

DS8000

AUDIO DISTRIBUTION SYSTEM

Operator's Manual Revision 1.13

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DECLARATION OF CONFORMITY

We, the manufacturer:

**XTA Electronics Limited,
The Design House
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Stourport on Severn
Worcestershire
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DY13 9BZ**

acknowledge our responsibility that the following products:

**Kind of equipment: Audio Splitter
Commodity Code: 8518408990
Type Designation: DS8000**

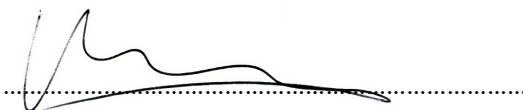
is manufactured:

in accordance with EMC Directive 2004/108/EC,
in compliance with the following norm(s) or document(s):
Technical Regulations: EN55103-1:1996, EN55103-2:1996

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: May 2012



THANKS

Thank you for choosing a DS8000 audio distribution system 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 XTA 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 XTA product, please contact us.

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



INTRODUCTION

Taking on board all the welcome feedback we have received over the years about the DS800, we've redesigned our famous mic/line distribution system "from the ground up", and are proud to introduce the DS8000.

Featuring all new microphone pre-amps designed by Gottlier award winning Alex Cooper, the DS8000 offers many novel facilities including a dual redundant power supply, simple Outside Broadcast "one to many" split switching and 48V "safe" functions to prevent tampering.

Subtle panel lighting for dark under-stage environments and the option of adding an ADC card for integration into digital networks, plus bespoke new output transformers all combine to produce a package that enhances its predecessor's reputation as a flexible, rugged high quality distribution system.

The DS8000 is a 2U, 8 input to 32 output mic/line distribution system with 16 transformer balanced isolated outputs, and 16 electronically balanced outputs fitted as standard. Input transformers can be ordered as an option, as can the replacement of the electronically balanced outputs with transformer balanced outputs.

Additionally, the "D" version of the unit can be factory fitted (non-retrofittable) with an AES output card that combines "XTA-grade" performance analogue to digital converters with microprocessor controlled digital output capabilities, providing two sets of independent AES digital outs with adjustable sample rate, and internal/external word clock sync capability.



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 point 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.

INSTRUCTIONS DE SECURITE IMPORTANTES



ATTENTION: RISQUE DE CHOC ELECTRIQUE. NE PAS OUVRIR



Le symbole représentant un éclair fléché 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.

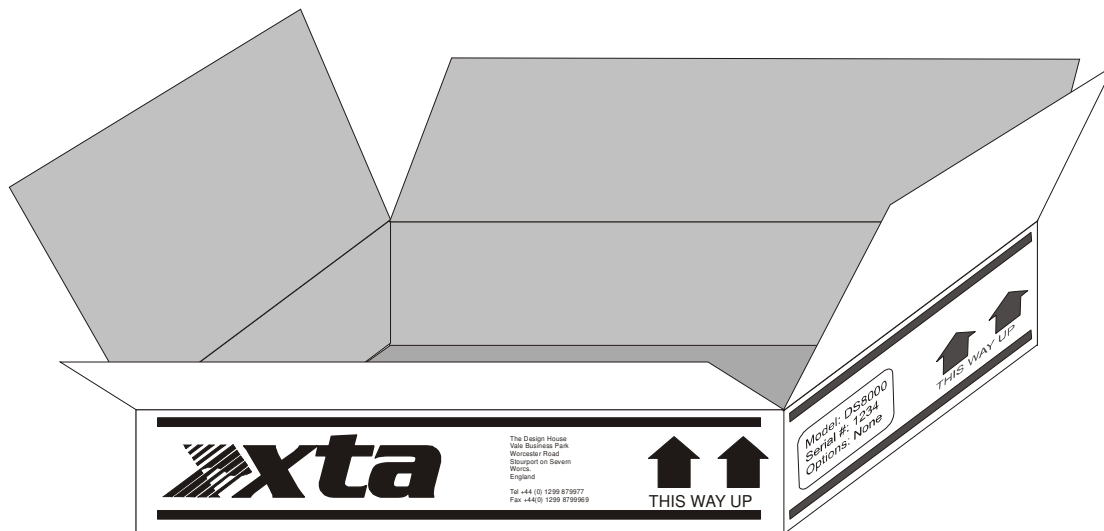
ATTENTION: Pour éviter toute blessure, cet appareil doit être solidement fixé à la torture, conformément aux instructions d'installation.

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 ouvertures 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 chauffage, 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 garantisiez 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.

Installing your DS8000:

Unpacking

After unpacking the unit, please check it carefully for any damage. If any is found, immediately notify the carrier concerned - you, the consignee, must instigate any claim. Please retain all packaging in case of future re-shipment.



Electrical Considerations

The unit is fitted with a universal power supply that will operate from 100V to 240V AC mains. 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.

Mechanical Considerations

To ensure that this equipment performs to specification, it should be mounted in a suitable rack or enclosure. As this unit is convection cooled, ensure that there is adequate clearance around the vents on the sides of the unit to allow air to circulate.

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

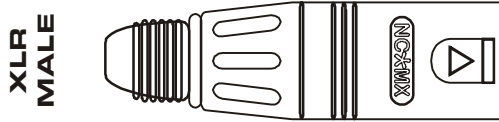
Please also see the notes regarding maintenance on page 23.



Connecting your DS8000:

Inputs

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



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

The unit 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 +)

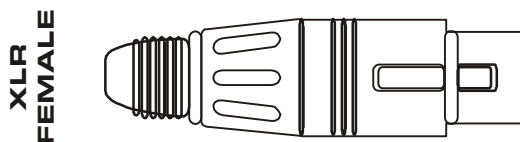
PIN3: Cold (ground 0V)

NOTE: This unit is wired to the latest industry recommendations. PIN1 is connected directly to the chassis/mains earth on the FOH and MON outputs only. If ground loops (mains hum) are encountered try using the ground lift switches on the rear panel. If problems persist, consult your dealer/supplier.

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

Outputs

Outputs are also made via 3-pin XLR connectors wired as follows:



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

Note that the rear panel outputs are electronically balanced and so are not galvanically (electrically) isolated. Front panel outputs are transformer balanced and so are isolated.

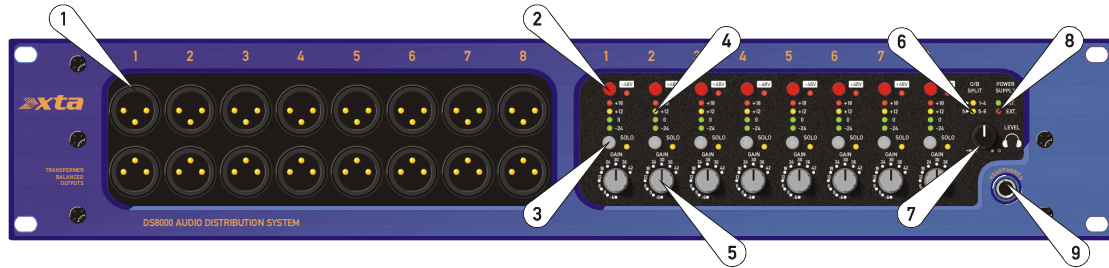
External Supply

This socket must only be used to connect directly to another DS8000 and NOT as an input from a separate supply. Attempting to connect another supply to this socket will damage the unit and invalidate the warranty.

Connection to another DS8000 is via a standard 5-pin to 5-pin XLR cable wired 1-1. Please keep this cable as short as possible (ideally 1-2 metres maximum) to prevent voltage drop affecting both units' performance in the event of a back-up situation.

