



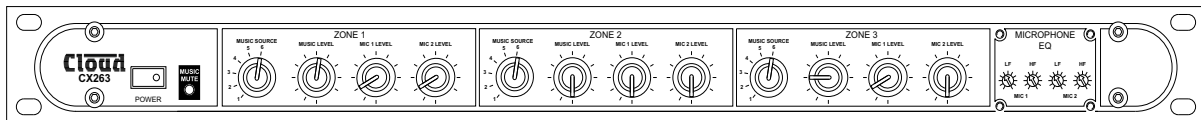
CX263 ZONE MIXER

Cloud Electronics Limited

CX263 Installation & Setup Guide

CLOUD ELECTRONICS LIMITED

CX263 Installation and Setup Guide



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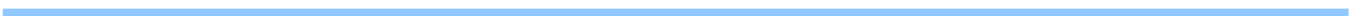
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1 Safety Notes

For more detailed information refer to the rear of the manual.

- ◆ **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 any servicing to qualified service personnel.**
- ◆ **If the moulded plug is cut off the lead for any reason, the discarded plug is a potential hazard and should be disposed of in a responsible manner.**

2 General Description

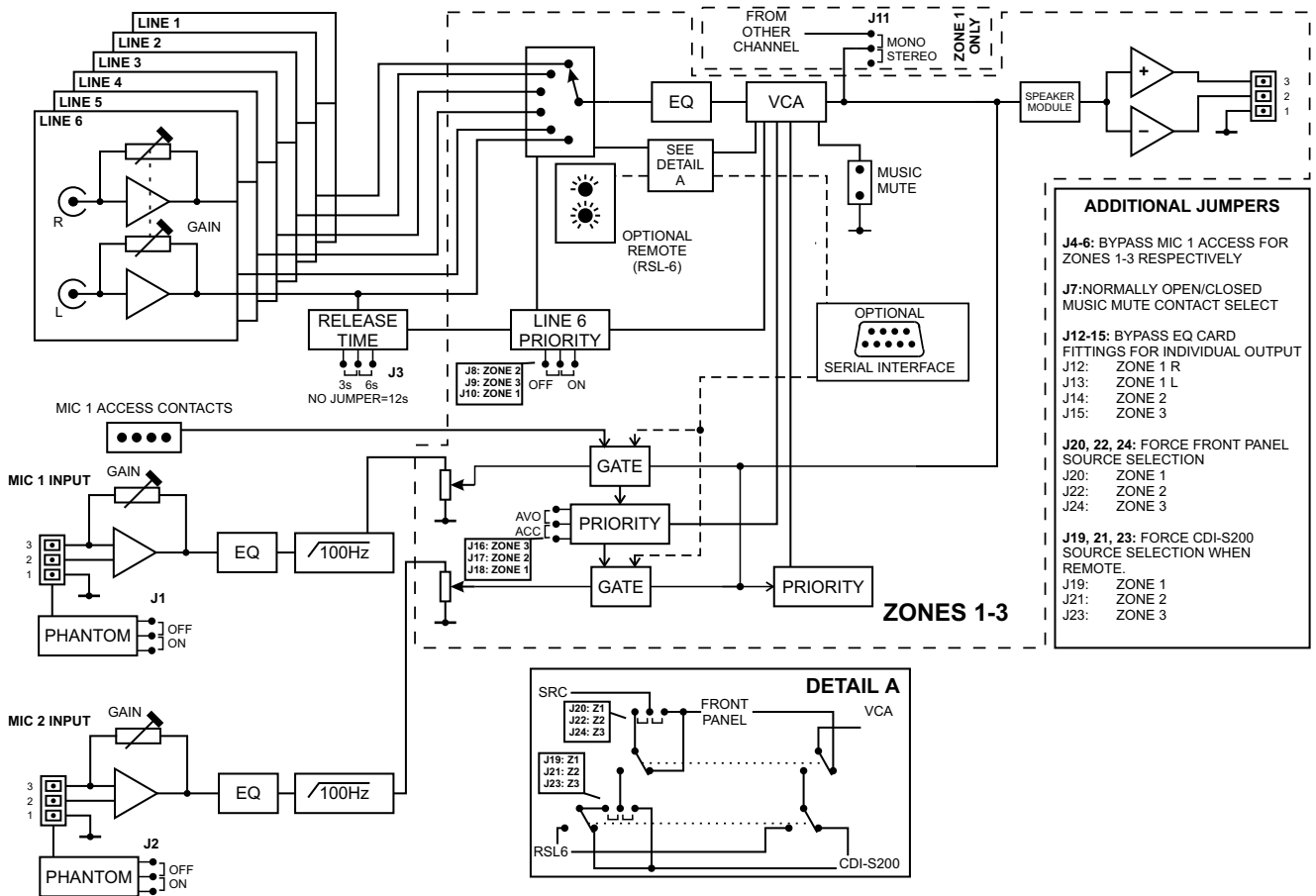
The Cloud CX263 is a stereo/mono mixer with a single stereo zone output and two mono zone outputs. It has application where up to six line sources are to be distributed to a single stereo and two mono zones. There are various optional accessories that extend the flexibility of the CX263:

- ◆ **Optional serial interface card which can control:**
 - ◆ **Music source selection and level control for each individual zone**
 - ◆ **Music mute control**
 - ◆ **Microphone mute control**
 - ◆ **Mic 1 access control for each zone**
- ◆ **Optional remote plates which control music source selection and level for each zone.**
- ◆ **A dedicated four zone paging mic with pre-announcement chime.**
- ◆ **Equalisation Modules for Bose® Speakers**

Along with these accessories the CX263 has: - Microphone priorities, paging microphone access contacts, fire alarm mute connections and the possibility for Line 6 to have priority over other music signals.

