Cloud
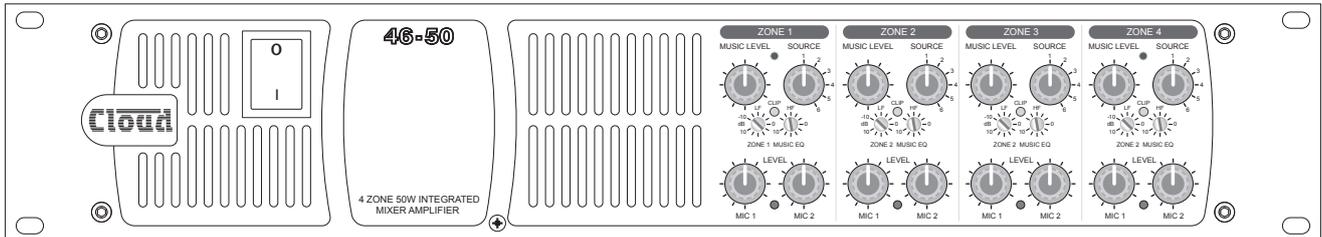
46-50 FOUR ZONE INTEGRATED MIXER AMPLIFIER

Installation and User Guide

WARNING:

To reduce the risk of fire or electric shock, do not expose this appliance to rain or moisture.

CAUTION:

Use of controls or adjustments or performance of procedures other than those specified may result in hazardous radiation exposure.

CAUTION RISK OF ELECTRIC SHOCK DO NOT OPEN	WARNING: SHOCK HAZARD – DO NOT OPEN AVIS: RISQUE DE CHOC ELECTRIQUE – NE PAS OUVRIR
	The lightning flash with the arrowhead symbol within an equilateral triangle, is intended to alert you to the presence of uninsulated dangerous voltages within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock.
	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.

IMPORTANT SAFETY 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. 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. Only use attachments/accessories specified by the manufacturer.

12. Use only with the cart, stand, 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 tip-over.

13. Unplug this apparatus during lightning storms or when unused for long periods of time.

14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been 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.

Do not expose the apparatus to dripping or splashing, and ensure that no objects filled with water, such as vases, are placed on the apparatus.

L'appareil ne doit être exposé aux écoulements ou aux éclaboussures et aucun objet ne contenant de liquide, tel qu'un vase, ne doit être placé sur l'appareil.

The mains plug is used as the disconnect device and it should remain readily accessible during intended use. In order to isolate the apparatus from the mains, the mains plug should be completely removed form the mains outlet socket.

Le prise du secteur ne doit pas être obstruée ou doit être facilement accessible pendant son utilisation. Pour être complètement déconnnecté de l'alimentation d'entrée, la prise doit être débranchée du secteur.

This apparatus is of Class 1 construction and must only be connected to a mains outlet socket with a protective earthing connection.

Terminals marked with the ⚡ symbol may use Class 2 Wiring, but voltages at these terminals may be of sufficient magnitude to constitute a risk of electric shock. The external wiring connected to these terminals requires installation by an instructed person or the use of pre-made leads or cords.

Contents

SAFETY INFORMATION

Safety Notes regarding Installation

- Do not expose the unit to water or moisture.

- Do not expose the unit to naked flames.

- Do not block or restrict any air vent.

- Do not operate the unit in ambient temperatures above 35°C

- Do not touch any part or terminal carrying the hazardous live symbol ⚡ while power is supplied to the unit.

- Do not perform any internal adjustments unless you are qualified to do so and fully understand the hazards associated with mains-operated equipment.

- The unit has no user-serviceable parts. Refer servicing to qualified service personnel.

- If the moulded plug is cut off the AC power lead for any reason, the discarded plug is a potential hazard and should be disposed of in a responsible manner.

Conformities

This product conforms to the following European EMC Standards:

BS EN 55103-1:2009

BS EN 55103-2:2009

CE

This product has been tested for use in commercial and light industrial environments. If the unit is used in controlled EMC environments, the urban outdoors, heavy industrial environments or close to railways, transmitters, overhead power lines, etc., the performance of the unit may be degraded.

The product conforms to the following European electrical safety standard:

BS EN 60065:2012

Safety Considerations and Information

The Cloud 46-50 must be earthed. Ensure that the mains power supply provides an effective earth connection using a three-wire termination.

Caution – High Voltage

Do not touch any part or terminal carrying the hazardous live symbol ⚡ while power is applied to the unit. Terminals to which the hazardous live symbol refers require installation by a qualified person.

Caution – Mains Fuse

The 46-50 contains no user-replaceable fuses. Mains over-current protection is provided by the fuse in the IEC receptacle; only replace this fuse with one of an identical type and rating. If the replacement fuse blows immediately it indicates that the mixer amplifier has developed a fault, which should be referred to competent service personnel.

Caution – Servicing

The unit contains no user-serviceable parts. Refer servicing to qualified personnel. Do not perform servicing unless you are qualified to do so. Disconnect the power cable from the unit before removing the top panel and do not make any internal adjustments with the unit switched on. Only reassemble the unit using bolts/screws identical to the original parts.

OVERVIEW

Introduction

Thank you for purchasing this Cloud Multi-Zone Mixer Amplifier. We are confident that you will be pleased with its performance, features, flexibility and reliability.

The Cloud 46-50 is a four-zone analogue audio mixing amplifier. It combines simple control of background music with versatile microphone paging and power amplification in a single unit. It is suitable for use in many types of premises, including pubs, bars, clubs, shops, offices, hotels, etc. It is compatible with Cloud PM Series paging microphones and is also designed to interface with most third-party paging microphones conforming to industry standards.

Scope of this manual

This manual provides a comprehensive guide to the features and functionality of the Cloud 46-50 Multi-Zone Mixer Amplifier. The 46-50 is available in two versions, the 46-50 and 46-50T. The two models are identical in facilities and features, and differ only in that the 46-50T includes a factory-fitted and pre-wired CXL-4160 transformer module for 70 V-line operation (can be altered to 100 V-line operation).

Please read through the manual to become fully acquainted with the various configuration and control functions the 46-50 offers.

The manual is arranged as follows:

- **Overview** – introduction to the 46-50 and its options.
- **Installation** – wiring the 46-50 in a practical situation.
- **Setting Up & Operation** – setting the system up and user instructions.
- **Options and Additional Information** – additional information about system options.
- **Appendix** – additional technical information. Includes technical specifications.

The 46-50 Installation and User Guide includes basic information on interfacing Cloud PM Series paging microphones and connecting Cloud RL-1 Series and RSL-6 Series remote control plates. Full installation information for each of these options is supplied with the items themselves.

Thank you again for placing your confidence in Cloud products.

What's in the box

Unpack the 46-50 and its accessories with care. It is always a good idea to store all packaging (if practical), in case you ever need to return the unit to your Cloud dealer for any reason.

As well as this manual, the shipping carton should contain the items listed below. Please contact your Cloud dealer immediately if any of them are missing or damaged.

- Cloud 46-50 (or 46-50T) Multi-Zone Mixer Amplifier
- IEC mains lead (AC cord) with moulded plug appropriate to the territory
- Set of mating connectors for all rear panel multi-pin screw-terminal connectors
- Set of four rubber feet
- Front panel security cover (prevents access to Zone EQ controls)
- 4qty M3 x 6 hex-head screws for security cover
- 2 mm hex key (for security cover screws)
- Miniature multi-blade adjustment tool

46-50 Main features

- Mixer Amplifier for four zones
- Six (unbalanced) stereo line inputs with individual gain trim controls
- Front panel user controls for music source, music level and level of each microphone, for each zone, plus preset controls for HF/LF EQ
- Two balanced mic inputs; 15 V phantom power selectable on either or both
- Contact closure access port for paging zone selection – most OEM paging systems supported
- Switchable mic-over-music priority (Automatic Voice Over)
- Selectable LINE 6 priority per-zone, with choice of release times
- 4 x 50 W power output (lo-Z operation)
- Zone 1 Facility Port (Dsub) for connection to remote sources and external control
- Zones 1 & 2 auxiliary line level outputs (pre-power amplifier), for connection of additional external amplifiers
- Slave mode: two power amplifier stages may be fed from a single programme source
- Rear panel adjustments for: i) mic input sensitivity and HF/LF EQ, ii) zone output HF/LF music EQ, iii) utility output music and mic level
- Optional internal CXL-4160 4-channel 70/100 V transformer module can be retrofitted to convert 46-50 to 46-50T
- Optional external CXL-40T 70/100 V toroidal transformers available for use with any or all outputs
- Selectable 65 Hz high-pass filter per-output (for use with 70/100 V transformers)
- Music Mute control input (N/O or N/C) to interface to emergency system
- Compatible with standard Cloud remote control plates: RL Series (music level) and RSL Series (music level and source selection), per-zone
- Optional EQ cards available to suit various popular installation loudspeakers may be fitted to any or all outputs
- 2U 19" rack-mounting unit
- Thermostatically-controlled fan cooling

Optional system components

The following components may form part of the audio system and may be ordered separately if required. They may also be retrofitted to a system at a later time. Separate datasheets are available for each of the individual components; download them at www.cloud.co.uk.

