

MC²
AUDIO

δ Series

Network Audio Power Amplifiers

DELTA 40/80/100/120
Operating Instructions

MC²
AUDIO

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DECLARATION OF CONFORMITY

We, the manufacturer:

**MC² Audio,
Units 6-8 Kingsgate
Heathpark Industrial Estate
Honiton, Devon
England
EX14 1YG**

acknowledge our responsibility that the following products:

Kind of equipment: Audio amplifier
Commodity Code: 8518408099
**Type Designation: Delta80DSP, Delta100DSP
Delta40S, Delta80S, Delta100S, Delta120S
T500, T1000, T1500, T2000, T3500, T4-250
Ti500, Ti1000, Ti1500, Ti2000, Ti3500, Ti4-250
E15, E25, E45, E60, E90, E100, E475
S800, S1400, D80DSP
and all OEM variants of these models**

are manufactured:

in accordance with EMC Directive 2004/108/EC,
in compliance with the following norm(s) or document(s):
Technical Regulations: EN55103-1:2009, EN55103-2:2009

and

in accordance with the Low Voltage Directive 2006/95/EC,
in compliance with the following norm(s) or document(s):
Technical Regulations: EN/IEC60065:2002 7th Edition

Signed:

Name: Alex Cooper
Position: Research and Development Manager
Date: January 2017

THANKS

Thank you for choosing a Delta Series amplifier for your application. Please spend a little time reading through this manual, so that you obtain the best possible performance from the unit and become familiar with its operating requirements.

All MC² products are carefully designed and engineered for cutting-edge performance and world-class reliability. If you would like further information about this or any other MC² product, please contact us.

We wish you many years of service from this amplifier and look forward to hearing from you in the near future.



INTRODUCTION

The Delta Series has been designed to combine incredible audio power and performance with ultra-flexible connectivity for both remote control and audio. Exemplary audio processing is assured through the use of XTA's DSP platform in the DSP enabled models, and power amplifier capabilities are taken care of with high efficiency output stages and a generous power supply.

Accepting analogue, *or optional Dante networked audio*, this extra connectivity means that the Delta Series non-DSP models can also be used in installation systems which already have a centralized DSP core but require the flexibility of being able to pick up multiple channels of audio from a network.

With a range of power levels available in the Delta Series, the non-DSP amplifiers can be networked to a single Delta DSP model, creating a powerful, efficient system that's easy to expand and adapt for use in live, install and everything in between.

#powermeetsprocessing

IMPORTANT SAFETY INSTRUCTIONS

CAUTION: RISK OF ELECTRIC SHOCK.
DO NOT OPEN

The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation mark within an equilateral triangle is intended to alert the user of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING: Apparatus with CLASS I construction shall be connected to a MAINS socket outlet with a protective earthing connection.

WARNING: To prevent injury, this apparatus must be securely attached to the rack in accordance with the installation instructions.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings, install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources, such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.



12. Use only with the cart, tripod, bracket or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from a tip over.

13. Unplug this apparatus during lightning storms or when unused for a long period of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as if the power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.
16. To completely disconnect this equipment from the AC mains, disconnect the power cord from the mains circuit breaker.
17. This unit is fitted with a 3-wire power cord. For safety reasons, THE EARTH LEAD SHOULD NOT BE DISCONNECTED IN ANY CIRCUMSTANCE.



18. Correct disposal of this product: This symbol indicates that this product must not be disposed of with household waste, according to the WEEE Directive (2012/19/EU) and your national law. This product should be taken to a collection center licensed for the recycling of waste electrical and electronic equipment (EEE). The mishandling of this type of waste could have a possible negative impact on the environment and human health due to potentially hazardous substances that are generally associated with EEE. At the same time, your cooperation in the correct disposal of this product will contribute to the efficient use of natural resources. For more information about where you can take your waste equipment for recycling, please contact your local city office, or your household waste collection service.

INSTRUCTIONS DE SECURITE IMPORTANTES


**ATTENTION: RISQUE DE CHOC ELECTRIQUE.
NE PAS OUVRIR**


Le symbole représentant un éclair fêché dans un triangle équilatéral a pour but d'alerter l'utilisateur de la présence d'une "tension dangereuse" non isolée à l'intérieur du boîtier, pouvant être d'une force suffisante pour constituer un risque d'électrocution.



Le point d'exclamation dans un triangle équilatéral a pour but d'alerter l'utilisateur de la présence d'instructions importantes concernant le fonctionnement et la maintenance, dans la documentation qui accompagne l'appareil.

ATTENTION: Appareils de construction de CLASSE I doit être raccordé au réseau électrique via une prise de courant reliée à la terre.

ATTENTION: Pour éviter toute blessure, cet appareil doit être solidement fixé à la torture, conformément aux instructions d'installation.

1. Lisez ces consignes.
2. Conservez ces consignes.
3. Respectez tous les avertissements.
4. Respectez toutes les consignes d'utilisation.
5. N'utilisez jamais l'appareil à proximité d'un liquide.
6. Nettoyez l'appareil avec un chiffon sec.
7. Veillez à ne pas empêcher la bonne ventilation de l'appareil via ses ouïes de ventilation. Respectez les consignes du fabricant concernant l'installation de l'appareil.
8. Ne placez pas l'appareil à proximité d'une source de chaleur telle qu'un chauffe eau, une cuisinière ou tout appareil dégageant de la chaleur (y compris un ampli de puissance).
9. Ne supprimez jamais la sécurité des prises bipolaires ou des prises terre. Les prises bipolaires possèdent deux contacts de largeur différente. Le plus large est le contact de sécurité. Les prises terre possèdent deux contacts plus une mise à la terre servant de sécurité. Si la prise du bloc d'alimentation ou du cordon d'alimentation fourni ne correspond pas à celles de votre installation électrique, faites appel à un électricien pour effectuer le changement de prise.
10. Installez le cordon d'alimentation de telle façon que personne ne puisse marcher dessus et qu'il soit protégé d'arêtes coupantes. Assurez-vous que le cordon d'alimentation est suffisamment protégé, notamment au niveau de sa prise électrique et de l'endroit où il est relié à l'appareil; cela est également valable pour une éventuelle rallonge électrique.
11. Utilisez exclusivement des accessoires et des appareils supplémentaires recommandés par le fabricant.
12. Utilisez exclusivement des chariots, des diables, des présentoirs, des pieds et des surfaces de travail recommandés par le fabricant ou livrés avec le produit. Déplacez précautionneusement tout chariot ou diable chargé pour éviter d'éventuelles blessures en cas de chute.



