DQRack Touring Power & Control Solution

System Quick Start Guide
v1 September 2019

EM ACOUSTICS

LOUDSPEAKERS REDEFINED

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DECLARATION OF CONFORMITY

The products contained within this manual conform to the requirements of the EMC Directive 89/336/EEC, amended by 92/31/EEC and to the requirements of the Low Voltage Directive 73/23/EEC amended by 93/68/EEC.

EMC Emission	EN55103-1:1996
Immunity	EN55103-2:1996
Electrical Safety	EN60065:1993

RECYCLING

This product and its packaging constitute the applicable product according to the WEEE directive. Please ensure that at the end of the working life of this product, it is disposed of sensibly in accordance with local and national recycling regulations. The packaging supplied with this product is recyclable. Please retain all packaging, however if disposing of this packaging please ensure that you comply with local recycling regulations. These products also all comply to the RoHS Directive 2002/95/EC.

1.0 - Introduction

Thank you for purchasing the DQRack from EM Acoustics – the ultimate power and control solution for any EM Acoustics system.

The DQRack is a state-of-the-art amplification and control package, bringing together 12 channels of Class D amplification, input flexibility in the form of analogue, AES digital and Dante™ networked audio, combined with data, mains power and output power distribution.

This quick-start guide covers basic configuration and network connectivity for the DQRack. If you feel we have missed anything, or you have a question not covered by this manual, please visit our website www.emacoustics.co.uk and send us a message or give us a call – we're only too happy to help.

The operation of the DQ20 amplifiers themselves is covered within DQ Series user manual available on our website.

