



HANDBOOK

## AVN-Commentator Unit

AVN-CU2-DANTE and AVN-CU4-DANTE

*Portable commentator units with Dante® AoIP interfacing.*



Manufacturers of Audio Products for AV,  
Installed Sound, Broadcast Radio & Broadcast TV

**SONIFEX**

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This handbook is for use with the following product:

AVN-CU2-DANTE and AVN-CU4-DANTE portable commentator units with Dante® AoIP interfacing.  
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## Register Online for an Extended 2 Year Warranty

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

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

Product: \_\_\_\_\_

Serial No: \_\_\_\_\_

To register your product, please go online to [www.sonifex.co.uk/register](http://www.sonifex.co.uk/register)

## Product Warranty - 2 Year Extended

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

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

## Repairs & Returns

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

## CE Conformity

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

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

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

## Safety & Installation of Mains Operated Equipment

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

## Voltage Setting Checks

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

## Fuse Rating

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

## Power Cable & Connection

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

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

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

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

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

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

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

## WEEE Directive



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

## Atmosphere/Environment

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

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

# 1. AVN-Commentator Unit

## Introduction

The AVN-CU2-DANTE and AVN-CU4-DANTE are portable commentator units. Using Dante® AoIP together with 4 wire connections both the AVN-CU2-DANTE and AVN-CU4-DANTE bridge 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 encoders, illuminated buttons, status indicators, and a TFT display showing useful information. An embedded web server is also implemented and is used to access audio routing and more advanced options.

The unit supports up to 16 input and output AoIP channels and up to 16 simultaneous input and output AoIP streams. AoIP streams are setup via Dante® Controller with more detailed configuration performed using the built-in web GUI. Once Dante® flows have been made, the mix engine allows inputs and outputs to be mixed freely to AoIP or physical inputs and outputs, controlled using the programmable buttons and rotary encoders on the unit.

The AVN-CU2-DANTE provides two locking mic/line inputs each with +48V phantom power indication and a wide, adjustable gain range. It has two stereo headphone outputs with locking 6.35 mm (¼ inch) jack sockets, suitable for operation by two commentators. The AVN-CU4-DANTE provides four commentator positions with four mic/line inputs and four stereo headphone outputs.

Both units can be powered using Power over Ethernet (PoE), using Neutrik EtherCON connectors, with primary and secondary ports for power and data redundancy. There is an additional 4 pin XLR 12V DC input for use when PoE is not available or extra power redundancy is required. The AVN-CU4-DANTE also provides a fused AC mains electricity input on an IEC

inlet, with universal supply allowing for the varying voltage and frequency requirements of different countries.

The AVN-CU2 provides 6 push-button rotary encoders and 12 key-cap buttons, whilst the AVN-CU4 provides 12 push-button rotary encoders and 24 key-cap buttons. Push-button rotary encoders can be used to control, input levels, output levels and panning of assigned audio sources whilst key-cap buttons can be configured to perform various functions such as taking commentators on-air and activating GPIO.

Each rotary encoder has a separate colour-coded meter section showing the channel name, detailed level metering, left/right panning and a limiter indication, the brightness of the display is adjustable allowing it to remain readable in bright daylight. The colour of each encoder can be programmed allowing a commentator to quickly identify source and destination groups, and so perform adjustment to audio groups intuitively.

Metering is available on each input/output, with output metering configurable as pre or post level adjustment. The top of the display shows output metering, a limiter indication and the name of the output. A limiter with a configurable threshold is also available on every output.

On the AVN-CU2, 2 four-wire RJ45 connections are available on the back panel of the device. One is used as an input and the other is used as an output, both connections can be individually configured as either digital (AES3) or analogue. The input can be routed to the main (program) bus, talkback buses, commentator headphones, the output four-wire connection, and any AoIP outputs. The output can receive audio from the main (program) bus, talkback buses, commentator microphones, the input four-wire connection, and any AoIP inputs.

The AVN-CU4 provides further connectivity with four analogue line inputs on XLR sockets with latching locks, six analogue line outputs on XLR plugs, one RJ45 digital (AES3) stereo input and one RJ45 digital (AES3) stereo output.

Each unit 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 and can be configured to allow for any button function at any position. There are some standard operations available:

- On-Air control for each commentator position, used to connect mic audio to the main output, either over AoIP or via the physical audio connections.
- A menu button can be used to access limited setup options on the TFT display.
- Page buttons change the display and encoders to monitor an additional set of sources, mix points or outputs. Up to 4 pages per display can be pre-programmed. So, for the AVN-CU2 4 pages labelled 1-4 can be configured on its display and for the AVN-CU4, 4 pages labelled 1-4 can be configured on the left-hand display and another 4 pages labelled 1-4 can be configured on the right-hand display. For example; one page might be used for commentator mics and headphones, one might be used for talkback inputs, one might be used for physical, Dante, or tone inputs, and another may be used for outputs such as the main output.
- User buttons 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.

- A cough control is available for each commentator position which temporarily takes the commentator off-air while pressed.
- 4 T/B (talkback) controls are available for each commentator position, which can be configured to initiate talkback over AoIP or the physical audio connections using the 4 talkback buses. The talkback buttons can be configured to operate with lazy-gang talkback. 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 found on page 4 to get your device up and running.
2. Setup device names and channel labels in Dante Controller, view the **Configuring a Device** section on page 21 for instructions.
3. Routing audio in Dante Controller, view the **Routing Audio** section on page 25 for instructions.
4. Adding Dante inputs and Dante outputs to the commentator unit, view the **Adding Dante Input and Output Groups** section on page 53 for instructions.
5. Configuring user buttons on the top panel of the commentator unit, view the **Front Panel Settings and Control** section on page 44 for instructions.
6. Controlling inputs, outputs, and mix-points with encoders, view the **Adding an Encoder** section on page 58 for instructions.
7. Locking user buttons and encoders, view the **Locking User Buttons and Encoders** section on page 70.
8. Saving and loading profiles, view the **Save Configuration to A File** section found on page 83 and the **Load Configuration from A File** section found on page 83.
9. Controlling the commentator unit remotely, view the **Remote Control** section on page 91.

### 3. Quick Start

#### Connecting to the AVN-CU2/AVN-CU4



1. Plug an Ethernet cable into the primary port of the AVN-CU2/AVN-CU4



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' PoE status LEDs



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 PSU LED will turn green. It is possible to power the unit with PoE and DC at the same time for redundancy



7. When AC power is available the AC PSU LED will illuminate green



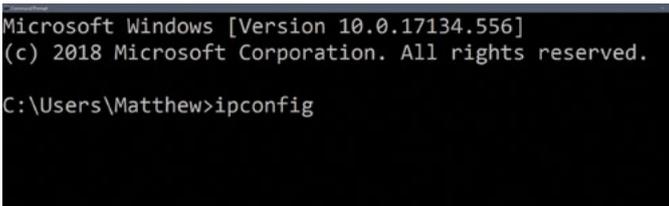
6. On the AVN-CU4 the option to power the unit via an AC supply is available



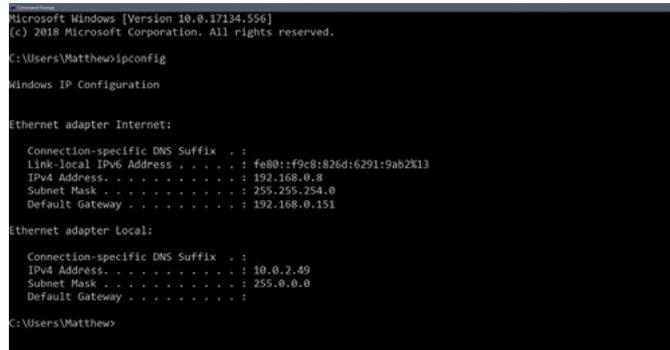
8. Connect an Ethernet cable into the Ethernet port of your PC



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



10. 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'



11. Press enter on the keyboard and note the IP address of your network adaptor connected to the same network switch. In this case it is '10.0.2.49' with a subnet mask of '255.0.0.0'



12. Press the 'Menu' button on the front panel of the commentator unit, and select the 'Network' sub-menu by pressing down on the white encoder



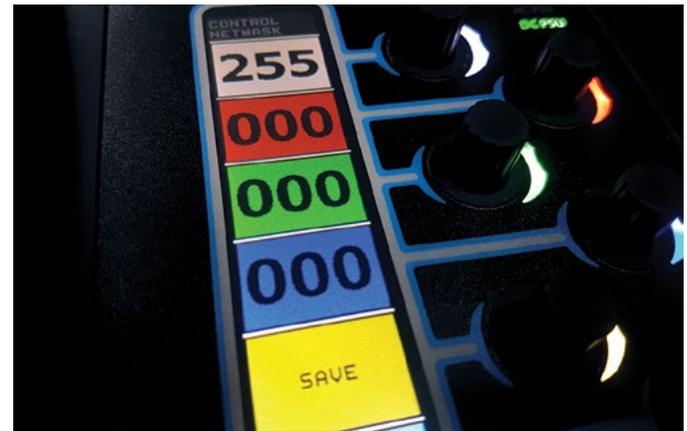
13. This sub-menu shows the available network ports on the commentator unit, select the 'Control' port by pressing the white encoder



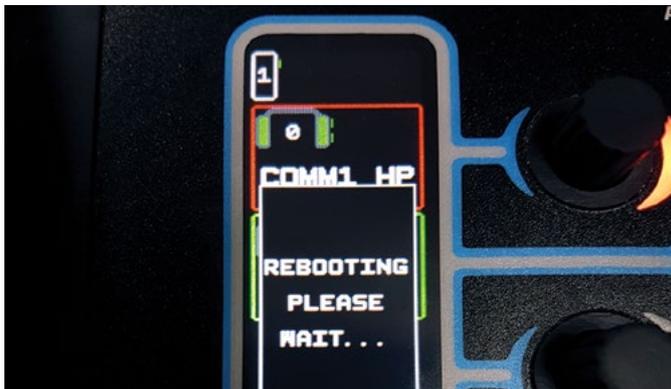
14. This sub-menu shows the IP address settings of the control port, select 'IP Address' by pressing the red encoder



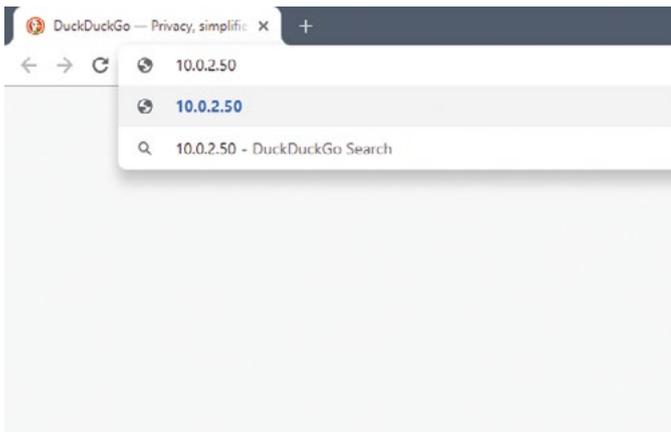
15. Modify the IP address so that it is within the same subnet as your PC, then select 'Save' using the yellow encoder



16. This takes you back to the control port sub-menu. Select 'Netmask' using the green encoder, and then change the subnet to match the subnet of your PC, again selecting 'Save' once complete



17. Select 'Close' using the cyan encoder, this closes the menu. The unit will then restart to apply the changes



18. Open your web browser, type the IP address into the address bar and press enter

avn Dante SONIFEX  
Manufacturers of Audio Products for AV, Installed Sound, Broadcast Radio & Broadcast TV  
AVN-CU2  
AVN-CU2-D0A4B10006CD

Description: Commentator Unit

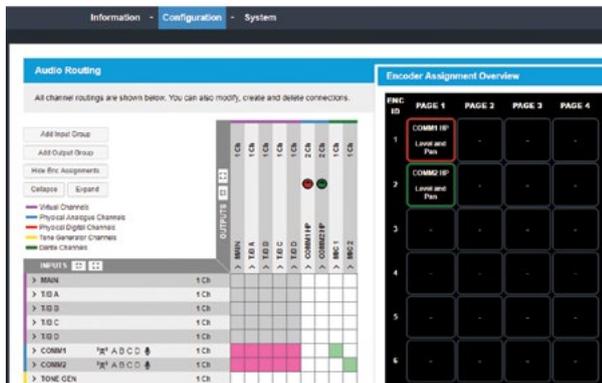
Information - Configuration - System

Device Information		Help: Device Information
Device ID:	AVN-CU2	This page displays information about the connected device. It is important to record and send us this information when requesting technical support.
Host Name:	AVN-CU2-D0A4B10006CD	
Friendly Name:	AVN-CU2-D0A4B10006CD	
Serial Number:		
Firmware Version:	D0.0.1752	
Dante Version:	4.0.9.2	
Front Panel Version:	1.44	
DC Voltage:	11.996V	
Pri PoE Voltage:	11.982V	
Sec PoE Voltage:	0.00V	
Temperature:	67°C	
System Up Time:	0 hrs 42 mins	

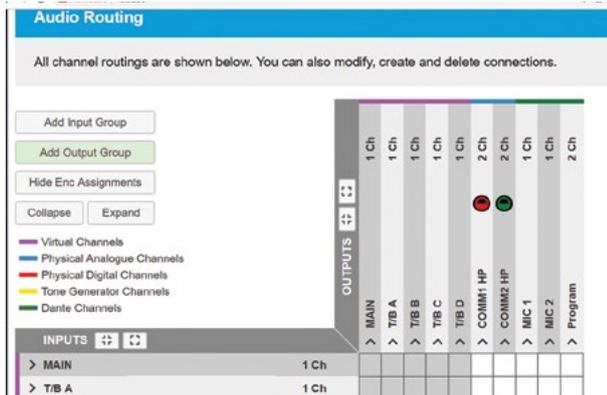
Control Port Information		Help: Control Port Information
Hardware Address:	D0:A4:B1:00:06:CD	This section displays information about the control port network connection to the device. The control port is the webservice address and is used to interrogate and modify device settings.
Actual IP Address:	10.0.2.50	
Actual Subnet Mask:	255.0.0.0	
Addressing Mode:	Static	

19. The device information web page will open

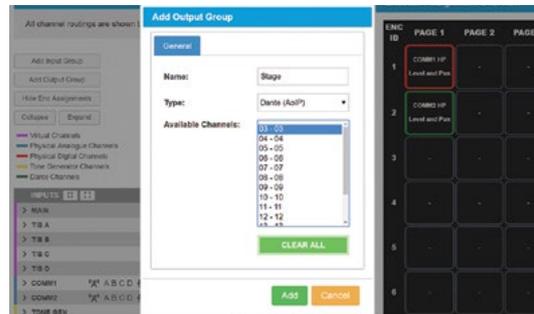
## Adding A Main Program Output



1. In the device's web page, hover over the configuration tab and click 'Audio Routing', the audio routing web page will open. Currently, each commentator mic is routed to a Dante channel



2. Click the 'Add Output Group' button. This is highlighted in green in the picture



3. The 'Add Output Group' window opens. Enter a name and then change the type, which in this case is a Dante output called 'Stage' on channel 3. Click 'Add'



4. The output group will be added to the output section of the 'Audio Routing' web page. A black box shows which box on the routing grid you are currently over and blue lines coming from this show which input and output this box corresponds to. Clicking once on the box expands groups to display their channels, clicking again will route the input to the output channel

- Virtual Channels
- Physical Analogue Channels
- Physical Digital Channels
- Tone Generator Channels
- Dante Channels

INPUTS		OUTPUTS									
		MAIN	T/B A	T/B B	T/B C	T/B D	COMM1 HP	COMM2 HP	MIC 1	MIC 2	Stage
MAIN	1										
T/B A	1 Ch										
T/B B	1 Ch										
T/B C	1 Ch										
T/B D	1 Ch										
COMM1	1 Ch										
COMM2	1 Ch										
TONE GEN	1 Ch										

5. The new routing is now shown on the routing grid, this is symbolised by the green box between the input and output channel. Click on the output to configure it

6. Selecting 'Main Meter' will cause any audio on the output to be displayed in the main meter section on the top panel display of the device. There won't be any audio yet. Click apply

## Primary Dante Port Information

**Hardware Address:** D0:A4:B1:00:06:D4

**Actual IP Address:** 10.0.2.48

**Actual Subnet Mask:** 255.0.0.0

**Addressing Mode:** Dynamic

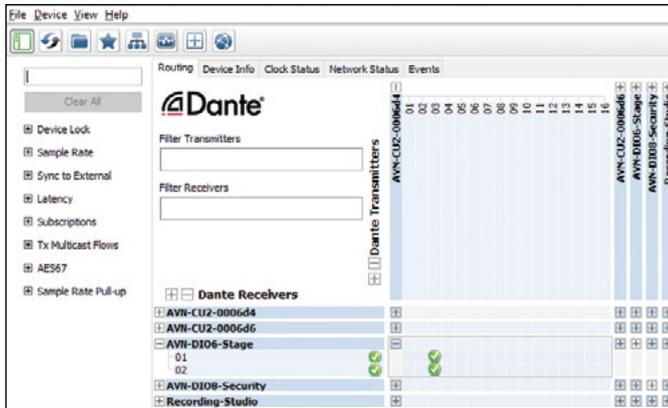
## Secondary Dante Port Information

**Hardware Address:** D0:A4:B1:00:06:D5

7. Within the 'Device Information' web page the six characters used to identify the device within Dante controller can be found, in this case the characters are 0006D4

The screenshot shows the Dante Controller Network View interface. The interface is divided into several sections: Routing, Device Info, Clock Status, Network Status, and Events. The Dante logo is prominently displayed. Below the logo, there are filters for Transmitters and Receivers. The main area shows a routing table with columns for Dante Transmitters and Dante Receivers. The Dante Transmitters column lists AVN-CU2-0006d4, AVN-CU2-0006d6, AVN-DIO6-Stage, 01, 02, AVN-DIO8-Security, and Recording-Studio. The Dante Receivers column lists AVN-CU2-0006d4, AVN-CU2-0006d6, AVN-DIO6-Stage, AVN-DIO8-Security, and Recording-Studio. A routing entry is highlighted in red, showing a path from AVN-DIO8-Security to AVN-DIO6-Stage via AVN-CU2-0006d4.

8. In 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 a routing to the Dante device 'AVN-DIO6-Stage' is made



9. Since the 'Stage' output was created on channel 3, a routing between channel 3 of the unit is made to both channels of the 'AVN-DIO6-Stage'. After a short time two green ticks should be displayed



11. Next press the 'On-Air 1' button 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 main metering change whilst using the microphone and the position is on-air



10. Now any audio on the 'Main' output will be routed to the other Dante device. Pressing the 'On-Air 1' button on the top panel of the device will cause any sound on the first commentators' microphone to be heard on the device receiving the stage output. Connect a microphone and pair of headphones to the commentator unit

## Assigning an Encoder

All channel routings are shown below. You can also modify, create and delete connections.

Virtual Channels  
 Physical Analogue Channels  
 Physical Digital Channels  
 Tone Generator Channels  
 Dante Channels

OUTPUTS

MAIN	1 Ch
T/B A	1 Ch
T/B B	1 Ch
T/B C	1 Ch
T/B D	1 Ch
COMM1 HP	2 Ch
COMM2 HP	2 Ch
MIC 1	1 Ch
MIC 2	1 Ch
Stage	1 Ch

1. When you open the 'Audio Routing' web page the 'Encoder Assignment Overview' window should be displayed, if it has been hidden, you can click the 'Show Enc Assignments' button

**Audio Routing**

All channel routings are shown below. You can also modify, create and delete connections.

Virtual Channels  
 Physical Analogue Channels  
 Physical Digital Channels  
 Tone Generator Channels  
 Dante Channels

Encoder Assignment Overview

ENC ID	PAGE 1	PAGE 2
1	COMM1 HP Level and Pan	
2	COMM2 HP Level and Pan	
3		
4		
5		
6		

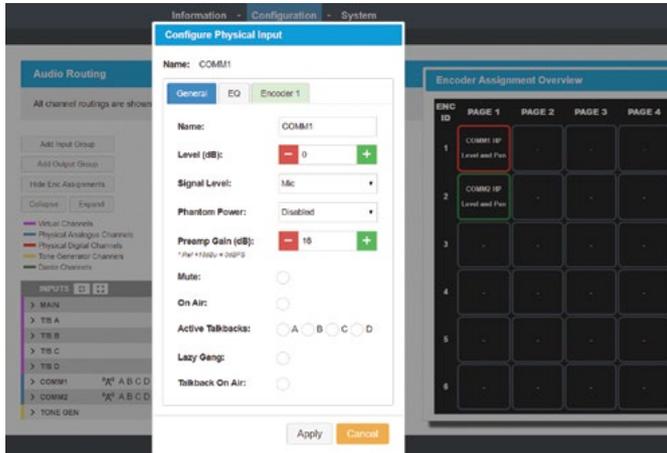
INPUTS

MAIN	1 Ch
T/B A	1 Ch
T/B B	1 Ch
T/B C	1 Ch
T/B D	1 Ch
COMM1	1 Ch
COMM2	1 Ch
tone GEN	1 Ch

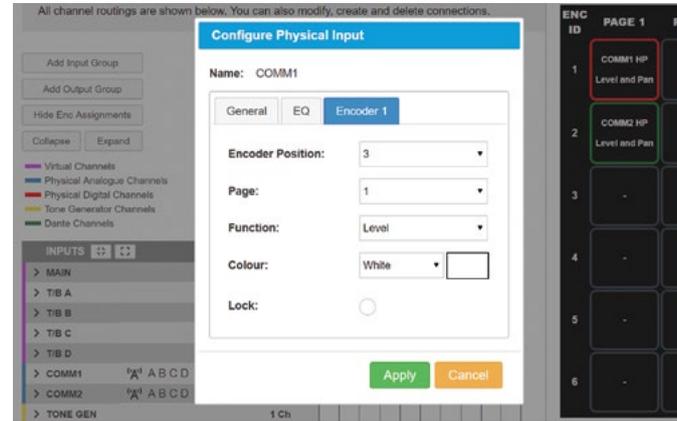
OUTPUTS

MAIN	1 Ch
T/B A	1 Ch
T/B B	1 Ch
T/B C	1 Ch
T/B D	1 Ch
COMM1 HP	2 Ch
COMM2 HP	2 Ch
MIC 1	1 Ch
MIC 2	1 Ch
Stage	1 Ch

2. The encoder assignments overview shows the page, position, colour, name of input/output, and function of each encoder



3. Click on the input, output, or mix-point you would like to add an encoder to. In this case the first commentators' microphone is selected. In this window select the 'Encoder 1' tab



4. Looking at the encoder assignments overview, encoder position 3 on page 1 is currently free. In the 'Encoder Position' dropdown of the 'Encoder 1' tab select 3. The 'Function' dropdown appears, select 'Level' from this list. Click apply

**Audio Routing**

All channel routings are shown below. You can also modify, create and delete connections.

Virtual Channels  
 Physical Analogue Channels  
 Physical Digital Channels  
 Tone Generator Channels  
 Dante Channels

INPUTS	MAIN	TIB A	TIB B	TIB C	TIB D	COMM1 HP	COMM2 HP	MIC 1	MIC 2	Stage
MAIN	1 Ch									
TIB A	1 Ch									
TIB B	1 Ch									
TIB C	1 Ch									
TIB D	1 Ch									
COMM1	1 Ch									
COMM2	1 Ch									
TONE GEN	1 Ch									

**Encoder Assignments**

ENC ID PAGE 1

1	COMM1 HP Level and Pan
2	COMM2 HP Level and Pan
3	COMM1 Level
4	
5	
6	

5. The new encoder will be displayed in the overview window and also on the actual commentator input



6. The encoder can now also be seen on the top panel of the device, the metering for the audio received by the input is shown along with the current level adjustment. Turn the encoder clockwise and anti-clockwise to adjust this value. Double pressing the encoder will cause the input to mute and unmute

## Configuring Talkback

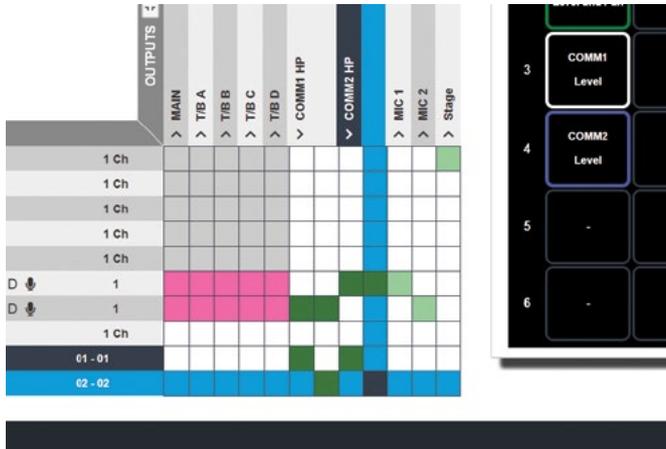
The screenshot shows the 'Audio Routing' interface. On the left, there are buttons for 'Add Input Group', 'Add Output Group', 'Hide Enc Assignments', 'Collapse', and 'Expand'. Below these are legends for channel types: Virtual Channels (purple), Physical Analogue Channels (blue), Physical Digital Channels (red), Tone Generator Channels (yellow), and Dante Channels (green). The main routing table shows connections between inputs and outputs. The 'ENC ID' panel on the right shows encoder assignments for 'PAGE 1', with 'COMM1 HP Level and Pan' and 'COMM2 HP Level and Pan' highlighted in red and green boxes respectively.

