

DN1248^{Plus}

OPERATORS MANUAL

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IMPORTANT SAFETY INSTRUCTIONS



These symbols are internationally accepted symbols that warn of potential hazards with electrical products.



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 to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

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 of the ventilation openings. Install in accordance with the manufacturers instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus 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 third prong are provided for your safety. When 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. Unplug this apparatus during lightning storms or when unused for long periods of time.
12. Refer all testing to qualified personnel. Servicing is required when the apparatus is damaged in any way, such as 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.

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KLARK TEKNIK
SIGNAL PROCESSING BY DEFINITION

MIDAS
DESIGNED FOR A PURE PERFORMANCE

DECLARATION OF CONFORMITY

We, **Klark Teknik Group (UK) Plc**

of, Klark Teknik Building, Walter Nash Road, Kidderminster, Worcestershire, DY11 7HJ

Declare that a sample of the following product:-

Product Type Number	Product Description	Nominal Voltage (s)	Current	Freq
DN1248 Plus		115V AC 230V AC	130mA 260mA	50/60Hz

to which this declaration refers, is in conformity with the following directives and/or standards:-

Directive(s)	Test Standard(s)
89/336/EEC Electromagnetic Compatibility Directive amended by 92/31/EEC & 93/68/EEC 73/23/EEC, Low Voltage Directive, amended by 93/68/EEC	
Generic Standard Using EN55103 Limits and Methods	EN50081/1
Class B Conducted Emissions Pavi	EN55103
Class B Radiated Emissions Pavi	EN55103
Fast Transient Bursts at 2kV	EN61000-4-4
Static Discharge at 4kV	EN61000-4-2
Electrical Stress Test	EN60204
Electrical Safety	UL6500-96

Signed:.....


Date: 10th December, 1999

Name: David Hoare

Authority: Technical Director, Klark Teknik Group (UK) Plc

Attention!

Where applicable, the attention of the specifier, purchaser, installer or user is drawn to special limitations of use which must be observed when these products are taken into service to maintain compliance with the above directives. Details of these special measures and limitations to use are available on request and are available in product manuals.

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Thank You For Using This Klark Teknik Product

To obtain maximum performance from this precision electronic product, please study these instructions carefully. Installation and operating the mic splitter is not complicated, but the flexibility provided by its operating features merits familiarisation with its controls and connections. This unit has been prepared to comply with the power supply requirements that exist in your location.

Precautions

Do not install this unit in a location subjected to excessive heat, dust or mechanical vibration.

Voltage Selection and Power Connection

Connection is made by means of an IEC standard power socket. The rear panel text indicates the voltage range required for satisfactory operation of the unit.

Before connecting this unit to the mains supply, ensure the fuse fitted is the correct type and rating is as indicated on the rear panel, adjacent to the fuse holder.

Safety Warning

This unit is fitted with 3-pin power socket: For safety reasons the earth lead should not be disconnected. Signal ground is referenced internally to chassis via a resistor capacitor network which provides earth loop immunity.

To prevent shock or fire hazard, do not expose the unit to rain or moisture. To avoid electrical shock do not remove covers. Refer servicing to qualified personnel only.

Attention!

Cables:

This product should only be used with high quality, screened twisted pair audio cables, terminated with metal bodied 3-pin XLR connectors. The cable should be connected to pin 1. Any other cable type or configuration for the audio signals may result in degraded performance due to electromagnetic interference.

Electric Fields:

Should this product be used in an electromagnetic field that is amplitude modulated by an audio frequency signal (20Hz to 20kHz), the signal to noise ratio may be degraded. Degradation of up to 60dB at a frequency corresponding to the modulation signal may be experienced under extreme conditions (3V/m, 90% modulation).

