



**MS424**

**4 Channel 1:4 Active Unity Gain Mic Splitter**

**OPERATION MANUAL**



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**The MS424** is a 4 channel 1 into 4 Unity Gain Active Microphone Splitter in a compact 1U self powered case. The MS424 is designed for applications where multiple feeds are required from one set of microphones without the signal degradation experienced with most passive splitting solutions. The Unity Gain design philosophy allows simple integration into existing systems without the need for lengthy re-calibration.

Each of the MS424 channels has an electronically balanced input, which may be transformer balanced as an option, and four independently buffered transformer balanced outputs on XLR connectors. Output '1' may be linked directly to the input via a rear panel LINK switch on each channel. The unit may also be configured, by way of internal links, to feed 8, 12 or 16 outputs from any one input, allowing the MS424 to be used for press box applications.

The front panel of the MS424 gives access to outputs 3 and 4 as well as Phantom Power switching with phantom presence LED, and Pad switching for line level signals. The Inputs and Outputs 1&2 are grouped on the rear panel together with the Output 1 Link switches.

The MS424's internal power supply makes it ideally suited to smaller installations where it becomes highly cost effective when compared to externally powered alternatives. However the MS424 may also be used in multi-channel applications, particularly when transformer isolation is required for broadcast feeds.

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## 2. TECHNICAL SPECIFICATIONS

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### 2.1 ELECTRICAL

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<i>Frequency response::</i>	20 Hz to 20 kHz, +0, -0.5 dB
<i>Input Impedance::</i>	2 k $\Omega$
<i>Maximum Input Level:</i>	0 dBu (+20 dBu with Pad)
<i>Equivalent Input Noise (EIN):</i>	better than -121 dBu
<i>Output Source Impedance:</i>	less than 50 $\Omega$
<i>Output Load Impedance:</i>	150 $\Omega$ to infinity
<i>Gain:</i>	0 dB (-20dB with Pad)
<i>Total Harmonic Distortion (THD):</i>	better than 0.01 % (1kHz, 150 $\Omega$ load)
<i>Intermodulation Distortion:</i>	better than 0.01% 60Hz + 7kHz mixed 7:1 at 0dBu output
<i>Power supply:</i>	230Vac or 115Vac, 50/60Hz *100Vac, 50/60Hz
<i>Consumption:</i>	16VA

### 2.2 PHYSICAL

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<i>Input Connector:</i>	XLR-F 3 Pin, Pin 2 = hot
<i>Output Connectors:</i>	XLR-M 3 Pin, Pin 2 = hot
<i>Power Connection:</i>	Detachable IEC 3 pin socket lead
<i>Dimensions:</i>	483 (19") W, 208 (8.2") D, 44 (1.75")H
<i>Weight:</i>	Unit: 4kg    Shipping: 4.8kg
<i>Temperature Range:</i>	Operating: 0°C to 50°C Storage: -30°C to 75°C

0dBu = 0.775Vrms

Owing to our continued development programme modifications may be made to existing products, features or specification without notice.

### 3.1 INSPECTION AND UNPACKING

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The MS424 has been carefully packed at our factory in a carton designed to withstand handling in transit. Should the unit appear to have been damaged in transit, notify your dealer immediately and do not discard any of the packing. The carton should contain -

- The MS424
- Power cord - country specific, please check
- Operator Manual (this book)

### 3.2 OPERATING ENVIRONMENT

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The MS424 is designed to operate between 0°C and 40°C (32-112°F) with relative humidity no more than 80%. Should the units be installed in an equipment rack, ensure that the ambient temperature conforms to these levels.

### 3.3 CE STANDARDS AND THE LOW VOLTAGE DIRECTIVE (LVD)

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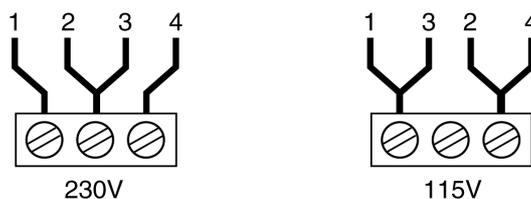
The MS424 has been designed to comply with the latest Electromagnetic Compatibility (EMC) regulations. However we recommend you do not operate the unit close to strong emitters of electromagnetic radiation such as power transformers, motors, mobile telephones or radio transmitters.