Operating your DS8000:

Front Panel Controls and Sockets



1: Transformer balanced outputs: These are post gain control and are galvanically isolated. Pin 1 on the XLR sockets is NOT connected by default, but this can be changed if required – please see notes on page 17 for more information.

2: 48V phantom power switch and indicator: Press this to send 48V phantom power to this input socket. Note that the indicator will illuminate even if the rear “PANEL SAFE” switch has been pressed. Please check this switch if no phantom power seems to be present.

3: Solo listen switch and indicator: Press this to send the respective input channel signal to the solo bus, and to the headphone amp (on this unit). Solo switching is additive so more than one may be enabled at once and they will mix on the bus. It's good practice to make sure you turn solos off even if you unplug your headphones, especially when you have the solo bus connected between units, as a stray solo left on can waste hours looking for the odd signal you can hear in your headphones if it is on a different but connected unit! Note that if an “O/B Split” is enabled then the solo switch on a “slave” channel will STILL route the respective input to the solo bus.

4: Channel output meter: This meter shows output level relative to the electronic MON and FOH outputs. It is affected by the gain control.

5: Gain control: This rotary switch allows the input gain for the respective channel to be adjusted and has a wide enough range to cater for microphone level signals (and amplify them to line level) as well as padding down “very hot” line level signals if required.

6: O/B Split indicators: These LEDs show the status of the rear panel “O/B Split” switches – if illuminated, then the respective input (1 or 5) is routed to multiple channels' outputs (for input 1 this is all outputs on channels 1-4, and for input 5, this is all outputs on channels 5-8). For more information on this feature please see page 14.

7: Headphone volume: This control adjusts the level fed to the headphones – remember if all solo switches are OFF, nothing will be heard so it's advisable to turn this down before “soloing” any channel as it may suddenly be very loud!

8: Power supply status indicators: Under normal circumstances, only the green INT. (Internal) LED should be illuminated, even when two units are interconnected via the external supply sockets on the rear. Should one unit's power fail, the other will supply power to both, and the red EXT. (External) LED will illuminate instead on the “failed” unit.

9: Headphone socket: connect headphones to monitor the solo bus. The headphones channels are driven separately but are mono.

Rear Panel Controls and Sockets



- 1: Mains input socket: Supply voltage is 100-240V AC. This unit must be earthed.
- 2: Word clock and Lock LED: This BNC socket (when ADC option fitted) can provide either a word clock output or input, dependent on the ADC jumper setting). Please see the ADC option set-up, starting on page 18.
- 3: 48V safe switches: These switches allow the disabling of three different 48V controls. If the "MON" safe switch is enabled then sensing of phantom power via all MON output sockets will NOT enable on 48V on the inputs. If the "FOH" safe switch is enabled then sensing of phantom power via all FOH output sockets will NOT enable on 48V on the inputs. If the "PANEL" safe switch is enabled then pressing a "48V" switch on the front panel will NOT enable on 48V on the inputs. Note the LED by the respective 48V will still illuminate, even though 48V is not sent to the input socket.
- 4: Ext. supply socket: Two units can be connected together via a 5-pin to 5-pin XLR cable (wired 1-1) so that, in the event of either unit losing its mains supply, the other unit can power both. Further notes on this feature are given on page 10.
- 5: Solo bus input/output sockets: The solo bus is externally accessible via these sockets, allowing multiple units to share the bus. When units are "daisy-chained" using this bus, plugging headphones into any unit will provide monitoring of any input channel, without needing to move the headphones from unit to unit.
- 6: Input XLR sockets: The input channels are electronically balanced and accept signals up to +26dBu. They have a high input impedance of over 10k ohms so will not "load" microphone signals which can lead to dulling when combined with long cable lengths. For more on this topic, see the section at the end of this manual starting on page 26.
- 7: O/B split switches: To provide more outputs from a single input, rather than have to connect the output of one channel back into the input of another (and in the process, sacrifice performance by having to route some channels through cascaded preamps), this can be performed internally by pressing one of these switches. Input 1 can be routed to drive all outputs on channels 1 to 4 (so providing a 1 to 16 split), and input 5 can split to all outputs on channel 5 to 8. Note that the meters on "slave" channels will show the same reading as the "master" channel, and the gain controls on the slave channels won't adjust their respective output levels.

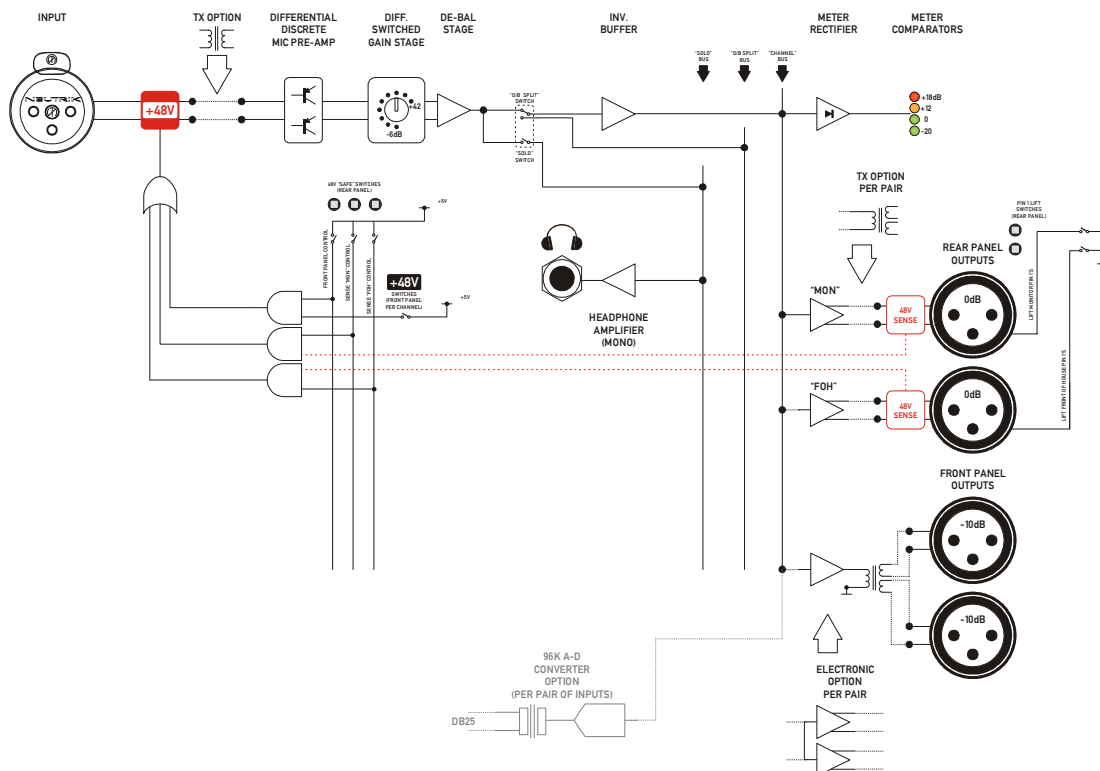
8: AES option: This DB25 socket (not fitted unless option is present) provides multiple AES digital output feeds and may be used in conjunction with the word clock I/O BNC socket. Please see the ADC option set-up, starting on page 18.

9: Pin 1 lift switches: To isolate the ground connections of either the FOH outputs or MON outputs, each bank of eight can have their ground (earth) connection isolated from the local ground within the unit.

10: FOH and MON outputs: The "Front of House" and "Monitor" sockets are electronically balanced outputs with a maximum level of +20dB (into 600R) capable of driving long cables with excellent CMR to minimise noise pick-up.

