

USER MANUAL FOR AE-6703 AES67/AES3 32x32 CHANNEL BIDIRECTIONAL CONVERTER

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CONTACTS AND OFFICES



1 FUNCTIONAL OVERVIEW

The **GDC AE-6703** is a bidirectional converter capable of converting 32 channels of audio in each direction concurrently (total of 64 channel processing). It allows 32 channels of AES3 audio input to be transmitted as AES67 network audio while at the same time allowing another 32 channels of AES67 network audio input to be output as AES3 audio.

The AE-6703 AES67 Converter operates in the multicast mode based on the AES67 standard which is compatible with Dante®, so it can communicate with related devices. The AE-6703 can be configured according to the user's requirements via the supplied software application. The external interface of the device is AES3, which is used to connect AES3 input and output devices.

2 **DIMENSIONS**

Front View





Unit (mm)



3 PRODUCT SPECIFICATIONS

AES3 Input Voltage	2-7Vр-р
AES3 Impedance	110 Ohm balanced
Number of Audio Channels	32 x 32
AES67 Sample Rate	48K
Maximum Input/Output	0 dBFS
AES3 Input Sample Rate	44.1K, 48K, 88.2K, 96K
AES3 Output Sample Rate	48K
AES3 Output Voltage	3.3V p-p
AES3 Input Port	4 x RJ-45
AES3 Output Port	4 x RJ-45
AES67 In/Out Port	2 x RJ-45
Mains Plug	C14
Main Input Voltage	DC 12V, 1.0A, Max. 50 - 60Hz
Maximum Power Consumption	12W
Dimensions (WxHxD)	483 x 44 x 195 mm (1U)
Shipping Dimensions (WxHxD)	545 x 140 x 275 mm
Net Weight	3.2 KG
Shipping Weight	3.5 KG

Table 1

4 PACKING LIST

The AE-6703 AES67 Converter package consists of the components listed under Table 2.

Sr. No.	Part Description	Photo	Quantity
1	AE-6703 AES67 Converter unit	Statistic and	1 PCS.
2	Power Adapter*		1 PCS.
3	Power Cable		1 PCS.

Table 2

4.1 Power Adapter Specifications



Figure 2: AE-6703 Power Adapter

Adapter Input	AC 100V – 240V, 1.0A, Max. 50 – 60Hz
Adapter Output	DC 12V, 5.417A, Max 65W
	T 11 A

Table 3

5 AE-6703 FRONT AND REAR PANEL DESCRIPTION

5.1 Front Panel



$(1) \rightarrow$ 32-Channel Audio Signal Indicator

From left to right are the 1 to 32 channel audio signal indications, indicating whether the channel has audio signal input or output. By default, the factory setting is output indication. For more details on modifying the audio signal indicators, please refer to **Section 13.2**.

$(2) \rightarrow$ Operating Status Indicator (Power)

After the device self-test is normal, the light keeps flashing, indicating that the device is running normally.

$(3) \rightarrow$ Audio Data Reception Indicator (AES67)

After the receive route is configured, this indicator lights up, indicating that the received audio data from AES67 is normal.

$(4) \rightarrow$ Error Indicator (!)

When the device is operating normally, this indicator is not lit. It is lit whenever an error occurs.

(5) \rightarrow Input Status Indicator (IN)

This indicator is lit when the audio signal light is configured for AES3 input indication.

$(6) \rightarrow \text{Output Status Indicator (OUT)}$

This indicator is lit when the audio signal light is configured for AES3 output indication.

$(7) \rightarrow$ Debug Serial Port

It is only used for engineering debugging and not used during normal operation.

5.2 Back Panel



Figure 4: AE-6703 Back Panel Connectors

$\textcircled{1} \rightarrow \text{DC 12V}$ Power Interface (positive inside and negative outside)

For safety, use only the supplied power adapter.

(2) \rightarrow Network Interface AES67(A) and AES67(B)

When connecting a switch, users can only use one of the interfaces and cannot connect two interfaces to the same switch.

$(3) \rightarrow$ Four sets of AES3 Input Interfaces (Input)

The interface is in the form of RJ-45 and each interface corresponds to eight input channels. There is an indicator light on each side of the interface. The left light indicates whether the first four channels have input signals and the right light indicates whether the last four channels have input signals. As long as any one of them has a signal, the corresponding indicator light will light up.

(4) \rightarrow Four sets of AES3 Output Interfaces (Output)

The form and indicator light distribution of the output interface are the same as those of the input interface. When the indicator at the corresponding position is lit, it means that the corresponding four channels have output signals.

6 ETHERNET/ AES3 WIRE CONNECTION

- **Network Connection**: AES6703 uses a standard gigabit network interface. Please use a Gigabit Switch and a network cable to connect the equipment, please refer to **T568B** for the interface standard.
- AES3 Digital Connection: When AE-6703 is connected to AES3 input/output device, use a good quality shielded Category 6 network cable. The interface standard is T568B and the corresponding relationship between the four pairs and the channel is as follows:
 - Pair 1 corresponds to channel 1-2
 - Pair 2 corresponds to channel 3-4
 - Pair 3 corresponds to channel 5-6
 - Pair 4 corresponds to channel 7-8



NOTE: For details regarding the AES3 connections on the SR-1000 Extreme -24 IMB; please refer to the '<u>GDC</u> <u>SR-1000 Installation Manual'</u>.