13. Débranchez l'appareil de la tension secteur en cas d'orage ou si l'appareil reste inutilisé pendant une longue période de temps.
14. Les travaux d'entretien de l'appareil doivent être effectués uniquement par du personnel qualifié. Aucun entretien n'est nécessaire sauf si l'appareil est endommagé de quelque façon que ce soit (dommages sur le cordon d'alimentation ou la prise par exemple), si un liquide ou un objet a pénétré à l'intérieur du châssis, si l'appareil a été exposé à la pluie ou à l'humidité, s'il ne fonctionne pas correctement ou à la suite d'une chute.
15. N'exposez pas cet équipement au fait de tomber goutte à goutte ou au fait d'éclabousser et gardez qu'aucun objet rempli des liquides, comme les vases, n'est placé sur l'équipement.
16. Pour complètement débrancher cet équipement de la conduite principale de courant alternatif, débranchez la corde de pouvoir du disjoncteur de conduite principale.
17. Cette unité est correspondue avec une corde de pouvoir de 3 fils. Pour les raisons de sécurité, L'AVANCE DE TERRE NE DEVRAIT ÊTRE DÉBRANCHÉE DANS AUCUNE CIRCONSTANCE.



18. Mise au rebut appropriée de ce produit: Ce symbole indique qu'en accord avec la directive DEEE (2012/19/EU) et les lois en vigueur dans votre pays, ce produit ne doit pas être jeté avec les déchets ménagers. Ce produit doit être déposé dans un point de collecte agréé pour le recyclage des déchets d'équipements électriques et électroniques (EEE). Une mauvaise manipulation de ce type de déchets pourrait avoir un impact négatif sur l'environnement et la santé à cause des substances potentiellement dangereuses généralement associées à ces équipements. n même temps, votre coopération dans la mise au rebut de ce produit contribuera à l'utilisation efficace des ressources naturelles. Pour plus d'informations sur l'endroit où vous pouvez déposer vos déchets d'équipements pour le recyclage, veuillez contacter votre mairie ou votre centre local de collecte des déchets.

Installing Your Amplifier: Electrical Considerations

The amplifier has been manufactured to comply with your local power supply requirements, but before connecting the unit to the supply, ensure that the voltage (printed on the rear panel) is correct.

The amplifier is fitted with either a 100/120V or 220/240V tapped transformer according to customer requirements.

Make sure power outlets conform to the power requirements listed on the back of the unit. Damage caused by connecting to improper AC voltage is not covered by the warranty.

SAFETY WARNING

Where a MAINS plug or appliance coupler is used as the disconnect device, it should remain readily operable.

Where the amplifier is mounted in a rack and permanently connected to the mains, then the rack should be installed with a readily accessible connector or an ALL POLE circuit breaker with 3mm breaking distances.

This unit is fitted with a 3-wire power cord.

For safety reasons,

THE EARTH LEAD SHOULD NOT BE DISCONNECTED IN ANY CIRCUMSTANCE.

If ground loops are encountered consult the section on connecting your amplifier on page 11.

The wiring colours are:

230V AREAS: EARTH = GREEN AND YELLOW
NEUTRAL = BLUE
LIVE = BROWN

DO NOT USE THE UNIT IF THE ELECTRICAL POWER CORD IS FRAYED OR BROKEN. The power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords and plugs and the point where they exit from the appliance.

ALWAYS OPERATE THE UNIT WITH THE AC GROUND WIRE CONNECTED TO THE ELECTRICAL SYSTEM GROUND. Precautions should be taken so that the means of grounding of a piece of equipment is not defeated.

DO NOT REMOVE THE LID. Removing the lid will expose you to potentially dangerous voltages. There are no user serviceable parts inside.

ESD strikes to the unit's front panel that are in excess of 4000 volts may cause disturbance to the status LEDs on the unit. This will not affect audio performance and will be corrected on the next power up cycle.

Installing Your Amplifier: Mechanical Considerations

To ensure that this equipment performs to specification, it should be mounted in a suitable rack or enclosure as described below. Like all high power amplifiers, it should be kept away from other equipment which is sensitive to magnetic fields. Also, this amplifier may suffer a substantial reduction in performance if it is subjected to, or mounted close to equipment which radiates high RF fields.

Warning: To prevent injury, this apparatus must be securely attached to the rack in accordance with the installation instructions

When mounting the amplifier in a rack or enclosure:

Be aware that...

THE FRONT PANEL IS NOT CAPABLE OF SUPPORTING THE UNIT ON ITS OWN.

Make sure that the rear of the unit is adequately supported. The brackets which are supplied fit standard 19 inch (483mm) rack mounting systems.

ENSURE THERE IS ADEQUATE VENTILATION.

The cooling fans suck cool air in through the front and blow hot air out at the rear of the unit through the ventilating grills. The front and rear of the amplifier should have free exposure to the air (i.e. in a rack leave the front & rear doors off), with 2cm air gap at the sides.

IF AIR IS NOT ALLOWED TO ESCAPE FROM THE REAR, OVER-HEATING WILL OCCUR.

Take care when mounting other equipment in the same rack.

Make sure that the rack unit has a separate earth connection (technical earth).

Please also see the notes regarding maintenance on page 18.

Installing Your Amplifier: RF Emissions

The high frequency resonant converters in the Delta Series amplifiers have been designed to have very low radio frequency (RF) emissions; however even these low level emissions can cause interference with other equipment.

In order for this to be minimised, the amplifier should be mounted in a metal rack enclosure, which should have a separate (technical) Earth. Alternatively, a separate earth should be attached to the amplifier at the rear rack mounting bracket.