LM-2 remote active module

> **IMPORTANT**
>
> Connection of the LM-2 is via screened Cat 5 cable and RJ-45 connectors. It is primarily intended for direct connection to Cloud products such as the Z4 and Z8MK3 Zone Mixers and the 46-120 Mixer Amplifier, but will operate correctly with the 46-50 following wiring modifications. A Technical Note describing its use with the 46-50 is available from the Cloud website www.cloud.co.uk.
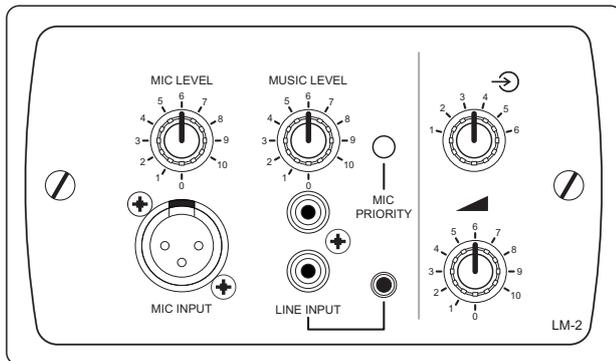
The LM-2 is an active input module with one microphone and one stereo line input, which allows a microphone and a line level audio source - such as a DJ mixer, laptop, MP3 player or similar - to be connected to the 46-50 at a remote location. The module also includes the functions of the RSL-6 Remote Control Plate (see opposite), permitting control of zone music level and source. A music ducking button activates the 46-50's priority circuitry; when enabled, a microphone signal from the LM-2 will reduce the music level in the zone. The LM-2 connects to the 46-50's **ZONE 1 FACILITY PORT** (but see note above), and thus will generally be installed within Zone 1.

See page 16 for more information.

Note: the 46-50 is also compatible with certain earlier Cloud remote modules such as the LM-1 and DM-1. Please see www.cloud.co.uk/accessories/archive for more information.

RL-1 Series Remote Music Level Controls
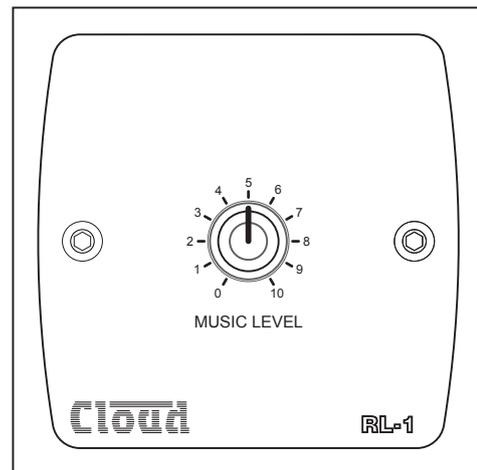
The RL-1 Series is a range of small plates with a single control for locally adjusting the music level in a zone. They connect to one of the 46-50's **REMOTE MUSIC CONTROL** ports. See page 15 and page 21 for more information.

RSL-6 Series Remote Music Level/ Source Controls
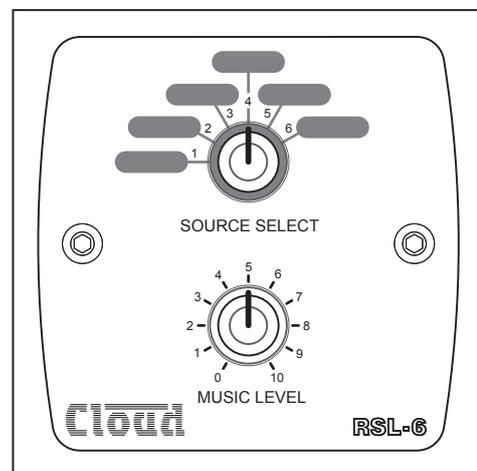
The RSL-6 Series is a range of plates allowing local (per-zone) music source selection as well as music level control. They are the same size as the RL-1s, and connect in a similar way. See page 16 and page 21 for more information.

PM Series microphones
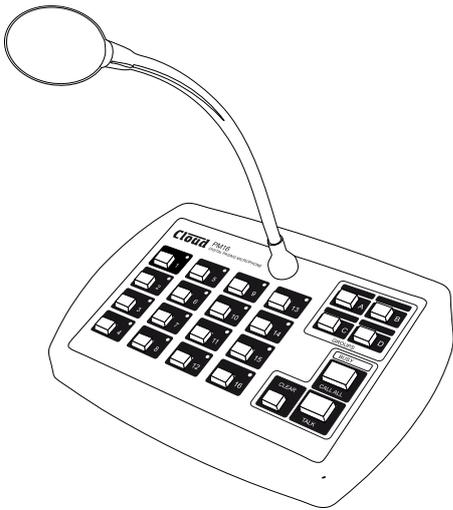
Cloud PM Series paging microphones may be connected directly to the 46-50 using **MIC 1** input and the **PAGING ACCESS** port. Models are available which can page to 4, 8, 12 or 16 zones, and also to 4 or 8 zones with storage for built-in spot announcements. As the 46-50 only supports four zones, not all zones on the "higher" models can be accommodated by a single 46-50; the PM4 and PM4-SA (4-zone) models are most likely to be useful. See page 14 for more information.
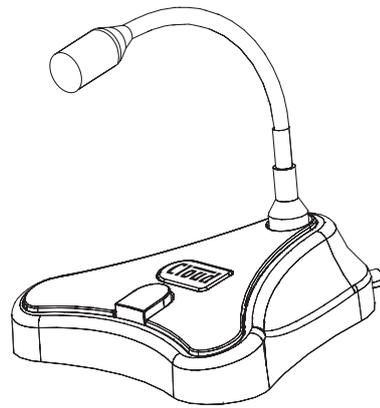
The Cloud PM1 paging microphone is also compatible with the 46-50. It is a much simpler unit which addresses a single zone (although zones may be paralleled for wider access). See page 15 for more information.
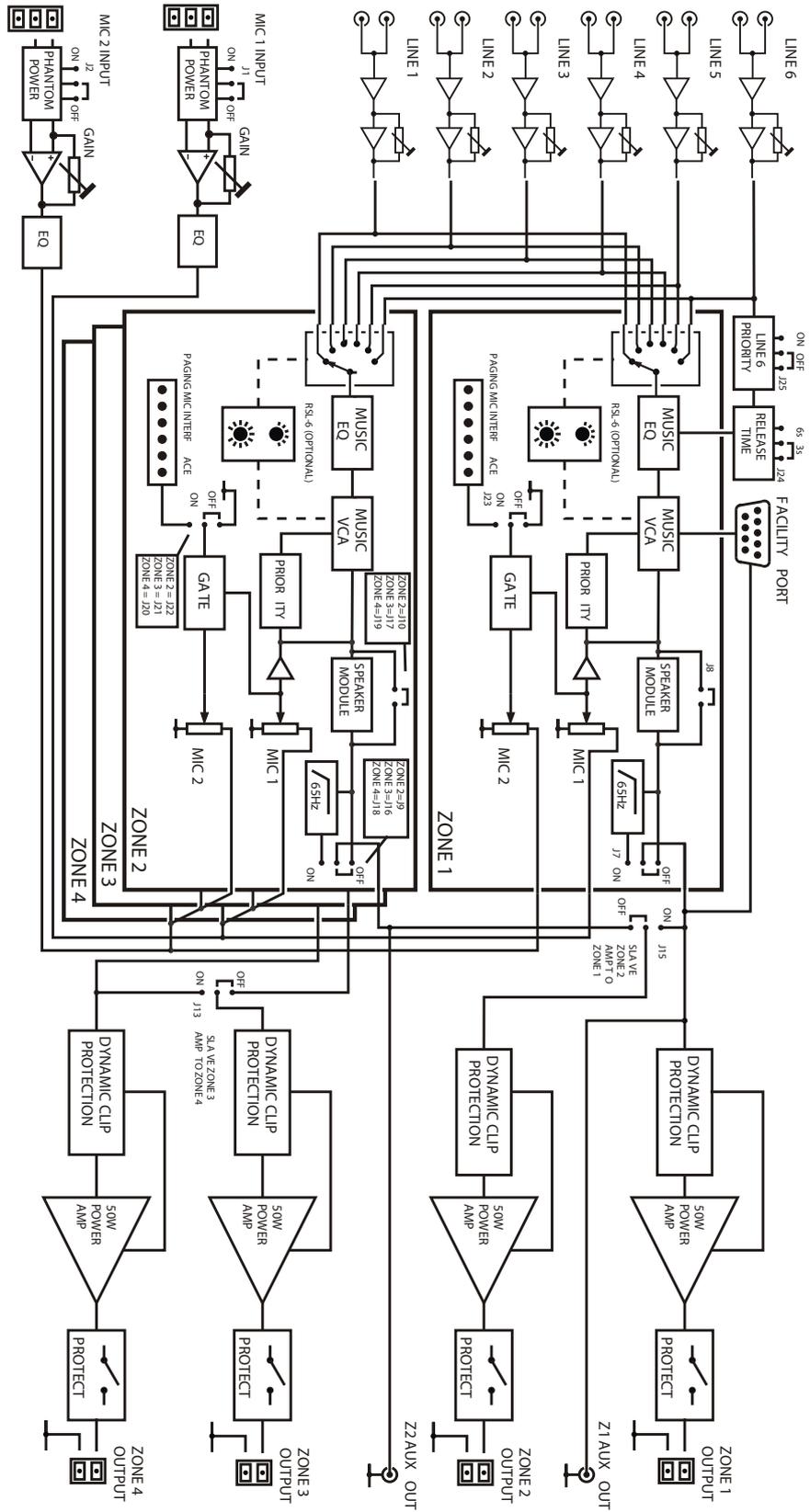
The simplified block diagram above illustrates the basic signal architecture of the 46-50.

