



# CM-CU21 Commentator Unit

## User Handbook



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- pro audio with a smile



# CM-CU21 COMMENTATOR UNIT



## CM-CU21 COMMENTATOR UNIT HANDBOOK

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<b>Warranty</b>	<b>i</b>
Warranty and Liability	i
Unpacking the Commentator Unit	iii
Returning the Warranty Card	iii
<b>Safety Information</b>	<b>iv</b>
Safety of Mains Operated Equipment	iv
Voltage Setting Checks	iv
Fuse Rating	iv
Power Cable and Connection	iv
Ordering the Correct Mains Lead	v
<b>Installation Information</b>	<b>v</b>
Atmosphere	v
Electromagnetic Radiation	v
WEEE & RoHS Directives - Sonifex Statement	vi
<b>1 CM-CU21 Commentator Unit</b>	<b>1</b>
Introduction	1
<b>2 Main Panel Controls &amp; Indicators</b>	<b>3</b>
On Air Buttons	3
Talkback Buttons	3
Headphone Monitor Controls	4
Commentator 3 Line Input Level Control	4
PPM Meter Display	4
Limit LED	5
Power LED	5
<b>3 Front Panel Controls &amp; Connections</b>	<b>6</b>
Phantom Power Select Switches	6
Microphone Input Gain Controls	6
Headphone Outputs	6
Microphone/Line Inputs	6
<b>4 Rear Panel Controls &amp; Connections</b>	<b>7</b>
On Air Lock Controls	7
Talkback Gang Switch	7
Limiter Controls	7
Test Tone Switch	7
Return Audio Inputs	8
Audio Outputs	8
DC Supply Input	8
GPIO Port	8
Mains Power	9
<b>5 Configuration Options</b>	<b>10</b>
Configuration option settings for page 1	10
Configuration option settings for page 2	11
Configuration option settings for page 3	12
Configuration option settings for page 4	12
Configuration option settings for page 5	13
Configuration option settings for page 6	13
Configuration options for page 7	14
<b>6 Technical Specification For CM-CU21 Commentator Unit</b>	<b>16</b>



## CONTENTS

# FIGURES



## FIGURES

Figures	
Fig A: Packing List	iii
Fig B: Power Connections	iv
Fig C: Mains Lead Table	v
Fig 1-1: CM-CU21 Commentator Unit	1
Fig 1-2: CM-CU21 Commentator Unit Block Diagram	2
Fig 2-1: Top Panel View Of CM-CU21	3
Fig 3-1: Front Panel View Of CM-CU21	6
Fig 3-2: Rear Panel View Of CM-CU21	7



## Warranty

### Warranty and Liability

**Important: the purchaser is advised to read this clause**

- (a) The Company agrees to repair or (at its discretion) replace Goods which are found to be defective (fair wear and tear excepted) and which are returned to the Company within 12 months of the date of despatch provided that each of the following are satisfied:
- (i) notification of any defect is given to the Company immediately upon its becoming apparent to the Purchaser;
  - (ii) the Goods have only been operated under normal operating conditions and have only been subject to normal use (and in particular the Goods must have been correctly connected and must not have been subject to high voltage or to ionising radiation and must not have been used contrary to the Company's technical recommendations);
  - (iii) the Goods are returned to the Company's premises at the Purchaser's expense;
  - (iv) any Goods or parts of Goods replaced shall become the property of the Company;
  - (v) no work whatsoever (other than normal and proper maintenance) has been carried out to the Goods or any part of the Goods without the Company's prior written consent;
  - (vi) the defect has not arisen from a design made, furnished or specified by the Purchaser;
  - (vii) the Goods have been assembled or incorporated into other goods only in accordance with any instructions issued by the Company;
  - (viii) the defect has not arisen from a design modified by the Purchaser;
  - (ix) the defect has not arisen from an item manufactured by a person other than the Company.

In respect of any item manufactured by a person other than the Company, the Purchaser shall only be entitled to the benefit of any warranty or guarantee provided by such manufacturer to the Company.