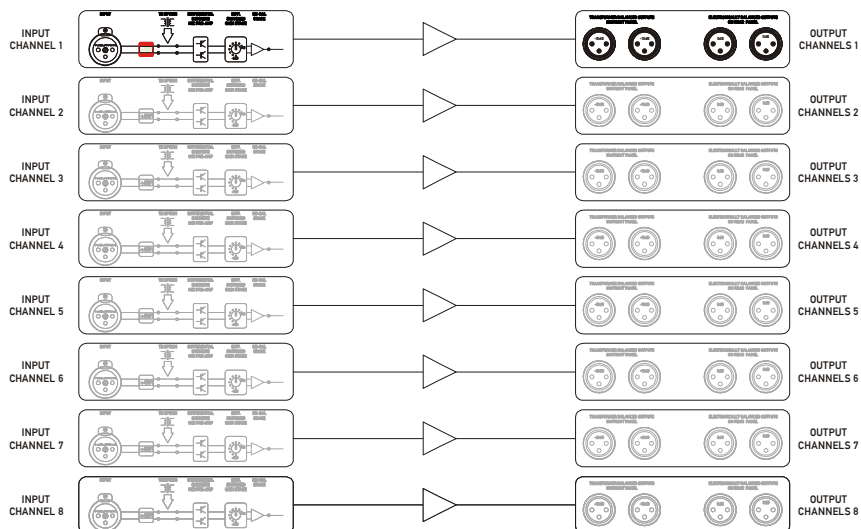
11: Sample rate LED: Tri-colour LED shows sample rate of AES outputs (if option fitted) Please see the ADC option set-up, starting on page 18.

Internal Block Diagrams and Description

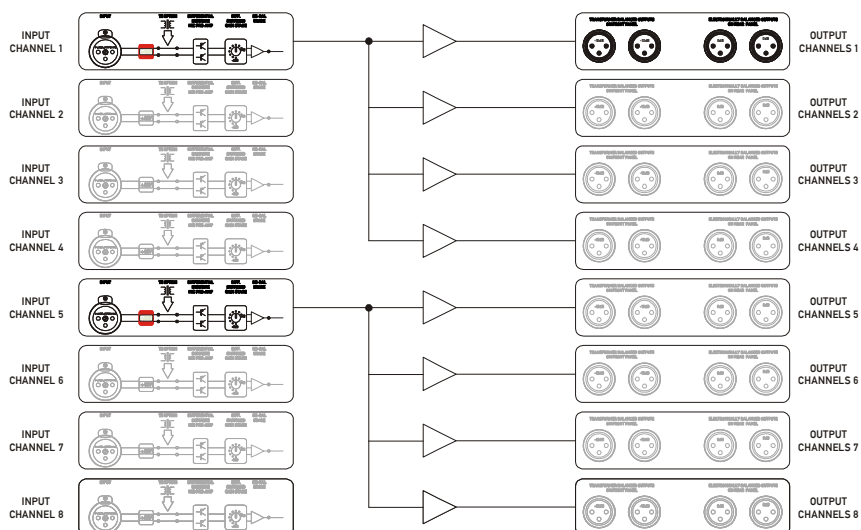


One channel is shown above. The input signal is fed, still balanced, to a discrete transistor pre-amplifier, which includes the gain switching control on the front panel. Following this, the signal is debalanced and fed in parallel to a pair of CMOS soft switches. The front panel "Solo" switch enables the addition of this channel's signal to the solo bus (additive). The rear panel "O/B Split" switch(s) toggle a changeover action between the signal going either directly to an individual channel's bus, or to the "O/B Split" bus which feeds the common bus to a group of four output channels (with 1-4 or 5-8).

The output bus signal is split to individual output drivers in the case of the rear panel electronically balanced outputs (FOH and MON) at 0dB, and a driver for the transformer balanced outputs on the front panel. These outputs are two sets of taps from the same transformer and operate at -10dB. The output bus signal also feeds a precision rectifier stage to drive the channel metering.



Input to output paths with "O/B Split" features disabled.



Input to output paths with "O/B Split" features enabled.

The FOH and MON output sockets also have sensing circuitry to detect the presence of 48V phantom power being sent from a desk. This can then enable the local 48V power to be switched onto the respective input on the unit.

These sense signals are logically controlled – each has a respective rear panel “safe” switch that has to be *disabled* to allow the remote echoing of the sensed phantom power to operate the local source in the unit.

There is also a “safe” switch” to disable the front panel 48V switching if required. This facility does NOT disable the 48V LEDs on the front panel – these will still operate as a safety measure to show which channels will have phantom power applied should the “safe” switch be disabled.

Finally, the solo bus is directly connected to the headphone amplifier and anything switched via the front panel "Solo" switches will be mixed onto this bus along with any incoming signals on the external solo input on the rear panel.

As the monitoring point for the solo signal is before the "O/B Split" switching, enabling a "Solo" on a channel whilst in "O/B Split" mode will still feed the local channel's input signal onto the bus, NOT the signal being derived from the master channel (and being fed to the local channel's outputs).

The metering monitor point is post the "O/B Split" switches so meters will always show the master channel's signal in split mode.



Internal Adjustments of your DS8000:

User options

The following options are adjustable by you, the user, without invalidating the warranty. Please observe the safety warnings before you undertake any of these adjustments!

SAFETY WARNINGS

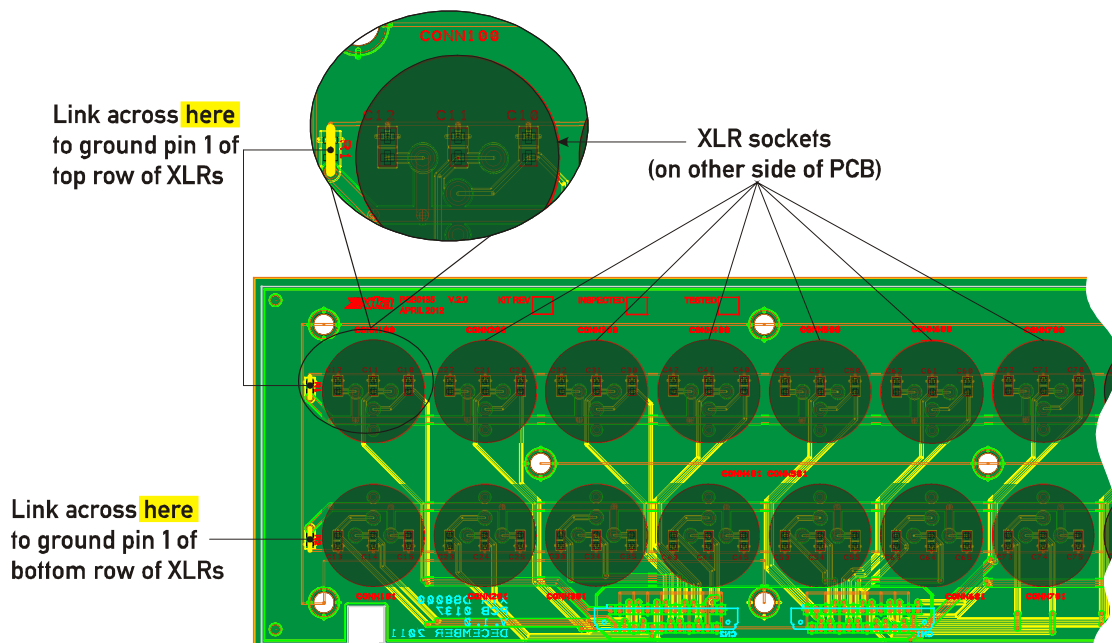
Disconnect the unit from the mains supply before removing the cover!
Lethal voltages in excess of the mains input voltage are present – do not remove the protective cover from the internal power supply!