Front panel description

Only Zone 1 controls indicated;
those for the other Zones are identical.
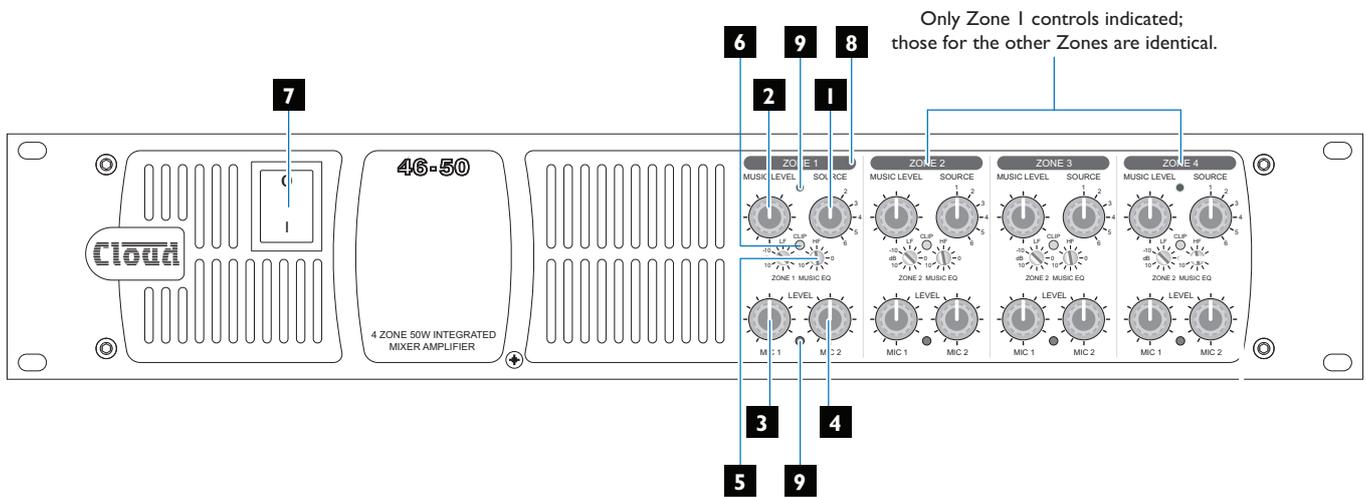
1. **SOURCE** – 6-way rotary switch selecting which Line Input (LINE 1 to LINE 6) will be the music source for each zone. See page 18.

2. **MUSIC LEVEL** – adjusts the music level in each zone. See page 18.

3. **MIC 1** – adjusts the level of the microphone connected to the rear panel MIC 1 input in each zone. See page 18.

4. **MIC 2** – as [3], but controls level of MIC 2 input.

5. **MUSIC EQ** – two preset controls for adjusting HF/LF EQ in each zone. See page 18.

6. **CLIP** – per-zone red LEDs; illuminate when the output stage's Dynamic Clip Limiter is active. This indicates that the level is too high.

7. Power – rocker switch.

8. Zone idents – a space is provided above each zone's controls for printed labels identifying the zone by name.

9. Fixing holes for security cover – prevents access to Zone EQ controls.

Rear panel description
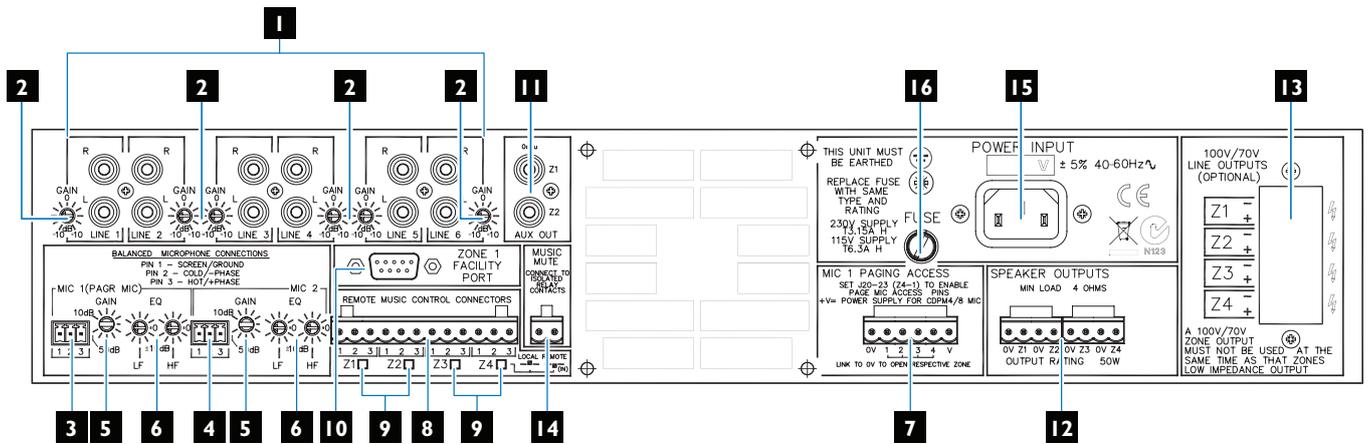
1. **LINE 1 to LINE 6** – six pairs of RCA (phono) sockets for connection of music sources. Inputs are stereo, summed internally to mono. See page 13.

2. **GAIN** – preset trim control for each line input, providing ±10 dB of gain adjustment for input level matching. See page 18.

3. **MIC 1** – balanced microphone input on 3-pin 3.5 mm-pitch screw-terminal connector. See page 14. This input should be used in conjunction with the ACCESS CONTACTS connector [7] for paging.

4. **MIC 2** – balanced input for a second microphone; 3-pin 3.5 mm-pitch screw-terminal connector.

5. **GAIN** – preset mic gain controls for MIC 1 and MIC 2, gain range 10 to 60 dB. See page 18.

6. **MIC EQ** – HF & LF preset EQ controls. See page 18.

7. **PAGING ACCESS** – 6-pin 5 mm-pitch screw-terminal connector for per-zone paging access by contact closure. See page 14.

8. **REMOTE MUSIC CONTROL** – 3-pin 5 mm-pitch screw terminal connector for each primary zone, for connection of RL-1/RSL-6 remote control plates. See page 15.

9. **LOCAL/REMOTE** – switches determine whether front panel music source and level controls will remain active when remote control plates are connected (per-zone). See page 15.

10. **ZONE 1 FACILITY PORT** – 9-pin Dsub socket, for connection of remote input/control modules, or as an auxiliary input. See page 16.

11. **AUX OUT** – unbalanced line level outputs for Zone 1 and Zone 2 at 0 dBu. See page 17.

12. **SPEAKER OUTPUTS** – low-impedance outputs for each of the four zones on 3-pin 3.5 mm-pitch screw-terminal connector. See page 16.

13. **100V/70V OUTPUTS** – location of output terminals for 70/100 V-line operation when CXL-4160 transformer module is fitted internally (either on Model 46-50T, or as retrofitted option). See page 17.

14. **MUSIC MUTE** – 2-pin 5 mm-pitch screw terminal connector for connection of external emergency muting relay (e.g., fire control panel). See page 17.

15. Mains – IEC receptacle for AC mains. See page 13.

16. **FUSE** – mains fuse. See page 13 for fuse details.

INSTALLATION

Hardware considerations

The 46-50 Mixer Amplifier is built in a 2U-high 19" rack mount enclosure. It is recommended that the 46-50 is installed in a 19" rack wherever possible. The units are approx. 320 mm deep, but at least 400 mm of rack depth should be available to allow for rear connectors and cabling.

The 46-50 uses thermostatically-controlled forced-air cooling, using a two-speed fan. The enclosure has air intake slots in the front panel; ensure that these are not obstructed once the unit is installed. Warmed air is expelled at the rear of the unit by the fan. It is recommended that 1U blank panels are fitted in the rack above and below the 46-50; do not fit slotted ventilation panels as these defeat the action of forced-air cooling.

If the unit is to be used free-standing (i.e., not mounted in a rack), the four feet supplied in the accessory pack should be fitted to the bottom of the chassis. These should be inserted into the four 5 mm dia. holes clearly identifiable in the corners of the bottom panel.

The choice of location will be dictated by the specifics of the system and building layout. It is recommended that wherever possible, the 46-50 should be mounted adjacent to as many of the music sources (CD players, music servers, TV receiver boxes, etc.) as practical.

When deciding the Mixer Amplifier's location, bear in mind that access to it (particularly the rear panel) will probably be required even if a full complement of remote controls is being fitted as part of the system, as certain adjustments can only be made on the unit itself.

Power Supply

The European version of the 46-50 operates on standard 230 V AC mains; an alternative version is available which operates on 115 V AC. An IEC mains cable with a plug appropriate for each country is supplied with the European unit. The unit's power consumption is 181 VA (measured using 8th-power pink noise driving 4 x 4 ohm loads).

Fuses and ratings

The only externally-accessible fuse is an AC mains fuse in the IEC connector housing. **Only replace a fuse with one of exactly the same type**. The table below gives the correct fuse types.

VERSION	RATING	FUSE TYPE
230 V	3.15 A	20 mm x 5 mm slo-blo T3.15AH
115 V	6.3 A	20 mm x 5 mm slo-blo T6.3AH

The fuseholder is of the "bayonet" type; press and twist the holder anticlockwise to remove the fuse. If a replacement fuse blows immediately, it indicates that the mixer amplifier has developed a fault, which should be referred to competent service personnel.

Internally, two 20mm x 5mm fast-blow F4.0A fuses protect each amplifier channel (eight in total). These are service components, and should not require attention. Failure of any of these fuses indicates a fault condition, which should be immediately referred to a competent technician or authorised service centre.

System connections

Music sources

Connect the system's various music sources to **LINE 1** to **LINE 6**. All line inputs offer unbalanced connection for stereo sources on a pair of standard RCA jacks (phono sockets). The sensitivity range available should allow most standard items of audio equipment such as computers/tablets, music servers and media receivers, etc., to operate at a satisfactory level. Most equipment of this type will have stereo unbalanced outputs, and as long as the source equipment is adjacent to the Mixer Amplifier, normal phono-phono (or 3.5 mm jack-to-phono) leads can be used. Always avoid using pre-made leads of an unnecessary length.

Mono and stereo sources:

The mixing section of the 46-50 is mono; the stereo line inputs are summed internally. Stereo sources should be connected in a normal stereo configuration, using both L and R inputs. If connecting a mono source with only a single output, it may be connected to either the left or the right input.

Balanced sources:

If it is necessary to connect an item of source equipment with a balanced output to the 46-50's line inputs, ideally, a balancing transformer should be inserted between the source and the unbalanced input. Suitable audio transformers, which should have a ratio of 1:1, are readily available from major audio component suppliers. The transformer(s) should be mounted as close to the 46-50 as practical, and housed in a screened enclosure if they are not individually screened. The preferred connection method is shown below.

Balanced outputs (XLRs):
pin 1 ground
pin 2 hot
pin 3 cold
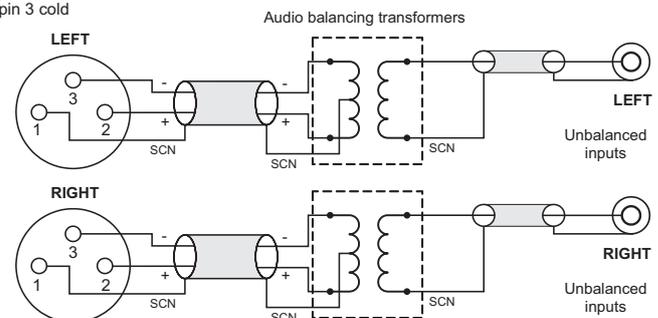
If transformers are not available, a balanced source may feed an unbalanced input directly as long as care is taken over how the connections are made. A variety of design techniques are in use to implement balanced outputs in audio equipment,

and some designs require different wiring protocols to others, but to connect only the 'hot' and 'screen' to the unbalanced input while leaving the 'cold' unconnected has been found to work satisfactorily in many situations. However, in all cases, installers are advised to check the manuals with each item for guidance on how the outputs should be connected to an unbalanced input.

Microphone input

Inputs **MIC 1** and **MIC 2** are intended for the direct connection of microphones. They are electronically balanced and transformerless with an input impedance of greater than 2 kohms and optimised for use with microphones of 200 to 600 ohms impedance. The screw terminal input connectors should be wired thus:

PIN	CONNECTION
1	Screen
2	Signal '-' (cold)
3	Signal '+' (hot)

Unbalanced microphones may be used by connecting pin 2 to pin 1 (cable screen) in the mating (male) screw-terminal connector. 15 V phantom power is available, see page 18.

Either mic input may be routed to any of the zones in use, at any level in each zone. Microphone priority may be set so that any microphone announcements automatically reduce the music level in that zone while the announcement is in progress (see page 19 for more details.)

Paging system connections

Cloud PM Series paging microphones may be connected directly to the 46-50.

Two connections are required: the paging mic audio signal should be connected to the **MIC 1** input ([3] on page 12) and the control cable to the 6-pin **PAGING ACCESS** port ([7] on page 12). The pinout of the **PAGING ACCESS** port is given below:

PIN NO.	FUNCTION
1	0 V
2	Zone 1
3	Zone 2
4	Zone 3
5	Zone 4
6	+15 V

Connecting PM4/4SA paging microphones

These microphones are equipped with both digital and analogue paging interfaces; with the 46-50, the analogue interface is used. PM microphones are available in 4, 8, 12 or 16-zone versions; the installer should be sure he/she understands how paging zones correspond to mixer zones before commencing wiring. Although the 46-50 only supports a maximum of four zones, there is no technical reason to prevent a PM microphone being used in a restricted manner.

Standard two-core screened audio cable may be used for the audio signal, and stranded multicore (6-core is suitable) cable with an overall screen for the control cable. Note that PM Series microphones may obtain their DC power from the 46-50, but SA versions and need an external PSU.

Connections on the PM microphone are made via the rear cable access glands and screw terminal blocks on the main internal PCB (TERM2 and TERM 8 in the case of a PM4). Full connection details can be found in the PM Series Installation and User Guide.

The diagram below shows the cable connections between a PM4 and a 46-50, where power is supplied by the 46-50.
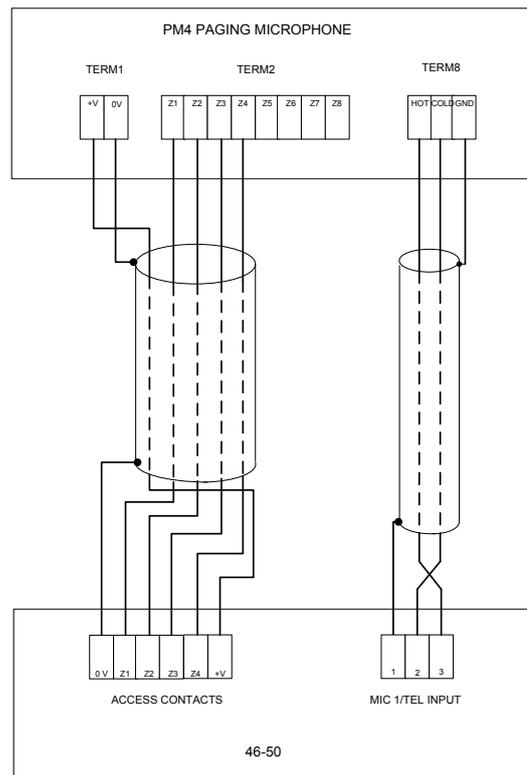
Note that the default factory setting routes **MIC 1** to all four zones at all times. In order for **MIC 1** to function correctly with a paging mic, internal jumpers J23 (Zone 1), J22 (Zone 2), J21 (Zone 3) and J20 (Zone 4) should be removed to enable the **PAGING ACCESS** connector. See page 24 for jumper locations.

For automatic music ducking during an announcement, internal jumper J12 must be in its 'ON' position. See page 19 for further information.

Connecting a PM1 paging mic

The PM1 is a simple, passive paging microphone suitable for situations where announcements are always made to the same zone(s). It can be connected directly to the 46-50 Mixer Amplifier, the control cable being wired to the pin(s) of the **PAGING ACCESS** port corresponding to the zone(s) in which announcements are required. Any or all of the zones may be paralleled if multiple zones need to operate from the PM1.

Either a single 2-pair individually-screened cable may be used (this gives the neatest finish), or two separate standard microphone cables. Connections on the PM1 are made via the rear cable gland in the base and the screw terminal blocks on the internal PCB (U2 and U3). Full connection details can be found in the PM1 Installation and User Guide. Note that the PM1 does not require DC power.

The diagram below shows the connections between a PM1 and a 46-50. Use of 2-pair cable is assumed; the same wiring principle is adopted if separate cables are being used for audio and control.

Note that the default factory setting routes **MIC 1** to all four zones at all times. In order for **MIC 1** to function correctly with a paging mic, internal jumpers J23 (Zone 1), J22 (Zone 2), J21 (Zone 3) and J20 (Zone 4) should be removed to enable the **PAGING ACCESS** connector. See page 24 for jumper locations.
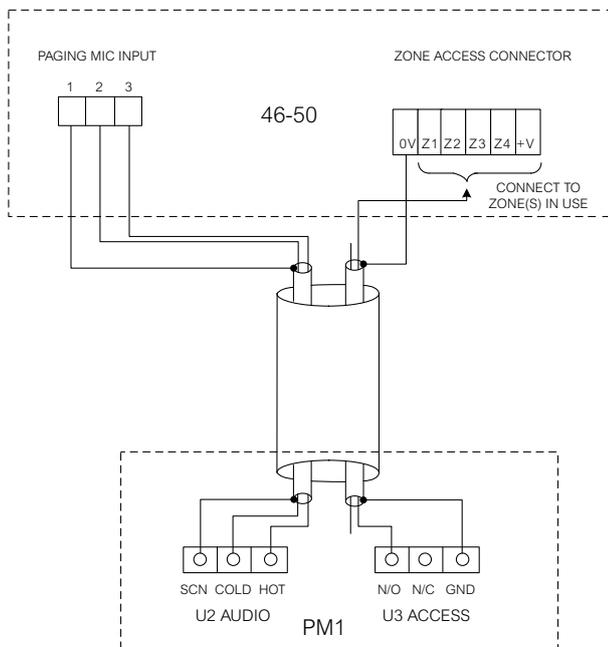
For automatic music ducking during an announcement, internal jumper J12 must be in its 'ON' position. See page 19 for further information.

Connecting OEM paging microphones

Other manufacturers' paging microphones may be used with the 46-50, provided they make the microphone signal available at a suitable level (the 46-50's mic gain adjustment range should be sufficient to accommodate most types), and that paging zone selection is by simple "contact closure-to-ground". Providing these conditions are met, the connection method described above for a Cloud PM4, or for the PM1 in the case of a single-zone mic, may be used.

Music control

Like many other Cloud products, the 46-50 allows remote control of music level and source selection in each of the primary zones. Cloud remote control plates from the RL-1 Series (music level only) and RSL-6 Series (music level and source selection) provide an elegant solution, though control via a DC voltage from third-party systems is also possible (see page 21).

Both types of plate connect via the **REMOTE MUSIC CONTROL** connectors for the relevant zone (see [8] on page 12). These connectors are 3-pin 5 mm-pitch screw terminal type; please refer to page 21 for additional information regarding cable lengths, etc.

Connecting an RL-1 Series remote control plate

Wire the remote control plate as shown below. Either single-core screened or twin-and-screen cable may be used; in the case of the latter, ignore one of the cores. Maximum reliable cable run is 100 m
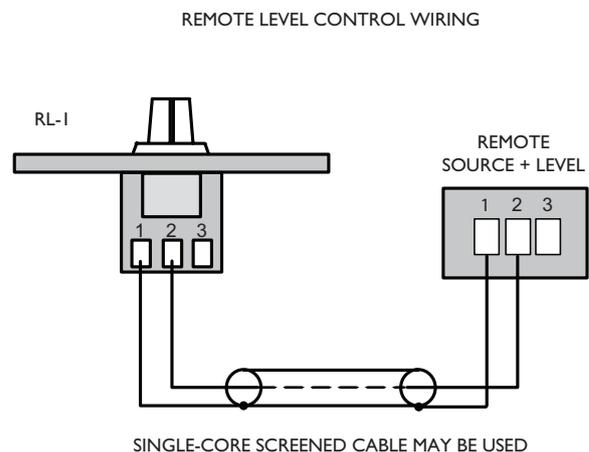
Before the RL-1 will operate, the zone's Music Control Port must be enabled by setting the adjacent push-button switch ([9] on page 12) to REMOTE (i.e., pressing it in). In this setting, the zone's front panel **MUSIC LEVEL** and **SOURCE** controls become inoperative. As music source selection will still be required from the mixer amplifier's front panel when an RL-1 is in use, the REMOTE setting may be overridden for the source selection control only by moving internal jumper J3 (Zone 1), J4 (Zone 2), J5 (Zone 3) or J6 (Zone 4) on the main internal PCB. See page 24 for location of internal jumpers.

Connecting an RSL-6 Series remote control plate

Wire the remote control plate as shown below. Twin-and-screen cable should be used. Maximum reliable cable run is 100 m.

REMOTE SOURCE & LEVEL CONTROL WIRING

USE TWO-CORE SCREENED CABLE
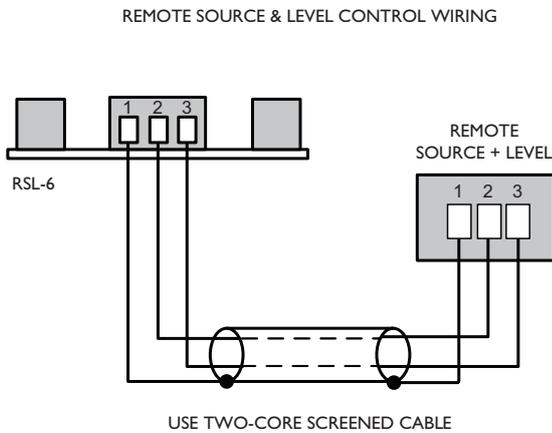
Before the RSL-6 will operate, the zone's Music Control Port must be enabled by setting the adjacent push-button switch ([9] on page 12) to REMOTE (i.e., pressing it in). In this setting, the zone's front panel **MUSIC LEVEL** and **SOURCE** controls become inoperative.

Zone 1 Facility Port

Zone 1 of the mixer amplifier is provided with a **FACILITY PORT** in the form of a female 9-pin Dsub connector on the rear panel. This may be used to connect a remote active input/control module, but may also be used as a general-purpose auxiliary balanced input (see page 22 for more information on this application). Note that an audio source connected via the **FACILITY PORT** will only be available in Zone 1, and no other.

Active modules operate from DC power supplied by the 46-50. The current consumed by each module is minimal and in the vast majority of installations there will be no power supply issues.

The pinout of the **FACILITY PORT** connector is given in the table below:

PIN	USE
1	Remote source select
2	Remote level control
3	Balanced audio input hot (+)
4	Balanced audio input cold (-)
5	Noise Gate control
6	-15 V DC
7	+15 V DC
8	0 V DC
9	VCA control voltage

Connecting an LM-2 remote active module

The Cloud LM-2 remote active module may be connected to the FACILITY PORT using screened Cat 5 cable. (Note that as the cable carries analogue audio, only screened Cat 5 should be used.) As the LM-2 is primarily designed for use with RJ45 connectors (and is itself fitted with an RJ45), it is necessary to wire the screened Cat 5 cable to a mating male 9-pin Dsub connector in order to use it with the 46-50. This procedure, and details of how to configure the 46-50 to suit, are explained in full in Cloud Technical Note TN-007, which may be downloaded as a PDF file from the Resources page at www.cloud.co.uk.

Speaker outputs (Lo-Z)

The speaker output connector is an 8-pin, 5 mm-pitch screw-terminal connector. Four mating 2-pin connectors are supplied. The power amplifier outputs for all four zones are present on this connector. Connect to speakers using pairs of terminals as shown in the table:

	Panel marking	Connect to:
1	**0V**	Zone 1 output '-'
2	**Z1**	Zone 1 output '+'
3	**0V**	Zone 2 output '-'
4	**Z2**	Zone 2 output '+'
5	**0V**	Zone 3 output '-'
6	**Z3**	Zone 3 output '+'
7	**0V**	Zone 4 output '-'
8	**Z4**	Zone 4 output '+'

Each output stage is designed to drive into an impedance of not less than 4 ohms. Check the impedance of the loudspeaker(s) in use and, taking into account any series and/or parallel wiring, ensure that the total load on each channel is not less than 4 ohms.

Speaker outputs (100/70 V-line operation)

The 46-50 may be converted for 100/70 V-line operation by the use of the Cloud CXL-4160 transformer module. This module is fitted internally, and consists of four independent transformers with separate flying leads, so any or all outputs of the 46-50 may be converted to 100 V and/or 70 V-line operation as required.

⚠️ The low-impedance outputs are still active, but should not have a load connected to them while the 70 V/100 V-line outputs are in use.

In the 46-50T model variant, the CXL-4160 is pre-installed at the factory, and wired for 70 V-line operation. This can be changed to 100 V-line operation (per-output) if wished by moving on-board links. Alternatively, the standard 46-50 model may be modified for 100/70 V-line operation by retrofitting the CXL-4160 module, which is available from Cloud Electronics as an option. Full installation instructions are supplied with the module.

When the CXL-4160 is fitted, an 8-pin parallel entry screw-terminal connector occupies the blank connector slot [13] at page 12. The connector is wired as shown below:

	Panel marking	Connect to:
1	Z1-	Zone 1 output '-'
2	Z1+	Zone 1 output '+'
3	Z2-	Zone 2 output '-'
4	Z2+	Zone 2 output '+'
5	Z3-	Zone 3 output '-'
6	Z3+	Zone 3 output '+'
7	Z4-	Zone 4 output '-'
8	Z4+	Zone 4 output '+'

If preferred, individual external transformers may be employed to convert outputs for 100/70 V-line operation. A suitable transformer is the CXL-40T, available as an accessory from Cloud Electronics. A 19" rack tray for mounting multiples of these is also available.

When using the 46-50 for 100/70 V-line operation, the 65 Hz high-pass filters in each zone to be used in this mode should be enabled. See page 18 for full details.

Auxiliary line outputs

In large zones, it may be necessary to use additional amplifiers to obtain the necessary power to drive a greater number of loudspeakers, or to drive some loudspeaker types requiring high power levels than the 50 W available from the 46-50's channels. To permit the connection of further amplifiers (or any other equipment), unbalanced outputs from the 46-50's pre-amplifier sections for Zones 1 and 2 are available at the rear panel phono (RCA) connectors labelled **AUX OUT Z1** & **Z2**.

All Zone1 and 2 controls and settings on the front and rear panels (levels, source selection, priority settings, etc.) affect the Auxiliary line outputs. However, note that their source is pre the switchable 65 Hz high pass filters, thus any additional amplifiers connected at the **AUX OUT** outputs would need to have hi-pass filters applied if they were being used to drive 100/70 V-line circuits.

Music Mute

External muting of music is available at the **MUSIC MUTE** connector. National or Local Authority regulations governing such systems may require that normal programme material (i.e., music) should be muted in an emergency, to ensure that any emergency messages are clearly audible.

The Music Mute input is on a 2-pin 5 mm-pitch screw-terminal connector. It should be connected to the appropriate alarm output on whichever building management system registers the alarm (typically the Fire System). The alarm output must be volt-free; if no such output is available, an intermediate relay or other isolation device must be installed between the alarm output and the Music Mute input.

REMOTE MUSIC MUTE TERMINATIONS
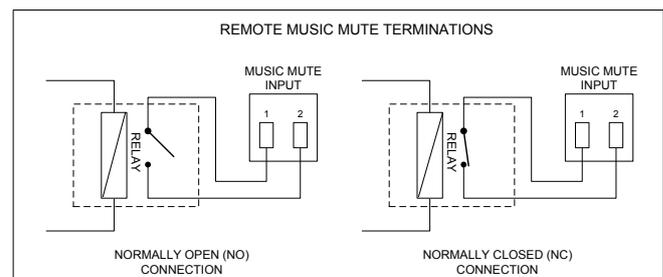
SETTING UP & OPERATION

Music Inputs

Gain & level

To avoid dramatic changes in volume when switching between sources, the 46-50's music inputs are provided with preset gain trim controls ([2] on page 12). These vary the input sensitivity from -12 dBu (195 mV) to +8 dBu (2.0 V). When setting the system up, play audio from all the sources in use and listen to them one at a time in a convenient zone (ideally that in which the mixer is located) at a reasonable volume. Taking a source of "average" volume as the reference, the gain controls of the others should be adjusted so that there is no appreciable difference in volume between any of the sources. (With a typical music source, setting the gain on its channel to mid-way is a good starting point.) Note that consideration may need to be given to the type of programme in use, particularly if one or more sources are TV sound.

In normal operation, the music level in each primary zone is set with the **MUSIC LEVEL** control on the front panel ([2] on page 11). This control will not be operative if the corresponding rear panel **LOCAL/REMOTE** push-button is set to REMOTE.

Note that the setting of the music level has no effect on microphone volume.

Local/remote control

If a zone has an RL-1 or RSL-6 Series remote control plate connected in any zone(s), the corresponding rear panel **LOCAL/REMOTE** push-button(s) must be set to REMOTE (button in) for the remote controls to be operative and for the corresponding front panel controls to be disabled. Zones without such plates should be set to LOCAL (button out).

The setting of the internal jumpers J3 to J6 (on the main PCB) is also relevant. The default setting is SW. This means that the method of zone music source selection will be determined by the rear panel switch setting; the front panel control will make the selection if **LOCAL/REMOTE** is set to LOCAL and via a remote plate or other external control if set to REMOTE. If a jumper is set to FR, the source selection will always be made with the front panel control whatever is connected at the rear panel or the setting of the LOCAL/REMOTE switch. If external control of music level only (i.e., not source selection) is required, J3 (Zone 1), J4 (Zone 2), J5 (Zone 3) and/or J6 (Zone 4) should be set to FR and the **LOCAL/REMOTE** switch to REMOTE.

See page 24 for location of internal jumpers.

Microphone input

Phantom power

Both microphone inputs have 15 V phantom power available. This will be adequate to power a wide range of condenser microphones. (Some "studio quality" mics may require a higher phantom voltage and thus necessitate an external PSU.) To enable phantom power at a mic input, internal motherboard jumpers J1 (**MIC 1**) and/or J2 (**MIC 2**) should be moved to their ON position. See page 24 for jumper location.

Phantom power should NOT be enabled if dynamic microphones are to be used.

Gain & level

Both microphone inputs are provided with a rear panel preset **GAIN** control ([5] on page 12). A wide range of gain is available and there should be no problem in obtaining a satisfactory level from any normal microphone.

The **GAIN** controls should be adjusted by speaking normally into a microphone of the correct type. Turn the front panel **MIC LEVEL** control up to maximum and listen in a convenient zone; the rear panel gain control should be carefully advanced until the mic volume is as loud as it is ever likely to be needed, and then reduced slightly. There should be no audible distortion. The use to which the microphone is to be put should be borne in mind – karaoke is more likely to overload the mic preamplifier than spoken announcements, if the gain is not set correctly.

In normal operation, the mic level in each primary zone is set with the **MIC LEVEL** controls on the front panel ([3] on page 11).

EQ

The mic input has associated HF and LF EQ controls ([6] on page 12) These provide 10 dB of cut or boost at 5 kHz and 100 Hz respectively and should be adjusted by listening to achieve a clear mic sound. Again, the application should be borne in mind when making adjustments.

High-pass filter

The mic input has a fixed 100 Hz high-pass filter to remove the lowest frequencies. This helps to reduce the effects of breath blasts and microphone handling noise. The filter is always in circuit.

Zone outputs

In normal operation, the music level in each zone will be set by the front panel **MUSIC LEVEL** control, or by a corresponding control on a remote plate.

EQ

The various zones in a building often have different acoustic properties, and may also have different models of loudspeaker installed. The 46-50 is fitted with per-zone HF and LF EQ adjustments for the music signal ([5] on page 11) to enable the audio frequency response to be best matched to each zone's acoustics. The controls should be adjusted by listening; up to 10 dB of cut or boost at 10 kHz (HF) and 50 Hz (LF) is available. Note that these EQ adjustments do not affect the frequency response of the microphone signal.

After the EQ has been adjusted during system commissioning, the EQ presets may be made inaccessible by fitting the security cover (one supplied with each Mixer Amplifier). See page 23 for fitting instructions.

High-pass filters

When the 46-50 is used to drive 70/100 V-line loudspeaker systems, either via an internal CXL-4160 module (as in the 46-50T) or via external CXL-40T transformers, there is a risk of transformer saturation at high levels and low frequencies. To prevent this, each of the 46-50's four channels is provided with a switchable 65 Hz high-pass filter. This should be enabled for any channel being used to drive 70/100 V-line systems.

The filters are enabled by moving internal main PCB jumpers J7 (Zone 1), J9 (Zone 2), J16 (Zone 3) and J18 (Zone 4). See page 24 for locations of PCB jumpers.

In the Model 46-50T, the jumpers are set with the filters enabled at the factory for all channels.

Slave Mode
(using output stages in parallel)

In some installations, a higher power output may be required in a zone than the 50 W the 46-50 power stages are rated at. To meet this requirement, the 46-50's output stages may have their inputs reconfigured so that the amplifiers driving Zones 1 and 2 outputs are both driven by the signal in Zone 1. Similarly, the amplifiers driving Zones 3 and 4 outputs may both be driven by the signal in Zone 4. (Clearly, using this option reduces the overall number of zone outputs available.)

The diagram below illustrates the options available:
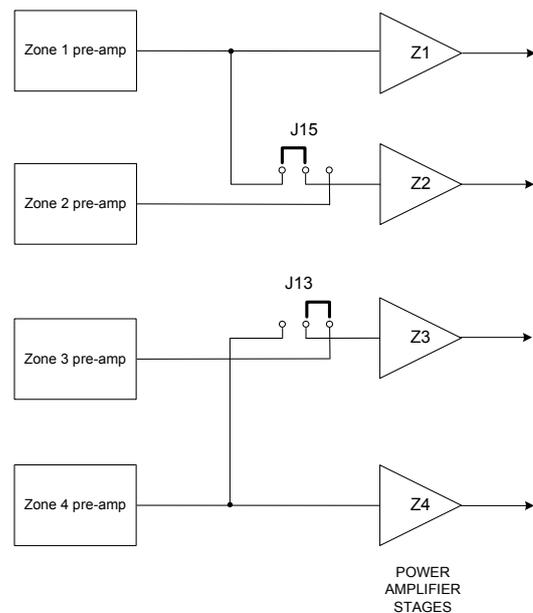
Selection of parallel operation is made by moving internal main PCB jumpers J15 (Zones 1 & 2) and/or J13 (Zones 3 & 4) from their default setting. See page 24 for locations of PCB jumpers.

Priorities

The 46-50 offers several options for determining what happens to music signals when announcements are made.

Mic-over-Music priority

Fully automatic, voice operated priority is available for the two mic inputs. This is selected by internal main PCB jumper J12, which is set ON at the factory to enable priority operation. When enabled, all music signals will attenuate by approximately 30 dB when the microphone is used; after the announcement, the music signals will restore smoothly to their former level.

If it is necessary to disable the priority function, to allow full mic/music mixing, J12 should be set to its OFF position. See page 24 for locations of PCB jumpers.

Mic 1-over-Mic 2 priority

Fully automatic, voice operated priority of Mic 1 over Mic 2 is provided; Mic 2 is ducked when a Mic 1 signal is detected in that zone.

To disable this, allowing the two mic inputs to be mixed, the 470R resistor R220 should be taken out of circuit by cutting one leg. Note that disabling this priority is not something that is easily reversed! The location of R220 is included on the PCB jumper location diagram at page 24.

Line 6 priority

It may sometimes be necessary for one music input to have priority over all the others; for example, a jukebox in a bar, or a digital sound store programmed to make automatic announcements in a public space. Input **LINE 6** may be set to have priority in Zone 1 (only) over whichever source is selected for the zone by its **SOURCE** control. This priority is set by moving internal jumper J24. (The default setting is 'OFF'.)

The "release" time may be set 3 s or 6 s by moving J25, or to 12 s by removing J25 altogether.

When the priority is selected, a signal present at Line 6 will force Zone 1's source selection to that input; when the signal disappears, the previously-selected source will be restored over the time constant selected by J25.

See page 24 for location of the internal jumpers.

Mic-over-Facility Port priority

If a remote active module is in use in Zone 1, it is possible to give a microphone connected at the 46-50 itself (at **MIC 1** or **MIC 2**) priority over input sources connected at the module. This might be desirable in function rooms, for example, where building-wide announcements may need to interrupt any local use.

This priority is set by internal main PCB jumper J14. The default setting is 'OFF'; in this position microphones or other sources connected at remote input modules will be autonomous and will not be overridden by announcements made via the mixer's mic inputs. Setting J14 to 'ON' will give priority to Mic 1 or Mic 2. The release time following an announcement is approx. 0.5 s.

Note that this priority is independent of the local MIC PRIORITY function which can be selected on the remote module.

OPTIONS AND ADDITIONAL INFORMATION

RL-1 and RSL-6 Series remote control plates – general considerations

Cloud RL-1 Series and RSL-6 Series remote control plates are available in three form factors, two fit single-gang UK or American electrical back boxes respectively; the third is a 50 x 50 mm "Media" module, suitable for "Euro-module" mounting frames available in most European countries. Back boxes of either the recessed type or surface-mounting type may be used, providing they are at least 25 mm deep.

The plates should be connected to the **REMOTE MUSIC CONTROL** port of the relevant zone using single- or twin-core screened cable as described at page 15 and page 16. The plate terminations are conventional screw terminals and the **REMOTE MUSIC CONTROL** port on the mixer is a 3-pin 5 mm-pitch screw terminal connector.

The remote control plates are passive and thus do not draw any current from the mixer.

Control of music source and level via external DC

It may be necessary in some installations to adjust the music level and select music source in one or more zones from an external control system (e.g., Crestron, AMX, etc.). If the **REMOTE MUSIC CONTROL** ports are not required for RL-1/RSL-6 Series remote control plates, they may be used to receive DC voltages from the external system to effect these adjustments.

Both music source selection and level can be controlled over their full ranges with a DC voltage of 0 to +10 V. The pinout of the **REMOTE MUSIC CONTROL** port is as follows:

PIN	USE
1	0 V ref.
2	Music level control (0 to +10 V)
3	Music source selection (0 to +10 V)

46-50
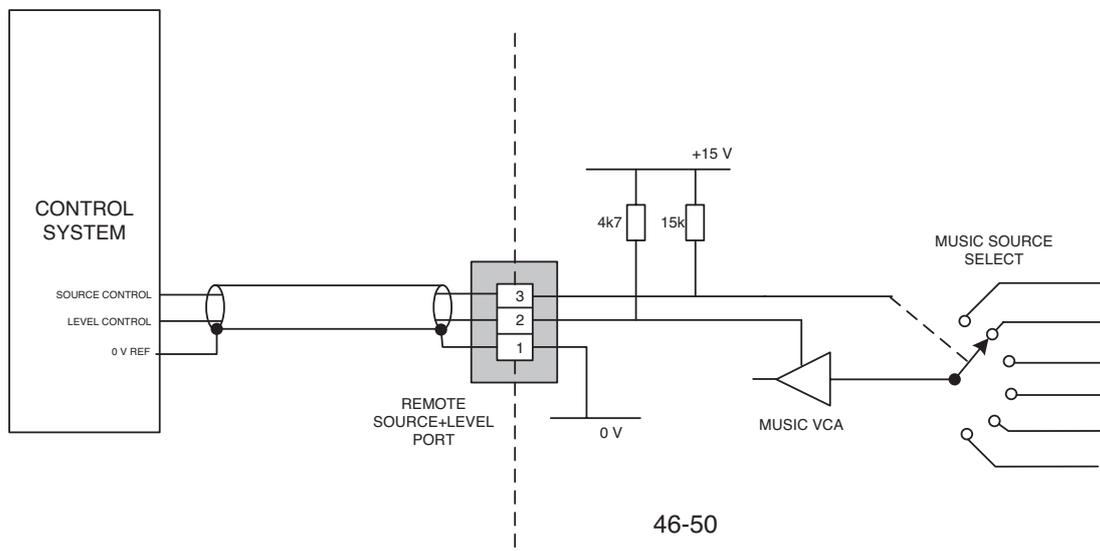
NOTE: If the control voltage source is not isolated from the power earth, there is a small risk of creating a 'ground loop' by linking the mixer technical ground (0 V) to the ground (0 V) of the equipment supplying the control voltages. To minimise this risk, we suggest that all pieces of equipment be in close proximity, and supplied from the same power outlet.

Music level

Music level in a zone may be varied over its full range by applying a DC voltage of between 0 V and +10 V to pin 2, the 0 V reference being connected to Pin 1. 0 V on pin 2 corresponds to maximum level and +10 V will produce 60 dB of attenuation. The rate of attenuation is approximately 165 mV/dB.

Note that there is an internal 4k7 "pull-up" resistor between pin 2 and the internal +15 V rail. If pin 2 is left "floating", this pull-up will result in full attenuation. The output impedance of the control voltage source should be low enough to overcome the effect of this resistor.

Music source

Music source for a zone may be controlled by applying various DC voltages of between 0 and +10V to pin 3, the 0V reference being connected to pin 1. 0V at pin 3 will select Line input 6 and between +7.5 and +9 V will select Line input 1. The other line inputs will be selected with intermediate voltages. Taking pin 3 above +9 V will deselect all inputs, making the zone effectively 'off' for music.

The table below lists the DC voltages required at pin 3 to select each line input. The third column is the value of a resistor which should be connected between pins 1 and 3 to permanently 'force' a zone to a particular line input.

INPUT	DC VOLTAGE	RESISTOR VALUE
OFF	>+9.0 V	
Line 1	+7.5 V	16k
Line 2	+6.0 V	11k
Line 3	+4.5 V	6k8
Line 4	+3.0 V	3k9
Line 5	+1.5 V	1k8
Line 6	0 V	short-circuit

Note that there is an internal 15k "pull-up" resistor between pin 3 and the internal +15 V rail. If pin 3 is left "floating", this pull-up will cause 'OFF' to be selected. The output impedance of the control voltage source should be low enough to overcome the effect of this resistor.

Using the Facility Port as an auxiliary zone input

The Facility Port provides a balanced audio input. If a port is not connected to an active remote module, it may be used as a direct input to Zone 1 from other equipment forming part of the system (for example, a permanently installed DJ mixer which only ever needs to route its output to Zone 1.)

Wire an external balanced source to the facility port as shown below:
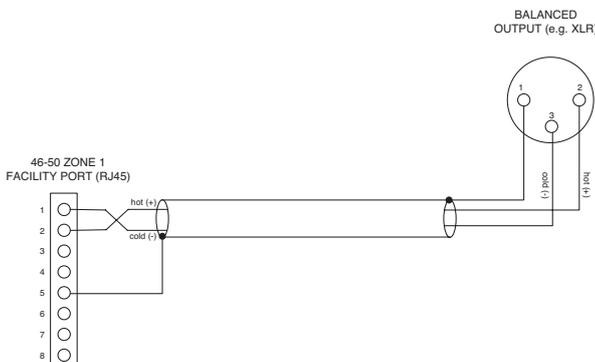
An unbalanced source may also be connected; the use of balancing transformers is recommended

Fitting loudspeaker EQ cards

The 46-50 is compatible with various popular installed-sound loudspeakers; a single-channel loudspeaker equalisation module may be fitted to any or all of the four outputs as required, to optimise the frequency response of the channel to the loudspeaker type being used.

The cards may be obtained from Cloud Electronics as optional accessories. Please check the Cloud website (www.cloud.co.uk) for makes and models of loudspeakers for which compatible EQ cards are available.

To install equalisation modules, first disconnect the 46-50 from the AC mains supply, then remove the top cover (8 screws). The modules plug into the white 12-pin in-line sockets labelled CON3 (Zone 1), CON4 (Zone 2), CON7 (Zone 3) and CON8 (Zone 4) on the main PCB. Refer to the main PCB layout diagram at page 24, and proceed as follows:

1. For each of the channel(s) having the EQ cards fitted, remove the factory jumper adjacent to the 12-pin socket as follows: J8 (Zone 1), J10 (Zone 2), J17 (Zone 3) and J19 (Zone 4). We recommend leaving the jumper on one pin to avoid losing it.

2. Plug the EQ card into the 12-pin socket, pressing gently until it clicks into place. Note the mating connector on the module has two small projections which engage with two notches on one side of the socket, to aid orientation.

3. Replace the top panel using the same screws.

Fitting the CXL-4160 transformer module

> **NOTE:** Full installation instructions are included with the transformer module.
> The notes below are an abridged version.

The CXL-4160 transformer allows the 46-50 to be used with 100/70 V-line loudspeaker systems.

1. Disconnect the 46-50 from the mains and remove the top cover.

2. Remove the blanking plate from the **100V/70V-LINE OUTPUTS** connector location on the rear panel; retain the plate and screws, nuts and washers.

3. The CXL-4160 is preset for 70 V-line or 100 V-line operation according to territory. If the alternative voltage is required, change the solder links on the rear of the CXL-4160 PCB.

4. Fit the module to the right-hand side of the 46-50 (viewed from the rear) by the eight hex spacers, using the screws supplied. The rear connector should project neatly through the vacated rear panel slot.

5. Plug the 8-pin connector on the flying lead assembly (supplied) onto the 8-pin header on the CXL-4160 PCB.

6. Plug the 2-pin connectors on the other end of the flying lead assembly onto the corresponding headers on the 46-50 main PCB (immediately behind the **100V/70V LINE OUTPUTS**). The wire pairs are colour-coded for ease of identification. Note that any or all of the four channels may be connected as required.

7. Enable the 65 Hz high-pass filters for the relevant channels (J7, J9, J16 & J18). See page 24 for jumper locations.

8. Fit the two hex spacers supplied to the holes vacated in Step 2 using the same screws, nuts and washers.

9. Replace the cover.

After connecting the 70/100 V-line loudspeaker system (see page 17), fit the blanking plate from Step 2 onto the hex spacers (Step 8) over the connector, with the printed warnings outwards.

Fitting the EQ security cover

A security cover is supplied with the 46-50 which can be fitted to the front panel to prevent access to the Zone EQ preset controls. The **MIC LEVEL**, **MUSIC LEVEL** and **SOURCE** controls remain accessible and the **CLIP** LED is still visible.

The panel is simply placed over the rotary control knobs and secured in place with the four M3x6 hex-head screws supplied.

APPENDIX

PCB jumper locations

The 46-50 has various internal jumpers, the setting of which may require alteration during installation. The diagram below shows the locations of the internal jumpers (not to scale) on the internal PCBs, and the table below lists each jumper and its purpose, together with the factory default setting.

Note that the 46-50 has various sub-boards in addition to the main PCB. One of these, the music control sub-board, carries two jumpers (J24 and J25), but all other jumpers are on the main PCB. Note that some main PCB jumpers are located below this sub-board, and to access these, it is necessary to remove the sub-board. This can be done by disconnecting the three ribbon cables linking the sub-board to elsewhere in the unit (two remain captive to the sub-board), removing the eight **SOURCE** and **MUSIC LEVEL** control knobs and shaft nuts, and then removing the three M3 screws at the rear of the sub-board.

Most jumpers have two possible positions; the black square in the symbol on the diagram below indicates the default setting. If any jumpers need to be changed, turn the 46-50 off and disconnect it from the mains. Undo the eight screws securing the top cover of the unit and remove it. Use a pair of small pliers to gently remove the jumpers from the PCB headers and reposition them as required. Refit the top cover using the same screws.

The PCB diagram (which is as viewed from the rear of the unit) also shows the locations of the sockets for the optional loudspeaker EQ cards (CON3, CON4, CON7 & CON8), resistor R220 (ref: Mic1-over-Mic 2 priority) and the Zone output connectors (see page 22).
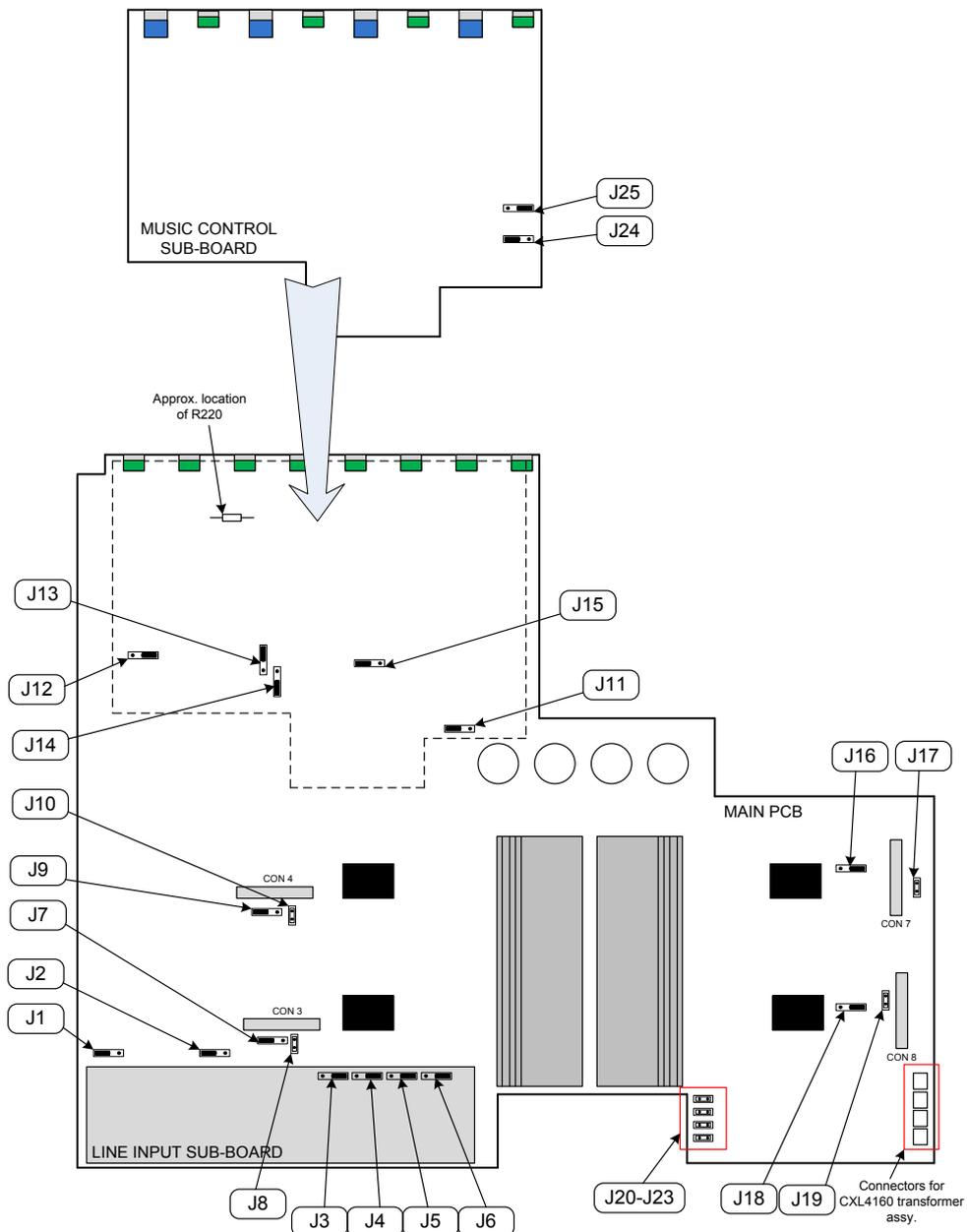
Table of internal jumpers and default settings

The table below lists each jumper and its purpose, together with location and factory default setting.

JUMPER	LOCATION	DESCRIPTION	EFFECT	DEFAULT
J1	Main board	Mic 1 phantom power	OFF: MIC 1 phantom power OFF ON: MIC 1 phantom power ON	OFF
J2	Main board	Mic 2 phantom power	OFF: MIC 2 phantom power OFF ON: MIC 2 phantom power ON	OFF
J3	Main board	Music source selection – Zone 1	SW: Source follows rear panel MUSIC CONTROL switch FR: Always via front panel only (Z1)	SW
J4	Main board	Music source selection – Zone 2	SW: Source follows rear panel MUSIC CONTROL switch FR: Always via front panel only (Z2)	SW
J5	Main board	Music source selection – Zone 3	SW: Source follows rear panel MUSIC CONTROL switch FR: Always via front panel only (Z3)	SW
J6	Main board	Music source selection – Zone 4	SW: Source follows rear panel MUSIC CONTROL switch FR: Always via front panel only (Z4)	SW
J7	Main board	Zone 1 65 Hz High Pass Filter	OFF: full frequency response ON: 65 Hz hi-pass filter enabled for Zone 1	OFF[1]
J8	Main board	Zone 1 EQ module bypass	PRESENT: No EQ module fitted in CON 3 ABSENT: EQ module fitted in CON 3	PRESENT
J9	Main board	Zone 2 65 Hz High Pass Filter	OFF: full frequency response ON: 65 Hz hi-pass filter enabled for Zone 2	OFF[1]
J10	Main board	Zone 2 EQ module bypass	PRESENT: No EQ module fitted in CON 10 ABSENT: EQ module fitted in CON 10	PRESENT
J11	Main Board	NO/NC Mute contacts	N/O: contact closure required for muting N/C: contact opening required for muting	N/O
J12	Main board	Mic over music priority	OFF: No priority – mics mix with music ON: Music ducks when mics in use	ON
J13	Main board	Zone 3 & 4 Slave mode	OFF: Zone 3 power stage input = Zone 3 signal ON: Zone 3 power stage input = Zone 4 signal	OFF
J14	Main board	Mic over Facility input priority	OFF: No priority ON: MIC 1 & 2 have VOX-triggered priority over signals at Facility Port	OFF
J15	Main board	Zone 1 & 2 Slave mode	OFF: Zone 2 power stage input = Zone 2 signal ON: Zone 2 power stage input = Zone 1 signal	OFF
J16	Main board	Zone 3 65 Hz High Pass Filter	OFF: full frequency response ON: 65 Hz hi-pass filter enabled for Zone 3	OFF[1]
J17	Main board	Zone 3 EQ module bypass	PRESENT: No EQ module fitted in CON 7 ABSENT: EQ module fitted in CON 7	PRESENT
J18	Main board	Zone 4 65 Hz High Pass Filter	OFF: full frequency response ON: 65 Hz hi-pass filter enabled for Zone 4	OFF[1]
J19	Main board	Zone 4 EQ module bypass	PRESENT: No EQ module fitted in CON 8 ABSENT: EQ module fitted in CON 8	PRESENT
J20	Main board	Mic1, Zone 1 Access Bypass	PRESENT: Mic has permanent access to Z1 ABSENT: Use access port to enable access to Z1	ON
J21	Main board	Mic1, Zone 2 Access Bypass	PRESENT: Mic has permanent access to Z2 ABSENT: Use access port to enable access to Z2	ON
J22	Main board	Mic1, Zone 3 Access Bypass	PRESENT: Mic has permanent access to Z3 ABSENT: Use access port to enable access to Z3	ON
J23	Main board	Mic1, Zone 4 Access Bypass	PRESENT: Mic has permanent access to Z4 ABSENT: Use access port to enable access to Z4	ON
J24	Music Control sub-board	Zone 1 Line 6 priority	OFF: No priority ON: Line 6 has VOX-triggered priority over other sources in Zone 1	OFF
J25	Music Control sub-board	Zone 1 Line 6 priority release time	3S: 3 seconds. release time 6S: 6 seconds release time ABSENT: 12 seconds release time	6S

1. These jumpers are factory-set to ON in Model 46-50T.

EMC considerations

The Cloud 46-50 fully conforms to the relevant electromagnetic compatibility (EMC) standards and is technically well behaved; you should experience no operational problems and under normal circumstances, no special precautions need to be taken. If the unit is to be used within close proximity to potential sources of HF disturbance such as high power communications transmitters, radar stations and the like, the performance of the mixer may be reduced; we suggest that the microphone cable screen be connected to the shell of the XLR type connector and the line input leads are kept as short as possible.

Ground loops

If, despite your best efforts, the completed sound system 'hums' you probably have a 'ground loop'. The offending signal source can often be identified by setting the volume control to minimum, then disconnecting the input leads (both left & right channels) on each line input until the 'hum' disappears. This problem is often caused by terminating a screened input cable into a signal source positioned a significant distance from the mixer. A good way of avoiding this potential problem is to use signal sources (typically 'consumer' equipment) that are double insulated with no connection to the mains supply earth. If a signal feed were derived from a second mixer (a club or microphone mixer for example) it would be perfectly normal to expect this to be earthed; we suggest that a transformer be used to isolate the signal and prevent a noisy loop (see page 13).
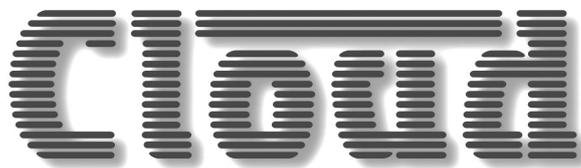
TECHNICAL SPECIFICATIONS

Technical specifications

Line Inputs		
Frequency Response	20Hz – 20KHz +/-0.5dB	
Distortion	<0.03%, 20 Hz to 20 kHz	
Sensitivity	195 mV (-12 dBu) to 2.0 V (+8 dBu)	
Input gain control range	20 dB	
Input Impedance	47 kohms	
Headroom	>20 dB	
Noise	-90 dB (0 dB gain, 22 Hz to 22 kHz)	
Equalisation	HF: ±10 dB @10 kHz; LF: ±10 dB @ 50 Hz	
Microphone Inputs		
Frequency Response	100 Hz -3 dB (fixed filter) to 20 kHz ±0.5 dB	
Distortion	<0.05%, 20 Hz to 20 kHz	
Gain Range	0 dB to 50 dB	
Input Impedance	>2 kohms (balanced)	
Common mode rejection	>70 dB @ 1 kHz	
Headroom	>20 dB	
Noise	-128 dB EIN, 22 Hz to 22 kHz (Rs = 150 ohms)	
Equalisation	HF: ±10 dB @ 5 kHz; LF: ±10 dB @ 100 Hz	
Outputs		
Low Impedance Outputs	4 ohm load	50 W
	8 ohm load	35 W
Auxiliary Outputs (Zones 1 & 2)		0 dBu (unbalanced)
100 V-line Output*		100 V balanced – 250 ohm min. load
70 V-line Output*		70 V balanced – 125 ohm min. load
Amplifier protection		Dynamic Clip Protection, VI Limiting, DC Offset, thermal & switch-on delay
Cooling		Variable speed DC fan

* with optional CXL-4160 module fitted internally

GENERAL SPECIFICATIONS

Power input		230 V ±5% (115 V ±5% available)
Fuse rating		230 V: T3.15AH; 115 V: T6.3AH
Fuse type		20 mm x 5 mm 250 V
Dimensions (wxhxd)	Net	482.6 mm x 88 mm (2U) x 382 mm deep 19" x 3.5" x 15"
	Shipping (Gross)	610 mm x 200 mm x460 mm 24" x 8" x 18"
Weights	Net	7.65 kg /17 lbs (46-50); 10.5 kg / 23.1 lbs (46-50T)
	Shipping (Gross)	10.2 kg / 23 lbs (46-50); 13.0 kg / 29.1 lbs (46-50T)

Cloud