About Your Amplifier: Dynamic Amplifier Performance Measurements

The Delta Series are the very latest example of a 'dynamic amplifier'. This new 'breed' of power amplifiers provide very high peak power levels in a much smaller, and lighter, package than previously possible with conventional amplifiers.

They are designed specifically for today's high power audio installations, which use multiple speakers with electronic crossovers or speaker controllers. These systems can handle very high transient signals that far exceed their RMS power rating. The Delta Series amplifiers have been designed to match this requirement and can deliver huge levels of power for short durations.

In order to protect themselves and the loudspeakers that they are driving, continuous signals such as sine waves, are automatically detected and reduced (ramped down) to a safe level.

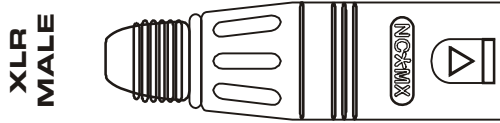
When trying to **measure the power output** however, continuous signals will give totally incorrect results. A dynamic signal, such as a tone burst, should be used and the levels measured by monitoring the waveform on an oscilloscope. The power envelope can then be accurately measured.

Our power output figures are measured using signals with known Crest Factors and are quoted at the rear of this manual on page 20 and on our website.

Please refer to the technical area of our website for further information – here you can download a set of Crest Factor tailored audio samples to allow you to compare our specifications with any other amplifier.

Connecting To Your Amplifier: Line Inputs and Outputs

The inputs are made via 3-pin XLR connectors, which are electronically balanced and should be connected via a high grade twin core screened cable, as follows:



PIN1: Screen (see note below)
PIN2: Hot (signal +)
PIN3: Cold (signal -)

The amplifier is designed to operate with fully balanced equipment and ground loops or loss of performance may be experienced if connected to unbalanced sources. If it is unavoidable however, the following wiring should be used. The cable should still be twin core plus screen.

PIN1: Screen - connected to the chassis of the unbalanced equipment - or left disconnected at the unbalanced end.
PIN2: Hot (signal +)
PIN3: Cold (ground 0V)

NOTE: This amplifier is wired to the latest industry recommendations. PIN1 is connected directly to the chassis/mains earth. If ground loops (mains hum) are encountered remove the screen connection from the other end of the cable and leave it open circuit. If problems persist, consult your dealer/supplier.

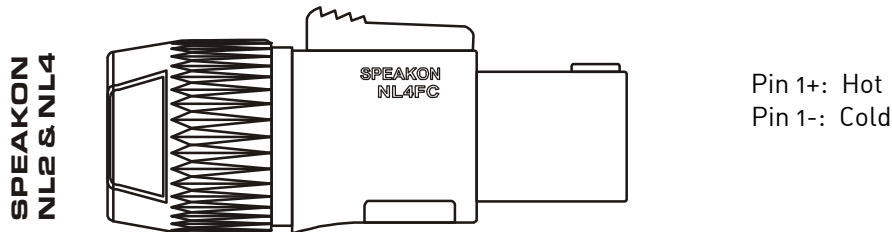
DO NOT TAMPER WITH OR ALTER ANY GROUND (EARTH) CONNECTIONS INSIDE THE AMPLIFIER.

For bridged operation input should be made to channel A (or C) only and the channels set for bridged mode for the appropriate pair of channels. Please see page 13 for details of how to do this.

Connecting To Your Amplifier: Speaker Outputs

For all four channel amplifiers (and excluding the Delta 120):

The speaker outputs are via Neutrik Speakon connectors. 2 pole (NL2FC) or 4 pole (NL4FC) connectors can be used.



Additionally, Channel 1 Speakon connector carries Channel B2 output on Pins +2 & -2 to allow easy bi-amping or bridged operation using a single NL4 connector. Similarly, Channel 3's Speakon connector also carries Channel 4 output.

Output Connector 1

Pin 2+: Hot Ch. 2
Pin 2-: Cold Ch. 2

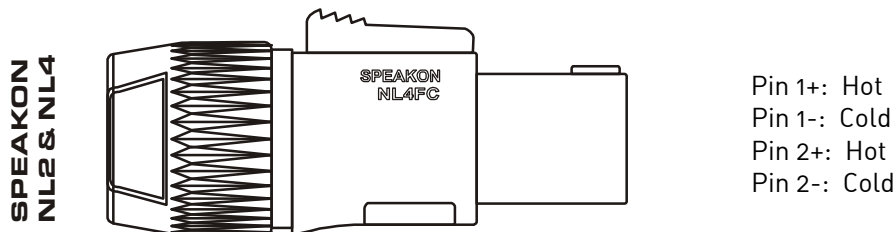
Output Connector 3

Pin 2+: Hot Ch. 4
Pin 2-: Cold Ch. 4

For bi-amped operation, connect as above.

For the Delta 120 two channel amplifier:

Bridging is NOT possible on the Delta 120. Due to the high output currents involved, each channel's Speakon connector uses both pairs of poles as below:



There must be no shared connections between channels.

Negative output terminals must not be joined together as they are not both at ground potential. Connecting them together will damage the amplifier and void the warranty!

As the currents involved are very high, and to ensure best performance, the speaker cables should be kept as short as possible and conform to the following minimum requirements:

Delta 40 NON-DSP, 11A into 4 Ohm speaker loads
Delta 80 NON-DSP, 14A into 4 Ohm speaker loads
Delta 100 NON-DSP, 20A into 4 Ohm speaker loads
Delta 120 NON-DSP, 25A into 4 Ohm speaker loads, 35A into 2 Ohm loads

When operating the amplifier into loads of less than 4 Ohms, be aware that the current capacity of the speaker cables will need to be increased above the values quoted here.

Do not connect the inputs/outputs to any other voltage source such as a battery, mains source or power supply, regardless of whether the amplifier is turned on or off.

Do not run the output of any amplifier channel back into another channel's input and do not parallel or series-connect an amplifier output with any other amplifier output.

Connecting To Your Amplifier: Bridged (Mono) Operation (excl. Delta 120)

Pairs of channels may be independently bridged – channel pair 1+2, and/or channel pair 3+4.

