HANDBOOK

AVN-Commentator Unit

AVN-CU1 Fixed Format Dante Unit

Portable commentator unit with Dante® AoIP interfacing.

SONIFEX

Audio Solutions for
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This handbook is for use with the following product:
AVN-CU1 portable commentator unit with Dante® AoIP interfacing
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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: _____

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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.

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

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.

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 and UKCA conformity

The products in this manual comply with the essential requirements of the relevant UK and European health, safety and environmental protection legislation. The technical justification file for this product is held at Sonifex Ltd. Relevant declarations of conformity can be found at:
https://www.sonifex.co.uk/declarations

WEEE Directive

Directive 2012/19/EU of the European Parliament and of the Council of 4th July 2012 lays down measures to protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste from electrical and electronic equipment (WEEE).

The policy of Sonifex Ltd is to comply with all applicable laws of all jurisdictions having authority over Sonifex's business, including the WEEE directive. Accordingly, Sonifex has implemented a rigorous program designed to ensure compliance of its products with the WEEE directive. The latest statements can be found at:
https://www.sonifex.co.uk/company/recycling

1. AVN-CU1 Commentator Unit
Introduction

The AVN-CU1 is a portable commentator unit. Using Dante® AoIP, the AVN-CU1 bridges the gap between old and new technology, allowing the ease of connectivity & functionality of AoIP together with the legacy connections needed to operate with existing infrastructure in some stadia and sports grounds.

The units have an easy to use physical interface with metal shafted encoder and potentiometers, illuminated buttons, status indicators, and an OLED display showing useful information. An embedded web server is also implemented and is used to modify network, audio and GPIO settings.

The unit supports up to 4 input and output AoIP channels and up to 4 simultaneous input and output AoIP streams. AoIP streams are setup via via Dante® Controller. Once Dante® flows have been made, the mix engine allows AoIP inputs to be mixed and routed to the headphones, and the mic/line input to be routed to the AoIP outputs, with the option to monitor the mic/line feed through the headphones.

The AVN-CU1 provides one locking mic/line input with +48V phantom power indication and a wide, adjustable gain range. It has two stereo headphone outputs with both a 6.35 mm (1⁄4 inch) jack socket and a 3.5mm, suitable for operation by one commentator. An additional male locking XLR plug is provided to output audio coming directly from the Mic/Line input.

The AVN-CU1 can be powered using Power over Ethernet (PoE) or with the additional 4 pin XLR 12V DC input, for use when PoE is not available or extra power redundancy is required. The unit uses Neutrik EtherCON connectors, with primary and secondary ports for power and data redundancy.

The AVN-CU1 provides 5 potentiometers, 5 key-cap buttons, 5 3-position toggle switches and a single push-button rotary encoder. Potentiometers are used to control the headphone source levels, one for each of the 4 incoming Dante channels, with an additional one for sidetone level control. Each one is colour coded to indicate the level that it controls. Switches control the panning of each of these audio sources and key-cap buttons are used to take the commentator On Air, activate GPIO and toggle the sending of audio to the 3 available talkback channels. The push-button rotary encoder is used to navigate the various menus on the OLED display. Below the key-cap buttons is a scribble pad to allow quick and easy source or destination labelling.

The unit has a high impact LED bar graph for metering and downlighting to indicate device status. Both of these and the key-cap buttons can have their brightness adjusted to allow easy operation in daylight. The default and status colour of the downlight can be customised as well as the status event that it reacts to using the web interface.

Metering is available on the mic/line input. A configurable limiter is available for both and a configurable high pass filter can be enabled for the incoming signal. The status of these effects is indicated on the display of the device as well as the type of signal being received by the input.

The AVN-CU1 has dual redundant network ports on both RJ45s (PoE using 2 Neutrik EtherCON® connectors) and SFP cages.

There are 10 configurable GPIO on a 15-way D-type connector with 1 switched changeover output.

All of the buttons have key-cap text that can be removed and changed to suit a user's needs. These are the standard labels and their functionality:

- On Air control, used to connect mic audio to an AoIP output and to the physical XLR output.
- A GPIO button which can be programmed to perform various functions using the web server, such as activating a physical GPO, a virtual GPO, a relay, or an event.
- 3 T/B (talkback) controls are available which can be configured to initiate talkback over AoIP. By default, activating a talkback will also take the commentator off air until the talkback state is cleared. It is also possible to configure talkback so that the commentator remains On Air when talkback is invoked.

2. Getting Started

We recommend you read the manual in this order.

1. View the Quick Start section to get your device up and running.
2. Setup device names and channel labels in Dante Controller, view the Configuring a Device section for instructions.
3. Routing audio in Dante Controller, view the Routing Audio section for instructions.
4. Configuring button and meter modes and locking controls on the top panel of the commentator unit, view the Front Panel Settings and Control section for instructions.
5. Saving and loading profiles, view the Save Configuration to A File section and the Load Configuration from A File section.
6. Controlling the commentator unit remotely, view the Remote Control section.

3. Quick Start
Connecting to the AVN-CU1

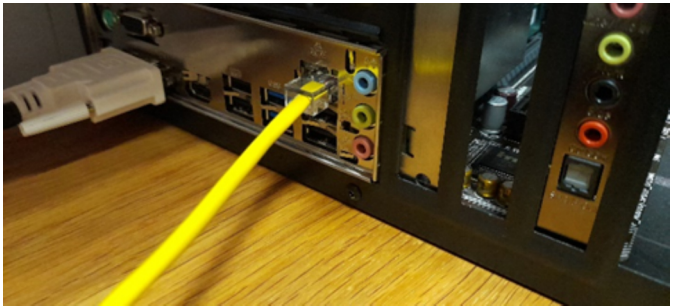
1. Plug an Ethernet cable into the primary port of the AVN-CU1.

2. Connect the other side of the Ethernet cable into your network switch.

3. If your network switch supports PoE, the unit can be powered using this method and is indicated by the ‘Pri’ and ‘Sec’ icons next to ‘POE’ on the display.

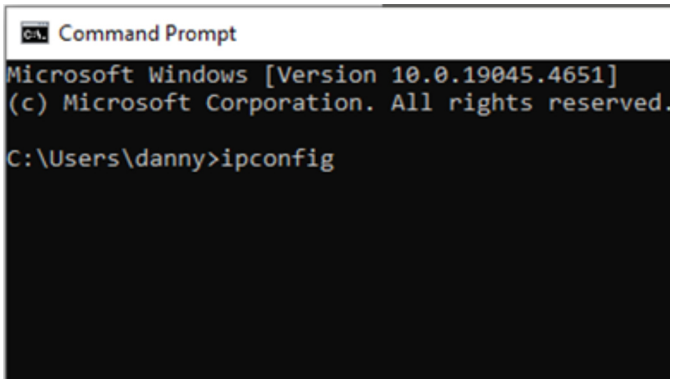
4. If your switch does not support PoE, the DC adaptor can be used instead and has the following pinout: Pin 1: Ground, Pin 2: N/C, Pin 3: N/C, Pin 4: +12V

5. When powered using a DC supply, the 'DC IN' field on the display will display the voltage being supplied by this connection and the status of 'OK', e.g. '11.993V OK'. It is possible to power the unit with PoE and DC at the same time for redundancy.

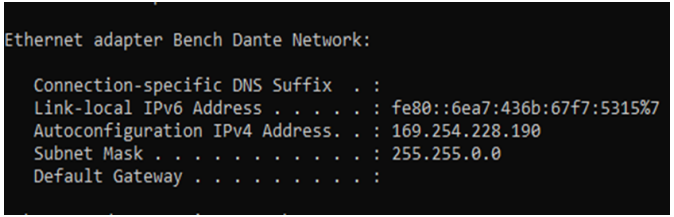


6. Connect an Ethernet cable to an Ethernet port on your PC.

7. Connect the other end of this Ethernet cable to your network switch.



8. In order to find the IP address of your Windows computer open the start menu and type 'Command Prompt', open Command Prompt and type 'ipconfig'. And then press enter.



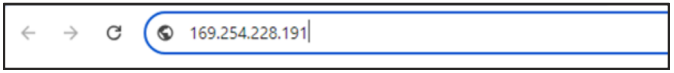
9. Note the IP address of your network adaptor connected to the network switch. In this case it is 169.254.228.190 with a subnet mask of 255.255.0.0.

10. Press the encoder for around 1 second the bring up the 'Main Menu' of the AVN-CU1. Press again to enter the 'Network' menu and again for the 'Primary' menu.

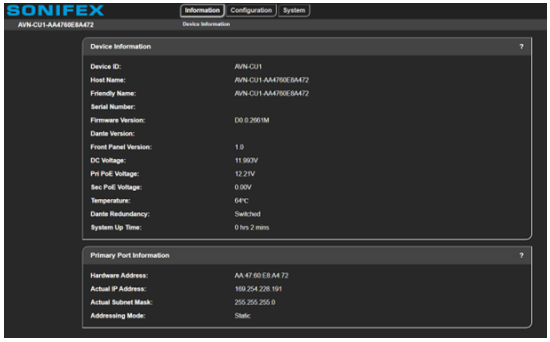
11. Select the 'IP Address' field and enter an IP address which is within the same subnet of your PC. In this case the PC's IP Address is 169.254.228.190 so the IP address 169.254.228.191 was entered. As the subnet mask in this case is 255.255.0.0, the device can be given any valid IP address as long as it starts with 169.254.

12. Enter an IP Address by navigating to each section of the IP Address by rotating the encoder. Then press the encoder to select, and rotate to edit to the desired number. Press the Encoder again to finish editing, and then select the next section. Repeat for all 4 sections of the IP Address and then select 'save'.

13. The unit will then restart to apply the changes.



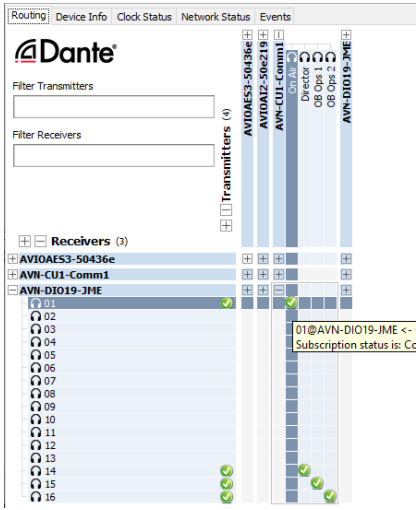
14. Open your web browser, type the IP address of the device into your address bar and press enter.



15. The device's web interface should open onto the 'Device Information' page.

4. Basic Usage

1. Launch Dante Controller from your PC, if it is not already open. By default, the device name in Dante Controller is based on the device type (AVN-CU1) and the last 6 digits of the primary Dante port's hardware address, though this name can be changed if required. In the Routing tab of Dante controller, expand the transmit channels of the device, and the receive channels of the device you want to route the audio to. In this case below, all routings are made to the Dante device 'AVN-DIO19-JME'. The 'On Air' output of the AVN-CU1 is connected to channel 1 of the AVN-DIO19 and the three talkback outputs are routed to channels 14, 15 and 16 of the AVN-DIO19, respectively.



2. The Dante output channels of the AVN-CU1 are all sourced from the microphone/Line input. Dante output channel assignments are described here:

2.1. The ‘On Air’ output is on Dante channel 1. This audio is present when the On Air button is on.

2.2. Channels 2 to 4 are the talkback outputs A to C, respectively. They are only active when the associated talkback button is on.

3. Now any audio on the ‘On Air’ output will be routed to the other Dante device. Pressing the ‘On Air’ button on the top panel of the device will cause any audio on the commentators’ microphone to be heard on the device receiving the ‘On Air’ output.

4. Next press the ‘On Air’ button (T6) on the top panel and speak into the microphone, the sound from your microphone should now be received by the other Dante device. You should also notice ‘On Air’ metering (T1) change whilst using the microphone.

5. The four Dante input channels are always routed to the headphone and their levels are controlled by the associated level control pots (T5) on the top panel.

6. Each source can be selected to be heard in the left ear, right ear or both ears by changing the relevant switches (T4).

7. In Dante Controller a channel from a transmitter is routed to a receiving channel of the Commentator Unit. Any audio from the transmitter will now be heard in the commentator’s headphones.

8. Pressing a talkback button (T7) will connect the commentator’s microphone to one of the three talkback outputs, allowing the commentator to be heard by the receiving device. By default, if the commentator is On Air whilst the talkback butt on is pressed, they will be taken off-air, this is indicated by On Air button turning off.

9. The sidetone control, allows the commentator to hear themself in either or both headphone channels.

5. Accessing the built-in Web Server

For basic usage, there is no requirement to access the web server in the AVN-CU1. Although, if you wish to change any settings such as line-up, input level or to control the unit remotely you can use the web UI.

1. Open your web browser, type the IP address of the unit into the address bar and press enter.

2. The device information web page will open.

3. The different pages of the web UI can be navigated to by using the tabs along to top.

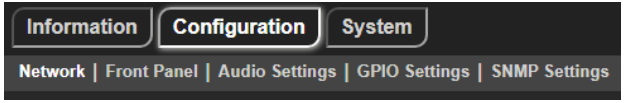


Fig 5-1: Web UI tabs

4. The Front Panel tab replicates the top panel of the unit. The buttons can be activated from this page as well as directly from the top panel.

