CLEVER acoustics

ZM 84 Audio Mixer

User Manual

Order code: CRAM41

WARNING

FOR YOUR OWN SAFETY, PLEASE READ THIS USER MANUAL CAREFULLY BEFORE YOUR INITIAL START-UP!

- Before your initial start-up, please make sure that there is no damage caused during transportation.
- Should there be any damage, consult your dealer and do not use the equipment.
- To maintain the equipment in good working condition and to ensure safe operation, it is necessary for the user to follow the safety instructions and warning notes written in this manual.
- Please note that damages caused by user modifications to this equipment are not subject to warranty.

CAUTION!
KEEP THIS EQUIPMENT AWAY FROM RAIN, MOISTURE AND LIQUIDS

CAUTION!
TAKE CARE USING THIS EQUIPMENT!
HIGH VOLTAGE-RISK OF ELECTRIC SHOCK!!

IMPORTANT:

The manufacturer will not accept liability for any resulting damages caused by the non-observance of this manual or any unauthorised modification to the equipment.

- Speaker & Amplifier systems can produce high sound pressure levels, please operate all controls with caution to ensure people are not exposed to excessive or dangerous sound pressure levels.
- Never let the power cable come into contact with other cables. Handle the power cable and all mains voltage connections with particular caution!
- Never remove warning or informative labels from the unit.
- Do not open the equipment and do not modify the unit.
- Do not switch the equipment on and off in short intervals, as this will reduce the system's life.
- Only use the equipment indoors.
- Do not expose to flammable sources, liquids or gases.
- Always disconnect the power from the mains when equipment is not in use or before cleaning! Only handle the power-cable by the plug. Never pull out the plug by pulling the power-cable.
- Make sure that the available voltage is 240V, 50Hz AC or 24V DC.
- Make sure that the power cable is never crimped or damaged. Check the equipment and the power cable periodically.
- If the equipment is dropped or damaged, disconnect the mains power supply immediately and have a qualified engineer inspect the equipment before operating again.
- If the equipment has been exposed to drastic temperature fluctuation (e.g. after transportation), do not connect power or switch it on immediately. The arising condensation might damage the equipment. Leave the equipment switched off until it has reached room temperature.
- If your product fails to function correctly, stop use immediately. Pack the unit securely (preferably in the original packing material), and return it to your Prolight dealer for service.
- Only use fuses of same type and rating.
- Repairs, servicing and power connection must only be carried out by a qualified technician. THIS UNIT CONTAINS NO USER SERVICEABLE PARTS.
- WARRANTY: Three years from date of purchase.

OPERATING DETERMINATIONS

If this equipment is operated in any other way, than those described in this manual, the product may suffer damage and the warranty becomes void. Incorrect operation may lead to danger e.g: short-circuit, burns and electric shocks etc.

Do not endanger your own safety and the safety of others!

Incorrect installation or use can cause serious damage to people and/or property.

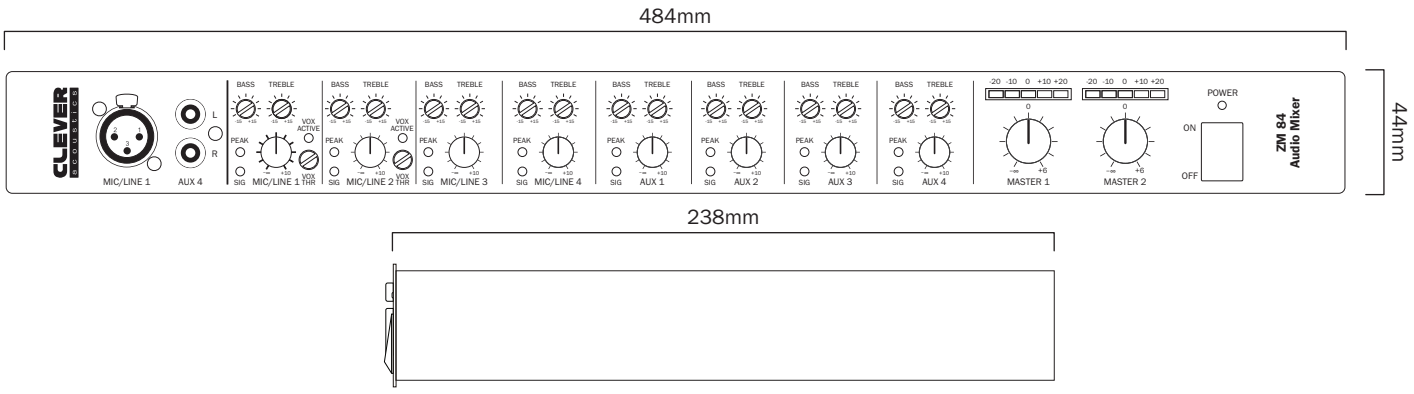
ZM 84 Audio Mixer

The ZM 84 rackmountable audio mixer from Clever Acoustics is ideal for public address and background music systems where multiple inputs are required. The front panel features easy to adjust operator controls plus a series of recessed engineer controls for bass, treble and VOX priority.

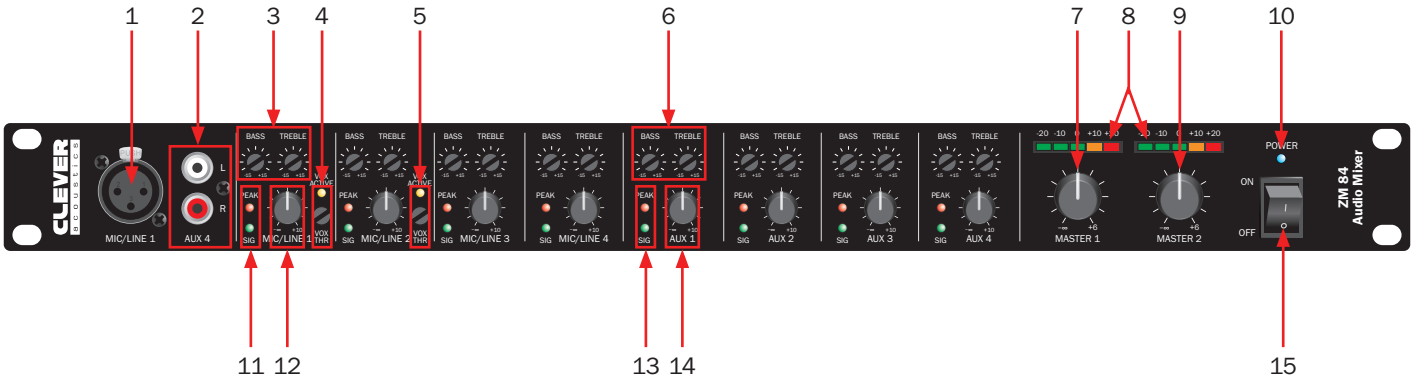
The ZM 84 mixer has 8 input channels, each with adjustable volume controls. Four of these channels are mono mic/line inputs via XLR sockets, the other four channels are RCA line level stereo inputs. Adding to the features the ZM 84 has a 2 band EQ for each channel, two master outputs and a front panel mounted AUX input ideal for MP3 players. Internally, the ZM 84 features a comprehensive jumper system for configuration of the output routing, high pass filters and audio bus in/out for linking multiple ZM 84 zone mixers.

