



GUARDIAN

CX4 MK III

**PRIORITY INTERFACE AND
SOUND LEVEL CONTROL**

USERS MANUAL

GUARDIAN CX4 MKIII

MK2

The Guardian CX4 MKIII performs the same functions as the CX4 mk2 but with added features and options:-

- Two independent sound level control circuits (Channels 1&2 and Channels 3&4).
- Security loops with adjustable sound level attenuation (Dim).
- Improved noise limiter section incorporating a slow acting average limiter and a separately adjustable peak limiter.
- Phantom power option for priority input.

Introduction

The Guardian CX4 MKIII has two functions, its first function is to provide a priority input into an audio system of either 4 mono or 2 stereo channels (Priority Override). The second function is to control the maximum operating audio sound level in 2 stereo channels (Sound level control).

Priority Override

The Guardian CX4 has been designed to be connected between the mixer (or pre amp) and the power amplifiers of an audio system. The unit is a 4 channel device usually connected as two stereo pairs.

The CX4 may be used with any sound system where a priority override facility is required e.g. Entertainment venue, shopping centres, malls, cruise ships or any public area where fire, security or other important announcements are required.

The priority input may be a microphone or line level source (selectable internally). When the unit is not triggered the priority input signal is available at the priority output socket. This is so that a microphone which is in normal use (i.e. DJ, MC, or compère) may also be used as the priority input.

Phantom power may be selected for the priority input if required by setting an internal jumper.

Operation

In normal mode programme signals pass through the 4 audio channels of the CX4 with no change in level. When the unit is triggered the incoming programme level is attenuated and the priority signal is mixed into the four outputs. When the unit is reset the priority signal is removed and the programme will fade back to the original volume.

The amount of attenuation and priority level can be adjusted by pre-set controls located under the front panel.

LED indicators of LIMIT, PEAK, DIM and PRIORITY are provided on the front panel to show the status of the unit. Connectors are provided on the rear panel for remote indicators should they be required.

Balanced inputs and outputs are provided which may be strapped unbalanced with no signal loss.

Control input (trigger)

The control input may be configured for voltage or switch operation. Jumpers located behind the front panel set the options and are labelled CONTROL SELECT. The position of two jumpers determine Voltage or Switch mode (be sure to move both jumpers).

Adjacent is a jumper labelled CTRL SENSE. This jumper allows the unit to be controlled in voltage mode by voltage applied or voltage removed, or in switch mode by normally open (N.O.) or normally closed (N.C.) switch contacts.

The factory setting is voltage mode. Volts applied to trigger the voltage required is (18-24Vdc). The current required is minimal, less than 10mA. The polarity is not critical. This voltage may be provided by the fire alarm panel or other suitable source.

Reset

There are two modes of reset - Automatic and Manual. The reset mode is selected by a jumper located behind the removable front panel. If Auto reset is selected the unit will automatically reset when the trigger signal is removed. If manual reset is selected, pressing the reset button after the trigger signal has been removed resets the unit.

Test

A test button for initial set up and testing is located adjacent to the reset button. Both reset and test buttons can be operated through small holes in the front panel using a small screwdriver, match, etc.

Sound level control

The sound level control function has been provided to control the maximum permitted sound level in an entertainment venue (Often necessary when having to conform to noise pollution requirements).

Each stereo channel has a separate sound level control facility allowing different levels to be set and therefore two separate areas to be independently controlled.

The sound level control uses 2 circuits, a slow acting sound level threshold (LIMIT) and a fast acting peak limiter (PEAK).

The unit monitors the level and if the level exceeds the limiter threshold the LIMIT indicator illuminates and the level will be reduced back to the threshold level. This limiter is controlled by the average programme content and is fairly slow acting so as not to reduce the dynamics of the music. (An internal jumper is provided to allow a faster operation if required).

The PEAK limiter threshold is the level above the limiter threshold that short peaks may be permitted to reach, a single drum beat or a short high vocal note will pass through the slower acting limiter threshold and be controlled by the setting of the peak threshold. When the level exceeds the peak threshold level the PEAK indicator illuminates.

By setting the average and peak presets maximum levels can be maintained without undue programme compression taking place so the music will still sound punchy and bright. But the system will be protected from undue peaks that could cause damage.

Either of the limit or peak functions can be disabled by turning the threshold preset fully clockwise.