The method is the same for both channel pairs:

Select the required bridged mode through the front panel MENU system (see page **Error! Bookmark not defined.** for more information).

Use Channel 1 or 3's Output Speakon connector and connect as follows:

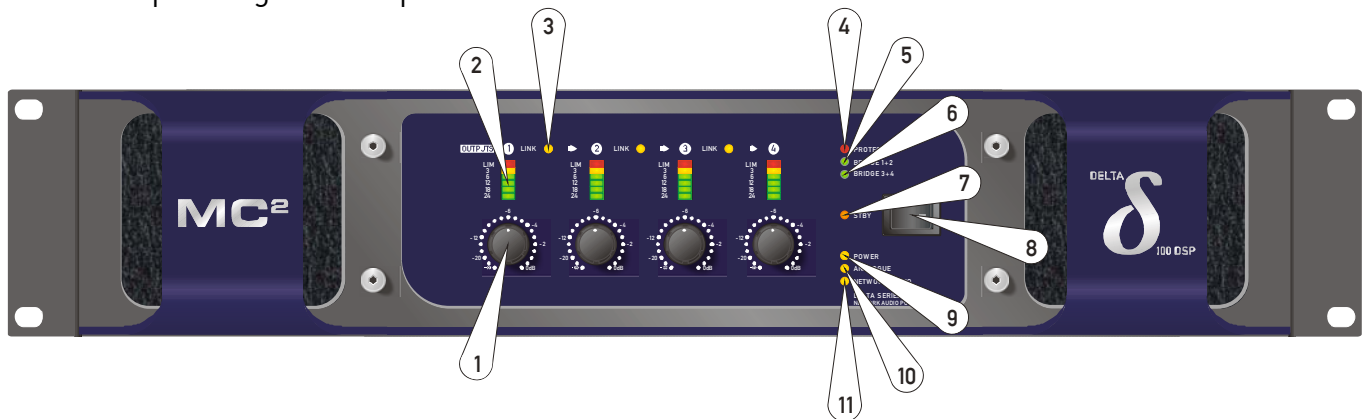
Pin 2+: Hot
Pin 1-: Cold

When operating in bridged mode, the minimum impedances are doubled.

The minimum load in bridged mode is 4 ohms.

Bridging is NOT possible on the Delta 120.

Operating Your Amplifier: Front Panel Controls and Indicators



1: Analogue level controls: These function in both analogue input and network audio input mode. To switch modes, use the rear panel switch as explained further on page 18.

2: Signal meters: These will show the level of the respective amplifier's output channel. The red LED in the meter will illuminate when the limiter threshold has been reached and limiting is occurring.

3: Link LED: This indicates if the channel is linked to its immediate neighbour. If this is illuminated, the attenuation control of the channel to the immediate right will not function as both channels are being fed from the left hand channel. The link switches are on the rear panel – see page NN for details. Linking is disabled in Network Audio mode and Link LEDs will be extinguished.

4: PROTECTION LED: If a condition exists, either internally or externally, that could cause damage to either the amplifier or the speakers, the protection circuit will disengage the outputs and this LED will illuminate/flash.

Typical conditions that could cause the protection to be triggered include very high frequency or subsonic input signals, DC in the inputs, short-circuited outputs, or internal high temperatures.

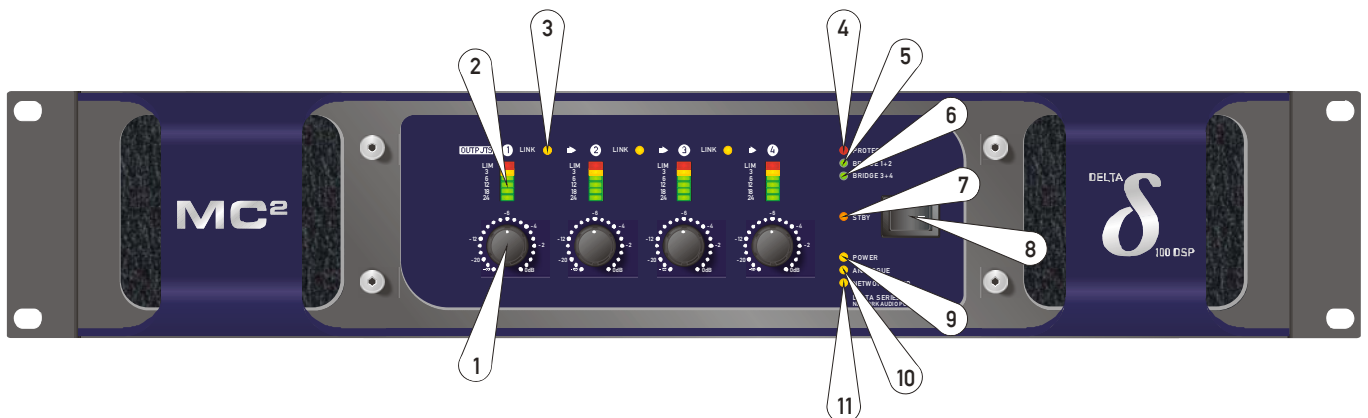
The protection circuit can affect all channels or a 'channel pair' depending on the type of fault. This is indicated by the combination of Protection LED illuminating and a corresponding message on the LCD. In this way, it is possible for two channels (a channel pair) to remain functioning even though a fault has caused the other channel pair to mute. A channel pair would be 1+2 or 3+4.

Temperature related faults will reset automatically if the unit has cooled sufficiently. Output short circuits will require manual reset after clearing the fault (switching off at the mains switch and then on again after a few seconds). Short circuits on either channel of a channel pair will only affect that channel pair.

5,6: BRIDGE pair LEDs: The channel pair LED will illuminate if these channels have been switched into bridged (mono) mode. See page 11 for details of how to connect your speaker to a bridged channel pair, and page **Error! Bookmark not defined.** for how to enable bridge mode.

7: STBY LED: The power amplifiers in the Delta 80 can be powered down leaving just the input circuitry and Dante network audio card (if fitted) active. This LED illuminates when the power amplifier sections are turned OFF.