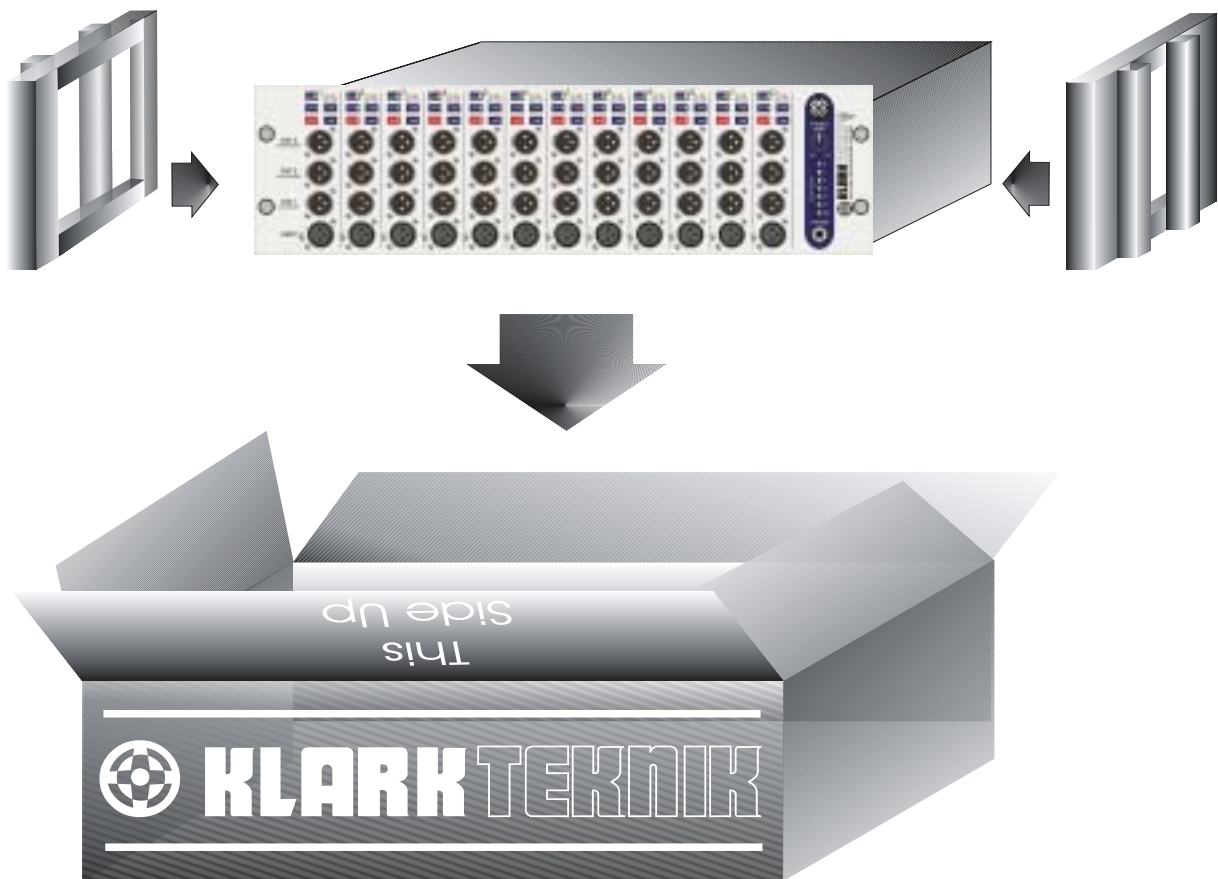
After You Have Unpacked The Unit

Save all the packing materials - they will prove valuable should it become necessary to transport or ship this product.

Please inspect this unit carefully for any signs of damage incurred during transportation. It has undergone stringent quality control inspection and tests prior to packing and left the factory in perfect condition.

If, however, the unit shows any signs of damage, notify the transportation company without delay. Only you, the consignee, may institute a claim against the carrier for damage during transportation.

If necessary, contact your supplier or as a last resort, your Klark Teknik importing agent, who will fully co-operate under such circumstances.



Introduction

The DN1248 Plus active microphone splitter brings the legendary sound and reliability of Klark Teknik to this application for the first time. Housed in a rugged 3U rack enclosure, the DN1248 Plus offers a cost and space-effective method of providing up to forty-eight outputs from twelve sources.

Key Features

- Midas Heritage Mic pre amp.
- Inter-unit linkable headphone bus with individual and multiple solo feature.
- -15dB pad, +30dB boost, earth lift and phantom power switches on all channels.
- Internal power supply with factory option of backup PSU.
- Five year international factory warranty.

The Klark Teknik DN1248 Plus is an extremely high performance, 12-channel active mic splitter housed in a 3U, rack mounting case with an integral switch mode power supply that can automatically adapt to mains voltages in the range 100 to 240 Volts (50 to 60Hz). A dual PSU is available as a factory fitted option. Applications include splitting on-stage mic and DI box feeds to service monitor and FOH consoles as well as to facilitate the multitrack recording or broadcasting of live events.

Each microphone input feeds a superbly specified mic preamp based on the circuitry used in the acclaimed MIDAS Heritage live sound console. There are four balanced outputs per channel, two transformer isolated and two electronically-balanced.

All the audio connections are on balanced XLRs (wired pin 2 hot) featuring gold plated connectors. The mic input and three of the four outputs (two transformer and one electronically balanced) are mounted on the front panel for easy access. The remaining output (electronically balanced) is located on the rear panel. Signal Present and Clip LEDs are provided for each channel and a solo system allows any channel or combination of channels to be monitored via the integral headphone amplifier. Two gain switches (+30dB and -15dB) may be used individually or in combination to optimise the preamplifier gain. Standard 48 volt phantom powering is individually switchable on each channel. Each mic input is also fitted with a ground lift switch.

WARNING

48V phantom disabled if ground lift switch selected.

Installation And Connection

The Klark Teknik DN1248 Plus is designed for standard 19" rack mounting and occupies 3U of rack space. Avoid mounting the unit directly above or below power amplifiers or power supplies that radiate excessive magnetic fields or heat. Ensure that the ventilation apertures on either side of the unit are not blocked or obstructed.

This unit must be earthed. If ground loop problems are encountered, the ground lift switches on the microphone inputs may be used. It is also permissible to disconnect the cable screen at one end or other of the output cables, though the signal input cable screen must be connected at both ends to ensure the phantom powering operates correctly.

The mains fuse should be rated T0.5L250V .