INPUTS	1 Ch	2 Ch	1 Ch	1 Ch				
OUTPUTS	1 Ch	2 Ch	1 Ch	1 Ch				
MAIN								
T/B A								
T/B B								
T/B C								
T/B D								
COMM1								
COMM2								
COMM1 HP								
COMM2 HP								
MIC 1								
MIC 2								
Stage								

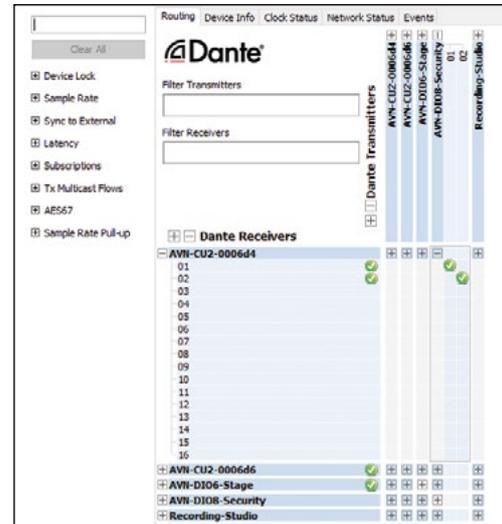
1. A level control for each commentator microphone has been added and each commentator has been routed to the other commentators' headphones. Now talkback will be configured

The screenshot shows the 'Audio Routing' interface with the 'Add Input Group' dialog box open. The dialog has a 'General' tab and fields for 'Name' (Security), 'Type' (Dante (AoIP)), and 'Available Channels' (01-01 to 10-10). There are 'Add' and 'Cancel' buttons at the bottom. The background shows the routing table and encoder assignments.

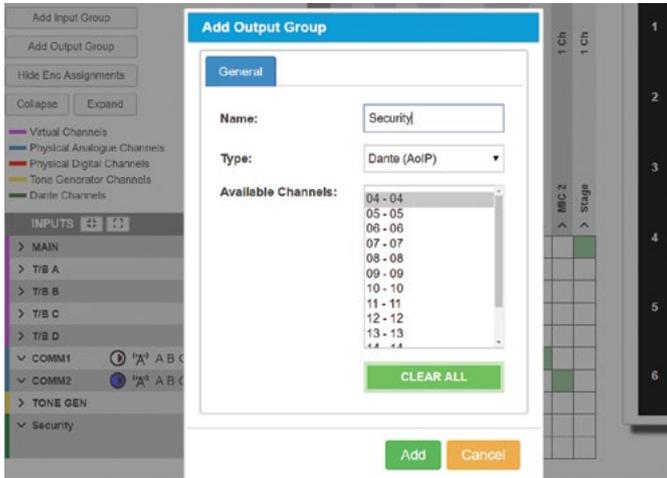
2. First an input group will be added to the device, this will be an AoIP stream from the person we want to hear



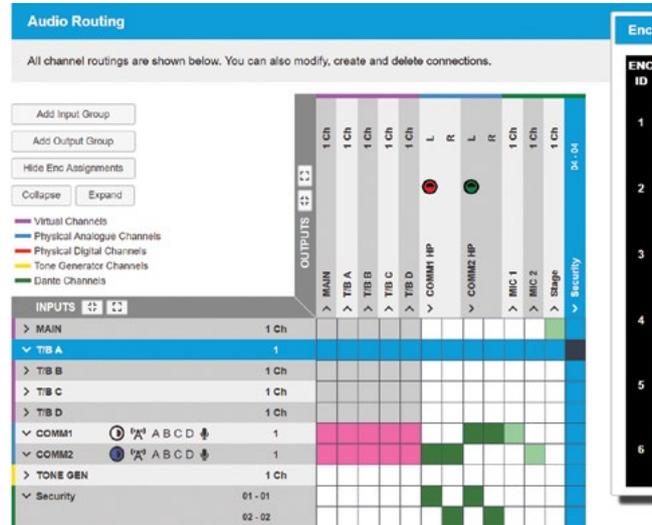
3. This input is routed directly to both the commentator's headphones



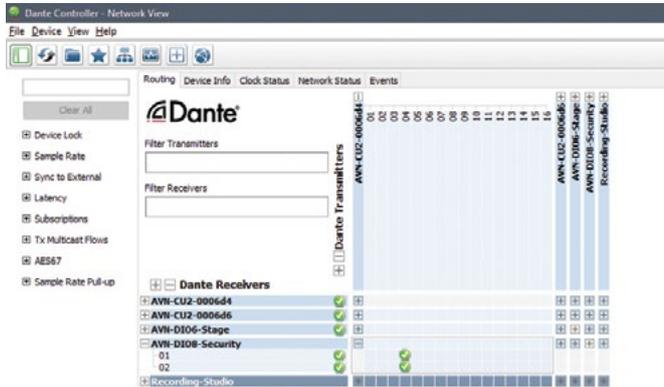
4. In Dante controller the transmitting device is routed to the receive channels 1 and 2 of our device, as these are the channels that were selected when we set up the input group. Any audio from the transmitting device will now be heard in the commentator's headphones



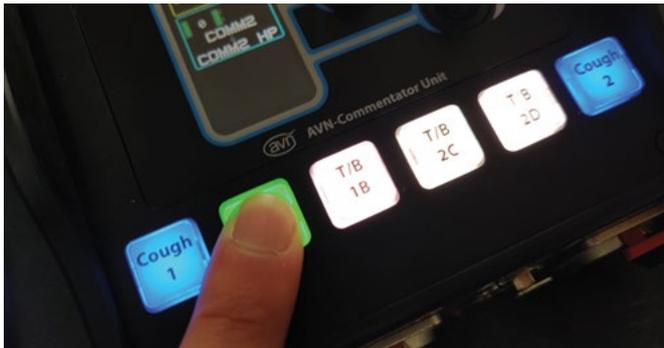
5. Next an output group is created to route the commentator's talkback to



6. Talkback bus A 'T/B A' is then routed to this output group



7. The Dante transmit channel 4 is then routed to the receive channels of the device talkback is intended to be transmitted to



8. When the 'T/B 1A' button is now pressed the first commentator will be able to be heard on the device set up to receive the audio, likewise when 'T/B 2A' is pressed the second commentator will be heard



9. If the commentator is on-air whilst the talkback button is pressed, they will be taken off-air this is shown by flashing the on-air button on and off

## 4. Dante Controller

Dante Controller is 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

The Dante Controller application can be downloaded from the official Audinate website, you will have to create an Audinate account if you don't have one already:

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

On the website you will notice the download section towards the right-hand side of the web page.

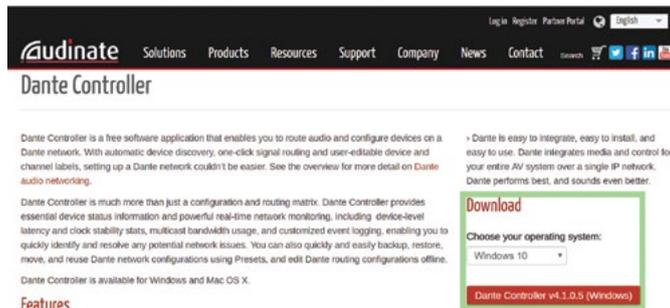


Fig 4-1: Dante Controller download web page

Select your operating system and click the red button, this will take you to another page with the correct download file.

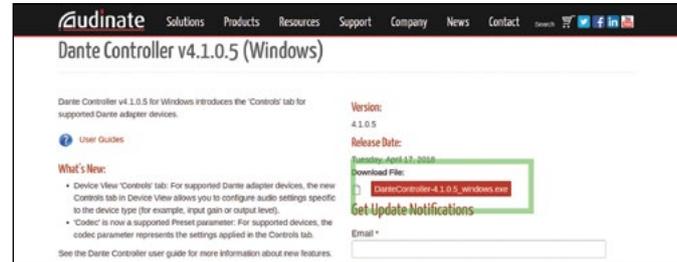


Fig 4-2: Download Dante Controller installer

The installer will be downloaded, open the installer file and follow the on-screen instructions.

After the installation is complete open the start menu and type, apps: Dante Controller

Press enter on the keyboard and Dante Controller should open.

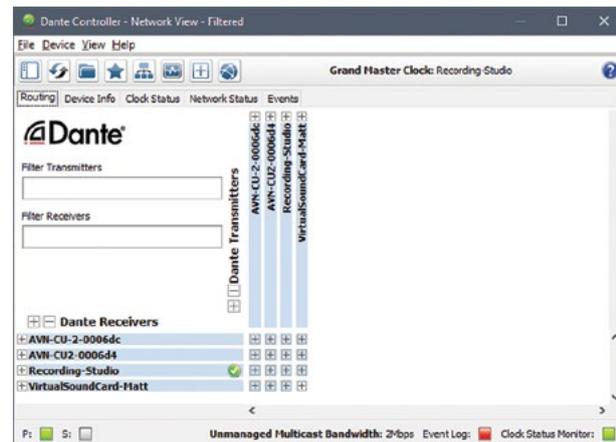


Fig 4-3: Dante Controller application window

## Configuring a Device

In order to configure a device in Dante Controller, double click the name of that device in the routing grid.

### Device Name

To change the device name, open the devices configuration window and click on the 'Device Config' tab.

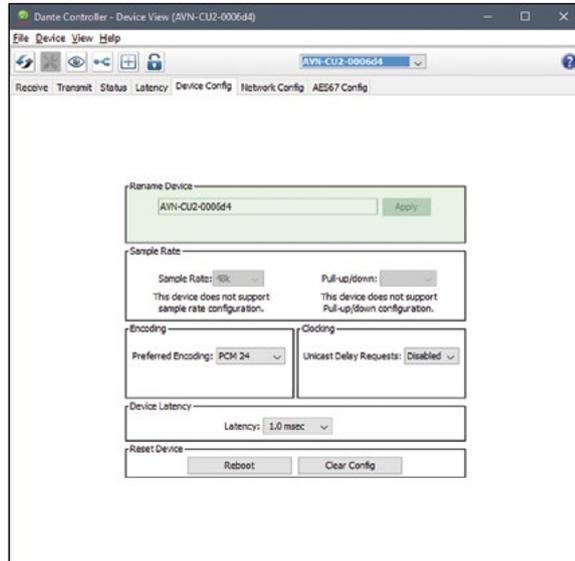


Fig 4-4: Device Config tab

The 'Rename Device' field is highlighted in the image above; the user can change the name that appears in Dante Controller for the device.

Change the name in the field and click apply.

In the routing grid you can then see the device is renamed, in this case the device is renamed to 'AVN-CU2-Matt'.

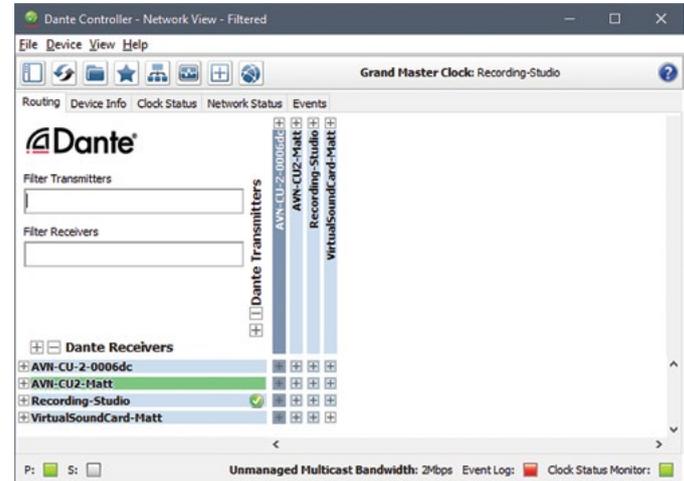


Fig 4-5: Renamed device



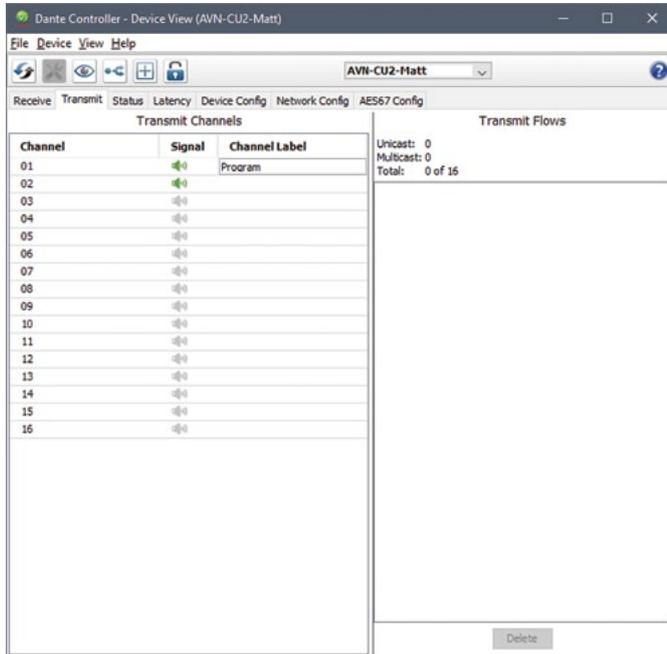


Fig 4-8: Changing transmit labels

After the desired changes have been made the configuration window can be closed.

The changes made are then reflected in the routing grid.

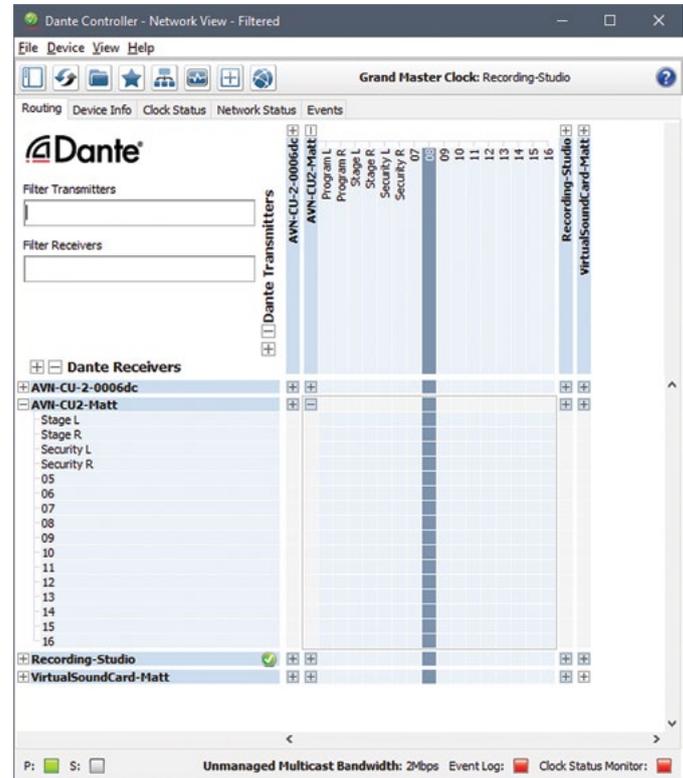


Fig 4-9: Channels with updated labels

## Filtering Devices

When there are a large number of devices on a network it would take a while to look through all the transmitters and receivers to find the right one. Therefore, filters are available which allow the user to sort through the devices and find the device they need quickly.

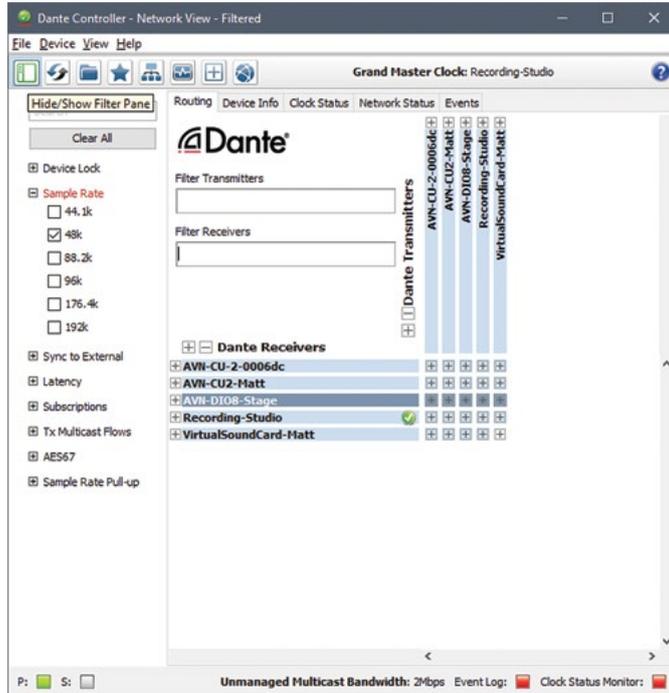


Fig 4-10: Showing the filter pane

By pressing the icon shown in the top left-hand corner the filter pane can be shown or hidden. Within the filter pane various different filters are displayed.

The sample rate section is expanded in this example and **48k** is selected to filter only devices with a sample rate of 48kHz.

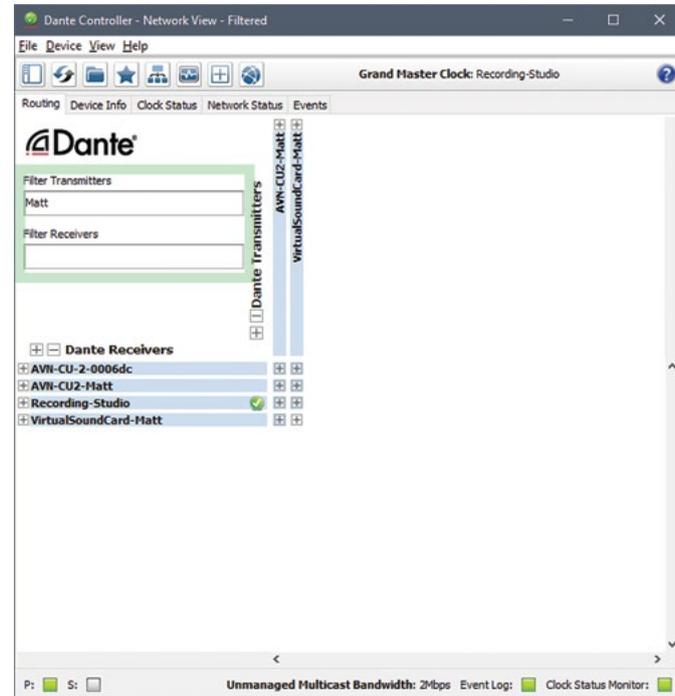


Fig 4-11: Filtering transmitters

Transmitters can be filtered by typing into the **Filter Transmitters** field, in the example 'Matt' is typed and devices which include this in their name are filtered.

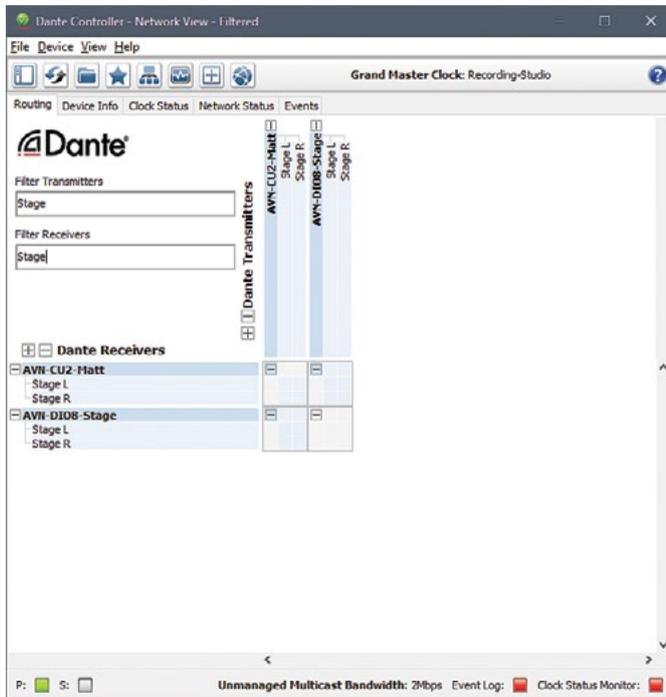


Fig 4-12: Filtered channels

These two fields can also filter the **channels** of transmitters and receivers. Typing 'Stage' into both fields all the devices and channels with 'Stage' in their name are shown.

## Routing Audio

Routing audio between two Dante devices is simple. Click on the box at which a transmit and receive channel meet.

In the example 'Stage L@AVN-DIO8-Stage' is routed to 'Stage L@AVN-CU2-Matt', 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 in it to show the routing has been made successfully.

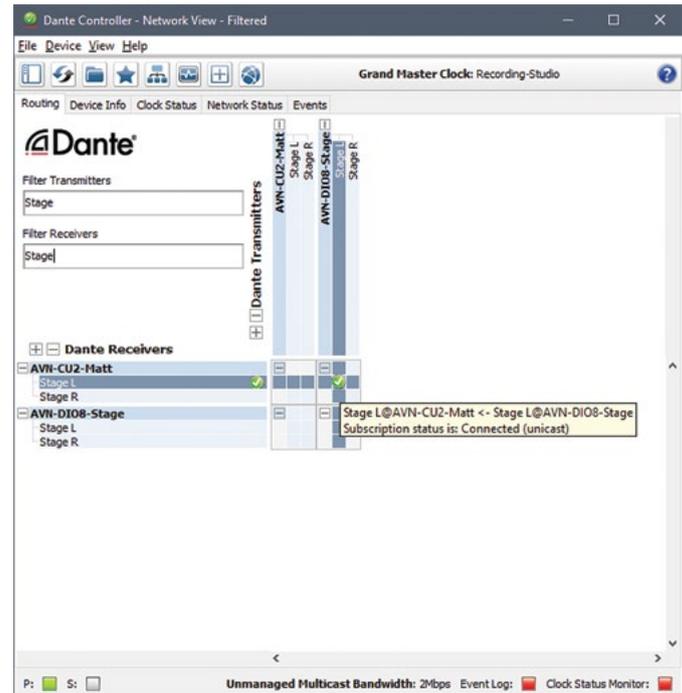


Fig 4-13: Simple routing

Multiple channels in a diagonal line can be routed at once by holding Ctrl down and pressing on the box with a minus sign.



Fig 4-14: Quick routing

## Clock Synchronisation

The clock synchronisation can be checked in the Clock Status tab.

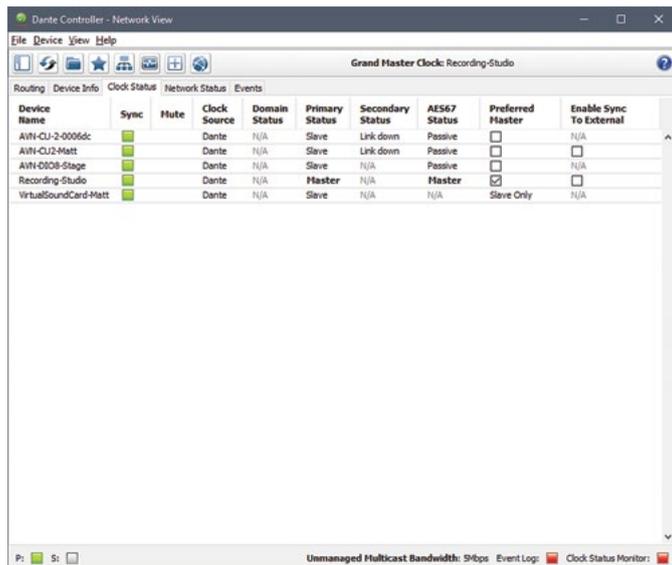


Fig 4-15: Clock status tab

The status of the PTP clocking between devices keeping audio in sync can be checked here, the **Primary Status** field tells the user whether their device is a PTP master or a PTP slave, a master device provides a clock which all slave devices on a network remain in sync with. The master device is selected using the best PTP clock algorithm. If you wish a certain device to be the master however then the **Preferred Master** checkbox can be selected.