8: Power Switch: This double pole switch turns the amplifier fully off and isolates it from the mains supply.



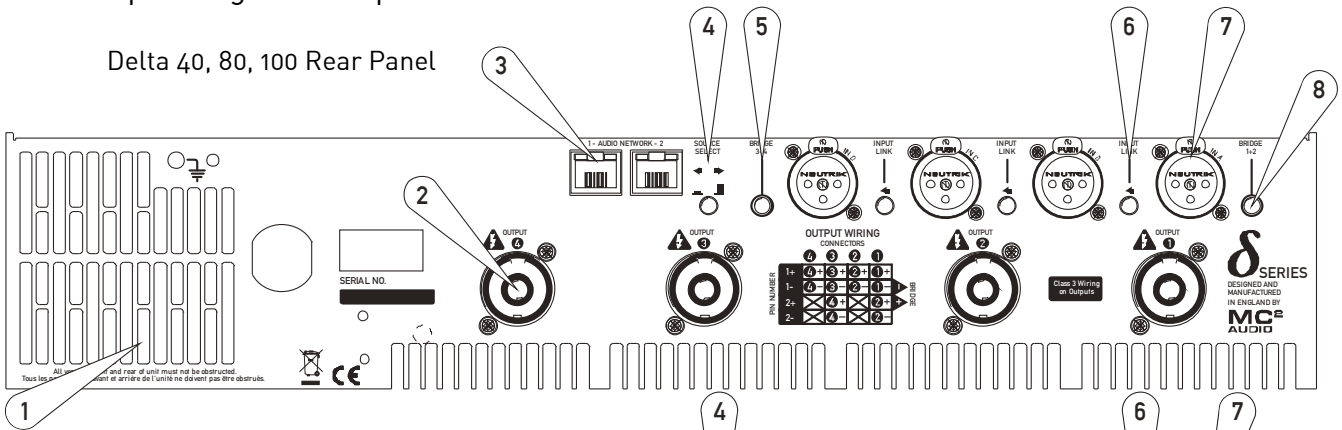
8: POWER LED: This will illuminate when the Power Switch is ON. It is not an indicator of connected supply.

9: ANALOGUE LED: This illuminates when the selected source is the four input XLRs.

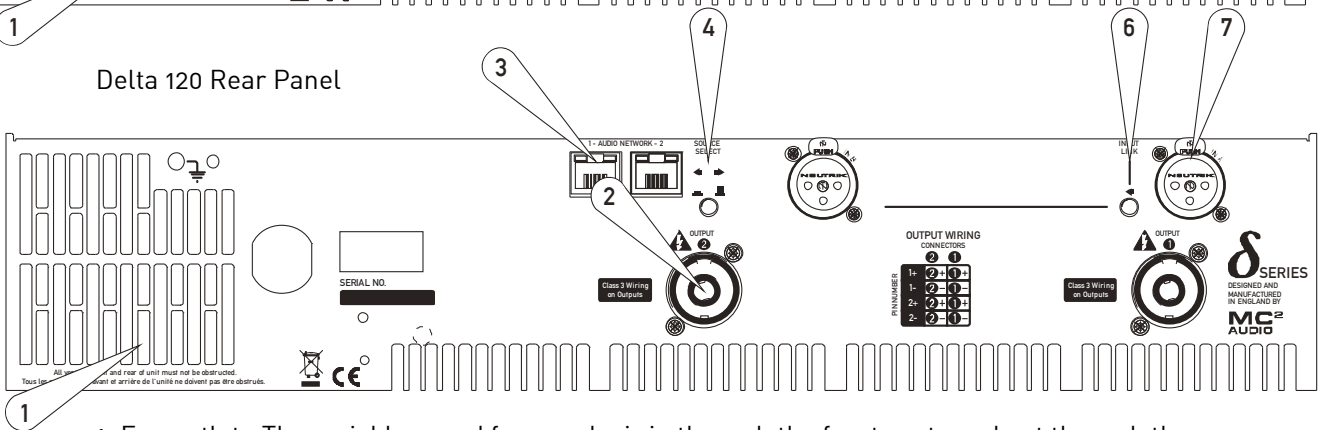
10: NETWORK AUDIO LED: This will illuminate when the selected source is the network audio connection. To switch modes, use the rear panel switch as explained further on page 18.

Operating Your Amplifier: Rear Panel Sockets and Switches

Delta 40, 80, 100 Rear Panel



Delta 120 Rear Panel



1: Fan outlet: The variable speed fans suck air in through the front vents and out through the back of the amplifier. Please see maintenance on page 18 for recommendations on how to clean this and the front foam sections.

2: Channel output Speakon socket: Normal output is on pins 1+ hot, 1- cold. On quad channel amplifiers, (**Delta 40, 80, 100**) Channel B's output is also wired to this socket to enable a single NL4 to provide both channels and to facilitate easier wiring in bridged mode. Channel B is wired pins 2+ hot, 2- cold. Similarly channel C's output Speakon socket carries Channel D's output. Check the table on the rear panel for details. On dual channel amplifiers (**Delta 120**) the second pair of pins on the Speakon carry the same channel again for greater current delivery.

3: Audio network connections: Four (two on Delta 120) additional inputs can be added to the available input choices via the optional Dante network card.

4: Source select switch: This selects either the four analogue input XLRs or the output of the network audio card as the audio source. It operates globally across all four channels (two on a Delta 120). See page 18 for more information.

5/8: Bridged (mono) switch [3+4]/(1+2): Press this switch to run this pair of amplifier channels in bridged mode. To run 1+2 bridged, press the switch on the far left of the panel, beside channel A's input XLR. **Bridging is NOT possible on the Delta 120.**

6: Link switch: Press this switch to link the input of the channel to its immediate left. Multiple channels may be linked using these switches so, for example, to link all outputs to input A, press all three switches IN and use input A only. The front panel attenuators will still operate independently when channels are linked. Linking is disabled in Network Audio mode and Link LEDs will be extinguished.

7: Input XLR sockets: Connect signal inputs to these sockets, wired pin 2 hot, 3 cold, 1 ground. For sensitivity and impedance of these inputs, see the specifications on page 20.