7 SAFETY INSTRUCTIONS

Explanation of Graphical Symbols:



The triangle with the lightning bolt is used to alert the user to the risk of electric shock.



The triangle with the exclamation point is used to alert the user to important operating or maintenance instructions.



The CE-mark indicates compliance with low voltage and electromagnetic compatibility.



Symbol for earth/ground connection.



Symbol indicating that the equipment is for indoor use only.



Symbol for conformity with Directive 2002/96/EC and Directive 2003/108/EC of the European Parliament on waste electrical and electronic equipment (WEEE).



WARNING: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT ATTEMPT TO OPEN ANY PART OF THE UNIT. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



TO COMPLETELY DISCONNECT THIS APPARATUS FROM THE AC MAINS, DISCONNECT THE POWER SUPPLY CORD PLUG FROM THE AC RECEPTACLE.



THE MAINS PLUG OF THE POWER SUPPLY CORD MUST REMAIN READILY ACCESSIBLE.



DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE, DRIPPING OR SPLASHING LIQUIDS. OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHOULD NOT BE PLACED ON THIS APPARATUS.



WHEN THE UNIT IS INSTALLED IN RACK CABINET OR A SHEFL, MAKE SURE THAT IT HAS SUFFICIENT SPACE ON ALL SIDES TO ALLOW FOR PROPER VENTILATION (50 CM FROM THE FRONT AND REAR VENTILATION OPENINGS).



CONNECTIONS TO THE MAINS SHALL BE DONE ONLY BY AN ELECTROTECHNICALLY SKILLED PERSON ACCORDING TO THE NATIONAL REQUIREMENTS OF THE COUNTRIES WHERE THE UNIT IS SOLD.



1. Read these instructions carefully.

2. Do not use this equipment near water.

- 3. Clean only with a dry cloth.
- 4. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- 5. Do not use near heat sources such as stoves, heat registers, radiators or other equipment(including amplifiers) that produces heat.
- 6. Do not use the unit near open fire sources.
- 7. Connect the unit only to the electric network with grounding. Use only electric plugs that provide grounding.
- 8. Protect the power cord from being walked on, pinched or otherwise damaged.
- 9. Use only accessories specified by the manufacturer.
- **10.** Unplug this unit during lightning storms or when unused for long periods.
- 11. Refer all servicing to qualified service personnel. Servicing is required when the system has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the unit, the unit has been exposed to rain or moisture, does not operate normally or has been dropped.
- 12. WARNING TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSETHIS SYSTEM UNIT TO RAIN OR MOISTURE.

THIS UNIT CONTAINS POTENTIALLY LETHAL VOLTAGES. TO PREVENT ELECTRIC SHOCK OR HAZARD, DO NOT REMOVE THE COVER. NO USER-SERVICEABLE PARTS INSIDE.REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

INSTALLING OF THIS UNIT MUST BE PERFORMED ONLY BY QUALIFIED TRAINED PERSONNEL FOLLOWING APPLICABLE SAFETY RULES. DO NOT ALLOW INSTALLING OF THIS UNIT IF INSTALLATION HARDWARE IS BROKEN, BENT, PARTS ARE MISSING OR IS OTHERWISE DAMAGED.

8 **REGULATORY INFORMATION**

FCC COMPLIANCE STATEMENT

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a <u>Class B digital device</u>, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

9 ROUTING DIAGRAM AND TYPICAL APPLICATION

The below example consists of an SR-1000 Extreme -24 IMB, AE-6703, Q-SYS Core, DAC-2824 and network or analog amplifiers. In this example; the 24 channels of AES3 audio from the SR-1000 Extreme -24 are transmitted to the Q-SYS Core for audio processing via the AE-6703. The processed audio from the Q-SYS Core is then transmitted back via the AE-6703 to a Digital-to-Analog Converter (DAC-2824) and then to analog Amplifiers OR directly from the Q-SYS Core to the network amplifiers that accept AES67 inputs.

Figure 5 illustrates the routing diagram for the AE-6703. The AES3 output device (SR-1000 Extreme -24) is connected to the AES3 input interface of the AE-6703 and it can transmit its own audio signal to other AES67 devices on the network through the network.

The DAC or other AES3 receiving device is connected to the AES3 output interface of the AE-6703, which can receive digital audio signals transmitted by the network.



Figure 6 depicts the typical connection method for the AE-6703 with the SR-1000 Extreme -24 IMB.



Figure 6: AE-6703 Typical Application

10 INSTALLATION AND CONFIGURATION

10.1 Device List

Sr. No.	Device Name	Photo	Quantity
1	GDC SR-1000 Extreme -24		1 PCS.
2	GDC AE-6703		1 PCS.
3	Q-SYS Core		1 PCS.
4	Gigabit Network Switch		1 PCS.
5	GDC DAC-2824	Bight is model basil formeline and the set of the set o	1 PCS.
6	RJ-45 AES Audio Cable		6 PCS.
Ø	Network Cable		3 PCS.