On devices with the AES67 mode enabled an **AES67 Status** is also displayed. A device with AES67 mode enabled will act as a boundary clock linking the AES67 network to the Dante network. If an AES67 only device is setup as a master clock a Dante device acting as a boundary clock will sync to the AES67 master and then provide a master clock to any Dante only devices.

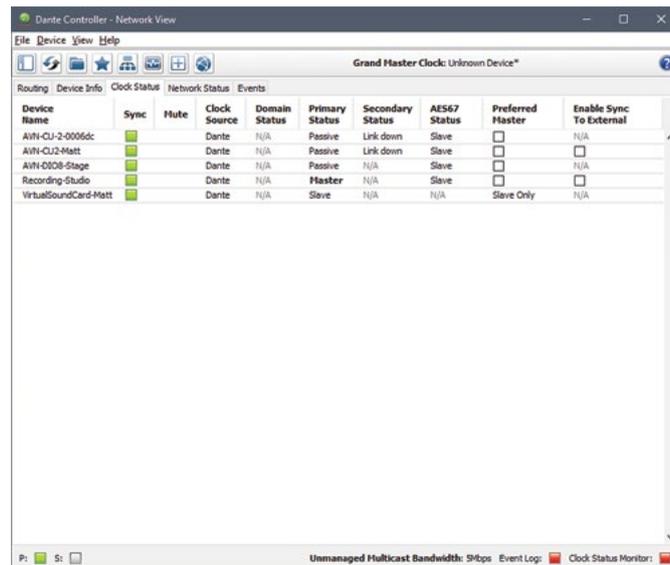


Fig 4-16: Clock status when AES67 device is master

In the first example shown by 'Fig 4 15 Clock status tab.' the device 'Recording-Studio' is the master device to both Dante and AES67 networks. Any Dante devices will become a slave as shown by their primary status, any devices which have AES67 mode enabled will have their AES67 status become passive.

In the second example the device 'Recording-Studio' is a slave on the AES67 network and provides a master clock to the Dante network. The device 'VirtualSoundCard-Matt' is a Dante only device and so the primary status shows that it is a slave and the AES67 status is shown as not applicable. Other devices which have AES67 mode enabled also become slaves to the AES67 master and so their primary status becomes passive.

## AES67 Compatibility

Dante devices with AES67 compatibility will have an **AES67 Config** tab within their device configuration window. Double click a device name to open the device configuration window and then click the **AES67 Config** tab.

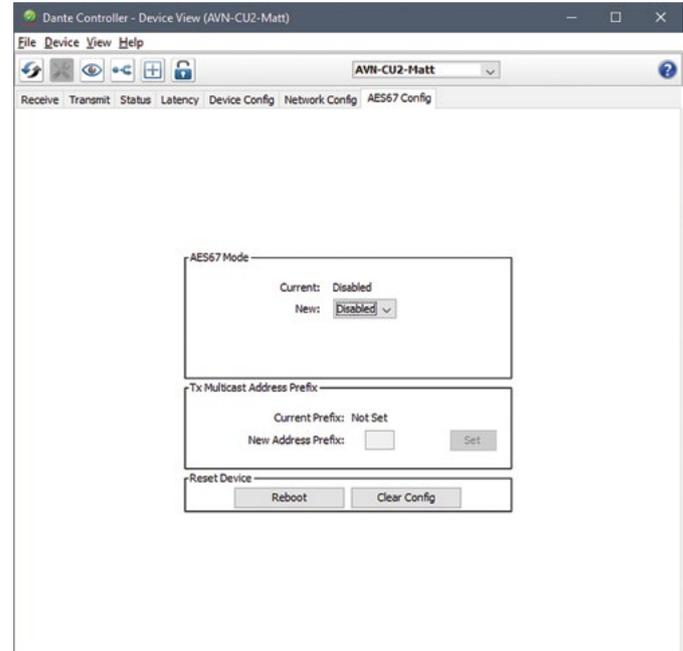


Fig 4-17: AES67 Config tab with AES67 mode disabled

This is **disabled** by default, select **enabled** from the dropdown menu to enable this mode. A warning will be displayed asking you to confirm the change, and that the device must be rebooted before the changes are made.

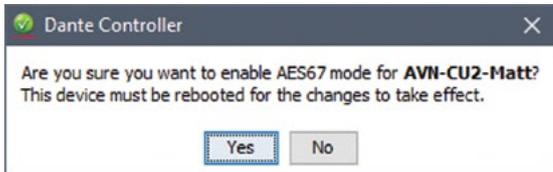


Fig 4-18: Warning message

Click **Yes** to continue. Then reboot the unit by clicking the **Reboot** button in the **Reset Device** section of this tab.

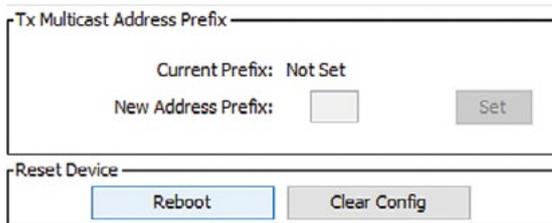


Fig 4-19: Reboot device

Another warning message will be shown asking you to confirm the reboot procedure.

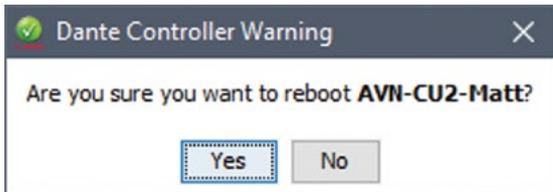


Fig 4-20: Reboot warning

Again, click **Yes** if you would like to continue. The device will reboot and upon re-entering the **AES67 Config** tab you will see that AES67 mode is now enabled. Also note the prefix address used for multicast, this 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.

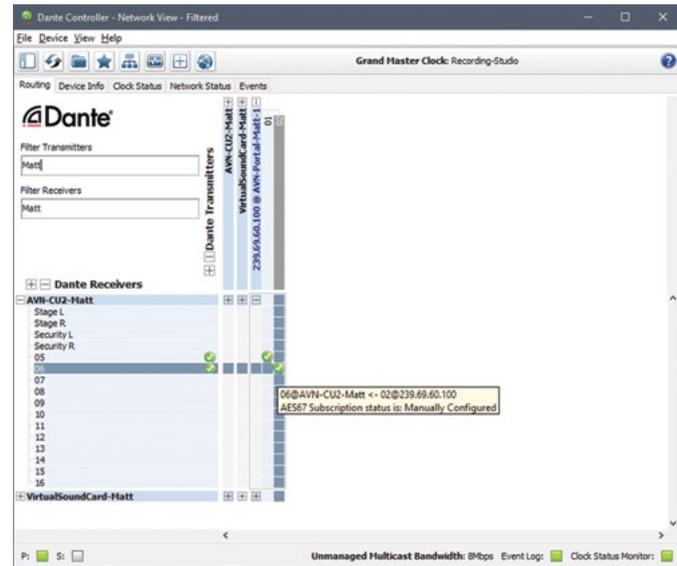


Fig 4-21: AES67 stream routing

In the example an AES67 stream 'AVN-Portal-Matt-1' on the multicast address '239.69.60.100' is routed to channels '05' and '06' on the device 'AVN-CU2-Matt'.

To create AES67 transmit streams first open the device configuration window, and click on the Create **Multicast** flow icon. Alternatively hold **Ctrl** and press **M**, the **Create Multicast Flow** window will then open.

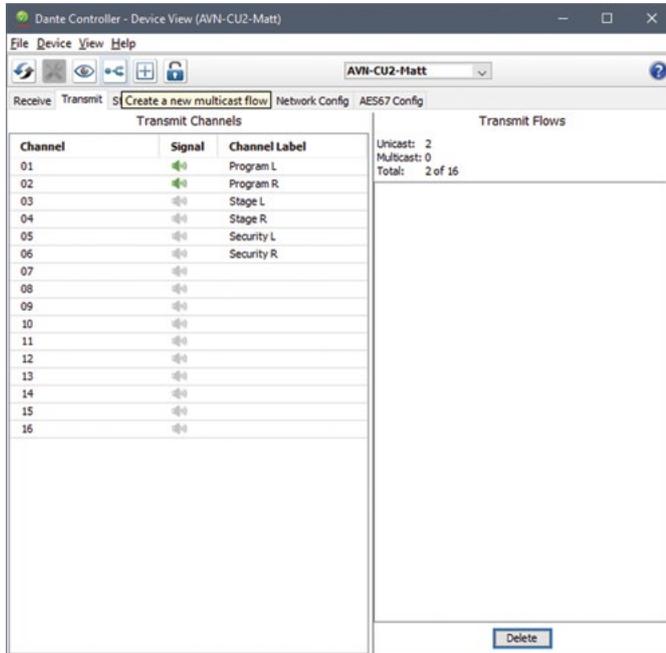


Fig 4-22: New multicast flow icon

In the **Create Multicast Flow** window select the **AES67 Flow** checkbox and select the channels you would like to add to the multicast flow.

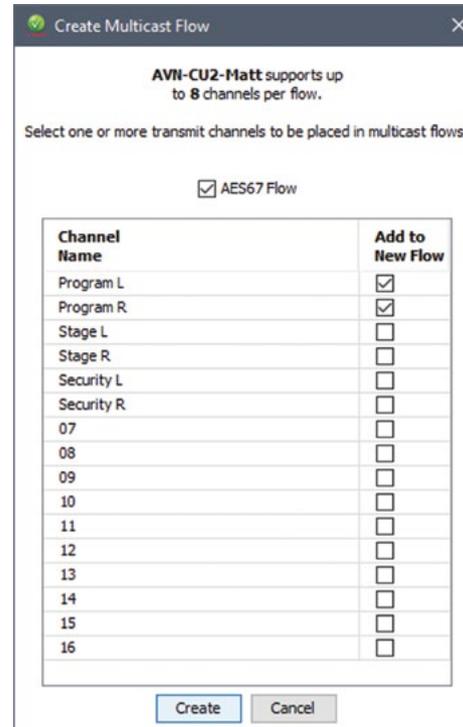


Fig 4-23: Create Multicast Flow window

In the example the channels 'Program L' and 'Program R' are added to the AES67 multicast flow, the **Create** button is then clicked.

The **Transmit** tab of the device configuration window will show the new multicast flow in the **Transmit Flows** side pane. This also shows the multicast address of the multicast flow.

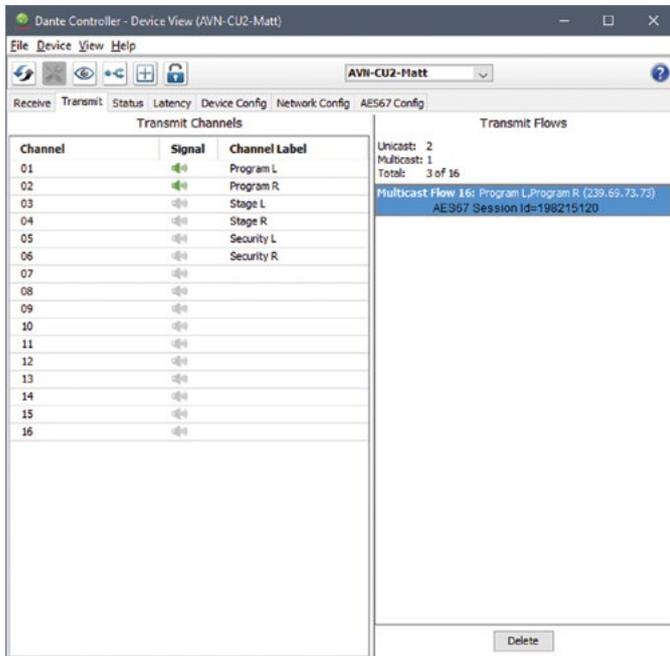


Fig 4-24: Multicast flow in side pane

In the example 'Multicast Flow 16' is created and has a multicast address of '239.69.73.73'.

The multicast flow can then be added to AES67 devices, in the example the multicast flow is added to an AVN-Portal.

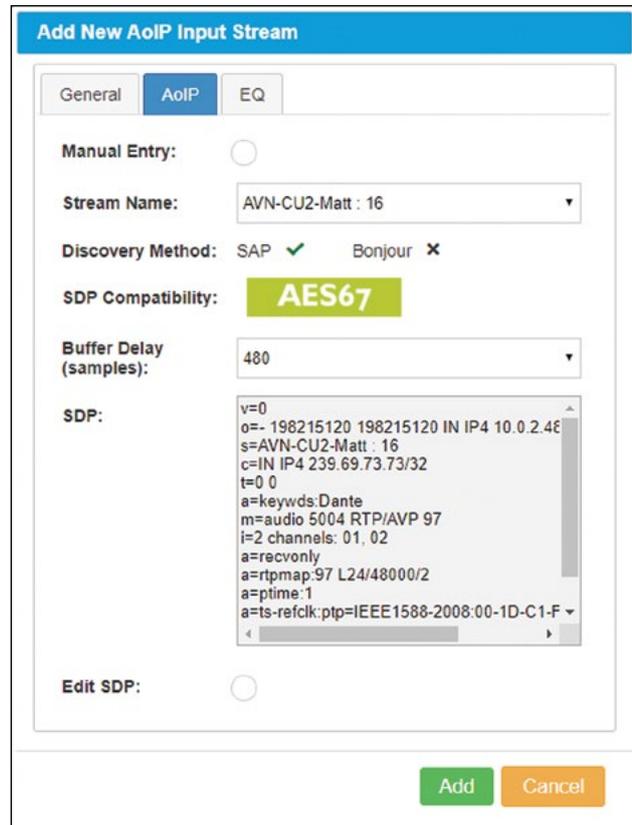


Fig 4-25: Adding the multicast flow to an AES67 device

The stream name is the name of the device followed by the flow number, in this case '16'. The SDP compatibility shows it is AES67 compatible.

## 5. Controls, Indicators and 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
- Front panel
- Back panel

### Top Panel

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

The top panel provides key-capped buttons which can be configured using the embedded webserver, these buttons allow the commentators to quickly perform functions including taking microphones on-air and off-air, and activating talkback, each buttons action and colour is fully configurable. A button can also be used to open the system menu, this allows basic settings to be configured, such settings include the brightness of LEDs, the network configuration, and also allows the user to select custom loaded pre-sets.

The rotary encoders are used to control the level, pan, and muting of sources, mix-points, and destinations. Each encoder has a side light which allows the commentator to associate colours with a specific source, mix-point, or destination. A quick double press of an encoder allows the assigned input, output or mix-point to be immediately muted or unmuted.

There is also a coloured display which is bright even in daylight viewing conditions, this displays useful information about audio assignments such as their level, whether they are muted, if there is any pan enabled and whether this pan is towards the left or the right. The page selected is also shown in the top-left of the display alongside the main output metering.

Status LEDs are also shown on the top panel which provides quick diagnostic information, such as whether the PTP clock is in sync and whether power is being provided to the unit.

### AVN-CU2-DANTE



Fig 5-1: AVN-CU2 Top Panel Labelled.

The AVN-CU2-DANTE has status LEDs, a TFT display, six encoders with colour indicators, and twelve illuminated buttons.

## AVN-CU4-DANTE

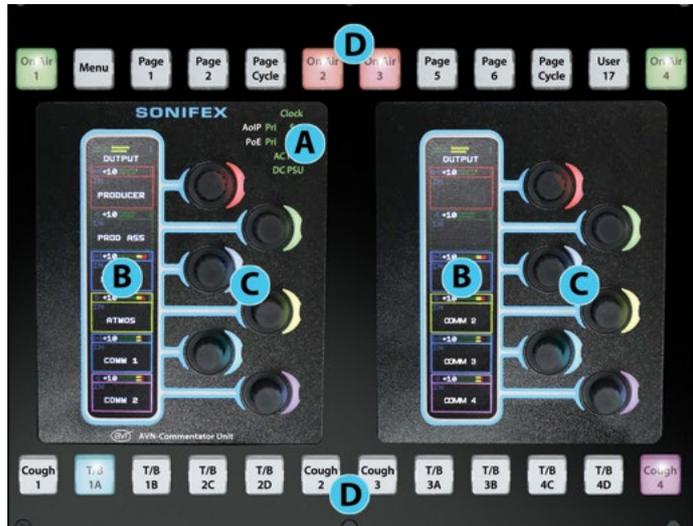


Fig 5-2: AVN-CU4 Top Panel Labelled.

The AVN-CU4-DANTE has status LEDs on the right-hand side of the panel, two TFT displays, twelve encoders with colour indicators (six on each TFT display), and twenty-four illuminated buttons.

### Status LEDs (A)

The status LEDs are located in the top right corner of the overlay on the AVN-CU2 and in the top right corner of the first overlay on the AVN-CU4.

### Clock

The 'Clock' status LED shows the status of the PTP clock, on the Dante network. The PTP clock is shared by AoIP devices in order to keep audio in sync. The status of the PTP clock is indicated by the colour and state of the 'Clock' status LED.

### Green

The 'Clock' status LED is green when the device is either a PTP master or a PTP slave.

### Red

The 'Clock' status LED is red PTP sync lost.

### AoIP

The status of the primary and the secondary AoIP network connections is indicated by the colour and the state of the 'Pri' and 'Sec' status LEDs.

### Green

If the status LED is green there is a valid AoIP connection on the corresponding connector.

### Off

If the status LED is not illuminated there is not a valid AoIP connection on the corresponding connector.

### PoE

The status of PoE on the primary and the secondary connections is indicated by the colour and the state of the 'Pri' and 'Sec' status LEDs.

### Green

If the status LED is green, PoE is available on the corresponding connector.

**Red**

If the status LED is red, PoE is unavailable on the corresponding connector.

**Off**

The status LED is not illuminated when it has been disabled in the embedded web servers' settings.

**AC PSU**

This applies to the AVN-CU4 only. The status of the AC power supply is indicated by the colour and state of the 'AC PSU' status LED.

**Green**

The 'AC PSU' status LED is green when a safe level of power is available on the AC power supply input.

**Red**

The 'AC PSU' status LED is red when the power on the AC power supply input is at an unsafe level or no AC power supply is connected.

**Off**

The 'AC PSU' status LED is not illuminated when disabled via the embedded web server.

**DC PSU**

The status of the DC power supply is indicated by the colour and state of the 'DC PSU' status LED.

**Green**

The 'DC PSU' status LED is green when a safe level of power is available on the DC power supply input.

**Red**

The 'DC PSU' status LED is red when the power on the DC power supply input is at an unsafe level or no DC power supply is connected.

**Off**

The 'DC PSU' status LED is not illuminated when disabled via the embedded web server.

**TFT Display (B)**

A TFT display is located to the left of the encoders. The TFT is split into six encoder sections and a top section which displays the currently selected page number and the metering of a chosen output. The 'encoder sections' below this, contain information about the assigned audio source, destination, or mix point.

**Encoders (C)**

Each of the encoders are assigned to their corresponding 'encoder section' on the TFT display and provide adjustment of the level and pan of the audio. The encoders are also used to navigate and adjust values within the system menu. Situated to the right-hand side of each encoder is an LED which is illuminated in a colour which corresponds to the 'encoder section' it controls.

**Illuminated Buttons (D)**

The AVN-CU2-DANTE has 12 illuminated push buttons, the AVN-CU4-DANTE has 24. Each button has a removable cap to allow the user to modify the label on the button. The action, colour and function of each button can be configured via the embedded web server.

## Front Panel

### AVN-CU2-DANTE



Fig 5-3: AVN-CU2 Front Panel

### AVN-CU4-DANTE



Fig 5-4: AVN-CU4 Front Panel

The AVN-CU2-DANTE has two locking XLR microphone/line inputs, two red LEDs indicating the presence of phantom power on the associated XLR input, and two locking 6.35 mm headphone jack sockets. The AVN-CU4-DANTE has four locking XLR microphone/line inputs, four red LEDs and four locking 6.35 mm headphone jack sockets.

#### Microphone/Line Input

Each locking XLR microphone/line input consists of three pins, the connections are as follows:

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

### Phantom Power Status LED

Each red LED illuminates when the corresponding input is set to supply phantom power. Phantom power can only be supplied when the microphone/line input is set to microphone mode. Phantom power is supplied at +48V. The settings of the microphone/line input can be configured via the embedded web server.

### Headphone Output

Each locking 6.35 mm headphone jack socket consists of three connections, these connections are as follows:

- Tip: Headphone Left
- Ring: Headphone Right
- Sleeve: Ground

Additional settings are available for the headphones these settings can be configured via the embedded web server.

## Back Panel

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

### AVN-CU2-DANTE



Fig 5-5: AVN-CU2 Back Panel

The AVN-CU2-DANTE has two Ethernet ports for AoIP and PoE, two SFP ports for alternative transceiver types for the AoIP connection, two RJ45 audio connections, a GPIO connector, a DC power connector, and a reset button.

## AVN-CU4-DANTE



Fig 5-6: AVN-CU4 Back Panel

The AVN-CU4-DANTE has two Ethernet ports for AoIP and PoE, two SFP ports for alternative transceiver types for the AoIP connection, two RJ45 audio connections, a GPIO connector, a DC power connector, a reset button, an AC connector with an anti-surge mains fuse, four additional XLR line inputs and six additional XLR line outputs.

### 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 PoE.

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, orange when operating at 100 Mbps, 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.

Each port can be used to provide power to the device via PoE (Power over Ethernet) in order to use this feature, a switch with PoE ports or a PoE injector is required.

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 alternative interface 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

### ***Stereo Analogue/Digital Input***

This RJ45 input can be configured as either analogue or digital via the embedded web server. The port uses a StudioHub+ compatible pinout as follows:

- Pin 1: Left+/AES3+
- Pin 2: Left-/AES3-
- Pin 3: Right+
- Pin 4: Ground
- Pin 5: No Connection
- Pin 6: Right-
- Pin 7: No Connection
- Pin 8: +12V

### ***Inputs A, B, C and D (AVN-CU4-DANTE only)***

These inputs are analogue inputs on locking female XLR connections. The inputs have the following pinout:

- Pin 1: Ground
- Pin 2: Input+
- Pin 3: Input-

## Audio Outputs

### ***Stereo Analogue/Digital Output***

This RJ45 output can be configured as either analogue or digital via the embedded web server. The port uses a StudioHub+ compatible pinout as follows:

- Pin 1: Left+/AES3+
- Pin 2: Left-/AES3-
- Pin 3: Right+
- Pin 4: Ground
- Pin 5: Cough GPI
- Pin 6: Right-
- Pin 7: No Connection
- Pin 8: +12V

**An AVN-HA1 or AVN-HD1 can be connected to this output, the AVN-HA1 or AVN-HD1 can then be used to control the cough GPI pin.**

### ***Outputs A, B, C, D, E and F (AVN-CU4-DANTE only)***

These outputs are analogue outputs on male XLR connections. The outputs have the following pinout:

- Pin 1: Ground
- Pin 2: Input+
- Pin 3: Input-

## GPIO Connector

The AVN-CU2-DANTE 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.

### AC Power Connection (AVN-CU4-DANTE only)

This universally filtered IEC is the mains AC input power supply to the unit.

### Mains Fuse (AVN-CU4-DANTE only)

This 20 mm x 5 mm anti-surge mains fuse is rated at 2A.

### +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: +12 V

### Reset Button

On the AVN-CU2-DANTE, the recessed reset button is situated to the right of the secondary Ethernet connection. On the AVN-CU4-DANTE the button is situated to the right of the mains AC input. A short press of the button will reboot the device leaving the configuration unaffected. Pressing and holding the button for 10 seconds will reboot the unit into recovery mode which can be used to install new device firmware.

## 6. 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 the 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. Either of these ports can be connected to a network and a computer on the same network can then access the embedded web server.

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>) or Bonjour Print Services.

Alternatively, the user can display the IP address on the main display of the device by navigating to the ‘Status’ section using the controls on the front panel. 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, simply type this into the address bar of a web browser. The ‘Device Information’ page of the connected AVN Commentator Unit will be displayed. This is the default page and will always be displayed first when connecting to the embedded web server. Each page of the web server shows the friendly name of the device in the upper right-hand corner, under the product name. This makes it easier to identify the connected device, especially

when configuring multiple devices at the same time. The right-hand side of each page has a brief help section that describes the content of each section.