As standard:

Outputs 1 and 4 are electronically balanced on conventionally wired XLRs (pin 1 screen, pin 2 hot and pin 3 return) with a nominal operating level of +4dBu and a maximum output capability of 21dBu. Transformer coupled outputs 2 and 3 have a maximum signal capability of +18dB. For unbalanced use, pin 3 of any output XLR may be grounded at the destination end of the cable.

For details of other DN1248 Plus options, please see Appendix A.

The source impedance of the electronically balanced outputs is 50 Ω while the transformer balanced outputs have a source impedance of 300 Ω . Both are designed to feed a minimum load of 600 Ω .

Basic Operation

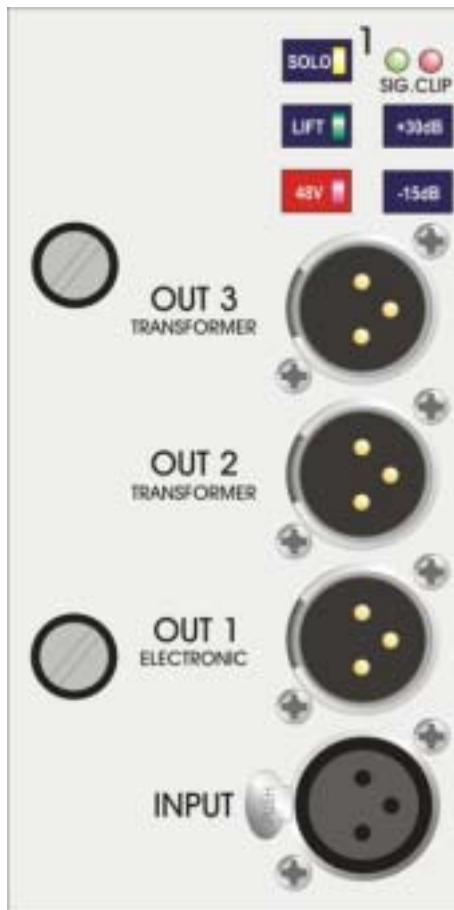


Connect all capacitor microphones and DI boxes to the DN1248 Plus before applying phantom power. Ensure that the sound system level is turned down at this stage to prevent switch-on thumps or acoustic feedback. The phantom power should be switched off for any channel being used with a dynamic microphone or passive DI box, though no problems should arise if the phantom power is inadvertently left switched on, providing the sources are wired for balanced operation and connected using conventionally wired balanced cables. Under no circumstances should phantom power be applied to any unbalanced input source.

Use the solo facility to check the level of each input individually and set the gain and pad buttons to achieve the highest possible signal level without the clip LED illuminating. Leave sufficient headroom to allow for unplanned increases in level during performance.

Both the transformer balanced and electronically balanced outputs offer exceptional audio quality combined with excellent line driving capability. However, the transformer outputs may be preferred in situations where absolute electrical isolation must be maintained, such as running feeds to mobile studios or outside broadcast facilities.

In theory, the electronically balanced outputs remove any opportunity for the audio transformers to colour the sound, but in practice, the sonic quality of the two types of outputs is very similar.



Out 3 Transformer balanced XLR output.

Out 2 Transformer balanced XLR output.

Out 1 Electronically balanced XLR output.

Input Balanced XLR for microphone level signals.

Out 4 See rear panel

Note:

If either of the transformer balanced outputs (2 and 3) is shorted out, the signal level on the other output may be adversely affected. The electronically balanced outputs (1 and 4) will remain unaffected.

Input and output 1 are duplicated on the rear panel. These duplicated connectors should not be used simultaneously as this will impair the performance of the unit.

Signal Present LED (Green)

An input signal in excess of -25dBu will cause the signal present LED to illuminate.

Signal Clip LED (Red)

An input signal in excess of +21dBu will cause the signal Clip LED to illuminate. The Clip LED illuminates approximately 0.5dB below the actual clip level.

Solo

Pressing the electronically latching Solo button permits any channel to be monitored in isolation via the headphone socket on the front of the unit. Each Solo button has an integral status LED and features a dual mode of operation. When pressed briefly, the solo function will latch on electronically, whereas if the button is pressed and held, the solo is active only for as long as the button is held down. Pressing the button again will exit solo mode. Multiple channels may be solo'd. When multiple units are linked, the solo system permits phones monitoring from any of the linked units.

48V

Applies 48 volt phantom power to the channel's microphone input.