Grounding pin 1 on front panel transformer balanced outputs

By default, the front panel transformer isolated outputs do not have pin 1 on the XLR sockets connected. This is the most usual way to operate transformer balanced outputs – the grounding use for a shield is derived from the "remote" device, to retain galvanic isolation and prevent possible hum loops or potential differences across various grounds causing other problems.

However, under certain circumstances, it may be preferable to connect this ground. This is achieved by adding links on the rear of the *front panel XLR PCB*. There are two links – one to connect the entire top row to ground, and one for the bottom row.

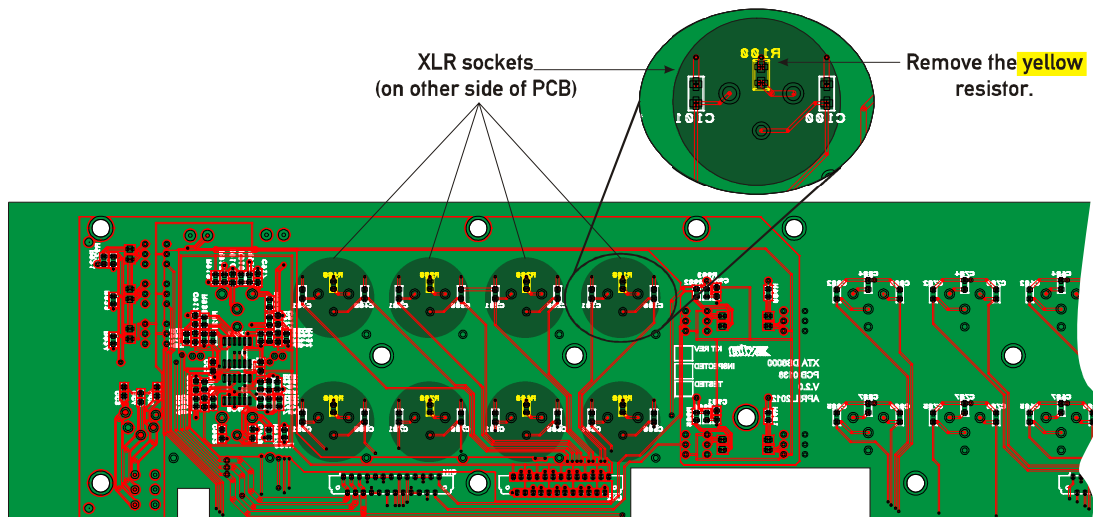
The diagram below shows the rear of the board, when viewed from behind (front panel *facing away from you*) with the link positions highlighted.



Lifting grounds on pin 1 connections on inputs

By default, the inputs have their pin connections grounded, but this can be lifted on an individual input basis, by *removing* the zero Ohm links on the *rear panel PCB*.

The diagram below shows the rear of the board, when viewed from behind (front panel *facing* you) with the link positions by each input highlighted.



AES Digital Output Options

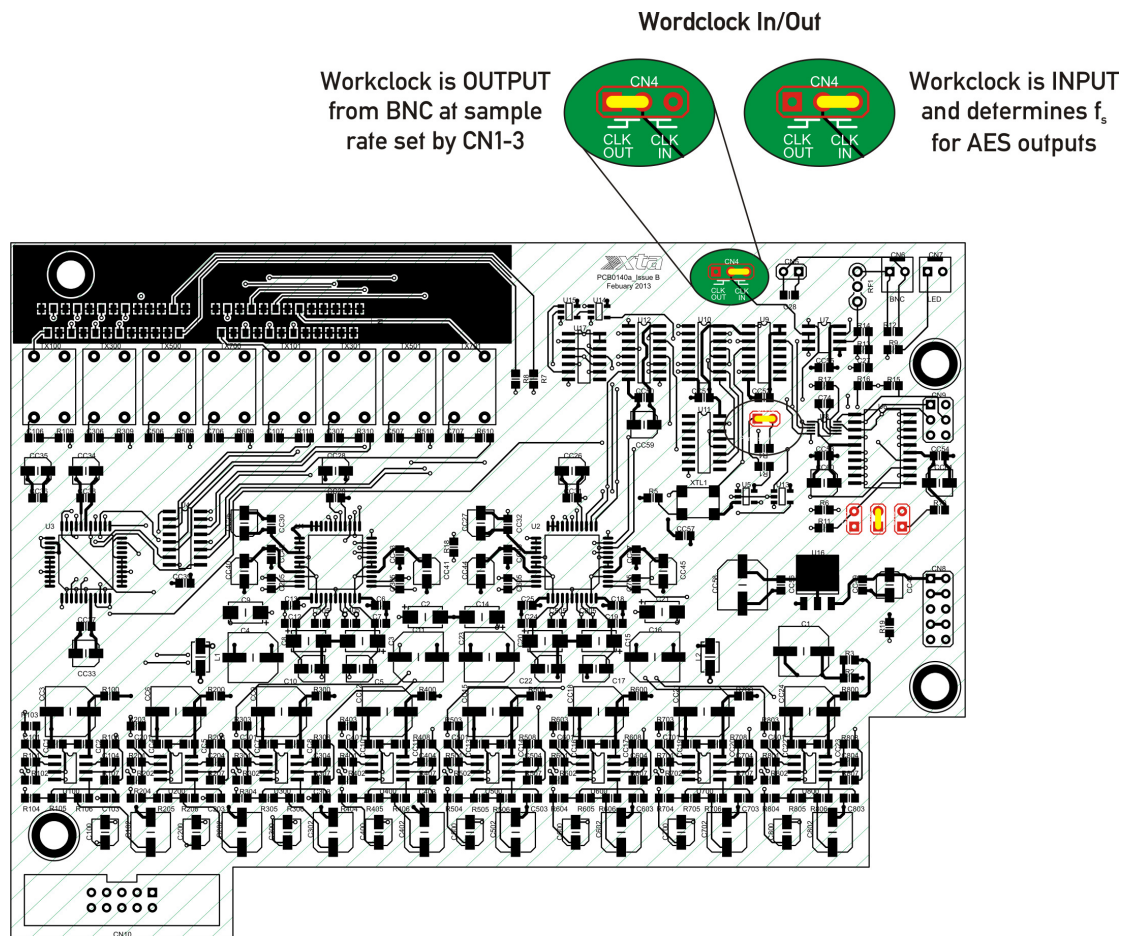
The digital AES option has four user adjustable settings, all selected by internal links on the AES option PCB. These are:

Internal or External wordclock

The DS8000 can either generate the clock for the AES digital outputs using its own internal clock, with adjustable sample rate (48k/96k/192k), or be synchronised via an external clock on the BNC connector.

Default setting as shipped is Internal wordclock (so BNC is an OUTPUT).

This selection is made by adjusting the link on the digital option PCB as show below.



Additionally, when the wordclock is set to internal, the BNC socket becomes an output, allowing additional DS8000s (or other units with a wordclock input) to be synchronised to this unit.

Lock LED operation

When sync is set to external, the lock LED beside the BNC socket will become active. It will be illuminated when a valid clock signal is being received, and flashing when an external clock is present but at an incorrect rate. If it is not illuminated then no signal is being received.

Single flashing indicates external clock at an incorrect sample rate – 5% tolerance for the normally accepted sample rates (so 48/96/192). Unit will switch to internal sync under these circumstances to prevent loss of audio.

Double flashing indicates locking to a clock that is outside the 5% tolerance for the normally accepted sample rates (so 48/96/192) – this is known as permissive mode and is explained below.