Fig 6-1: Device information page.

## Information

Device Information	
<b>Device ID:</b>	AVN-CU2
<b>Host Name:</b>	AVN-CU2-D0A4B10006CD
<b>Friendly Name:</b>	AVN-CU2-Matt
<b>Serial Number:</b>	
<b>Firmware Version:</b>	D0.0.1772
<b>Dante Version:</b>	4.0.9.2
<b>Front Panel Version:</b>	1.116
<b>DC Voltage:</b>	0.00V
<b>Pri PoE Voltage:</b>	11.982V
<b>Sec PoE Voltage:</b>	0.00V
<b>Temperature:</b>	68°C
<b>Dante Redundancy:</b>	Redundant
<b>System Up Time:</b>	2 hrs 40 mins

Fig 6-2: 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.

Control Port Information	
<b>Hardware Address:</b>	D0:A4:B1:00:06:CD
<b>Actual IP Address:</b>	10.0.2.74
<b>Actual Subnet Mask:</b>	255.0.0.0
<b>Addressing Mode:</b>	Dynamic

Primary Dante Port Information	
<b>Hardware Address:</b>	D0:A4:B1:00:06:D4
<b>Actual IP Address:</b>	10.0.2.48
<b>Actual Subnet Mask:</b>	255.0.0.0
<b>Addressing Mode:</b>	Dynamic

Secondary Dante Port Information	
<b>Hardware Address:</b>	D0:A4:B1:00:06:D5
<b>Actual IP Address:</b>	172.31.183.182
<b>Actual Subnet Mask:</b>	255.255.0.0
<b>Addressing Mode:</b>	Dynamic

Fig 6-3: Port information.

The lower half of the page shows the configuration of the network ports; the 'Control Port Information' shows the network address configuration of the embedded web server which can be accessed on both the 'Primary' and 'Secondary' Ethernet connections.

The 'Primary Dante Port Information' and the 'Secondary Dante 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 Dante controller application or via the 'network' configuration web page. If the Dante redundancy setting for the unit is set to "Switched" via Dante controller then only the Control Port and Primary Dante Port Information are shown here.

## Configuration

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

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

Each page with configurable settings has a 'Submit' button, this is initially greyed out and disabled when the page is loaded. After changes are made to the web page, the 'Submit' button is enabled and changes to a green colour, pressing this button will then save any changes made to the page. If the user tries to navigate to another webpage when changes have been made an alert box will be displayed asking the user if they would like to save the changes made, if the user selects 'OK' the changes are saved before moving to the new page, if 'Cancel' is selected, any changes made are discarded before moving to the new page.

### Network

The Network page shows the current configuration of the control port which is used to access the devices web server. The friendly name and security options can also be set here.

Device Name & Security	
Friendly Name:	AVN-CU2-Matt
Password:	*****
Retype Password:	*****
HTTP Port:	80

Fig 6-4: The 'Device Name & Security' section of the 'Network' webpage.

#### 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-CU2-1234567 or AVN-CU4-1234567. 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 a password must be retyped, this is to make sure 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.

Fig 6-5: The 'Control Port Settings' section of the 'Network' webpage.

Fig 6-6: The 'Primary Dante Network Port Settings' section of the 'Network' webpage

Fig 6-7: 'Secondary Dante Network Port Settings' section of the 'Network' webpage

### 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 Dante 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-CU2)**

Friendly Name: AVN-CU2-xxxxxxx  
(Where xxxxxxx is the product serial number)

**Control Port:**

Address Mode: Static  
Static IP Address: 192.168.0.100  
Static Subnet Mask: 255.255.255.0  
Static Gateway: 0.0.0.0

**Dante Primary Port:**

Address Mode: Dynamic  
Static IP Address: 192.168.0.101  
Static Subnet Mask: 255.255.255.0  
Static Gateway: 0.0.0.0

**Dante Secondary Port:**

Address Mode: Dynamic  
Static IP Address: 192.168.1.101  
Static Subnet Mask: 255.255.255.0  
Static Gateway: 0.0.0.0

**Network Defaults (AVN-CU4)**

Friendly Name: AVN-CU4-xxxxxxx  
(Where xxxxxxx is the product serial number)

**Control Port:**

Address Mode: Static  
Static IP Address: 192.168.0.100  
Static Subnet Mask: 255.255.255.0  
Static Gateway: 0.0.0.0

**Dante Primary Port:**

Address Mode: Dynamic  
Static IP Address: 192.168.0.101  
Static Subnet Mask: 255.255.255.0  
Static Gateway: 0.0.0.0

**Dante Secondary Port:**

Address Mode: Dynamic  
Static IP Address: 192.168.1.101  
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 display, status LEDs and button assignments. The page also allows remote control of the Commentator Unit using an interactive webpage.

### Front Panel Settings and Control



Fig 6-8: The 'Front Panel Settings and Control' section of the 'Front Panel' webpage

### Configure LEDs

To configure the brightness of the TFT display, push button LEDs, status LEDs, encoder LED bars and enable or disabled status LEDs open the configure LEDs window by clicking on the status LEDs.

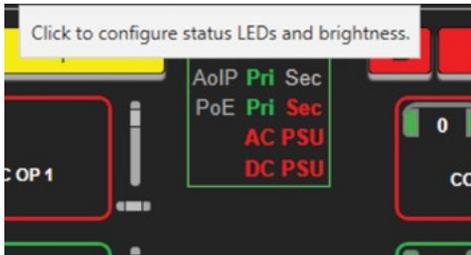


Fig 6-9: Configure status LEDs and brightness

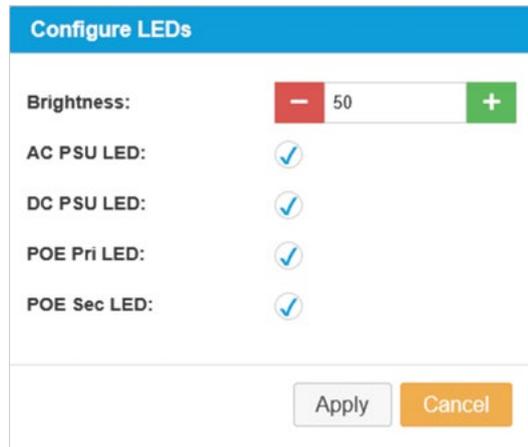


Fig 6-10: Configure LEDs window

### Brightness

The brightness can be adjusted by pressing the + and – buttons or by typing the value into the input field. This can be varied from 10% to 100% in steps of 10%.

### AC PSU Status LED (AVN-CU4-DANTE only)

Selecting this checkbox enables the AC PSU status LED, this LED is illuminated green when power is available on the AC connection. If the checkbox is not selected the LED is not illuminated.

### DC PSU Status LED

Selecting this checkbox enables the DC PSU status LED, this LED is illuminated green when power is available on the DC connection. If the checkbox is not selected the LED is not illuminated.

**PoE Primary Status LED**

Selecting this checkbox enables the PoE primary status LED, this LED is illuminated green when PoE power is available on the primary RJ45 connection. If the checkbox is not selected the LED is not illuminated.

**PoE Secondary Status LED**

Selecting this checkbox enables the PoE secondary status LED, this LED is illuminated green when PoE power is available on the secondary RJ45 connection. If the checkbox is not selected the LED is not illuminated.

**Configure Pages**

To configure a page first click on the page name as shown in the following image.

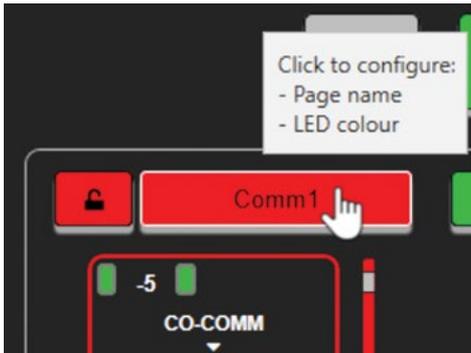


Fig 6-11: Page name

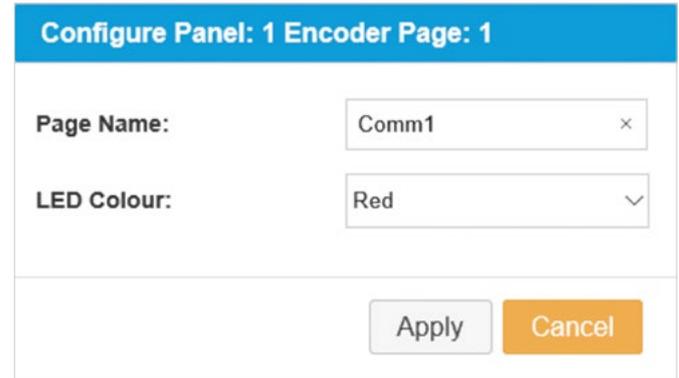


Fig 6-12: Configure panel page window

**Page Names**

A name can be given for each encoder page on the commentator unit, simply type the new page name in the **Page Name** field and then click

**Apply.** Note that the page name can be up to 10 characters in length and should be alphanumeric.

The new page names will now be shown in the **Encoder Assignments Overview** on the **Audio Routing** web page. In the example the page names are 'Headphones', 'Inputs', 'Mix', and 'Outputs'. For more information on the **Encoder Assignments Overview** look at the **Encoder Assignments** section within the **Audio Routing** section of this manual.

Encoder Assignment Overview

Display 1    Display 2

ENC ID	1 - Headphones	2 - Inputs	3 - Mix	4 - Outputs
1	Comm1 HP Level and Pan	Dante 1 Metering Only	Dante 1 Comm1 HP Level and Pan	Mic OP 1 Metering Only
2	Comm1 HP Level and Pan	Dante 2 Metering Only	Dante 2 Comm1 HP Level and Pan	Mic OP 2 Metering Only
3	Co-Comm Comm1 HP Level and Pan	Dante 3 Metering Only		
4	Comm2 HP Level and Pan	Dante 4 Metering Only	Dante 1 Comm2 HP Level and Pan	Dante 5 Metering Only
5	Comm2 HP Level and Pan		Dante 2 Comm2 HP Level and Pan	Dante 6 Metering Only
6	Co-Comm Comm2 HP Level and Pan			

Fig 6-13: Encoder assignment overview with page names

### Page LED Colours

A colour can be assigned to each encoder page using the LED Colour dropdown menu, the list of available colours is shown below:

- Off
- White
- Red
- Green
- Blue
- Yellow
- Cyan
- Magenta

A **Page Select** button will be illuminated in its corresponding page colour. A **Page Cycle** button will be illuminated in the colour corresponding to the current page if set up to follow page LED colours.

### Lock Pages

Pages can be locked to prevent the commentator from using any of the encoders on that page. To lock a page simply click the lock icon to the left of the page name, as seen in the image below.

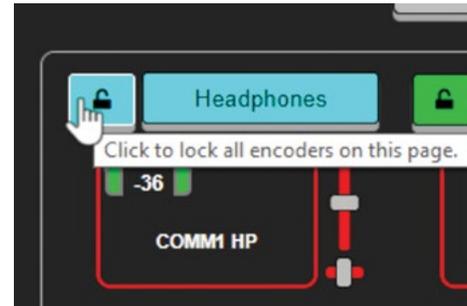


Fig 6-14: Lock page

The icon will then change to signify the page has been locked, the new icon is shown below.

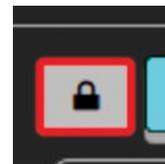


Fig 6-15: Locked page

When locked, lock icons also appear on the encoders in the encoder assignments overview window. When the commentator attempts to use a locked encoder, a warning will be displayed on the devices display.

**Lock Button Row**

A row of buttons can be locked by selecting the Lock Button Row checkbox. When locked pressing any button in the row will have no effect. A warning message will be displayed on the devices display.

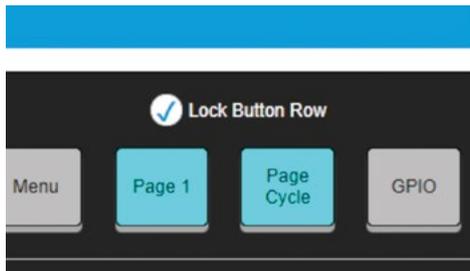


Fig 6-16: Lock button row

**Control and Configure Buttons**

Each button on the device is actionable and fully customisable from the front panel web page. To action a button left click it. To customise a button right click it, this opens the Configure Button window.

**Configure Button Window**

The title bar of the window names the button being configured. At the bottom of this window are two buttons 'Apply' and 'Cancel'. Pressing 'Apply' submits any changes made and clicking 'Cancel' discards any changes made, in both cases the window is automatically closed.

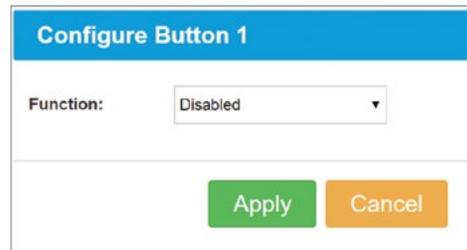


Fig 6-17: The 'Configure Button' window

**Function**

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

**Disabled**

The button performs no function when pressed, the button is never illuminated. All other options are hidden.

**On-Air**

The button enables or disables the mixing of a commentator input onto the main bus. The commentator input to mix is selected using the 'Comm Pos' drop-down menu.

One 'On-Air' button may be assigned for each commentator. This means there can be up to two 'On-Air' buttons on the AVN-CU2-DANTE and up to four 'On-Air' buttons on the AVN-CU4-DANTE.

When the On-Air function is selected the following options are also displayed:

- Comm Pos
- On LED Colour
- Off LED Colour
- Action
- Flash On T/B Or Cough
- Press & Hold For Off
- Lock

### **Talkback A/B/C/D**

The button enables or disables the mixing of a commentator input onto the talkback A/B/C/D bus. The commentator input to mix is selected using the 'Comm Pos' drop-down menu.

One 'T/B' button may be assigned for each commentator per talkback channel. The button is shown graphically with the commentator position and talkback channel, for example for a button controlling talkback to talkback channel C for commentator two the button will display 'T/B 2C'. This means there can be up to eight buttons assigned to 'Talkback' on the AVN-CU2-DANTE and up to sixteen buttons assigned to 'Talkback' on the AVN-CU4-DANTE.

When the Talkback A/B/C/D functions are selected the following options are also displayed:

- Comm Pos
- On LED Colour
- Off LED Colour
- Action
- Press & Hold For Off
- Lock

### **Page Select**

The button switches to the page selected using the 'Page #' drop-down menu. Each page controls different inputs, outputs and mix points.

One page select button can be assigned for each page on the device. Both

the AVN-CU2-DANTE and AVN-CU4-DANTE can have a maximum of four pages which allows for a maximum of four page select buttons.

When selected the following options are also displayed:

- Page #
- Lock

### **Page Cycle**

The button switches through all pages incrementally after reaching page four it loops back around to page one. The LED colour can be set to match the colour of the page selected by selecting "Follow Page LED Colours", for example if page three is selected and the colour of the page is set to 'Red' the button is illuminated red. If "Follow Page LED Colours" is unticked, the user can select a constant LED colour for to use for the 'Page Cycle' button

Only one 'Page Cycle' button can be assigned.

When selected the following options are also displayed:

- LED Colour (If Follow Page LED Colours is unticked)
- Follow Page LED Colours
- Lock

### **GPIO**

The button controls the state of a GPIO, the GPIO can be configured further in the GPIO page.

Each button on the device can be assigned as a GPIO. This provides a maximum of twelve GPIO buttons on the AVN-CU2-DANTE and a maximum of twenty-four GPIO buttons on the AVN-CU4-DANTE.

When selected the following options are also displayed:

- On LED Colour
- Off LED Colour
- Lock

**Cough**

The button temporarily takes a selected commentator's microphone off-air.

One 'Cough' button may be assigned for each commentator. This means there can be two 'Cough' buttons on the AVN-CU2-DANTE and four 'Cough' buttons on the AVN-CU4-DANTE.

When selected the following options are also displayed:

- Comm Pos
- On LED Colour
- Off LED Colour
- Action
- Press & Hold For Off
- Lock

**Menu**

The button brings up the system menu on the TFT display, pressing the button again whilst the menu is shown on the TFT display will close the menu.

Only one 'Menu' button can be assigned.

When selected the following options are also displayed:

- On LED Colour
- Lock

**Brightness**

The button jumps into the brightness control menu of the system menu on the TFT display; the brightness of the TFT display, push button LEDs, and status LEDs can then be adjusted.

Only one 'Brightness' button can be assigned.

When selected the following options are also displayed:

- On LED Colour
- Lock

**Comm Pos**

The 'Comm Pos' drop-down menu allows the user to select which commentator microphone the selected function applies to. On the AVN-CU2-DANTE this option ranges from 1 – 2. On the AVN-CU4-DANTE, this option ranges from 1 – 4.

**On LED Colour / Off LED Colour**

The colour of the LED when the function assigned to the button is active (On LED Colour) or inactive (Off LED Colour) can be configured.

The following options are available:

- Off
- White
- Red
- Green
- Blue
- Yellow
- Cyan
- Magenta

**Action**

This decides how the button behaves when pressed and when released. The options available are described below.

**Auto-Momentary**

If the button is pressed and release quickly, the assigned function is latched. When the button is pressed and released again, the function is deactivated. If the button is pressed for longer than 350 milliseconds, the button will then behave like a momentary button and the function is instead active until the button is released.

**Momentary**

The function is active whilst the button is pressed until it is released.

**Latching**

The function is latched active when the button is pressed and released, the button must then be pressed and released again to deactivate the function.

**Flash On T/B Or Cough**

Enabling this option causes the associated On-Air button to flash when either the T/B or cough button assigned to the same commentator position are used.

**Page #**

The page to switch to when the button being configured is pressed, this can be one of the following pages:

- 1
- 2
- 3
- 4

**Press & Hold for Off**

To protect against the user accidentally deactivating a button (for example the On-Air state) the “Press & Hold For Off” setting can be used. When this setting is enabled, an active button must be pressed and held for 5 seconds to be deactivated. The ‘Press & Hold For Off’ option overrides the ‘Action’ property to ‘Latching’.

**Lock**

When a button has ‘Lock’ enabled pressing that button has no effect and “Locked” will flash up in the top section of the TFT display. The LED will continue to show the state the LED was in before ‘Lock’ was enabled. A button can be locked in either the on or off state.

**Remote Control**

Each encoder is displayed on the front panel web page. They can be controlled from here.

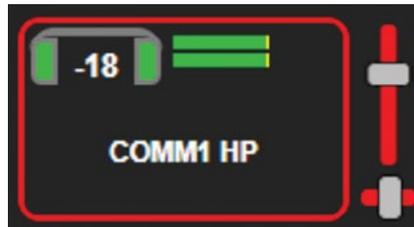


Fig 6-18: Remote control

**Level**

The audio level is displayed using two metering bars on stereo sources and a single metering bar for mono sources, yellow metering is displayed once the audio level rises above 0 dBu (0 dBFS = 18 dBu D/A line-up). Limiting is applied when the audio level rises above 18 dBu helping to prevent distortion of the output, limiting is indicated using a red bar to the right of the metering.

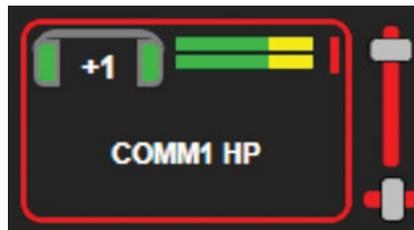


Fig 6-19: Limiting

**Gain**

The gain in dBs being applied to the audio is displayed in the top left corner. The gain can be adjusted using the vertical slider toward the right, moving the slider upwards increases the gain to the maximum of 10 dB's, moving it downwards allows the audio to be attenuated by 80 dB's.

**Pan**

The audio can be panned left and right on stereo sources, the current share of audio on each channel can be seen around the gain value.

The pan is controlled using the horizontal slider to the right, moving the slider completely left muted the right channel and moving the slider completely right mutes the left channel.

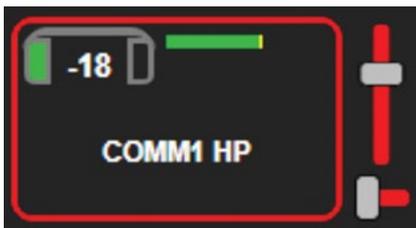


Fig 6-20: Pan control

**Mute**

An audio source can be muted by double clicking it. Double clicking again unmutes the audio source. A muted source is indicated with the mute icon.

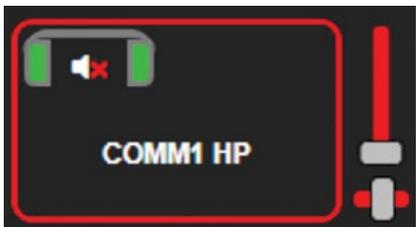


Fig 6-21: Muted

**Audio Routing**

The audio routing webpage allows complete configuration of audio and encoder assignments, in essence this page can be used to:

- Add and configure inputs and outputs, such as selecting their type and their line-up.
- Creating routings between different inputs and outputs.
- Add encoders to inputs, outputs and mix-points.
- Lock and configure functionality of encoders, such as level control and panning.
- View the current encoder assignments.

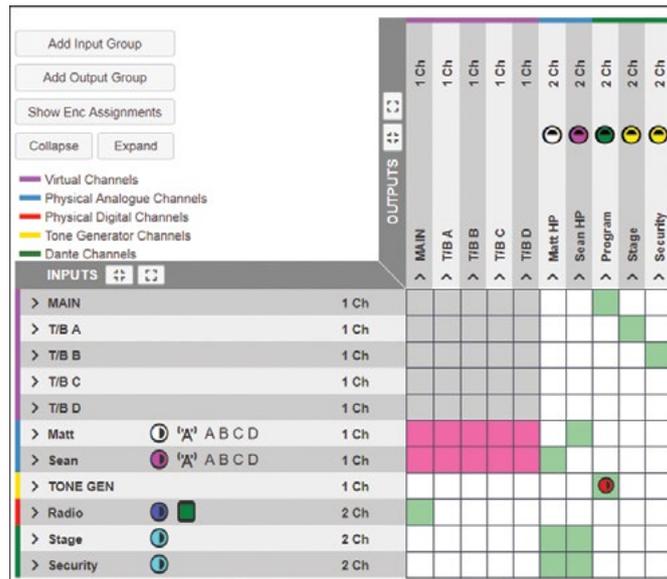


Fig 6-22: The 'Audio Routing Grid' of the 'Audio Routing' webpage.

At the top-left of the grid, buttons are provided to add input and output groups to the routing grid, hide the current encoder assignments table and collapse or expand the routing grid. Underneath these buttons a key explains the different input and output types.

Audio input groups are shown on the left-hand side of the grid, various icons appear next to the names of any inputs giving an overview of things like encoder assignments, the on-air state or active talkback buses, this is explained in detail later on. Audio output groups are shown along the top of the grid with their currently assigned encoders.

### Virtual Inputs and Outputs

There are a number of virtual buses and the commentary mic/line inputs are routed to these by default (these routings are fixed and are shown in pink) physical or AoIP inputs can also be routed to the virtual buses. The virtual buses then appear as inputs that can be routed to a physical or AoIP output. This allows the user to group inputs from different sources onto a bus then route them all at the same time to physical or AoIP outputs. The buses also provide smart functionality for the commentator line/mic inputs. For example, when a commentary position line/mic input is on air, the audio from this source will be present on the “Main” virtual bus. If a Talkback control is active then the audio from the commentary position will be present on the relevant talkback virtual bus.

### Main Bus

The main bus contains audio from commentators when they are on-air, other audio sources can be routed to the main bus and will remain there whether a commentator is on-air or not.

### T/B Bus

There are four talkback buses available, a talkback bus contains audio from any commentator that has chosen to speak on that bus using the associated button for that bus A/B/C/D. A button can be configured to enable/disable a specific talkback bus in the front panel web page.

### Co-Comm Bus

Audio from all other commentators can be heard when the co-commentator bus is routed to a commentator’s headphones. The commentator can then hear other commentators but won’t hear themselves. Note the co-commentator bus is only available on the AVN-CU4.