+30dB

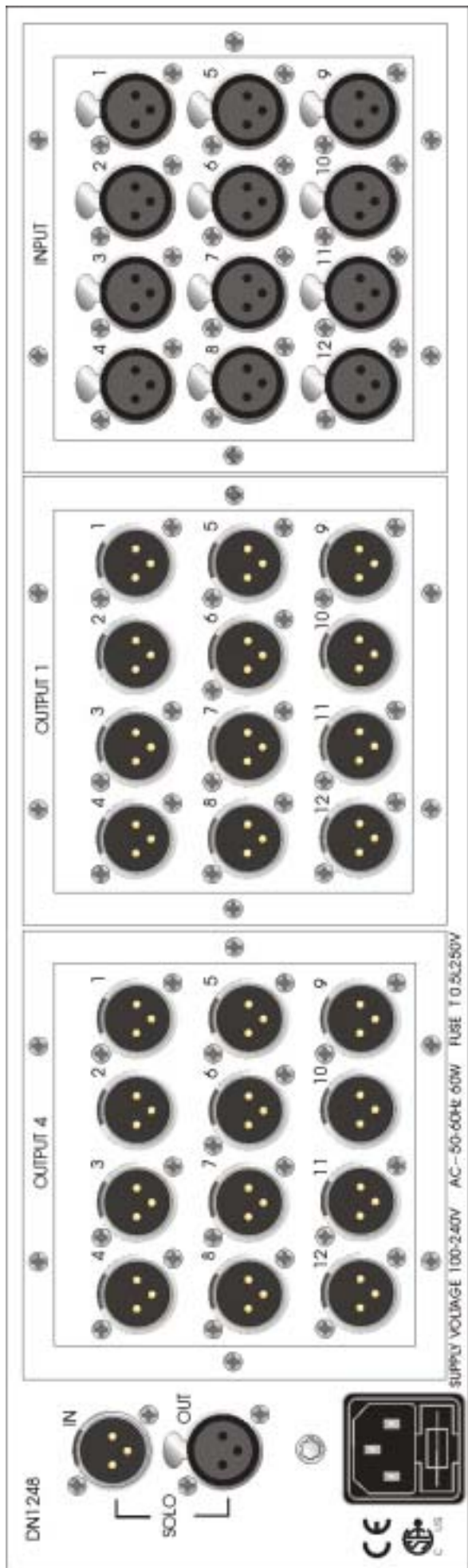
Switches in 30dB of mic pre-amp gain.

-15dB

Switches in a 15dB attenuator pad. (Note that both switches may be used together when a gain of 15dB is required.)

Lift

Isolates the input signal ground. Note: Switching in the ground lift disables phantom power operation. The Lift switch has an integral red status LED.



Inputs

Duplicates of Input connections on the front panel (wired in parallel).

Channels 1 to 12

Out 1

Electronically balanced XLR output located on the rear panel. Duplicates for output 1 connectors on the front panel (wired in parallel).

Out 4

Electronically balanced XLR output located on the rear panel.

Solo Bus Connectors

These are standard 3-pin male and female XLR sockets enabling the solo systems of two or more DN1248 Plus's to be linked by means of standard microphone cables. When linked, the units act as a single unit for solo monitoring purposes with the solo'd output being available on the phones outputs of any linked units