If the security loop (DIM) is broken the limit threshold will be reduced by an amount set on the DIM presets (located behind the front panel) and the DIM indicator will illuminate. The security loop could be used on doors or windows for example, so if opened (more music escapes) the limit threshold is reduced by a preset amount.

Set up

Remove the 5 front panel screws and drop off the front panel to access the preset controls.

Priority

Factory setting is for microphone input.

If phantom power is required follow the instructions for **Phantom power** in the section headed **Internal options**.

If line input is required follow the instructions for **Priority input selector** in the section headed **Internal options**.

Connect the priority source to the socket marked "IN" under the "MIC OR LINE I/P" section, the priority source will now be available from the adjacent socket marked "OUT" until the priority is triggered. If the priority source is required for normal day to day use it may be used by connecting to the "OUT" connector.

To set the control protocol, on the PCB behind the front panel locate relevant jumpers for control input (towards left of front) and follow legend on PCB to set as required. See drawing 860PCB towards back of manual.

For manual or auto reset, locate the jumper on the front panel PCB for reset (right of centre) and follow legend on PCB to set as required. See drawing 860PCB towards back of manual.

Test the control input with a trigger input and check the "TEST" button operates, check the reset operates as required (manual or autoreset) when the trigger is removed.

Connect the audio channels (normally the mixer/zoner output) to the "IN" XLR of channels 1 – 4 (priority only can be 4 mono channels, 2 mono and 1 stereo channel or 2 stereo channels. Sound level control is 2 stereo or 2 mono channels only. Stereo is channels 1 & 2 and/or channels 3&4).

The adjacent connector to each input is the output for that channel (marked "OUT"). Connect the output to whatever was previously connected to the mixer/zoner (usually this will be equalisation, crossover or amplifiers).

Sound level control

1 On the front panel PCB set PEAK and THRESHOLD presets for channel 1&2 fully clockwise and check the security loop is unbroken.

2 Put music through the CX4 (with Amplifiers at full volume and level held on the Mixer) and set Mixer to give maximum required sound level.

3 If sound level control is not required jump to 9 below.

4 Adjust THRESHOLD preset anti-clockwise until LIMIT indicator illuminates.

5 Increase the Music level into the CX4 until the required peak threshold level (recommend about +6dB, use MIXER output meter as indicator because CX4 will be limiting audio level) and adjust the PEAK preset until the PEAK indicator illuminates.

6 Reduce music level back to maximum required audio level (PEAK off and LIMIT indicator illuminated).

7 If security loops are to be used then remove security loop for channels 1&2 (Pins 3&4 rear connector, DIM indicator will illuminate) and adjust DIM preset to give required audio level with security loop broken.

8 Restore security loop.

9 Trigger priority input, either with the "TEST" button or via the control input (music still at maximum required audio level), and adjust priority programme attenuation preset for Channel 1&2 (generally music should be quiet but audible).

10 Apply priority input and adjust priority volume "OVERALL GAIN" when setting channels 1&2, and priority volume "CHANS 3&4" when setting channels 3&4.

11 Remove the trigger and press "RESET" (if set for "AUTORESET" then wait for unit to autoreset).

12 Setting for channels 1&2 is now complete.

Repeat from 1 above for setting of presets for channels 3&4.

Internal options

N.B. Internal settings should be undertaken by skilled personnel only.

DISCONNECT THE UNIT FROM THE MAINS SUPPLY

Remove the top case cover by removing 6 screws located at the sides of the unit and 2 screws located on the top of the unit. (Re-assemble in the reverse order)

Refer to drawing 860PCB (towards the back of the manual) for positions of internal options.

Mains Voltage

The CX4 MkIII has been designed to operate on 220-240Vac or 110-120Vac. A slide switch located on the PCB behind the mains input connector selects the operating voltage. The voltage selected is displayed on the switch 230 (220-240V) 115 (110-120).

DAMAGE MAY RESULT IF THE UNIT IS CONNECTED TO THE WRONG SUPPLY VOLTAGE

THIS UNIT MUST BE EARTHED

Fuses

Mains fuse sizes are 250mA anti surge for 220-240V operation and 500mA anti surge for 110-120V operation. **It is important for safety reasons that the correct fuse sizes are always used.**

Phantom Power

If phantom power is required for the priority microphone it may be selected on a jumper located rear left edge of the CX4 looking from the front panel. Legend on the PCB indicates setting.