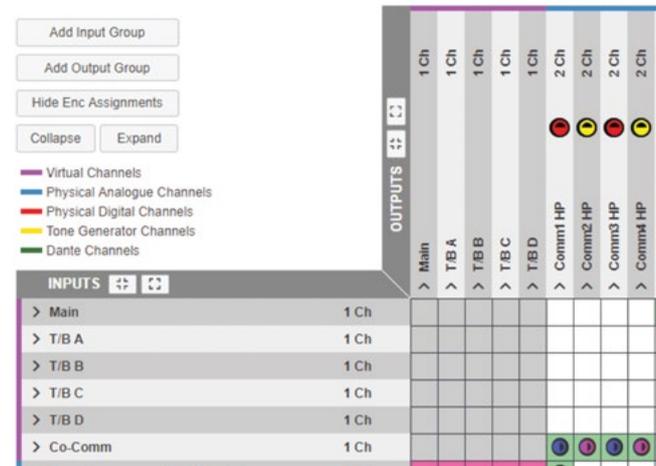


Fig 6-23: Co-comm bus

### Mix-Points

Between the input and output sections is the routing grid which allows connections to be made between inputs and outputs, encoders can also be assigned to these connections to provide additional control. We call these routings ‘mix-points’. Routings are generally represented by green boxes (or pink boxes if they represent a fixed routing). See the **Routing Grid** section of this manual for more information.

### Adding Dante Input and Output Groups

Dante input groups allow audio routed to channels belonging to **Dante Receivers** within the Dante Controller application to be used as inputs to the commentator unit.

In the section **Routing Audio** the audio from the 'AVN-DIO8-Stage' device was routed into the receiving channels of 'AVN-CU2-Matt'.

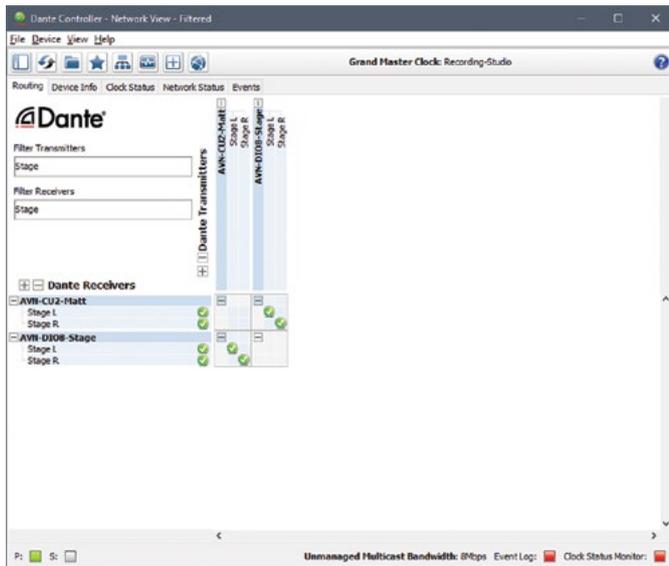


Fig 6-24: Dante Controller routings

These two receiving channels are called 'Stage L' and 'Stage R'. In the audio routing grid of the commentator unit click **Add Input Group** the add input group window will open.

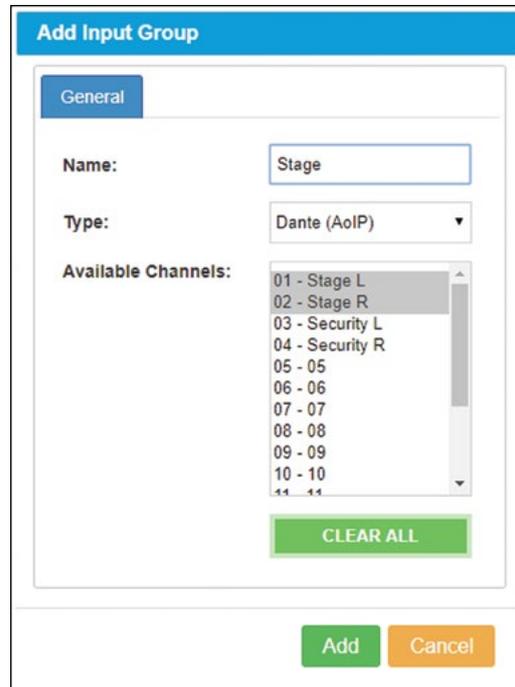


Fig 6-25: Adding a Dante input group

In the add input group window a name is given to the unit. The input type is set to Dante and from the available channels, 'Stage L' and 'Stage R' can be selected, these are the channels that audio was routed to in Dante Controller. The **Add** button is then clicked.

INPUTS									
MAIN	1								
T/B A	1								
T/B B	1								
T/B C	1 Ch								
T/B D	1 Ch								
Mic-Matt	1 Ch								
Mic-Sean	1 Ch								
TONE GEN	1								
Stage	01 - Stage L								
	02 - Stage R								

Fig 6-26: New Dante input stream

Notice that the 'Stage' input can now be seen in the input section of the **Audio Routing Grid** pressing the arrow to the left-hand side of the input expands the input group to show the channels belonging to it.

The channels of the 'Stage' input can then be routed to the outputs as required, in the example they are then routed to the commentator's headphones.

Add Input Group

Add Output Group

Hide Enc Assignments

Collapse Expand

Virtual Channels  
Physical Analogue Channels  
Physical Digital Channels  
Tone Generator Channels  
Dante Channels

OUTPUTS									
MAIN	1 Ch								
T/B A	1 Ch								
T/B B	1 Ch								
T/B C	1 Ch								
T/B D	1 Ch								
HP-Matt	L R								
HP-Sean	L R								
Program	2 Ch								

INPUTS									
MAIN	1								
T/B A	1								
T/B B	1								
T/B C	1 Ch								
T/B D	1 Ch								
Mic-Matt	1 Ch								
Mic-Sean	1 Ch								
TONE GEN	1								
Stage	01 - Stage L								
	02 - Stage R								

Fig 6-27: Dante input routed

Audio can also be routed to the **Transmit** channels of the device, this is done by creating an output group and selecting the required transmit channels.

Click the **Add Output Group** button, a window will open. Type in a name for the new output and select Dante from the type dropdown menu. From the available channels 'Stage L' and 'Stage R' are selected, these were setup earlier in Dante Controller and are routed to the device 'AVN-DIO8-Stage', this can be seen in 'Fig 6-24: Dante Controller routings' on page 53. The **Add** button is then clicked.

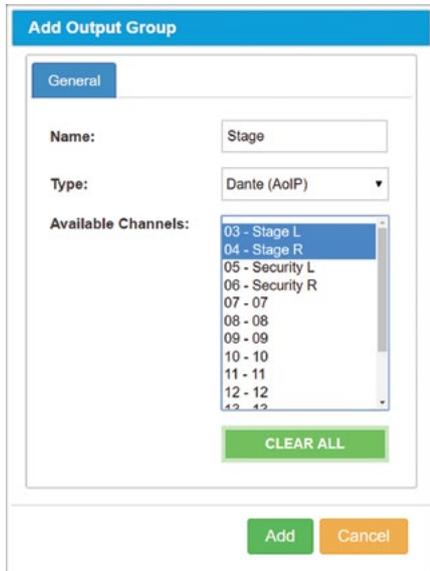


Fig 6-28: Adding a Dante output group

The output can then be seen in the Outputs section of the routing grid. Inputs can now be routed to this output and any audio will be transmitted on the Dante AoIP stream. In the example the Virtual Input T/B A is routed to the 'Stage' output so that when the commentator activates T/B A their microphone can be heard by the people behind the stage.

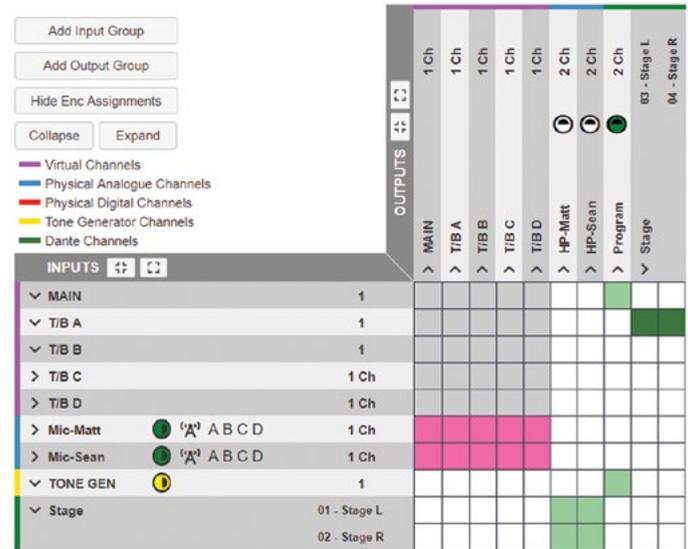


Fig 6-29: Routing to Dante output group

### Adding an Input Group

By default, the commentator has the virtual inputs added to the routing grid, these can't be removed. The two commentator microphones on the AVN-CU2-DANTE and the four commentator microphones on the AVN-CU4-DANTE are also added by default and have fixed routings to the virtual outputs. Lastly a tone generator is also added to the inputs section by default.

Additional digital, analogue, and Dante inputs can be added to the unit as the user desires.

The screenshot shows the 'Add Input Group' window with the following details:

- Title:** Add Input Group
- Tab:** General
- Name:** Mix
- Type:** Analogue (Physical)
- Available Channels:** STEREO IN 1-1, STEREO IN 1-2
- Buttons:** CLEAR ALL (green), Add (green), Cancel (orange)

Fig 6-30: The 'General' tab of the 'Add Input Group' window.

To add a new input group to the audio routing grid;

- Click the **Add Input Group** button, this will open a new window.
- Type in a name for the new input group, this name is displayed as the label for the input on the inputs section of the grid.
- Select the input type, digital and analogue inputs are located on the rear of the device whereas Dante® inputs are accessible using Dante Controller®.
- Select which of the available channels you would like to add to the group. A maximum of 8 channels can be added to a group.
- Click the **Add** button, the input group will now appear in the inputs section of the audio routing grid with the name provided.

Tips;

- A tooltip will be displayed if there are any issues with adding the input.

- The shift button  $\uparrow$  and control button *Ctrl* can be used to select multiple channels.
- The Clear **All** button can be pressed to deselect all channels.
- Clicking **Cancel** at any time will discard all changes.

### Adding an Output Group

By default, the commentator has the virtual outputs added to the routing grid, these can't be removed. The two commentator headphones on the AVN-CU2-DANTE and the four commentator headphones on the AVN-CU4-DANTE are also added by default.

Additional digital, analogue, and Dante outputs can be added to the unit as the user desires.

The screenshot shows the 'Add Output Group' window with the following details:

- Title:** Add Output Group
- Tab:** General
- Name:** Security
- Type:** Dante (AoIP)
- Available Channels:** 05 - 05, 06 - 06, 07 - 07, 08 - 08, 09 - 09, 10 - 10, 11 - 11, 12 - 12, 13 - 13, 14 - 14
- Buttons:** CLEAR ALL (green), Add (green), Cancel (orange)

Fig 6-31: The 'General' tab of the 'Add Output Group' window.

To add a new output group to the audio routing grid;

- Click the **Add Output Group** button, this will open a new window.
- Type in a name for the new output group, this name is displayed as the label for the group on the outputs section of the grid.
- Select the output type, digital and analogue outputs are located on the rear of the device whereas Dante® outputs are accessible using Dante Controller®.
- Select the available channels you would like to add to the group. A maximum of 8 channels can be added to a group.
- Click the **Add** button, the output will now appear in the outputs section of the grid with the name provided.

Tips;

- A tooltip will be displayed if there are any issues with adding the output.
- The shift button **↑** and control button **Ctrl** can be used to select multiple channels.
- The **Clear All** button can be pressed to deselect all channels.
- Clicking **Cancel** at any time will discard all changes.

### Encoder Assignments

The encoder assignments overview shows;

- The current position of encoders on each page.
- The input/output or mixed point an encoder belongs to.
- The colour of the encoder.
- The encoder’s function.
- Whether an encoder is locked.

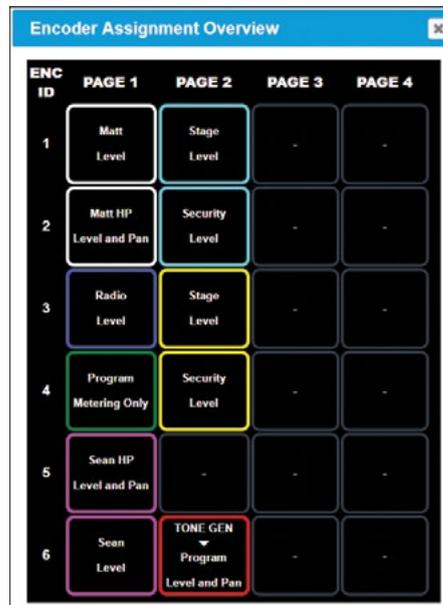


Fig 6-32: The 'Show Encoder Assignments' window.

Down the left-hand side the **encoder position** on a page is displayed, along the top the **page** the encoder is on is displayed. On the AVN-CU2-DANTE four pages are shown whereas on the AVN-CU4-DANTE eight pages are shown.

The colour of the box matches the colour of the encoder, in the box first the name of the input/output is displayed, then underneath this the functionality of the encoder is displayed. If no encoder is assigned to a particular encoder position/page the box is greyed out and no text is displayed. If an encoder is locked, a lock symbol is also shown.

For example, in the image provided pages 1 and 3 are clear. In encoder position 3 on page 1 however you can see the input/output called 'Radio', you can also see that this encoder is blue and that the encoder controls only the level of that audio input/output.

Whilst this window is open other settings on the 'Audio Routing' webpage can still be modified. The window can be hidden by clicking the "Hide Enc Assignments" button

### Adding an Encoder

An encoder can be assigned to an input, mix-point, or output. To add an encoder, click on the input, mix-point, or output you would like to add it to. The configuration window for the point clicked will be displayed.

In the example image a mix-point between 'Mic-Sean' and 'HP-Matt' is selected.

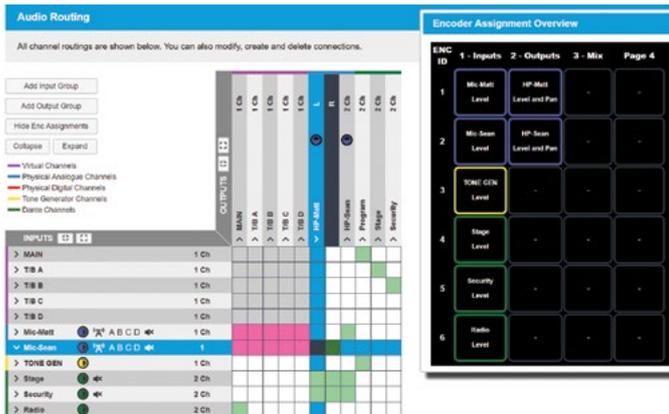


Fig 6-33: Mix-point select

This opens up the configuration window for that mix-point. In this window the 'Encoder 1' tab is selected.

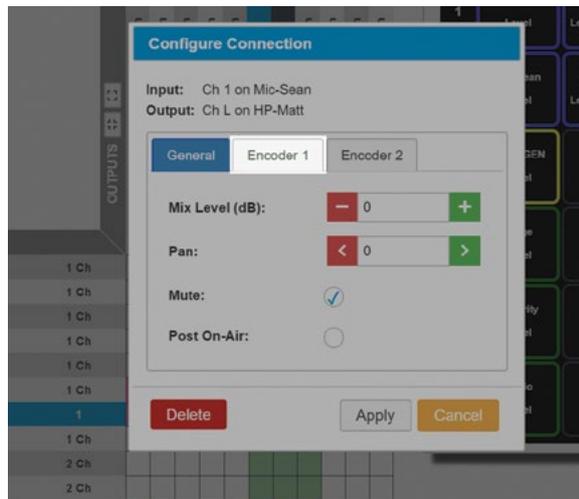


Fig 6-34: Select encoder tab

In the encoder tab the page to place the encoder on must be selected, in this case page 3 is selected. Looking at the Encoder Assignment Overview it can be seen that all the encoder position on this page are available, in this case the encoder is placed in position 1. The function of the button can also be selected, in this case it is set to Level and Pan this means that both the level of the audio and the pan left and right can be controlled using the encoder. The pan mode is set to variable meaning that the pan is adjusted gradually rather than placing all audio on the left, the right, or both channels. Finally, the colour is set to white, this defines the colour of the segment on the display as well as the LED side bar next to the encoder.

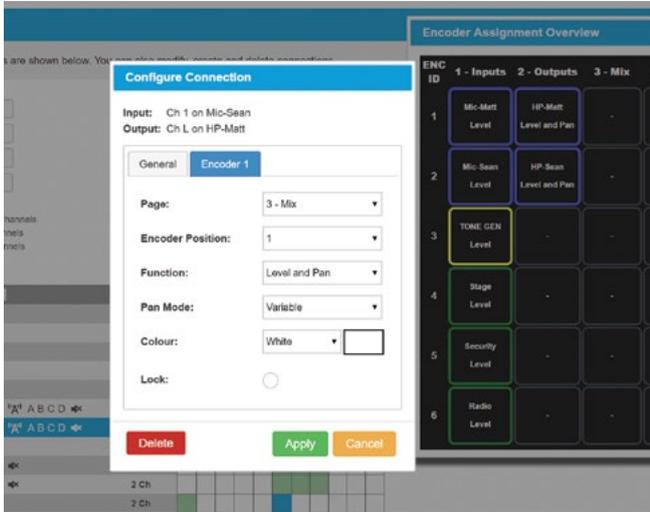


Fig 6-35: Encoder setup

Pressing Apply adds the encoder, this can then be seen in the Encoder Assignment Overview.

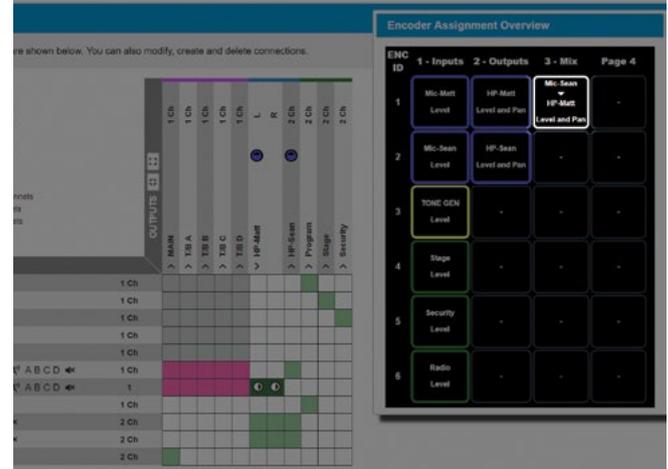


Fig 6-36: Added encoder in encoder assignment overview

Also notice that on the mix-point selected the encoder is added to the left and right channels.

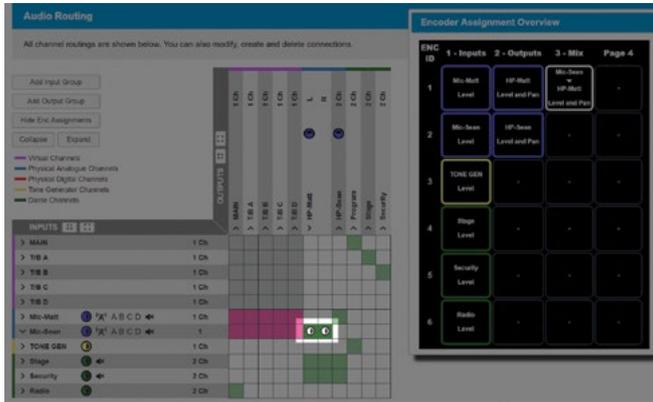


Fig 6-37: Added encoder in grid

Now if page 3 is selected on the top panel of the device, the newly added encoder can be seen, rotating this encoder clockwise and anti-clockwise allows the level of audio to be adjusted. Pressing the encoder once switches the encoder to pan mode, this allows the audio to be panned left and right by rotating the encoder clockwise and anti-clockwise.



Fig 6-38: Added encoder on top panel

Encoders can also be setup for inputs and outputs by instead clicking on an input or output and configuring an encoder there. For more information on encoders and the full list of options available to them see the section Encoder Tabs on page 65.

### Collapsing and Expanding View

Inputs and outputs can be expanded or collapsed, when expanded individual channels belonging to an input/output can be seen, when collapsed only the input/output is shown along with a channel count.

Individual inputs and outputs can be expanded/collapsed by clicking the arrow next to that input/output.



Fig 6-39: Collapsed I/O



Fig 6-40: Expanded I/O

The whole input or output sections can be expanded/collapsed by pressing the following buttons.



Fig 6-41: The collapse button.



Fig 6-42: The expand button.

There are also global collapse and expand buttons which collapse and expand all inputs and outputs.

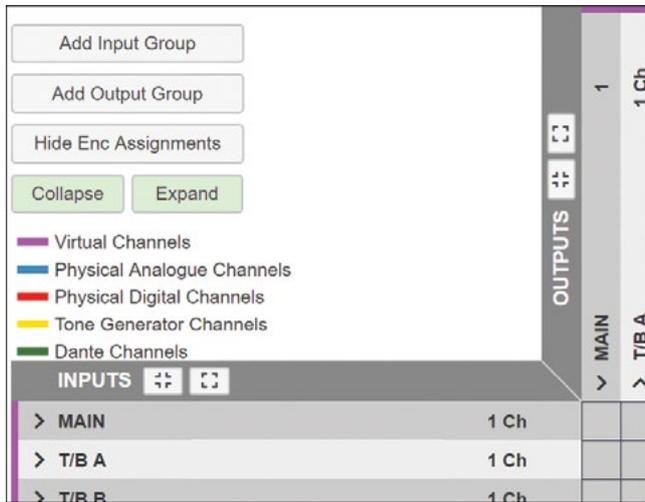


Fig 6-43: Global expand and collapse buttons.

The global expand and collapse buttons are highlighted in green in the image above.

### Configuring Input and Output Groups

To configure an input or output group click on the name of that group. Clicking on icons on the input or output section will open up the window at the relevant tab.

*For example, if the encoder is clicked the encoder configuration window will automatically be opened.*

The commentator inputs can be identified easily as they have on-air and talkback symbols on them as well as having pink fixed channels connected in the routing grid.

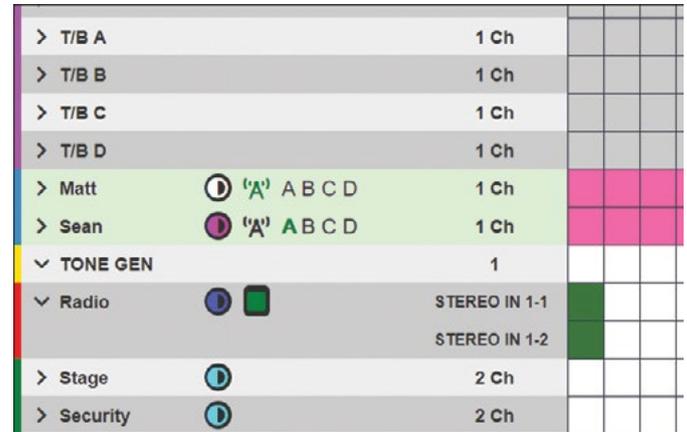


Fig 6-44: Identifying the commentator microphones.

The two inputs on this commentator unit are highlighted in green in the image above. Clicking on the name label opens the configuration window to the general tab.

The configuration window that appears on the screen provides various options. Some of these options (e.g. the name) are common across all input and output types and some are specific to the particular input or output type that has been selected.

**General Tab**

Fig 6-45: General Tab - Commentator Unit

**Name**

Applies to all input and output groups. The name field provides a user-friendly name to the input or output that is being configured. This must be at least 1 character long; some characters are not allowed in the name if these are used in the name a warning message will be shown.

**Level**

Applies to all input and output groups. The value in the level field can be modified using the + and – buttons or by typing in a value. The value in the field shows how many dB the signal is amplified by. The minimum value is -80 dB and the maximum value is +10 dB.

**Limiter Threshold**

Applies to output groups only.

Set the dBFS level that the limiter associated with the selected output group will activate at. The minimum value is -40dBFS and the maximum value is 0dBFS.

**Output Metering**

Applies to output groups only.

Set whether the metering shown on the TFT display for this output is obtained Pre or post Level Adjustment. When “Pre-Level Adjustment” is selected the metering, value does not take the “Level” setting into account. When “Post-Level Adjustment” is selected the metering, value takes the “Level” setting into account.

**Signal Level**

Applies to commentary position microphone mode.

The ‘Signal Level’ can be set to either ‘Mic’ or ‘Line’. Selecting ‘Mic’ displays the options for ‘Phantom Power’ and ‘Preamp Gain’ whereas selecting ‘Line’ displays the ‘Audio Line Up’ option. When an input is set to ‘Mic’ level a microphone icon will be shown next to the input name.

**Phantom Power**

Applies to commentary position inputs in microphone/line inputs only.