Front panel controls have been kept to a minimum. Most behavioural controls can be found close to their respective inputs on the rear panel, except for the microphone equalisation controls which can be found on the front right section of the front panel. These front panel tone controls are concealed once the tamperproof fascia is in place.

3 Schematic Diagram



4 Installation

The Cloud CX263 occupies one unit of standard 19" equipment rack. The microphone inputs and all zone outputs are balanced. Ventilation holes on the base of the unit should not be obscured. The CX263 is 150mm deep but a depth of 250mm should be allowed to clear connectors.

5 Stereo Inputs

The line inputs are suitable for most music sources such as compact disc players, tape players and receivers etc.. All inputs are unbalanced and use RCA type phono sockets. Input impedance is 48kΩ.

5.1 Sensitivity and Gain Control

All six line inputs have pre-set gain controls which are accessible on the rear panel, adjacent to their respective input sockets. The input sensitivity can be varied from -18dBu (100mVrms) to + 6dBu (1.5Vrms). The pre-set gain controls should be set so that all the input signals operate at the same level (0dBu) within the CX263, which ensures that the music level controls have an optimum control range.

5.2 Music source and level controls - Local or Remote

The music level control function can be controlled from either the front panel, or a remote control plate located up to 100m from the CX263. The CX263 is compatible with the RSL-6 and RL-1 analogue remote control wallplates. The CX263 is also compatible with the CDI-S200 serial interface module (see section 9.1 for installation details). Both analogue remote control plates can be mounted onto a standard British flush or surface mounted 25mm deep back box. Two-core cable with overall screen should be used to connect the remote controls to the Cloud CX263 the diagrams above show how to connect the two remote plates. To configure a zone to operate with an analogue remote wallplate (such as the RSL-6) the switches located next to the remote plate connector on the rear panel need to be in the 'REM' (in) and 'AN' (in) positions respectively. Self-adhesive labels (supplied) can be affixed to the tamperproof facia and/or RSL-6 to identify the available input sources.

To connect a RL-1 plate to one zone of the CX263, the unit must be internally configured to route the source selection functionality to either the front panel control, or to the CDI-S200 serial interface module. This can be done by setting jumpers J19-24 (see section 9.1 for jumper locations). Remote units should be connected as shown in these diagrams.

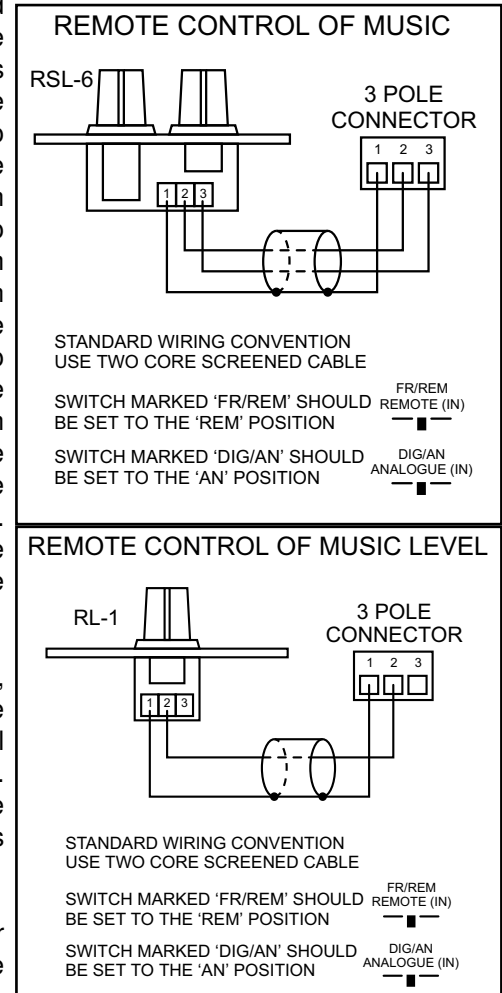
The RSL-6A and RL-1A wallplates are available for the American market. The operation of these remotes is identical to their European counterparts, but they have been designed to fit a single gang US electrical outlet box. Front panel dimensions are 4½" x 2¾".

When setting the jumper(s) please ensure that you:

- **Remove the mains cable from the rear of the product before removing the top panel.**
- **Only reassemble the unit using screws identical to the original parts.**

5.3 Music Equalisation

Equalisation for the music signals treble and bass is provided via the rear panel pre-set controls in order to allow the installer to tailor the response of the music signals to suit the acoustics and speakers of each individual zone. The equalisation controls for each output are on the rear panel to the right of the respective output connector(s); they are clearly marked 'HF' (High Frequency) and 'LF' (Low Frequency). A flat frequency response can be achieved by positioning the slots on the control shafts either in the horizontal plane (for stereo zones) or the vertical plane (for mono zones); the HF control has a range of ±10dB at 10kHz and the LF control has a range of ±10dB at 50Hz.