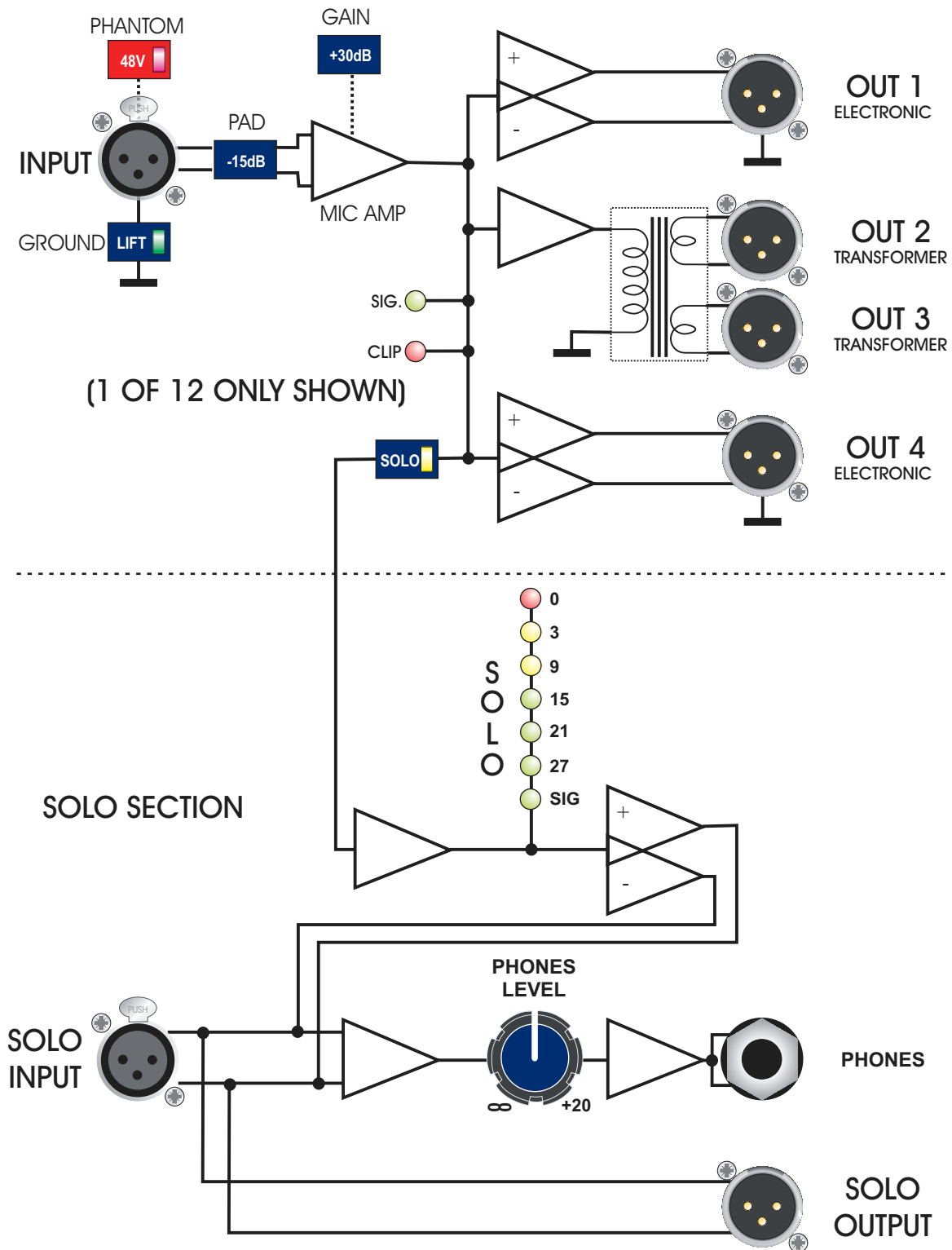
Mains Inlet

Standard non-switched IEC mains connector. A suitable cable is provided.

Connector plate

Dimensions of the plate: 124.5mm x 118mm
Internal dimensions: 106.5mm x 100mm

Mic Channel



The mic input is based around the same circuitry as used in the Midas Heritage live sound console and features exceptionally low noise and distortion combined with a generous level of headroom. The mic preamp gain may be adjusted by using the -15dB pad and +30dB boost switches either singly or in combination. With neither selected, the signal path is unity gain. The gain range is adequate to accommodate most microphones, keyboards, DI boxes, backline preamp outputs and active guitar/basses. Passive guitars require a high impedance load and should be connected via a suitable active DI box, such as the Klark Teknik LBB100 or DN1414.

Headphone Amp

Illuminated Logo

The DN1248 Plus has no mains power switch. When power is connected, a blue LED will illuminate the logo on the right of the front panel.

Phones Level

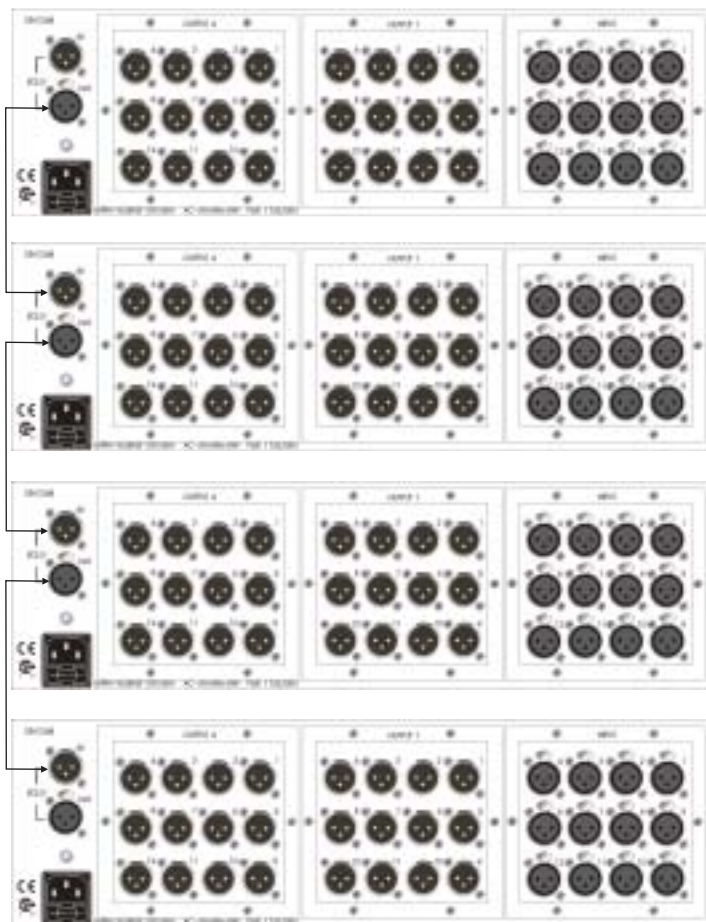
Sets the level of the headphone output used for Solo monitoring.

Meter

Seven segment LED meter monitors the level of any soloed signal in the range -40 (Sig) to 0dB. The metering may be used in conjunction with the input gain switches and the solo buttons to optimise the input gain settings.

Phones

Standard quarter inch TRS jack to accept conventionally wired stereo headphones. Any soloed channel or channels will appear at the headphone output under control of the Phones Volume control.



Solo Bus Operation

Pressing the electronically latching Solo button permits any channel to be monitored in isolation via the headphone socket on the front of the unit. Each Solo button has an integral status LED and features a dual mode of operation. When pressed briefly, the solo function will latch on electronically, whereas if the button is pressed and held, the solo is active only for as long as the button is held down. A channel which has been electronically latched can be cleared by briefly pressing in the same manner. The electronic latching function allows multiple channels to be switched onto the Solo bus.