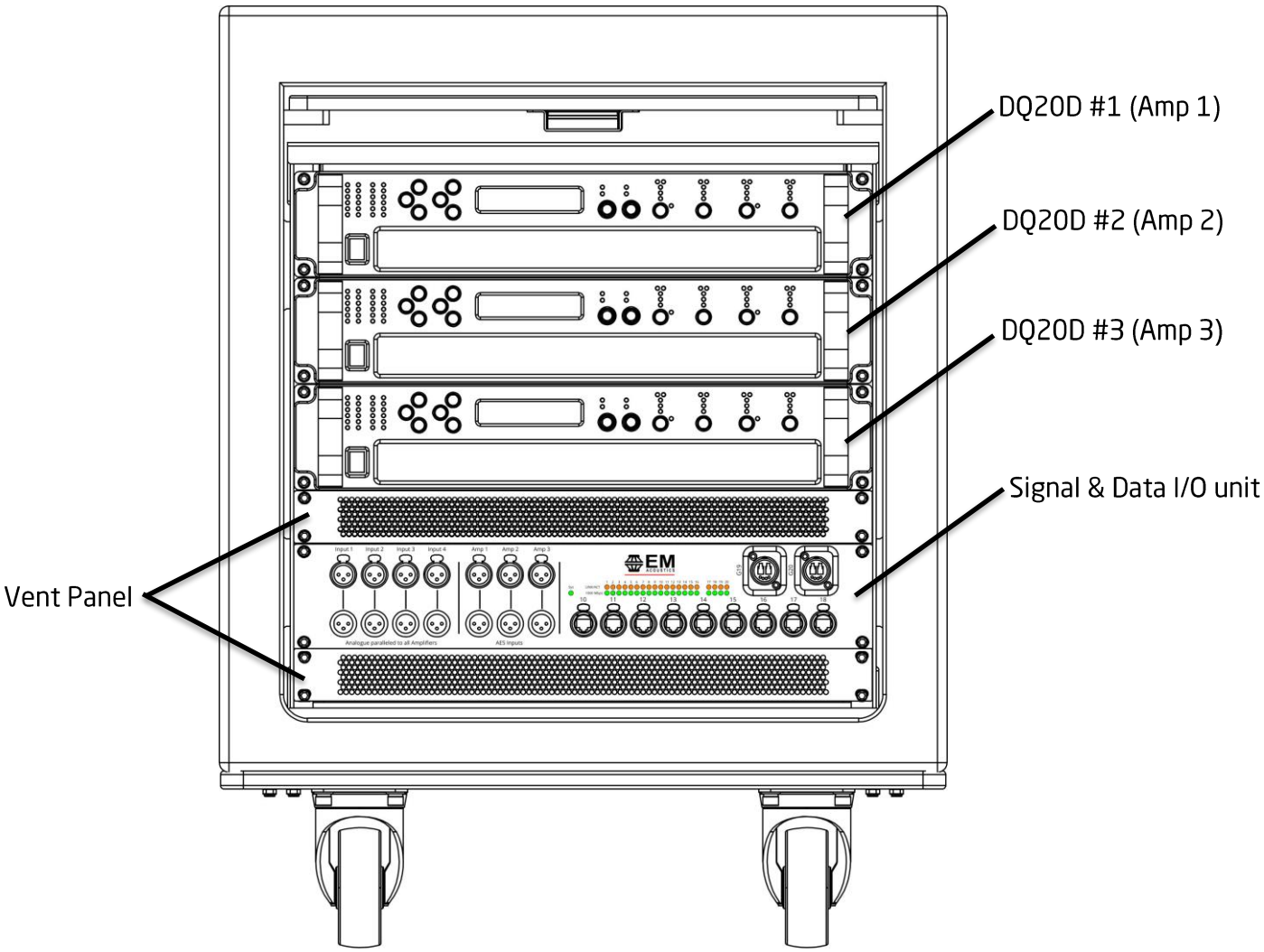
Unpacking

Please take care when unpacking your product. Once unpacked, please inspect each item thoroughly for any transit damage and in the case of any damage please notify your carrier immediately. It is the responsibility of you, the consignee, to instigate any claim. Please retain all original packaging in case of future re-shipment.