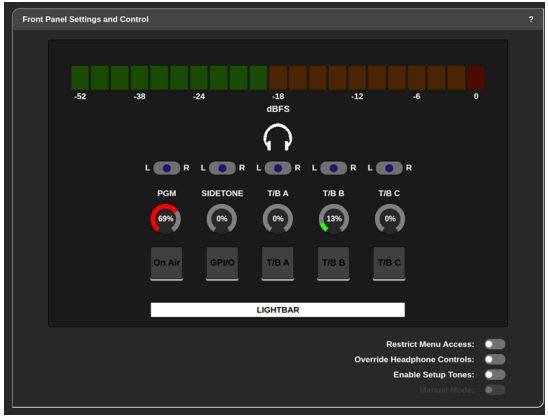


Fig 5-2: Front panel tab window

The remaining controls and indicators are, by default, for status only. Right-clicking on the buttons allows you to alter the mode and colour of each button.

5. Right-clicking on the meter allows you to change the scale and source settings.

6. Right-clicking on the lightbar allows you to change the brightness, colours and source settings.

7. Right-clicking on the area between the meter and the buttons allows you to change the brightness of the meter and button LEDs.

8. The Audio Settings tab allows access to all the settings associated with the audio inputs and outputs.

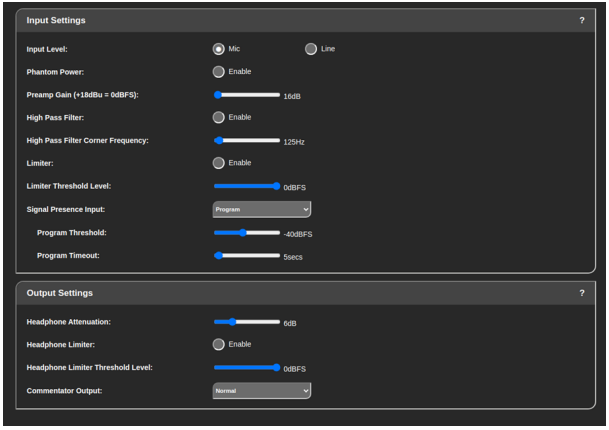


Fig 5-3: Input settings window

6. Firmware Updates

Firmware updates are performed via the Software Update web UI. This is always available at the HTTP port 8080. This is accessible by typing the IP address of the unit into the address bar of the browser followed by :8080 and then pressing enter. For example:

http://169.254.228.191:8080/

The following web page should then be visible.

Fig 6-1: Software update Window

The AVN-CU1 can hold two images of firmware, image A and image B. This provides a fail-safe if things go wrong. The currently active firmware image is displayed in the list of status properties on the left-hand side of the screen. When you apply a new firmware update, it is automatically applied to the image not currently in use. The unit then reboots and starts from this new image, maintaining the previous image to fall back to in case of failure or error.

It is also possible to perform a factory reset and manually reboot into a selected firmware image by selecting the advanced options button.

The device configuration button takes you back to the unit's main web UI.

7. Dante Controller

Dante Controller is an application used to create connections between Dante enabled devices on the network, this section will help you get up and running, however for more detailed documentation it is recommended that you visit the official documentation page at:

https://dev.audinate.com/GA/dante-controller/userguide/webhelp/home.htm

Download and Install Dante Controller

Dante Controller can be downloaded from the official Audinate website, you will have to create an Audinate account if you do not already have one:

https://www.audinate.com/products/software/dante-controller

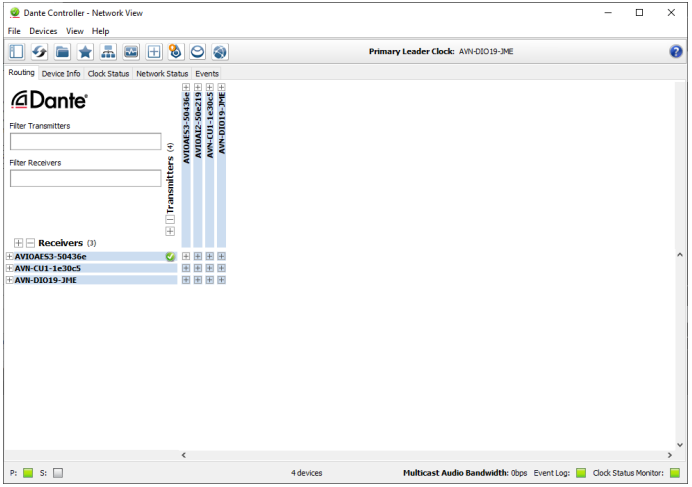


Fig 7-1: Dante Controller application Window

Configuring a Device

In order to configure a device in Dante Controller, double click the name of that device in the routing grid. This opens the **Device View** window.

Device Name

To change the device name, open the **Device View** window and click on the **Device Config** tab. Change the name in the **Rename Device** field and click

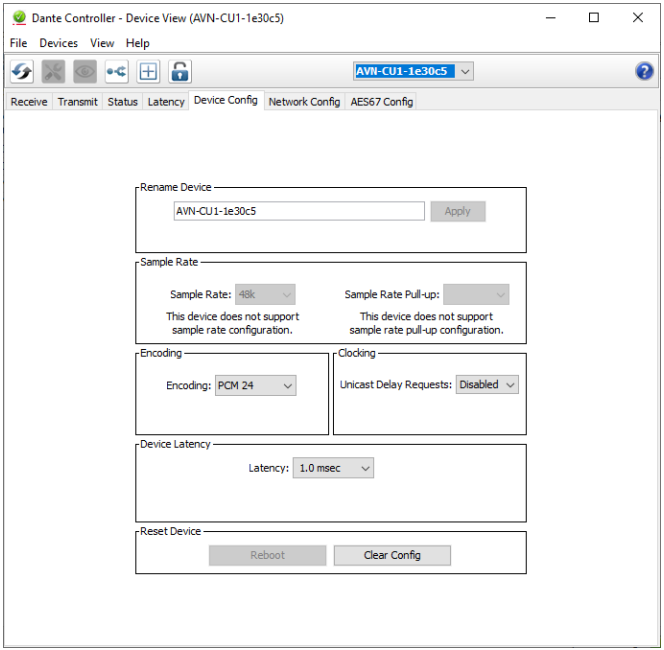


Fig 7-2: Davice Config Tab

In the routing grid you can see the device is renamed, in this case it is renamed to AVN-CU1-Comm1.

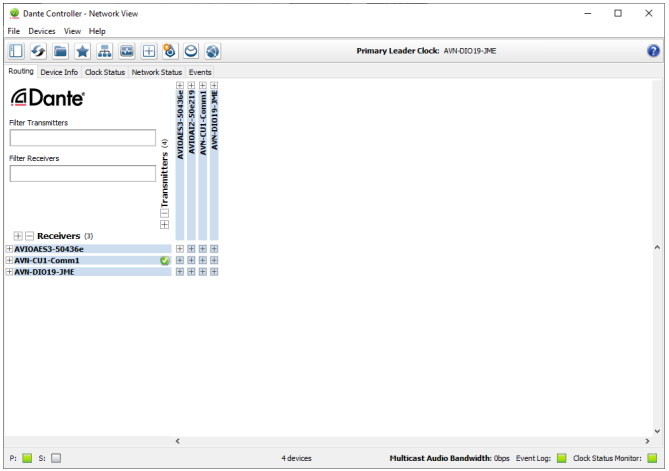


Fig 7-3: Renamed device in routing grid

Channel Labels

The labels of transmit and receive channels can also be changed. By default, the channels on the AVN-CU1 are labelled according to their functions.

Default transmit channel labels:

- On Air
- Talkback A
- Talkback B
- Talkback C

- Program
- Talkback A

Default receive channel labels:

- Talkback B
- Talkback C

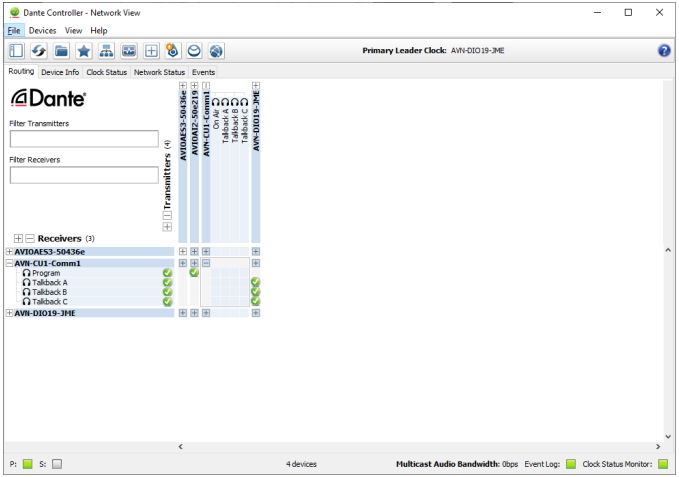


Fig 7-4: Device with default channel labels for AVN-CU1

To edit receive channel labels open the **Device View** and select the **Receive** tab.

Click a **Channel** field and enter a new name.

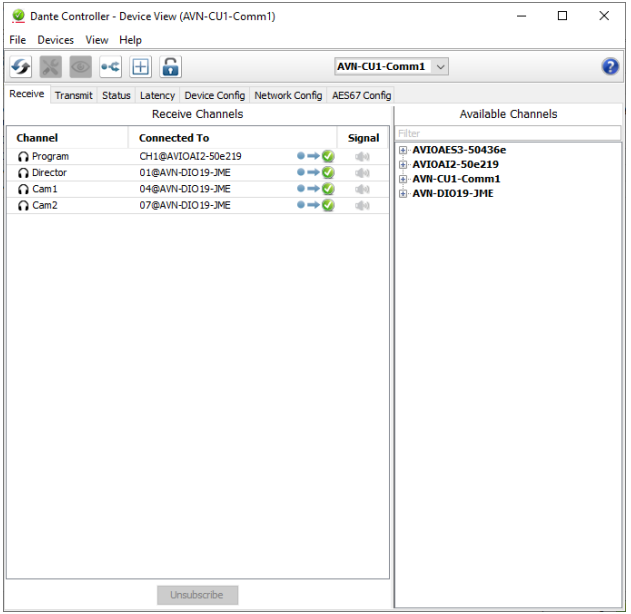


Fig 7-5: Changing receive channel labels

To edit transmit channel labels open the **Device View** and select the **Transmit** tab.

Click a **Channel** field and enter a new name.

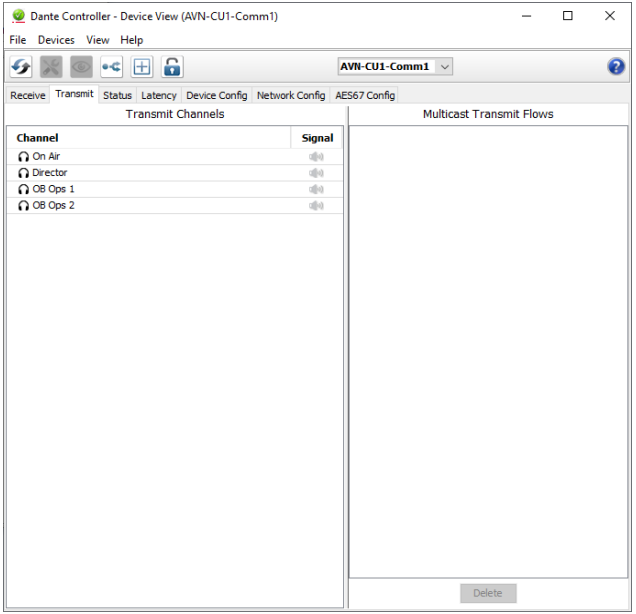


Fig 7-6: Changing transmit channel labels

After the desired changes have been made the **Device View** window can be closed and the changes made are then reflected in the routing grid.

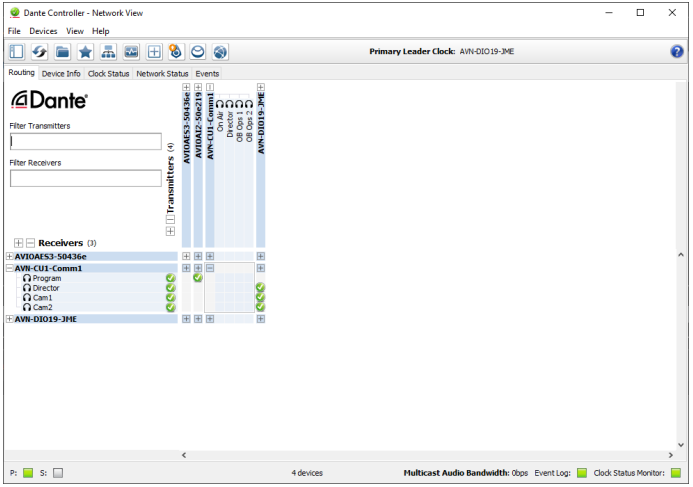


Fig 7-7: Channels with updated labels

Filtering Devices

Filters are available which allow the user to sort through devices and find the device they need quickly. Click the **Hide/Show Filter Pane** icon to view the filter pane. In the example below the **Audio Sample Rate** filter is used to display only devices operating at **48k.**

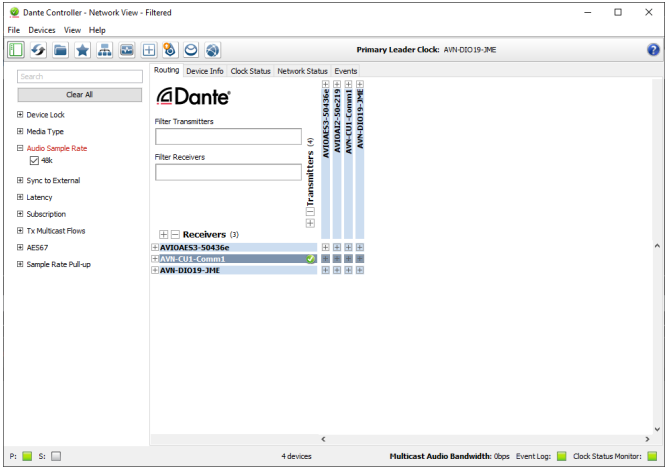


Fig 7-8: Showing the Filter pane

The **Filter Transmitters** and **Filter Receivers** fields can be used to filter devices by their name and the names of their channels.