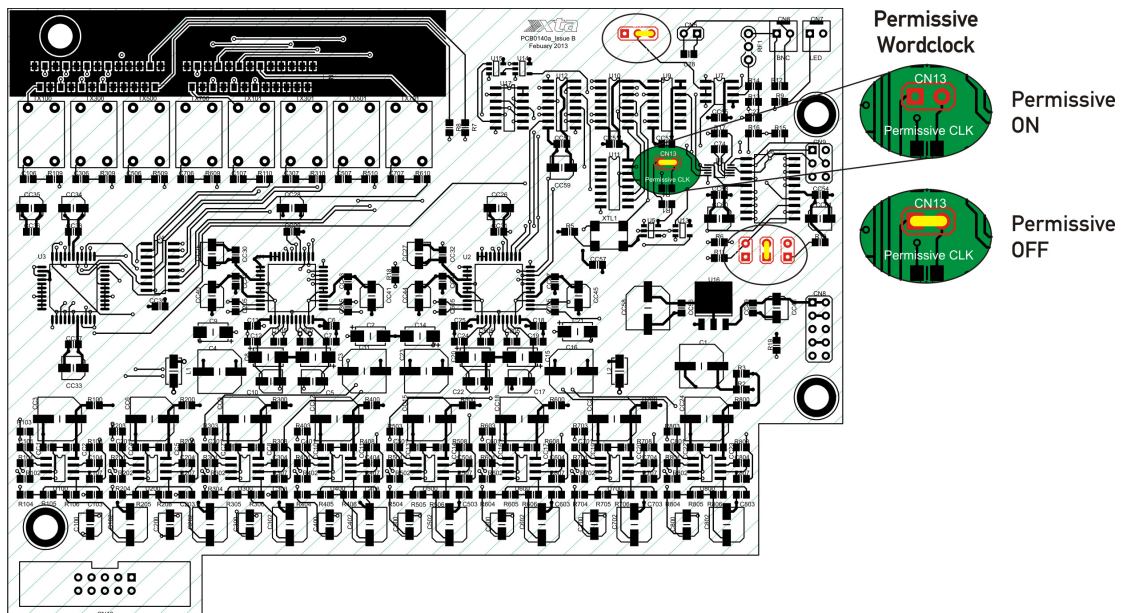
Permissive Clock Mode

When sync is set to external, the DS8000 will only lock to an external wordclock if it falls within close tolerance of a standard professional sample rate – so 48kHz, 96kHz or 192kHz, $\pm 5\%$.

Default setting as shipped is Permissive Mode OFF.

Should there be a requirement to support a non-standard professional rate (such as 44.1kHz or 88.1kHz), permissive clock mode can be enabled which will permit synchronisation from 32kHz up to 224kHz.

This selection is made by adjusting the link on the digital option PCB as show below.



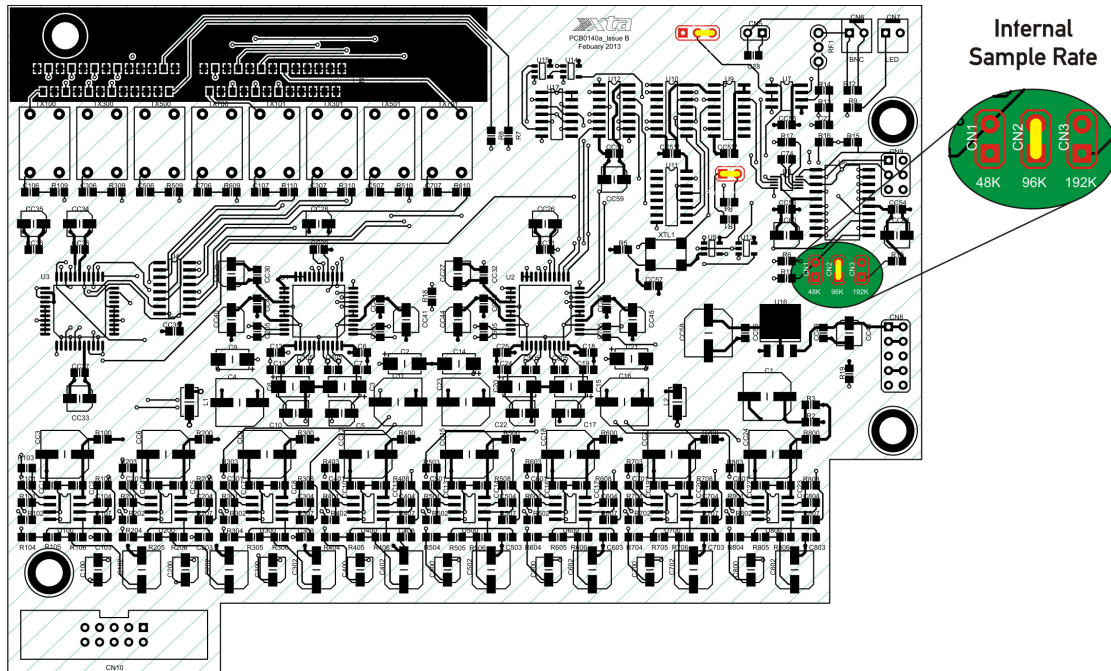
Note: In this mode, the output sample rate will exactly follow the external wordclock sample rate – we recommend only enabling this mode if it is explicitly required, to avoid confusion and synchronisation problems “downstream” from the unit.

Internal Sample Rate

When sync is set to internal, the DS8000 will operate the AES digital outputs at one of three professional rates – 48kHz, 96kHz or 192kHz. The unit's analogue bandwidth extends beyond the typical Nyquist point for 48kHz digital systems, ensuring that the higher sample rates' wider bandwidth may be utilised.

Default setting as shipped is 96kHz.

The rate is adjustable via links on the digital option PCB as show below.



f_s Sample rate LED operation

This tri colour LED will illuminate to show the sample rate being used by the AES outputs:

- Red** = 48kHz
- Yellow** = 96kHz
- Green** = 192kHz

The table below summarises how it operates in both permissive and non-permissive mode.

	No External Clock	External Clock $\pm 5\%$	Ext. Clock 32k-224k
Permissive OFF	Lock LED: Off f_s LED: Int. rate	Lock LED: On f_s LED: Ext. rate	Lock LED: Single flash f_s LED: Int. rate
Permissive ON	Lock LED: Off f_s LED: Int. rate	Lock LED: On f_s LED: Ext. rate	Lock LED: Double flash f_s LED: Ext. rate ¹