- Four MIC/LINE XLR balanced inputs each with 80Hz high pass filter, switchable 48V phantom power, -30dB pad and adjustable gain control
- MIC1 input features XLR connectors located on both the front and rear panel
- Four stereo AUX unbalanced phono input channels, three mounted on the rear panel, one mounted on the front panel
- Each input channel is equipped with volume control and tone control
- Signal/peak value LED light monitors for each input channel
- Each input channel can be assigned to any output channel via the internal jumper system
- MIC1/MIC2 priority control and adjustable threshold value
- Four XLR balanced outputs with outputs 3 and 4 in parallel connection with 2 channels of RCA unbalanced outputs
- Four audio BUS balanced inputs via RJ45 which can be routed into the main XLR outputs with adjustable volume
- Four audio BUS balanced outputs via RJ45 for linking to additional ZM 84 2 zone audio mixers
- Five segment, LED output level indicators
- Mute function via contact closure for muting all channels
- Internal switch mode, multi voltage power supply
- 1U 19” rackmount chassis with brushed aluminium front panel

Specifications	ZM 84 Audio Mixer
Power consumption	20W
Power supply	100-240V AC 50Hz/60Hz
Fuse	T1A 250V
Dimensions	44 x 484 x 238mm
Weight	3.9kg
Order code	CRAM41

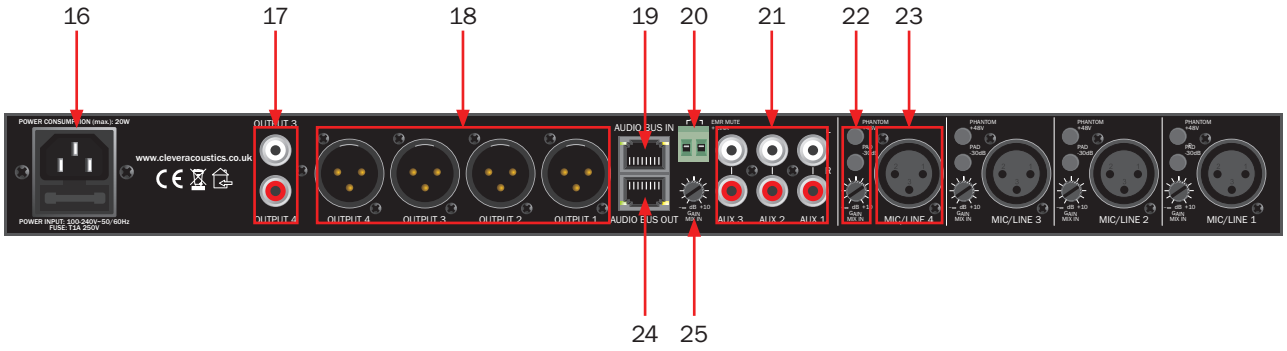


Front Panel Layout:



01 - MIC/Line 1 Signal Input
02 - AUX 4 Signal Input
03 - MIC/Line 1-4 Tone Control
04 - MIC 1 Mute (VOA Priority) Adjustment
05 - MIC 2 Mute (VOA Priority) Adjustment
06 - AUX 1-4 Tone Control
07 - Zone 1 Master Volume Controls
08 - Output VU Meter
09 - Zone 2 Master Volume Controls
10 - Power Indicator LED
11 - MIC/Line 1-4 Signal and Overload LED Indicators
12 - MIC/Line 1-4 Volume Controls
13 - AUX 1-4 Signal and Overload LED Indicators
14 - AUX 1-4 Volume Controls
15 - Power Switch

Rear Panel Layout:



16 - AC Mains Power Input
17 - Unbalanced Line Outputs – Zones 3-4
18 - Balanced Line Outputs – Zones 1-4
19 - Audio BUS RJ45 Input
20 - Emergency Mute Facility
21 - AUX 1-3 Unbalanced Stereo Line Level Inputs
22 - MIC/Line Gain, Phantom Power (+48V) and 30dB Pad Controls
23 - MIC/Line Balanced Audio Inputs
24 - Audio BUS RJ45 Output
25 - Audio BUS RJ45 Input Volume Control

Layout identification:

1. MIC/Line 1 Signal Input

MIC/Line 1 signal input is replicated from the rear panel onto the front panel of the ZM 84 for ease of access. MIC/Line/Phantom Power selection and gain control for this input is located on the rear panel.

2. AUX 4 Signal Input

Stereo line level input via L/R female phono (RCA) sockets.

3. MIC/Line 1-4 Tone Control

During initial setup the high frequency and low frequency tone adjustments should be set to the zero point (3 O'clock position). Turn the level control anti clockwise to reduce the high/low frequency tones, or turn clockwise to adjust the increase the high/low frequency tones. Adjustments should be made gradually to avoid any sudden changes to the audio output.

4. MIC 1 Mute (VOX Priority) Adjustment

Microphone input 1 features automatic priority (VOX) over MIC/LINE channels 3 &4 plus AUX channels 1-4. To adjust the sensitivity, turn the potentiometer anti-clockwise for the clockwise to reduce the sensitivity or clockwise to increase the sensitivity. Note: when the VOX priority is activated, both MIC/Line1 and MIC/Line2 will be activated. When the VOX function is activated, the LED indicator will illuminate amber.

5. MIC 2 Mute (VOX Priority) Adjustment

Microphone input 2 features automatic priority (VOX) over MIC/LINE channels 3 &4 plus AUX channels 1-4. To adjust the sensitivity, turn the potentiometer anti-clockwise for the clockwise to reduce the sensitivity or clockwise to increase the sensitivity. Note: when the VOX priority is activated, both MIC/Line1 and MIC/Line2 will be activated.

6. AUX 1-4 Tone Control

During initial setup the high frequency and low frequency tone adjustments should be set to the zero point (3 O'clock position). Turn the level control anti clockwise to reduce the high/low frequency tones, or turn clockwise to adjust the increase the high/low frequency tones. Adjustments should be made gradually to avoid any sudden changes to the audio output.

7. Zone 1 Master Volume Controls

The Zone 1 master output volume is adjustable. Turn the level control anti clockwise to the lowest setting, or turn clockwise to adjust to the highest setting.

8. Output VU Meter

The output level indicator (VU meter) has three green LEDs and two amber LEDs. During normal operation, the output meter should show only green LEDs. As the output reaches maximum, the first amber LED will illuminate followed by the red LED to indicate +20dB over signal. Care should be taken to keep the output signal within the green LEDs with only occasional peak's illuminating the amber LEDs. If the Red +20dB LED is illuminated, the output volume should be reduced.