- (b) In respect of computer software supplied by the Company the Company does not warrant that the use of the software will be uninterrupted or error free.
- (c) The Company accepts liability:
- (i) for death or personal injury to the extent that it results from the negligence of the Company, its employees (whilst in the course of their employment) or its agents (in the course of the agency);



WARRANTY

## WARRANTY



## WARRANTY

- (ii) for any breach by the Company of any statutory undertaking as to title, quiet possession and freedom from encumbrance.
- (d) Subject to conditions (a) and (c) from the time of despatch of the Goods from the Company's premises the Purchaser shall be responsible for any defect in the Goods or loss, damage, nuisance or interference whatsoever consequential economic or otherwise or wastage of material resulting from or caused by or to the Goods. In particular the Company shall not be liable for any loss of profits or other economic losses. The Company accordingly excludes all liability for the same.
- (e) At the request and expense of the Purchaser the Company will test the Goods to ascertain performance levels and provide a report of the results of that test. The report will be accurate at the time of the test, to the best of the belief and knowledge of the Company, and the Company accepts no liability in respect of its accuracy beyond that set out in Condition (a).
- (f) Subject to Condition (e) no representation, condition, warranty or other term, express or implied (by statute or otherwise) is given by the Company that the Goods are of any particular quality or standard or will enable the Purchaser to attain any particular performance or result, or will be suitable for any particular purpose or use under specific conditions or will provide any particular capacity, notwithstanding that the requirement for such performance, result or capacity or that such particular purpose or conditions may have been known (or ought to have been known) to the Company, its employees or agents.
- (g)
  - (i) To the extent that the Company is held legally liable to the Purchaser for any single breach of contract, tort, representation or other act or default, the Company's liability for the same shall not exceed the Price of the Goods.
  - (ii) The restriction of liability in Condition (g)(i) shall not apply to any liability accepted by the Seller in Condition (c).
- (h) Where the Goods are sold under a consumer transaction (as defined by the Consumer Transactions (Restrictions on Statements) Order 1976) the statutory rights of the Purchaser are not affected by these Conditions of Sale.



Unpacking the Commentator Unit

The Commentator Unit is shipped with the following equipment. Please check your packaging to ensure that you have all of the items below. If anything is missing, please contact the supplier of your equipment immediately.

Item	Quantity Commentator Unit
Commentator Unit	1
IEC mains lead fitted with moulded mains plug	1
Handbook and warranty card	1

Fig A: Packing List

Each Commentator Unit is shipped in protective packaging and should be inspected for damage before use. Where an item is found to have transit damage, notify the carrier immediately with all the relevant details of the shipment. Packing materials should be kept for inspection and also for if the product needs to be returned.

Returning the Warranty Card

In order to register the date of purchase so that we can keep you informed of any design improvements or modifications, it is important to complete the warranty registration document that is enclosed and return it to Sonifex Ltd in the UK.

For your own records you should write down the serial number (which can be found on the rear of the Commentator Unit).

Serial Number	.....
---------------	-------



WARRANTY

# SAFETY INFORMATION

## Safety Information

### Safety of Mains Operated Equipment



This equipment has been designed to meet the safety regulations currently advised in the country of purchase and it conforms to the safety regulations specified by use of the CE Mark.

**Warning :** There are no user serviceable parts inside the equipment. If you should ever need to look inside the unit, always disconnect the mains supply before removing the equipment covers.

### Voltage Setting Checks

Ensure that the machine operating voltage is correct for your mains power supply by checking the box in which your Commentator Unit was supplied. The voltage is shown on the box label. Please note that all Commentator Units have a universal power supply.

### Fuse Rating

The Commentator Unit is supplied with a single fuse in the live conducting path of the mains power input. For reasons of safety it is important that the correct rating and type of fuse is used. Incorrectly rated fuses could present a possible fire hazard, under equipment fault conditions. The fuse rating for the Commentator Unit is:

Universal 85-264V operation - 1A 5x20mm SB

The active fuse is fitted on the outside rear panel of the unit.

### Power Cable and Connection

An IEC power connector is supplied with the Commentator Unit which has a moulded plug attached – this is a legal requirement. If no moulded plug has been supplied with your Commentator Unit, please contact your supplier, because an IEC connector is always supplied from the Sonifex factory.

If for any reason, you need to use the Commentator Unit with a different power cable, you should use the following wiring guidelines.

Wire Colour	Connection
Green, or green and yellow	Earth (E)
Blue, or black	Neutral (N)
Brown, or red	Live (L)

*Fig B: Power Connections*

Connect the equipment in accordance with the connection details and before applying power to the unit, check that the machine has the correct operating voltage for your mains power supply.