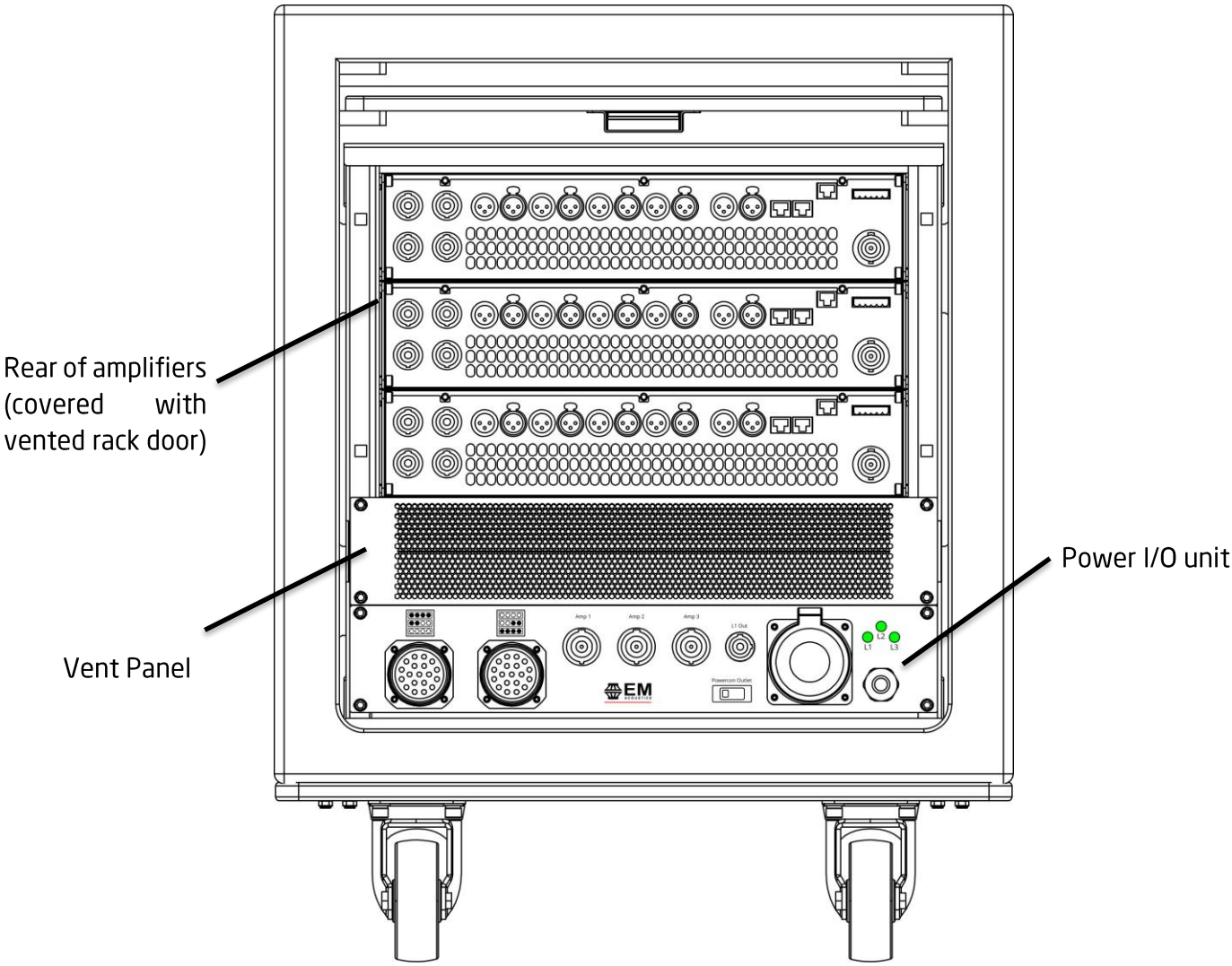
2.0 – DQRack Component overview

This chapter gives a simple overview of the individual components that make up the DQRack system.

