeps production running smoothly.

#### To configure the eASRC

Go on the clock setup page, look at the Ax-C-AES67 line and activate the eASRC feature.



#### WARNING

- If an ADSP card is used in SRC mode, it must be placed in the slot immediately before the card requiring the SRC conversion.
- If an ADSP card is used in SRC mode, the ASRC must be activated on the DSP card and the eASRC deactivated on the concerned card.

## 5.5. Audio Routing

### 5.5.1. Basic Audio Routing with Aneman controller

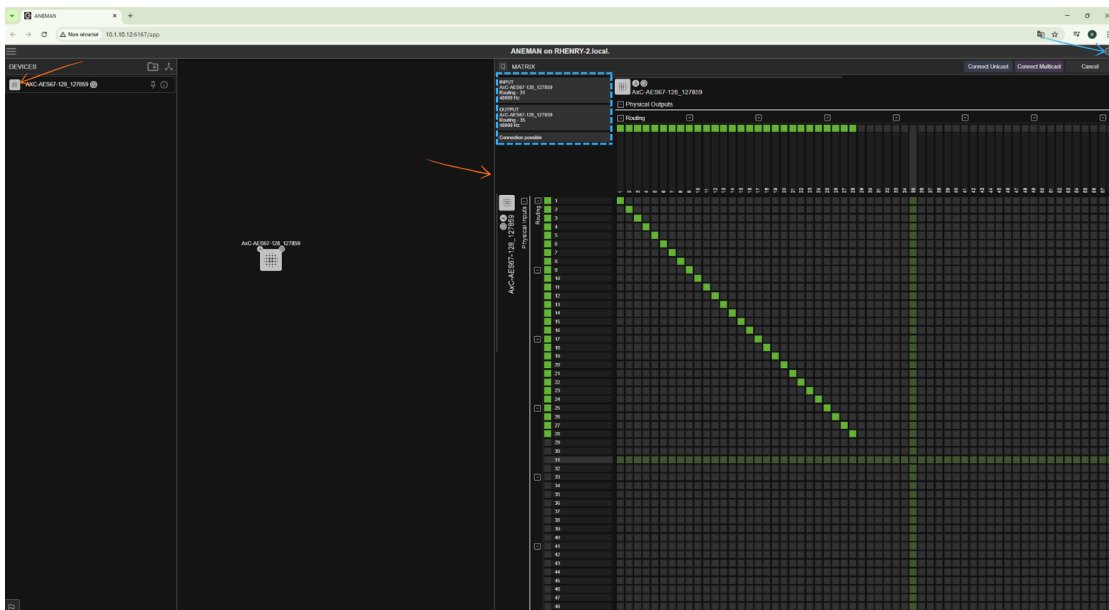
Previously based on a fixed slot priority system, audio routing on AVBx ToolBox devices is now fully managed via an internal routing matrix. Complete flexibility is allowed in configuration through this evolution:

- From Network to Slots: Any of the 64 or 128 available audio channels from the AES67 network can now be freely routed to Slot 2, Slot 3, or both, depending on the needs and the capacity of the destination cards.
- From Slots to Network: Similarly, the 64 or 128 audio inputs to be streamed onto the AES67 network can be sourced from any slot (Slot 2 or Slot 3) through the matrix.

The legacy slot-priority constraints are completely removed by this software-defined approach, enabling entirely configurable point-to-point or point-to-multipoint routing to be performed within the ToolBox.

The patch can be executed directly in AVS-Monit or with ANEMAN Controller software in order to route Audio ToolBox ins and outs to/from the AES67 Network.

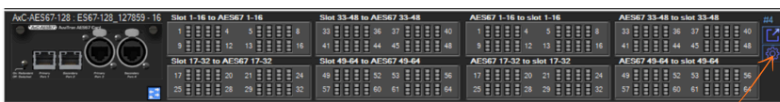
Our systems are fully compatible with this matrix architecture. Seamless integration is guaranteed, and all point-to-point or point-to-multipoint routing configurations can be successfully established between our devices and the AVBx ToolBox via the ANEMAN Controller interface :