**Important Note :** The terminal marked on the rear panel must be earthed.



### Ordering the Correct Mains Lead

When ordering a Commentator Unit from Sonifex, it is helpful if you can specify your required operating voltage and mains lead. After the product code add:

UK, for 230V, UK 3 pin to IEC lead



EC, for 230V, European Schuko 2 pin to IEC lead



US, for 115V, 3 pin to IEC lead



AU for 230V, Australasian 3 pin to IEC lead



*Fig C: Mains Lead Table*

E.g. order CM-CU21 UK for a UK IEC lead to be supplied.

## Installation Information

### Atmosphere

The units should be installed in an area that is not subject to excessive temperature variation ( $<0^{\circ}\text{C}$ ,  $>50^{\circ}\text{C}$ ), moisture, dust or vibration.

### Electromagnetic Radiation

The cover is connected to earth by means of the fixing screws. It is essential to maintain this earth ground connection to ensure a safe operating environment and provide electromagnetic shielding.

# WEEE & ROHS DIRECTIVE



## WEEE & ROHS DIRECTIVE

### WEEE & RoHS Directives - Sonifex Statement



The Waste Electrical and Electronic Equipment (WEEE) Directive was agreed on 13 February 2003, along with the related Directive 2002/95/EC on Restrictions of the use of certain Hazardous Substances in electrical and electronic equipment (RoHS).

The **Waste Electrical and Electronic Equipment Directive (WEEE)** aims to minimise the impacts of electrical and electronic equipment on the environment during their life times and when they become waste. It applies to a huge spectrum of products. It encourages and sets criteria for the collection, treatment, recycling and recovery of waste electrical and electronic equipment. All products manufactured by Sonifex Ltd have the WEEE directive label placed on the case. It gives a contact for individuals who are unsure about the correct procedure when the product has reached its "end of use".

Sonifex Ltd will be happy to give you information about local organisations that can reprocess the products, or alternatively all products that have reached "end of use" can be returned to Sonifex and will be reprocessed correctly free of charge.

Sonifex Ltd has phased out the use of certain hazardous substances identified in the European Union's **Restriction of Hazardous Substances (RoHS)** directive. The RoHS directive limits the use of certain hazardous substances currently used in EEE manufacture, including lead, mercury, cadmium, hexavalent chromium, and halide-containing compounds PBB (polybrominated biphenyl) and PBDE (polybrominated diphenyl ether). Elimination of these substances will result in more environmentally friendly recycling of electronic equipment. For the products which Sonifex manufacture, the main area where products were affected was in the use of lead for manufacturing and assembling electronics circuit boards.

Sonifex Ltd practices lead-free (LF) manufacturing processes. LF solder is used on the surface-mount PCB manufacturing processes and for hand soldering. The printed circuit boards (PCBs) used are either gold plated, or immersion tin plated, both of which use no lead. Historically the PCBs were hot air solder levelled (HASL) PCBs which used tin/lead based solder.

The manufacturing processes include the assembly of purchased components from various sources. Product is offered as RoHS compliant, or LF, only after sufficient evidence is received from the component manufacturers that their components are RoHS compliant. Sonifex Ltd relies solely on the distributor, or manufacturer, of the components for identification of RoHS compliance. Thus whilst every effort is made to ensure compliance, Sonifex Ltd makes no warranty, or certification, or declaration of compliance concerning said components.

Sonifex Ltd defines "Lead Free" as pertaining to any product, which has been manufactured by Sonifex Ltd using components which have been declared by the manufacturers as "Lead Free". All statements by Sonifex Ltd of RoHS compliance are based on component manufacturer documentation.

## 1 CM-CU21 Commentator Unit

### Introduction



Fig 1-1: CM-CU21 Commentator Unit

The CM-CU21 Commentator Unit is a high quality, portable broadcast mixer and 4-wire talkback unit. Its sturdy construction and flexibility of features make it suitable for use in a wide variety of environments.

It provides two fully featured commentator positions and a third guest position that can alternatively be used as a line-level input, allowing program idents/effects to be mixed with the commentator inputs. Each position has an individual output, with two additional outputs providing a mix of all active commentary channels. A limit indicator on the main panel shows when the adjustable limiter on the mix outputs is active, and a bright 21 segment LED PPM meter, which can be disabled, shows the main output level.