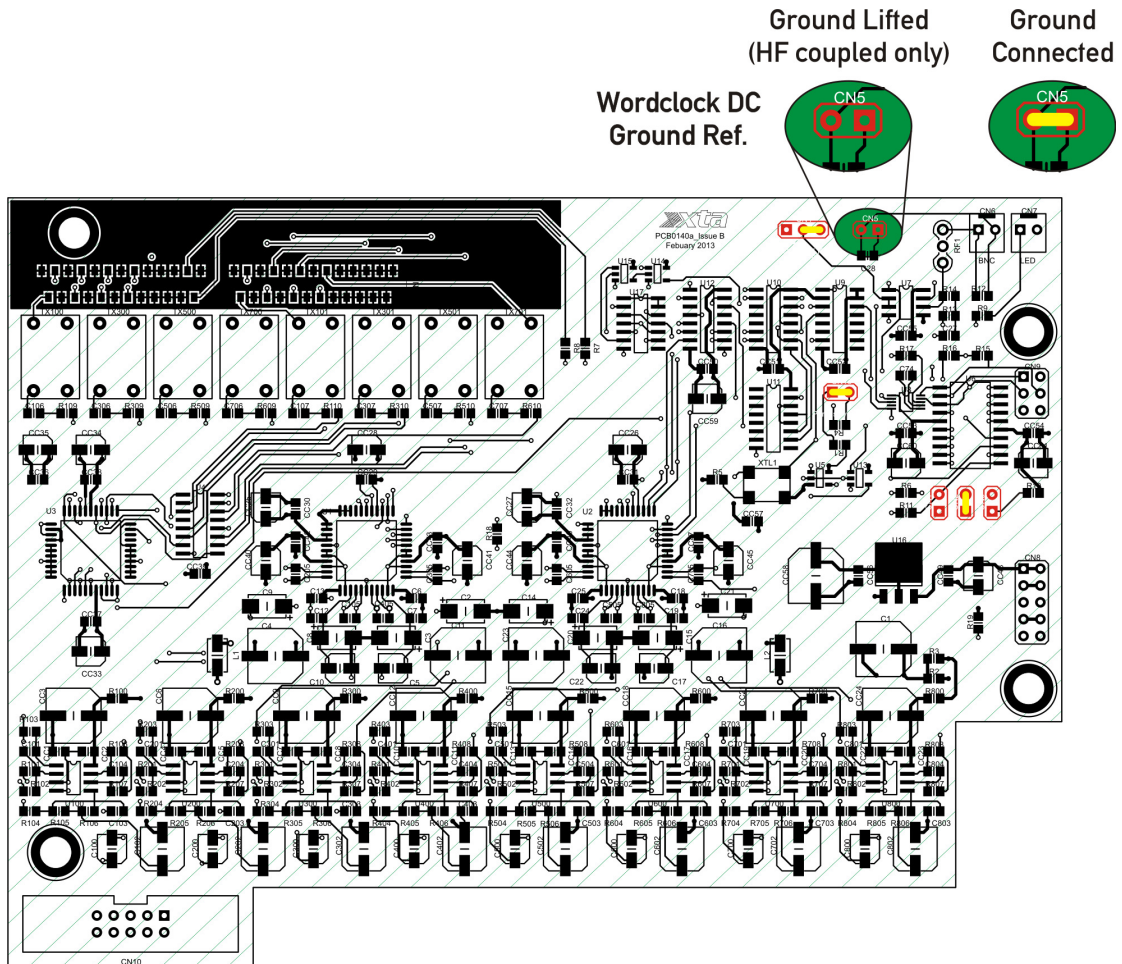
¹ In permissive mode, when external clock is not within 5% of 48/96/192k, sample rate LED will show the *nearest* professional rate.

Wordclock DC Ground Reference (Ground lift)

To minimise the introduction of mains frequency ground loops into the system when connecting to the wordclock BNC, the ground on this connection is only coupled to the internal ground at high frequencies (via a capacitor).

This assumes that the device at the other end of the cable has a mains ground reference. If it does not then the link shown below on the digital option PCB can be fitted.

Default setting as shipped is ground lifted (HF coupled only).



A typical scenario where the ground link might be required would be if the device receiving a wordclock from the DS8000 (or supplying a wordclock sync signal to the DS8000) has an external DC supply or is USB powered from a laptop running on battery power – a high-end USB soundcard for example.

AES Outputs: Pinout and Drive Capabilities

Two transformer balanced, isolated sets of AES outputs are available on the DB25 connector. The wiring follows the TASCAM convention, as shown in the table below:

Output Pair	Hot	Cold	Ground
A1 (Chs 1&2)	24	12	25
A2 (Chs 3&4)	10	23	11
A3 (Chs 5&6)	21	9	22
A4 (Chs 7&8)	7	20	8
B1 (Chs 1&2)	18	6	19
B2 (Chs 3&4)	4	17	5
B3 (Chs 5&6)	15	3	16
B4 (Chs 7&8)	1	14	2

The DS8000's digital outputs utilise industry standard drivers and circuitry to ensure that the performance of the digital outputs is as widely compatible as possible with other professional equipment.

The pairs of outputs will drive into 110R standard loads, tested up to cable distances of 100 metres.

Please ensure that high quality AES specified cable is used for all connections – the use of poor cables on one AES pair may have an adverse effect on the other pair (incorrect terminations/loads on A1 may have an affect B1 and so on).

If you are unsure about what type of cable to use, please feel free to give us a call to discuss your application or email tech@xta.co.uk.

Looking After your DS8000:

Maintenance

Before any routine maintenance, please ensure that your unit is disconnected from the mains supply!

No internal maintenance of the unit is necessary. Check that the vents on the sides of the unit (especially the power supply vents on the right hand side – with front panel facing you) are free of dust and debris build-up. Should they get blocked, clean them using a vacuum cleaner and a soft paintbrush to dislodge any build-up.

The casework of the unit 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.

Warranty

Your DS8000 is guaranteed for a period of five (5) years from the date of purchase. 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 it yourself, as doing so will invalidate the warranty.

Our contact details are:

XTA Electronics Ltd,
The Design House
Vale Business Park
Worcester Road
Stourport on Severn
Worcs
England
DY 13 9BZ

Tel: +44(0)1299 879977

Fax: +44(0)1299 879969

email: sales@xta.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 unit or need copies of this manual in digital form, or datasheets and photographs. The datasheets also contain architect's and engineer's specifications.

www.xta.co.uk



Factory fit options

The following options are available for your unit.

Please note that these are **factory-fit only** options and must be ordered at the time of purchase.

Convert electronic ally balanced inputs to transformer balanced inputs:

This is performed on all eight channels as a group and cannot be applied to individual inputs.

Convert electronic ally balanced rear outputs to transformer balanced outputs:

This is performed on all eight outputs as a group and cannot be applied to individual outputs. Note that this option drops the gain on these outputs by 10dB so they run (with the gain control set to 0dB) at -10dB through the unit.

Convert transformer balanced front outputs to electronically balanced outputs:

This is performed on all sixteen outputs as a group and cannot be applied to individual outputs. Note that this option increases the gain on these outputs by 10dB so they run (with the gain control set to 0dB) at 0dB through the unit.

AES digital output board:

This option adds 96k 24bit high quality analogue to digital conversion to each input channel and provides additional AES-3 output streams via a DB25 connector on the rear panel, along with optional word clock sync (selectable to be an output or input).

Performance of your DS8000:

Technical Specifications

Inputs (8 off)

Parameter (Units)	Electronic (standard)	Transformer (option)
Maximum Input Level (dBu)	+26dBu	-
Max Broad Spectrum Signal (dBu)	+26dBu	+26dBu
Max Low Frequency Signal 30Hz (dBu)	+26dBu	+16dBu
Differential Impedance (Ohms)	10k	5k
Isolation (kV)	-	2.5kV
Common Mode Rejection Ratio (dB) typical		
@100Hz, 0dB Gain	85dB	85dB
@100Hz, 30dB Gain	120dB	120dB
@1kHz, 0dB Gain	85dB	85dB
@1kHz, 30dB Gain	120dB	120dB

Outputs (8 off)

Parameter (Units)	Electronic (standard)	Transformer (option)
Maximum Output Level into 600R (dBu)	+20dBu	+10dBu
Nominal Signal Level, relative to 0dB gain (dB)	0dB	-10dB
Differential Impedance (Ohms)	<50R	<150R
Isolation (kV)	-	2.5kV

System

Parameter (Units)	Electronic (standard)	Transformer (option)
Frequency Response, 22Hz – 22kHz (dB)	+0/-0.5dB	+0/-1.5dB
Distortion 1kHz 0dB Gain +4dBu Output (%)	<0.01%	<0.01%
Equivalent Input Noise 0dB Gain 22Hz – 22kHz (dBu)	<-101dBu	<-101dBu
Equivalent Input Noise 30dB Gain 22Hz-22kHz (dBu)	<-124dBu	<-120dBu
Crosstalk All Channels (dB)		
@1kHz, 0dB gain	-100dBu	-100dBu
@16kHz, 0dB gain	-80dBu	-80dBu
@1kHz, 30dB gain	-100dBu	-100dBu
@16kHz, 30dB gain	-80dBu	-80dBu

General

Parameter (Units)	
Headphone Output	
Nominal Signal Level (dBu)	+10dBu
Source Impedance (Ohms)	<10R
Maximum Power into 50 Ohms (W)	0.5W
Metering steps (dBu)	-20[G];0[G];+12[Y];+18[R]
Gain Steps (dB)	6;0;+6;+12;+18;+24;+30;+36;+42
Mains Supply Voltage	100-240V
Power Consumption, normal operation* (W)	<20W
Power Consumption, backup mode* (W)	<40W
Dimensions H x W x D (mm)	
Unboxed	88 x 482 x 312
Boxed	160 x 560 x 400
Weight with standard options(kgs)	
Unboxed	6.1kgs
Boxed – shipping	7.5kgs
*Power consumption figures measured without AES option fitted	



Appendix I:

All about splitters

A splitter, or distribution system, is responsible for providing multiple feeds from a single audio source to enable different processing devices to share the same input signal. In this way a signal is split and distributed to multiple destinations.