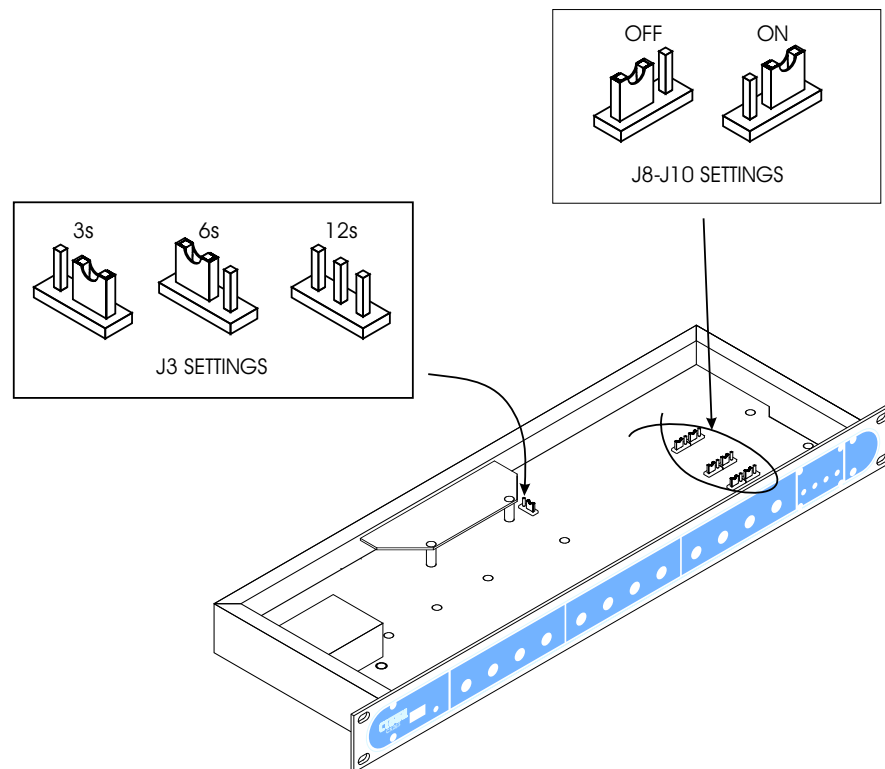
5.4 Line 6 Priority

The line 6 music input can be given priority over other music signals in each zone individually. This function is intended for use with sources such as jukeboxes or spot announcement players. This priority is only enforced when a signal is detected at line 6, at which point the selected music source will mute, making way for the line 6 signal. Once the signal on line 6 ceases, the selected music source will smoothly restore to its former level. The time taken for this restoration can be 3, 6 or 12 seconds dependant on how internal jumper J3 has been set; this jumper effects the restoration time in all zones and is set to 3 seconds as factory default. In order to switch priority on or off, the internal jumpers J8-10 can be set; these allow priority to be selected on a per zone basis. Both jumpers for a zone will need to be set in the same position; failing to do so will result in incorrect operation of the priority circuitry.

When setting the jumper(s) please ensure that you:

- **Remove the mains cable from the rear of the product before removing the top panel.**
- **Only reassemble the unit using screws identical to the original parts.**

NOTE: The release time constant jumper is common to *all* zones on the CX263.



6 Microphone Input

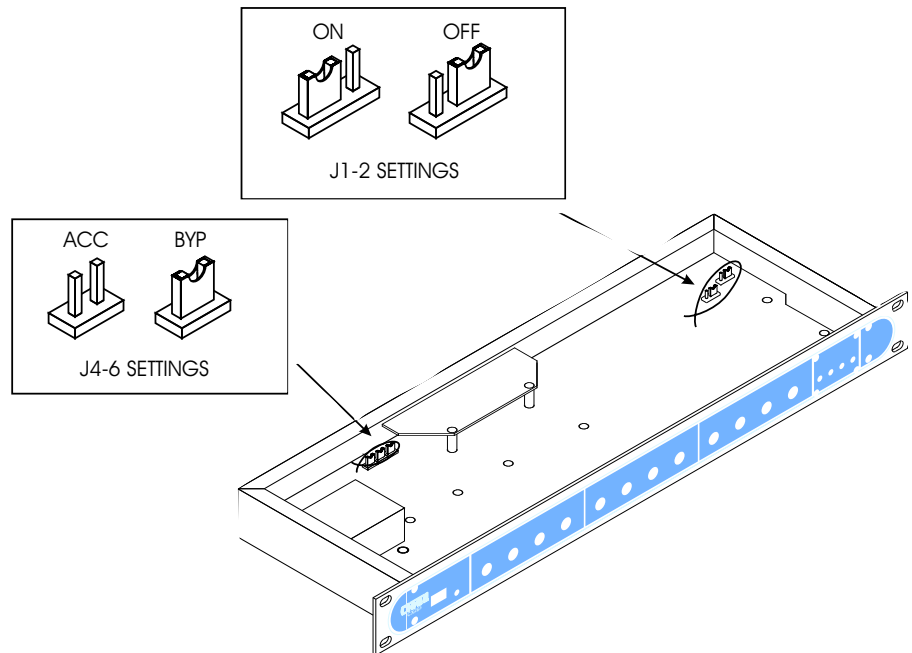
Two microphone inputs are provided with electronically balanced, transformer-less circuitry configured for optimum low noise performance. The input impedance is greater than $2k\Omega$ and suitable for microphones in the 200Ω to 600Ω range. Input is via the 3-pin plug in screw terminal type connector (Phoenix type) located on the rear panel. A facility to provide 15V phantom power is included that is activated by setting the internal jumpers J1 (Mic 1) or J2 (Mic 2) to the 'ON' position.