The ‘Phantom Power’ option can be enabled or disabled using the dropdown menu. When Phantom power is enabled a +48V DC supply is provided to the microphone, some microphones require this to power any

active electronic circuitry they contain. When phantom power is enabled, the microphone icon will be coloured green.

### **Preamp Gain**

Applies to commentary position microphone/line inputs only.

The user can add from 0 to 60 dB of gain to the microphone input by pressing the '+' and '-' buttons or manually entering a value into the 'Preamp Gain' input field.

### **Audio Line Up**

Applies to commentary position inputs, in line mode, stereo analogue input (AVN-CU2-DANTE), input A/B/C/D (AVN-CU4-DANTE).

The line-up level can be set under the 'Audio Line Up' dropdown menu. This determines the analogue audio level that is equal to the 0 dBFS full scale digital value. This can be set to either 15, 18, 20, 22, or 24 dBu. The audio line-up level will depend on the minimum and maximum audio levels that need to be provided, this will vary depending on the standard used geographically.

### **Mute**

Applies to all input and output groups.

An input or output group can be muted by selecting the 'Mute' checkbox. If a group is muted, a mute icon will be shown next to the group name in the grid.

### **On Air**

Applies to commentary position microphone/line inputs only.

When selected, the 'On Air' option routes the selected commentator input on to the main audio bus, if a button is configured with the 'On Air' function it will also illuminate.

### **Active Talkbacks**

Applies to commentary position microphone/line inputs only.

Four checkboxes are provided labelled 'A', 'B', 'C', and 'D'. When these are checked, the selected commentator input will be routed to the corresponding talkback bus. If a corresponding front panel button is configured for this commentary position and talkback bus, it will also illuminate.

### **Lazy Gang**

Applies to commentary position microphone/line inputs only.

Selecting the 'Lazy Gang' option causes all talkbacks corresponding to the physical input to be enabled/disabled when any of the talkbacks on that physical input become enabled/disabled. This setting can be used to allow the user to set up a single talkback button that will control the routing of the input to all talkback buses simultaneously.

### **Talkback On-Air**

Applies to commentary position microphone/line inputs only.

In normal operation when a talkback is active on a microphone/line input, the input is taken off air this is designed to allow the commentator to talk to people without broadcasting the conversation on air. Enabling 'Talkback On-Air' prevents the commentator from being taken off air when talkback is enabled, hence allowing a conversation to also be heard on air.

### **Pan**

Applies to stereo outputs only (i.e. an output group consisting of 2 channels).

The value in the pan field can be modified using the + and - buttons or by typing in a value. The value in the field can be varied between a minimum of -12 which means audio is fully left and +12 which means that audio is fully right.

**Headphone Attenuation**

Applies to headphone outputs only

The value in the headphone attenuation field can be modified using the + and – buttons or by typing in a value. The value in the field can be varied between a minimum of 0 and a maximum of 24, the value given is measured in dB and determines how much the signal to the headphones is reduced by.

**Bypass SRC**

Applies to digital input groups only

If the sample rate of the input signal is the same as the Dante clock that is being used by the device, then there is no need to carry out any sample rate conversion. This option allows the user to bypass sample rate conversion for the selected input.

**Main Meter**

Applies to output groups only.

When ticked, the metering data for the selected output will be shown at the top segment of the TFT display.

**Channel Info**

Applies to Dante inputs and outputs only.

This entry provides a list of the Dante channels that are part of the selected group. This helps to determine how the selected group corresponds to the grid shown in Dante Controller.

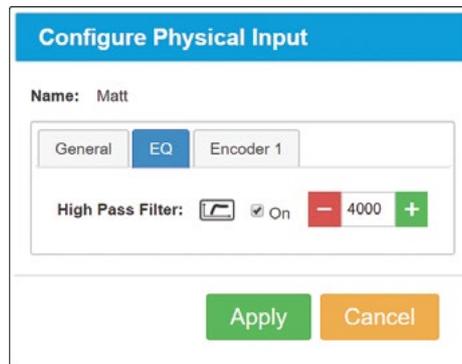
**EQ Tab**

Fig 6-46: The ‘EQ’ tab of the ‘Configure Physical Input’ window of a microphone/line input.

The EQ tab is only available on the commentator inputs (microphone/line inputs).

**High Pass Filter**

The ‘High Pass Filter’ can be enabled by selecting the ‘On’ checkbox. This removes low frequency components from a signal the frequency of the lowest components to be allowed can be set using the ‘+’ and ‘-’ buttons or by typing in a value in the input field. The value in this field can be any whole number from 40 Hz to 10000 Hz. If a filter is set up for an input, an EQ icon will be shown next to the input name in the audio routing grid.

## Encoder Tabs

The screenshot shows a web interface titled "Configure Physical Input". At the top, there are three tabs: "General", "EQ", and "Encoder 1". Below the tabs, the "Name" is set to "Matt". The "Encoder 1" tab is active, showing the following settings:

- Encoder Position:** 1
- Page:** 1
- Function:** Level
- Colour:** White
- Lock:** (unchecked)

At the bottom of the window, there are two buttons: "Apply" (green) and "Cancel" (orange).

Fig 6-47: The 'Encoder 1' tab of the 'Configure Physical Input' window of any input.

The first encoder tab is used to assign an encoder to the selected input, output or mix point, this encoder can then be used to adjust the audio of the input, output or mix point.

Once an encoder is assigned to an input or output, an encoder symbol of the configured colour will be displayed alongside the name of the input or output on the grid. When an encoder is assigned to a mix point, an encoder symbol will be shown in the green coloured box which indicates the mix point.

The second encoder tab is only available on a stereo output group or for mix points that are routing audio to a stereo output group. In this case, the second tab will only be shown when the 'Pan and Level' function is not selected in the first encoder tab.

The second encoder tab provides exactly the same options as the first encoder tab. The Encoder 2 tabs allows the user to assign two encoders to the same mix-point or output – one to control the level and another to control the pan.

Once the second encoder is configured for an output an icon is not displayed alongside that output, that is unless only the second encoder is configured; in which case an encoder symbol with the same colour selected in the colour settings section will be displayed alongside that output.

The options available in the "Encoder 1" and "Encoder 2" tabs are described below:

### Page

The 'Page' setting allows the user to select which page the encoder being configured will appear on, an encoder may only be used once per page. There are four pages available, the user also has the option to assign an encoder to all pages by selecting 'All' from the dropdown list. This option can be set to 'Unassigned' if the user does not want to control this input, output or mix-point.

### Encoder Position

The 'Encoder Position' setting allows the user to choose which of the encoders on the unit will be used to control the selected input, output or mix-point. Only the encoders that are available for the selected page will be shown in the Encoder Position dropdown list. On the AVN-CU2-DANTE the user can select from up to six encoders. On the AVN-CU4-DANTE the user can select from up to twelve encoders.

### **Function**

The 'Function' setting allows the user to decide how they would like encoder to function. "Metering only" and "Level" are always available. On stereo outputs or mix points that are routing audio to a stereo output, "Pan" and "Level and Pan" options are also available

### **Metering Only**

The section of the TFT display assigned to the encoder being configured displays metering data for the group the encoder is configured for. However, turning the encoder doesn't modify the audio.

### **Level**

The section of the TFT display assigned to the encoder being configured displays data about the group the encoder is configured for, turning the encoder clockwise increases the level of the audio in that group and turning the encoder anti-clockwise decreases the level of the audio in that group. A double click of the encoder will mute the assigned input. Double clicking the encoder for a muted input again will return the level to the previous value.

### **Pan**

**Only available on stereo output groups or on mix-points that are routing audio to a stereo output group.**

When pan is selected the 'Pan Mode' option is also displayed. The pan function allows the groups audio to be adjusted so more audio is on the left or right. Turning the assigned encoder anti-clockwise will increase the level of audio on the left channel and reduce the level of audio on the right channel. Turning the assigned encoder clockwise will increase the level of audio on the right channel and reduce the level of audio on the left channel. The 'Pan Mode' option provides further customisability of this function.

### **Level and Pan**

**Only available on stereo output groups or on mix-points that are routing audio to a stereo output group.**

When level and pan is selected the 'Pan Mode' option is displayed and the second encoder tab is hidden.

When the level and pan function is set, pressing the assigned encoder downwards causes the encoder to switch between level and pan adjustment modes. See the 'Pan' function section and 'Level' function section for more details about those two modes.

### **Pan Mode**

The pan mode option becomes available when either the 'Pan' or 'Level and Pan' function is selected. This option allows the user to select between the two following modes:

### **Switched**

When switched mode is selected the encoder switches between centre, fully left, and fully right panning modes. If the pan was previously set to 'Variable' mode then the pan is set to the nearest position between the three.

### **Variable**

When variable mode is selected the encoder adjusts the pan value gradually between the values -12 (fully left) and 12 (fully right) allowing for more precise panning control.

**Colour**

The 'Colour' setting allows the user to set the colour of the LED bar next to the encoder and the box around the encoders section of the TFT display. The following options are available:

- White
- Red
- Green
- Blue
- Yellow
- Cyan
- Magenta

To the right of the dropdown list is also a box which displays the colour selected.

**Lock**

Selecting the 'Lock' checkbox causes the encoder to be locked and so turning or pressing the encoder no longer has an effect. This can be used to setup an encoder and prevent the presenter from changing it, for example the level of an output. If a locked encoder is turned or pressed, "ENC LOCKED" will flash on the screen to indicate that the encoder is currently locked.

**Routing Grid**

The routing grid uses coloured routing squares to show the status of a routing within the grid.



Fig 6-48: Normal un-routed square.

Normal un-routed squares will be displayed in white, this represents a I/O or channel that has not yet been routed but is allowed to be, hovering over this and clicking will cause I/O to be expanded if they are not all ready expanded, or if the I/O is expanded so that channels are displayed the two associated channel that meet at the routing will be routed.

In order to make it easier for the user to know which channel or I/O they are hovered over. The following square is used.



Fig 6-49: Hovered square.

In conjunction with this a series of blue squares in line with that square appear, with the I/O label or channel label also being highlighted in blue.



Fig 6-50: Associated I/O or channel is highlighted.

A routed channel is displayed using the following square.



Fig 6-51: Routed channel square.

This means that audio is routed from the input channel in line with this square to the output channel in line with this square. If the routing grid is collapsed so that only I/O are displayed, if there is a routing on any of the channels belonging to that input a lighter green square is displayed.



Fig 6-52: Routed I/O square.

Clicking on a routed square will cause the 'Configure Connection' window to be displayed.

Routing can also be quickly removed without entering the 'Configure Connection' window for each routing. Instead the user can hold 'Ctrl' on the keyboard and hover over a routing, the follow square is displayed.



Fig 6-53: Delete routing square.

This shows that the routing can be deleted. In order to delete the routing, click on the routing whilst it is red.

On the commentator units there are some I/O that can't be routed. These un-routable I/O are represented by the following coloured squares.



Fig 6-54: Un-routable square.

Upon hovering over these un-routable squares, the cursor is changed to a 'not-allowed' type cursor.



Fig 6-55: Routing not allowed square and cursor.

On the commentator unit there are some fixed routings that cannot be edited, if the routing grid is collapsed so that only I/O are shown if an I/O has any channels within it that contain a fixed routing this is represented using the following coloured square.



Fig 6-56: Fixed routed I/O square.

If the I/O is instead expanded so that the channel within are displayed, fixed routings are instead represented using the following coloured squares.



Fig 6-57: Fixed routed channel square.

Hovering over the fixed routed channel square will display the 'not-allowed' type cursor. Clicking on one of these routings will do nothing.

### Configure Connection

When a mix-point routing is selected the 'Configure Connection' window is displayed this shows general information about the routing as well as any options that are available.

The 'Input' field displays the name of the input channel and the 'Output' field shows the name of the output channel that this routing connects together. At the bottom of the window are the 'Apply' and 'Cancel' buttons. Pressing 'Apply' will save any valid changes and close the window, the button is enabled once changes have been made. Pressing 'Cancel' will discard any changes and close the window.

Routings can be removed from the audio routing grid by clicking the 'Delete' button at the bottom of the window.

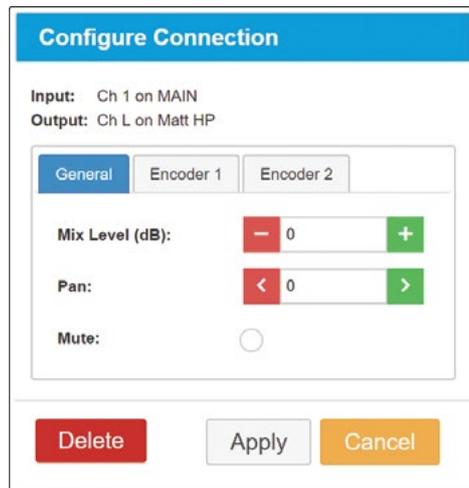
**General Tab**


Fig 6-58: The 'General' tab of the 'Configure Connection' window of a mix-point

**Mix Level**

The value in the level field can be modified using the + and – buttons or by typing in a value. The value in the field shows how many dB the signal is amplified by. The minimum value is -80 dB and the maximum value is +10 dB.

**Pan**

The value in the pan field can be modified using the + and – buttons or by typing in a value. The value in the field can be varied between a minimum of -12 which means audio is fully left and +12 which means that audio is fully right.

**Mute**

A routing can be muted by selecting the 'Mute' checkbox. If routing is muted, hovering over the routing will display 'Muted'.

**Encoder 1 Tab and Encoder 2 Tab**

These tabs contain the same options and settings as the encoder tabs for the individual inputs and outputs – see the description of the Encoder tabs under the Configuring Input and Output Groups section of this manual.

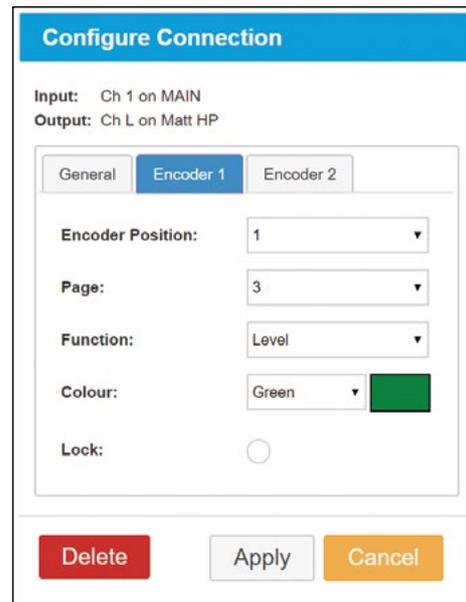


Fig 6-59: The 'Encoder 1' tab of the 'Configure Connection' window.

### Locking User Buttons and Encoders

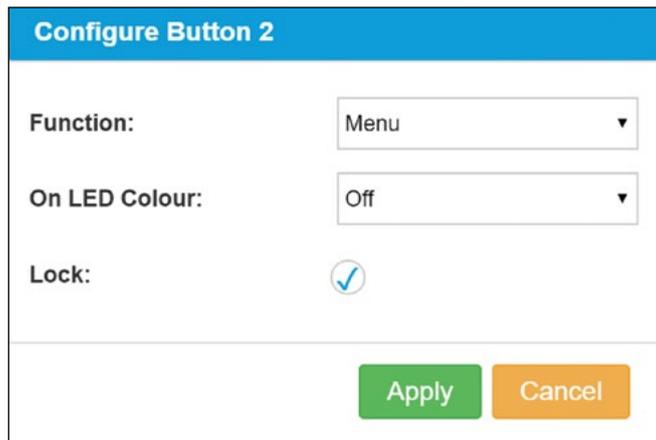
After the unit has been setup user buttons and encoders may be locked to prevent the commentator from using them.

User buttons can be locked in the **Front Panel** web page and encoders can be locked in the **Audio Routing** web page.

For example, the **Menu** button could be locked to prevent the commentator from changing the network settings or configuration loaded on the device.

To lock the menu button, navigate to the **Front Panel** web page.

**Right-click** on the button setup as **Menu** and select **Lock** then click **Apply**.



**Configure Button 2**

**Function:**

**On LED Colour:**

**Lock:**

**Apply** **Cancel**

Fig 6-60: Menu lock configured

Now when the menu button is pressed from the front panel of the device, in the main meter section of the of the display the LOCKED message will be displayed, and the menu will not be opened.



Fig 6-61: Locked message

An encoder may be locked to prevent the commentator from adjusting the level or the pan of audio it is assigned.

To lock an encoder, first navigate to the **Audio Routing** web page.

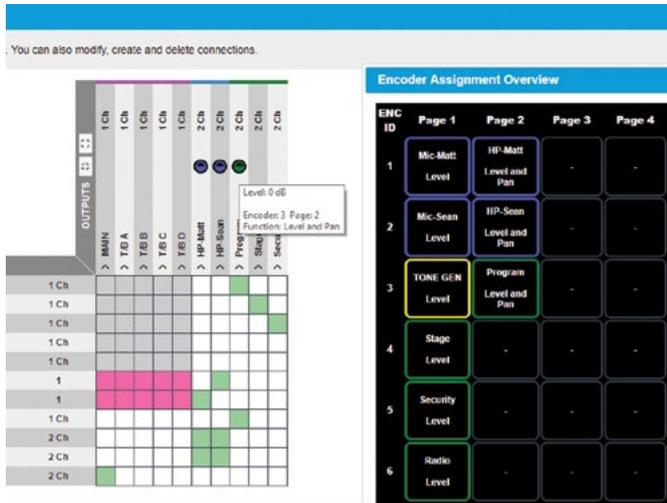


Fig 6-62: Encoder selection

Clicking on the encoder will open the encoder configuration tab. Select **Lock** and click **Apply**.

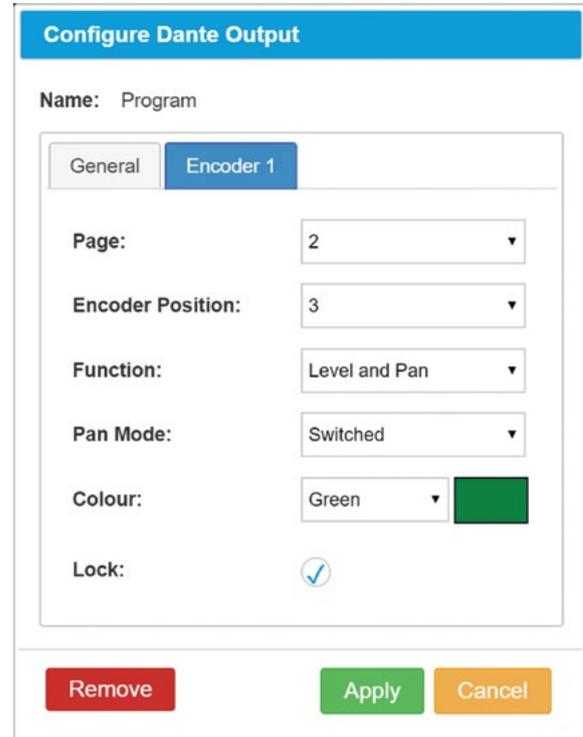


Fig 6-63: Encoder configuration

Now a lock icon will appear next to the encoder in the **Encoder Assignment Overview**.

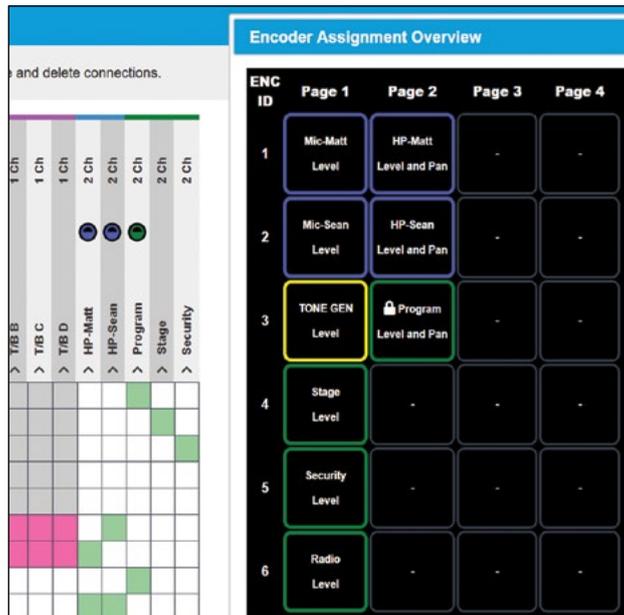


Fig 6-64: Locked icon in encoder assignment overview

Now when the encoder is turned or pressed, the **ENC LOCKED** message will be displayed in the encoder segment.



Fig 6-65: Locked encoder message

Pages can be locked to prevent the commentator from using any of the encoders on that page. To lock a page simply click the lock icon to the left of the page name, as seen in the image below.

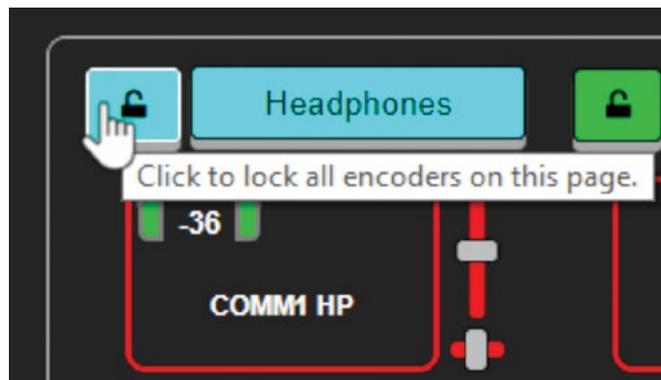


Fig 6-66: Lock page

The icon will then change to signify the page has been locked, the new icon is shown below.

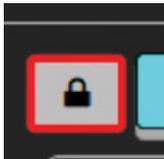


Fig 6-67: Locked page

When locked, lock icons also appear on the encoders in the encoder assignments overview window. When the commentator attempts to use a locked encoder, a warning will be displayed on the devices display.

A row of buttons can be locked by selecting the **Lock Button Row** checkbox. When locked pressing any button in the row will have no effect. A warning message will be displayed on the devices display.

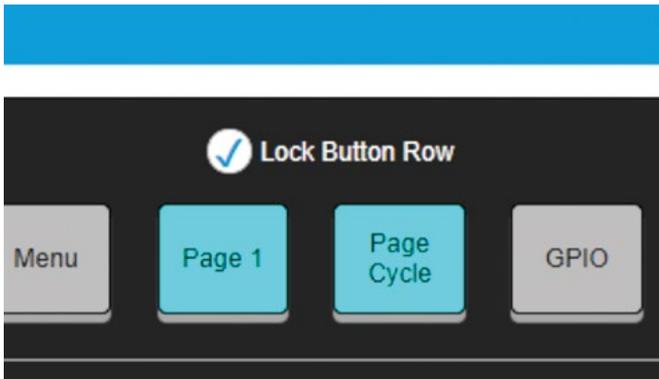


Fig 6-68: Lock button row

For example, if Encoder Page 1 is locked and the Encoder Assignments Overview is checked, all the encoders on page 1 will be locked.

Encoder Assignment Overview

ENC ID	Page 1	Page 2	Page 3	Page 4
1	🔒 Mic-Matt Level	HP-Matt Level and Pan	-	-
2	🔒 Mic-Sean Level	HP-Sean Level and Pan	-	-
3	🔒 TONE GEN Level	🔒 Program Level and Pan	-	-
4	🔒 Stage Level	-	-	-
5	🔒 Security Level	-	-	-
6	🔒 Radio Level	-	-	-

Fig 6-69: Encoder assignments group lock

## GPIO Settings

On the 'GPIO Settings' webpage an overview of connections between logical inputs and logical outputs can be seen, this web page allows the device to be configured to perform actions when a particular event or set of events occurs.

On the input side we have the following options;

- Physical GPI
- Virtual GPI
- Cough GPI
- Events
- User buttons

On the output side we have these options instead;

- Physical GPO
- Virtual GPO
- Events
- User LEDs
- Relays

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

*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 1' 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 first commentator is on-air their corresponding on-air LED sign will illuminate.*

Below is an image showing an example GPIO settings setup.