Two talkback output channels, with a built in limiter, are available to each of the two main commentators, and they can be linked to provide simultaneous operation.

A wide input gain range and switchable phantom power on each commentary position provides supports for a variety of microphone types, from high output phantom units to low output ribbon microphones.

There are 4 transformer balanced return audio inputs which, along with the commentator inputs, are routed to the headphone monitor controls. With these headphone controls, any input can be level adjusted, and sent to either the left, right or both ears.

# 1 CM-CU21 COMMENTATOR UNIT

A GPIO port gives an open-collector driven output indication of any active on-air or talkback channels, and four remote inputs provide an external call/alert to each of the talkback controls.

The Commentator Unit has a built in line-up tone generator for easy channel identification and cabling checks, and a flexible range of options allow the unit to be customised to better suit the operational and users' personal requirements.

## INTRODUCTION

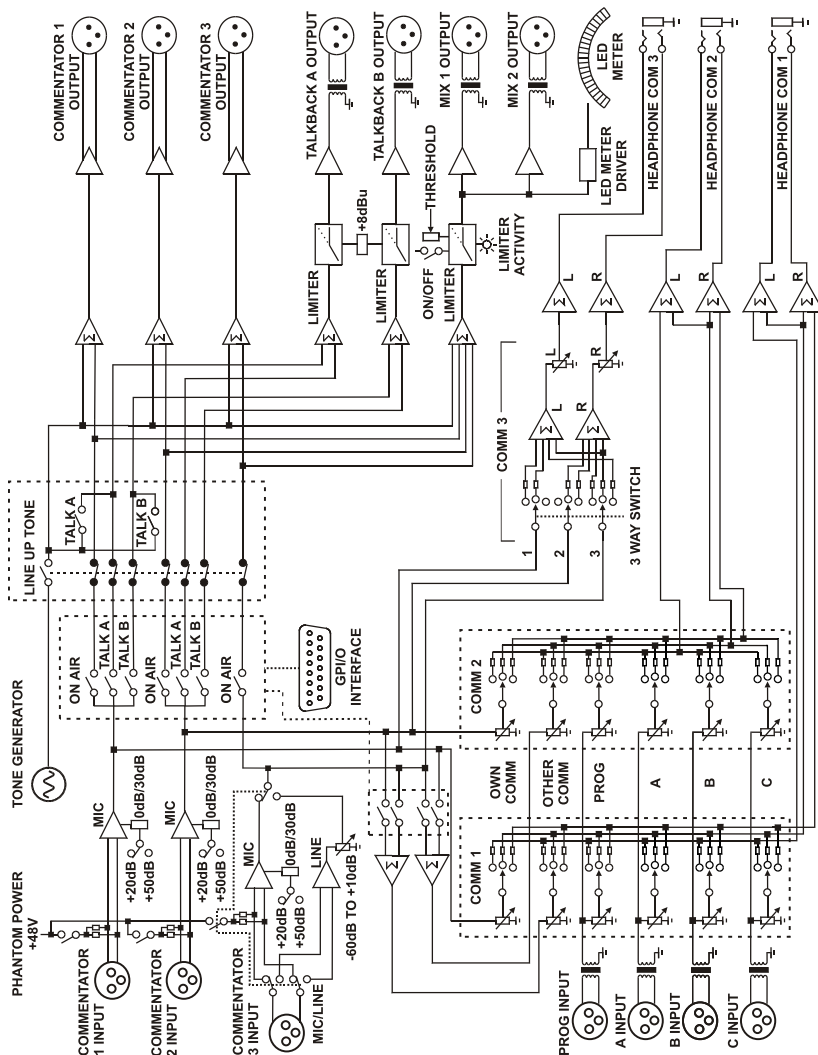


Fig 1-2: CM-CU21 Commentator Unit Block Diagram

## 2 Main Panel Controls & Indicators



Fig 2-1: Top Panel View Of CM-CU21

The main or top panel of the Commentator Unit is split into four areas. To the left and right are the main commentator position controls, with the third commentator/guest position controls located in the centre, below the power indicator, mix output limiter active indicator and the PPM meter display.