The Solo bus external linking facility allows solo'd channels to be monitored using the headphone amp on any of the connected units.

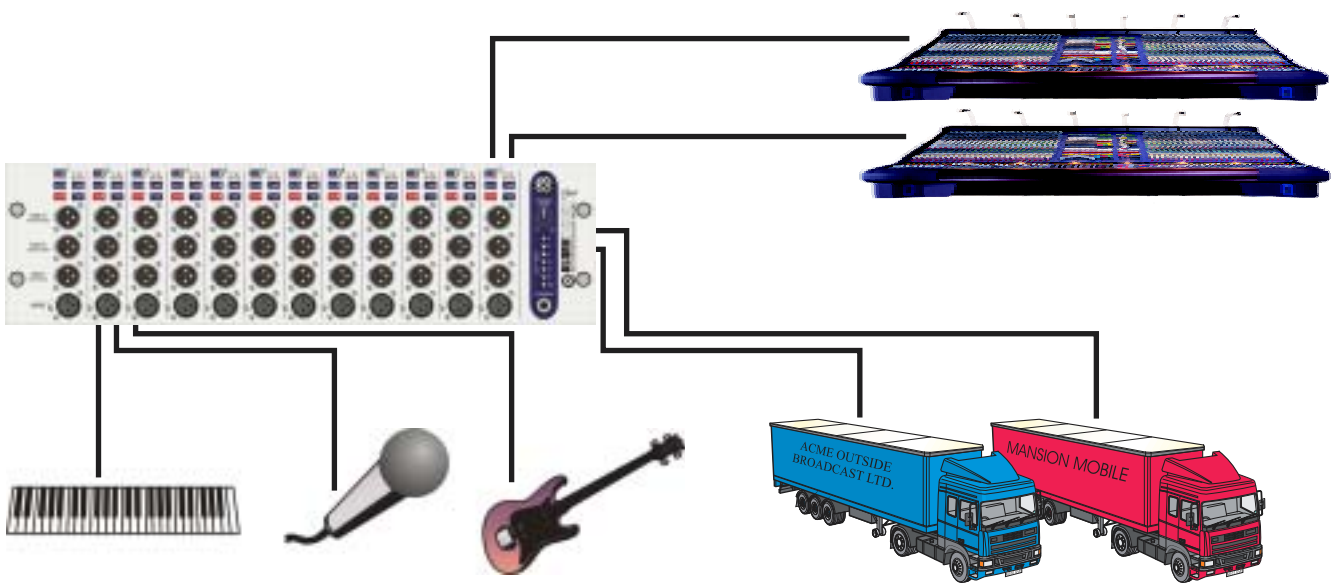
Note:

The Solo bus bargraph on each connected unit only displays the signal level for that unit, which has the advantage of making it easier to isolate level or connection problems. Multiple units are connected Solo Out to Solo In as shown left.

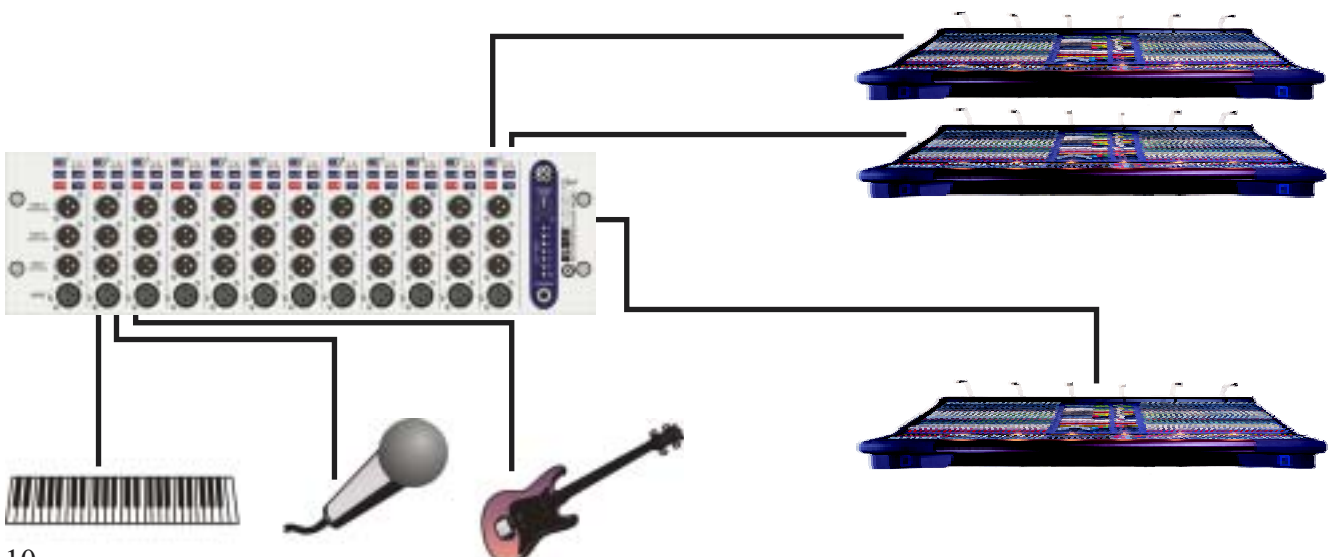
Applications

In a live recording situation, the DN1248 Plus may be used either to split the stage mic signals at source or to take feeds from the group outputs of a live sound console. It is also able to accommodate feeds from backline preamp outputs, active instruments, keyboards and so on. Because there are four outputs per channel, it is possible to interpose the unit between an instrument and its backline amplification while still providing up to three feeds for mixing, monitoring or recording. A number of examples are illustrated below.