Table 4

10.2 Network Connection



Figure 7: Network Connection Diagram for AE-6703

10.3 Software required for AE-6703 Configuration

The AE-6703 device can be configured using the AudioGridController software. The provided AudioGridController file needs to be renamed as "AudioGridController.exe" (please contact GDC for the AudioGridController software file). Once renamed, double-click on this file in order to open the AudioGridController interface on your laptop/PC.

NOTE: The AudioGridController.exe file can be opened on a laptop or PC running <u>Microsoft Windows 7/</u><u>Windows 10/ Windows 11</u> Operating System.



Figure 8: AudioGridController Software

10.4 Configuring the IP Address for AE-6703

WARNING: Since this step requires the device to be rebooted; please complete this step before powering-up the DAC or Amplifier in order to avoid hearing the reboot shock from the speakers.

In order to modify the IP Address of the AE-6703 device, make sure the network interface IPs of your laptop/PC are set as follows:

- Change the 'IP Address' to "<u>169.254. xx. xx</u>".
- Change the 'Subnet mask' to "<u>255.255.0.0</u>".

Run the AudioGridController software. When the software is run for the first time, the network settings window will automatically be shown (as shown in **Figure 9**). Select the network interface card which is connected to the audio network. You also can re-select the network interface card using the **Options** \rightarrow **choose netcard interface** option.

Once done, restart the AudioGridController software.

Intel(R) Ethernet Connection (7) I219-LM Bluetooth Device (Personal Area Network) Intel(R) Ethernet Connection (7) I219-LM Intel(R) Wi-Fi 6 AX200 160MHz	Intel(R) Ethernet Connection (7) I219-LM
Intel(R) Ethernet Connection (7) I219-LM ■ Bluetooth Device (Personal Area Network) Intel(R) Ethernet Connection (7) I219-LM Intel(R) Wi-Fi 6 AX200 160MHz	Intel(R) Ethernet Connection (7) I219-LM
Bluetooth Device (Personal Area Network) Intel(R) Ethernet Connection (7) 1219-LM Intel(R) Wi-Fi 6 AX200 160MHz	Bluetooth Device (Personal Area Network)
Intel(R) Ethernet Connection (7) I219-LM Intel(R) Wi-Fi 6 AX200 160MHz	bidetood i Device (Fersonal Area Network)
Intel(R) Wi-Fi 6 AX200 160MHz	Intel(R) Ethernet Connection (7) I219-LM
	Intel(R) Wi-Fi 6 AX200 160MHz

Figure 9: Select Network Interface

As shown in **Figure 10**, click on the **Device Config** sub-tab. Select the device '**GDC-a203-662d**' from the Select device drop-down list.

Select device GDC-a	03-6624	Backup / Recovery
Device Name	Network Config	Backup
Landa and and and and and and and and and	← Obtain an IP address automatically	Recovery
GDC-a203-662d	Manually configuare an IP address	
Apply	IP Address 192 , 168 , 0 , 50	-Multicast flow
	Apply	
Sample Rate 48K ¥ Enc	oding PCM 24 V Latency 2 MS V	Create / Delete

Figure 10: Modify IP Address

NOTE: In case you are unable to select any device in this drop-down list; click on the **Device info** sub-tab and check if any 'Unknown Device' is listed (refer to **Figure 11**). Confirm that the IP Address of your laptop/PC and the IP Address of this 'Unknown Device' belong to the same subnet (For example; as shown in **Figure 11**, it should be <u>169.254.xx.xx</u>).

If you can't see any 'Unknown Device' either, please make sure you select the correct network interface card and check the connection with AE-6703.)

Audio	GridController1.33									-	
View	Options Help										
	4 ↑ ↓ ↓ 品	8									
nal	Receive / Transmit Input Pro	cess Output Process D	evice Info Devi	ce Config							
	Device Name	Model Name	Model	FPGA Version	MCU Version	ID.Addross	MAC/AES67 IP:Port	Tx(mb	Rx(mb	Lin	kSpeed
	Device Name Unknown Device	Model Name	Model	FPGA Version	MCU Version	10 Address 169.254.126.43	MAC/AES67 IP:Port 00-AC-09-64-7E-2B	Tx(mb	Rx(mb	Lin	kSpeed
	Device Name Unknown Device AES6/-IX-1	Model Name	Model	FPGA Version	MCU Version	10 Addross 169.254.126.43 192.168.2.20	MAC/AES67 IP:Port 00-AC-09-64-7E-2B 233.254.113.0:5004	Tx(mb	Rx(mb	Lin	kSpeed
1	Device Name Unknown Device AES67-1X-1 AES67-TX-2	Model Name	Model	FPGA Version	MCU Version	10.0ddcocc 169.254.126.43 192.168.2.20 192.168.2.20	MAC/AES67 IP:Port 00-AC-09-64-7E-2B 233.254.113.0:5004 233.254.113.1:5004	9.6 9.6	Rx(mb	Lin	kSpeed
	Device Name Unknown Device AES67-TX-1 AES67-TX-2 AES67-TX-4	Model Name	Model	FPGA Version	MCU Version	10.4ddcocc 169.254.126.43 192.168.2.20 192.168.2.20 192.168.2.20	MAC/AES67 IP:Port 00-AC-09-64-7E-2B 233.254.113.0:5004 233.254.113.1:5004 233.254.113.3:5004	9.6 9.6 9.6 9.6	Rx(mb	Linl	kSpeed