### On Air Buttons

The On Air buttons route the commentator microphone input signal to the corresponding Comm output and to both of the Mix Outputs, where it is mixed with all other active commentator signals. These buttons have a latching action; press to activate and press again to deactivate. When an On Air control is active, the button illuminates red and the corresponding open collector driver output on the GPIO port is activated.

### Talkback Buttons

The Talkback A and B buttons allow either of the two main commentators' microphone signals to be redirected to the corresponding Talkback output. The associated Comm output is muted and the commentators' signal is removed from the Mix Outputs. The four

## 2 CM-CU21 COMMENTATOR UNIT



### MAIN PANEL CONTROLS & INDICATORS

return audio inputs Prog, A, B and C function normally when a Talkback channel is active, allowing full-duplex communication between the commentator and a third party. These buttons have a momentary action by default; press to activate, release to deactivate. See section 5 Configuration Options on page 10 for details of how to change the button action. When a Talkback control is active, the button illuminates green and the corresponding open collector driver output on the GPIO port is activated.

#### Headphone Monitor Controls

The two main commentator positions have six sets of headphones controls which allow them to monitor all of units' return audio and active commentator inputs. Each available input has an associated level adjustment potentiometer and a headphone channel selector switch. Each potentiometer provides a level adjustment from "full off" to "full on", and the headphone channel selector determines which ear the associated signal is routed to; either the left, the right or to both ears when the switch is in the centre position. By default, the commentator input signals are only routed to the headphone monitor controls when the corresponding On Air control is active. It is possible to route each of these signals to the headphones permanently, regardless of the state of the corresponding On Air control. See section 5 Configuration Options on page 10 for details.

The guest position, commentator 3, can be set to accept a line level input, and an additional option can be configured to prevent this signal from being routed to the commentator 1 and 2 headphone monitors.

The headphone controls for the third commentator position consist of left and right level adjustment potentiometers, and a switch to select the routing for the commentator input signals. With the switch in the left position, commentator 1 is heard in the left ear and commentator 3 is heard in the right ear. With the switch in the right position, commentator 2 is heard in the right ear and commentator 3 is heard in the left ear. When the switch is in the centre position, commentator 1 is heard in the left ear, commentator 2 is heard in the right ear and commentator 3's own signal is heard in both ears.

#### Commentator 3 Line Input Level Control

When the third commentator input is set to accept a line input, this potentiometer sets the gain applied to the signal prior to being routed to the headphone monitor and main output channels. The gain range is -83dB to +10dB with a maximum input level of +25dBu.

#### PPM Meter Display

The 21 segment LED PPM meter display indicates the level of the signal on the mix outputs. The PPM scale conforms to IEC60268-10 11a and a dB scale is also shown. There are options to set the brightness level of the PPM meter, or it can be disabled if it is not required. See section 5 Configuration Options on page 10 for details.

**Limit LED**

The limit LED illuminates when the adjustable limiter on the mix outputs is enabled and active. See section 4 Rear Panel Controls on page 7 for details of how to enable and adjust the limiter. The colour and brightness level of the limit LED can be changed if required, see section 5 Configuration Options on page 10 for details.

**Power LED**

The power LED indicates that the unit has power from either of its mains or DC inputs when it illuminates red. If this indicator is not on when mains power is connected to the unit, this may indicate a ruptured mains fuse or a problem with the internal power supply module. The power LED also indicates when the unit is in setup mode by flashing amber/red.





# 3 CM-CU21 COMMENTATOR UNIT

## 3 Front Panel Controls & Connections



Fig 3-1: Front Panel View Of CM-CU21

The front panel of the Commentator Unit has all of the commentator inputs and headphone outputs as well as the microphone power and gain controls.

### Phantom Power Select Switches

Each of the three commentator inputs support phantom powered microphones. The two main commentator positions have dedicated phantom power switches that enable the 48V supply. The third commentator position has a three way switch that sets the input type. When the switch is in the bottom position, the input is a line level input. With the switch in the centre position, the input is for microphones not requiring phantom power. The top switch position enables the microphone input phantom power.

### Microphone Input Gain Controls

Each of the commentator microphone inputs has an individually adjustable gain setting. The total gain range of +20dB to +80dB is split into two, to provide greater accuracy of adjustment. The mic gain switch sets the base gain value of either +20dB or +50dB for the corresponding input. The associated mic gain potentiometer can then be adjusted to add up to 30dB of additional gain.