Priority input selector

The priority input selector is located behind the priority in/out sockets - two jumpers select mic or line input. A label showing the jumper positions is provided. (Be sure to move both jumpers)

The factory setting is for a Microphone input.

Earth lift

A jumper is provided to lift the audio common (0VE) from mains earth. This may be necessary in some installations. A skilled audio system specialist should determine if this is necessary, otherwise this should be left in the factory supplied or normal position.

Limiter time constant

As described in the noise limiter section a jumper is provided to allow some adjustment to the limiter speed. This jumper is located towards the left center of the PCB viewed from the front and is clearly labelled.

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GUARDIAN CX4 MKIII TECHNICAL SPECIFICATION

Gain	Normal operation, unity gain +0dB -1dB
Frequency Response	20Hz - 20KHz + 0.5dB -1dB
Distortion THD @ 1KHz	O/P +20dBu <.015% (Typically .007%)
Noise	< -90dBu EIN
Inputs	Balanced
Connector type	XLR
Input impedance	> 30K Ohms
Max input level	+22dBu
Outputs	Electronically balanced
Connector type	XLR
Max O/P level	+22dBu into 600R load
Controls	Situated behind removable front panel (counting from the left)
1	Priority input level all channels.
2	Priority input level channels 3&4 (allows chans 3&4 to be lower than chans 1&2)
3	Attenuation channels 1&2. Range 0dB to -60dB (factory setting -20dB)
4	Attenuation channels 3&4. Range 0dB to -60dB (factory setting -20dB)
5	Peak threshold 1&2 setting of peak limiter above the average limit threshold
6	Limit threshold 1&2 (average) adjustable range -20dBu to +22dBu
7	DIM limit threshold 1&2 limit threshold
8	Peak threshold 3&4 setting of peak limiter above the average limit threshold
9	Limit threshold 3&4 (average) adjustable range -20dBu to +22dBu
10	DIM limit threshold 3&4 limit threshold
11	Reset momentary action push button (adjacent jumper position determines the type of reset - auto or manual.
12	Test momentary action push button. (For set-up and testing)
Priority input	Internally selectable Mic – Line (18V Phantom power available on a jumper).
Connector type	XLR in and out
Set to Mic	Low impedance. Balanced. Max gain 70dB
Set to Line	10K Balanced. Max I/P level +30dBu
Visual indicators	Power - 2 x Green LED's. Limit 2 x Red LED's. Peak - 2 x Amber LED's. Dim - 2 x Red LED's. Priority override - Red LED.
Control input connections	Pins 1 & 2 18V - 24V DC (Voltage mode)/Isolated switch contacts (Switch Auxiliary 2 x 6 Way screw terminal connector mode)
Security loop	Pins 3&4 channels 1&2, Pins 5 & 6 channels 3&4. Break to trigger
Remote indicator outputs	A & G N/C B & H Dim LED +VE C & I Limit LED +VE D & J Peak LED +VE E & K Priority LED +VE F & L Common 0VE
Outputs will drive LED's without	series resistors (or suitable solid state relays to drive mains voltage indicators).
Dimensions	19" rack mounting. 1RU, Width 482mm (19"), Depth 206mm (8.1"), Height 44mm (1.75")
Finish:-	Front - and Rear panels- Black anodised aluminium with silver notation which will not rub off in use. Case - black plastic coated steel.
Power	IEC Connector 220 - 240V AC. Mains Fuse 250mA Anti Surge (slow blow) 110 – 120V AC. Mains fuse 500mA Anti Surge (slow blow)