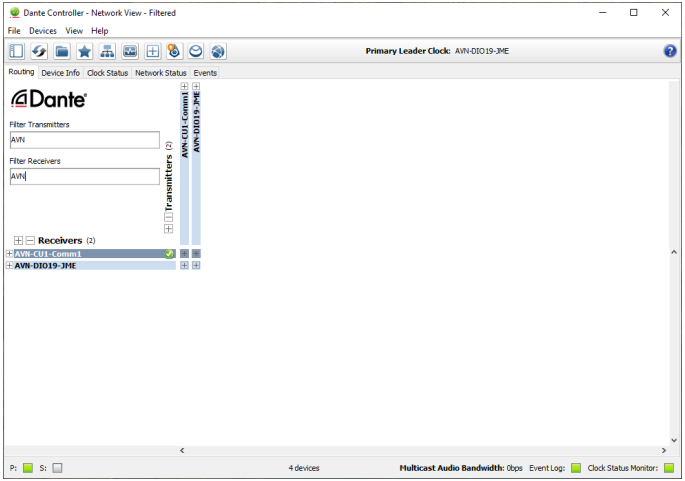


Fig 7-9: Filtering transmitters and receivers

Routing Audio

To route audio, click on a square between a transmit and receive channel. Initially an hour glass icon is shown on the square to indicate a routing is pending, after a short time this then changes to a green circle with a tick to show the routing has been made successfully. In the example below, On Air@AVN-CU1-Comm1 is routed to CH1@AVIOAES3-5046e.

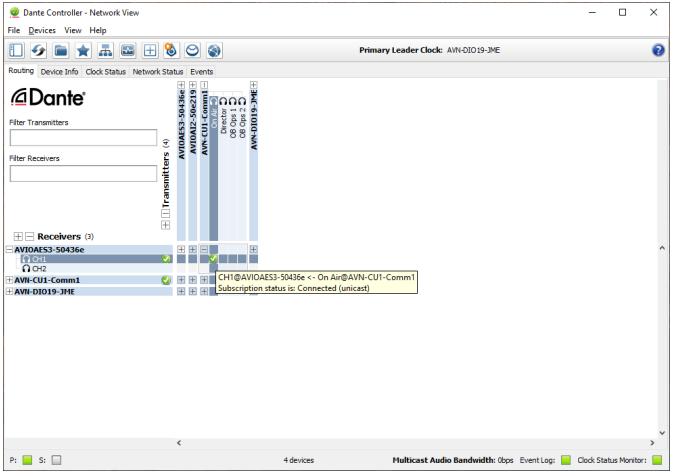


Fig 7-10: Dante Network View

Hold Ctrl and click the collapse square to connect all diagonal routings.

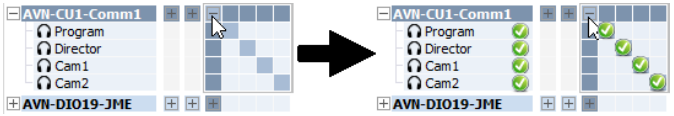


Fig 7- 11: Quick Routing

AES67 Compatibility

Dante devices with AES67 compatibility will have an **AES67 Config** tab within the **Device View** window.

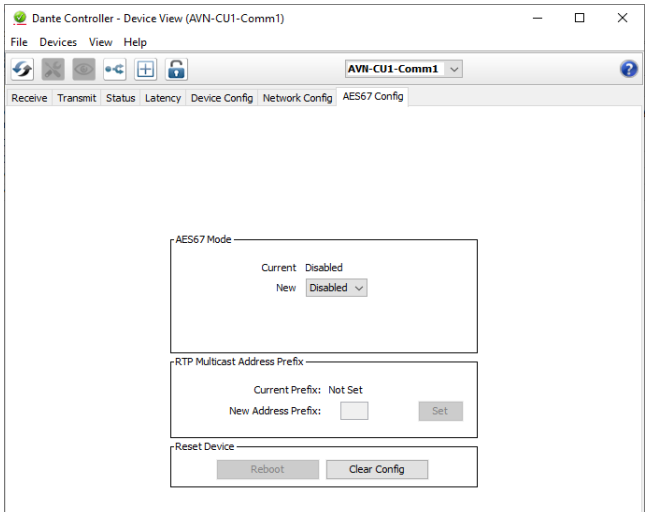


Fig 7-12: AES67 Config tab with AES67 mode disabled

AES67 Mode is disabled by default, select **Enabled** from the dropdown menu to enable this mode. A warning message is displayed, click **Yes** to confirm the changes. The device must then be rebooted for the changes to take effect.

Click **Reboot** to reboot the device. A warning will be displayed, click **Yes** to continue with the reboot. The device will reboot and upon re-entering the **AES67 Config** tab you will see that **AES67 Mode** is now **Enabled**. Also note the **Current Prefix** used is set to 69 by default.

To route audio from an AES67 device to a Dante device with AES67 mode enabled, first ensure that the multicast address of the source AoIP stream has the same prefix as the device you would like to route it to. By default the prefix is 69 so the multicast address of the AoIP stream should be 239.69.X.X where the value of X can be any number between 0 and 255, the user should make sure the address is not used more than once otherwise AoIP streams will clash.

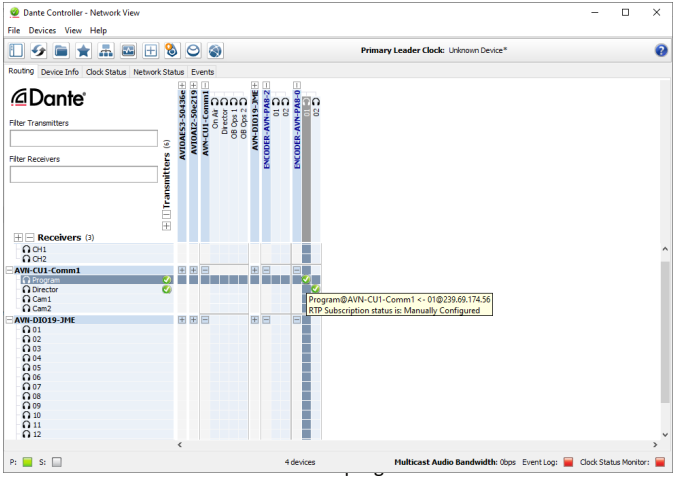


Fig 7-13: Receiving audio from an AES67 device

AVN-CU1-Comm1.

To transmit audio to an AES67 device, open device view and click on the create multicast flow icon. In the create multicast flow window, select the AES67 option and then select the channels you would like to add to the multicast flow.

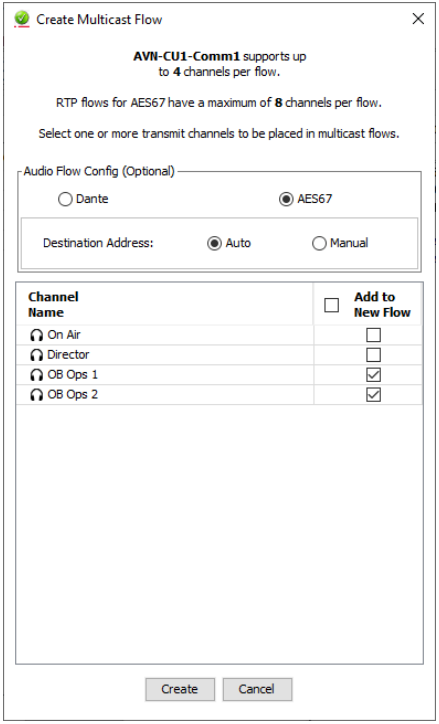


Fig 7-14: Creating a multicast flow

In the example, the channels OB Ops 1 and OB Ops 2 are added to the AES67 multicast flow. When the required channels have been selected, press the **Create** button.

In **Device View** the **Transmit** tab will show the new multicast flow in the **Multicast Transmit Flows** side pane. This also shows the multicast address and port number of the multicast flow.

In the example **RTP Multicast Flow 2** is created, it has a multicast address of 239.69.209.29 and a port number of 5004. The multicast flow can be discovered by and added to AES67 devices.

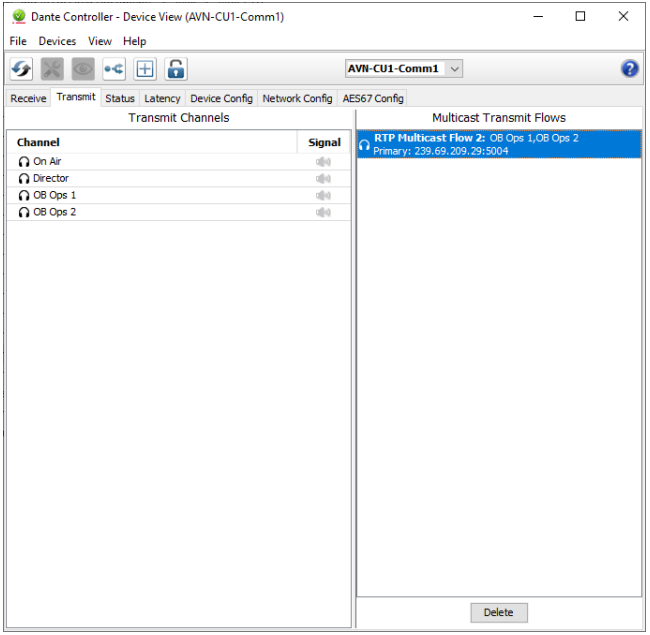


Fig 7-15: Multicast Transmit Flows side pane

When the multicast flow is no longer required it can be deleted by clicking **Delete.**

Clock Synchronisation

Precision Time Protocol (PTP) is used to keep the audio transferred between devices synchronised. Clock synchronisation can be monitored in the **Clock Status** tab.

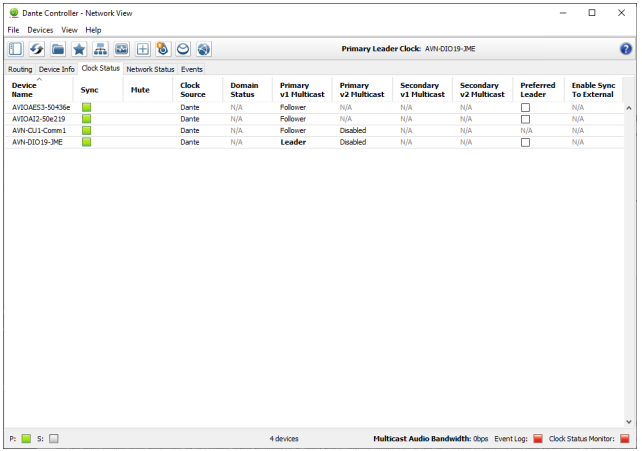


Fig 7-16: Clock Status Tab

Dante devices use PTPv1 for sychronisation. The **Primary v1 Multicast** column indicates whether a device is a PTPv1 master (Leader) or slave (Follower). A master device provides a clock which all slave devices sync with. The master device is automatically selected using the best master clock algorithm (BMCA), however this can be overriden by selecting the **Preferred Leader** checkbox.

On devices with the **AES67 Mode** enabled the **Primary v2 Multicast** column indicates whether the device is a PTPv2 master or slave. An AES67 enabled

device will act as a boundary clock keeping PTPv1 devices in sync with PTPv2 devices. Additional AES67 enabled devices will become passive PTPv1 devices.

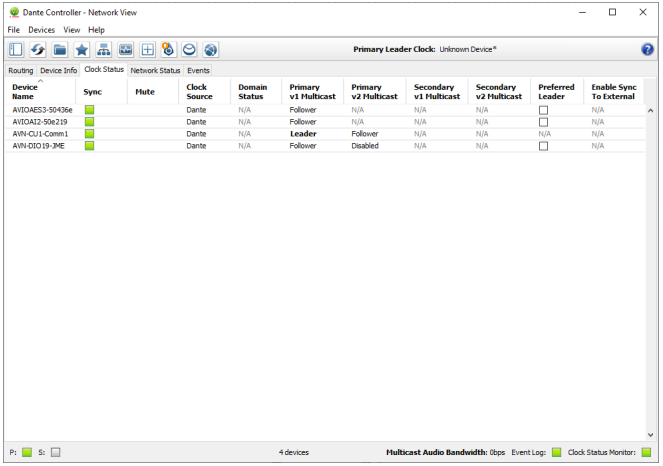


Fig 7-17: Clock Status using and AES67 Master Clock

In the example above, AVN-CU1-Comm1 is AES67 enabled and has become a follower to another PTPv2 device. The other PTPv2 device is not a Dante device and is therefore not displayed in Dante Controller. AVN-CU1-Comm1 then acts as a boundary clock keeping PTPv1 devices in sync with PTPv2 Devices.