### Headphone Outputs

The front panel mounted headphone outputs are via 1/4" stereo jack sockets. The two main commentator positions have locking sockets to prevent the headphone plug from being accidentally pulled out.

### Microphone/Line Inputs

The microphone inputs for the two main commentators and the microphone/line level input for the third position are via 3 pin female XLR-3 connectors with the following connections:

- Pin 1: Ground
- Pin 2: Phase
- Pin 3: Non-phase



## 4 Rear Panel Controls & Connections



Fig 3-2: Rear Panel View Of CM-CU21

The rear panel of the Commentator Unit carries the four return audio inputs and all comm., talkback and mix output connectors. Four additional controls are located on the rear panel; On Air Lock, Talkback Gang, Limiter and Test Tone.

### On Air Lock Controls

The on air lock prevents any of the commentators on air buttons from being deactivated accidentally. When the on air lock is enabled, an on air channel can only be deactivated by first pressing the pushbutton located next to the on air lock switch. A slot in the rear panel makes locating the on air lock pushbutton easy; simply position your finger in the slot in the rear panel, indicated by the "ON AIR LOCK" text on the top panel, then slide your finger down the slot until you reach the pushbutton.

### Talkback Gang Switch

The talkback gang switch links the operation of each of the main commentators' talkback A and B buttons. When this switch is on, pressing one of the talkback buttons will automatically activate the commentators' other talkback button.

### Limiter Controls

The limiter enable switch and level potentiometer control the limiter that is applied to the main mix outputs. The potentiometer sets the threshold level at which the limiter becomes active, and has a range of between -13dB to the maximum output level of +25dB.

### Test Tone Switch

The Commentator Unit has a built in Test Tone generator which selectively routes a line-up tone to all outputs to assist channel identification and cabling checks. There are two test tone modes; manual and auto. Regardless of mode, a 1 kHz tone is permanently routed to the mix outputs and the PPM meter will indicate that the signal level is 0dBu. The test tone is enabled by sliding the switch to the upper "ON" position. To change the test tone mode; keep the Commentator 1 and Commentator 2 On Air buttons pressed for 2.5 seconds.

With the test tone in manual mode, all On Air and Talkback buttons will flash amber. The test tone can be routed to the Comm and Talkback outputs by pressing the corresponding

# 4 CM-CU21 COMMENTATOR UNIT



## REAR PANEL CONTROLS & CONNECTIONS

On Air or Talkback buttons. The On Air buttons will illuminate red when pressed and the Talkback buttons will illuminate green. When the button is released, the tone on that output will be muted.

With the test tone in auto mode, each of the Comm and Talkback outputs are automatically identified by a unique number of short tone bursts, lasting 0.25 seconds each, which are repeated every 3 seconds. Each button flashes when tone is being routed to the corresponding output. The number of pulses on each output is shown below:

Comm 1	1 pulse
Comm 2	2 pulses
Comm 3	3 pulses
Talkback A	4 pulses
Talkback B	5 pulses

The 4 return audio inputs function normally when the test tone is enabled. This could be useful in allowing the user to receive instructions on which channel to output tone to when using the test tone in manual mode. When the test tone is disabled, normal operating mode is resumed and the On Air and Talkback buttons will be returned to the state they were in prior to entering test tone mode.

### Return Audio Inputs

The four transformer balanced return audio inputs, Prog, A, B and C are via 3 pin female XLR-3 connectors with the following connections:

- Pin 1: Ground
- Pin 2: Phase
- Pin 3: Non-phase

### Audio Outputs

The three electronically balanced commentator outputs Comm1-3, and the transformer balanced talkback A and B and mix outputs are all via 3 pin male XLR-3 connectors with the following connections:

- Pin 1: Ground
- Pin 2: Phase
- Pin 3: Non-phase

### DC Supply Input

The commentator unit can be powered from an external, regulated 12V or 24V DC power source. The DC input is via a 4 pin male XLR-4 connector with the following connections:

- Pin 1: 0V
- Pin 2: +12VDC input
- Pin 3: +24VDC input
- Pin 4: no connection

When powering the Commentator Unit via the DC supply input, it is important to ensure the unit is suitably earthed. An earth connection point is provided on the rear panel in the form of a M4 stud and screw and this should be connected directly to a technical earth.