2.1 - DQRack - Front



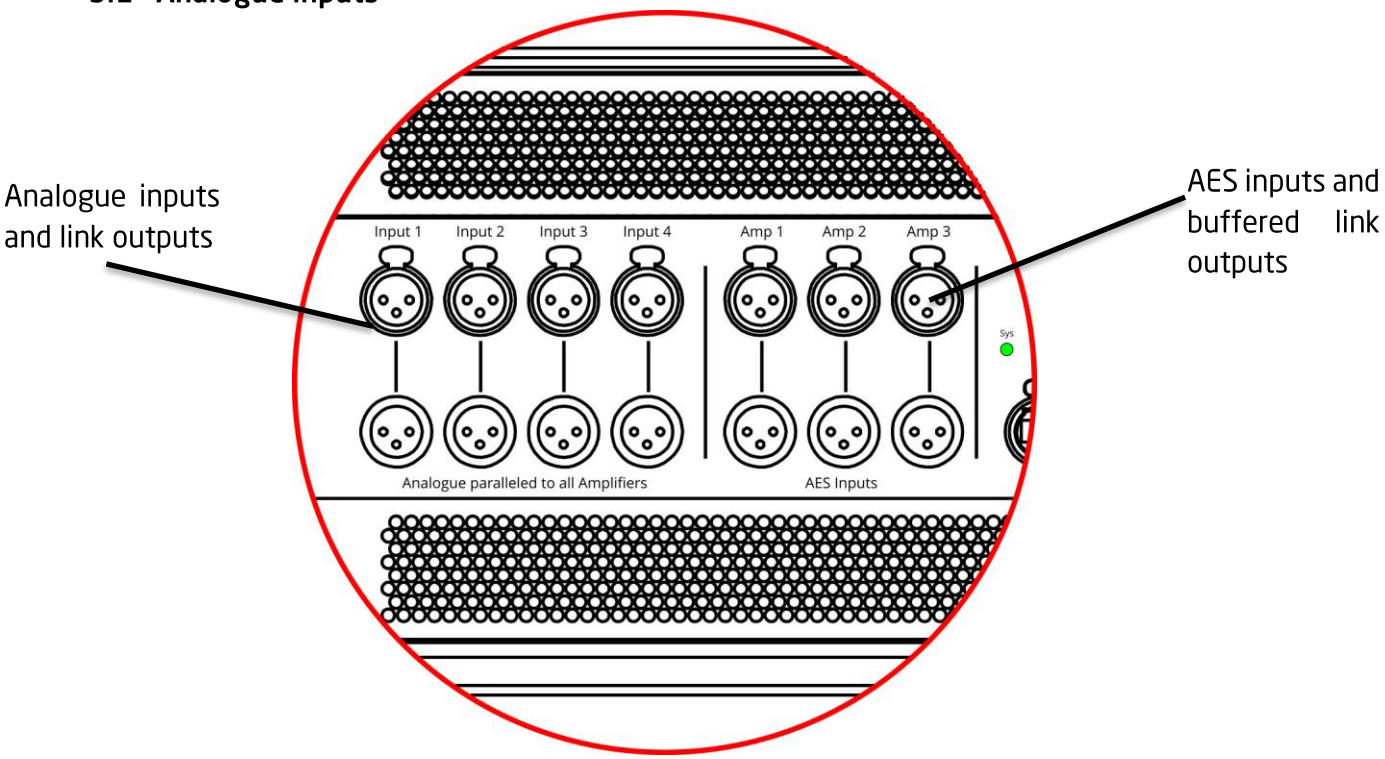
2.2 - DQRack - Rear



3.0 – Audio Input Connections

There are three methods for getting audio signals into the DQRack, all via the Signal & Data I/O unit on the front panel.

3.1 – Analogue inputs



Analogue inputs 1-4 are presented on the front panel of the DQRack signal I/O unit. These correspond to physical inputs 1-4 on Amplifier 1.

Amplifiers 2 & 3 have their analogue inputs directly connected to amplifier 1, so the analogue signal will feed all amplifiers.

The analogue signal is a direct pass-through, so signal will still be fed to all amplifiers regardless of the input type selected on any of the three amplifiers. This means that amplifiers 1 & 2 could be fed from Dante or AES inputs, and amplifier 3 can still be fed directly from the analogue inputs without having to re-patch the DQRack.