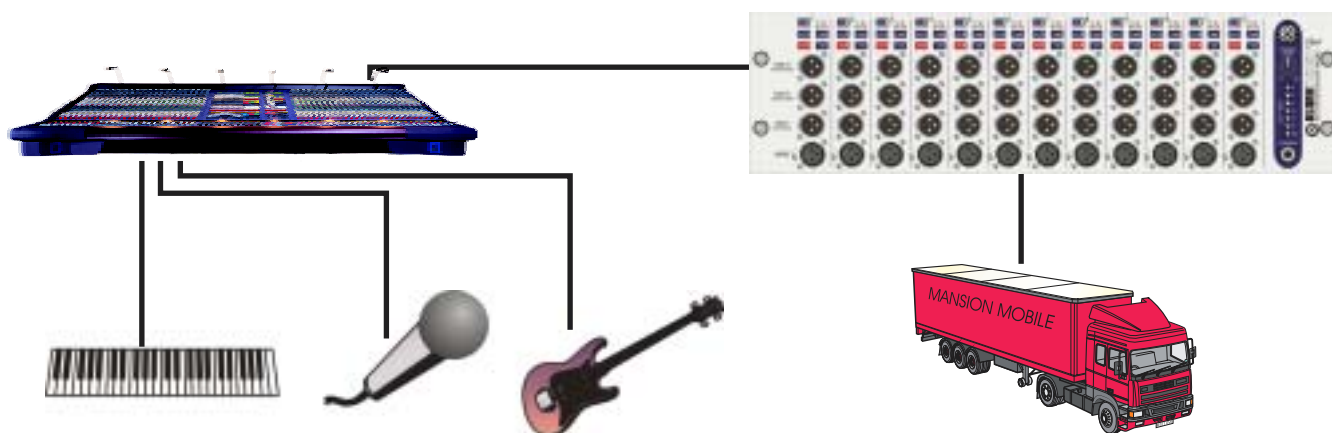
Example 1 Shows an outside broadcast application where the DN1248 Plus supplies feeds to both the FOH live sound console and a monitor console as well as to two outside broadcast/recording trucks. Normally the transformer balanced outputs (2 and 3) would be used to feed the OB trucks.



Example 2 Shows a simple live recording situation where the stage mic feeds are split to serve the FOH live sound console, a monitor console and an on-site recording console. It is recommended that one of the transformer balanced outputs is used to feed the recording console, especially if the grounding scheme is outside the control of the PA operator.



Example 3 Shows a live recording application where the DN1248 Plus is used to provide isolated feeds from the group outputs of the FOH live sound console.



Architect's and Engineer's Specification

The Mic Splitter shall provide 12 discrete audio channels in a standard 3U 19" rack mount chassis. Each channel shall have a microphone preamplifier, two transformer-isolated outputs, and two electronically balanced outputs with two paralleled connectors. The inputs and the two electronic outputs shall be mounted on the rear panel and the inputs and one set of the electronic outputs will be mounted on the front panel in addition to both sets of transformer balanced outputs. The unit should have the option of having all outputs transformer balanced.

Each channel shall also provide separate +30dB boost and -15dB pad switches, switchable +48V phantom power, an earth lift function and a soloing facility.

The Mic Splitter shall have a headphone amp to allow the monitoring of soloed audio channels. The headphone amplifier shall have a ¼ -inch jack socket for the headphones, a rotary level control for the headphones output and a seven-segment LED bargraph for monitoring the solo'd signal level.

Each Mic Splitter shall meet or exceed the following performance specifications:

Electronically Balanced Outputs

Distortion < 0.01% (1kHz @ +4dBu)
Frequency response +0/-0.5dB (20Hz to 20 kHz)

Transformer Balanced Outputs

Distortion <0.01% (1kHz @ +4dBu)
Frequency response +0/-1.0dB (20Hz to 20kHz)

The audio connections for each of the twelve audio channels shall be via 3-pin XLR style connectors female connectors for the inputs and male connectors for the outputs.

The unit shall be capable of operating from a 90 to 250V, 50 to 60Hz AC power source. The unit should have the option of dual redundant power supplies.

The Mic Splitter shall be the Klark Teknik model DN1248 Plus and no alternative option is available.