## GPIO Port

The Commentator Units' GPIO port has 7 open-collector driven outputs and 4 active low inputs. The 7 open-collector outputs, which are low (conducting) when active, indicate which of the On Air or Talkback channels are active.

Each of the 4 active low inputs drives a call/alert signal on the corresponding Talkback button. When an input is active, the associated Talkback button will flash amber.

The GPIO port connector is a 15-way female D-type with the following pin assignments:

Pin Number	I/O	Function
1	O	Commentator 1 ON AIR active – open collector output
2	O	Commentator 1 TALKBACK A active – open collector output
3	O	Commentator 1 TALKBACK B active – open collector output
4	O	Commentator 2 ON AIR active – open collector output
5	O	Commentator 2 TALKBACK A active – open collector output
6	O	Commentator 2 TALKBACK B active – open collector output
7	O	Commentator 3 ON AIR active – open collector output
8	-	no connection
9	-	Digital ground (0V)
10	I	Commentator 1 TALKBACK A call/alert – active low input
11	I	Commentator 1 TALKBACK B call/alert – active low input
12	-	Digital ground (0V)
13	I	Commentator 2 TALKBACK A call/alert – active low input
14	I	Commentator 2 TALKBACK B call/alert – active low input
15	-	Digital ground (0V)

## Mains Power

Mains power is applied via a standard three-pin IEC male socket. Mains voltages between 85V and 264V AC at frequencies between 47 and 63Hz are accepted without adjustment. A 1A, 5 x 20mm SB fuse is used. The Earth pin **MUST** be connected to ensure safety.



# 5 CM-CU21 COMMENTATOR UNIT



## CONFIGURATION OPTIONS

### 5 Configuration Options

The Commentator Unit has several user configurable options that can be changed to suit specific operational or personal requirements. These options can only be changed by entering a setup mode, which is accessible when the unit is powered-up.

**To enter setup mode:** apply power to the unit whilst keeping the Commentator 1 and Commentator 2 On Air buttons pressed for 5 seconds. The power indicator LED will flash red and amber to indicate setup mode has been entered. The Commentator 1 and Commentator 2 On Air buttons can now be released.

The configuration options are arranged in 7 pages, with up to 7 options in each page. The current page number is indicated on the PPM display by a single illuminated segment. Please note, when page 6 is selected, all the segments in the PPM display are enabled to indicate the current PPM illumination level setting. Each option within the selected page is associated with one of the 7 main control buttons on the top panel of the unit. Each button flashes in a recurring sequence to indicate the current mode setting of the associated option. One flash equals mode 1, two flashes equals mode 2 etc. Buttons that do not have an associated option in the current page do not flash.

**To change the current page:** press and hold the Commentator 3 On Air button for at least 1 second. The PPM display will change to indicate the new page.

**To change the option mode setting:** press the appropriate button once. The number of flashes will increase to indicate the new mode setting. Once the maximum option mode setting has been reached, the value will wrap around to mode 1.

The configuration option settings for each page are listed below. The factory default settings for each option are shown in brackets:

#### Configuration option settings for page 1

Commentator 1 ON AIR button:

- Mode 1 Commentator 1 ON AIR is permanently disabled and cannot be selected.
- Mode 2 Commentator 1 ON AIR can be selected as normal (default).
- Mode 3 Commentator 1 ON AIR is permanently selected and cannot be disabled.

Commentator 1 TALKBACK A button:

- Mode 1 Commentator 1 TALKBACK A button momentary mode enabled (default).
- Mode 2 Commentator 1 TALKBACK A button latching mode enabled.
- Mode 3 Commentator 1 TALKBACK A button momentary and latching modes enabled.

Commentator 1 TALKBACK B button:

- Mode 1 Commentator 1 TALKBACK B button momentary mode enabled (default).
- Mode 2 Commentator 1 TALKBACK B button latching mode enabled.
- Mode 3 Commentator 1 TALKBACK B button momentary and latching modes enabled.

Commentator 2 ON AIR button:

- Mode 1 Commentator 2 ON AIR is permanently disabled and cannot be selected.
- Mode 2 Commentator 2 ON AIR can be selected as normal (default).
- Mode 3 Commentator 2 ON AIR is permanently selected and cannot be disabled.