Microphone inputs follow the balanced audio pin convention shown below:

Pin 1 - GROUND

Pin 2 - COLD

Pin 3 - HOT



When setting the jumper please ensure that you:

- **Remove the mains cable from the rear of the product before removing the top panel.**
- **Only reassemble the unit using screws identical to the original parts.**

6.1 Paging Access Contacts

Access contacts for the microphone 1 input signal are provided to control which zones the microphone will be active in. This provides the facility for paging microphones, such as the Cloud CPM-4, to be connected to the CX263. The access contacts work on a short-to-ground system, which is compatible with the majority of paging microphones. If the microphone 1 input is to be used with standard microphones, the contacts can be bypassed via the configuration of the internal jumpers detailed below:

J4-6: Zones 1-3 respectively

Note: We advise that when you remove a jumper you leave it connected to one pin of the header so it remains with the apparatus for future use.

Upon leaving the factory, the unit is configured to bypass the microphone access contacts. In order to activate the access contact for a particular zone, the appropriate link will need to be removed.

Paging Access Contacts continued

When setting the jumper(s) please ensure that you:

- **Remove the mains cable from the rear of the product before removing the top panel.**
- **Only reassemble the unit using screws identical to the original parts.**

NOTE: The CX263 does not provide a power supply pin on these access contacts, so any paging microphone used with the CX263 will need to use its own external supply.

NOTE: For the CDI-S200 serial interface card to have control over Mic 1 access, the access contacts on the rear panel need to be enabled.

6.2 Microphone Gain Controls

A pre-set gain control is provided adjacent to each microphone input. The gain can be adjusted from 10dB to 50dB. A high overload margin is maintained at all gain settings.

6.3 Microphone Level Controls

Front panel microphone level controls are provided for each stereo zone. Rotating any microphone level control fully anti-clockwise effectively turns the microphone off. In addition, microphone 1 can be muted on a zone-by-zone basis using the access contacts on the rear panel or the CDI-S200 if installed.

6.4 Microphone Equalisation

Two-band equalisation is provided for each microphone input. The pre-set controls to adjust the equalisation are located at the lower right hand side of the front panel. The characteristics of the equalisation are optimised for the tonal correction of speech signals. The HF control provides $\pm 10\text{dB}$ at 5kHz whilst the LF control provides $\pm 10\text{dB}$ at 100Hz. These controls will be concealed once the tamperproof facia is attached.

To effectively bypass the microphone equalisation section, both pre-set controls for that input should be set to 0dBu (mid-position/vertical).

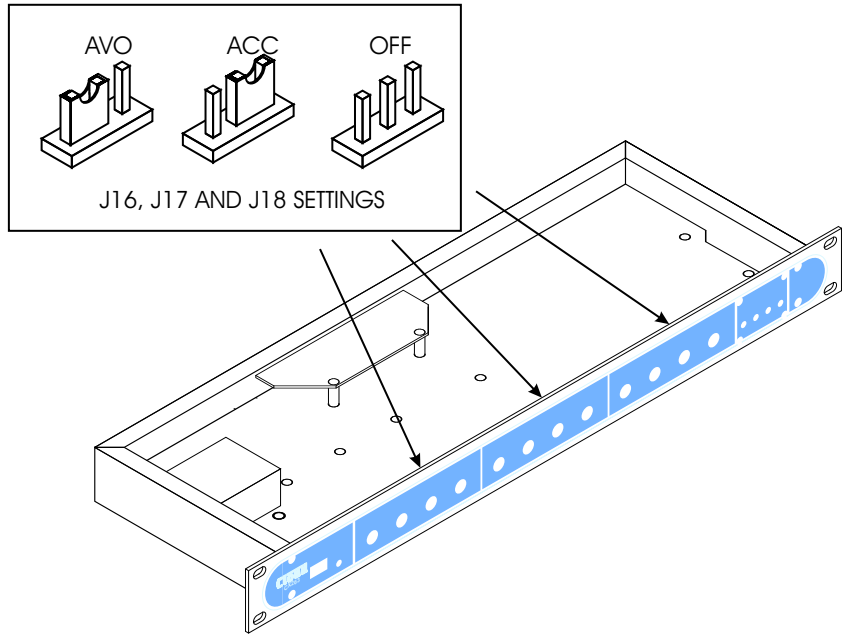
6.5 High Pass Filter

Both microphone signals pass through a 100Hz high pass filter. This is to reduce breath blasts and handling noise on the microphone audio.

6.6 Microphone 1 priority

The microphone 1 input on the CX263 is automatically configured to take priority over both the music signals and the microphone 2 input. When the priority circuit is triggered, the microphone 2 input signals are effectively muted. See the next section for details of the effect on music signals in the zone.