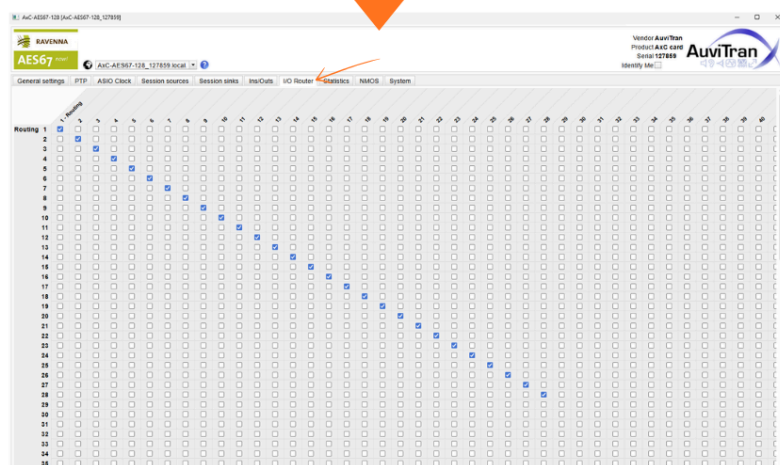
**Note**

→ Aneman version 2.1 b2872

### 5.5.2. Basic Audio Routing with “Specific parameters”



The matrix can be patched directly in AVS-Monitor as an alternative to installing additional controllers or using ANEMAN. This is achieved by navigating to 'Specific parameters' and selecting 'I/O Router'. Existing patches created in ANEMAN will be automatically reflected here.

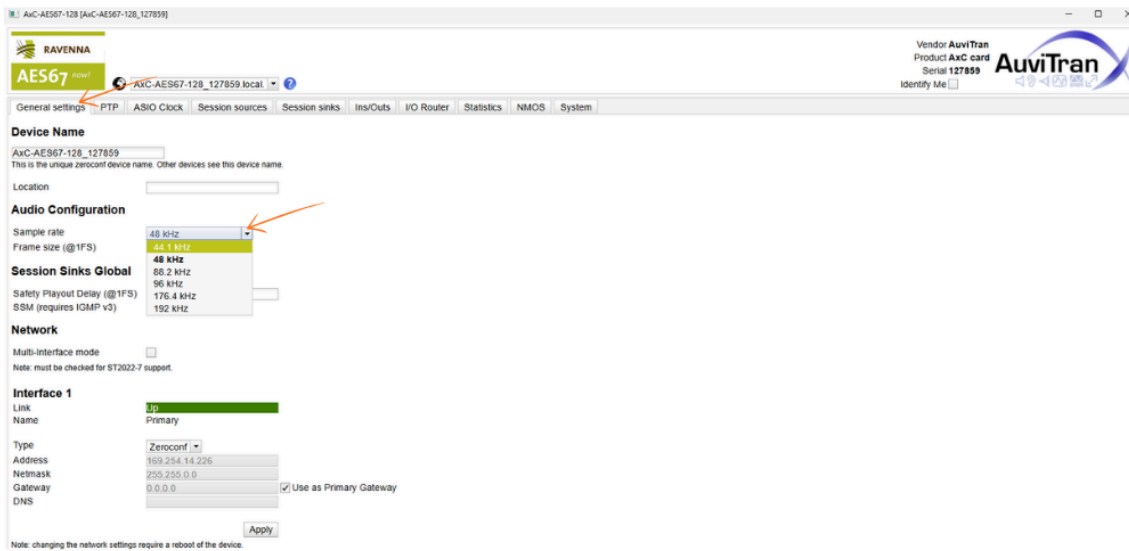


**WARNING**

- The matrix is an internal matrix of AES67 and not an AVBx matrix.. We recommend working with the native interface because it's everything in the same interface and easier to use.

## 5.6. Sample Rate

The AxC-AES67 can work at 44.1, 48, 88.2 or 96 kHz sample rate frequency. The working sample rate can be easily changed using AVS-Monitor. To do so, go to "General settings Audio Configuration" in Specific parameters. Change "Sample rate" or "Frame size":

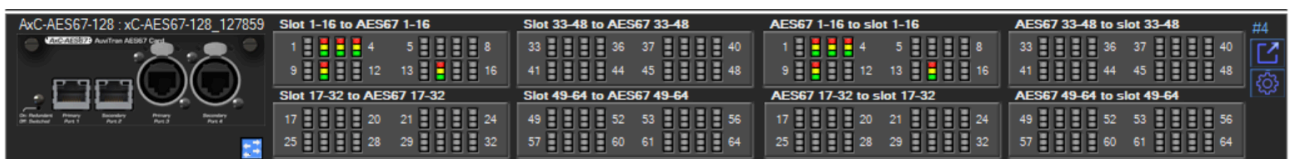


In order for the sample rate to be adapted to meet system requirements, the desired frequency is selected via the 'Sample Rate' combo box. A device reboot should be performed once this setting is modified.

Care must be taken to ensure that patching is only executed between devices sharing the same sample rate. All other devices within the Audio Toolbox rack are also to be set to the proper sampling frequency to prevent audio issues.

## 5.7. Vu-Meters

AVS-Monitor Control page displays real-time signal/clip vu meters for all AxC-AES67 64 inputs and 64 outputs audio channels.



Refresh time is approximately 10 times per second. On the left, "Slot to AES67" vu-meters are audio channels that come from Toolbox backplane, and go "to" the AES67 network. On the right, "AES67 to Slot" vu-meters are audio channels that come from the AES67network, and go "in" the Toolbox backplane.