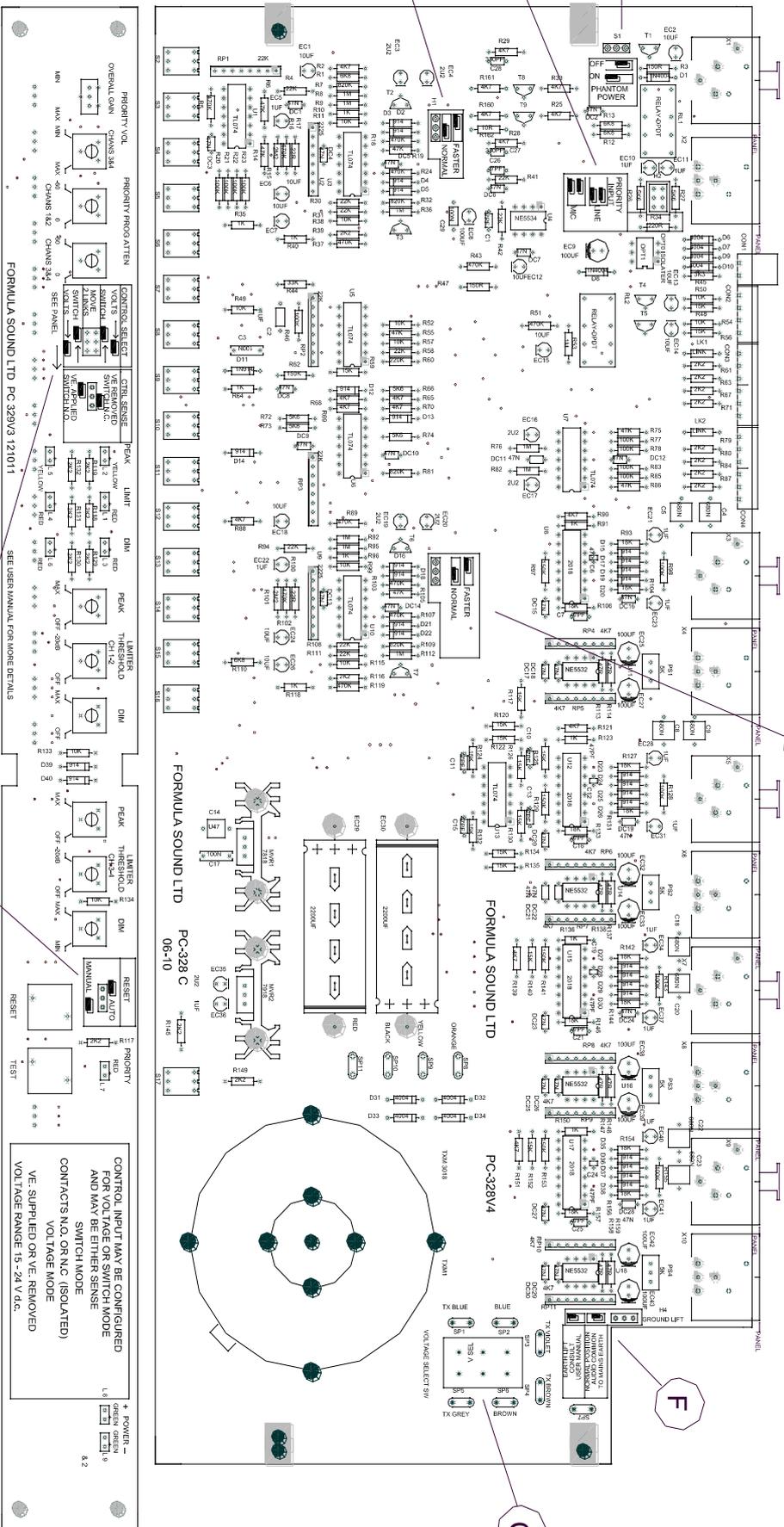
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TITLE CX4 MKIII INTERNAL ADJUSTMENTS

DRG No. 860PCB

DATE 09-03-2012 ISSUE 1

- A. Phantom power selector for priority microphone
- B. Priority input mic or line level selection
- C. Mains Voltage selector switch (slide switch)
- D. Peak level response CH 1 & 2
- E. Peak level response CH 3 & 4
- F. Ground lift for diagnostic purposes only
- G. Priority control protocol selection - volts or contacts
- H. Manual or Auto reset selection



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E.U. CERTIFICATE OF CONFORMITY

We declare that the products listed conform to the following directives and standards

89/336/EEC amended by 92/31/EEC and 93/68/EEC

BS EN 50082-1 BS EN 50081-1

PRODUCT TYPE

GUARDIAN CX4 MKIII

The CE mark was first applied in 1995

Signed 

B. J. Penaligon General Manager

Attention

The attention of the specifier, purchaser, installer, or user is drawn to the fact that good wiring practice must be observed when connecting the above equipment. Good quality connectors and screened cables must be used for all audio connections. Twin screened cables should be used for all balanced lines.

THIS EQUIPMENT MUST BE EARTHED
CONSULT THE USERS MANUAL FOR TECHNICAL DETAILS