Operating Your Amplifier: Initial Set-up and Switching On

Please read all documentation before operating your amplifier and retain all documentation for future reference.

Do not spill water or other liquids into or on the unit and do not operate your amplifier while standing in liquid.

Do not block fan intake or rear ventilation outlets or operate the unit in an environment that could impede the free flow of air around the unit.

If your amplifier is used in an extremely dusty or smoky environment, it should be cleaned of any collected debris at regular intervals. Please also see the notes regarding maintenance on page 18.

It is important that the power output of your amplifier is matched to the power handling capacity of your loudspeaker. If not, damage to the loudspeaker could occur.

Switching On...

At 'switch-on' the protection circuit will initially activate whilst the circuits stabilise, indicated by the red Protection LED illuminating, in addition to various other LEDs. After a few seconds the red Protection LED will extinguish indicating a satisfactory working condition.

Other LEDs may remain illuminated depending upon rear panel switch settings and input connections. If the Protection LED does not extinguish after 5 seconds the unit may be faulty or some external connections may be incorrect or inappropriate. If this occurs, you should power down the unit and remove all external connections (except for the mains power supply) and repeat the power up sequence. If the problem persists please contact us – details on page 19.

Operating Your Amplifier: Switching between analogue & networked audio

Your amplifier may be fitted with a Dante network audio cord, which includes 24-bit 96kHz high performance analogue to digital converters, allowing the amplifier to use four channels chosen from a Dante network.

As the digital audio network will most likely be running at a higher level compared to your analogue inputs, we strongly recommend you turn the front panel attenuators to minimum before switching modes.

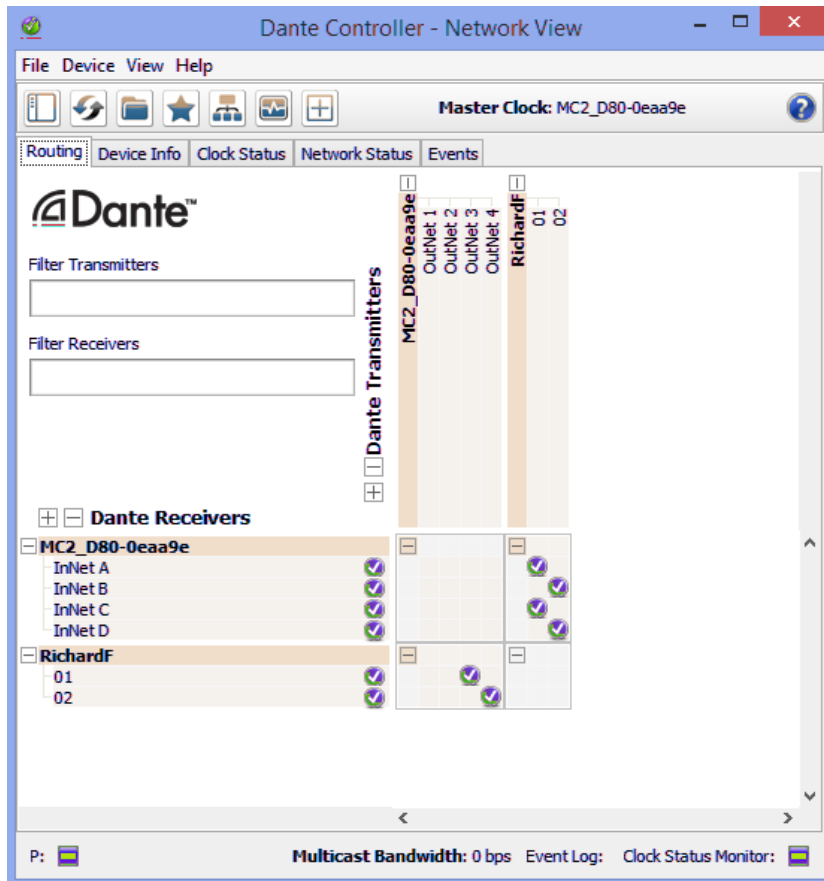
To switch to network audio mode, depress the rear panel switch marked “Source Select”.

Slowly increase the levels again after the mode has been changed.

You will need to use Dante Controller to choose which channels to feed to the amplifier’s inputs. It can be downloaded free here:

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

The amplifier’s inputs will appear in a manner similar to the example below:



Note that the rear panel “Link” switches do not function in Network Audio mode as any linkage can be set up as part of the source selection within Dante Controller. Front panel “Link” LEDs will also extinguish.

Looking After Your Amplifier: Maintenance

These maintenance instructions are for use by qualified personnel only. Before any routine maintenance, please ensure that your amplifier is disconnected from the mains supply!

The filter behind the air intake apertures on the front of your amplifier should be cleaned or replaced periodically, e.g. 3 -6 months. (Filters in amplifiers located in more 'dirty' atmospheres may require more frequent maintenance).

The filter should be 'dry' cleaned, using a vacuum cleaner preferably. Running the unit without a filter is not recommended. We recommend replacement of filters every 2-3 years, depending on usage. Replacement filter material is available directly from us.

If the fan vents on the rear of the amplifier develop a build-up of dust/debris on the finger guards, they can be cleaned with a dry paintbrush and a vacuum cleaner.

The casework of the amplifier may be cleaned with a lightly dampened cloth – do not use any solvents as they will damage the paint finish and could remove printing.

If you have any doubts about carrying out maintenance, please refer to a service engineer or contact your local dealer.

Looking After Your Amplifier: Warranty

Your amplifier is guaranteed for a period of five (5) years from the date of manufacture. Please note that this does not apply to OEM versions of the amplifier – please consult your manufacturer for their warranty terms. We hope that it gives you many more years of reliable service than this, but should anything go wrong, please contact us to advise you about repairs or any spares you might require.

Please do not attempt to repair the amplifier yourself as doing so will invalidate the warranty.