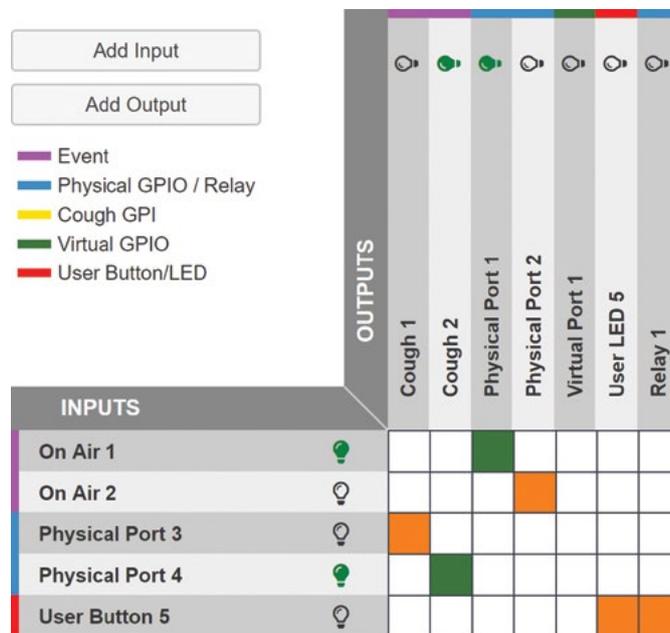


Fig 6-70: The 'GPIO Routing Grid' of the 'GPIO Settings' webpage.

On the left-hand side of the routing grid the inputs are shown, these can be; events, physical GPI, virtual GPI, cough GPI, or user buttons. Above the routing grid the outputs are shown, these can be; events, physical GPO, virtual GPO, user LEDs, or relays.

When first started the device will have no inputs or outputs setup, to add an input or an output to the grid click on the 'Add Input' and 'Add Output' buttons. After adding inputs and outputs to the GPIO grid they can then be routed to each other. Routings in green are active routings and routings in orange are inactive routings.

In the image above Fig: 6-70 we can see that commentator position 1 is on-air as the lightbulb is green, this then means that the routing between on-air 1 and physical port 1 becomes active shown by the green box, finally we see the lightbulb on the physical port 1 section is green which shows that this physical port is active.

### Add Input

Clicking on the button 'Add Input' brings up a window with the title 'Add Input' the window has one tab 'General'. The selected tab is represented with a blue background, when the window is opened the 'General' tab is selected by default. At the bottom of this window are the 'Add' and 'Cancel' buttons. Pressing 'Add' will add the input to the GPIO grid. Pressing 'Cancel' at any time will close the window without making any changes.

### General Tab

Fig 6-71: The 'General' tab of the 'Add Input' window.

### 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 options 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 options are also displayed:

- Available Ports
- vGPIO Source

### Cough

Allows a cough input to be created this cough port can be activated by connecting an AVN-HA1 or AVN-HD1 to the stereo analogue/digital output on the AVN-CU2 or stereo digital output on the AVN-CU4, this can then be used as a trigger for an output.

When selected the following options are also displayed:

- Available Ports

### 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 options are also displayed:

- Available Events

**User Button**

Allows a user button on the front panel of the device to be setup to trigger an output, note that the user button will only work as an input if it is set up as a 'GPIO' within the 'Button Assignments' sections of the 'Front Panel' web page.

When selected the following options are also displayed:

- Available Buttons

**Available Ports**

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

There are ten physical ports available, ten virtual ports available, and one cough port available.

**Input Mode (Physical GPI Only)**

The input mode can be set to either 'Momentary' or 'Latching'.

**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.

**AC Power Off (AVN-CU4 Only)**

Active when the status of the AC port is in fault condition (red AC status LED).

**DC Power Off**

Active when the status of the DC port is in fault condition (red DC status LED).

**PoE1 Power Off**

Active when the status of the primary PoE port is in fault condition (red PoE Pri status LED).

**PoE2 Power Off**

Active when the status of the secondary PoE port is in fault condition (red PoE Sec status LED).

**PTP Sync Lost**

Active when the connection to the PTP master is lost.

**On Air n**

Active when commentator position 'n' is on air.

**Cough n**

Active when commentator position 'n' is in cough mode.

**T/B n l**

Active when commentator position 'n' is routed to talkback bus 'l'.

### Available Buttons

The 'Available Buttons' drop-down menu allows the user to select which of the available user buttons to setup, this provides 12 user buttons on the AVN-CU2 variant and 24 user buttons on the AVN-CU4 variant.

### Add Output

Clicking on the button 'Add Output' brings up a window with the title 'Add Output' the window has one tab 'General'. The selected tab is represented with a blue background, when the window is opened the 'General' tab is selected by default. At the bottom of this window are the 'Add' and 'Cancel' buttons. Pressing 'Add' will add the output to the GPIO grid. Pressing 'Cancel' at any time will close the window without making any changes.

### General Tab

Fig 6-72: The 'General' tab of the 'Add Output' window.

### Type

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

#### Physical GPIO

Allows a general-purpose output on the rear panel of the device to be enabled when any of the inputs routed to this output are active.

When selected the following options are also displayed:

- Available Ports

#### Virtual GPIO

Creates a virtual general-purpose output on the network, this virtual general-purpose output becomes active when any of the inputs routed to this output are active.

When selected the following options are also displayed:

- Available Ports

#### Event

Allows an event to be activated when any of the inputs routed to this output are active.

When selected the following options are also displayed:

- Available Events

#### User LED

Allows the user LED to be toggled between its on colour and its off colour, the on colour is displayed when any of the inputs routed to this output are active, note that the user LED will only work as an output if it is set up as a 'GPIO' within the 'Button Assignments' sections of the 'Front Panel' web page.

When selected the following options are also displayed:

- Available Buttons

#### **Relay**

Allows the relay available on the 'GPIO' connector, to be toggled on and off when any of the inputs routed to this output are activated.

When selected the following options are also displayed:

- Available Relays

#### **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.

#### **Available Events**

This drop-down menu allows the event to be triggered when any input routed to this output is active, the list of options are as follows.

#### **On Air n**

Activate commentator position 'n' on air control.

#### **Cough n**

Activate commentator position 'n' cough mode control.

#### **T/B n l**

Activate commentator position 'n' routing to talkback bus 'l'.

#### **Available LEDs**

The 'Available LEDs' drop-down menu allows the user to select which of the available user LEDs to setup, this provides 12 user LEDs on the AVN-CU2 variant and 24 user LEDs on the AVN-CU4 variant.

#### **Available Relays**

The 'Available Relays' drop-down menu 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 both the AVN-CU2 and AVN-CU4.

#### **Routing Grid**

The routing grid uses coloured routing squares to show the status of a routing within the grid.

#### **Creating Routings**

Normal un-routed squares will be displayed in white, this represents a potential connection between an input and output that has not yet been routed but is allowed to be, when one of these squares is hovered over the square changes to the following grey colour. In conjunction with this a series of blue squares in line with that square appear, with the input and output labels also being highlighted in blue.



Fig 6-73: Normal un-routed square.



Fig 6-74: Hovered square.

This gives the final overall layout,

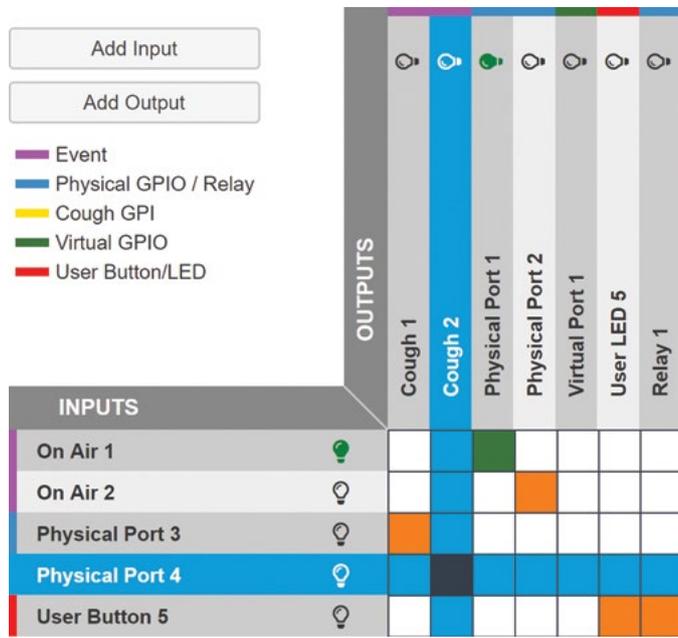


Fig 6-75: Potential routing

Clicking on the square then causes a routing to be made between that input and output. In the example above clicking would connect physical port 4 to the cough event for commentator 2.

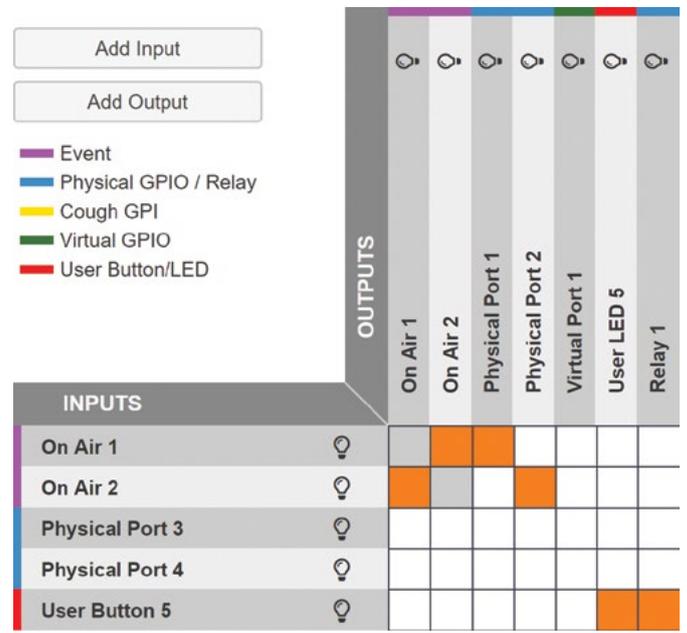


Fig 6-76: Event To Event Routing

An event can be routed to another event as long as it is not the same event, in the example picture above each on-air event is routed to the other, this means that activating one on-air will activate the other, notice that an event can't be routed to itself however, for example on-air 1 can't be routed to on-air 1, this is shown using a grey coloured square.

A routed inactive connection is displayed using an orange square, where as an active connection is displayed using a dark green square.



Fig 6-77: Routed inactive connection square.



Fig 6-78: Routed active connection square.

When a connection is active the output connected will become active.

### Lightbulbs

Alongside inputs and outputs on the grid are light-bulb symbols, these are normally a dark grey colour but become green when the input or output is activated.



Fig 6-79: Inactive Lightbulb



Fig 6-80: Active Lightbulb

### Quick Delete

Routing can also be quickly removed without entering the 'Configure Connection' window for each routing. Instead the user can hold 'Ctrl' on the keyboard and hover over a routing, a red square is displayed.



Fig 6-81: Delete routing square.

This shows that the routing can be deleted. In order to delete the routing, click on the routing whilst it is red.

### Un-routable Squares

There are some inputs that can't be routed to certain outputs, for example an input event can't be routed to the same output event. In this case a grey square is shown and clicking on the square does nothing. Upon hovering over these un-routable squares, the cursor is changed to a 'not-allowed' type cursor.



Fig 6-82: Un-routable square.



Fig 6-83: Routing not allowed square and cursor.

## Configure Connection

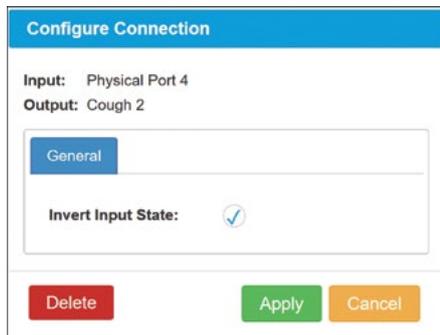


Fig 6-84: Configure connection window/Invert input state

The configure connection window is displayed when a routing is clicked, by default this opens up on the 'General' tab which is highlighted in blue. At the top of the window the input and output being configured is displayed at the bottom of the window the 'Delete', 'Apply', and 'Cancel' buttons are displayed, pressing the 'Delete' button will remove the routing, pressing the 'Apply' button will apply any changes, and pressing the 'Cancel' button will close the window without applying any changes.

### Invert Input State

This option inverts the input state, this means that if the input is inactive the output routing will be active and if the input is active the routing will become inactive. For example, if the connection between physical port 4 and the event cough 2 is inverted, cough 2 will be activated whenever physical port 4 is not active.

## SNMP Settings

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

The SNMP master can also get and set certain parameters of the unit.

The SNMP setting web page consists of two sections these are the 'Download Sonifex MIB Files' section and the 'SNMP Settings' section. At the bottom of the web page is the 'Submit' button this is used to save any changes made to the configuration, this is disabled (grey button) by default and then becomes enabled (green button) when changes are made to the configuration.

### Download Sonifex MIB Files



Fig 6-85: Download Sonifex MIB files.

The section contains a single button 'Download'. Pressing the download button causes two files to be downloaded 'SONIFEX-GPIO-MIB' and 'SONIFEX-MIB' these are used by the SNMP master to decode messages received over SNMP.

## SNMP Settings

The screenshot shows a web form titled "SNMP Settings". It contains four labeled input fields:

- System Location:** Studio 1
- System Contact:** Alex
- Community:** AoIP
- Trap Destination:** 10.0.2.8

Fig 6-86: SNMP Settings

This section is used to setup the SNMP configuration.

### 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 again this may be set to any value which is between 0 and 100 character is 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 long.

### 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 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 need to extract the 'SWU' file from the archive, this can be done in Windows by right-clicking the archive and selecting extract all.



Fig 6-87: Update Firmware Section of System Webpage.

Clicking update will then bring up a window explaining the firmware update procedure, clicking the continue button will cause the unit to reboot into maintenance mode and allow the new firmware to be uploaded to the unit.

### 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.



Fig 6-88: Save Configuration Section of System Webpage.

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.

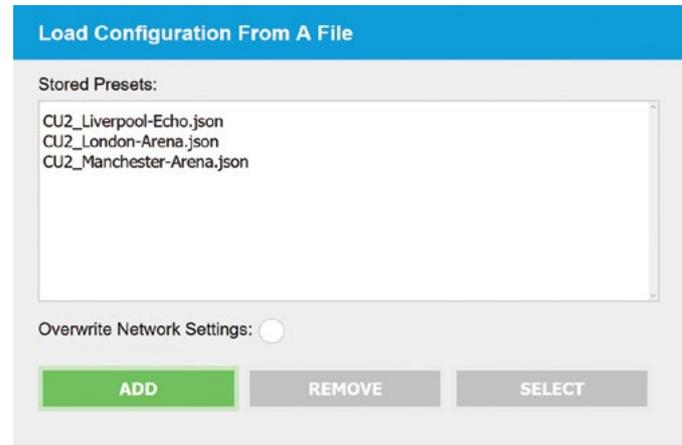


Fig 6-89: Configuration pre-sets

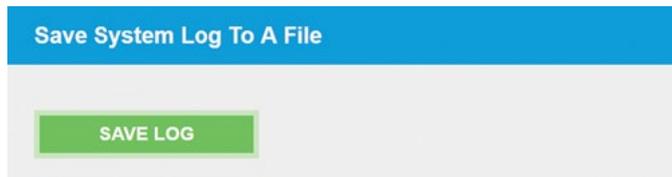
A maximum of 8 pre-sets can be added to the unit, a pre-set is added by clicking the Add button and selecting a local configuration file. A pre-set can be removed by selecting it in the menu and clicking the Remove button. A pre-set is loaded on the unit by selecting the pre-set in the menu and pressing 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.

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 Save log.



*Fig 6-90: Save System Log Section of System Webpage*

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, a quick reboot can often fix any 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.



*Fig 6-91: Reboot or Factory Reset Section of System Webpage*

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.

## 7. System Menu

The system menu can be opened by pressing a push button assigned with the 'Menu' function. If there are no push buttons assigned to the 'Menu' function then the menu can still be accessed if buttons 1, 6 7 and 12 (the 4 corner buttons) are pressed while the unit is booting and the loading screen is shown on the TFT display. When the buttons are pressed "Displaying Menu" is shown on the display. When the unit has then been initialised, it will load into the system menu.

To navigate the system menu, an encoder is pressed in order to select the corresponding item from that menu. The LED bar located next to each encoder is illuminated in the same colour as the corresponding menu item. In the brightness menu all LED bars are illuminated regardless of the menu items.

When an item is selected from the system menu the background colour is gradually erased once fully erased an operation is performed, this allows the commentator time to acknowledge that they have pressed an encoder.

When the system menu opens the following items are displayed;

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

You can exit this menu by clicking the 'Menu' push button again or by selecting the 'Close' menu item.

The output section of the TFT display shows the name of the current sub-menu whilst in the system menu, except in the main menu when no name is shown.

## Network

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

- Control
- Primary
- Secondary
- Back
- Close

### Control

In this sub-menu, the user can configure the connection to the devices embedded web server. When the control sub-menu opens the following items are displayed;

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

### Mode

The currently selected mode is represented by a tick, the mode can be set to one of two options;

### 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 in the other sections will be assigned to the port.

**IP Address**

The four octets of the IP address are split onto four of the encoder display sections.

Pressing an encoder assigned to an octet will cause each digit to be highlighted in turn whilst a digit is highlighted the encoder can be rotated in order to increase or decrease the value. After all digits have been cycled an individual digit is no longer highlighted and so changes can be saved. Only one octet can be modified at a time and trying to save the new IP address without completing changes will bring up a warning message telling you to do so. If changes have been made that you no longer wish to keep the 'Cancel' menu item can be selected.

Selecting 'Save' will cause the new IP address to be saved and the unit to restart.

**Netmask**

The netmask sub-menu allows the subnet mask of the port to be configured, this menu works in the same way the 'IP Address' menu.

**Gateway**

The gateway sub-menu allows the address of the router being used to access the port to be configured, this menu works in the same way the 'IP Address' menu.

**Primary**

The primary port is used for Dante connections, this provides the same options as the 'Control' port, after changes are made the unit will restart.

**Secondary**

The secondary port is used to provide redundancy to Dante connections if the port is in redundant mode, this provides the same options as the 'Control' port, however after changes are made the unit will restart.

*If the port is in switched mode these settings can still be changed, they will be stored in the configuration file and loaded when the port is switched back to redundant mode via the Dante controller application.*

**Brightness**

The brightness sub-menu is used to set the brightness of the TFT display, push button LEDs, status LEDs, and encoder LED bars.

Whilst in the brightness sub-menu all the encoder LED bars are on, this allows the level of each of the colours to be seen.

Pressing the first encoder causes the percentage to be highlighted, the brightness can then be adjusted by rotating the encoder. The brightness is adjusted in 10% steps. The brightness is adjusted as this value is increased or decreased, after the optimum level has been reached the encoder is then pressed again before pressing save. If the save button is pressed before the changes have been complete then a warning message will be displayed asking you to do so.

If the brightness has been adjusted but you don't want to save the settings the 'Cancel' menu item can be selected to discard any changes.

**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
- Friendly Name
- Control IP Address
- Control Netmask

- Control MAC Address
- Primary IP Address
- Primary Netmask
- Primary MAC Address
- Secondary IP Address
- Secondary Netmask
- Secondary MAC Address
- System Uptime

## Config

The configuration sub-menu provides a list of currently available pre-set configurations uploaded to the device, the name of each is scrolled. When more configurations are available than can fit in the menu item sections each of the encoders can then be rotated in order to move up and down the list.

Press down on an encoder in order to select the configuration which corresponds to that encoder. The selected pre-set configuration is then marked with a tick. Selecting save in this sub-menu and then closing the menu will cause the unit to reboot and the selected configuration to be loaded to the unit. To cancel changes made the cancel button is instead pressed in the sub-menu before leaving the menu.

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

## Audio

The audio sub-menu allows the adjustment of various audio settings for each commentator position. First the commentator position is selected, positions 1 to 2 can be selected on the AVN-CU2 and positions 1 to 4 can be selected on the AVN-CU4.

After the commentator position is selected, the 'Input' option can be selected to modify the commentator's input configuration, or the

'Headphone' option can be selected to modify the commentator's headphone configuration.

### Input

Within this sub-menu is the 'Signal' option, 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

When in line mode the following options are available:

- Line up
- HPF

### 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

In the line-up menu, 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

In the HPF (High Pass Filter) sub-menu are two items, the first 'HPF State' allows enabling and disabling of the high pass filter, the second item

'Frequency' allows the cut-off frequency for the high pass filter to be adjusted, the cut-off frequency can be from 40 Hz to 3 kHz.

### **Headphone**

Within this sub-menu are two options 'Attenuate' and 'Set Limit'.

#### **Attenuate**

The 'Attenuate' option allows the headphone attenuation (measured in dB) to be adjusted, this can be set to a value from 0 dB up to 24 dB.

#### **Set Limit**

The 'Set Limit' option allows a limiter 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.

## 8. Ember+

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

This can be downloaded from:

<https://github.com/Lawo/ember-plus/releases/tag/v1.8.0-rc.1>

When you first open the Ember+ viewer the following window is displayed.

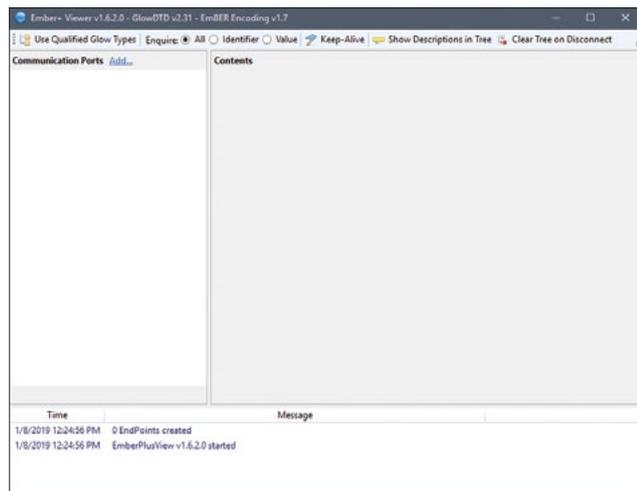


Fig 8-1: Empty Ember+ Window

Clicking on the 'Add...' text next to 'Communication Ports' then opens a window.



Fig 8-2: Add New Device Window

Type in the IP address of the devices control port and leave the port number as 9000 then click 'OK'.

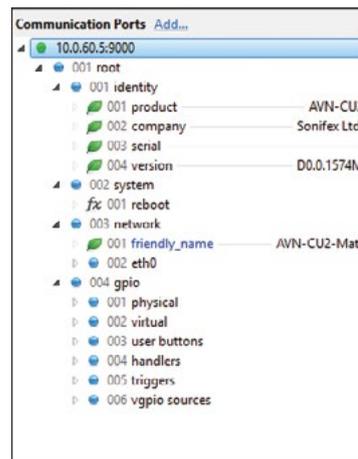


Fig 8-3: Device Tree

Now under 'Communication Ports' you can see the device tree.

Currently there are four main sections.

- Identity
- System
- Network
- GPIO

The identity section 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.

The system section currently holds a reboot function. Selecting the reboot function and clicking the 'Invoke' button will cause the unit to be rebooted.

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

- Friendly name - The name given to the device by the user, this can be edited by selecting it from this menu. And clicking 'Change...'.
  - Eth0 – The devices control port.
    - Mode - Allows the user to select between 'Static' and 'Dynamic' addressing modes.
    - IP Address - Allows the user to enter an IP address for the device which is used when the device is in the 'Static' addressing mode.
    - Netmask - Allows the user to enter a subnet mask for the device which is used when the device is in the 'Static' addressing mode.
    - Gateway - Allows the user to enter a gateway address for the device which is used when the device is in the 'Static' addressing mode.
    - MAC Address - This specifies the MAC address of the port.

## 9. Remote Control

Remote control of the unit is available using various methods, these are:

- Using the embedded web server
- Using physical and virtual GPIO
- Using Ember+

### 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 microphones are on-air, whether talkback is enabled, the level of inputs, mix-points, and outputs (and muting), and the pan of outputs or mix-points.

#### Front Panel Control

All the functionality available from the front panel is also available through the web server via the front panel web page, this allows the user to control the volume and pan of each encoder as well as activating any of the function buttons, further options are available to lock buttons and encoders to prevent their physical use, for more information on front panel control view the Remote Control section on page 50.

#### On-Air Control

Navigate to the Audio Routing web page. Click on the commentator input you would like to put on-air.