9. Zone 2 Master Volume Controls

The Zone 2 master output volume is adjustable. Turn the level control anti clockwise to the lowest setting, or turn clockwise to adjust to the highest setting.

10. Power Indicator LED

The Power LED will illuminate to indicate the zone mixer is powered on. If the power LED is not illuminated, check first the position of the on/off switch and then check the mains supply (including fuse).

11. MIC/Line 1-4 Signal & Overload LED Indicators

Each input channel features visual indication of signal present, and signal overload. To indicate when a signal is inputted into a channel, the green signal LED will flash or if the signal is strong the LED will illuminate fully. When the input signal is too high for the pre-amplifier, the signal overload LED will flash red, indicating a reduction in gain may be required to prevent signal distortion or system damage. For MIC/Line inputs 1-4 the gain reduction can be made using the gain potentiometer on the rear panel, for AUX 1-4 the gain reduction must be made at source or using an in-line attenuator.

12. MIC/Line 1-4 Volume Controls

Each of the MIC/Line volumes are adjustable. Turn the level control anti clockwise to the lowest setting, or turn clockwise to adjust to the highest setting.

13. AUX 1-4 Signal & Overload LED Indicators

Each input channel features visual indication of signal present, and signal overload. To indicate when a signal is inputted into a channel, the green signal LED will flash or if the signal is strong the LED will illuminate fully. When the input signal is too high for the pre-amplifier, the signal overload LED will flash red, indicating a reduction in gain may be required to prevent signal distortion or system damage. For AUX 1-4 channels the gain reduction must be made at the audio source or using an in-line attenuator.

14. AUX 1-4 Volume Controls

Each of the AUX volumes are adjustable. Turn the level control anti clockwise to the lowest setting, or turn clockwise to adjust to the highest setting.

15. Power Switch

On/Off control for the zone mixer.

16. AC Mains Power Input

240V~50Hz AC mains voltage input. This product falls under CLASS 1 and must have a protective earth connection at all times.

17. Unbalanced Line Outputs – Record outputs 3-4

Unbalanced, 0dBu mono outputs for each of the two record outputs. Each zone output features a female phono (RCA) connector. The output volume for the record outputs is fixed and is not altered by the master volume control for the zone outputs.

18. Balanced Line Outputs – Zones 1-2

Balanced, +4dBu mono outputs for each of the two output zones. Each zone output features a male XLR connector.

19. Audio BUS RJ45 Input

The ZM 84 features an RJ45 input port for linking multiple ZM 84 zone mixers. The input volume may be adjusted using the Audio BUS Input Volume Control.

20. Emergency Mute Facility

The emergency mute facility provides system wide MUTE function. To activate the mute facility, use a contact closure or relay to close the circuit between the two contacts of the Emergency Mute port.

21. AUX 1-3 Unbalanced Stereo Line Level Inputs

AUX inputs 1-3 each feature a pair of unbalanced, phono (RCA) sockets for line level input from audio sources such as radio tuners, CD players or MP3 players.

22. MIC/Line 1-4 Gain, Phantom power (+48V) and 30dB pad controls.

Each of the MIC/Line inputs 1 thru 4 all feature controls for input gain, phantom power and 30dB attenuation pad.

- Input Gain: To allow the installer to match levels between audio sources, the ZM 84 features a rotary input gain control for each channel. Turn the level control anti clockwise to the lowest setting, or turn clockwise to adjust to the highest setting.
- +48V Phantom Power: The ZM 84 features switchable phantom power on each of the MIC 1-4 channels for use with condenser type microphones. Selection of Phantom Power status should be made before the zone mixer is powered on. Phantom Power relies on balanced cabling for correct operation.
- -30dB Attenuation Pad: To facilitate the use of line level audio sources, MIC/Line inputs 1-4 each feature a switchable -30dB attenuation pad. If the input signal is too high or known to be from a line level source, the attenuation pad should be switched on by pressing the switch to the IN position.
- The ZM 84 features an 80Hz low cut filter, this can be activated via the internal jumper system. To do so, a qualified engineer must power down the unit, disconnect from power and follow the instructions in this manual to use the correct internal jumper.

23. MIC/Line 1-4 Balanced Audio Inputs

MIC/Line inputs 1-4 all feature balanced, mono audio inputs, each with selectable phantom power (48V), -30dB attenuation pad and adjustable input gain (-60dB ~ +10dB) for use with MIC/ MIC+Phantom/Line signals.

24. Audio BUS RJ45 Output

The ZM 84 features an RJ45 output port for linking multiple ZM 84 zone mixers. The audio routing may be selected via the internal jumper system.

25. Audio BUS RJ45 Input Volume Control

To adjust the input signal level on the Audio BUS, turn the level control anti clockwise to the lowest setting, or turn clockwise to adjust to the highest setting.

Power On/Off Procedure

Prior to making any connection to the mains power or audio inputs/outputs, turn all level controls counter clockwise to the “min” position and all tone (equaliser) controls to the mid (zero) point.

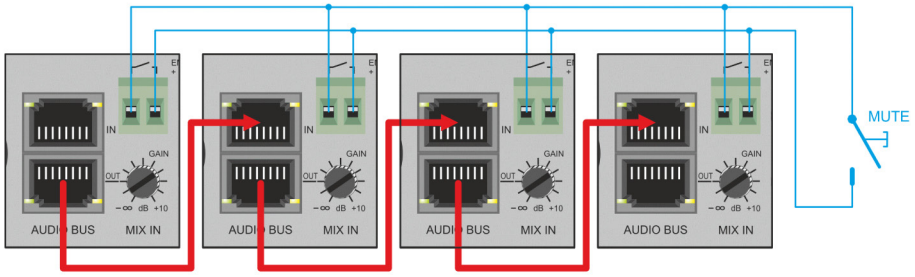
Switch on the zone mixer and any audio sources (MP3 players, CD players, Microphones etc) before powering the systems amplifier ON. The last product to be switched on should be the power/slave amplifiers to prevent any unwanted noise or potential damage to speakers or amplifiers. If you wish to power off the system, turn the amplifier’s master volume control counter clockwise to the “min” position before switching the amplifier OFF before any audio sources are switched off. By following this procedure it will prevent acoustic shocks to the speakers or potential damage to system components.

After connecting all audio sources and powering on the system, adjust the level of each audio input, select the zone routing in order to achieve the desired “mix” for each zone. Care should be taken to when adjusting microphone input volumes and the master volume, adjust both of these in small increment’s to avoid feedback (howl around). The goal is to achieve a clear balance between music and voice ensuring announcements can be clearly heard.

Internal Jumper System Configuration:

Cascading Multiple Units:

Via the AUDIO BUS IN and OUT connectors 16 units can be combined to one system so that you have available max. 64 MIC/LINE and 48 AUX inputs.



The audio signal will be fed to the next unit via the “AUDIO BUS OUT“ output.