8. Controls, Indicators & Connections

This section contains information about the interactivity of the different panels of the device. This includes pinouts, status colour definitions, and various other useful information.
This section will cover the following:

- Top panel
- Back panel

Top Panel

The top panel can be used to control audio sources, audio destinations and audio mix points.

The unit has an OLED display which provides a variety of information to the user on 3 pages. The first status page displays information such as AoIP, POE, DC and clock information in addition to the type of scale being used by the LED meter. The next page shows information related to the selected input type, either mic or line, and includes gain level, phantom power status, HPF status & limiter status. The third page show the headphone master gain and limiter status, as well as confidence metering for the 4 Dante input channels. The rotary encoder can be used to adjust the master gain from any of the main display pages, and the current setting will be briefly displayed if a different page is being used. A brief press on the rotary encoder changes the displayed page.

The top panel provides 5 potentiometers which can be used to control the level of each of the 4 incoming AoIP channels in addition to the commentator's own voice (sidetone) in the user's headphones. Each potentiometer (except for sidetone) is accompanied by an illuminated push button which routes the commentator's audio to the corresponding Dante output (On Air, T/B A, T/B B & T/B C) as well as a 3-position toggle switch to route audio to the left, right or both channels of the headphone output. Below the push buttons is a scribble pad that allows for quick and easy

source or destination labelling.

A curved LED bar graph meter at the top of the panel provides a high impact audio input level indicator in both dBFS and VU. The scale currently in use is shown on the first 'Display Status' page.

Back Panel

The back panel provides all of the physical connections. These connections provide power, audio inputs and outputs, and allow the user to control and configure the device.

The AVN-CU1 has two Ethernet ports for AoIP and PoE, two SFP ports for alternative transceiver types for the AoIP connection, a mic/line input, a commentator audio output, a 3.5mm and ¼" headphone output, a GPIO connector, a DC power connector, a reset button and a grounding terminal.

Ethernet Ports

The two locking Ethernet ports on the back of the device are labelled 'Primary' and 'Secondary' and are used for AoIP connectivity and to provide power to the device via Power over Ethernet (PoE). This can be provided via a supporting network switch or by using a PoE injector.

The two ports can be configured to function in either redundant or switched mode, via the Dante Controller interface. Selecting redundant mode allows the two ports to be connected to separate networks, this means that if one network fails, the other network will be used instead; in this case a separate address is given to each port. Selecting switched mode allows devices to be daisy chained allowing the secondary port to be used by another AoIP device in order to communicate on the network; in this case only the 'Primary' port is given an address.

Each Ethernet port has two LED indicators. The LED located to the top-left of the port indicates the link state, this is green when the connection is operating at 1 Gbps, and off when operating at any other speed. The LED located to the top-right of the port flashes if data is being transmitted/received on the port, the rate of the flashing varies depending on the rate of data transmission.

Both Ethernet ports are locking in order to prevent accidental removal of any connections. In order to remove a connector, the 'PUSH' button should be held whilst removing the connector.

SFP Ports

The SFP (Small Form-factor Pluggable) connector allows an alternativeinterface type (for example fibre) to be used for each network port. If an SFP interface is used, the corresponding RJ45 port cannot be used for network communications at the same time. However, the RJ45 port can still be used to provide PoE functionality.

Audio Inputs

Mic/Line Input

Analogue audio input on a locking female XLR Connector with the following pinout:

Pin 1: Ground
Pin 2: Mic/Line Phase
Pin 3: Mic/Line Non-Phase

Audio Outputs

Headphone Output

Both a 3.5mm and 1⁄4" connector are available for headphone connectivity, suitable for use by one commentator. The connectors have the following pinout:

Tip: Headphone Left
Ring: Headphone Right
Sleeve: Ground

Commentator Output

A line level direct output of the mic/line input. It can be configured to be on, off or active when the on air button is active. The male XLR connector has the following pinout:

Pin 1: Output Ground
Pin 2: Output Phase
Pin 3: Output Non-Phase

+12V DC Input

This 4-pin connector allows an external +12V DC power supply to be used to power the unit. The connection has the following pinout:

Pin 1: Ground
Pin 2: +12V (Legacy)
Pin 3: N/C
Pin 4: +12V

Phantom Power Status LED

Indicates Phantom power on the mic/line input. Phantom power can only be supplied when the mic/line input is set to mic mode. Phantom power is supplied at +48V.

Reset Button

On the AVN-CU1, the recessed reset button is situated to the right of the secondary Ethernet connection. Pressing the button will reboot the unit.

GPIO Connector

The AVN-CU1 Has a single female D-SUB (DA-15) connection, this provides 10 configurable GPIO and a voltage free switching relay contact. The connection has the following pinout:

Pin 1: GPIO Port 1
Pin 2: GPIO Port 2
Pin 3: GPIO Port 3
Pin 4: GPIO Port 4
Pin 5: GPIO Port 5
Pin 6: Relay – Normally Open Contact
Pin 7: Relay – Normally Closed Contact
Pin 8: Relay – Common
Pin 9: GPIO Port 6
Pin 10: GPIO Port 7
Pin 11: GPIO Port 8
Pin 12: GPIO Port 9
Pin 13: GPIO Port 10
Pin 14: Fused (50 mA) +12V DC Supply
Pin 15: Ground

The +12V DC supply is fused and has a maximum output current of 50 mA.

GPIO ports can be set up as outputs (GPO) or inputs (GPI). GPO are open collector, this means the output pin is connected to ground when the GPO is active. GPI are active low and are triggered when pulled down to ground. GPIO configuration can be managed through the devices embedded web server.

9. Embedded Web Server

The AVN Commentator Units have an embedded web server which provides easy access to all the configuration options through a web browser. It also gives access to system information and allows firmware to be easily updated when new firmware releases are made available.

The device has two Ethernet ports on its back panel, one is the 'Primary' Ethernet port and the other is the 'Secondary' Ethernet port. When the Interface Mode is set to 'Redundant', the web server can only be accessed via the primary port. When it is set to 'Switched', the web server can be accessed via both ports.

Fig 9-1: Device Information Page

By default, the embedded web server is set to static address mode. The IP address of the embedded web server is 192.168.0.100 with a subnet mask of 255.255.255.0. If the network address mode for the port to be used has been set to 'Dynamic', the unit will attempt to acquire an IP address from a DHCP server. If no DHCP server is found, an automatically generated IP address will be used.

The active IP address for the network port can be found using a service discovery tool such as the 'Discovery Application' which can be found on the Sonifex website: (http://sonifex.co.uk/technical/software/index.shtml#sfxsrvdisc)

Alternatively, the user can display the IP address on the main display of the device by pressing and holding the rotary encoder until the main menu is shown, and then navigating to and selecting the 'Status' section. Turning the rotary encoder scrolls through the displayed information. If the embedded web server has yet to acquire an IP address or has failed to link, the corresponding IP address and subnet mask will show 0.0.0.0

Once the IP address of the embedded web server is known, type this into the address bar of a web browser. The 'Device Information' page will then be displayed. This is the default page and will always be displayed first when connecting to the embedded web server. The friendly name of the device is shown underneath the Sonifex logo. This makes it easier to identify the connected device especially when configuring multiple devices at the same time. Help information can be found by clicking on the question mark in the corresponding section.

Information

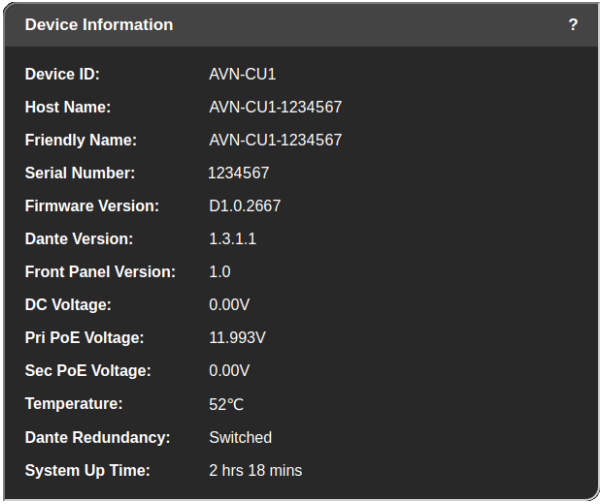


Fig 9-2: Device Information

This information shows the current status of the unit as well as the software versions of the various modules running on the unit. When contacting Sonifex technical support, it is important to provide the information shown on this page.

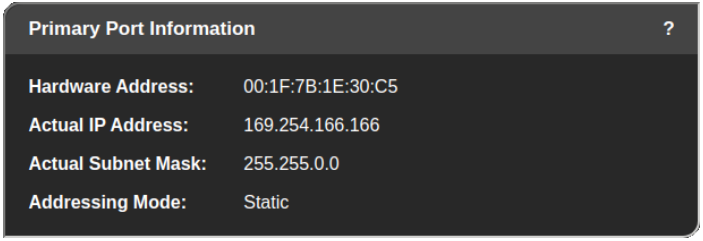


Fig 9-3: Port Information

The lower half of the page shows the configuration of the network ports.

The 'Primary Port Information' and the 'Secondary Port Information' shows the configuration information of each port to the Dante audio network. The network settings of these two ports can be controlled via the 'Network' configuration web page. If the Dante interface mode setting for the unit is set to "Switched", then only the Primary Port Information will be shown here.

Configuration

There are five sections under the 'Configuration' tab, these are as follows.

- Network
- Front Panel
- Audio Routing
- GPIO Settings
- SNMP Settings

Network

The Network page shows the current configuration for the Primary and Secondary Network ports. Please note the secondary port will only be shown if the Dante Interface Mode is set to redundant. The friendly name and security options can also be set here

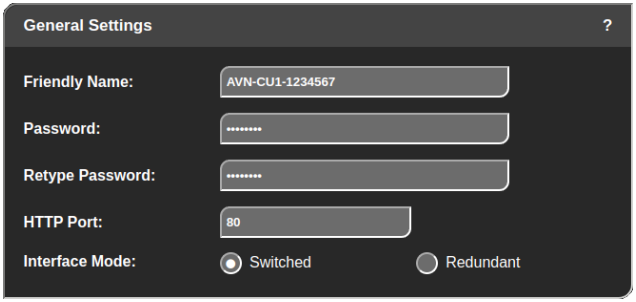


Fig 9-4: General Settings

Friendly Name

The friendly name identifies the unit on the network. It is a good idea to assign a user name or location as this is easily recognised by other users. The default friendly name is made from the device ID and the 7-digit product serial number i.e. AVN-CU1-1234567. The friendly name can only contain letters, numbers and hyphens although it cannot start or end with a hyphen.

Password

In order to prevent other users connected to the same network from modifying the configuration of the device, it is possible to protect your device with a password. The password may be between 4 and 8 characters long and may only contain numbers and letters.

Retype Password

In this field the password must be retyped. This is to ensure you didn't accidentally enter your intended password incorrectly.

Removing Password Protection

Password protection can be removed from a device by clearing both the 'Password' and 'Retype Password' fields and clicking submit.

HTTP Port

The HTTP port number can be set to any integer from '1024' up to and including '65535', or to '80' the default value. The value entered determines which port the web server on the device will use. When the port number is modified the unit will be restarted automatically. To view the web pages of a device with a modified port number, the port number must be specified in the address bar of the web browser after the IP address and separated by a colon.

For example, if the HTTP port of a unit is set to '1024' and the IP address of the unit is '192.168.0.100' then 'http://192.168.0.100:1024' would need to be entered into the address bar of the web browser.

When the port is set to its default value of '80', a port number doesn't need to be specified when accessing the web server.

The web server on the unit is advertised as an Avahi / Bonjour service so tools like Sonifex Service Discovery or avahi-browse will be able to discover the address and port number being used by the web server on the unit.

Interface Mode

This option sets the configuration mode for the network ports. In switched mode, the primary port is the main Dante audio port and the secondary port will behave as a standard switch port allowing daisy chaining through the device. In redundant mode, the secondary port can be connected to a redundant network to provide backup in case the primary network fails.