The screenshot shows the Remote Control interface for audio routing. At the top, there are control buttons: 'Add Input Group', 'Add Output Group', 'Hide Enc Assignments', 'Collapse', and 'Expand'. Below these is a legend for channel types: Virtual Channels (purple), Physical Analogue Channels (blue), Physical Digital Channels (red), Tone Generator Channels (yellow), and Dante Channels (green). The main interface is a routing matrix with 'INPUTS' on the left and 'OUTPUTS' on the top. The 'Mic-Matt' input is selected, indicated by a blue circle and a pink highlight in the matrix cells for MAIN, T/B A, T/B B, and T/B C. The 'Mic-Sean' input is also visible with a blue circle. The 'TONE GEN' input is highlighted in yellow. The 'Stage' and 'Security' outputs are highlighted in green. The 'Radio' output is highlighted in blue.

INPUTS	MAIN	T/B A	T/B B	T/B C	T/B D	HP-Matt	HP-Sean	Program	Stage	Security
> MAIN	1 Ch									
> T/B A	1 Ch									
> T/B B	1 Ch									
> T/B C	1 Ch									
> T/B D	1 Ch									
> Mic-Matt	1 Ch									
> Mic-Sean	1 Ch									
> TONE GEN	1 Ch									
> Stage	2 Ch									
> Security	2 Ch									
> Radio	2 Ch									

Fig 9-1: Select commentator input

In the General tab select On-Air, click Apply.

**Mute:**

**On Air:**

**Active Talkbacks:**  A  B  C  D

**Lazy Gang:**

**Talkback On Air:**

Fig 9-2: Select On-Air

If the on-air icon is green the commentator is on-air.

- Virtual Channels
- Physical Analogue Channels
- Physical Digital Channels
- Tone Generator Channels
- Dante Channels

INPUTS	OUTPUTS									
	MAIN	T/B A	T/B B	T/B C	T/B D	HP-Matt	HP-Sean	Program	Stage	Security
MAIN	1 Ch									
T/B A	1 Ch									
T/B B	1 Ch									
T/B C	1 Ch									
T/B D	1 Ch									
Mic-Matt	1 Ch					<span style="color: blue;">●</span>	<span style="color: blue;">●</span>			
Mic-Sean	1 Ch					<span style="color: blue;">●</span>	<span style="color: blue;">●</span>			
TONE GEN	1 Ch							<span style="color: yellow;">●</span>		
Stage	2 Ch								<span style="color: green;">●</span>	
Security	2 Ch									<span style="color: green;">●</span>
Radio	2 Ch									<span style="color: green;">●</span>

Fig 9-3: On-Air icon

### Talkback Control

Navigate to the Audio Routing web page. Click on the commentator input you would like to activate talkback for.

In the General tab select the Active Talkbacks, click Apply.

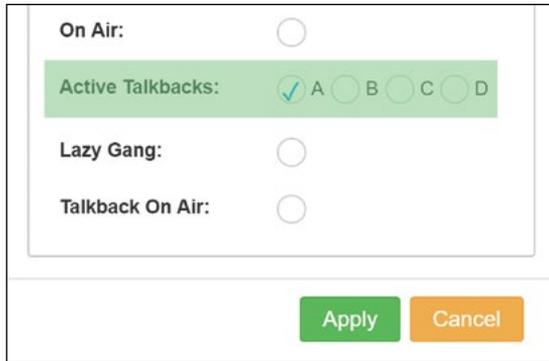


Fig 9-4: Select active talkbacks

If a talkback icon is green then talkback is active.

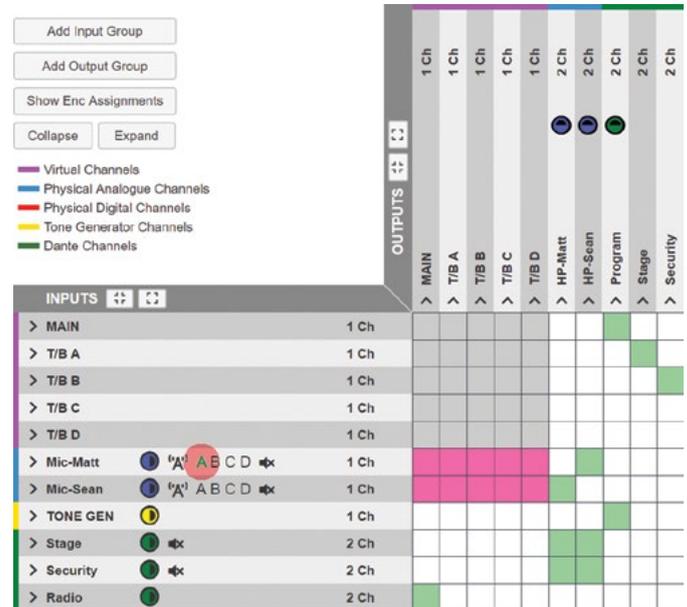


Fig 9-5: Talkback icon

### Level Control

Navigate to the Audio Routing web page. Click on the input, mix-point, or output you would like to level adjust.

In the General tab locate the Level (dB) field and increase or decrease the level as necessary. Press Apply.

### Mute Control

Navigate to the **Audio Routing** web page. Click on the input, mix-point, or output you would like to mute/unmute.

In the **General** tab locate the **Mute** checkbox and select/deselect it as necessary. Press **Apply**.

A mute icon will be displayed on inputs and outputs that are muted. If the mouse is hovered over a mix-point, a tool tip will be displayed which will say if the mix-point is muted or not.

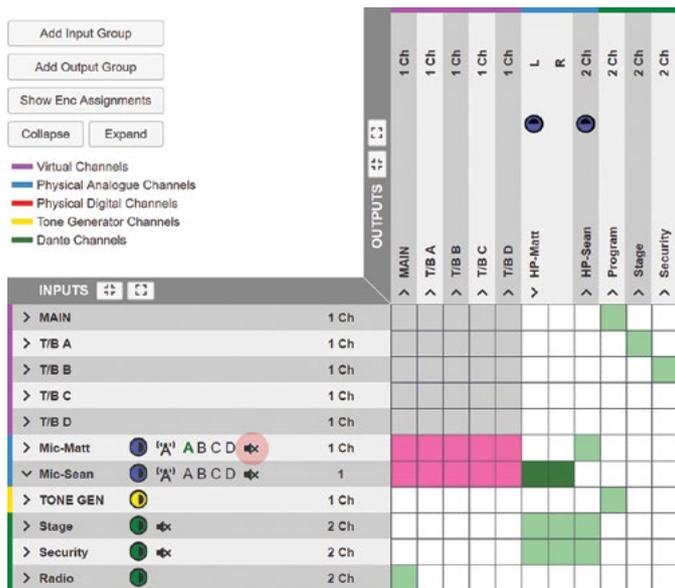


Fig 9-6: Mute icon

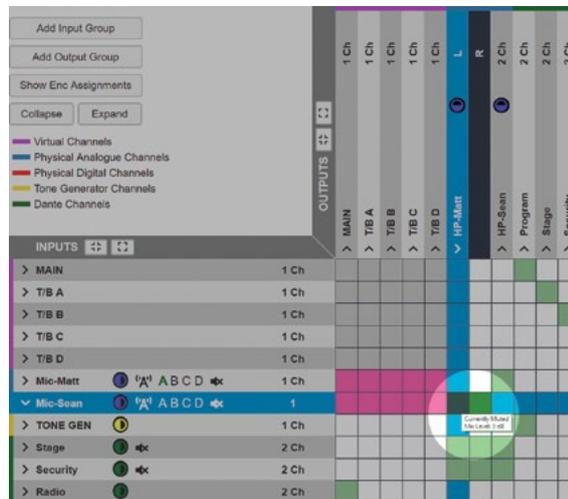


Fig 9-7: Muted mix-point

### Pan Control

Navigate to the **Audio Routing** web page. Click on the mix-point, or output you would like to pan.

In the **General** tab locate the **Pan** field and increase or decrease the pan as necessary. Press **Apply**.

**Note** that the value in pan will jump between the values -12, 0, and +12 if a pan encoder is setup on that mix-point/output and it is set to switched mode. For finer control of the pan value, set the encoder to variable mode.

## GPI Control

Physical and virtual GPI can be used to control certain functionality of the device remotely. A virtual GPI is controlled using a virtual GPO from another device to drive it. A physical GPI can be made active by connecting it to ground.

As covered in the **GPIO** Settings section on page 74 outputs include:

- Physical GPO
- Virtual GPO
- Events
- User LEDs
- Relays

Physical GPO can be found on the GPIO connector and are active low, this means they are connected to ground when active.

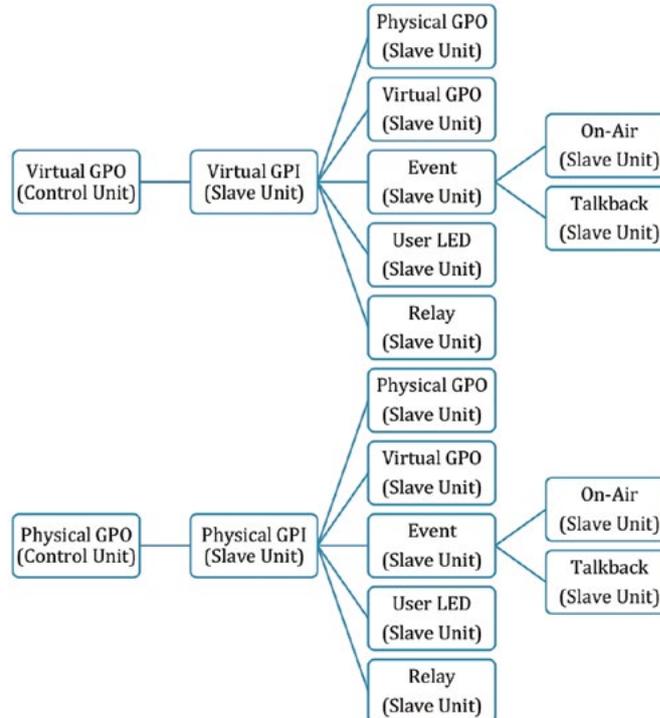
Virtual GPO can be used to drive virtual GPI on other devices.

Events include:

- On Air for each commentator
- T/B for each commentator to each bus A/B/C/D

User LEDs are available when a button has been setup as a GPIO within the front panel settings.

A relay can also be turned on and off.



In the following example a user button on an AVN-Portal is set up to remotely control the on-air state for the first commentator on an AVN-CU2.

On the AVN-Portal, in the **GPIO Settings** web page the user button is added as an input (GPI) and a virtual port is added as an output (GPO) and the two are connected. The user button state now sets the state of the virtual GPO.

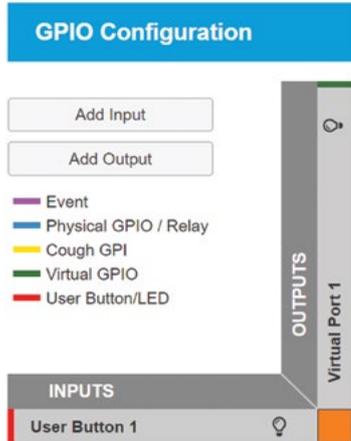


Fig 9-8: GPIO configuration of control device (AVN-Portal)

On the AVN-CU2-DANTE in the **GPIO Settings** web page, a virtual GPI is added. The vGPIO Source is set to be the virtual GPO that we just set up on the AVN-Portal. The state of this input on the AVN-CU2-DANTE will now mirror the state on the output of the AVN-Portal allowing this input to be controlled remotely from the AVN-Portal.

Fig 9-9: Add virtual GPI

The **On Air 1** event is then added as an output.

Fig 9-10: Add output event

These inputs and outputs are then connected.

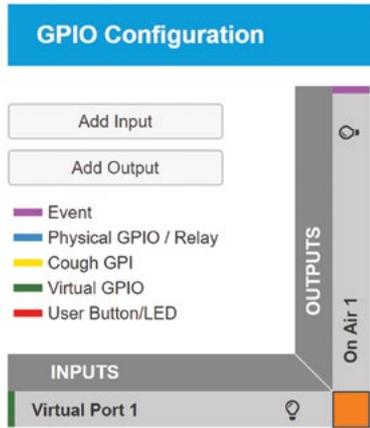


Fig 9-11: GPIO configuration of slave device (AVN-CU2-DANTE)

Now when the user button is pressed on the front panel of the AVN-Portal the commentator is put on-air on the AVN-CU2-DANTE.

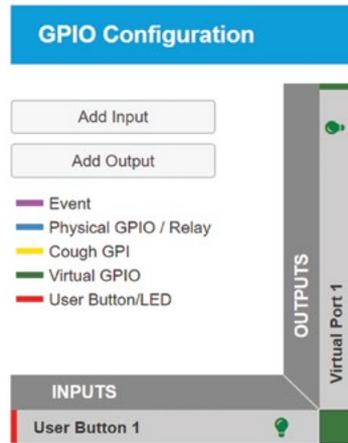


Fig 9-12: Active user button on the AVN-Portal

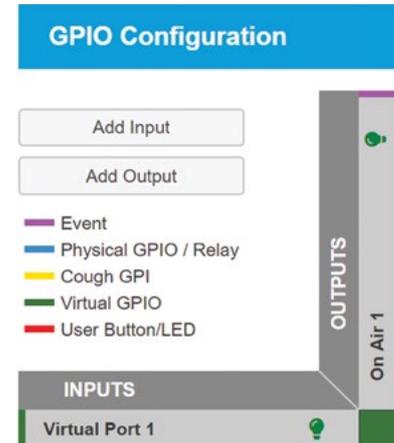


Fig 9-13: Active on-air on the AVN-CU2-DANTE

## Ember+ Control

The Ember+ Viewer can also be used to configure and control some settings for more information view the **Ember+** section on page 88.

## 10. Technical Specifications for AVN-CU2-DANTE & AVN-CU4-DANTE

### AVN-CU2-DANTE

#### Network and AoIP

AoIP Standard:	Dante
Number of Channels:	16 receive, 16 transmit
Number of Streams:	16 receive, 16 transmit
Sample Rate:	48 kHz
Format:	Linear PCM, 16 or 24 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):	2.5k $\Omega$ electronically balanced
Input Impedance (Line Mode):	>10k $\Omega$ 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):	<-98dBFS, -30dBFS, 20Hz – 20kHz, 20kHz BW
Equivalent Input Noise (Mic Mode):	125dB Ref. 76dB preamp gain, $R_s = 200\Omega$

Noise (Line Mode): <-100dBFS, 20kHz BW,  $R_s = 200\Omega$

C.M.R.R. >60dB @ 1kHz

Phantom Power (Mic Mode): +48V

High Pass Filter: 12dB/octave, user selectable frequency

#### Stereo Analogue/Digital Input

Input Impedance (Analogue Mode): >20k $\Omega$  electronically balanced

Input Impedance (Digital Mode): 110 $\Omega$

Supported Input Rates (Digital Mode): 32kHz, 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz and 192kHz

0dBFS Line-up (Analogue Mode): User selectable +15dBu / +18dBu / +20dBu / +22dBu / +24dBu = 0dBFS

Frequency Response (Analogue Mode): +0/-0.2dB 20Hz to 20kHz  
Ref 0dBu @ 1kHz

THD+N (Analogue Mode): <-107dBFS, -30dBFS, 20Hz – 20kHz, 20kHz BW

Noise (Analogue Mode): <-108dBFS, 20kHz BW,  $R_s = 200\Omega$

C.M.R.R. (Analogue Mode): >60dB @ 1kHz

#### Stereo Analogue/Digital Output

Output Impedance (Analogue Mode): <50 $\Omega$

Output Impedance (Digital Mode): 110 $\Omega$

Supported Output Rates (Digital Mode): 48kHz

0dBFS Line-up (Analogue Mode): User selectable 0dBFS = +15dBu / +18dBu / +20dBu / +22dBu / +24dBu

Frequency Response (Analogue Mode): +0/-0.5dB 20Hz to 20kHz  
Ref 0dBu @ 1kHz

THD+N (Analogue Mode):	<-107dBFS, -30dBFS, 20Hz – 20kHz, 20kHz BW
Noise (Analogue Mode):	<-107dBFS, 20kHz BW

**Headphone Outputs**

Drive Capability	Drives 150mW into 32Ω to 600Ω headphones
0dBFS Line-up:	Fixed 0dBFS = +18dBu
Frequency Response:	+0/-0.2dB 20Hz to 20kHz Ref 0dBu @ 1kHz

THD+N:	<-107dBFS, -30dBFS, 20Hz – 20kHz, 20kHz BW
Noise:	<-110dBFS, 20kHz BW

**Main Panel Operational Controls & Indicators**

Power LED	Sonifex logo illuminates when power is present
Pushbuttons:	12 x illuminated buttons that can be assigned to any of the following functions, and configured: On-Air / Talkback / Page # / Page Cycle / GPO / Cough / Menu / Brightness

Display:	480 x 107 pixel colour TFT display showing pan status, level, metering, control type, source/mix/destination names and main output metering
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Status LEDs:	Clock / AoIP status / PoE status and PSU status LEDs to monitor power and connectivity. Can be disabled if required
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Rotary Encoders:	6 x robust soft touch rotary encoders with adjacent configurable light bars for group/source/commentator grouping and identification
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**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**

Stereo Analogue/ Digital Input:	RJ45 socket (electronically balanced)
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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

**PoE Power**

Standard:	802.3at Type 1
Class:	0
PD Power Range:	0.44 W to 12.94 W
Typical PSE Power Usage:	13 W
Max PSE Power Usage:	15.4 W

**Equipment Type**

AVN-CU2-DANTE	Dante® Commentator Unit, 2 Commentators
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**Physical Specification**

Dimensions (Raw):	13.5cm (W) x 23cm (D) x 9.0cm (H - rear) 6.6cm (H - Front) 9.3cm (H - Maximum) 5.3" (W) x 9" (D) x 3.5" (H - front) x 2.6" (H - rear) 3.7" (H - Maximum)
Dimensions (Boxed):	30.5cm (W) x 21.5cm (D) x 16.3cm (H) 12" (W) x 8.5" (D) x 6.4" (H)
Weight:	Nett: 1.8kg Gross: 2.1kg Nett: 3.96lbs Gross: 4.62lbs

**Accessories**

AVN-DCX60	DC Power Supply for AVN Range, 4 pin XLR socket, 60W
AVN-TC3 (Case Only)	Transport Case, AVN-CU2-DANTE & Power Supply Cut-out
AVN-TC3 (Case Only) Dimensions(Raw):	46.5cm (W) x 36cm (D) x 17.6cm (H) 18.3" (W) x 14.2" (D) x 6.9" (H)
AVN-TC3 (Case Only) Dimensions (Boxed):	52cm (W) x 21.5cm (D) x 43cm (H) 20.5" (W) x 8.5" (D) x 16.9" (H)
AVN-TC3 (Case Only) Weight:	Net: 3.0kg Gross: 3.5kg Net:6.6lbs Gross: 7.7lbs

## AVN-CU4

<b>Network and AoIP</b>	
AoIP Standard:	Dante
Number of Channels:	16 receive, 16 transmit
Number of Streams:	16 receive, 16 transmit
Sample Rate:	48 kHz
Format:	Linear PCM, 16 or 24 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
<b>Mic/Line Inputs</b>	
Input Impedance (Mic Mode):	2.5k $\Omega$ electronically balanced
Input Impedance (Line Mode):	>10k $\Omega$ electronically balanced
Preamp Gain (Mic Mode):	User selectable 0dB to 60dB in 3dB steps
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 22kHz
Frequency Response (Line Mode):	Ref 0dBu @ 1kHz
THD+N (Mic Mode):	<-90dBFS, -64dBFS, 20Hz – 20kHz, 40dB gain, 20kHz BW
THD+N (Line Mode):	<-98dBFS, -30dBFS, 20Hz – 20kHz, 20kHz BW
Equivalent Input Noise (Mic Mode):	127dB Ref. 60dB preamp gain, $R_s = 200\Omega$
Noise (Line Mode):	<-110dBFS, 20kHz BW, $R_s = 200\Omega$
C.M.R.R.	>60dB

<b>Stereo Digital Input</b>	
Input Impedance:	110 $\Omega$
Supported Input rates:	32kHz, 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz and 192kHz

<b>Stereo Digital Output</b>	
Output Impedance:	110 $\Omega$
Supported output rates:	48kHz

<b>Analogue Line Inputs</b>	
Input Impedance:	>20k $\Omega$ electronically balanced
0dBFS Line-up:	User selectable +15dBu / +18dBu / +20dBu / +22dBu / +24dBu = 0dBFS
Frequency Response:	+0/-0.2dB 20Hz to 22kHz Ref 0dBu @ 1kHz
THD+N:	<-110dBFS, -30dBFS, 20Hz – 20kHz, 20kHz BW
Noise:	<-110dBFS, 20kHz BW, $R_s = 200\Omega$
C.M.R.R.:	>60dB

<b>Analogue Line Outputs</b>	
Output Impedance:	<50 $\Omega$
0dBFS Line-up:	User selectable 0dBFS = +15dBu / +18dBu / +20dBu / +22dBu / +24dBu
Frequency Response:	+0/-0.5dB 20Hz to 22kHz Ref 0dBu @ 1kHz
THD+N:	<-110dBFS, -30dBFS, 20Hz – 20kHz, 20kHz BW
Noise:	<-110dBFS, 20kHz BW

<b>Headphone Outputs</b>	
Drive Capability	Drives 150mW into 32 $\Omega$ to 600 $\Omega$ Headphones
0dBFS Line-up:	Fixed 0dBFS = +18dBu
Frequency Response:	+0/-0.2dB 20Hz to 22kHz Ref 0dBu @ 1kHz
THD+N:	<-108dBFS, -30dBFS, 20Hz – 20kHz, 20kHz BW
Noise:	<-110dBFS, 20kHz BW

**Main Panel Operational Controls & Indicators**

Power LED	Sonifex logo illuminates when power is present
Pushbuttons:	24 x illuminated buttons that can be assigned to any of the following functions, and configured: On-Air / Talkback / Page # / Page Cycle / GPO / Cough / Menu / Brightness
Display:	2 x 480 x 107 pixel colour TFT display showing pan status, level, metering, control type, source/mix/destination names and main output metering
Status LEDs:	Clock / AoIP status / PoE status and PSU status LEDs to monitor power and connectivity. Can be disabled if required
Rotary Encoders:	12 x robust soft touch rotary encoders with adjacent configurable light bars for group/source/commentator grouping and identification

**Front Panel Connections**

Headphone Outputs:	4 x Neutrik ¼" (6.35mm) locking jack sockets
Microphone/Line Inputs:	4 x Neutrik 3 pin latching XLR sockets

**Rear Panel Connections**

Stereo Digital Input:	RJ45 socket (electronically balanced)
Stereo Digital Output:	RJ45 socket (electronically balanced)
Analogue Line Inputs:	4 x Neutrik locking XLR sockets
Analogue Line Outputs:	6 x Neutrik locking XLR plugs
GPIO Port:	15-way 'D'-type socket
Network:	2 x 1Gbps Neutrik EtherCON receptacles, with PoE, Maximum 12W
DC Input:	2 x SFP slots for alternative interfaces Neutrik 4 pin XLR plug, 12VDC, Maximum 12W

Mains Input:	Filtered IEC, 85 – 264VAC, 47-63 Hz, 60W max
Fuse Rating:	Anti-surge fuse 2A 20 x 5mm

**PoE Power**

Standard:	802.3at Type 1
Class:	4
PD Power Range:	12.95 W to 25.50 W
Typical PSE Power Usage:	20W
Max PSE Power Usage:	30W

**Equipment Type**

AVN-CU4-DANTE	AVN Dante commentator unit, 4 commentators
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**Physical Specification**

Dimensions (Raw):	25.7cm (W) x 22.9cm (D) x 9.2cm (H - max), 6.5cm (H - front), 8.9cm (H - rear) 10.1" (W) x 9" (D) x 3.6" (H - max), 2.6" (H - front), 3.5" (H - rear)
Dimensions (Boxed):	37cm (W) x 35.5cm (D) x 19cm (H) 14.6" (W) x 14" (D) x 7.5" (H)

**Accessories**

AVN-DCX60	DC Power Supply for AVN Range, 4 pin XLR socket, 60W
AVN-TC1 (Case Only)	Transport Case, AVN-CU2-DANTE & Power Supply Cut-out
AVN-TC1 (Case Only)	46.5cm (W) x 36cm (D) x 17.6cm (H)
Dimensions(Raw):	18.3" (W) x 14.2" (D) x 6.9" (H)
AVN-TC1 (Case Only)	52cm (W) x 21.5cm (D) x 43cm (H)
Dimensions (Boxed):	20.5" (W) x 8.5" (D) x 16.9" (H)
AVN-TC1 (Case Only)	Net: 3.0kg Gross: 3.5kg
Weight:	Net:6.6lbs Gross: 7.7lbs

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