The unit should only be connected to a power supply of the type described in 3.4 POWER REQUIREMENTS or as marked on the unit. Disconnect the mains supply before removing any cover.

### 3.4 POWER REQUIREMENTS

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The MS424 is factory configured for either 230V 50Hz ac or 115V 60Hz ac mains operation. Please refer to the following diagram which shows the transformer connections for 230V and 115V –



The rating of the rear panel fuse is as follows

230V            115V  
T100mA        T200mA        Both are slow blow type

**Please note:**

**If the fuse requires changing at any time please ensure the correct type is fitted. An incorrect fuse could cause damage to the unit and may constitute a fire hazard.**

The detachable IEC mains lead connections to the appliance are coloured in accordance with the following code:

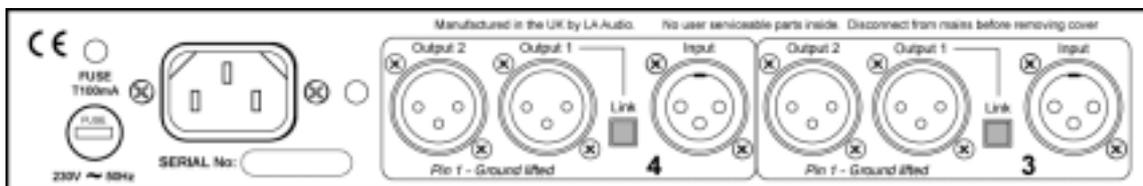
Green-and-Yellow	Earth
Blue	Neutral
Brown	Live

**WARNING: THIS APPLIANCE MUST BE EARTHED**

**Please note:**

**A protective earth connection, made by way of the earth conductor in the power cord, is essential for safe operation.**

### 3.5 EXTERNAL CONNECTIONS



The Inputs on the Model MS424 are female XLR type connectors. These are wired as follows -

XLR-F	Pin 1	* Screen
	Pin 2	Hot (+ve)
	Pin 3	Cold (-ve)

\* Pin 1 is ground lifted by a 100R resistor to Audio ground and by a 47nF

capacitor to Chassis ground. This configuration prevents ground loop hum and ensures a low impedance path for RF (Radio Interference) away from the audio.

Although the inputs are designed for 'balanced' signals either pin 2 or 3 can be connected to pin 1 for unbalanced operation.

All outputs on the MS424 are balanced on male XLR type connectors. These are wired as follows -

XLR-M	Pin 1	* Screen
	Pin 2	Hot (+ve)
	Pin 3	Cold (-ve)

\* Pin 1 is ground lifted - see above.

Although the inputs are designed for 'balanced' signals either pin 2 or 3 can be connected to pin 1 for unbalanced operation.

### **3.6 SIGNAL LEVELS**

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The input to output voltage gain on the MS424 is 0dB. Maximum input signal level will depend on the setting of the Pad switch.

*0dB* (down) position is for microphone levels and maximum input level is 0dBu.

The *-20dB* position should be used for line level signals. Maximum input level is then +20dBu and voltage gain will be -20dB.

Maximum output level from the MS424 is +20dBu into a 600Ω load.

## 4. WARRANTY

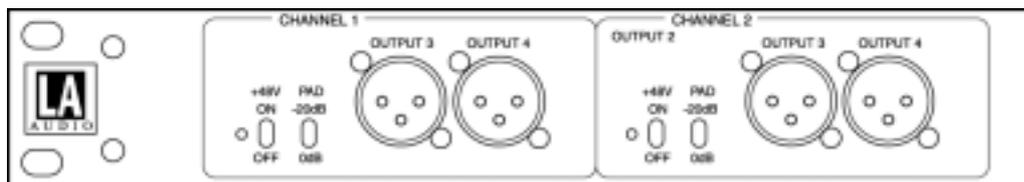
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Your MS424 has been manufactured to a high standard using quality components. If correctly installed and operated the unit should give years of problem free operation.