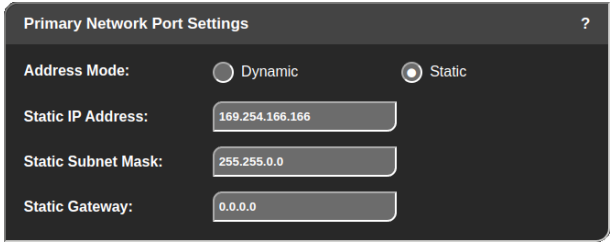


Fig 9-5: Primary Network Port Settings

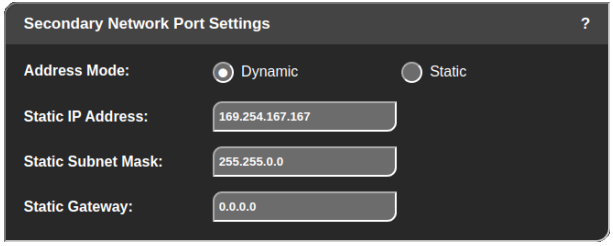


Fig 9-6: Secondary Network Port Settings

Address Mode

The address mode determines how the port obtains its IP address. When set to dynamic, the unit will attempt to acquire an IP address automatically from either a DHCP server or via auto configuration if no DHCP server is found. The actual IP address will be shown on the device information page. When static mode is used, the IP address and subnet mask values entered will be assigned to the port.

Static IP Address

This is the IP address that will be assigned to the port when static address mode is selected. It is important to ensure that this IP address is not currently in use on the network. This value is not used when the address mode is dynamic.

Static Subnet Mask

This is the subnet mask that will be used for the port when static address mode is selected. This value is not used when the address mode is dynamic.

Static Gateway

This is the router IP address that will be used for the port when static address mode is selected.

Note

If the device is in switched mode the secondary network port settings will not be displayed.

If any of the network configuration options are changed, the unit will automatically restart to implement the new settings. If the address mode of the control port is changed, a new connection will need to be made once the unit has restarted and the IP address assigned via DHCP is known. Otherwise, the new page will be reloaded automatically once the restart of the unit is complete.

Network Defaults (AVN-CU1)

Friendly Name:	AVN-CU1-xxxxxxx
	(Where xxxxxxx is the product serial number)
Interface Mode:	Switched
Primary Network Port:	Address Mode: Static
	Static IP Address: 192.168.0.100
	Static Subnet Mask: 255.255.255.0
	Static Gateway: 0.0.0.0
Secondary Network Port:	Address Mode: Static
	Static IP Address: 192.168.1.100
	Static Subnet Mask: 255.255.255.0
	Static Gateway: 0.0.0.0

Front Panel

The front panel page allows the user to configure the meter scale, pushbutton settings, brightness and colour preferences of the device and access some additional device settings. The page is updated in real time and shows a live representation of the physical unit, this allows remote control of the Commentator Unit.

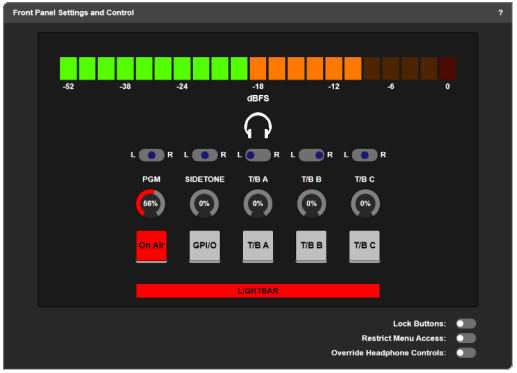


Fig 9-7: Front Panel Settings and Control

Configure Meter

To change the meter's scale and source settings, simply right click on the meter in the web interface to bring up the 'Configure Meter' screen.

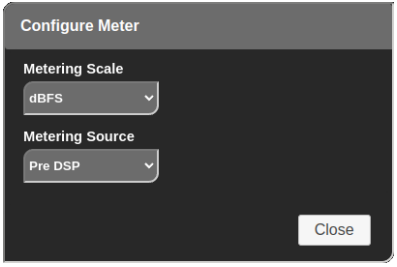


Fig 9-8: Configure Meter

Metering Scale

Use the drop-down menu to change the scale used by the meter by selecting either dBFS or VU mode.

Metering Source

Use the drop-down to choose whether the meter displays the signal level before Digital Signal Processing (DSP) or after by selecting 'Pre DSP' or 'Post DSP' accordingly.

Configure Meter and Button LED Brightness

Right click on the panel anywhere near the pan switches or audio level meters to access these settings.

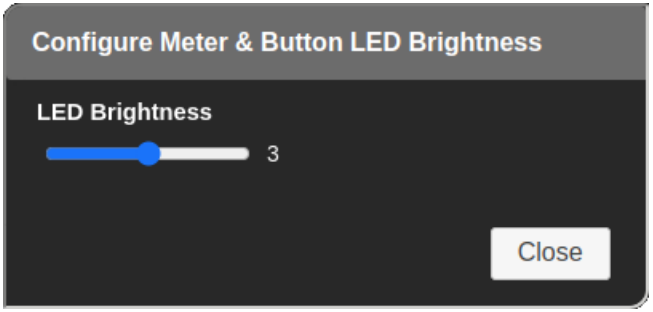


Fig 9-9: Configure Meter and Button LED Brightness

LED Brightness

Use the slider to change the brightness of the signal meter and the pushbuttons. There are 9 stages of brightness available including 'Off'.

Configure On Air & GPIO Buttons

Right click while hovering over the 'On Air' or 'GPIO' button to open the configuration settings.

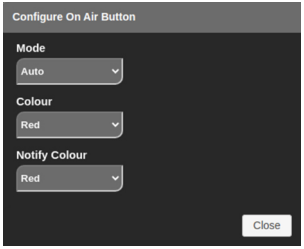


Fig 9-10: Configure On Air Button

Mode

Here, the button behaviour can can be changed.
The options available are:

- Always Off: The button is locked in the off state and any presses of the button are ignored.
- Momentary: The function is active only for the time the button is held down.
- Latching: Pressing a button will toggle that function on and pressing it again will turn it off.
- Auto: A combination of latched and momentary is used (e.g. short press the On Air button to toggle it or hold it down to speak momentarily)
- Always On: The button is locked in the on state and any presses of the button are ignored.

Colour

Use the drop-down menu to select the colour that will be displayed when the button is active.

Notify Colour: It is possible to put the buttons into notify mode using the On-Air Notify or **GPIO** Notify output events on the **GPIO** grid. When in notify mode, the button will flash.Use the drop-down menu to select the colour that the button will flash when it is in notify mode.

Configure Talkback Buttons

Right click while hovering over any of the 3 **'T/B'** buttons to open its configuration settings. The displayed options are the same for the 3 talkback buttons.

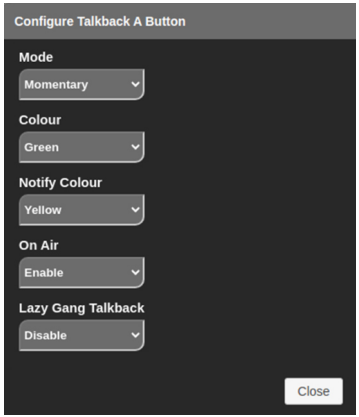


Fig 9-11: Configure Talkback A Button

Mode

Functionality is the same as the **On Air** and **GPIO** buttons.

Colour

Use the drop-down menu to select the colour that will be displayed when the **T/B** button is active.

Notify Colour

It is possible to put the buttons into notify mode using the On-Air Notify or **GPIO** Notify output events on the **GPIO** grid. When in notify mode, the button will flash. Use the drop-down menu to select the colour that the button will flash when it is in notify mode.

On Air

This setting allows you to choose whether enabling this talkback channel disables the On Air channel until talkback is disabled again. While this setting is disabled, you will see that if 'On Air' is illuminated on the AVN-CU1 it will be turned off when the corresponding 'T/B' button is pressed. Enabling this setting allows both 'On Air' and this 'T/B' button to be active simultaneously.

Lazy Gang Talkback

When enabled, pressing any of the 3 T/B buttons will activate all the talkback channels at once.

This is useful for when all 3 users on the talkback channels need to be communicated with at the same time.

Configure Lightbar

Right click while hovering over the 'LIGHTBAR' icon to open its configuration settings.

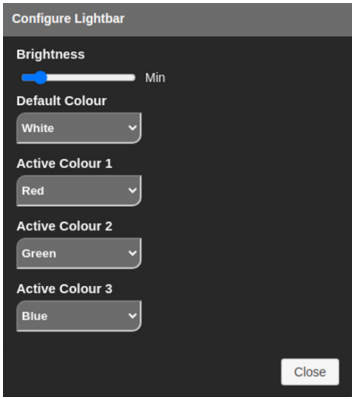


Fig 9-12: Configure Lightbar

Brightness

Use this slider to change the brightness of the downlighting on the device. There are 9 stages of brightness available including Off.

Default Colour

This drop-down menu allows you to choose the colour of the downlighting during normal operation of the device. There is also the option of 'Off' if downlighting is only desired for status indication.

Active Colour 1/2/3

On the GPIO grid it is possible to select "Lightbar On x" "Lightbar Flash x" or "Lightbar Sweep x" output events. These drop downs allow you to choose the colour that the downlighting will illuminate, flash or sweep when the relevant GPIO output events are activated.

Active Source

This option selects the event that will cause the 'Active Colour' to be displayed by the downlighting. Individual events can be selected for each of the pushbutton functions, or for when one or more of the T/B buttons are activated. The 'None' option allows the lightbar to remain at the default colour.

Additional Settings

Some extra device permissions and remote-control features are selectable on this page including Button Locking, Menu Access Restrictions and Headphone Control Override.

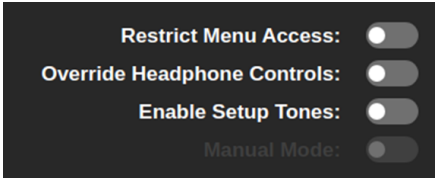


Fig 9-13: Additional Settings

Restrict Menu Access

Enabling this setting prevents the user of the AVN-CU1 from being able to access the device's Main Menu, preventing them from accessing various Network, Audio and other configuration settings.

Override Headphone Control

Enabling this setting disables the headphone routing switches and level potentiometers on the front panel of the device, and allows the settings to be controlled directly from the web interface.

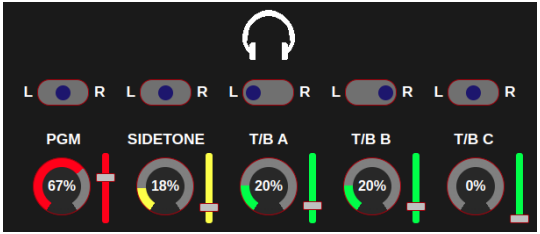


Fig 9-14: Headphone Level and Panning Control

Enable Setup Tones

Enabling this setting sets the Dante output channels into tone mode. It is used with the “Manual Mode” switch. By default the automatic tone mode is used, the On-Air and Talkback buttons will illuminate and the tones will be heard on each Dante transmit channel in time with when the buttons flash green. The number of pulses of the tone per second heard on each channel help identify the channel:

- On Air (dante tx channel 0) pulses once per second.
- Talkback A (dante tx channel 1) pulses twice per second.
- Talkback B (dante tx channel 2) pulses three times per second.
- Talkback C (dante tx channel 3) pulses four times per second.

If Manual mode is selected, the automatic pulsing of the tone on each channel is disabled, and the user controls when the tones are heard on each channel by pressing the button to activate the tone on the desired channel. When the button is red, tones are not present on the channel, when the button is green the tones will be heard. The ablity to enable tone mode is disabled when the device is on air.

Additional Settings

Some extra device permissions and remote-control features are selectable on this page including Button Locking, Menu Access Restrictions and Headphone Control Override.

The headphone switches now directly control the audio routing, and the sliders next to each level percentage indicator can be used to change the audio levels. Simply click and drag the sliders up or down to adjust the corresponding channel.

When this setting is disabled, the headphone routing and audio levels will return to the current settings on the frontpanel and the device can be used as normal once again.

Audio Settings

The audio settings provide options for the audio inputs and outputs on the AVN-CU1

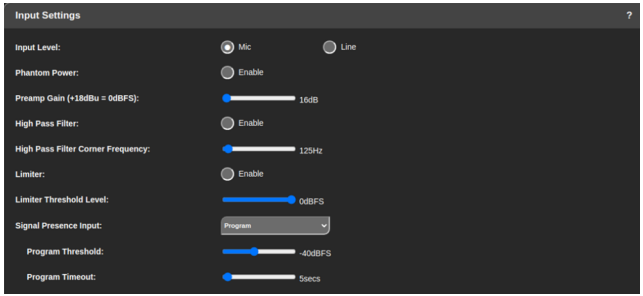


Fig 9-15: Mic input settings

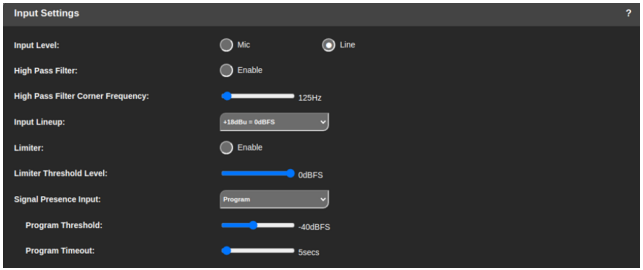


Fig 9-16: Line input settings

Input Level

The AVN-CU1 supports both mic level and line level signals via the single XLR input on the back panel. The type of signal being input can be selected here by clicking the radio button next to the desired connection type.

It is important that the input signal type selected matches the signal type that is actually being used.

Phantom Power

Selecting this checkbox enables or disables the phantom power supplied to the Mic/Line XLR input. Phantom power is supplied at +48v. An LED above the primary ethernet connection on the back panel of the device is illuminated when phantom power is enabled. This option is only available when the input level is set to mic.