The ideal device will perform this task with minimal signal degradation and minimal interaction between the destination(s) and the source itself.

Signal degradation may be caused by several factors:

- 1) Noise and interference pick-up due to low-level signals being transmitted long distances, perhaps using unbalanced cables.
- 2) Hum and electrical interference due to multiple ground (earth) systems – at each signal destination.
- 3) High frequency attenuation due to cable capacitance causing HF roll-off, especially when dealing with long distance cable runs
- 4) Overall signal level may be attenuated due to the sharing (splitting) of the signal across multiple destinations, leading to a poor signal to noise ratio.

The task of signal distribution can, at its most basic level, be as simple as a “Y-Split” cable which feeds two inputs from a single output, perhaps to drive two amplifiers from the same mixing console output. Indeed, this is what happens when the “Link” output is used on many amplifiers – the link socket is just wired in parallel with the input, so splitting the signal in two.

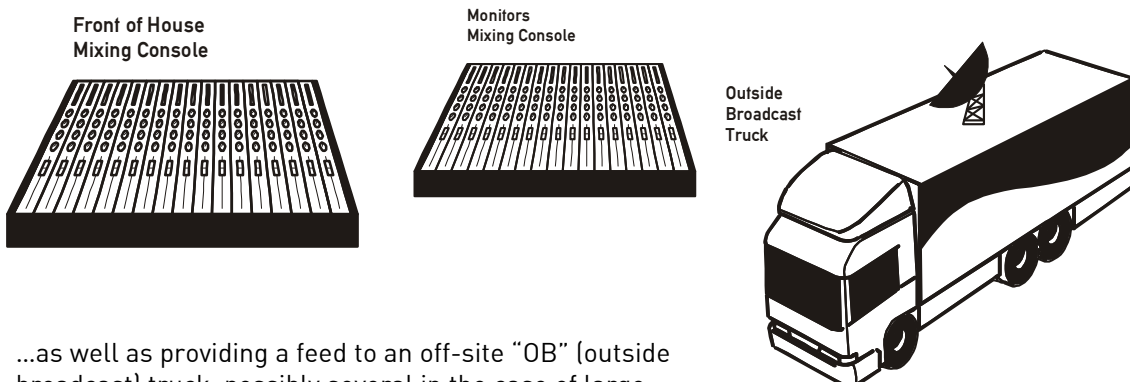
However, consider a slightly more complex scenario, and one which is quite commonplace in the field of live concert audio.

Low Level
Mic Signal (~-40dBu)



The microphone signals derived on-stage are required to travel considerable distances to provide audio for several different requirements. The signal from the microphone is at a very low level and so prone to picking up noise from other equipment on stage such as lighting dimmer packs, computers and RF sources such as mobile phones and wireless packs.

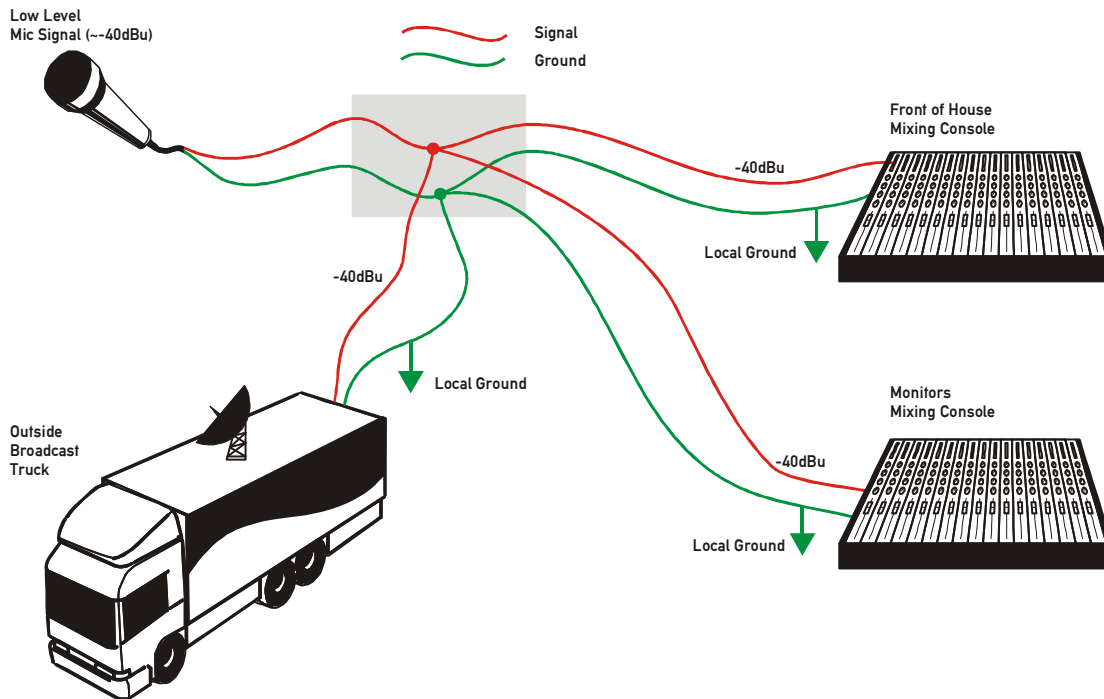
This signal must be split and fed to both the Front of House and Monitors mixing consoles



...as well as providing a feed to an off-site “OB” (outside broadcast) truck, possibly several in the case of large sporting or news events.

Passive splitter with No Isolation

Consider the scenario below – this shows the most basic method of splitting the signal and distributing it to all the required inputs. This “passive” splitter is so called because it does not contain any “active” (powered) components and so requires no power to function.