Microphone 1 priority can be triggered by either signal detection (AVO) or the zone access contacts on the rear panel (ACC). Access triggered priority should only be selected when a paging microphone with the CX263. To configure the microphone 1 priority, internal jumpers J16-18 (Zones 3-1 respectively) will need setting to the appropriate positions.



Jumpers are located behind the microphone 1 level control for each zone.

Jumper positions:

AVO: Priority is triggered when a signal is detected on the microphone input and the zone is being accessed.

ACC: Priority is triggered as soon as the access contact for that zone is shorted to ground.

OFF: This position is not marked, but can be achieved by removing the jumper altogether

NOTE: When removing a jumper link, we advise that the link be left connected to one pin of the jumper header to prevent accidental loss.

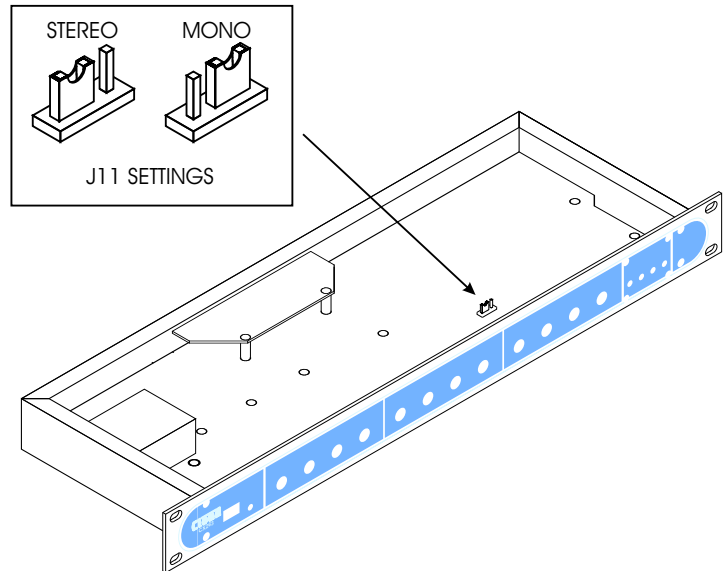
6.7 Microphone over Music priority

Both microphones take priority over music signals. When the priority circuit is triggered, music signals in the respective zones are attenuated by 30dB until the priority circuitry is released. Once priority has been released, the music signal will be smoothly restored to its former level. Microphone 2 will trigger this priority circuit when there is a signal detected on the microphone. Microphone 1 can trigger the circuit either via signal detection (AVO) or via the rear panel access contacts (ACC). For details of how to configure the Microphone 1 triggering mechanism, refer to section 6.6.

It is possible to permanently disable the microphone over music priority in a particular zone by cutting the indicated track for that zone and microphone input. Tracks are clearly marked on the PCB and it is possible to disable one microphone's priority without disabling the other's.

7 Output Details

Each output terminal is balanced, using a 3 pole 'Phoenix' type connector that can operate into loads as low as $1k2\Omega$. The nominal output level is 0dBu (775mVrms) but the mixer can operate with a wide range of signals up to a maximum output level of +20dBu (7.75Vrms). For balanced interconnections, 2-core screened cable should be used. Connect the screen to pin 1, the reverse phase signal (normally blue or black) to pin 2 and the in-phase signal (normally red) to pin 3. If you wish to connect any zone output to an unbalanced input, connect the cable screen to pin 1 with the hot connection (inner core) to pin 3 and make no connection to pin 2.

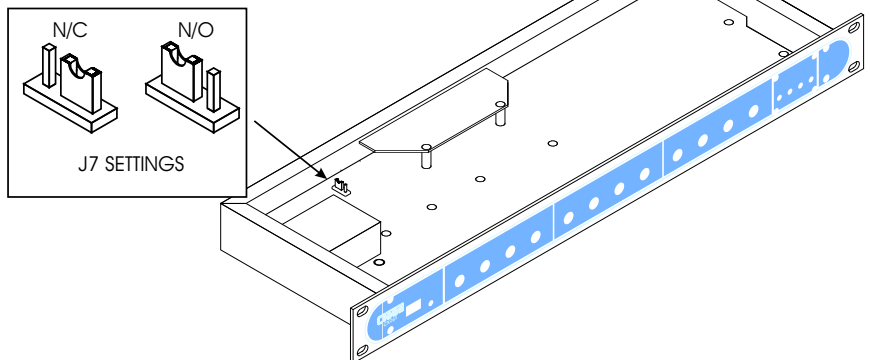


Note that unbalanced signals should not be run over long distances. It is recommended that you only use unbalanced connections between pieces of equipment that are in the same rack.

The stereo zone on the CX263 (Zone 1) can be configured to run in mono. When the zone is configured to run in mono, both left and right outputs from the zone will present the same summed mono signal. Zone 1 is set to run in stereo by default, but this can be changed via internal jumper J11.

8 Remote Music Mute - Fire Alarm interface

In certain installations, such as licensed premises or retail outlets within a shopping mall, there may be a local authority or fire service requirement to mute the music signals via a fire alarm control panel in an alarm condition. The CX263 provides a facility to mute the music signals only, by using a fully isolated pair of contacts. This is usually a relay mounted close to the CX263, which is powered by the fire alarm control panel. The relay can either be closed or opened in an alarm condition, but the internal jumper J7 *must* be set to the corresponding position:



- **N/C:** Normally closed means that alarm condition is when the relay opens.
- **N/O:** Normally open means that alarm condition is when the relay closes.