Specifications

Inputs

Input impedance	> 2k
CMRR	> -100dB @ 100Hz to 10kHz
Equivalent input noise	< - 100dBu @ unity gain
Connectors	3 pin male XLR
Signal present level	> - 25dBu
Signal clip level	> + 21dBu

Outputs

Electronically balanced	
Source impedance	50
Min Load	600
Max level	+ 21dBu @ 1kHz
Connectors	3 pin female XLR

Transformer balanced & isolated

Source impedance	300
Min Load	600 (-3dB level loss into 200)
Max level	+ 18dBu @ 1kHz
Connectors	3 pin female XLR

Performance

Electronically balanced	
Frequency response	+ 0 / - 0.5dB 20Hz to 20kHz
Distortion	< 0.01 % @ 1kHz +4dB
Transformer balanced & isolated	
Frequency response	+ 0 / -3.0dB 20Hz to 20kHz
Distortion	< 0.05 % @ 1kHz +4dB

Power Requirements

90 to 250V a.c @ 50/60Hz @ < 75VA
3 pin IEC connector.

Dimensions

Width	483 mm (19 inches)
Height	132 mm (5.2 inches)
Depth	300 mm (12 inches)

Weights

Nett	7.4 kg
Shipping	8.4 kg

Appendix A

Product Variants

The DN1248 Plus is offered in four variants:

DN1248 Plus - Standard unit with two electronic and two transformer outputs per channel and one power supply.

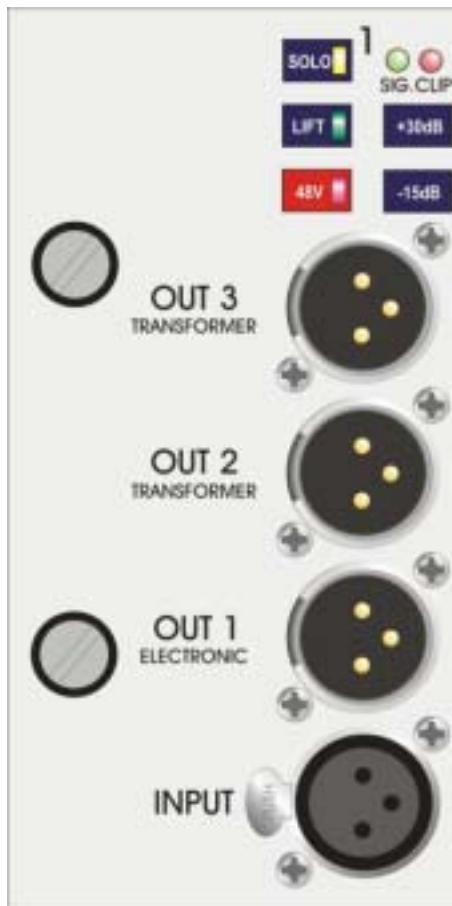
DN1248 Plus AT - “All-Transformer” unit with four transformer-balanced outputs and one power supply.

DN1248 Plus DP - “Dual Power Supply” unit, a standard unit with dual-redundant power supplies.

DN1248 Plus FM - The “Full Monte” version, the AT and DP options combined to give a unit with four transformer-balanced outputs per channel and dual redundant power supplies.

All-Transformer Output Variants (AT, FM)

The legending of the front panels of these units is different to the standard and DP versions in that OUT1 is shown as being transformer balanced.



Out 3 Transformer balanced XLR output.

Out 2 Transformer balanced XLR output.

Out 1 Transformer balanced XLR output.

Input Balanced XLR for microphone level signals.

Out 4 See rear panel

Note:

If either outputs 1 and 4 or 2 and 3 are shorted then the signal on the other output may be adversely affected.

Input and output 1 are duplicated on the rear panel. These duplicated connectors should not be used simultaneously as this will impair the performance of the unit.

Dual-Redundant Power Supply Variants (DP, FM)

The rear panels of these units include separate green LED indicators for each power supply to provide confirmation that they are working correctly. If a power supply fails then the corresponding LED will cease to illuminate. The unit will continue to work normally and the blue power-on LED on the front of the unit will illuminate as long as one of the power supplies is working, however the blue LED does not provide any indication if one of the supplies has failed.



Appendix B

Rear Panel Blanking Plate and User Multipole Connections

The rear panel has three removable connector plates which as standard are used for connections for the input and outputs 1 and 4 of each of the twelve channels. Spare unpunched plates are available from your distributor to allow the fitting of custom connector configurations. The circuit board for each of the twelve channels has a row of spring-leaf terminals along its rear edge for cable termination.

CAUTION: These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

The top cover should be removed from the unit to gain access to the blanking plate and the circuit board terminals. Please ensure that all screws are retained and used to re-attach the cover and blanking plate. ***Any warranty claims resulting from damage to the unit will be void if all of the screws are not used to re-secure both the cover and the blanking plate.***

The input and all four outputs are brought out to the circuit board terminals; to make a connection insert a small flat-bladed screwdriver into the upper rectangular slot and using a levering motion, move the screwdriver away from the circuit board - this action will open the contacts in the lower opening in the connector so that the bare ends of a wire can be inserted. Moving the screwdriver in the other direction will close the contacts, which will then hold the wire securely. ***Any warranty claims will be void if the damage has been caused by excessive force to these multipole connectors.*** It is recommended that screened twisted pair cable is used to make the connections between the individual circuit boards and the multipole connectors.

