



# CX233 Zoner Mixer

## Installation & User Guide

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# CX233 Zone Mixer

## Installation and operation manual

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## 1 General Description

The CX233 is a versatile multi-source mixer/zoner that can be used with confidence as part of a professional sound system. The impressive performance and flexible routing options together with the remote level control facility make it suitable for a wide range of applications. In addition, the fire alarm mute facility, emergency microphone mode and DC power supply option make the mixer/zoner well equipped to satisfy local authority and fire department requirements.

## 2 Music Inputs

### 2.01 Music Inputs

All three line inputs have a flat frequency response and are suitable for most music sources such as compact disc players, tape players and tuners etc. Unbalanced signals make use of RCA phono sockets and balanced inputs use XLR connectors. The nominal input sensitivity is 0dBu (775mV)  $\pm$ 12dB.

### 2.02 Gain Control

All music inputs have pre-set gain controls mounted on the rear panel adjacent to the input connectors. The range of the control is  $\pm$ 12dB. As the nominal input sensitivity is 0dBu (775mV), the input sensitivity can be varied from -12dBu (195mV) to +12dBu (3.08V) and this gain control should be set to allow the front panel level controls to have an optimum range of control.

### 2.03 Front panel level controls

These controls simply set the level of the music source assigned to a particular input channel. There is a provision to apply a self adhesive label above the control, to clearly identify the source.

### 2.04 Priority

Line 1 input has a provision to provide priority over line inputs 2 and 3. The switch is positioned to the right of the line 1 zone select switches and is marked "PR". When the priority is active, and a signal present on line 1 this will automatically override line inputs 2 and 3. A typical application for line 1 input priority is where a juke box signal is required to override the background music signal. There is a delay of approximately 20 seconds before any signals present on lines 2 and 3 are restored. This delay will be sufficient to prevent short bursts of background music during title changes.

## 3 Microphone Inputs

### 3.01 Mic Inputs

Two microphone inputs are provided and the microphone amplifier is an electronically balanced, transformerless design configured for optimum low noise performance. The input impedance is greater than 2K and is suitable for microphones in the 200 to 600 ohm range. Inputs are via Gold plated 3 pin XLR type connectors with latch which are located on the rear panel. To operate the channel in the unbalanced mode, it is suggested that the pin 3 terminal be connected to the ground terminal (Pin 1) inside the XLR cable plug.

### 3.02 Gain Control

Pre-set gain controls are provided adjacent to the respective XLR input connector. The gain can be adjusted from 6dB to 60dB of gain. The wide range of gain allows direct connection of high output devices such as radio microphones without the need for input attenuators. A high overload margin of 20dB is maintained at all gain settings.

### 3.03 Front Panel Level Controls

These are provided for the user to set the desired signal level and are often used by an unskilled operator. It is suggested that the gain control on the rear panel is set at a level where it is not possible to have excessive gain even when the front panel level control is fully clockwise. Self adhesive labels are provided to customise the controls.

### 3.04 Priority

Both microphone inputs have optional automatic priority. When a microphone is used with the priority operative, any music signal which is present will be attenuated. Normal music operation will be restored smoothly after the announcement has been made. The respective priority switch is positioned to the right of the zone select switches and is marked "PR".

### 3.05 Equalisation

Comprehensive equalisation is provided for the microphone signals and common controls are used for both channels. The treble control (HF) has a range of  $\pm 10$ dB at 5kHz and the bass control (LF) has a range of  $\pm 10$ dB at 100Hz. In addition to the treble and bass controls, a contour switch is provided. This can be used to improve intelligibility of speech particularly when Hi-Fi loudspeakers are being used. The "contour" switch introduces a boost of 6dB at 3kHz.

### 3.06 Emergency Mode

This facility operates on Mic 2 input only and is primarily for the purpose of interfacing a dedicated evacuation microphone or evacuation message player. When the "emergency" mode of operation is selected, the Mic 2 input is normally muted and becomes active in all 3 zones when the fire alarm is activated.

## 4 Zone Outputs

### 4.01 Zone Outputs

All three stereo zone outputs are balanced and can operate with loads as low as 600 ohm. 3 pin XLR type connectors are used for all outputs. The nominal output is 0dBu (775mV) but the CX233 can operate satisfactorily with a wide range of signal levels up to a maximum balanced output of +26dBu. If you are connecting any zone output to an unbalanced input see section 9.02 "Unbalanced Mode".