Preamp Gain

This slider controls the gain level of the mic input signal. It can be adjusted by moving the slider left and right. A range of +16dB to +76dB is available. This option is only availbale when the input level is set to mic.

Input Lineup

This sets the analogue audio level that corresponds to 0dBFS (Full scale digital value). This can be set to +15, +18, +20, +22 or +24dBu. This option is only available when the input level is set to line.

High Pass Filter

This option enables the high pass filter for the selected input level

High Pass Filter Corner Frequency

Sets the high pass filter corner frequency between 40Hz and 3kHz.

Limiter

This option enables the audio level limiter for the selected input level.

Limiter Threshold Level

Sets the audio threshold level for the mic/line limiter. Audio above this level will be limited.

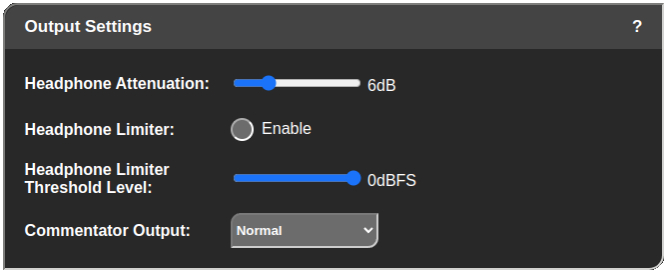


Fig 9-17: Output settings

Signal Presence Input

Signal presence detection can be configured on the Dante receive or the mic/line input channels (Program, TalkbackA, Talkback B, Talkback C or Mic/Line). When an audio signal is detected, a corresponding GPIO grid input event will be activated and can be used to trigger a button into notify state or flash the lightbar for example. This drop down selects an input and the Threshold and Timeout sliders below the drop down can be used to determine when the event is triggered.

Threshold

Set the audio level in dBFS where the signal presence event is triggered. When the input audio reaches this level the corresponding GPIO input event becomes active.

Timeout

Set how long (in seconds) that the audio level has to be below the threshold for the corresponding GPIO input event to be deactivated.

Headphone Attenuation

Allows the headphone attenuation (measured in dB) to be adjusted and can be set to a value from 0dB up to 24dB.

Headphone Limiter

This option enables the audio level limiter for the headphone output.

Headphone Limiter Threshold Level

Sets the audio threshold level for the headphone limiter. Audio above this level will be limited.

Commentator Output

This controls the routing of the Mic/Line input to the Comm Out connector on the rear panel of the AVN-CU1. When set to 'disable', the output is muted. When set to 'Always On', the signal is always routed. In 'Normal' mode, the signal is routed only when the On Air button is active.

GPIO Settings

The **GPIO Settings** web page shows an overview of connections between logical inputs and logical outputs. This web page allows the device to be configured to perform actions when events occur.

The inputs can be of type:

- Physical GPI
- Virtual GPI
- Events

The outputs can be of type:

- Physical GPO
- Virtual GPO
- Events
- Relay

An example scenario of when these logical connections might be useful is as follows:

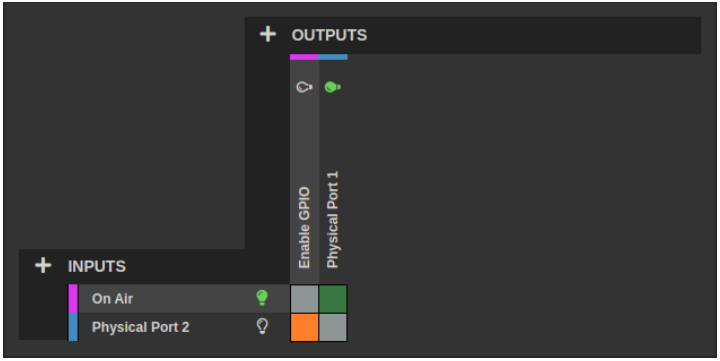


Fig 9-18: Example GPIO routing grid

In a particular setup there is an LED sign which can be controlled using a physical GPIO connection, the commentator wants this LED sign to be turned on whenever they are On Air, therefore they add the event **On Air** as an input, then they add a physical GPIO as an output selecting **Physical Port 1**. They then click in the white square which is in line with both that input and that output which causes a connection between the two to be made. Now whenever the commentator is On Air their corresponding On Air LED sign will illuminate.

In the example, the commentator is On Air indicated by the green lightbulb on the input On Air and the routing to Physical Port 1 becomes active indicated by the green box between them.

Inputs and outputs can be added to the GPIO routing grid by clicking the + icon next to INPUTS or OUTPUTS. Once added, routings can be made between inputs and outputs. An orange square indicates an inactive routing, a green square indicates an active routing.

Add Input

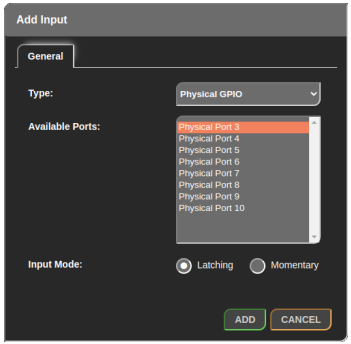


Fig 9-19: Adding an input to the GPIO routing grid

Type

The type drop-down menu allows the user to configure how the input will operate, the options available are described below.

Physical GPIO

Allows a general-purpose input on the rear panel of the device to be used as a trigger for an output.

When selected the following fields are also displayed:

- Available Ports
- Input Mode

Virtual GPIO

Allows a virtual general-purpose input to be created using a source from the network, this can then be used as a trigger for an output.

When selected the following fields are also displayed:

- Available Ports
- vGPIO Source

Event

Allows an input event to be selected which will then cause an output to be triggered, for example an input event could be set when DC power is lost.

When selected the following fields are also displayed:

- Available Events

Available Ports

This drop-down menu allows the user to select which of the available physical ports or virtual ports to setup, this is dependent on the type of port selected.

There are ten physical ports available and ten virtual ports available.

Input Mode (Physical GPI Only)

Momentary

When the input mode is set to Momentary, the input function is enabled only whilst the input is active.

Latching

When the input mode is set to Latching, making the input active briefly will toggle whether the input function is enabled or disabled.

vGPIO Source (Virtual GPI Only)

The vGPIO Source drop-down window allows the user to select a virtual general-purpose output port from another device that is available on the network and use that to set the state of the virtual input.

Available Events

This drop-down menu allows an event to be selected that can then be used as an input to drive the state of another output, the list of options are as follows.

Primary Link Down
Active when no connection is available via the primary network port on the device.

Secondary Link Down
Active when no connection is available via the secondary network port on the device.

DC Power Off
Active when the status of the DC port is in fault condition.

POE1 Power Off
Active when the status of the primary PoE port is in fault condition.

POE2 Power Off
Active when the status of the secondary PoE port is in fault condition.

PTP Sync Lost
Active when the connection to the PTP master is lost.

On Air
Active when the On Air button is activated.

GPIO:
Active when the GPIO button is activated.

Talkback A/B/C
Active when the corresponding Talkback channel is activated

Signal Present: Program / Talkback A / Talkback B / Talkback C / Mic Line
Active when audio is present on the corresponding input. The threshold and timeout behaviour for these events can be configured in the Audio Settings menu.

Add Output

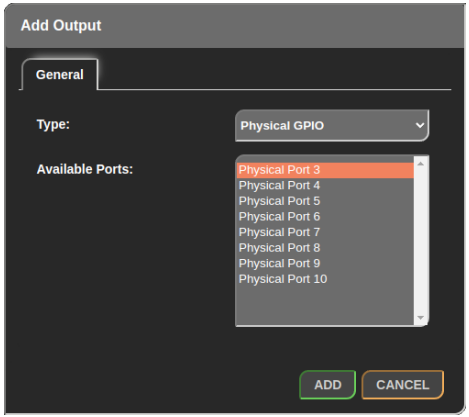


Fig 9-20: Adding an output to the GPIO routing grid

Type
Allows the user to configure the outputs operation.

Physical GPIO
Allows a GPO on the rear panel of the device to be activated.

When selected the following fields are also displayed:

- Available Ports

Virtual GPIO
Creates a virtual GPO on the network which can be activated.

When selected the following fields are also displayed:

- Available Ports

Event
Allows an event to be activated. When selected the following fields are also displayed:

- Available Events

Relay
Allows the relay available on the GPIO connector, to be toggled on and off.

When selected the following options are also displayed:

- Available Relays

Available Ports
Allows the user to select which of the available physical ports or virtual ports to setup, this is dependent on the type of port selected. There are ten physical ports available and ten virtual ports available.

Available Events
Allows the event to be triggered when any input routed to this output is active, the list of options are as follows.

Enable On Air
The On Air channel is enabled on the device.

Enable GPIO
Activates the GPIO button on the device.

Enable Talback A/B/C
Enables the corresponding talkback channel on the device.

On Air / GPIO / Talkback A/B/C Notify
When this event type is triggered, the corresponding button is put into notify mode and the button will flash in the “Notify colour” set in the frontpanel menu.

Lightbar On Colour 1 / 2 / 3
When this event type is triggered, the lightbar will be illuminated in the corresponding colour. The LED colours 1,2 and 3 can be configured via the Front Panel webpage.

Lightbar Sweep Colour 1 / 2 / 3
When this event type is triggered, the lightbar will be illuminated in a sweep pattern in the corresponding colour. The LED colours 1,2 and 3 can be configured via the Front Panel webpage.

Lightbar Flash Colour X

When this event type is triggered, the lightbar will flash. Where a single colour is contained in the name (e.g. Lightbar Flash 1) The LED will flash between off and the selected LED colour. Where 2 colours are listed in the event name (e.g. Lightbar Flash Colours 2/3) The LED will alternate between the 2 colours. The LED colours 1,2 and 3 can be configured via the Front Panel webpage.

Available Relays

Allows the user to select which of the available relays on the device is to be
setup as an output. There is one relay available on the AVN-CU1.

Routing Grid

Create Connection

Clicking on a square in the routing grid creates a connection.

Orange squares indicate inactive connections.

Green squares indicate active connections.

Dark grey squares indicate an input and output are not allowed to be connected, for example an event cannot be routed to the same event.

When an input is active, indicated by a green lightbulb next to the input name, the connection becomes active. This in turn makes the output active which is indicated by a green lightbulb next to the output name.

Remove Connection

Hold the control key and click a connection to delete it. Alternatively click on a connection and then click Delete in the Configure Connection window.

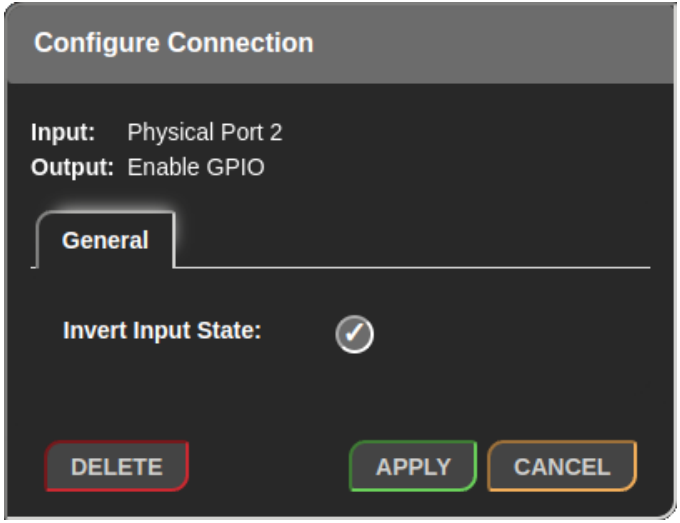


Fig 9-21: Invert Connection

Invert Connection

A connection can be inverted by clicking the connection and then selecting **Invert Input State** in the **Configure Connection** window. Now when the connection would normally be active it is inactive, and when it would normally be inactive it is active.

SNMP Settings

The SNMP settings web page allows configuration of SNMP messages and can be used send traps to an SNMP master which can then perform tasks such as sending email.

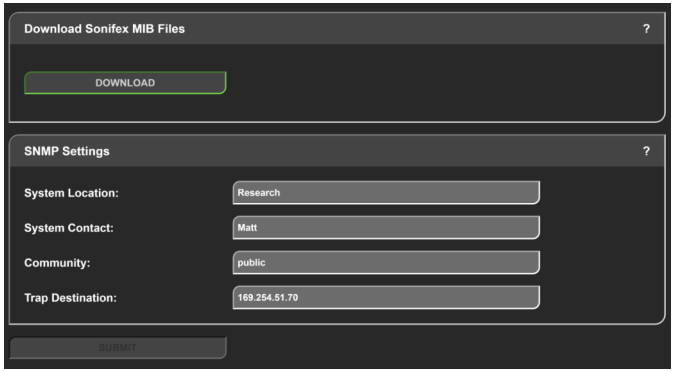


Fig 9- 22: SNMP Webpage

Download Sonifex MIB Files

Click **Download** to download two files SONIFEX-GPIO-MIB and SONIFEX-MIB these are used by the SNMP master to decode received messages.

SNMP Settings

System Location

The system location is used to specify the physical location of the unit. This may be set to any value which is between 0 and 20 characters in length. The system location can be accessed via SNMP using the OID 1.3.6.1.2.1.1.6 (sysLocation).