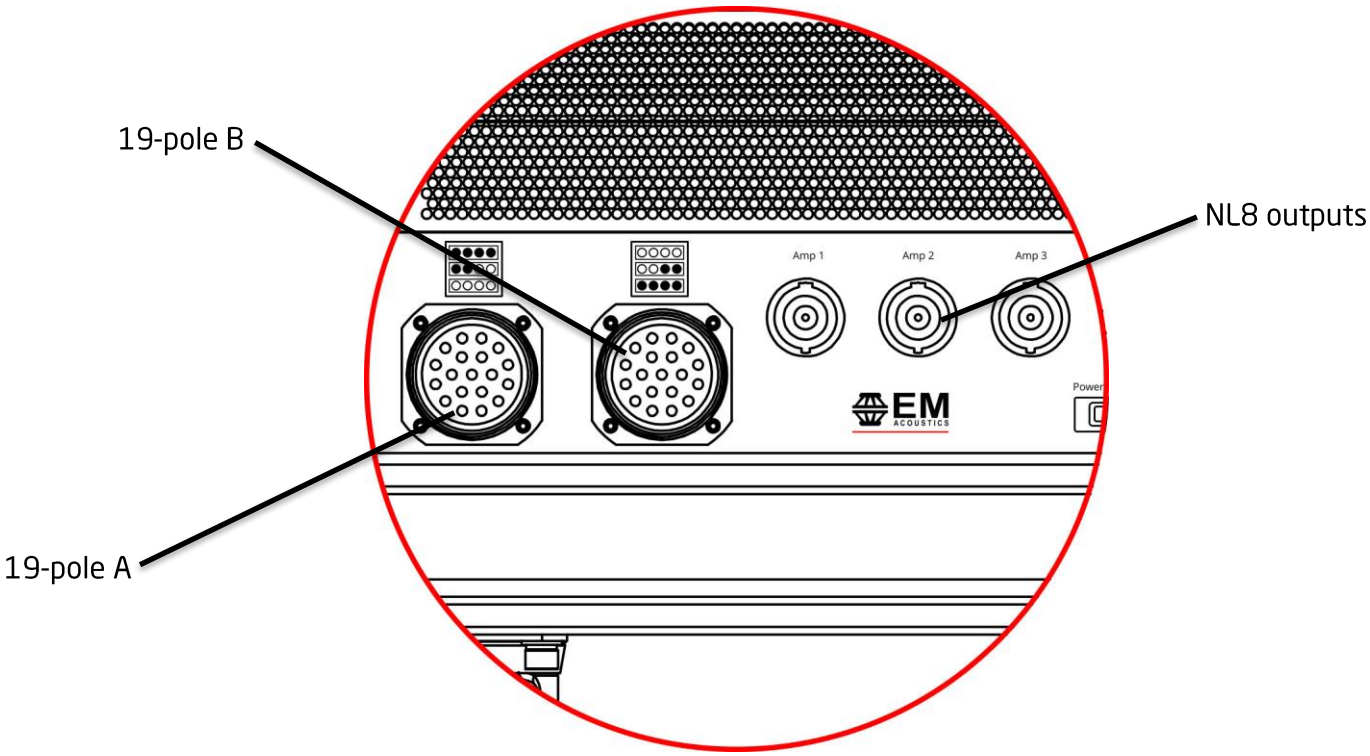
3.2 – AES inputs

AES inputs and buffered outputs are presented on the front panel of the DQRack signal I/O unit. Unlike the analogue inputs, these are not directly linked so any parallel or daisy-chain wiring must be done using the input/output connectors on the front panel.

The AES outputs from the DQ20 amplifiers are buffered, so there is no degradation of signal quality when linking units together.

4.0 - Audio Output Connections

Two output connector types are provided, and it is possible to use a combination of both. Each amplifier feeds its own Neutrik SpeakON NL8 outlet (labelled amp 1 / amp 2 / amp 3) and there are two 19-pole outlets which carry 6 amplifier channels each.



Be aware that all connections are live at any point – so ensure you do not accidentally connect additional loudspeakers in parallel if using NL8 and 19-pole connections at the same time.