### 4.02 Equalisation

All three zone output circuits have independent treble (HF) and bass (LF) controls. The treble control has a range of  $\pm 10$ dB at 10kHz and the bass (LF) control has  $\pm 10$ dB at 50Hz. These controls can be used to provide compensation for differing acoustics or loudspeaker types.

### 4.03 Stereo/Mono Operation

All CX233's leave the factory configured for stereo operation. By configuring circuit jumpers on the upper PCB each output zone can be configured to operate in the mono mode.

When operating in the mono mode, the output signal is present on both left and right output connectors and either, or both may be used.

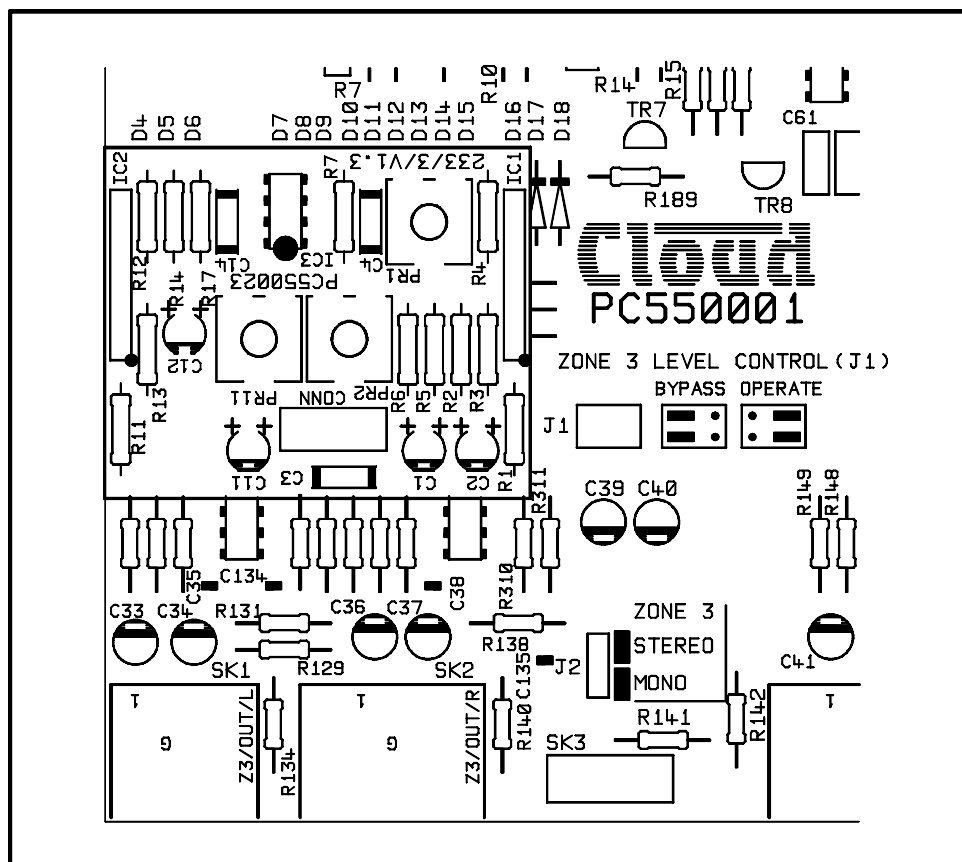
## 5 VCA Modules

### 5.01 VCA Modules

Local control of the signal level can be achieved on all three zone outputs by fitting optional stereo VCA modules. These compact modules utilise a pair of industry standard low distortion VCA's and simply plug into the upper PCB adjacent to the output circuitry. The modules can be retro-fitted but the CX233 would normally be supplied with the modules fitted if specified at the time of ordering.

### 5.02 Fitting VCA Modules

1. Before commencing any work, the CX233 must be disconnected from its power source whether this be AC or DC.
2. Remove the CX233 top panel.