System Contact

The system contact is used to specify the user of the device. This may be set to any value which is between 0 and 100 characters in length. The system contact can be accessed via SNMP using the OID 1.3.6.1.2.1.1.4 (sysContact).

Community

The SNMP community string is used as a form of security. If the string is set to 'public' without quotation marks, any SNMP master on the network may query the device. If the community string is set to anything else, the SNMP master will need to send this community string along with any SNMP requests in order to acquire the requested information. Otherwise the request will be denied. This may be set to any value which is between 0 and 20 characters in length.

Trap Destination

The trap destination is the IP address of the SNMP master. This allows the device to send SNMP trap messages to the SNMP master containing information about the devices current state. For example, a SNMP trap message is sent when the state of a GPI is changed, along with information about that GPI such as the GPI number and its current state.

Disabling SNMP Trap Messages

To prevent SNMP Trap Messages from being sent, the 'Trap Destination' field can be cleared and the form submitted.

System

The system web page is used for the following:

- Updating the unit
- Saving and loading configuration files
- Retrieving the unit's system logs
- Rebooting and resetting the unit

Update Firmware

In this section, the current firmware version on the connected unit is shown. New versions of firmware will be released as new features are added, and when any bug fixes are completed. Click on the software downloads link to visit the firmware downloads webpage of the Sonifex website. If an update is available for your unit, you can download it as a zipped archive file. You will then need to extract the 'SWU' file from the archive. This can be done in Windows by right-clicking the archive and selecting extract all.

Clicking update will then show the software update page. Follow the on screen instructions to select and install a new firmware version, or select Show Advanced Options to select the existing firmware image to boot.

Save Configuration To A File

The currently loaded configuration of the unit can be saved to a local 'JSON' file by clicking the save config button. The filename will be the device ID followed by an underscore and the device's friendly name.

It is a good idea to save the configuration settings of all units on the network once they have been setup as this provides a quick and easy way of returning the units to a known working condition.

Load Configuration from A File

This section is used to load stored pre-set files. This is useful when the unit is being moved between locations with different setups. Configuration files store the complete setup of the unit including the units network settings, however network settings are only changed when the Overwrite Network Settings checkbox is selected.

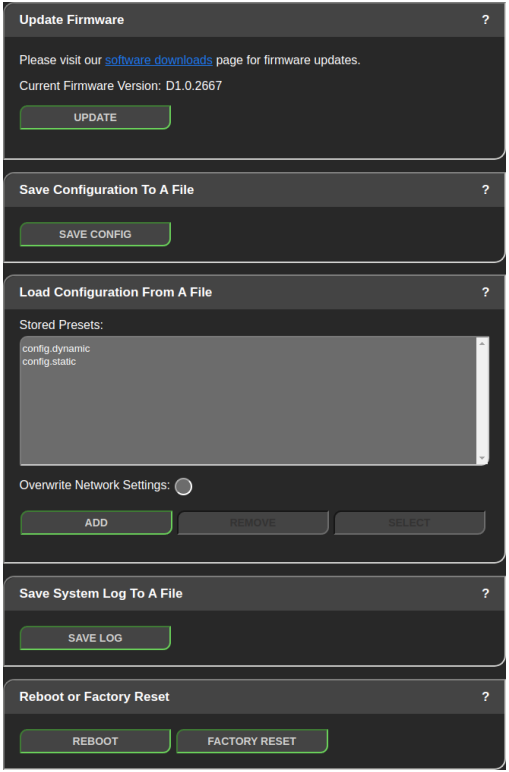


Fig 9-23: System Webpage

A maximum of 8 pre-sets can be added to the unit. A pre-set is added by clicking the Add button and selecting a local configuration file. A pre-set can be removed by selecting it in the list and clicking the Remove button. A pre-set is loaded on the unit by selecting the pre-set in the list and pressing the Select button. If it is necessary to also load the network settings that are present in the configuration file, the Overwrite Network

Settings checkbox can be selected. If you would like to maintain the current network settings, uncheck this option and all other settings stored in the selected pre-set will be applied.

settings that are present in the configuration file, the overwrite network settings checkbox can be selected. If you would like to maintain the current network settings, uncheck this option and all other settings stored in the selected pre-set will be applied.

When a pre-set is loaded, the unit will automatically reboot to load the new configuration settings. This takes approximately 25 seconds during which time a progress page will be shown. If the settings of the network port the browser is connected to have changed, a new connection will need to be made once the unit has restarted. Otherwise, the device information page will be shown automatically.

Save System Log To A File

An internal log records system events and errors. The current log can be retrieved from the device by clicking the Save Log button.

If there have been no process crashes the current log is saved and is a single text file. Otherwise multiple logs will be stored together in a 'TAR' archive file. This archive can be sent to Sonifex to help you resolve any issues with the unit.

Reboot or Factory Reset

The unit can be rebooted using the reboot button, and this can often fix minor issues with the unit. After rebooting, the webpage should automatically be reloaded. The factory reset button restores the unit to factory settings. Restoring the factory settings will also cause the unit to reboot.

The pre-set configuration files previously uploaded to the unit will still be available after a factory reset, this allows the unit to be quickly restored to a known working state.

10. Main Menu

The main menu can be accessed by pressing and holding the AVN-CU1's encoder for around 1 second. Turning the encoder will allow you to navigate up and down the list of sub-menus and settings. Select a sub menu or setting by pressing the encoder while hovering over that option.

When the system menu opens, the following items are displayed:

- Network
- Audio
- Brightness
- Config
- Setup
- Status
- Close

You can exit the menu by selecting the close menu item, which is available in each of the sub-menus.

Network

In the network sub-menu, the user can set the configuration for each of the device's network ports. When the network sub-menu opens the following items are displayed:

- Primary
- Secondary
- Back
- Close

Primary

In this sub-menu, the user can configure the primary connection to the device. Here, the following items are displayed:

- Mode
- IP Address
- Netmask
- Gateway
- Back
- Close

Mode

Dynamic

When set to dynamic, the unit will attempt to acquire an IP address automatically from either a DHCP server or via auto configuration if no DHCP server is found.

Static

When static mode is used, the IP address and subnet mask values provided will be assigned to the port.

IP Address
To edit the IP address, use the rotary encoder to select the required octet to edit, then press the encoder button to enable edit mode. The value can now be changed by turning the encoder to cycle through numbers from 0 to 255. Pressing down on the encoder will allow you to navigate to the next octet of the IP address. Select the Save option to save the entered IP address or select Cancel to discard your changes.

Netmask
Configure the subnet mask for this connection. The address is edited in the same way as the IP Address.

Gateway
Configure the gateway for this connection. The address is edited in the same way as the IP Address.

Secondary
This port is used to provide redundancy to Dante connections when the dante interface mode is set to redundant. This provides the same options as the Primary port.

If the Dante Interface mode is set to switched, these settings can still be changed. They will be stored in the configuration file and loaded when the Dante Interface mode is set back to redundant mode.

Audio
The audio sub-menu allows the adjustment of various audio settings for the AVN-CU1 such as input type and headphone output settings.

In this section, the following items are displayed

- Input
- Headphone
- Comm Output
- Back
- Close

Input
Signal
This allows the commentator input to be switched between microphone and line modes.

When in microphone mode the following options are available:

- Gain
- Phantom
- HPF
- Limiter

When in line mode the following options are available:

- Line up
- HPF
- Limiter

Gain
In the gain sub-menu, the pre-amp gain (measured in dB) can be adjusted from 16 dB to 76 dB.

Phantom
In the phantom sub-menu, phantom power can be enabled or disabled.

Line up
The line-up level can be adjusted between the following values:

- +15 dBu = 0 dBFS
- +18 dBu = 0 dBFS
- +20 dBu = 0 dBFS
- +22 dBu = 0 dBFS
- +24 dBu = 0 dBFS

HPF
The HPF (High Pass Filter) sub-menu provides two items. The State allows enabling and disabling of the high pass filter. The Frequency allows the cut-off frequency for the high pass filter to be adjusted from 40 Hz to 3 kHz.

Limiter

The mic/line input limiter sub-menu provides two items. The state allows enabling and disabling of the limiter. The Threshold sets the level at which the mic/line audio level will be limited, with a value from -40 dBFS up to 0dBFS

Headphone

Attenuate

Allows the headphone attenuation to be adjusted from 0 dB up to 24 dB.

Limiter

Allows a limiter to be enabled and a threshold to be set for the commentator headphones. This helps to prevent distortion of audio as the audio level rises. The threshold for the headphones can be set to a value from -40 dBFS up to 0 dBFS.

Comm Output

Allows the functionality of the Commentator Output on the Back Panel of the AVN-CU1 to be switched between **Disabled, Always On** and **Normal.** When **Disabled** is selected, no audio will be routed to the Comm output. When **Always On** is selected, commentator audio will always be routed to the Comm output. When **Normal** is selected, audio is only routed when the On Air button is active.

Brightness

This sub-menu allows the brightness level of the **Frontpanel** and **Lightbar** to be adjusted. There are 9 levels available for each setting including **Max, Min** and **Off. Frontpanel** brightness controls the LED meter and pushbuttons and **Lightbar** controls the downlight at the front of the device.

Configuration

Provides a list of currently available pre-set configs uploaded to the device. When more configs are available than can fit in the menu, the encoder can be rotated in order to move up and down the list. Press down on the encoder to select the corresponding pre-set config. The unit will then reboot and load the selected config settings. Select Back or Close to leave the menu without changing the configuration.

When loading a configuration from the system menu, network settings are not overwritten.

The **Reset Defaults** option is also available and will reset the device back to its default configuration when selected.

Setup

Provides a list of setup options:

Output Tones – In this menu you can select “Auto” or “Manual” and this will put the Dante tranmit channels in to tone mode. Auto mode pulses tones on each channel to aid identification, manual mode allows the user to enable or disable tones on each Dante output channel. See “Enable Setup Tones” in the front panel webpage documentation for more information. Note that tone modes cannot be activated if the deviceis currently on air.

Status

The status sub-menu provides a detailed list of the device’s current settings and status. The following information is included in the list:

- Product ID
- Firmware Version
- Serial Number
- Name
- Primary IP Address
- Primary Netmask
- Primary MAC Address
- Secondary IP Address
- Secondary Netmask
- Secondary MAC Address
- System Uptime
- System Temperature
- Front Panel Version

11. Ember+

Device information and configuration can also be viewed and modified using Ember+.

EmberPlus Viewer can be downloaded from:
https://github.com/Lawo/ember-plus/releases

To add a device to the viewer click **Add** next to **Communication Ports**. In the window that appears an IP address and port is required. Type in the IP address of the unit and leave the port number as 9000.

A device tree appears under **Communication Ports**.

There are six main nodes:

- identity
- system
- network
- frontpanel
- audio
- gpio

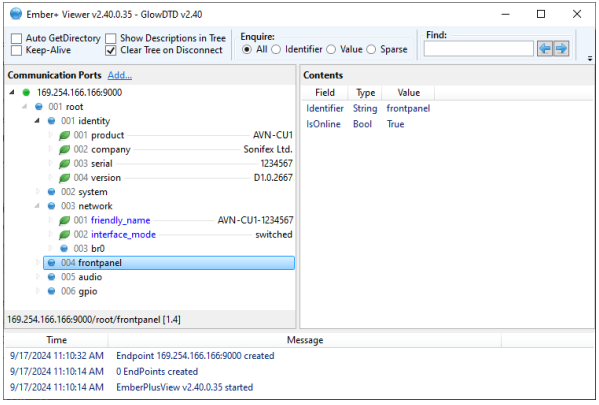


Fig 11-1: Ember+ Viewer

The **identity** node contains device information:

- product - This specifies the type of product being used.
- company - This specifies the manufacturer of the product.
- serial - This specifies the devices serial number.
- version - This specifies the devices current firmware version.

Within the **system** node is a reboot function, clicking **Invoke** will cause the unit to be rebooted.

The **network** node contains the network configuration. After changing any network settings via Ember+ the unit has to be rebooted to apply the changes. The **network** node contains the following options:

- friendly_name - The name given to the device. Text value
- interface_mode - Selects the Dante Interface mode.
  Enumerated value: 1 = **Switched**
  2 = **Redundant**
- br0 - The devices primary network port. It contains the following options:
  - mode - Selects the ports addressing mode.
    Enumerated value: 0 = **disabled**
    1 = **static**
    2 = **dynamic**
  - ip_address - Static mode IP address. Text value.
  - netmask - Static mode subnet mask. Text value.
  - gateway - Static mode gateway address. Text value.
  - mac_address - Port MAC address. Read only value.
- br1 - The devices secondary network port. This shows the same configuration options as br0 and will only be available if the Interface Mode is set to **Redundant**.