4.1 - Output Connection Wiring

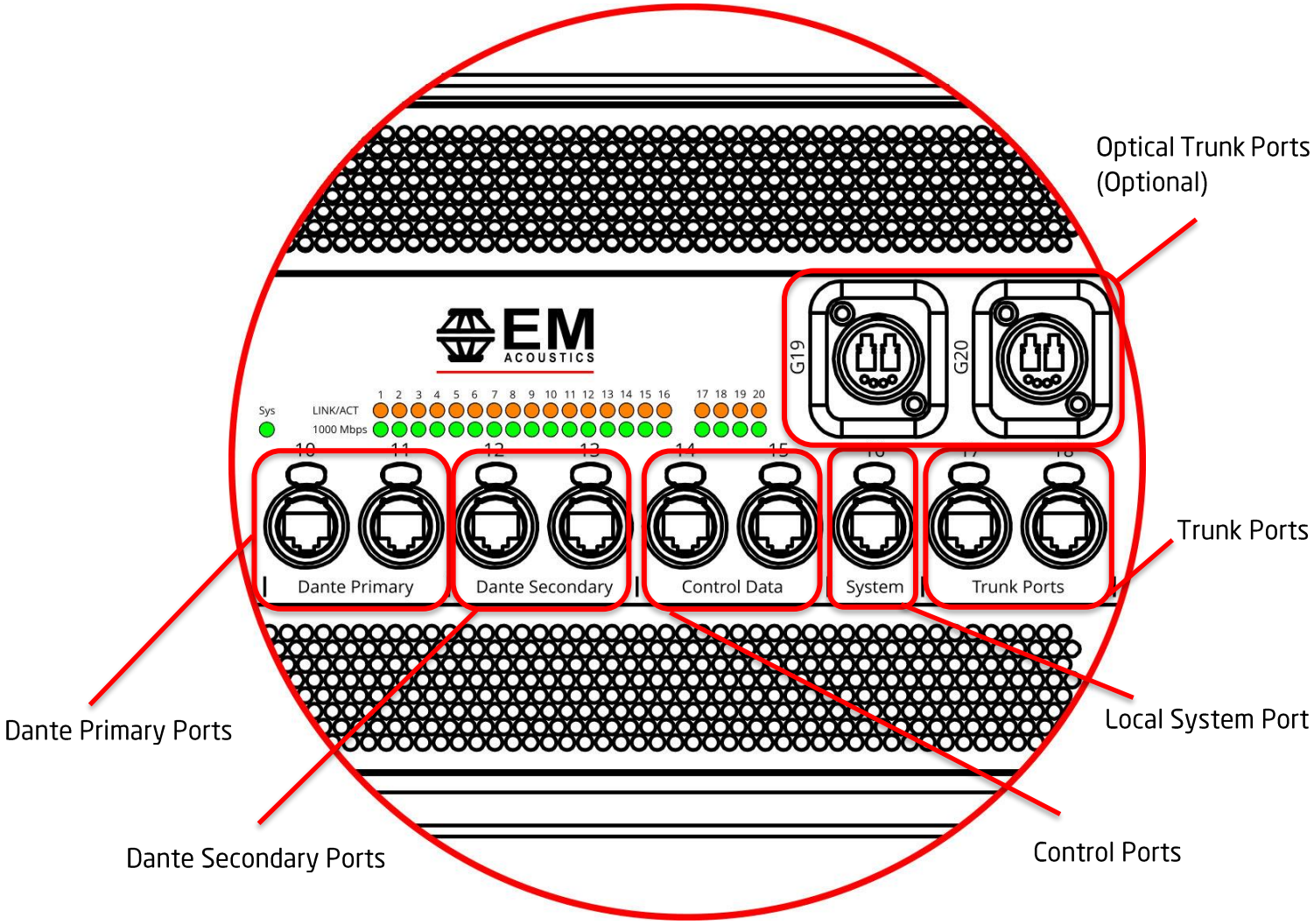
The twelve amplifier channels within the DQRack are configured to the various output connectors as shown in the table below:

Amplifier	Channel & Polarity	NL8 connection	19-pole Connector & Pin
19-pole connector A			
1	A, positive	Amp 1, 1+	A, Pin 1
1	A, negative	Amp 1, 1-	A, Pin 2
1	B, positive	Amp 1, 2+	A, Pin 3
1	B, negative	Amp 1, 2-	A, Pin 4
1	C, positive	Amp 1, 3+	A, Pin 5
1	C, negative	Amp 1, 3-	A, Pin 6
1	D, positive	Amp 1, 4+	A, Pin 7
1	D, negative	Amp 1, 4-	A, Pin 8
2	A, positive	Amp 2, 1+	A, Pin 9
2	A, negative	Amp 2, 1-	A, Pin 10
2	B, positive	Amp 2, 2+	A, Pin 11
2	B, negative	Amp 2, 2-	A, Pin 12
19-pole connector B			
2	C, positive	Amp 2, 3+	B, Pin 1
2	C, negative	Amp 2, 3-	B, Pin 2
2	D, positive	Amp 2, 4+	B, Pin 3
2	D, negative	Amp 2, 4-	B, Pin 4
3	A, positive	Amp 3, 1+	B, Pin 5
3	A, negative	Amp 3, 1-	B, Pin 6
3	B, positive	Amp 3, 2+	B, Pin 7
3	B, negative	Amp 3, 2-	B, Pin 8
3	C, positive	Amp 3, 3+	B, Pin 9
3	C, negative	Amp 3, 3-	B, Pin 10
3	D, positive	Amp 3, 4+	B, Pin 11
3	D, negative	Amp 3, 4-	B, Pin 12

Various split cables are available from EM Acoustics, designed to work with the DQRack to provide direct connection to loudspeakers in the appropriate way.