When setting the jumper(s) please ensure that you:

- **Remove the mains cable from the rear of the product before removing the top panel.**
- **Only reassemble the unit using screws identical to the original parts.**

Upon leaving the factory, the unit is configured for a normally open relay connection.

9 Optional Modules

There are only two types of internal optional modules which can be fitted to the CX263:

- ◆ **CDI-S200 serial interface card**
- ◆ **Bose Active Equalisation Modules**

9.1 CDI-S200 serial interface card

The CDI-S200 is an RS-232 compliant, serial interface option card for the CX263. The CDI-S200 can control:

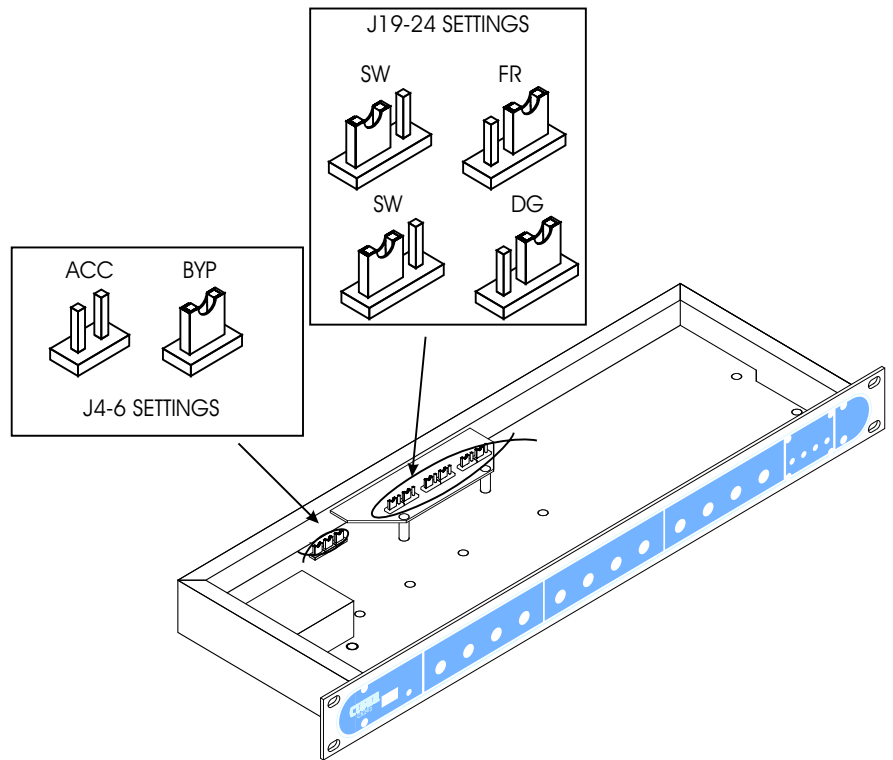
- ◆ **Music source selection and level in any zone**
- ◆ **Individual microphone mutes**
- ◆ **Music Mute**
- ◆ **Microphone access switching for Microphone 1**

Installation:

1. Switch off the mains supply to the CX263 and remove the CX263's power lead.
2. Remove the unit's top panel.
3. Remove the blanking plate covering the hole for the serial interface card in the rear panel.
4. Remove the hex pillars connected to the 9-pin sub-D socket.
5. Configure the CDI-S200 to operate at the correct baud rate and flow control. It is simplest to do this before the module is fully installed.
6. Locate and remove the M3 screw in front of CON 2 and the M3 screw directly to the left of it, closest to the small network of diodes. Both screws are indicated on the white PCB legend with large arrows. Keep the screws.
7. Install a 25mm hex pillar (supplied with the module) into each of the screw holes from the previous step.
8. Connect the module ribbon cable to CON 2 on the mainboard.
9. Install the CDI-S200 in the inverted position, such that the 9-pin sub socket fits snugly through the hole in the rear panel, and the two holes at the back of the card are in line with the hex pillars rising up from the main board.
10. Insert the hex pillars taken from the module socket through the holes in the rear panel into the CDI-S200 socket.
11. Use the M3 screws saved from step 6 to affix the rear of the board to the hex pillars rising from the mainboard.
12. Configure jumpers J19-24 and the rear panel switches to allow the CDI-S200 to control music functions in the zones you select. In order for the CDI-S200 to control the music functions in a zone, the rear panel switches need to be in the 'REM' (in) position and the 'DG' (out) position.
13. Configure jumpers J4-6 to enable/disable serial control of the microphone 1 access switching.
14. Replace the top panel

NOTE: PCB jumper markings indicate the position of the link as a filled box.

CDI-S200 Serial Interface Card continued



FR/SW Jumper	DG/SW Jumper	DIG/AN Switch	FR/REM Switch	Source Control	Level Control
N/A	N/A	N/A	FR	Front panel	Front panel
SW	SW	AN	REM	RSL-6	RSL-6
SW	N/A	DIG	REM	CDI-S200	CDI-S200
SW	DG	AN	REM	CDI-S200	RSL-6/RL-1
FR	N/A	AN	REM	Front panel	RSL-6/RL-1
FR	N/A	DIG	REM	Front panel	CDI-S200

Table of Jumper and Switch settings for music function controls

The table above shows the possible combinations for control of the music functions on the CX263, based on the rear panel switches for each zone and the jumpers J19-24 that determine which aspect of the system controls source selection in each zone. The music level control will always be determined by the switches, the jumpers will only effect the source selection.