The **front panel** node contains the state and configuration of all aspects of the device's front panel. The **front panel** node contains the following options:

The frontpanel node contains the state and configuration of all aspects of the device's front panel. The frontpanel node contains the following options:

• meter scale - The mic/line input level meter scale. Enumerated value:

0 = dBFS
1 = VU

• meter source - Selects where the audio is sampled for the level meter. Enumerated value:

0 = pre DSP
1 = post DSP

• onair button mode - The button mode for the On Air button.
• gpio button mode - The button mode for the GPIO button.
• talkback A button mode - The button mode for the T/B A button.
• talkback B button mode - The button mode for the T/B B button.
• talkback C button mode - The button mode for the T/B C button.
Enumerated value:

0 = Always Off
1 = Momentary
2 = Latching
3 = Auto
4 = Always On

• onair button colour – The colour the on air button should illuminate when activated.
• onair button notify colour – The colour the on air button should flash when in notify mode.
• gpio button colour – The colour the gpio button should illuminate when activated.
• gpio button notify colour – The colour the gpio button should flash when in notify mode.
• talkback A button colour – The colour the T/B A button should illuminate when activated.
• talkback A button notify colour – The colour the T/B A button should flash when in notify mode.
• talkback B button colour – The colour the T/B B button should illuminate when activated.
• talkback B button notify colour – The colour the T/B B button should flash when in notify mode.
• talkback C button colour – The colour the T/B C button should illuminate when activated.
• talkback C button notify colour – The colour the T/B C button should flash when in notify mode.
Enumerated value:

0 = Off
1 = Red
2 = Green
3 = Blue
4 = Yellow
5 = Cyan
6 = Magenta
7 = White

• talkback A onair - On Air remains active when Talkback A is active.
• talkback B onair - On Air remains active when Talkback B is active.
• talkback C onair - On Air remains active when Talkback C is active.
Boolean value.
• lazy gang talkback - Operates all talkbacks when either A, B or C is active. Boolean value.
• frontpanel brightness - The brightness level of the front panel.
Enumerated value:

0 = Off
1 = Min
2 = 1
3 = 2
4 = 3
5 = 4
6 = 5
7 = 6
8 = Max

• hide menu - Prevents access to the front panel menu. Boolean value.
• override enable - Allows the headphone output controls to be controlled exclusively from the web server. Boolean value.
• lightbar brightness - The brightness level of the lightbar.
Enumerated value:

0 = Off
1 = Min
2 = 1
3 = 2
4 = 3
5 = 4
6 = 5
7 = 6
8 = Max

- lightbar default colour - The non-active lightbar colour.
- lightbar active colour1 - The active lightbar colour option 1.
- lightbar active colour2 - The active lightbar colour option 2.
- lightbar active colour3 - The active lightbar colour option 3.

Enumerated value:

0 = Off
1 = Red
2 = Green
3 = Blue
4 = Yellow
5 = Cyan
6 = Magenta
7 = White

The **audio** node contains information such as the type of input signal being used and configuration settings for the high pass filters & limiters. The **audio** node contains the following options:

- signal level - The type of input signal being used.
  Enumerated value: 0 = **Mic**
  1 = **Line**
- phantom power - Enables mic phantom power. Boolean value.
- preamp gain (dB) - The mic preamp gain setting.
  Integer value: min = **16**
  max = **76**
- mic line hpf enable - Enables the input high pass filter. Boolean value.
- mic line hpf frequency (Hz) - The cut-off frequency for the HPF.
  Integer value: min = **40**
  max = **3000**
- line up - The audio level that corresponds to 0dBFS.
  Enumerated value: 0 = **+15dBu = 0dBFS**
  1 = **+18dBu = 0dBFS**
  2 = **+20dBu = 0dBFS**
  3 = **+22dBu = 0dBFS**
  4 = **+24dBu = 0dBFS**
- mic line limiter enable - Enables the input limiter. Boolean value.
- mic line limiter threshold (dBFS) - The input limiter threshold level.
  Integer value: min = **-40**
  max = **0**

- program signal presence threshold (dB) – The threshold where the presence event for the program dante input channel should be activated
- talkback A signal presence threshold (dB) – The threshold where the presence event for the talkback B dante input channel should be activated
- talkback B signal presence threshold (dB) – The thershold where the presence event for the talbkabB dante input channel should be activated
- talkback C signal presence threshold (dB) – The threshold where the presence event for the talkback C dante input channel should be activated.
- mic line signal presence threshold (dB) – The threshold where the presence event for the mic/line input should be activated.
- Integer value: min = -70 max = 0
- program signal presence timeout (s) – how long audio on program input should be below threshold before deasserting signal presence event.
- talkback A signal presence timeout (s) – how long audio on talkback A input should be below threshold before deasserting signal presence event.

- talkback B signal presence timeout (s) – how long audio on talkback B input should be below threshold before deasserting signal presence event.
- talkback C signal presence timeout(s) – how long audio on talkback C input should be below threshold before deasserting signal presence event.
- mic line signal presence timeout (s) – how long audio on mic/line input should be below threshold before deasserting signal presence event. Integer value: min = **0**
  max = **300**
- headphone attenuation - The headphone output attenuation level.
  Integer value: min = **0**
  max = **24**
- headphone limiter enable - Enables the headphone output limiter. Boolean value.
- headphone limiter threshold (dBFS) - The headphone limiter threshold level.
  Integer value: min = **-40**
  max = **0**
- comm output – Controls the audio routed to the comm output.
  Enumerated value: 0 = **Disable**
  1 = **Always On**
  2 = **Normal**

- on air dante tx channel label – Set the channel label for the on air dante tx channel (tx channel 0)
- talkback A dante tx channel label – Set the channel label for the talkback A dante tx channel (tx channel 1)
- talkback B dante tx channel label – Set the channel label for the talkback B dante tx channel (tx channel 2)
- talkback C dante tx channel label – Set the channel label for the talkback C dante tx channel (tx channel 3)

- program dante rx channel label – Set the channel label for the program dante rx channel (rx channel 0)
- talkback A dante rx channel label – Set the channel label for the talkback A dante rx channel (rx channel 1)
- talkback B dante rx channel label – Set the channel label for the talkback B dante rx channel (rx channel 2)
- talkback C dante rx channel label – Set the channel label for the talkback C dante rx channel (rx channel 3)

The **gpio** node provides the same options found on the **GPIO Settings** web page of the devices web server and allows connections to be configured. Names of input events are found under the **triggers** node and can be entered into an **output triggers** field. Names of output events are found under the **handlers** node and can be entered into an **input functions** field. Names of virtual GPIO sources are found under the **vgpio sources** node and can be entered into the **vgpio source** field of a **vgpio** under the **virtual** node.

12. Remote Control

The unit can be controlled remotely using the Embedded web server, physical and virtual GPIO, and EmberPlus.

Embedded Web Server Control

The embedded web server allows the user to control various settings which would normally be controlled using the front panel. The operator of the embedded web server can control whether the commentator microphone is On Air, whether talkback is enabled and the level and routing of audio to the headphones.

Pushbutton Control

The frontpanel On Air, GPIO and Talkback buttons can be operated remotely on the Front Panel web page, by clicking on the button. The current button mode will determine how the button responds, and the illumination shows when the button is active. Right click on the button to change the associated options. The Lock Buttons switch on the web page can be used to prevent the operation of the buttons from the front panel, so they will only operate under the control of the web page.

Headphone Output Routing and Level Control

The Override Headphone Controls switch allows the headphone routing and levels to be controlled exclusively from the web page in real time, so the changes are immediate. The controls on the front panel of the device will have no effect when this mode is enabled.

GPI Control

Physical and virtual GPI can be used to activate events such as on air and talkback. These settings can be configured as decribed in the **GPIO Settings** section.

Virtual GPI are controlled using virtual GPO from other devices.

Physical GPI can be made active by shorting their corresponding pin to the ground pin on the GPIO remotes connector.

Ember+ Control

The Ember+ Viewer can also be used to configure and control the GPIO settings.

13. Technical Specifications for AVN-CU1

AVN-CU1

Network and AoIP	
AoIP Standard:	Dante
Number of Channels:	4 receive, 4 transmit
Number of Streams:	4 receive, 4 transmit
Sample Rate:	48 kHz
Format:	Linear PCM, 16, 2 or 32 bit
AES67 Support:	Yes
Connectivity:	2 x RJ45 and 2 x SFP
Speed:	1Gbps and 100Mbps
Network Modes:	Switched or redundant
Dante Domain Manager Ready:	Yes

Mic/Line Inputs	
Input Impedance (Mic Mode):	2.5kΩ electronically balanced
Input Impedance (Line Mode):	>10kΩ electronically balanced
Preamp Gain (Mic Mode):	User selectable 16dB to 76dB in 3dB steps (Ref. +18dBu = 0dBFS)
0dBFS Line-up (Mic Mode):	-58dBu @ Max preamp gain, +2dBu @ Min preamp gain
0dBFS Line-up (Line Mode):	User selectable +15dBu / +18dBu / +20dBu / +22dBu / +24dBu = 0dBFS
Frequency Response (Mic Mode):	+0/-0.2dB 20Hz to 20kHz Ref 40dB gain @ 1kHz
Frequency Response (Line Mode):	+0/-0.2dB 20Hz to 20kHz Ref 0dBu @ 1kHz
THD+N (Mic Mode):	<-90dBFS, -64dBFS, 20Hz – 20kHz, 40dB gain, 20kHz BW
THD+N (Line Mode):	<-97dBFS, -30dBFS, 20Hz – 20kHz, 20kHz BW
Equivalent Input Noise (Mic Mode):	125dB Ref. 76dB preamp gain, Rs = 200Ω
Noise (Line Mode):	<-98dBFS, 20kHz BW, Rs = 200Ω
C.M.R.R.:	>60dB @ 1kHz
Phantom Power (Mic Mode):	+48V
High Pass Filter:	12dB/octave, user selectable frequency

Headphone Outputs	
Drive Capability:	Drives 150mW into 32Ω to 600Ω headphones
0dBFS Line-up:	-20dBFS = +18dBu Ref. Single Dante source, volume pot = maximum, master HP level = 0dB
Frequency Response:	+0/-0.2dB 20Hz to 20kHz Ref 0dBu @ 1kHz
THD+N:	<-104dBFS, -50dBFS, 20dB gain on potentiometer, 20Hz – 20kHz, 20kHz BW
Noise:	<-108dBFS A-weighted, 20dB gain on potentiometer, 20kHz BW

Rear Panel Connections	
Stereo Analogue/ Digital Input:	RJ45 socket (electronically balanced)
Stereo Analogue/ Digital Output:	RJ45 socket (electronically balanced)
GPIO Port:	15-way 'D'-type socket
DC Input:	Neutrik 4 pin XLR plug, 12VDC, Maximum 12W
Network:	2 x 1Gbps Neutrik EtherCON receptacles, with PoE, maximum 12W 2 x SFP slots for alternative interfaces

Main Panel Operational Controls & Indicators	
LED Level Meter:	21 segment display showing mic/line level. Scale selectable (PPM or VU). Brightness selectable. Monitoring point selectable (Pre or Post DSP)
Pushbuttons:	5 x Illuminated buttons that have the following functions: GPIO / On Air / GPO / Talkback A / Talkback B / Talkback C
Display:	128 x 64 pixel white OLED display showing status, signal presence, HP level and configuration
Rotary Encoders:	1 x robust soft touch rotary encoder for master headphone level control, display page and menu navigation.
Potentiometers:	5 x Colour coded potentiometers that control the level of each input signal in the headphone output. They are bound to the following channels: PGM / Sidetone / Talkback A / Talkback B /Talkback C
3-Position toggle switches:	5 x Toggle switches for panning each input channel to either the Left, Right or Centre of the headphone output signal
Scribble Pad:	Scribble pad below the 5 potentiometers and pushbuttons for quick and easy source or destination labelling
Configurable Downlight LED's:	Colour adjustable LED's. Defaults to On Air indication.

Front Panel Connections	
Headphone Outputs:	2 x Neutrik ¼" (6.35mm) locking jack sockets
Microphone/Line Inputs:	2 x Neutrik 3 pin latching XLR sockets

Rear Panel Connections	
Power LED	RJ45 socket (electronically balanced)
Mic / Line Input	1 x Neutrik 3 pin latching XLR socket
Phantom Power LED:	Illuminates red when phantom power is enabled
Headphone Outputs:	1 x ¼" (6.35mm) jack socket 1 x 3.5mm jack socket Outputs are paralleled
GPIO Port:	15-way 'D'-type socket
DC Input:	Neutrik 4 pin XLR plug, 12VDC, Maximum 12W
Network:	2 x 1Gbps Neutrik EtherCON receptacles, with PoE, maximum 12W 2 x SFP slots for alternative interfaces

PoE Power	
Standard:	802.3af
Class:	0
PD Power Range:	0.44 W to 12.94 W
Typical PSE Power Usage:	6W
Max PSE Power Usage:	15.4 W

Equipment Type	
AVN-CU1	Dante® Commentator Unit, 1 Commentators

Physical Specification	
Dimensions (Raw):	13cm (W) x 18.5cm (D) x 9.5cm (H) 5.1" (W) x 7.3" (D) x 3.7" (H)
Dimensions (Boxed):	14.3cm (W) x 23.6cm (D) x 14.3cm (H) 5.6" (W) x 9.3" (D) x 5.6" (H)
Weight:	Nett: 1.73kgs Gross: 2.27kgs Nett: 3.82lbs Gross: 5.00lbs

Accessories	
AVN-DCX60	DC Power Supply for AVN Range, 4 pin XLR socket, 60W
CM-TC1 (Case Only)	Commentary Transport Case
CM-GM2	Professional Gooseneck Condenser Microphone

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