Figure 11: Check Device info sub-tab

Under the **Network Config** section, select the 'Manually configure an IP address' option and update the IP Address and Subnet Mask values as per the cinema network. Click the Apply button and then click the Reboot button. The AE-6703 device will automatically restart to complete the IP modification process.

Once the IP Address of the AE-6703 device has been modified, ensure that the network interfaces for the Q-SYS Core, AE-6703 and SR-1000 Extreme -24 IMB are configured such that they belong to the same subnet (in this example, <u>192.168.0.xx</u>) as your laptop/PC.

Network Configuration		LAN A
IMB Ethernet 2: Subnet Mask:	192.168.0.12 255.255.255.0	Minc Aduless. Link Speed. 00:60:74:FD:9B:71 1000 Mbps Mode: IP Address: Static 192.166.0.20 255.255.255.0 0.0.0.0
	SR-1000 Extreme -24	QSC Core Nano
IP 地址(!): 子网掩码(!_): 默认网关(!_):	192.168.0.199 255.255.255.0 .	Network Config Obtain an IP address automatically Manually configuare an IP address
		IP Address 192 168 0 50 Subnet Mask 255 255 0

Figure 12: Configure Network Interfaces for other devices

11 CONFIGURING THE AES67 SEND STREAM

AES67 is a standard protocol. When a multicast stream is created by a device that is compatible with this protocol, it periodically sends an SAP/SDP bulletin informing it of the information about the created multicast stream, such as the *multicast address, port, protocol type, sampling frequency, code bits, included channels, and packaging time.*

The parameters used by AE-6703 have <u>48KHz</u> sampling rate, <u>24-bit</u> encoding, <u>1ms</u> packetization time and a single multicast stream contains up to <u>8 channels</u>.

The 'AudioGridController' software is required to operate the AE-6703 device. This section provides a brief description of the main content of the operation.

11.1 Create AES67 Output Stream (AE-6703)

As shown in **Figure 13**, open the AudioGridController software and select the device that needs to create a multicast stream in the Select device drop-down box under the **Device Config** tab. Then, click the Create/Delete button within the **Multicast flow** section to open the multicast flow operation interface.

Receive / Transmit Input Process Output Pro-	Less Device Into Device Coning	
	102 159 0 50	Backup / Recovery
Select device	152-100.0.00	Backup
Device Name	Network Config	
GDC-a203-662d	 Obtain an IP address automatically Manually configuare an IP address 	Recovery
· · · · · · · · · · · · · · · · · · ·	IP Address 192 . 168 . 0 . 50	∼ Multicast flow
Apply	Subnet Mask 255 , 255 , 255 , 0	
	Apply	
		Create / Delete
Sample Rate 48K 💌 Er	Latency 2 MS	

Figure 13: Create AES67 Output Stream on AE-6703

C AG AES67 IP 0 + 0 + 0 + 0 Image: Manual Source Port C AES67 Dest Port Dest Port 0 dect channels to be placed into a multicast flow: Up to 8 channels Multicast flow Ist 0 Transmite channel name Add to multicast flow 0 0 10 01 IF IF 0 0 0 11 13 13 13 13 14 15 12 13 12 12 12 12 13 13 12	Aulticast flow Config				
Maruel IP and Port Dest Port Image: Control of the second	⊂ ag	AES67 IP	0.0.0.0	Manual Source Port	
Multicast flow:	AES67	iual IP and Port Dest Port	0	0	
Transmite channel name Add to multicast flow 01 V 02 V 03 V 04 V 05 V 06 V 07 V 08 V 09 V 11 V 12 V 13 V 14 V 15 V 16 V 17 V 18 V 22 V 23 V 13 V 14 V 15 V 20 V 23 V 24 V 25 V 26 V 27 V 28 V 29 V 30 V 31 V 32 V	elect channels to be placed into Up to 8 chan	a multicast flow: nels	Multicast flow list		
01 IF 02 IF 03 IF 04 IF 05 IF 06 IF 07 IF 08 IF 09 IF 11 IF 12 IF 13 IF 14 IF 15 IF 16 IF 17 IF 18 IF 20 IF 21 IF 23 IF 24 IF 25 IF 26 IF 27 IF 28 IF 29 IF 30 IF 31 IF 32 IF	Transmite channel name	Add to multicast flow	RTP MF 29: 239.69.29.	147:5004 25 26 27 28 29 30 31	32
02 IV 03 IV 04 IV 05 IV 06 IV 07 IV 08 IV 09 IV 10 IV 11 IV 12 IV 13 IV 14 IV 15 IV 16 IV 17 IV 18 IV 20 IV 21 IV 22 IV 23 IV 24 IV 25 IV 26 IV 27 IV 28 IV 30 IV 31 IV	01		RTP MF 30: 239,69.30.	147:5004 17 18 19 20 21 22 23	24
03 V 04 V 05 V 06 V 07 V 08 V 09 V 10 V 11 V 12 V 13 V 14 V 15 V 16 V 17 V 20 V 21 V 23 V 24 V 25 V 26 V 27 V 30 V 31 V	02		DTD ME 22, 220 CO 22	147. 5004 1 2 2 4 5 6 7 0	
04 V 05 V 06 V 07 V 08 V 09 V 10 V 11 V 12 V 13 V 14 V 15 V 16 V 17 V 18 V 20 V 21 V 22 V 23 V 24 V 25 V 26 V 27 V 28 V 30 V 31 V	03		KIP MP 32: 239.69.32.	14/: 004 1 2 3 4 5 6 / 8	_
05 ビ 06 ビ 07 ビ 08 ビ 09 ビ 10 ビ 11 ビ 12 ジ 13 ビ 14 ビ 15 ビ 16 ビ 17 ビ 18 ビ 20 ビ 21 ビ 23 ビ 24 ビ 25 ビ 26 ビ 27 ビ 28 ビ 30 ビ 31 ビ	04				
06 ビ 07 ビ 08 ビ 09 レ 10 ビ 11 ビ 12 ビ 13 ビ 14 ビ 15 ビ 16 ビ 17 ビ 18 ビ 19 ビ 20 ビ 21 ビ 22 ビ 23 ビ 24 ビ 25 ビ 26 ビ 27 ビ 30 ビ 31 ビ 32 ビ	05				
07 ビ 08 ビ 09 ビ 10 ビ 11 ビ 12 ビ 13 ビ 14 ビ 15 ビ 16 ビ 17 ビ 18 ビ 19 ビ 20 ビ 21 ビ 22 ビ 23 ビ 24 ビ 25 ビ 26 ビ 27 ビ 28 ビ 30 ビ 31 ビ	06				
08 マ 09 マ 10 マ 11 マ 12 マ 13 マ 14 マ 15 マ 16 マ 17 ワ 18 マ 19 マ 20 マ 21 マ 23 マ 24 マ 25 マ 26 マ 27 マ 28 マ 30 マ 31 マ 32 マ	07				
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12 $\overrightarrow{\nabla}$ 13 $\overrightarrow{\nabla}$ 14 $\overleftarrow{\nabla}$ 15 $\overrightarrow{\nabla}$ 16 $\overrightarrow{\nabla}$ 17 $\overrightarrow{\nabla}$ 18 $\overrightarrow{\nabla}$ 20 $\overrightarrow{\nabla}$ 21 $\overrightarrow{\nabla}$ 22 $\overrightarrow{\nabla}$ 23 $\overrightarrow{\nabla}$ 24 $\overrightarrow{\nabla}$ 25 $\overrightarrow{\nabla}$ 26 $\overrightarrow{\nabla}$ 27 $\overrightarrow{\nabla}$ 30 $\overrightarrow{\nabla}$ 31 $\overrightarrow{\nabla}$	11	V			
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14 V 15 V 16 V 17 V 18 V 19 V 20 V 21 V 23 V 24 V 25 V 26 V 27 V 28 V 30 V 31 V	13	V			
15 V 16 V 17 V 18 V 19 V 20 V 21 V 23 V 24 V 25 V 26 V 27 V 28 V 30 V 31 V	14	V			
16 \bigtriangledown 17 \checkmark 18 \checkmark 19 \checkmark 20 \checkmark 21 \checkmark 22 \checkmark 23 \checkmark 24 \checkmark 25 \checkmark 26 \checkmark 27 \checkmark 28 \checkmark 30 \checkmark 31 \checkmark	15				
17 $\overline{\vee}$ 18 $\overline{\vee}$ 19 $\overline{\vee}$ 20 $\overline{\vee}$ 21 $\overline{\vee}$ 22 $\overline{\vee}$ 23 $\overline{\vee}$ 23 $\overline{\vee}$ 24 $\overline{\vee}$ 25 $\overline{\vee}$ 26 $\overline{\vee}$ 27 $\overline{\vee}$ 28 $\overline{\vee}$ 30 $\overline{\vee}$ 31 $\overline{\vee}$ 32 $\overline{\vee}$	16	V			
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21 V 22 V 23 V 24 V 25 V 26 V 27 V 28 V 30 V 31 V	20	\checkmark			
22 IV 23 IV 24 IV 25 IV 26 IV 27 IV 28 IV 30 IV 31 IV 32 IV	21	\checkmark			
23 V 24 V 25 V 26 V 27 V 28 V 30 V 31 V	22				
24 107 25 107 26 107 27 107 28 107 29 107 30 107 31 107 32 107	23	×			
25 IV 26 IV 27 IV 28 IV 29 IV 30 IV 31 IV 32 IV	24	×			
26 IV 27 IV 28 IV 29 IV 30 IV 31 IV 32 IV	25	V	_		
27 I√ 28 I√ 29 I√ 30 I√ 31 I√ 32 I√	26	×			
28 V 29 V 30 V 31 V 32 V	27	14 A			
29 IV 30 IV 31 IV 32 IV	28		-		
30 V 31 V 32 V	29	1×			
	30	No. 1	-		
32	31				
	32	IV.			

Figure 14: Multicast Flow Config.

As shown in Figure 14, a AES67 multicast stream can be created by following the steps mentioned below:

Step 1: Select AES67 type

Under the **Multicast Flow Config** box, select 'AES67'. Unless the receiving device has special requirements, it is generally not necessary to specify the multicast AES67 IP and Dest port. When you need to specify related parameters, check Manual IP and Port and fill in the specified multicast IP and port.

Step 2: Select the send channel

Under the **Channel list** on the left below, select the check-box against the channel to be sent. After more than 8 channels, it will automatically prompt that the maximum value has been reached. It is no longer allowed to join, but it can be modified.

Step 3: Create AES67 multicast stream

Click the Create button to create an AES67 multicast stream OR click the Create All button. It will automatically generate four streams per group of 8 channels.

WARNING: If you use the Create All button to create a multicast stream, all multicast streams which have been previously created will be overwritten.

As indicated in **Figure 14**, the **Multicast flow list** box (highlighted in Blue) displays the information of the multicast stream just created, including the multicast IP, port and the channel it contains. The successfully created multicast stream will also be displayed under the list of sending devices on the **Routing** sub-tab.

11.2 Delete AES67 Output Stream (AE-6703)

As shown in **Figure 14**, all multicast streams created by the device are displayed on the right side under the **Multicast flow list** box. Click to select the multicast stream to be deleted and then click the Delete button OR click the Delete All button to delete all multicast streams.

11.3 Create AES67 Output Stream (Q-SYS Core)

Open the 'QSC Designer' software and create an AES67 transmitter. It will automatically generate 8 channel AES67 streams named after the module name, as shown in **Figure 15**.

	Properties			
	AES67 Transmitter	Properties		
	Name	AES67-TX-1		
	Location	Default Location	-	
0	Connection Mode	Auto	-	
ŏ	Channel Count	8		
O AES67 Transmitter	Graphic Properties			
O AES07-1X-1	Fill		1	
8	Control Pins			
	Channel 1			
	Channel 2			
	♦ Channel 3			

Figure 15: Create AES67 transmitter on Q-SYS Core

12 CONFIGURING THE AES67 RECEIVE STREAM

Since the maximum interval between SAP/SDP announcements is <u>30 seconds</u>, some multicast streams may not be displayed when the software is first opened. After 30 seconds, the AES67 multicast streams in the LAN will be displayed on the top of the interface.

To ensure normal reception, please do not create a multicast stream with more than 8 channels.

12.1 AE-6703 receives AES67 Multicast Stream

Open the 'AudioGridController' software. As shown in **Figure 16**, '**AES67-TX-1**' is the AES67 multicast stream created by Q-SYS Core, which contains 8 channels. '**GDC-a203-662d**' is the receiving device. Click on the intersection with the sending channel. When the box turns into a Green ⁽¹⁾ symbol, it means the receiving is successful. Click on the Green ⁽¹⁾ symbol to cancel reception for this channel.



Figure 16: Create AES67 Input Stream on AE-6703

12.2 Q-SYS Core receives Multicast Stream created by AE-6703

Open the 'Q-SYS Designer' software and select the corresponding configuration. Press F5 to go online and double-click **AES67-Receiver** to open the AES67 multicast receiving interface.

1. Receive Multicast Stream

Click in the box corresponding to Stream Name to open the drop-down list and select the name of the multicast stream to be received. The reception is successful when the Status button is shown in Green and displays 'OK', as shown in **Figure 17**.

WARNING: If the Status button is displayed in Yellow, it is generally because the clock cannot be synchronized. Please check the clock settings and network connection to ensure that there is only one master clock in the LAN and that the network connection is good.



Figure 17: Receive Multicast Stream

2. View Multicast Stream Information

Click the **Details** tab to display the statistics of the received data and the details of the sending stream.

The received data statistics information shows the specific situation of the current received data, including the number of received data packets and the number of discarded, lost, and duplicated data packets.

As shown in **Figure 18**, click on the drop-down list to the right of Session Name and select the multicast stream that needs to be viewed in order to display the detailed information of the multicast stream. This includes the *multicast stream ID (SID)*, originating source *IP*, multicast stream name, number of channels included, multicast *IP*, sending port, protocol number, number of encoding bits, sampling rate, etc.

If the receiving device is using manual settings, it can be set according to the above information.

AES67 Receiver Al	ES67-RX-1 🗙
Stream Details	
Stream	
Details	Enabled: 1 Connected: 1 DSCP: 46 Count: 209905 Accept Count: 209905 Drop Count: 0 Missing Count: 752 Duplicate Count: 0 On Time: 209905 Too Late: 0 PT Mismatch: 0 Size Mismatch: 0
	reset details
SAP	
Session Name	GDC-a203-662d:32 (1080441376)
Raw SDP	v=0 o=- 1080441376 1080441376 IN IP4 169.254.102.58 s= GDC-a203-663a:32 i=6 channels: 01, 02, 03, 04, 05, 06 c=IN IP4 239.69.32.160/32 t=0 0 a=keywds:Dante a=recvonly m=audio 5004 RTP/AVP 101 a=rtpmap:101 L24/48000/6 a=ptime:1 a=recvonly a=ts-refclk:ptp=IEEE1588-2008:00-ac-49-FF-FE-40-66-3a:0 a=mediaclk:direct=0

Figure 18: View Multicast Stream Information

13 APPENDIX

13.1 AE-6703 Firmware Version Upgrade Procedure

Step 1: Open the Firmware upgrade tool (please contact GDC for the firmware upgrade tool file) and set the Local IP address to the correct IP address of your laptop/PC. Ensure that the IP address of the AE-6703 device and IP address of your laptop/PC belong to the same network segment.

FFGA IImware III	э 🗌					Browse	1
File siz	e	bytes					-
MCU firmware file	•					Browse	
File siz	e	bytes					
Device ID	IP	FPGA Ver	FPGA Upgrade	MCU Ver	MCU Upgrade	Status	Reboo
Audiocom-a203-6830	192.168.2.50	220510		220513			Г

Figure 19: Set Local IP

Step 2: In order to upgrade the FPGA firmware version, select the new FPGA firmware upgrade file (please contact GDC for the FPGA firmware file) by clicking on the **Browse** button alongside the FPGA firmware file option.

FPGA firmware file				— r	Browse	1
File size	bytes			-		
MCU firmware file		Μ			Browse]
Data (D:) > AES67 > 2510(1)		✓ ✓	õ	٩		
^	*	Date modified		Туре	Size	
Name			_			

Figure 20: Select firmware version file

Step 3: After selecting the FPGA firmware version file, click on the blank area (marked by the Red dotted lines in **Figure 21**) under the **'FPGA Upgrade'** column.

FPGA firmware file	D:\AES67\25	10(1)\fpga_a2	03_2510.bit			Browse	1
File size	587358	587358 bytes					
MCU firmware file						Browse	
File size	e	bytes					
Device ID	IP	FPGA Ver	FPGA Upgrade	MCU Ver	MCU Upgrade	Status	Reboo
Audiocom- <mark>a</mark> 203-6830	192.168.2.50	220510	- Chy	220513			

Figure 21: Initiate FPGA firmware upgrade

Step 4: Once the upgrade is complete; the 'FPGA Upgrade' column will display "100%" and the 'Status' column will display "Completed", as shown in Figure 22.

FPGA firmware file	D:\AES67\25	Browse					
File size	587358						
MCU firmware file							
File size		bytes					
Device ID	IP	FPGA Ver	FPGA Upgrade	MCU Ver	MCU Upgrade	Status	Reboo
udiocom-a203-6830	192 168 2 50	220510	100%	220513		Completed	F

Figure 22: FPGA Upgrade Complete

Step 5: In order to upgrade the MCU firmware version, select the new MCU firmware file (please contact GDC for the MCU firmware file) by clicking on the **Browse** button alongside the MCU firmware file option. Similar to **Steps 3 and 4**, click on the blank area under the '**MCU Upgrade**' column to initiate the upgrade and wait until the '**MCU Upgrade**' column displays "100%" and the '**Status**' column displays "Completed" (as shown in **Figure 23**).