Details on how to operate the CX263 via the CDI-S200 interface are provided in the module manual. The manual will arrive with the module, but can also be requested from info@cloud.co.uk if lost.

Current Consumption:

The CX263 can provide up to 80mA of power to internal modules. If this limit is exceeded, the unit will eventually overheat and then shutdown. The current consumed by a CDI-S200 card is 34mA.

9.2 Bose® Active Equalisation Modules

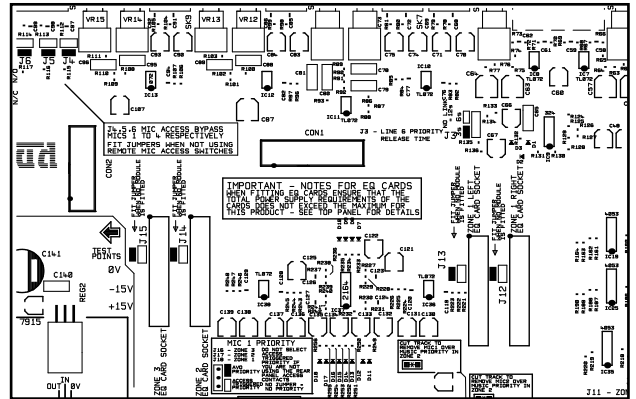
Each output channel has the facility to connect a plug-in Bose® equaliser module. See the table below for details of the connector for each output and the respective bypass jumper.

Installation:

1. Switch off the mains supply and remove the CX263's power lead.
2. Remove the unit's top panel
3. Remove bypass jumper (see table below for jumper map). We advise that when removing a jumper link, the connector remain attached to one pin of the header. This prevents loss of the link.
4. Fit the Bose® EQ module card to the connector. The EQ card should be perpendicular to the main board.
5. Apply moderate pressure to the Bose® EQ module until it locates with a click.
6. Replace the top panel.

OUTPUT	JUMPER
ZONE 1 RIGHT	J12
ZONE 1 LEFT	J13
ZONE 2	J14
ZONE 3	J15

EQ Module Bypass Jumpers



Location of Jumpers J12-15

Current Consumption:

The CX263 can provide 80mA of power to internal modules. If this limit is exceeded, the unit will eventually overheat and then shutdown. Below is a table detailing the types of equalisation module available and their relative current consumption.

MODEL OF EQUALISATION MODULE	CURRENT REQUIRED
M8, M32, MA12, 402, 502A, 802, MB4, MB24, 502B, 502BEX	12mA
LT3302, LT4402, LT9402, LT9702	17mA
M16	24mA

Current Consumption of Active Equalisation Modules by Model

10 Technical Specifications

Line Inputs

Frequency Response	20Hz-22kHz, +0, -0.5dB
Distortion	20Hz-22kHz, <0.05% Typical
Sensitivity	100mV (-17.8dBu) to 1.5V (+6dBu)
Input Gain Control	24dB range
Input Impedance	48k Ω
Headroom	>20dB
Noise	20Hz-22kHz (0dB gain), -88dB rms typical
Equalisation	LF: \pm 10dB 50Hz, HF: \pm 10dB 10kHz

Microphone Inputs

Frequency Response	100Hz -3dB (filter), 20kHz \pm 0.5dB
Distortion	20Hz-22kHz, <0.05%
Gain Range	10dB to 50dB
Input Impedance	>2k Ω (balanced)
Common Mode Rejection	1kHz, >70dB
Headroom	>20dB
Noise	20Hz-22kHz (0dB gain), -128dB EIN
Equalisation	LF: \pm 10dB 150Hz, HF: \pm 10dB 5kHz

Outputs

Nominal Output Level	0dBu
Minimum load impedance	1k2 Ω
Maximum Output Level	+20dBu

11 General Specifications

Power Input	230V/115V \pm 10%
Fuse Rating	T100mA 230V T200mA 115V
Fuse Type	20mm x 5mm 250V
Dimensions	482.60mm x 44.00mm(1U) x 152.5mm
Weight(kg)	2.15

12 Troubleshooting

12.1 Ground/Earth Loops

Despite your best efforts, if the completed sound system ‘hums’ you probably have a ‘ground loop’; the offending signal source can be found 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 CX263.