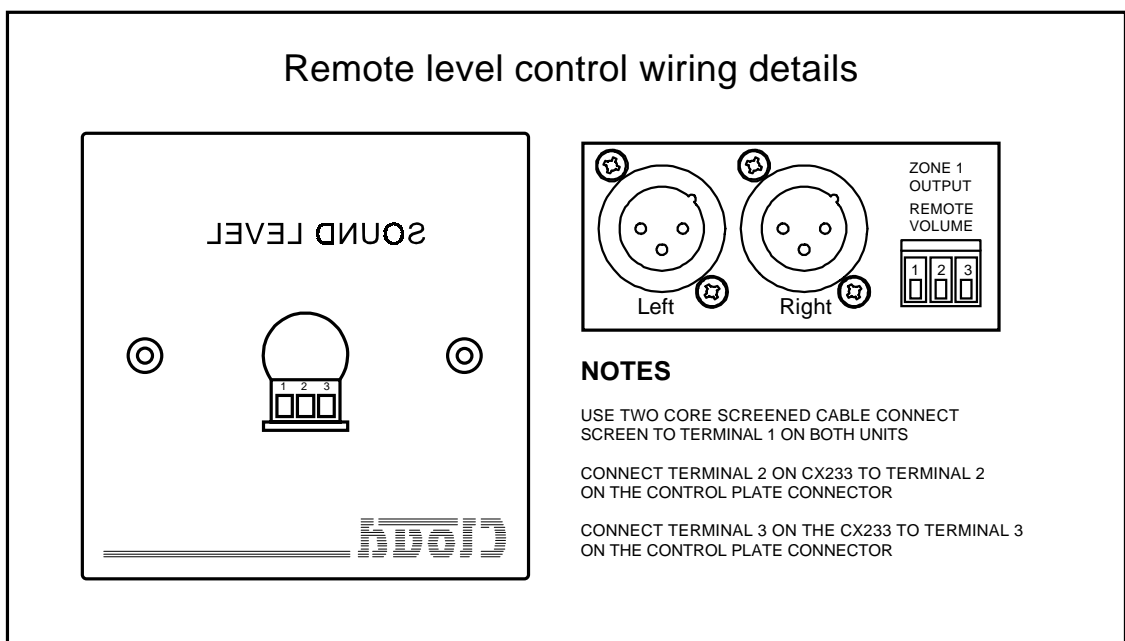
3. Locate the 10 pin male connector positioned adjacent to the respective output zones. This should have each end pair of contacts shorted by single circuit jumpers. Remove these two jumpers.

4. Carefully position the VCA module on to the 10 pin connector making sure that both rows of pins engage in the pcb mounted socket. This can be verified by checking that the 3mm fixing hole perfectly aligns with the mounting spacer.
5. When you are satisfied that the VCA module is correctly fitted, secure the module with the supplied M3 screw.
6. If you wish to bypass the respective front panel zone level control, the adjacent jumpers can be configured as detailed on the PCB. This would remove the front panel level control from the circuitry, leaving the remote level control to operate independently.
7. Refit the top panel.

### 5.03 Remote Level Plate

A remote level plate complete with control is supplied with each VCA module, this can be fitted directly onto a standard UK electrical single gang mounting box (recessed or surface) with a minimum depth of 25mm (not supplied). 2 core screened cable must be used to link the remote level control to the CX233.

When the remote level control facility is being used, it may be desirable to defeat the front panel zone level control on the CX233 and this can be done by configuring an internal jumper.



## 6 Optional DC Power Supply

### 6.01 Optional DC to DC Power Supply.

The DC supply kit is supplied with the following parts.

- 1 x NMXD 2415 DC to DC converter
- 2 x 1/4" PC mounting spade terminals
- 1 x PC mounting fuse holder
- 1 x 20x5mm T800mA Fuse
- 1 x 4 pin XLR connector with leads
- 2 x M3 fixing screws with nuts and washers

## 6.02 Fitting of DC to DC power supply

1. Disconnect the CX233 from the mains power
2. Remove the top and bottom panels
3. Fit the two spade terminals on to the PCB. It is clearly marked Red+ve, Black-ve. Then solder them in place
4. Fit the fuse holder to the PCB in the location marked F1. Solder this in place then fit the T800mA fuse.
5. Fit the NMXD2415 to the pcb, then solder in place.
6. All the soldered joints should be cut flush with the joint.
7. Remove the cover positioned over the 4 pin XLR mounting hole.
8. Fit the 4 pin XLR connector using the screws provided. Connect the red and black wires to the appropriate terminal on the PCB.
9. Re-fit the top and bottom panels.

## 7 Fire Alarm Interface (Remote Music Mute)

In certain circumstances, 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 CX233 provides a facility to attenuate or fully mute the music signals only, by using a fully floating pair of contacts in the control panel which would need to be closed during an alarm condition.