Our contact details are:

MC² Audio,
Units 6-8 Kingsgate
Heathpark Industrial Estate
Honiton, Devon
England
EX14 1YG

Tel: +44(0)1404 44633

Fax: +44(0)1404 44660

email: sales@mc2-audio.co.uk for general enquiries

Our website is a great place to get started if you have any questions regarding the general use of your amplifier or need copies of this manual in digital form, or datasheets and photographs. The datasheets also contain architect's and engineer's specifications.

www.mc2-audio.co.uk

Performance Of Your Amplifier: Specifications

Main Specifications

Parameter (Units)	Delta 40	Delta 80	Delta 100	Delta 120
Output Power per channel [Crest Factor = 4.8] (Watts)				
8 Ohms	500	1000	1400	2400
4 Ohms	1000	2000	2700	4600
2.7 Ohms	1400	2200	3700	6250
2 Ohms	1200	2000	3500	6800
Output Power per channel bridged [Crest Factor = 4.8] (Watts)				
8 Ohms	2000	4000	5600	---
4 Ohms	2400	4000	7000	---
THD+N, 4 Ohms (%)				
@1kHz, 1dB below max output power <	0.08	0.08	0.08	0.08
@20Hz - 20kHz, 1dB below max output power <	0.1	0.1	0.1	0.1
Gain Options (dB)	26/32	26/32	26/32	26/32
Sensitivity Options for max power (dBu)	6.23	8.79	10.7	13
Sensitivity Options for max power (Volts)	1.59	2.13	2.66	3.48
Frequency Response, +0/0.5dB (Hz)	20 – 20000	20 – 20000	20 – 20000	20 – 20000
Power Consumption, Nominal @ 240V, 4 Ohms (A)	2.9	5.0	7.5	6.4
Power Consumption, Nominal @ 120V, 4 Ohms (A)	6	10.4	15.5	13.2
Dimensions H x W x D (mm)				
Amplifier	88 x 482 x 428	88 x 482 x 428	88 x 482 x 428	88 x 482 x 428
Boxed	230 x 580 x 560	230 x 580 x 560	230 x 580 x 560	230 x 580 x 560
Boxed Shipping – all except UK	250 x 610 x 600	250 x 610 x 600	250 x 610 x 600	250 x 610 x 600
Weight (kgs)				
Amplifier	10.0	10.1	10.8	12.25
Boxed – shipping	12.0	11.6	12.3	14.25

Additional Specifications

Parameter (Units)	Delta 40	Delta 80	Delta 100	Delta 120
Input Impedance – Active Balanced (Ohms)	20k	20k	20k	20k
Input CMRR (dB)	> 60	> 60	> 60	> 60
Damping Factor, 1kHz, 8 ohms	> 400	> 400	> 400	> 400
Signal Limiters Present	Yes	Yes	Yes	Yes
Protection Present – Short Circuit / DC Output / Temperature	Yes	Yes	Yes	Yes
Mains In-rush Control Present	Yes	Yes	Yes	Yes
Output Power per channel, 8 Ohms (Watts)				
Continuous music [Crest Factor of 2.8 or 9dB]	485	975	1360	2350
Continuous music [Crest Factor of 4.8 or 14dB]	500	1000	1400	2400
Continuous music [Crest Factor of 7.8 or 18dB]	515	1025	1440	2450
Output Power per channel, 4 Ohms (Watts)				
Continuous music [Crest Factor of 2.8 or 9dB]	970	1950	2620	4600
Continuous music [Crest Factor of 4.8 or 14dB]	1000	2000	2700	4700
Continuous music [Crest Factor of 7.8 or 18dB]	1030	2050	2780	4800
Output Power per channel, 2.7 Ohms (Watts)				
Continuous music with Crest Factor of 2.8 [9dB]	1365	1960	3600	6050
Continuous music with Crest Factor of 4.8 [14dB]	1400	2010	3700	6250
Continuous music with Crest Factor of 7.8 [18dB]	1435	2060	3880	6350

Due to continuing product improvement, the above specifications are subject to change.

Performance Of Your Amplifier: Thermal Specifications

Power Consumption and Thermal Emissions – Delta 40

Mains (V)	Load (R)	Current Draw (A)				Thermal Emissions (W)			
		No Sig'l	Light	Average	Heavy	No Sig'l	Light	Average	Heavy
240	8	1.0	1.4	2.1	3.7	240	251	269	312
240	4	1.0	1.7	2.9	5.8	240	258	290	366
240	2.7	1.0	1.9	3.4	7.1	240	264	304	402
120	8	2.2	3.0	4.4	7.7	267	277	295	338
120	4	2.2	3.6	6.0	11.7	267	285	317	392
120	2.7	2.2	4.0	7.1	14.5	267	290	331	428

Power Consumption and Thermal Emissions – Delta 80

Mains (V)	Load (R)	Current Draw (A)				Thermal Emissions (W)			
		No Sig'l	Light	Average	Heavy	No Sig'l	Light	Average	Heavy
240	8	1.5	2.2	3.4	6.3	360	378	410	486
240	4	1.5	2.8	5.0	10.3	360	394	453	593
240	2.7	1.5	3.1	5.8	12.4	360	402	474	647
120	8	3.3	4.7	7.1	12.9	400	418	450	526
120	4	3.3	5.9	10.4	21.0	400	434	493	633
120	2.7	3.3	6.5	12.0	25.1	400	442	514	687

Power Consumption and Thermal Emissions – Delta 100

Mains (V)	Load (R)	Current Draw (A)				Thermal Emissions (W)			
		No Sig'l	Light	Average	Heavy	No Sig'l	Light	Average	Heavy
240	8	2.1	3.2	5.1	9.6	504	533	582	701
240	4	2.1	4.1	7.5	15.7	504	557	647	863
240	2.7	2.1	4.6	8.9	19.1	504	570	682	953
120	8	4.7	6.9	10.6	19.6	560	589	638	757
120	4	4.7	8.7	15.5	31.9	560	613	703	919
120	2.7	4.7	9.7	18.2	38.7	560	626	738	1009