However in the event of a defect in material or workmanship causing failure of the unit within one year of the date of original purchase we will agree to repair, or at our discretion, replace any defective item without charge for labour or parts. To receive service under this warranty it is necessary to return the unit to an SCV authorised service centre or to the factory with a dated receipt as proof of purchase. After repair the unit will be returned to you at our cost.

Limitations: This warranty does not cover damage resulting from accident or misuse. The warranty is void unless repairs are carried out by an authorised service centre. The warranty is void if the unit has been modified other than at the manufacturers instruction. The warranty does not cover components which have a limited life, such as valves, and which are expected to be periodically replaced for optimal performance. We do not warrant that the unit shall operate in any way other than as described in this manual.

## 5. DESCRIPTION OF CONTROLS



### Phantom switch

Switches +48V from the internal power supply to the Input connector on the rear panel.

To prevent the chance of damage to any external pieces of equipment, do not use the +48V power option with unbalanced input sources i.e. those where pins 1 & 3 or 1&2 are connected together. To avoid loud and potentially damaging electrical noise always turn down monitor speakers and connect your microphone before switching phantom power on.

### Phantom presence led

This led lights whenever Phantom Power is present at the Input connector. This power can be internally or externally supplied.

### Pad switch

Inserts a 20dB pad into the signal path. To be used when Line level signals are inputted to the MS424.

### OUTPUT 3 connector

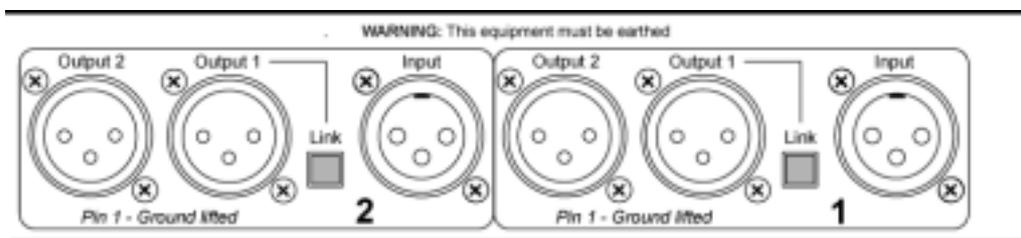
Transformer balanced and isolated output.

### OUTPUT 4 connector

Transformer balanced and isolated output.

### Power led

The blue POWER indicator is lit whenever power is applied to the unit.



### LINK switch

Pressing the LINK switch connects Output 1 directly to it's associated Input connector. All 3 pins on the Output 1 XLR are affected.

### OUTPUT 1 connector

Output 1 can be either a transformer split output or directly connected (LINKed) to the Input.

OUTPUT 2 connector  
Transformer balanced and isolated output.

## 6. OPTIONS

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### 6.1 CONFIGURATION

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Each channel of the MS424 consists an input stage and an output stage. These are connected internally by jumper links which allow the MS424 to be configured for the following options -

Option	Configuration	Channels
1	1 IN 4 OUT	4
2	1 IN 8 OUT	2
3	1 IN 12 OUT*	1
4	1 IN 16 OUT	1

\* Channel 4 still available as 1 x 4

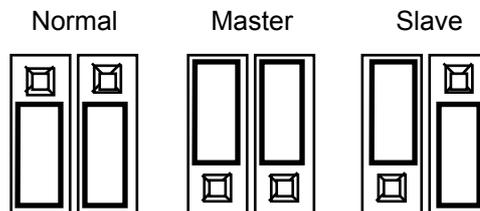
There are a pair of jumpers associated with each channel and two associated with the internal buss.

### 6.2 CHANNEL JUMPERS

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#### CHANNEL JUMPERS

The pair of jumpers for each channel select the channel to be Normal, Master or Slave. The 3 jumper configurations are shown below.



JP101& JP102, JP201 & JP202, JP301 & JP302, JP401 & JP402

Channel select jumpers as viewed from the front of the unit.

The function of these jumpers can be best understood by referring to the block diagram on the following page -

NORMAL

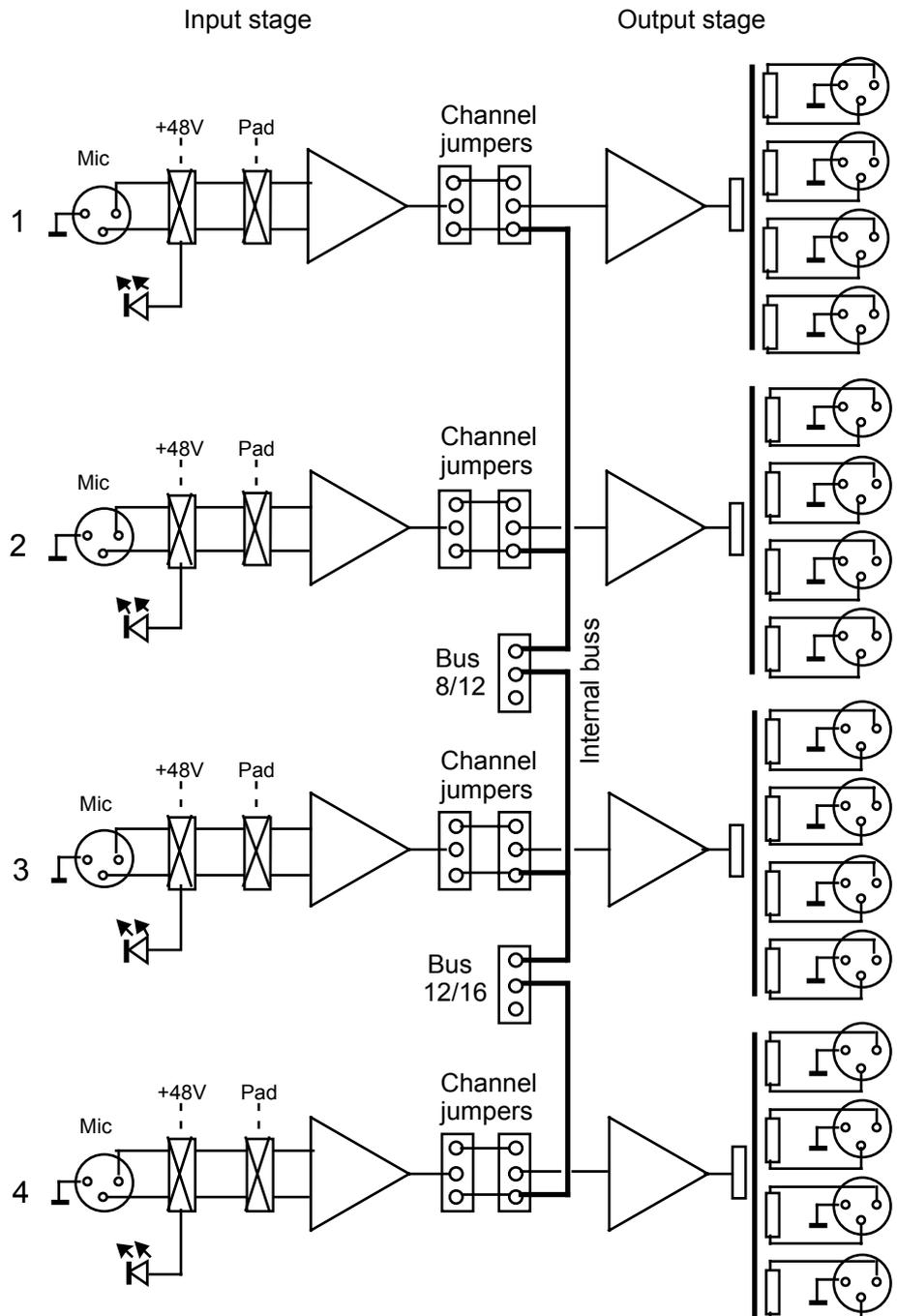
The channel Input stage is connected directly to its associated output stage. This provides 1 input to 4 output splitting and is the Factory default setting.

**MASTER**

The channel Input and output stage are connected to the internal bus. The Input signal is thus distributed to other output stages which have been configured as slaves.

**SLAVE**

The channel Input is disabled and its output connected to the internal bus. The output stage now outputs signal from the internal bus.

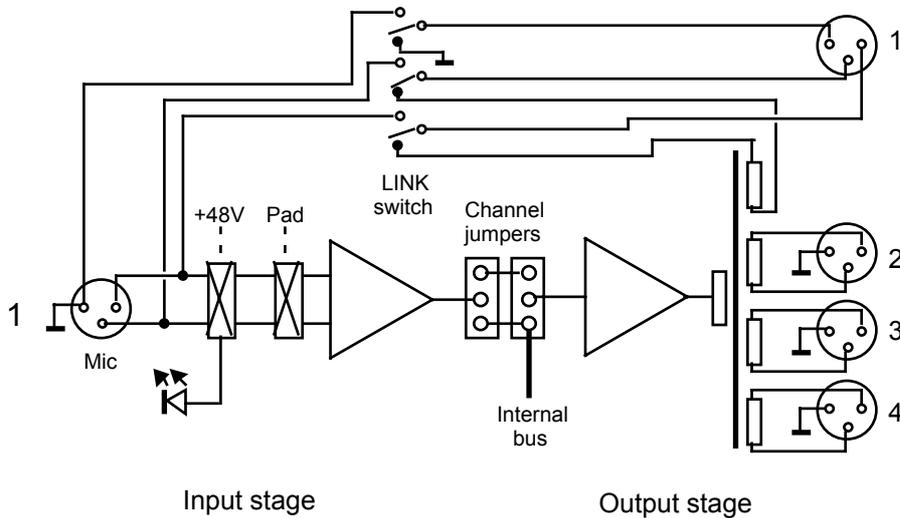


Block diagram of the MS424 showing the channel and bus option jumpers. Channel Input to Output 1 LINK switching not shown - see diagram on following page.

Only one Input stage at a time should be connected to the Internal Bus (Master mode)

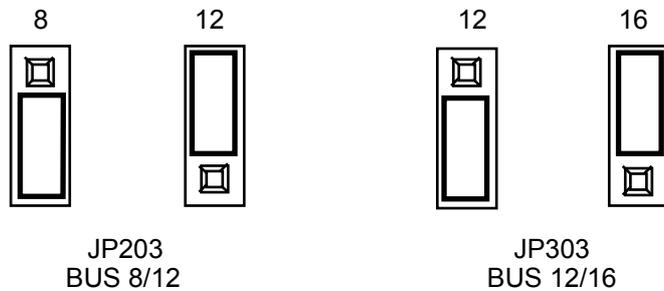
### 6.3 INTERNAL BUS JUMPERS

There are also two jumpers associated with the Internal Bus and determine the number of split outputs available.



Block diagram of a MS424 channel showing LINK switch for Output 1.

The two bus jumpers allow the MS424 to be configured for 2 x 8, 1 x 12 (with 1 x 4) and 1 x 16 outputs.



Bus option jumpers as viewed from the front of the unit.

## **6.4 TRANSFORMER BALANCED INPUTS**

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Transformer balanced inputs can be fitted to provide galvanic isolation between inputs and outputs. Although normally a factory build option, transformers can be retro fitted by an Audient service centre.

The MS424 is primarily designed to be used in theatres, fixed installations or touring companies who require split feeds of the same signal. The active design of the MS424 ensures that there is not loading or signal loss and as each output is independent a fault on one will not affect the others.

The Inputs and Outputs 1 & 2 have been sited on the rear panel so that for a typical installation using FOH (Front-of-House) and monitor consoles all connections are made to the rear of the unit.

Typically Outputs 3 & 4 could be used for Outside Broadcast trucks and mobile recording studios. Connections are made quick and easy by using standard XLR connectors throughout.

A LINK switch is provided which connects the Input of each channel directly to it's associated Output 1. This arrangement allows the original microphone signal to feed the FOH desk whilst providing 3 split outputs.

By using the internal jumpers the MS424 can be configured as a 2 input 8 output, 1 input 12 output or 1 input 16 output splitter for a variety of applications including multiple press feeds.