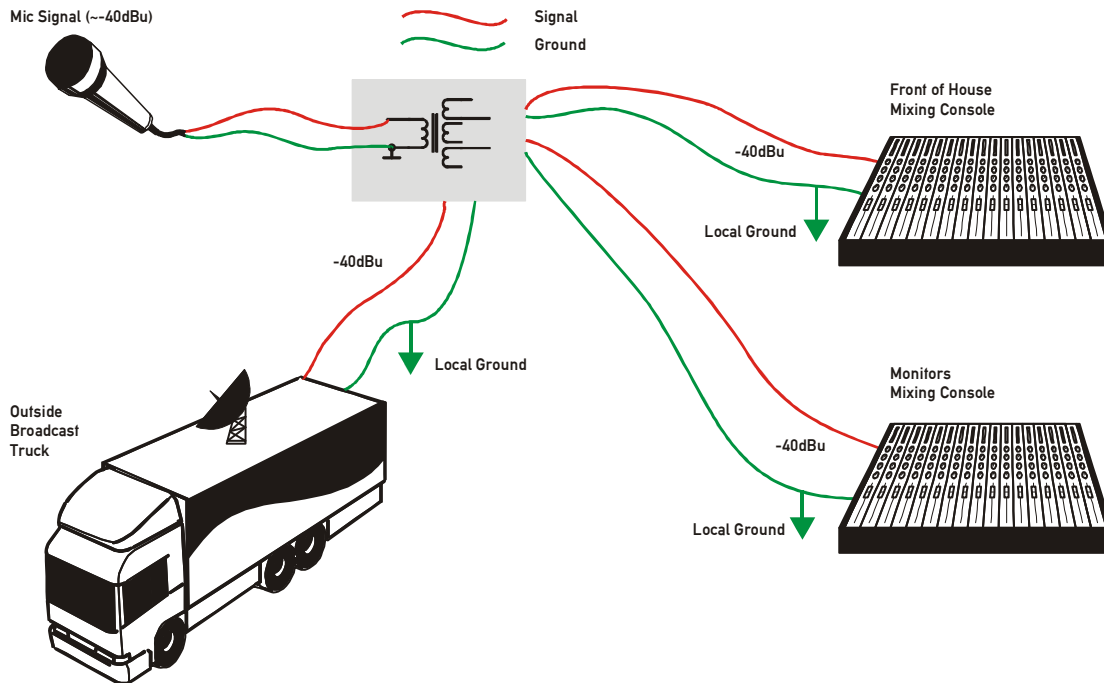


Whilst this method will work, there are several drawbacks:

- Being passive by nature, there can be no amplification of the signal levels to decrease their susceptibility to noise pickup. Bearing in mind that microphone signals are very low level, when dealing with long cable runs, any noise picked up will be amplified at the mixing desk when the preamp is used to boost the signal to a useable level.
- Long microphone cables runs normally means higher capacitance – this phenomenon creates a filter that will decrease the high frequency content present, leading to dull audio. Adding equalisation at the mixing desk to compensate will also accentuate the noise content of the signal.
- The input impedance of each “feed” (so in this case the two mixing desks and whatever is in the OB truck) will all appear in parallel, producing a significant additional loading effect on the signal, reducing its level even further for all connections.
- Phantom power to feed the microphone is normally fed by a pair of 6k8 resistors to limit the current draw available. Given that there may now potentially be three sources of phantom power, if these are all unintentionally enabled, the increased current and voltage available may cause damage to the microphone.
- The grounding scheme is just a single interconnected system where every ground is directly connected to every other one. Every engineer knows that multiple grounds normally mean, at the very least, hum problems! For example, the mixing desks above might well share a common ground with no problems, but the OB truck will probably have a generator and so create its own local ground, causing possible issues.

Passive Splitter with Transformer Isolation

This second system uses a passive splitter again, so no amplification on stage, but does utilise transformers to allow the grounds to be isolated from each other. The input is connected to one side, the primary, of the transformer, and multiple secondaries provide isolated outputs for each feed.



Whilst this set-up is considerably better in performance than a basic passive (parallel) split arrangement, to achieve good quality results, it is dependant on the transformers themselves being very good quality, and with quality comes increased expense.

The ground isolation will help prevent hum loops and associated noise issues, but the following problems still remain with an additional one also being introduced:

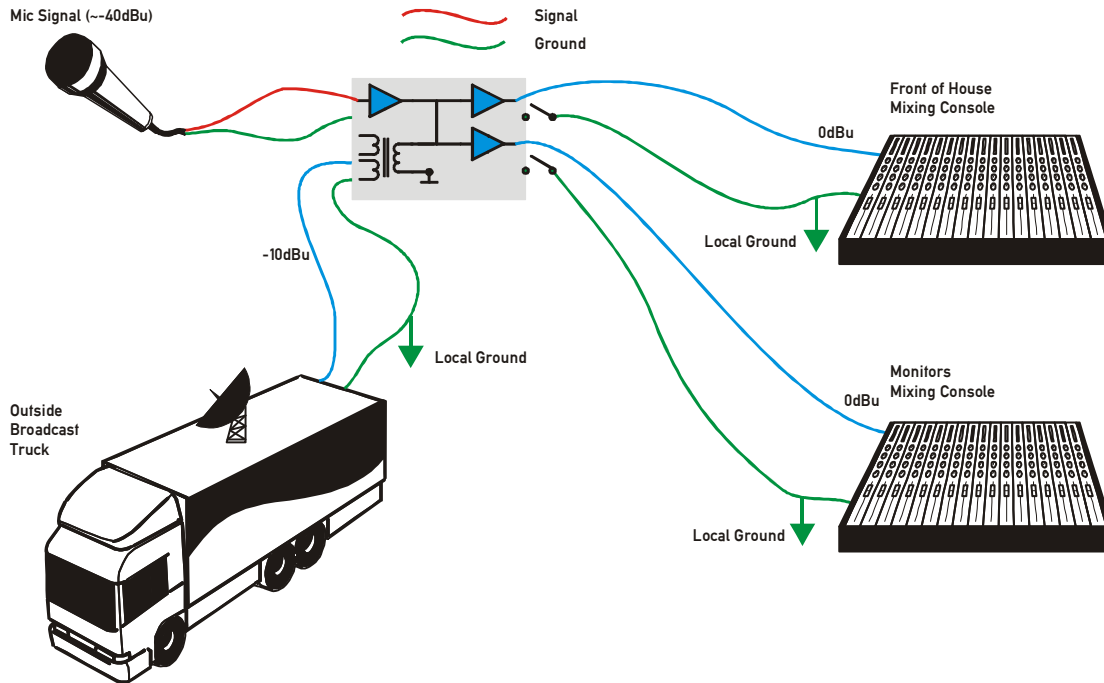
As there is still no active circuitry, the signals are still being distributed at low levels, which are susceptible to noise pickup – noise that will be amplified by the mixing desk's mic preamps.

The problem of cable capacitance and high frequency loss still remains, as most transformer systems offer a 1:1 ratio so the microphone loading is not altered. Using a transformer with a higher ratio is possible (perhaps 3:1) although the "trade-off" here is that the gain is reduced in the process, so making the already low level signals even lower. This is only really useful for line-level signals where a degree of gain loss is not quite so much an issue.

A new problem is introduced regarding phantom power. As DC is not passed through a transformer, locally derived phantom power must be generated for any microphones requiring a 48V supply. This may be via a direct passive parallel connection to one mixing desk (losing the full isolation) or via a separate supply.

Active Splitter with Transformer Isolation

The final solution addresses the problems inherent in passive transformer isolated systems by using active circuitry to provide gain where necessary and local 48V if required. This is the way the DS8000 works.



The low-level microphone signal is now fed through a gain stage that amplifies it to a professional line level signal using a high quality microphone pre-amp. This immediately means that all signals fed to other equipment will operate at line level, greatly reducing their susceptibility to noise pick-up. Also, being line-level, there will be no need to add gain at the desk, so there will not be the associated decrease in signal to noise ratio caused by the extra gain.

The output drivers for each feed are also lower impedance so reducing the effects of cable loading (the capacitive effect reducing HF content), resulting in a more accurate, flat response. These electronically balanced buffered outputs also have earth lift switches, which can isolate the ground connections if there are problems with hum loops.

The individual mixing desks are both fed from individual buffered outputs.

The OB truck is fed from a transformer-isolated output, itself running at line-level (-10dB) and being buffered independently from the electronically balanced outputs. This galvanic isolation ensures any separate grounding at the OB Truck will not introduce grounding problems.

As the DS8000 is an active device, it can generate the 48V phantom power required for the microphone inputs if required. It also senses 48V being switched in from a mixing desk and can enable the respective input's 48V supply if needed, providing seamless "echoing" of the phantom power.