In the remote music mute mode both microphone signals are automatically routed to all zone outputs bypassing any front panel switches, zone level controls and VCA controls. In addition to this all music signals are attenuated by 20dB or muted, dependant on the setting of the internal jumper.

It should be noted that in order to avoid a panic situation, the muting takes place gradually, over approximately 10 seconds. The recovery is also subject to a similar delay.

## 8 Mic 2 Emergency Mode

The Mic 2 input can be used for evacuation purposes by switching to the "emergency mode". In this mode, the Mic 2 input would be muted when the CX233 is working normally. When the fire alarm is activated, all music signals are muted/attenuated and both Mic signals are routed to all outputs as above in section 7.10. In addition to this the front panel level control for Mic 2 is rendered inoperative, instead a PCB mounted preset controls the level of Mic 2. The rear panel gain control remains active under these conditions. This emergency mode is intended to allow Mic 2 to be used for a dedicated evacuation Mic or evacuation message player.

## 9 Earthing

The 0v rail on the CX233 is connected to the mains earth and the mixer/zoner must always be earthed. If any mains powered signal source has its own earth, then earth loop hums may cause problems. The "hum" can be remedied in several ways. The preferred method is to operate all inputs and outputs in the balanced mode, with the cable screen only connected at the receiving end. Alternatively, re-route the mains supply of the apparatus to the same point as that of the CX233. (Note: Microphone cables must be earthed at both ends).

## 10 Unbalanced Mode

If the zone outputs are required to operate in the unbalanced mode, it is suggested that the unused pin of the XLR connector is not connected. The nominal output signal in this mode is -6dBu and a small amount of extra gain may be required.

## 11 Technical Specifications

### Music Channels

Frequency Response	±0.5db 20Hz/20kHz
Distortion	<0.05% 20Hz/20kHz (+10dBu O/P)
Nominal Input Level	0dBu/775mV
Input Impedance	20kΩ balanced 10kΩ unbalanced
Headroom	>20dB
Noise	0dB gain – 90dB CCIR – ARM
Input Gain Range	±12dB

### Microphone Channels

Frequency Response	±0.5db 100Hz/20kHz -3db 30Hz
Distortion	<0.03% 20Hz/20kHz (+10dBu O/P)
Maximum Gain	60dB
Gain Control Range	54dB
Headroom	>20dB
Noise	> - 128dB EIN 22Hz/22kHz (150Ω)
Equalisation	HF/High Frequency ±10dB 5kHz
	LF/Low Frequency ñ10dB 100Hz
	Contour +6dB at 3kHz
Input Impedance	>2kΩ (balanced)
Common Mode Rejection	>70dB 1kHz

### Zone Outputs

Nominal Output Level	0dBu balanced , -6dBu unbalanced
Minimum Load Impedance	600Ω
Equalisation	HF/High Frequency ±10dB 10kHz
	LF/Low Frequency ± 10dB 50Hz
Maximum Output Level	+26dbu balanced, +20dBu unbalanced



## General Specifications

Power Consumption	25VA
Power Requirements	115V $\pm$ 5% or 230V $\pm$ 5%
Fuse Ratings	Power T250mA at 115V
	Power T125mA at 230V
	Battery T800mA (internal)
Width	482.6mm (rack)
	432.0mm (free standing)
Height	88.0mm (2U)
Depth	192.00mm
Weight	5.1Kgs

This product conforms to the following European Standards

EN 50081-1: 1992  
 EN 50082-1: 1992  
 EN 60065 : 1994



## SAFETY CONSIDERATIONS

### CAUTION - MAINS FUSE

TO REDUCE THE RISK OF FIRE REPLACE THE MAINS FUSE ONLY WITH THE SAME TYPE, WHICH MUST BE A CLASS 3, 240 VOLT, TIME DELAY TYPE, RATED AT 125mA WHERE THE MAINS INPUT VOLTAGE IS SET TO 230 Volts  $\pm$  10% AC. FOR A MAINS VOLTAGE OF 115 Volts  $\pm$  10% AC. THE FUSE SHOULD BE RATED AT 250mA  
 THE FUSE BODY SIZE IS 20mm x 5mm.

### CAUTION - SERVICING

THIS UNIT CONTAINS NO USER SERVICEABLE PARTS. REFER ALL SERVICING TO QUALIFIED SERVICE PERSONNEL. DO NOT PERFORM ANY SERVICING UNLESS YOU ARE QUALIFIED TO DO SO.

### WARNING

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.