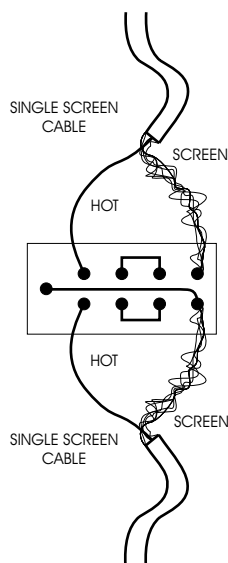
A good way of avoiding this potential problem is to use signal sources (CD players and the like) that are double insulated with no connection to the mains supply earth. If a signal feed is derived from a second device (a club or microphone mixer for example) it would be perfectly normal to expect this to be earthed; we suggest that a transformer be used to isolate the signal and prevent a noisy loop (see diagrams below)

12.2 Connecting balanced signals to unbalanced line inputs

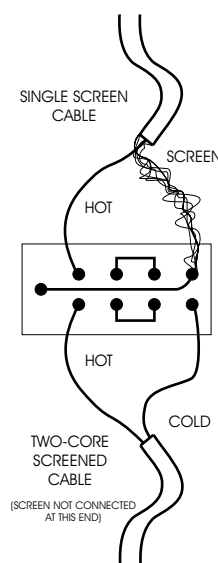
We recommend the use of a transformer to convert a balanced signal to an unbalanced signal suitable for direct connection to the CX263 line inputs. The transformer should be mounted close to the CX263 and the unbalanced output lead should be kept as short as possible. Where both the source and destination units are earthed, it is important to isolate the primary and secondary windings to avoid a potential ground loop; if there is any doubt about this, we suggest that the balanced cable screen is not connected at the transformer end. RS Components part 210-6447 is a suitable transformer for this application we recommend that the screening can (part number 210-6469) also be fitted to the transformer; Canford Audio supplies a similar transformer (part number OEP Z1604). All transformers should be wired to give a ratio of 1:1.

AUDIO TRANSFORMER
 RS PART NUMBER: 210-6447
 FITTED WITH SCREENING CAN
 RS PART NUMBER: 210-6469

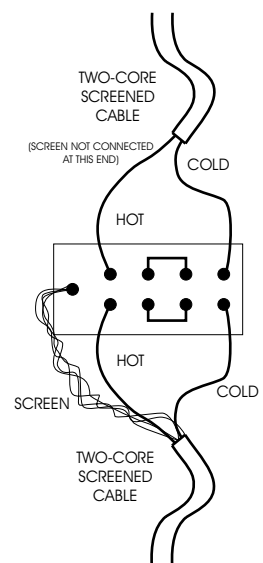
CONVERTING TWO PIECES OF UNBALANCED EQUIPMENT USING A 1:1 RATIO TRANSFORMER



CONVERTING UNBALANCED TO BALANCED USING A 1:1 RATIO TRANSFORMER



CONNECTING TWO PIECES OF BALANCED EQUIPMENT USING A 1:1 RATIO TRANSFORMER



12.3 Paging access switches not working correctly

The CX263 leaves the factory configured to bypass the microphone access contacts for all zone outputs, so that when the product arrives, all inputs are enabled in all zones. Internal jumpers J4 to J6 bypass access contacts for zones 1, 2 and 3 respectively. To enable access switching on one of the zones, disconnect the corresponding jumper.

NOTE: We advise that when you remove a jumper you leave it connected to one pin of the header so it remains with the apparatus for future use.

12.4 Connecting RL-1 remotes to the CX263

In order to connect an RL-1 remote to the CX263, the source selection function needs to be routed to either the front panel source selection switch or to the serial interface module. This can be accomplished by setting one of the following internal jumpers: J19-24 to either the 'FR' position (front-panel selection) or to the 'DG' position (interface card selection). If jumpers are set to select both digital and front panel source selection, the source will be selected from the front panel only. See the table below for the possible combinations.

12.5 CDI-S200 is not working correctly

For the CDI-S200 to operate correctly with the CX263, the CX263 needs to be configured to allow the CDI-S200 control of the functions required. Beside each analogue remote control connector on the rear panel of the CX263 there are two switches that determine which device will control the music functions of that zone. Inside the CX263 are jumpers J19-24, which can be used to route the source selection function in the respective zone regardless of the rear panel switch positions. The table below shows all the possible configurations and their respective outcomes.

FR/SW Jumper	DG/SW Jumper	DIG/AN Switch	FR/REM Switch	Source Control	Level Control
N/A	N/A	N/A	FR	Front panel	Front panel
SW	SW	AN	REM	RSL-6	RSL-6
SW	N/A	DIG	REM	CDI-S200	CDI-S200
SW	DG	AN	REM	CDI-S200	RSL-6/RL-1
FR	N/A	AN	REM	Front panel	RSL-6/RL-1
FR	N/A	DIG	REM	Front panel	CDI-S200

Table of Jumper and Switch settings for music function controls

Further to these switches and jumpers, in order for the CDI-S200 to control microphone 1 (for muting or for zone access), the links on internal jumpers J4-6 will need to be disconnected.

If there is any further difficulty, consult the CDI-S200 manual to ensure that the module is being used and connected correctly.

Safety Considerations and Information

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

When the mains switch is in the off 'O' position the live and neutral conductors of the mains transformer are disconnected.

CAUTION - 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 place liquid filled containers on or close to the unit.

CAUTION - Hazardous Live

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

Terminals to which the hazardous live symbol refers require installation by a qualified person.

CAUTION - Mains Fuse

Replace the mains fuse only with the same type and rating as marked on the rear panel. The fuse body size is 20mm x 5mm.

CAUTION - Servicing

The unit contains no user serviceable parts. Refer servicing to qualified service 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 screws identical to the original parts.

In the interest of continuing improvements Cloud Electronics Limited reserves the right to alter specifications without prior notice.

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Notes:
