

# DRAWMER



## CMC2 COMPACT MONITOR CONTROLLER

### CONTENTS

Warranty . . . . .	3
Safety Consideration . . . . .	3
Radio Frequencies Statement . . . . .	3
<i>Chapter 1 - Introduction</i>	
Introduction . . . . .	4
Installation . . . . .	6
Power Connection . . . . .	7
Security . . . . .	7
Audio Connection . . . . .	8
Typical Connection Guide . . . . .	9
<i>Chapter 2 - Control Description</i>	
Control Description . . . . .	10
Mix Checking Tips . . . . .	13
<i>Chapter 3 - General Information</i>	
If a fault develops . . . . .	15
Contacting Drawmer . . . . .	15
Specification . . . . .	15
Block Diagram . . . . .	16

## **COPYRIGHT**

This manual is copyrighted © 2017 by Drawmer Electronics Ltd. With all rights reserved. Under copyright laws, no part of this publication may be reproduced, transmitted, stored in a retrieval system or translated into any language in any form by any means, mechanical, optical, electronic, recording, or otherwise, without the written permission of Drawmer Electronics Ltd.

## ONE YEAR LIMITED WARRANTY

Drawmer Electronics Ltd., warrants the Drawmer **CMC2 Compact Monitor Controller** to conform substantially to the specifications of this manual for a period of one year from the original date of purchase when used in accordance with the specifications detailed in this manual. In the case of a valid warranty claim, your sole and exclusive remedy and Drawmer's entire liability under any theory of liability will be to, at Drawmer's discretion, repair or replace the product without charge, or, if not possible, to refund the purchase price to you. This warranty is not transferable. It applies only to the original purchaser of the product.

For warranty service please call your local Drawmer dealer. Alternatively call Drawmer Electronics Ltd. at +44 (0)1709 527574. Then ship the defective product, with transportation and insurance charges pre-paid, to Drawmer Electronics Ltd., Coleman Street, Parkgate, Rotherham, S62 6EL UK. Write the RA number in large letters in a prominent position on the shipping box. Enclose your name, address, telephone number, copy of the original sales invoice and a detailed description of the problem. Drawmer will not accept responsibility for loss or damage during transit.

This warranty is void if the product has been damaged by misuse, modification, unauthorised repair or installed with other equipment that proved to be faulty.

THIS WARRANTY IS IN LIEU OF ALL WARRANTIES, WHETHER ORAL OR WRITTEN, EXPRESSED, IMPLIED OR STATUTORY. DRAWMER MAKES NO OTHER WARRANTY EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. PURCHASER'S SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE REPAIR OR REPLACEMENT AS SPECIFIED HEREIN.

IN NO EVENT WILL DRAWMER ELECTRONICS LTD. BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY DEFECT IN THE PRODUCT, INCLUDING LOST PROFITS, DAMAGE TO PROPERTY, AND, TO THE EXTENT PERMITTED BY LAW, DAMAGE FOR PERSONAL INJURY, EVEN IF DRAWMER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Some states and specific countries do not allow the exclusion of implied warranties or limitations on how long an implied warranty may last, so the above limitations may not apply to you. This warranty gives you specific legal rights. You may have additional rights that vary from state to state, and country to country.

### For the USA

#### FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, then the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Unauthorised changes or modification to this system can void the users' authority to operate this equipment. This equipment requires shielded interface cables in order to meet FCC class B limit.

### For Canada

#### CLASS B NOTICE

This digital apparatus does not exceed the Class B limits for radio noise emissions set out in the Radio Interference Regulations of the Canadian Department of Communications.

#### CLASSE B AVIS

Cet appareil numérique ne dépasse pas les limites de la classe B au niveau des émissions de bruits radioélectriques fixés dans le Règlement des signaux parasites par le ministère Canadien des Communications.

## SAFETY CONSIDERATIONS

### CAUTION - SERVICING

DO NOT OPEN. REFER ALL SERVICING TO QUALIFIED SERVICE PERSONNEL.

### WARNING

TO REDUCE RISK OF FIRE/ELECTRIC SHOCK DO NOT EXPOSE THIS EQUIPMENT TO MOISTURE.

### WARNING

DO NOT ATTEMPT TO CHANGE OR TAMPER WITH THE SUPPLIED MAINS CABLES.

### WARNING

THERE ARE NO USER REPLACEABLE FUSES WITHIN EITHER THE CMC2 OR IT'S SUPPLIED POWER SUPPLY. IF FOR ANY REASON THE CMC2 CEASES TO WORK DO NOT ATTEMPT TO MEND IT - CONTACT DRAWMER TO ARRANGE FOR A REPAIR/REPLACEMENT.

**In the interests of product development, Drawmer reserve the right to modify or improve specifications of this product at any time, without prior notice.**

# CMC2

## Compact Monitor Controller

Building on their success in the stereo monitor controller market, Drawmer are aiming to complete their range with the CMC2, a low cost, low profile, compact desktop controller. Using the same audio circuitry as the ever popular MC2.1 & MC3.1 monitor controllers, Drawmer have reduced the feature set to produce a more cost effective solution, primarily aimed at the home studio market.



The CMC2 has 2 Stereo Inputs on 1/4" balanced jacks, plus a 3.5mm jack Aux input with variable level control. It supports 2 sets of monitors plus a sub-woofer, as well as headphones, which have a separate level control. Key Mix check features such as Phase Reverse, Mono & DIM are included, and the whole package is presented in a very low profile desktop enclosure with a footprint of just 18x16cm.



---

Can you trust the audio that your current monitor controller is providing? Is it colouring the sound? For all Drawmer monitor controllers it is imperative that what you record is exactly what you hear. The active circuit has been designed to faithfully produce the audio signal whilst removing many of the problems that a passive circuit will bring. There is one thing that should always be absolutely guaranteed - that you can rely on the accuracy of your monitor controller.



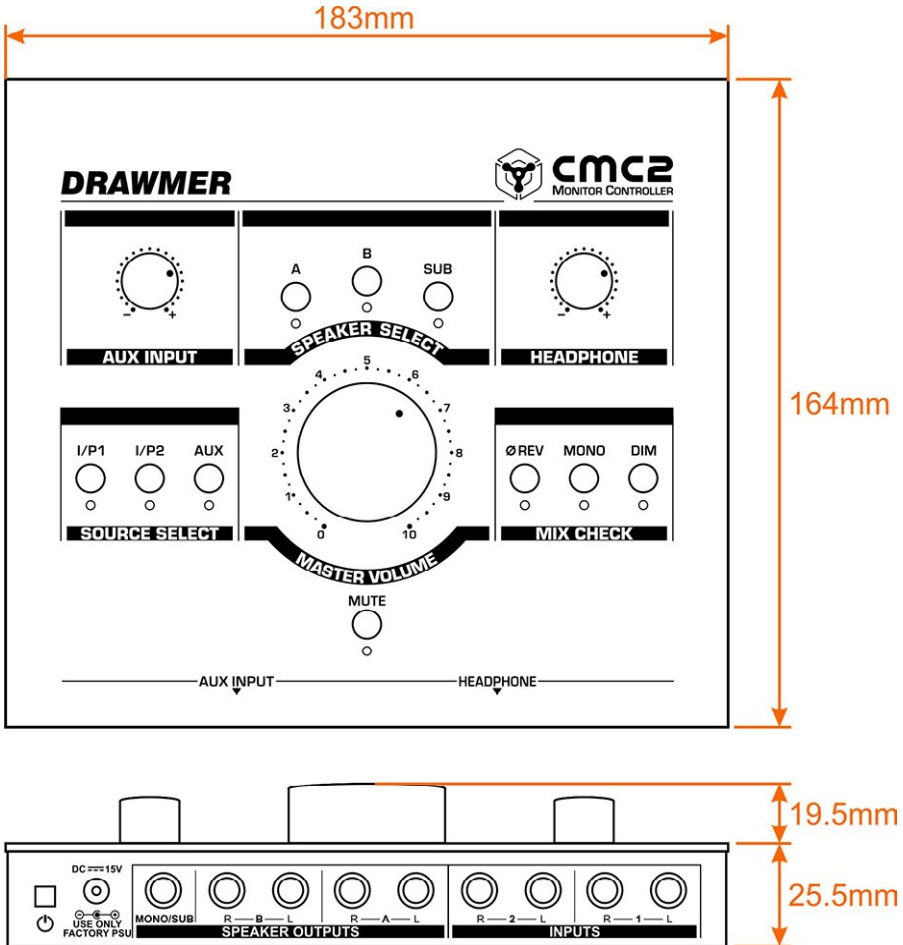
Main Features:

- Ultra low noise and transparent circuit design.
- Source switches can be active in any combination. 3 Inputs in Total - Two on 1/4" balanced jacks and One 3.5mm Front Panel Aux.
- 2x Speakers Plus a Mono Sub can be switched individually & simultaneously or give A/B comparisons, all with timed relay protection on all speaker outputs to prevent power up/down bangs.
- A large volume knob incorporating a paralleled custom quad pot for excellent channel matching and smooth feel.
- A Headphone Amplifier with Individual Level Controls with easy access to the jack on the front.
- Front Panel 3.5mm AUX Input with Level Control for connecting MP3 player, smartphone or tablet etc.
- Mix Checking facilities Include Dim, Phase Reverse and Mono, as well as an easy access Mute switch
- Kensington security slot.
- Very low profile desktop enclosure with a footprint of just 18x16cm.
- Rugged steel chassis and stylish brushed aluminium cover

# DRAWMER

## INSTALLATION

The CMC2 is a free standing, desktop unit. We have endeavoured to make the CMC2 as small as possible without compromising on controls, connections and above all sound quality. The unit has a footprint of just 18cm x 16cm with controls on the top, headphone and mp3/phone input on the front and all other connections on the rear panel.



---

## POWER CONNECTION

The CMC2 unit will be supplied with an external switching mode power supply that is capable of 100-240Vac continuous (90-264Vac max) and so should work globally. We strongly advise that the power supply that has been supplied with the CMC2 is used, rather than one with the equivalent ratings. In addition, should the power supply fail for any reason we strongly advise that you contact Drawmer for a replacement rather than repairing the unit yourselves. Failure to do either of these could permanently damage the CMC2 and will also invalidate the warranty.

The power supply will be supplied with 4 interchangeable AC pins for the UK, European, USA and Australian socket types. For your own safety, it is important that you use the correct adapter. The power supply must not be tampered with or modified.

Before connecting the CMC2 to the power supply ensure that all knobs are turned off (i.e. fully anticlockwise). A switch next to the d.c. power inlet on the rear of the unit switches the power on/off.



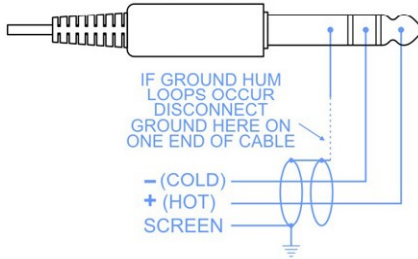
---

## SECURITY

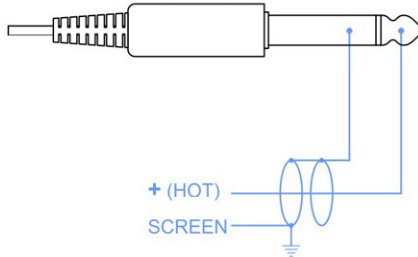
To help protect the CMC2 from theft the side has a Kensington Security Slot (also called a K-Slot) which enables the fitting of hardware locking accessories that can attach your CMC2 to an immovable object, making the CMC2 more of a challenge for the potential thieves to steal.

## AUDIO CONNECTIONS

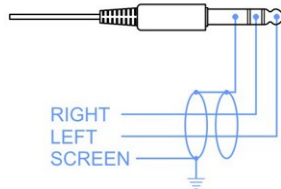
### 1/4" JACK - BALANCED MONO



### 1/4" TALK BACK JACK - UNBALANCED MONO



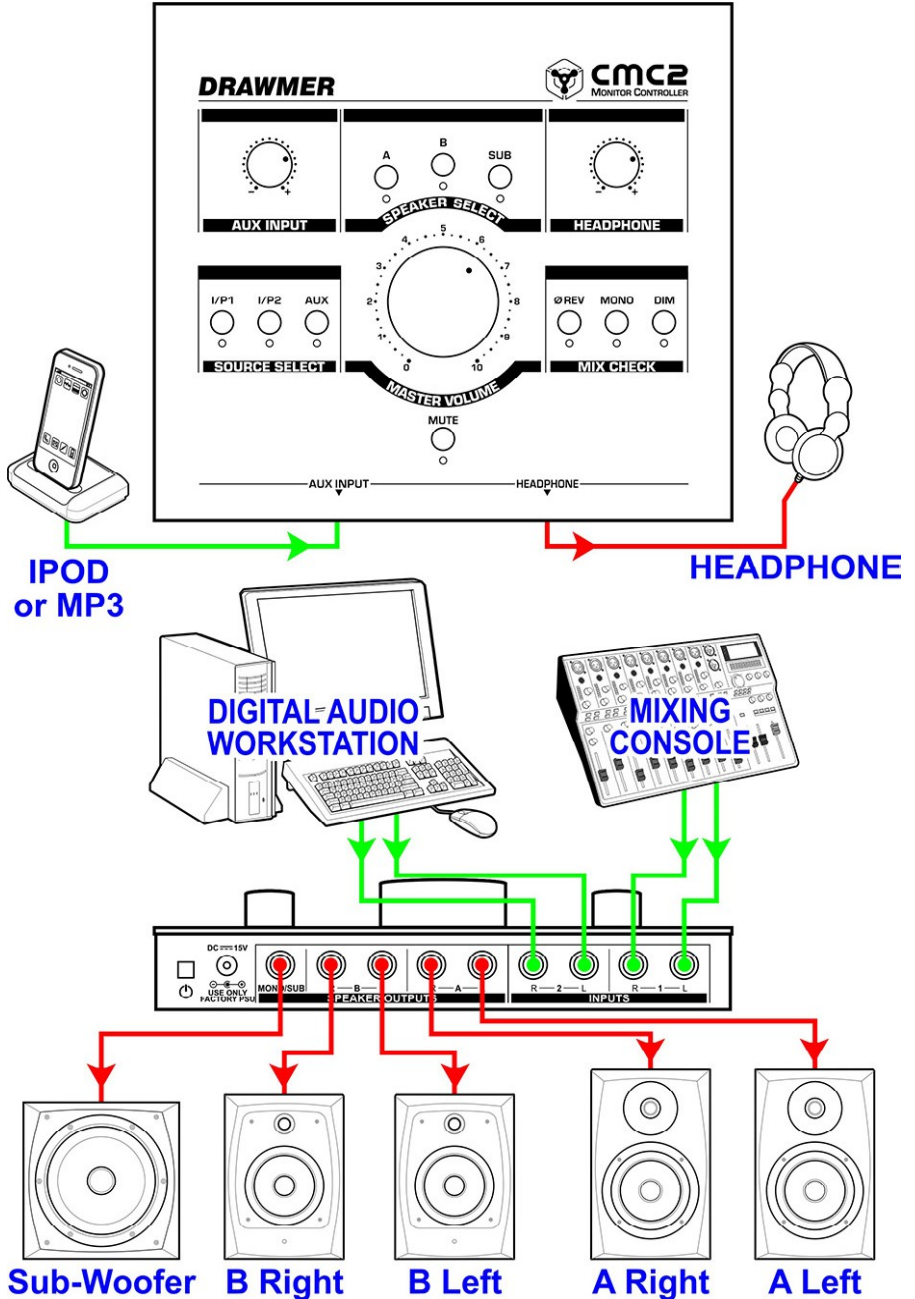
### 3.5mm HEADPHONE JACK



- Interference:  
If the unit is to be used where it may be exposed to high levels of disturbance such as found close to a TV or radio transmitter, we advise that the unit is operated in a balanced configuration. The screens of the signal cables should be connected to the chassis connection on the XLR connector as opposed to connecting to pin1. The CMC2 conforms to the EMC standards.
- Ground Loops:  
If ground loop problems are encountered, never disconnect the mains earth, but instead, try disconnecting the signal screen on one end of each of the cables connecting the outputs of the CMC2 to the patchbay. If such measures are necessary, balanced operation is recommended.

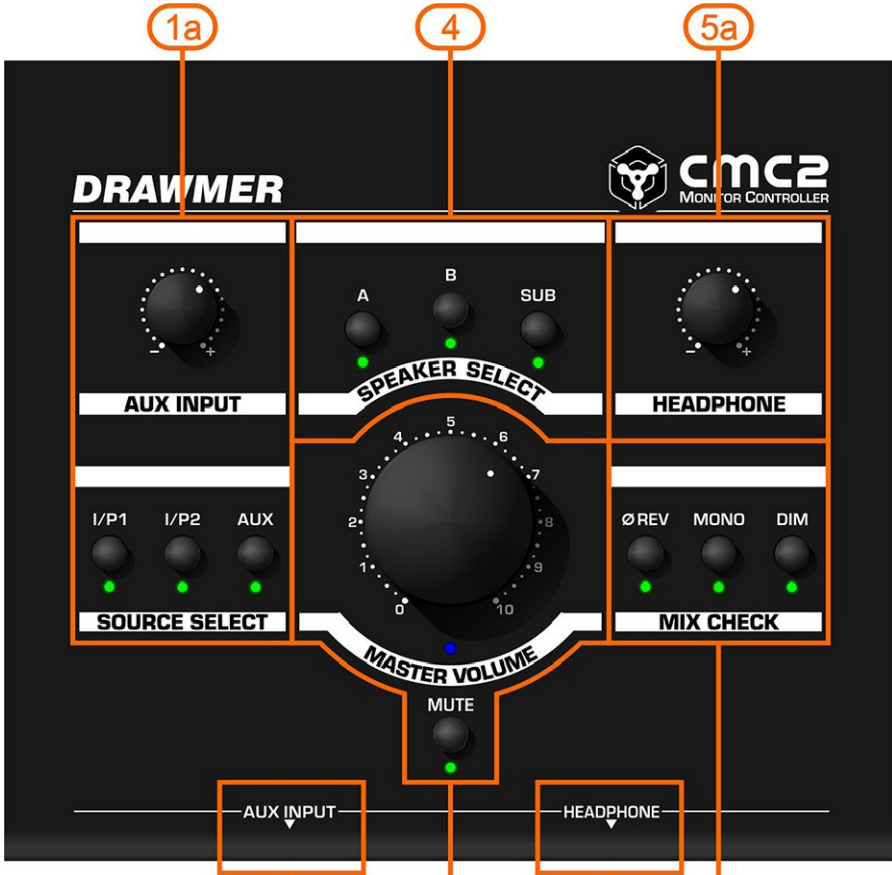


# TYPICAL CONNECTION GUIDE



**CONTROL DESCRIPTION**

As well as a transparent and precise signal path the CMC2 Compact Monitor Controller incorporates many impressive features which are invaluable to the sound engineer when listening to and examining the quality of the audio.



**1 SOURCE SELECT**

Three switches select which of **AUX (1b)** , **I/P1** and **I/P2 (6)** inputs are heard at the Speaker Outputs **(7)** and Headphones **(5)**. Each can be operated individually or simultaneously and in any combination. When operated simultaneously the individual signals are summed into a single stereo signal. Note that the CMC2 does not provide individual level trims for the I/P1 and I/P2 inputs and so any level matching should be applied before it reaches the CMC2.

An **AUX** 3.5mm stereo jack input is located on the front panel **(1b)** to allow easy access to connect a MP3 player, smartphone or similar audio device. A control knob **(1a)** allows the adjustment of the **AUX** volume to match the system level.

---

## 2 MIX CHECK

**Phase Reverse:** Inverts the polarity of the signal on the Left Channel and is used primarily to outline any phase problems that may be occurring in the mix/recording such as phase cancellation, or an unbalanced stereo signal. As the switch is toggled any phase issues will become more apparent and easier to identify.

**Mono:** With the switch active both Left and Right stereo signals are combined into a single mono signal.

It is necessary when testing the audio to not only listen to the signal in stereo but also in mono. It helps to outline problems in the mix, but also when testing for use on non-standard applications such as for broadcast or mobile phone.

**Dim:** With the switch active the output level is attenuated by 20dB's. It enables you to lower the volume without adjusting any of the settings.

## 3 MONITOR VOLUME

**Master Volume:** The Monitor Volume control adjusts the signal level of both stereo channels for all speaker outputs. The Volume knob affects the volume of the monitors A, B & Mono only and does not have a bearing on the headphones. The volume knob circuit design incorporates a paralleled custom quad potentiometer, for excellent channel matching and a smooth feel, with a range from Off (-infinity) to +6dB of gain.

Because the circuitry is active it allows for the signal level to be increased, unlike attenuating only devices, making subtle problems within a mix (such as noise at low levels, or unwanted harmonics, for example) more obvious and easier to iron out, especially during musical passages that would normally be quiet.

### **WARNING:**

It is recommended that you turn the volume control down to a lower level before turning the CMC2 off - this is to ensure that a sudden volume increase when turning on does not damage your speakers or your hearing

In addition, do not use excessive force at either end of the volume knob - it's size would mean that damaging the potentiometer is possible.

**Mute:** Cuts both channels (especially useful in an emergency). Note that **Mute** does not affect the headphones in the same way as it does the speakers. With the **Mute** switch active the headphones will still pass audio in just the same way as if it was inactive, they are not affected. This allows for someone to edit audio using headphones whilst a conversation is occurring in the control room, for example.

## 4 SPEAKERS

Three switches select which of the speaker outputs **A**, **B** or **SUB** are heard (7). Each switch can be operated individually or simultaneously and in any combination and is perfect for performing A/B comparisons between various monitor setups. As the switches do not toggle between outputs when doing A/B comparisons both of those switches should be pressed at the same time.

An additional benefit is derived when using a sub-bass. If the sub-bass is attached to the SUB/MONO output on the rear, outputs A and B could deliver the higher frequencies and allow for A/B (or in this case A+Sub/B+Sub) comparisons between the two monitor setups by pressing the A and B switches simultaneously and leaving SUB always active.

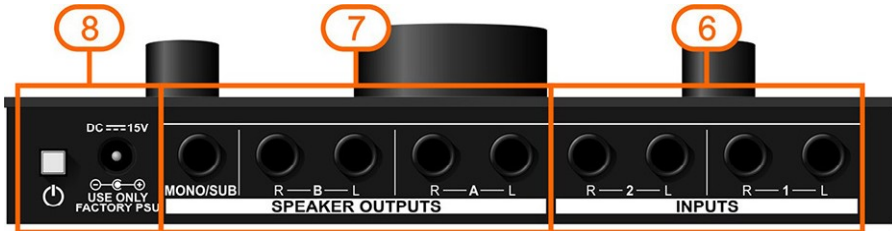
# DRAWMER

## 5 HEADPHONE

The CMC2 has a dedicated headphone output, via 1/4" TRS jack on the front face (5b), with individual headphone amplifier and level control (5a) on the front face - Note that the level control is not affected by the main large monitor volume knob (3), and have no bearing on volume of the rear panel outputs (7). Just like the main volume control the headphone knob circuit design incorporates a paralleled custom quad potentiometer, for excellent channel matching and a smooth feel.

### Warning:

It is advisable to unplug the headphones before switching the CMC2 on or off. It is also recommended that you turn the headphone level down before inserting the jack, and turn it up to your desired listening level - these measures will not only prevent your ears from being damaged but also the headphone's drivers. Also, note that these are high quality circuits and have been designed for professional headphones, so care must be taken when using lower standard, consumer quality headphones as damage could occur.



## 6 INPUTS

The CMC2 has three analogue inputs comprising **I/P1** & **I/P2** - both balanced 1/4" phono jack and also **AUX** - a 3.5mm stereo jack found on the front panel (1b). Each input is activated by the **Source** switches (1a).

## 7 OUTPUTS

Two stereo balanced speaker outputs- **A** and **B**, plus a dedicated mono speaker/sub-woofer output - **MONO/SUB** - are found on the rear of the unit, all in the form of 1/4" phono jacks.

Each output is activated by the **Speakers** switches (4) - and can be activated individually or simultaneously and in any configuration.

## 8 POWER

The CMC2 will be supplied with an external switching mode power supply that is capable of 100-240Vac continuous (90-264Vac max) and should work globally, but is supplied with a cable suitable for domestic power outlets in your country. We strongly advise that the power supply that has been supplied with the CMC2 is used, rather than one with the equivalent ratings. The push button switch activates the CMC2. Note that a timed relay protection circuit has been incorporated into circuit to prevent bangs and other potentially harmful artifacts from occurring during power up and power down.

---

## Mix Checking Tips

Due to the versatility of the CMC2 some very useful techniques for checking your mix can easily be achieved, that can help improve the balance within a mix, pinpoint stereo width, phase and mono problems, and also aid when monogising.

The following are a few handy tips to help eradicate problems and bring about a balance within the mix:

### **Not too loud...**

Give your ears a break. Do not have the volume too loud - frequent monitoring at anything above 90dB will only make your ears tired, meaning that you won't really hear the problems that may be occurring, and give you a false sense that the mix sounds nice and loud. Also, constant listening at anything above 100dB will probably have a long term detrimental effect on your hearing.

### **Shhhh...**

Get into a habit of listening to your mix at very low levels quite often. Remember that not everyone listening to your song has music blasting out. As well as giving your ears a break, it will heighten problems in the mix - Do the key elements have a good balance, or are some instruments more prominent than they should be? If something is too quiet or loud adjust its volume or use E.Q. to fix it. If the mix sounds good at low levels it's likely that it will when loud.

Note that on the CMC2 it is better to lower the volume level using the DIM switch and then turn the volume up, rather than only turning the volume down, as you maintain greater control over the volume as well as better left/right channel matching.

### **Increase the Volume of Quiet Passages.**

Because the CMC2 circuitry is active it allows for the signal level to be increased, rather than only attenuated, making subtle problems within the mix, such as noise at low levels, or unwanted harmonics, more obvious and easier to iron out, especially during passages that would normally be quiet.

### **Here, There and Everywhere.....**

Listen to your mix on as many systems as possible. The two monitor outputs allows for the addition of a non standard testing setup i.e. the system could be forced to emulate low-quality domestic reproduction systems as well as car speakers or a portable radio, by incorporating limited-bandwidth speakers to output B. In such conditions you may find that an instrument drops out of the mix, or another is too prominent, and adjustment to the mix need to be made. For best results calibrate the speakers to match the output level of the rest of the system.

### **Phase Reverse...**

Make use of the phase reverse switch. If the sound doesn't become less focused when the polarity is flipped then there is something wrong somewhere. Not only will the switch help confirm that the monitor speakers are wired up in the correct polarity, phase inversion on a particular instrument can at times improve the way the instrument interacts with the rest of the mix by removing the phase cancellation.

# DRAWMER

---

## Monogising

Check your mix in mono - often! Just because a mix sounds good in stereo doesn't mean it will sound good when the left and right channels are combined. Why should you care if your mix sounds good in mono? Well, most live music venues and dance club sound systems are mono - running the PA or sound system in mono is common practice to ensure music sounds good everywhere in the room because it removes the 'sweet spot' and the complex phase issues of stereo. In many cases the low frequencies will be put through a crossover and summed to mono before being sent to the sub, such as in a home theatre system, for example. Monogising is also necessary when testing the audio for use on non-standard applications such as for broadcast or mobile phone.

In addition, monogising will highlight phase problems. In some cases, when you activate the Mono switch you may hear comb-filtering, which will colour the sound of your mix and cause peaks and dips in its frequency response. When a stereo mix is combined into mono any elements that are out of phase will drop in level or may even disappear completely. This could be because left and right outputs are wired out of phase but its more likely to be due to phase cancellation. What causes phase cancellation?

Many stereo widening effects and techniques, such as chorus;

Simultaneous direct box and mic recording - If you've ever recorded a guitar simultaneously through a direct box and a microphone, you may have noticed the time alignment problems this causes. This type of situation can often be fixed by careful mic placement, or realigning the waveform in a DAW;

Where more than one microphone is used to record a source - on a multi-miked drumkit two mics may pick up the same signal and cancel each other out. One handy tip is to adjust the panning of your drums whilst in mono - the phase cancellation of the drums will improve, and sound even better when reverted back to stereo.

Listening in mono also highlights problems with the stereo width and balance of the mix and is more apparent when you use a lot of stereo-widening or width-enhancing techniques and tools. Switching mono in and out fairly quickly may make it apparent that the centre of the mix is shifting to the left or right, something that may go unnoticed if only working in stereo.

## Listen to the 'Stereo difference' or side signal

A very useful facility of the CMC2 is the ability to listen to the 'stereo difference' or side signal, very quickly and easily. The side signal is the difference between the two channels, and describes those elements that contribute to the stereo width.

Hearing the stereo difference is so simple using the CMC2: with the stereo signal playing, activate the **Phase Reverse** switch, and then sum the left and right channels using the **Mono** switch (in other words Left minus Right). It's that simple.

Being able to audition the 'side' signal is particularly useful for judging the quality and quantity of any ambience or reverberation in a stereo mix. It is also an invaluable facility if the stereo recording has timing differences between channels (such as caused by an azimuth error on a tape machine), or for aligning a pair of desk channels for use with X-Y stereo mic pairs. In both cases, listening for a deep cancellation null, as the two signals cancel each other out, is a very fast and accurate way of matching levels in each channel, which is the basis of accurate alignment.

**CMC2 GENERAL INFORMATION**

**IF A FAULT DEVELOPS**

For warranty service please call Drawmer Electronics Ltd. or their nearest authorised service facility, giving full details of the difficulty. A list of all main dealers can be found on the Drawmer webpages. On receipt of this information, service or shipping instructions will be forwarded to you.

No equipment should be returned under the warranty without prior consent from Drawmer or their authorised representative.

For service claims under the warranty agreement a service Returns Authorisation (RA) number will be issued. Write this RA number in large letters in a prominent position on the shipping box. Enclose your name, address, telephone number, copy of the original sales invoice and a detailed description of the problem.

Authorised returns should be prepaid and must be insured.

All Drawmer products are packaged in specially designed containers for protection. If the unit is to be returned, the original container must be used. If this container is not available, then the equipment should be packaged in substantial shock-proof material, capable of withstanding the handling for the transit.

**CONTACTING DRAWMER**

We will be pleased to answer all application questions to enhance your usage of Drawmer equipment.

Please address correspondence to:

**DRAWMER Electronics LTD**  
 Coleman Street  
 Parkgate  
 Rotherham  
 South Yorkshire  
 S62 6EL  
 United Kingdom

Telephone: **+44 (0) 1709 527574**  
 Fax: **+44 (0) 1709 526871**

Contact via E-mail: **tech@drawmer.com**

Further information on all Drawmer products, dealers, Authorised service departments and other contact information can be found on our website: **www.drawmer.com**

**SPECIFICATION**

Note: These specifications are provisional and may alter slightly upon product release.

**INPUT**

Maximum Input Level 21dBu

**OUTPUT**

Maximum Output Level before clipping 21dBu

**DYNAMIC RANGE**

@ unity gain 115dB

**CROSSTALK**

L/R @ 1kHz >80dB

**THD & NOISE**

unity gain 0dBu input 0,002%


**FREQUENCY RESPONSE**

20Hz-20kHz +/- 0.2dB

**PHASE RESPONSE**

20Hz-20kHz +/- 2degrees

**POWER REQUIREMENTS**

External Power Supply  
 Input: 100-240V ~ 50-60Hz, 0.48A MAX.  
 Output: 15V  1A  
 Voltage automatically selected by PSU



EMC Standards EN55022:2006+A1:2007 / EN6100-3-2 / EN6100-3-3

Use only the external PSU supplied by Drawmer or an accredited partner. Failure to do so could permanently damage the CMC2 and will also invalidate the warranty.

**CASE SIZE**

Depth 164mm  
 Width 183mm  
 Height 45mm

**WEIGHT**

1.1kg

## BLOCK DIAGRAM