Via the mute link connector the different mute signals are passed to the other units. This allows i.e. that a VOX priority of MIC1 not only mutes the inputs of the particular unit but also the inputs of the other units.

By internal jumpers you can select to what external mute signals a particular unit should react. You find more details in chapter 3.5.

By shortening the mute link connector all inputs of all connected units will be muted.

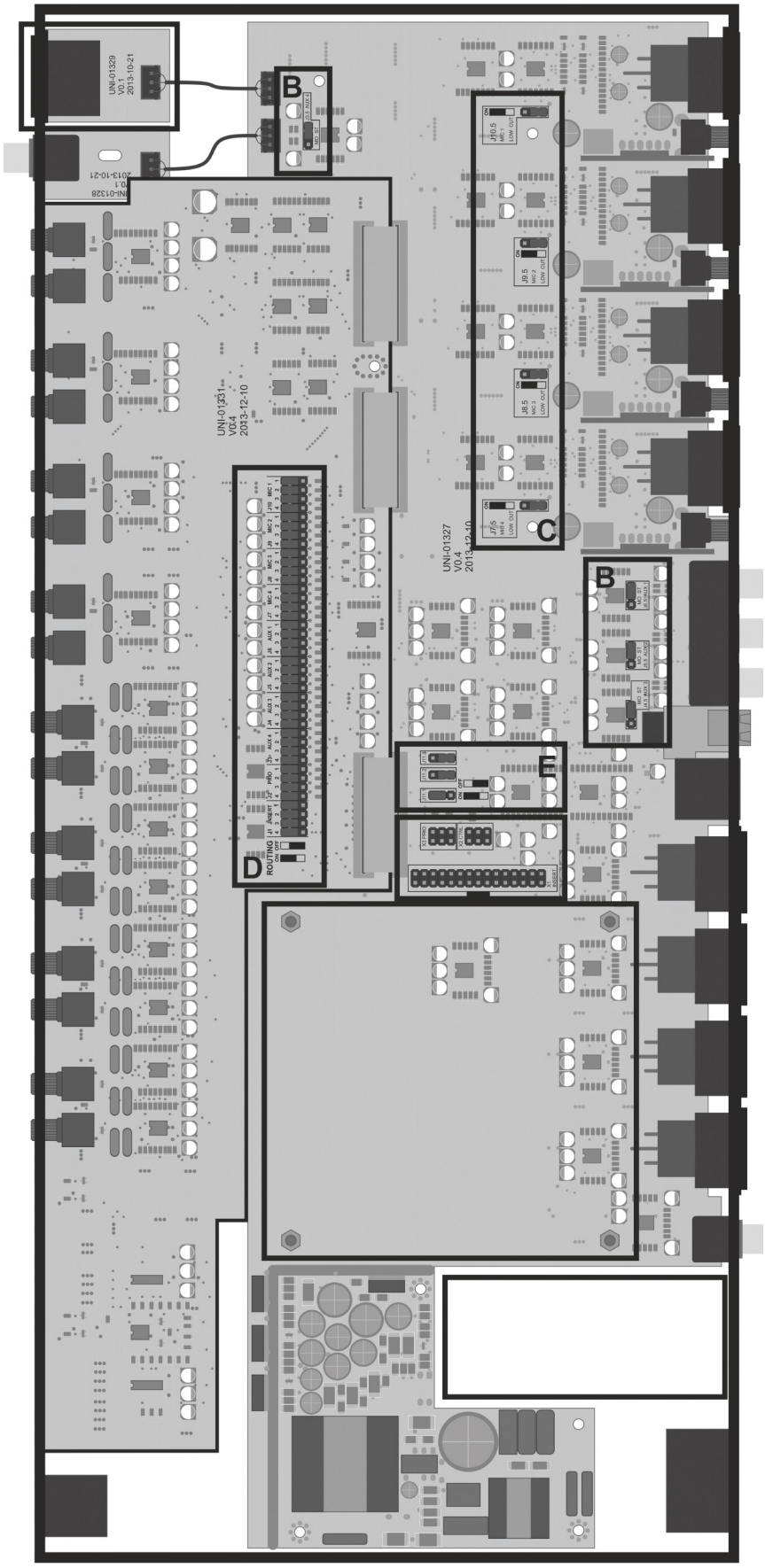
Positions of Jumpers:

B. Jumper for mono/stereo selection of AUX inputs.

C. Jumper for low cut On/Off of Mic inputs.

D. Jumper for input routing.

E. Jumper for MUTE-LINK mode.

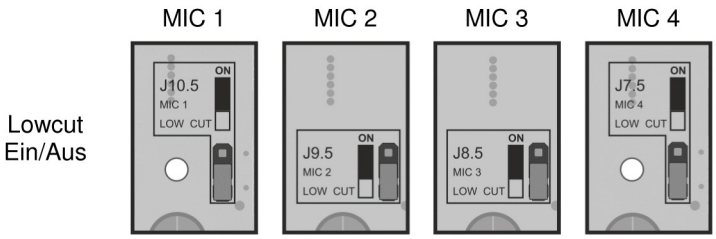


Important Warning: The internal jumper system should only be adjusted by a qualified engineer with suitable electrical knowledge. Before commencing any work internally, the ZM 84 should be disconnected and isolated from the electrical supply.

Low Cut:

For the inputs MIC1-4 a 80Hz low cut filter can be activated for each channel by setting of a jumper.

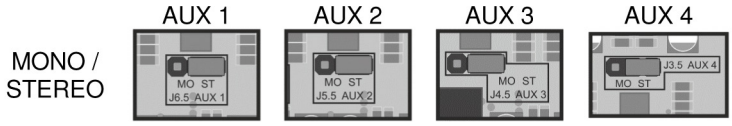
Factory setting is filter 'OFF'.



Mono / Stereo:

For the inputs MIC1-4 a 80Hz low cut filter can be activated for each channel by setting of a jumper.

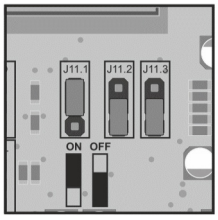
Factory setting is 'ST' (stereo).



Mute Link:

Configuration of the Mute-Link functions is done by these jumpers.

	ON	OFF
J11.1	Output of internal mute signals activated	Output of internal mute signals deactivated
J11.2	Output of external VOX signals deactivated	Output of external VOX signals activated
J11.3	Output of external PRIO signals deactivated	Output of external PRIO signals activated



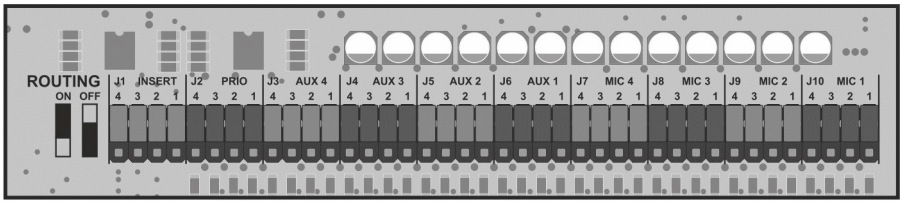
Factory setting is jumper J11.2, J11.3 in OFF, and the jumper J11.0 in ON position.

Signal Routing:

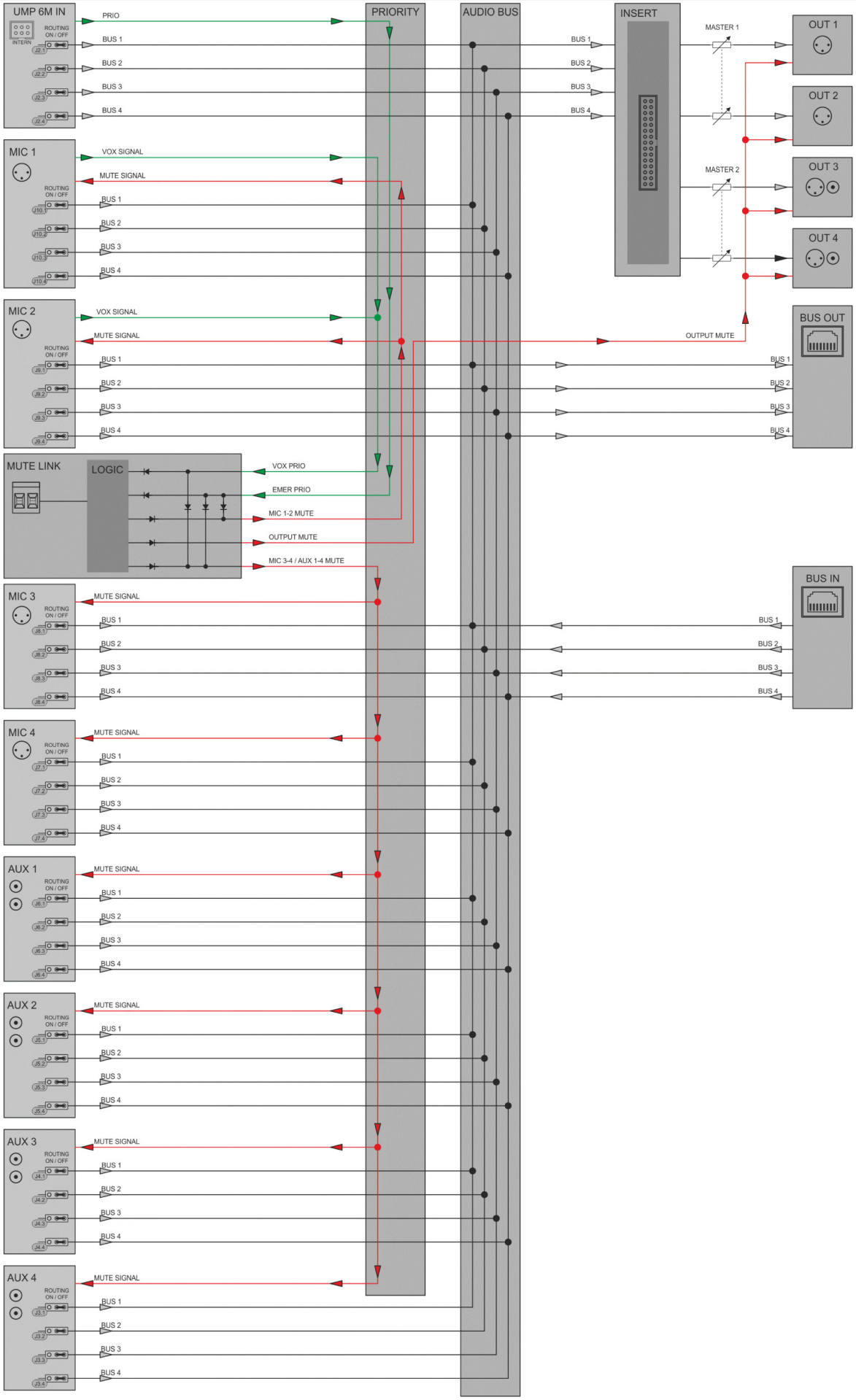
Every audio input can be individually assigned to one of the internal busses.

Factory setting is all jumpers in 'ON' position.

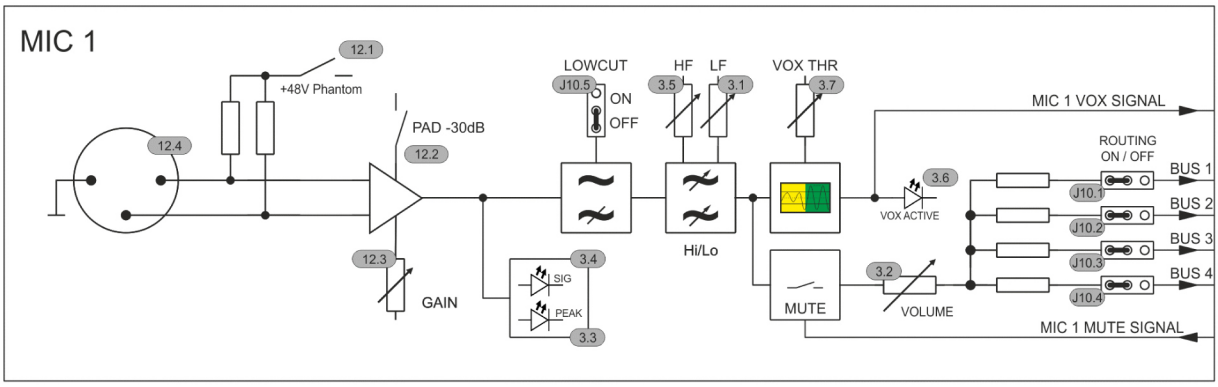
The function of the particular jumpers can be seen from the block diagram.



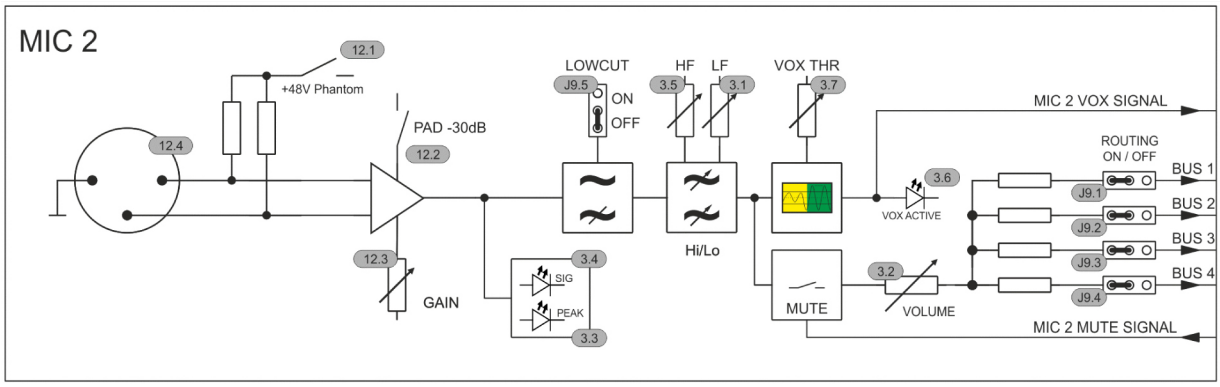
Block Overview Routing:



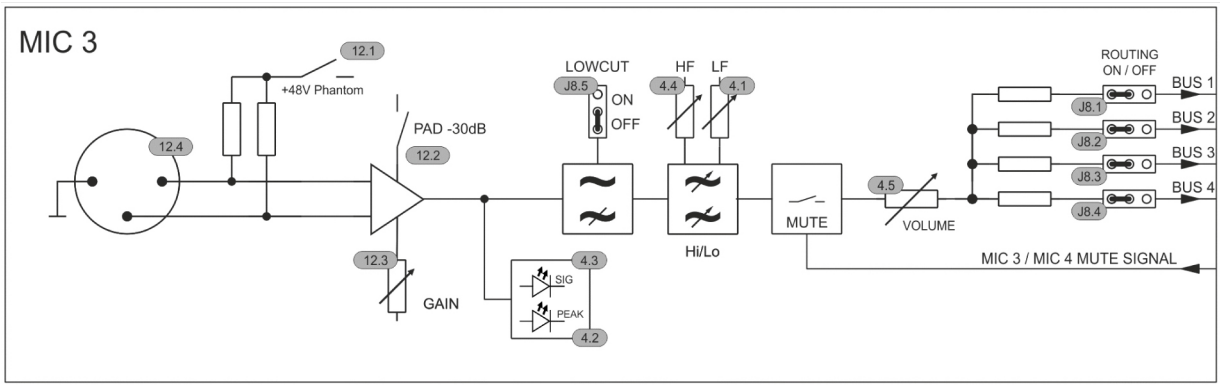
MIC 1 Block Diagram:



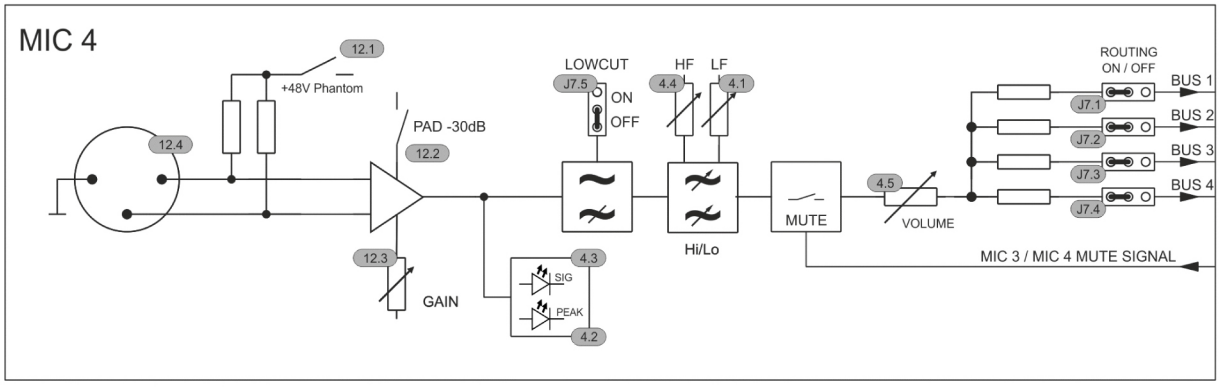
MIC 2 Block Diagram:



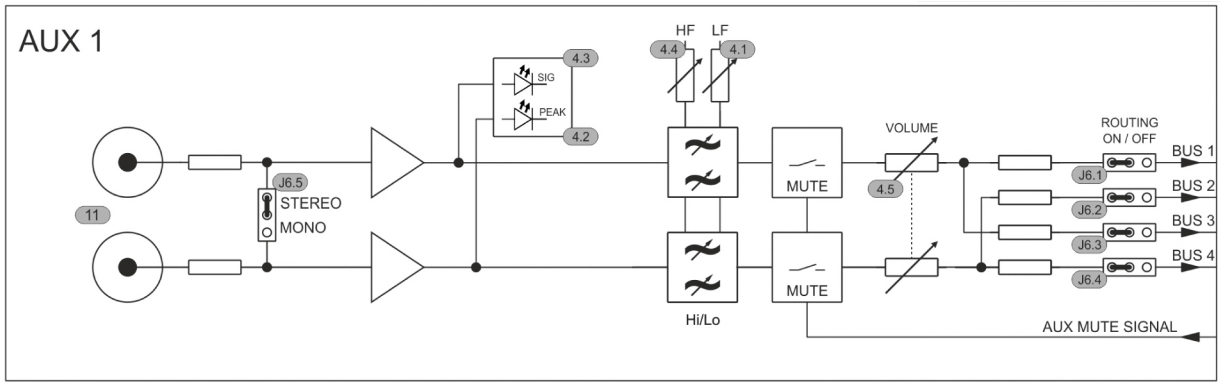
MIC 3 Block Diagram:



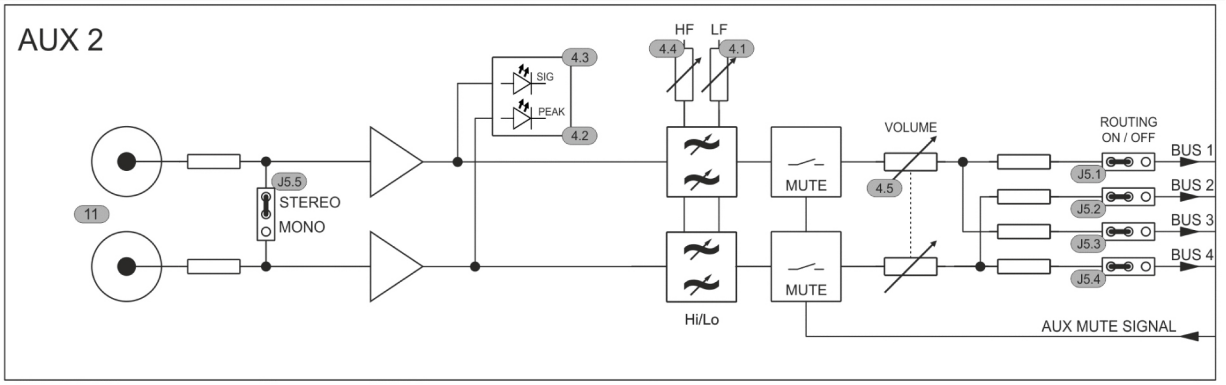
MIC 4 Block Diagram:



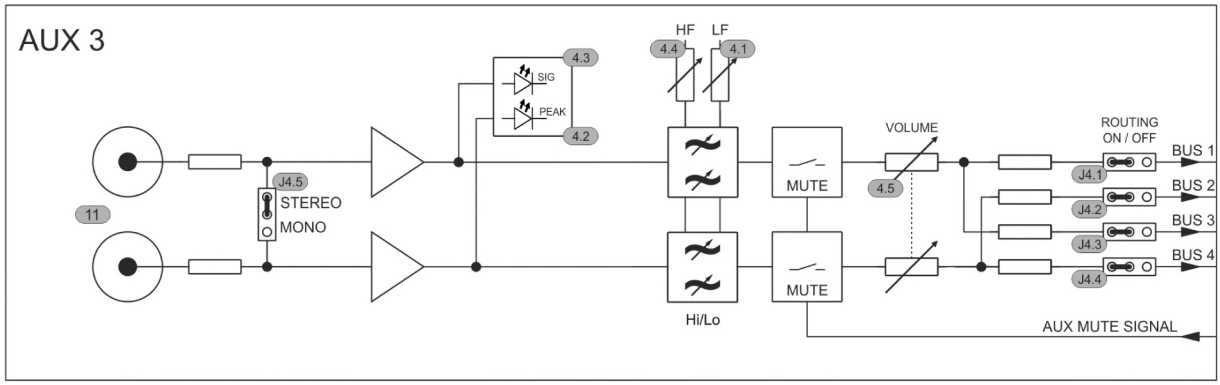
AUX 1 Block Diagram:



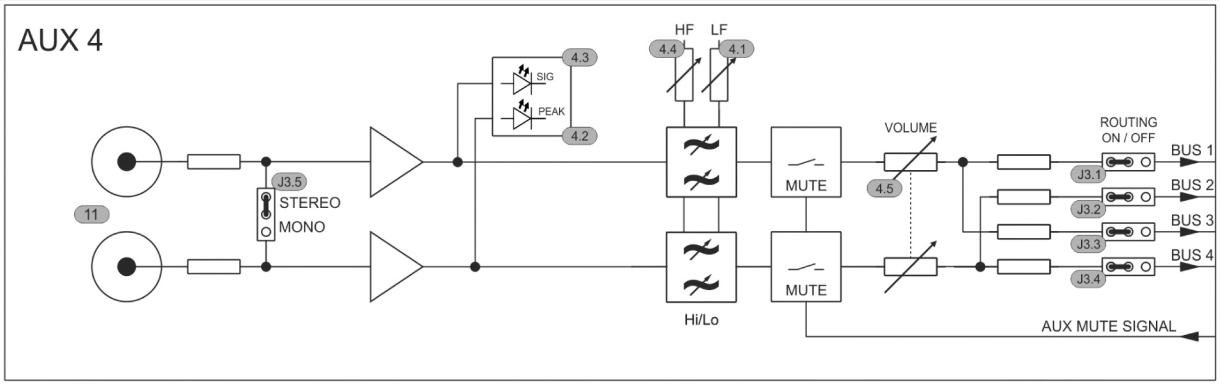
AUX 2 Block Diagram:



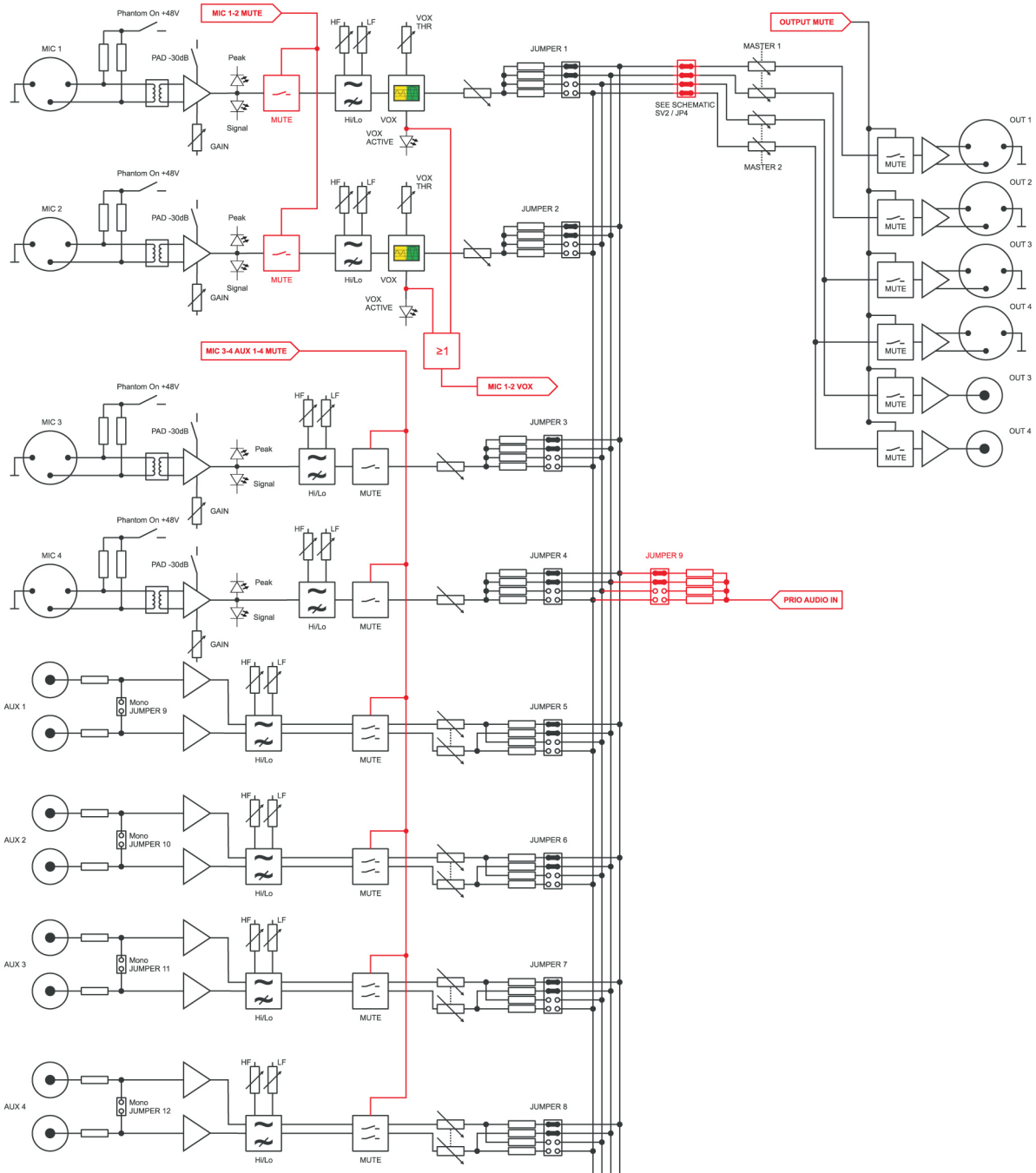
AUX 3 Block Diagram:



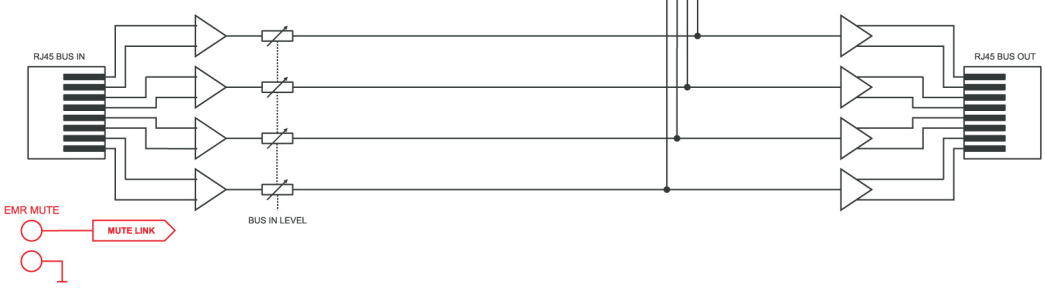
AUX 4 Block Diagram:



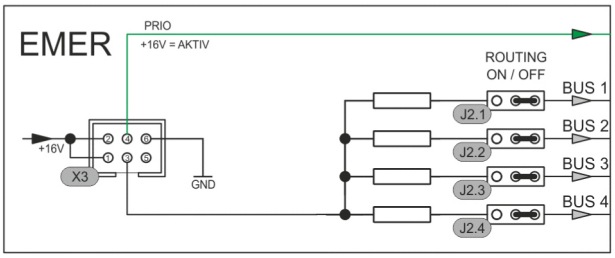
Block Diagram:



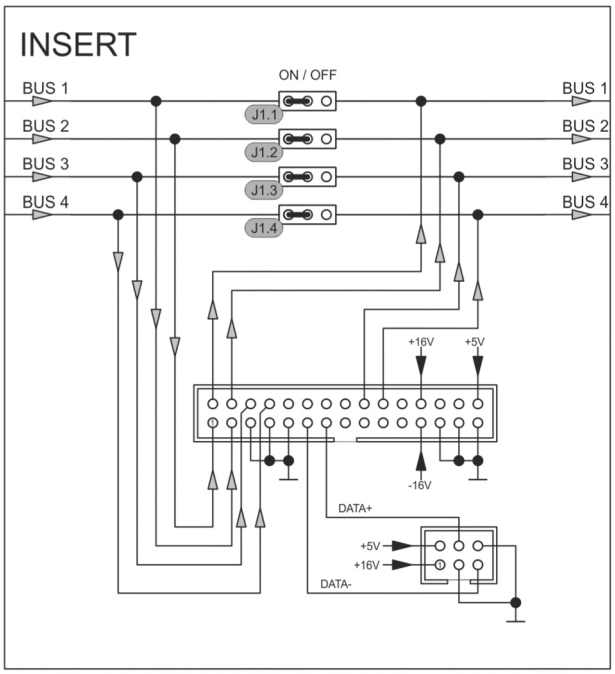
Pin Configuration:



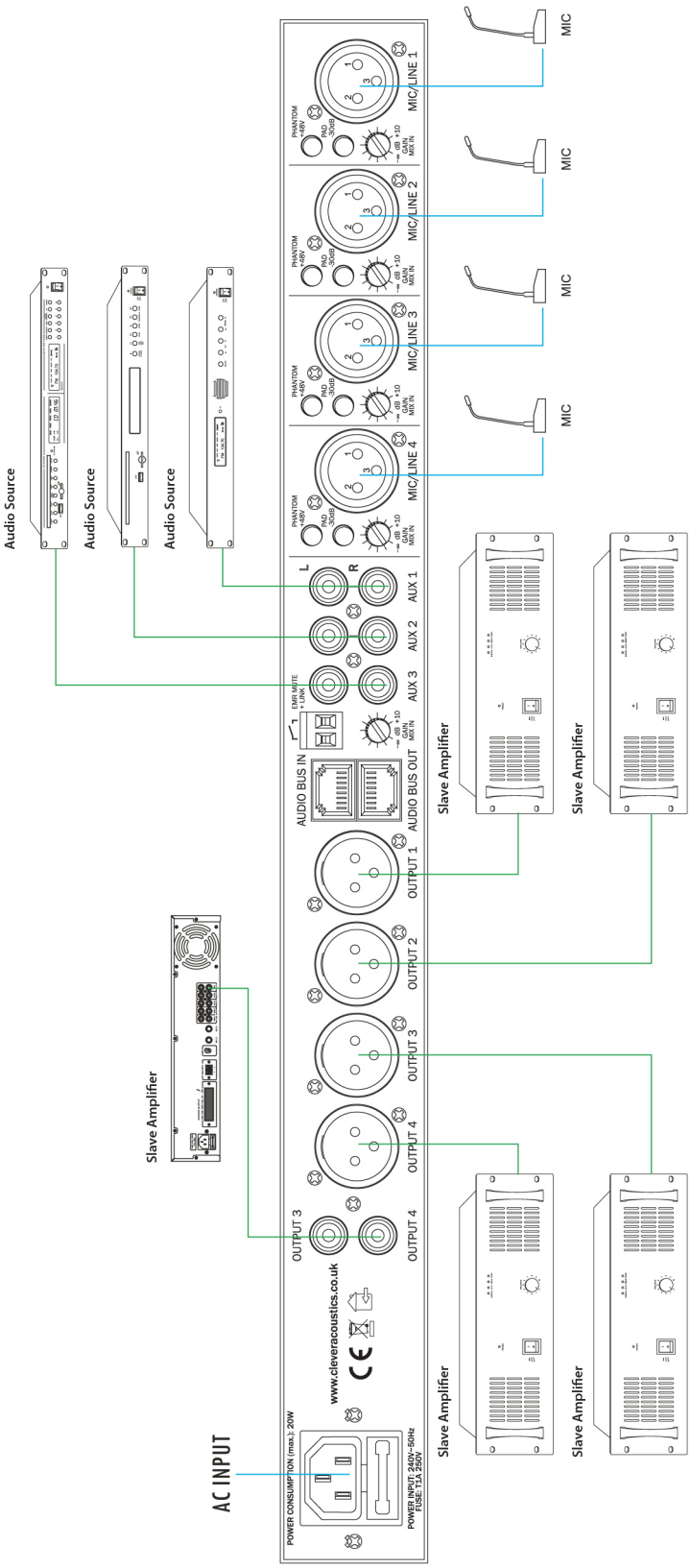
EMER Block Diagram:



INSERT Block Diagram:



Typical Panel Connections:



Correct Disposal of this Product (Waste Electrical & Electronic Equipment)

(Applicable in the European Union and other European countries with separate collection systems)

This marking shown on the product or its literature, indicates that it should not be disposed with other household wastes at the end of its working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources.

Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take this item for environmentally safe recycling.

Business users should contact their supplier and check the terms and conditions of the purchase contract. This product should not be mixed with other commercial wastes for disposal.