Select firmware files							
FPGA firmware fi	le D:\AES67\25	510(1)\fpga_a2	03_2510.bit			Browse]
File si	ize 587358	bytes					
MCU firmware fi	le D:\AES67\25	510(1)\mcu_407	7d_2513.bin			Browse	
File si	ize 187108	bytes					
Device ID	IP	FPGA Ver	FPGA Upgrade	MCU Ver	MCU Upgrade	Status	Reboo
Audiocom-a203-6830	192.168.2.50	220510	100%	220513	48%	Upgradin	
ocal IP 192.168.2.196 irmware upgrade tool V	• F	P Filter 0	- 255	All None	Rel	boot	Refresh
ocal IP 192.168.2.196 irmware upgrade tool V Select firmware files		P Filter 0	- 255	All None	Rel	boot	Refresh
ocal IP 192.168.2.196 irmware upgrade tool V Select firmware files FPGA firmware fi FIE si	■ IF 1.33 Ie D:\AES67\25 ize 587358	510(1)\/pga_a2	- 255	All None	a Rel	Browse	Refresh
ocal IP 192.168.2.196 irmware upgrade tool V Select firmware files FPGA firmware fi File si MCU firmware fi	I.33 Ie D:\AES67\25 ize 587358 Ie D:\AES67\25	 P Filter 510(1)\fpga_a2 bytes 510(1)\mcu_40 	- 255	All None	a Rel	Browse	Refresh
irmware upgrade tool V Select firmware files FPGA firmware fi File si MCU firmware fi File si	I.33 Ie D:∖AES67/25 ize 587358 Ie D:∖AES67/25 ize 187108	P Filter 0 510(1)\fpga_a2 bytes 510(1)\mcu_40 bytes	- 255	All None	a Rel	Browse	
ocal IP 192.168.2.196 irmware upgrade tool V Select firmware files FPGA firmware fi File si MCU firmware fi File si	I.33 Ie D:\AES67\25 ize 587358 Ie D:\AES67\25 ize 187108	P Filter 0 510(1)\fpga_a2 bytes 510(1)\mcu_40 bytes FPGA Ver	- 255	All None	MCU Upgrade	Browse Browse	Refresh
ocal IP 192.168.2.196	I.33 Ie D:\AES67\25 ize 587358 Ie D:\AES67\25 ize 187108 IP 192.168.2.50	 P Filter 0 510(1)\fpga_a2 bytes 510(1)\mcu_40 bytes FPGA Ver 220510 	- 255	All None	MCU Upgrade	Browse Browse	Refresh
ocal IP 192.168.2.196	I.33 Ie D:\AES67\25 ize 587358 Ie D:\AES67\25 ize 187108 IP I92.168.2.50	P Filter 0 510(1)\fpga_a2 bytes 510(1)\mcu_40 bytes 510(1)\mcu_40 bytes FPGA Ver 220510	- 255	All None	MCU Upgrade	Browse Browse Status Completed	Refresh
ocal IP 192.168.2.196	I.33 Ie D:\AES67\25 ize 587358 Ie D:\AES67\25 ize 187108 IP 192:168:2:50	P Filter 0 510(1)\fpga_a2 bytes 510(1)\mcu_40 510(1)\mcu_40 bytes FPGA Ver 220510	- 255	All None	MCU Upgrade	Browse Browse	Refresh
ocal IP 192.168.2.196	I.33 Ie D:\AES67\25 ize 587358 Ie D:\AES67\25 ize 187108 IP 192.168.2.50	P Filter 0 510(1)\fpga_a2 bytes 510(1)\mcu_40 bytes 510(1)\mcu_40 bytes FPGA Ver 220510	- 255	All None	MCU Upgrade	Browse Browse	Refresh
ocal IP 192.168.2.196	I.33 Ie D:\AES67\25 ize 587358 Ie D:\AES67\25 ize 187108 IP 192.168.2.50	P Filter 0 510(1)\fpga_a2 bytes 510(1)\mcu_40 bytes FPGA Ver 220510	- 255	All None	MCU Upgrade	Browse Browse Status Completed	Refresh

Figure 23: MCU upgrade complete

Step 6: After completing both the FPGA and MCU firmware version upgrades, select the checkbox under the **'Reboot'** column and click on the **Reboot** button (as shown in **Figure 24**). Then, switch off and restart the AE-6703 device.

FPGA firmware file	D:\AES67\25	Browse					
File size	587358 bytes						
MCU firmware file	D:\AES67\25	Browse					
File size	187108	bytes					
Device ID	IP	FPGA Ver	FPGA Upgrade	MCU Ver	MCU Upgrade	Status	Reboot
Device ID Audiocom-a203-6830	192.168.2.50	220510	100%	220513	100%	Completed	2

Figure 24 : Reboot device

13.2 AE-6703 Input/Output LED Indicator Switch

The 'AudioGridController' software <u>version 1.51</u> or later supports the modification of audio signal indicator display mode and threshold value. As shown in **Figure 25**, select the AE-6703 device from the Choose device drop-down box within the **Remote Control** tab. Under the **AE6703 LED Indicator** section, you can then select the type of audio signal ('Input' or 'Output') which the front panel LEDs should indicate.

You can also set a Threshold value here. If the level of the audio signal exceeds the set threshold value, the LED indicator will turn ON. The threshold value can range from <u>-120dB to 0dB</u>, which means this field will only accept an integer value between "0" and "120" (the negative sign is already present). By default, the threshold value is set to <u>-40dB</u>. The larger the value, the smaller the threshold.

Receive / Transmit Input Process Output Process Device Info Device Cor	fig Remote Control		
Choose device GDC-a203-780c			
- SerialPort	[[IE6703 LED Indicator	
	Send		
Corr Sand Corr Room			
	I™ Auto clear	Threshold - 40 dB Reset	
		legister	
		Address (Hex) Read	
		Value (Hex) Write	

Figure 25: AE-6703 Audio Signal Indicator Switch

13.3 AE-6703 Dante® Mode

In Dante[®] mode, you can view and configure devices directly using the Dante[®] Controller software (as shown in **Figure 26**). In case you are using Dante[®] mode; the AE-6703 and QSC devices must be on the same network segment and it is recommended to delete the AES67 stream.



Figure 26: Dante® Controller Software





GDC Technology manufacturing facility is ISO 9001:2015 certified.

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