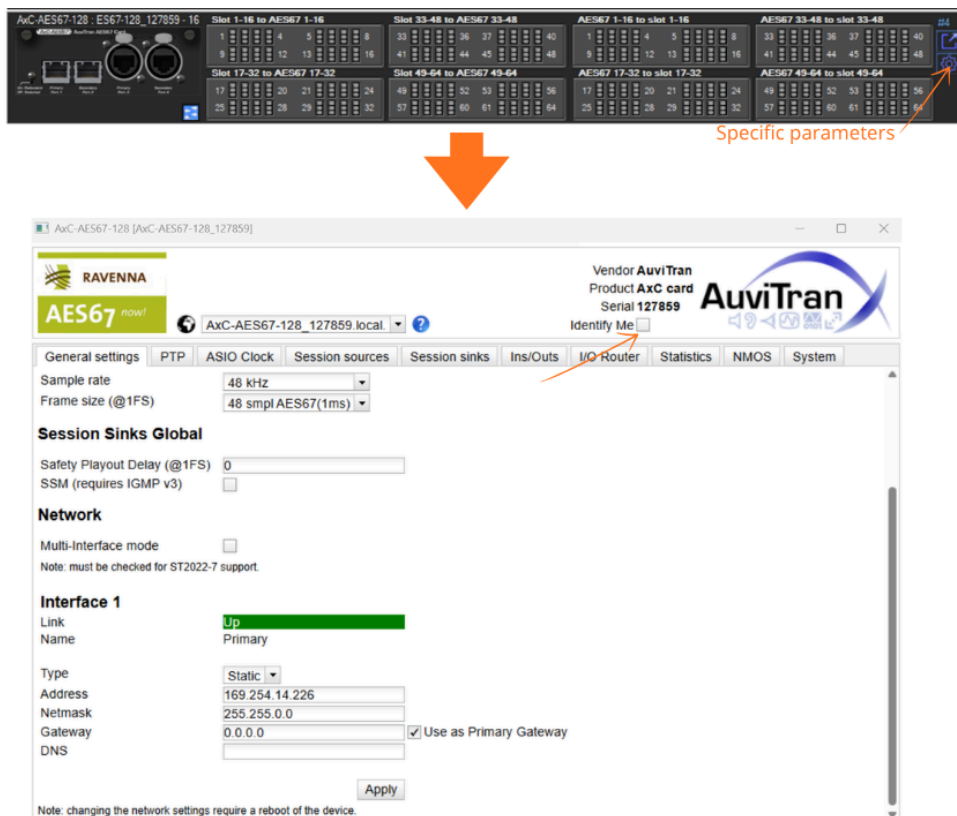
Signal/clip vu-meters have 4 states:

- OFF: signal is below -81dBfs
- GREEN : signal is between -81dBfs and -48dBfs
- GREEN + YELLOW : signal is between -48dBfs and -18dBfs
- GREEN + YELLOW + RED : signal is between -18dBfs and 0dBfs



## 5.8. Identify Card

Particular cards are identified over the network using the Ravenna web page. This is achieved by selecting the 'gear' icon located in the Device View window.



After the target card has been selected, this icon must be clicked. The front panel LEDs are automatically flashed for a few seconds, by which visual identification is greatly simplified.

## 5.9. Renaming AES67-ID

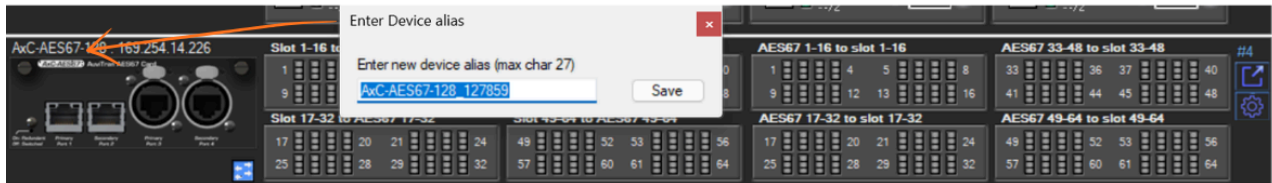
### WARNING

Each AES67 device has a unique MAC address, and a unique logical ID attached to it. This logical ID is called the AES67 ID. Communication and audio routing is made thanks to this AES67 ID.

From this point, it is highly recommended to change AES67 ID when no audio is playing, to avoid any undesired noise or audio loss

AES67 ID should be unique inside an AES67 network. To avoid any unwanted double ID, MAC address (that is always unique) is automatically added at the end of the AES67 ID.

In order for the AES67 card's name to be modified, the current name is to be clicked. A pop-up window will then be displayed where the new name can be typed in.



After the new name has been entered, the 'OK' button must be selected. No attention needs to be paid to the MAC address, which is automatically added following the user-defined name.

#### WARNING

- The first character of the AES67 ID should be a letter from "A" to "Z" (or "a" to "z"). No other character will be allowed. If the entered name is too long, it will be truncated to leave room for MAC addresses.