5.0 – Data Connections

The DQRack signal I/O unit contains a Cisco managed network switch, pre-configured for optimum performance within this closed-loop system.



Dante Primary Ports - these are to be used for Dante Primary input & link output. They are on VLAN 2.

Dante Secondary Ports - these are to be used for Dante Secondary input & link output. They are on VLAN 3.

Control Ports - these are to be used for establishing a control network. They are on VLAN 2.

Local System Port - this is for local computer connection to the DQRack network. It is on VLAN 2.

Trunk Ports – these carry all VLAN's and are to be used as main & redundant backup to link multiple DQRacks together.

5.1 - VLAN configurations

At the present time, the configuration that the DQRack ships with has two VLAN's established - VLAN 2 carries Dante Primary and control data, and VLAN 3 carries Dante Secondary.

A forthcoming future release will add in VLAN 1, and Control Data will be moved to VLAN 1 at that time.

5.2 - Full Port Configuration

Switch Port	Amplifier	Purpose	VLAN
1	1	Dante Primary	2
2	1	Dante Secondary	3
3	1	Control Data	2
4	2	Dante Primary	2
5	2	Dante Secondary	3
6	2	Control Data	2
7	3	Dante Primary	2
8	3	Dante Secondary	3
9	3	Control Data	2
10	Front Panel	Dante Primary	2
11	Front Panel	Dante Primary	2
12	Front Panel	Dante Secondary	3
13	Front Panel	Dante Secondary	3
14	Front Panel	Control Data	2
15	Front Panel	Control Data	2
16	Front Panel	Trunk Port	2
17	Front Panel	Trunk Port	TRUNK
18	Front Panel	Trunk Port	TRUNK
19	Front Panel	Optional Optical	TRUNK
20	Front Panel	Optional Optical	TRUNK

5.3 - Optical Trunk Ports

Optical Trunk Ports can be supplied as an option, or fitted afterward by the user. They can be configured to be single mode or multimode via SFP ports inside the unit. By default, these ports are configured to be trunk ports in alongside the ethernet trunk ports 17 & 18.

5.4 - Future Upgrades

At the current time, Spanning Tree is not implemented within this system - so multiple racks must only be connected together as a chain, not a loop. The planned system configuration file release for later in 2019 will implement this feature, as well as moving control data to VLAN 1.

6.0 – Mains Power

The DQRack is fitted with a 3-phase mains distribution unit, located within the Mains/Power I/O unit at the rear of the rack.

Mains power is fed to each amplifier via a pre-wired 32A Neutrik PowerCON connector – each cable is the correct length for its relevant amplifier and they are labelled.

The mains inlet is the trailing cable, fitted with a 32A CEE three phase connector.

- Ensure that the DQRack is used with power supplies with protective earth only.
- If there is any sign of obvious damage to either the cable or the CEE connector, do not use the unit and replace the damaged parts before further use.
- Please ensure the mains connector is accessible at all times in case of malfunction or danger which requires it to be powered down.
- Do not connect or disconnect the CEE connector whilst under load or live.

Required mains supply configuration:

3-phase 230V, 50/60Hz, 32A maximum

6.1 - Mains Link Connector

The mains link output socket allows a second DQRack to be linked to the main power supply.

IMPORTANT NOTE: To avoid the risk of overloading your main power supply, it is recommended that no more than **one** additional DQRack is connected.

6.2 – Mains indicators

When the DQRack is connected to an energized supply, the three green LED indicators on the rear of the mains/power I/O unit will light indicating the presence of each electrical phase.

6.3 – Auxiliary Mains Output

On the rear of the mains/power I/O unit is a 20A Neutrik PowerCON outlet, protected by a dedicated circuit breaker. This is connected to phase L1 and is intended to power low-current devices such as laptops or network gear in a system environment.

6.4 – Signal & Data I/O power

On the rear of the mains/power I/O unit there is a fixed trailing cable which supplies power to the network switch inside the signal & data I/O unit. This additional power supply is **not** controlled by the circuit breaker on the rear of the unit.