Power Consumption and Thermal Emissions – Delta 120

Mains (V)	Load (R)	(A)	Current Draw (A)			Thermal Emissions (W)				
			No Sig'l	Light	Average	Heavy	No Sig'l	Light	Average	Heavy
240	8		1.8	2.7	4.3	8.2	432	457	499	601
240	4		1.8	3.5	6.4	13.4	432	477	553	737
240	2		1.8	3.9	7.5	16.1	432	487	582	809
120	8		4.0	5.9	9.1	16.8	480	505	547	649
120	4		4.0	7.4	13.2	27.1	480	525	601	785
120	2		4.0	8.2	15.3	32.6	480	535	630	857

No Sig'l = Quiescent, Light = Crest Factor of 7.8(18dB),

Average = Crest Factor of 4.8(14dB), Heavy = Crest Factor of 2.8(9dB)

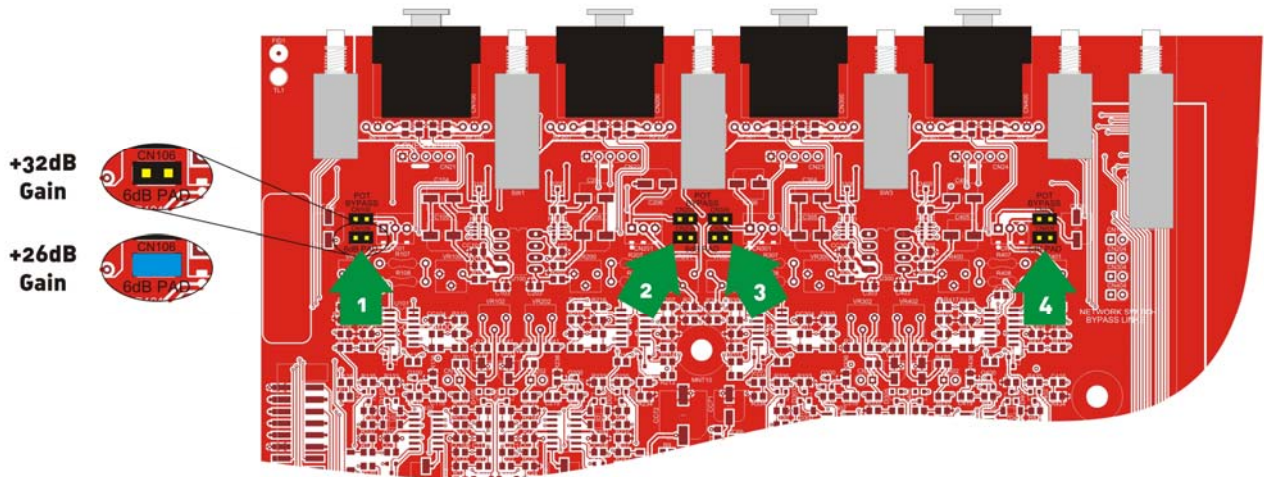
For details of measurement methods please refer to the Technical Support area of our website.

Internal Adjustments To Your Amplifier: Changing the Gain

These instructions are for use by qualified personnel only. Before any routine maintenance, please ensure that your amplifier is disconnected from the mains supply!

Gain/Sensitivity Settings

Adjustment is by adding a link on the input PCB – one link for each channel. Channel A's link is number 1 (CN106), channel B's is number 2 (CN206) and so on. The gain may be set to 26, or 32 (factory default setting).



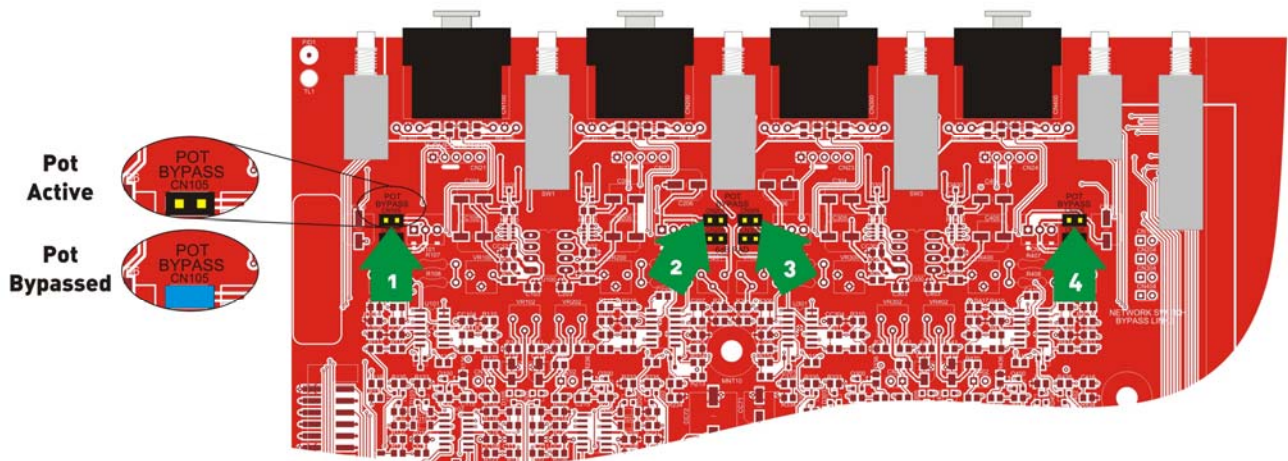
Remember, setting higher gain does not change the maximum available power but changes the level of signal input to achieve maximum power. In any case, provided that the input signal is less than 20dBu/7.7V, the built in limiter circuit will prevent distortion within the amplifier.

The gain should be set to match the signal level from the source – using the network audio inputs will normally result in the amplifier running “hotter” than usual, so adding these links and turning down the front panel attenuators will help.

Internal Adjustments To Your Amplifier: Disabling Front Panel Gain Pots

These instructions are for use by qualified personnel only. Before any routine maintenance, please ensure that your amplifier is disconnected from the mains supply!

For added security the front panel potentiometers can be disabled, preventing unwanted tampering with gain settings of any amplifier. This is achieved by setting links on the input board internally.



Adding a link to CN105 disables the pot for channel A, CN205 disables the pot for channel B, and so on.

Once disabled, the pot gain is set to 0dB (no attenuation).

Ensure that all four links are added/removed together to avoid any confusion and unnecessary service calls!