Commentator 2 TALKBACK A button:

- Mode 1 Commentator 2 TALKBACK A button momentary mode enabled (default).
- Mode 2 Commentator 2 TALKBACK A button latching mode enabled.
- Mode 3 Commentator 2 TALKBACK A button momentary and latching modes enabled.

Commentator 2 TALKBACK B button:

- Mode 1 Commentator 2 TALKBACK B button momentary mode enabled (default).
- Mode 2 Commentator 2 TALKBACK B button latching mode enabled.
- Mode 3 Commentator 2 TALKBACK B button momentary and latching modes enabled.

Commentator 3 ON AIR button:

- Mode 1 Commentator 3 ON AIR is permanently disabled and cannot be selected.
- Mode 2 Commentator 3 ON AIR can be selected as normal (default).
- Mode 3 Commentator 3 ON AIR is permanently selected and cannot be disabled.

Please note: Momentary mode button operation – press to activate, release to deactivate.  
Latching mode button operation – press once to activate, press again to deactivate.

## Configuration option settings for page 2

Commentator 1 ON AIR button:

- Mode 1 Commentator 3 line mode input is routed to Commentator 1 headphones (default).
- Mode 2 Commentator 3 line mode input is not routed to Commentator 1 headphones.

Commentator 1 TALKBACK A button:

No associated option on this page.

Commentator 1 TALKBACK B button:

No associated option on this page.

Commentator 2 ON AIR button:

- Mode 1 Commentator 3 line mode input is routed to Commentator 2 headphones (default).
- Mode 2 Commentator 3 line mode input is not routed to Commentator 2 headphones.

Commentator 2 TALKBACK A button:

No associated option on this page.

Commentator 2 TALKBACK B button:

No associated option on this page.

Commentator 3 ON AIR button:

No associated option on this page.

# 5 CM-CU21 COMMENTATOR UNIT



## CONFIGURATION OPTIONS

### Configuration option settings for page 3

Commentator 1 ON AIR button:

Mode 1 Commentator 1 input permanently routed to Commentator 1 headphones.

Mode 2 Commentator 1 input routed to Commentator 1 headphones only when Commentator 1 ON AIR is active (default).

Commentator 1 TALKBACK A button:

Mode 1 Commentator 2 input permanently routed to Commentator 1 headphones.

Mode 2 Commentator 2 input routed to Commentator 1 headphones only when Commentator 2 ON AIR is active (default).

Commentator 1 TALKBACK B button:

Mode 1 Commentator 3 input permanently routed to Commentator 1 headphones.

Mode 2 Commentator 3 input routed to Commentator 1 headphones only when Commentator 3 ON AIR is active (default).

Commentator 2 ON AIR button:

Mode 1 Commentator 2 input permanently routed to Commentator 2 headphones.

Mode 2 Commentator 2 input routed to Commentator 2 headphones only when Commentator 2 ON AIR is active (default).

Commentator 2 TALKBACK A button:

Mode 1 Commentator 1 input permanently routed to Commentator 2 headphones.

Mode 2 Commentator 1 input routed to Commentator 2 headphones only when Commentator 1 ON AIR is active (default).

Commentator 2 TALKBACK B button:

Mode 1 Commentator 3 input permanently routed to Commentator 2 headphones.

Mode 2 Commentator 3 input routed to Commentator 2 headphones only when Commentator 3 ON AIR is active (default).

Commentator 3 ON AIR button:

No associated option on this page.

### Configuration option settings for page 4

Commentator 1 ON AIR button:

No associated option on this page.

Commentator 1 TALKBACK A button:

No associated option on this page.

Commentator 1 TALKBACK B button:

No associated option on this page.

Commentator 2 ON AIR button:

No associated option on this page.

Commentator 2 TALKBACK A button:

No associated option on this page.

Commentator 2 TALKBACK B button:

No associated option on this page.

Commentator 3 ON AIR button:

No associated option on this page.

## Configuration option settings for page 5

Commentator 1 ON AIR button:

Mode 1 Limit indicator illuminates blue when active (default).

Mode 2 Limit indicator illuminates green when active.

Mode 3 Limit indicator illuminates red when active.

Mode 4 Limit indicator illuminates white when active. This setting can be used when a brighter limit indication is required.

Commentator 1 TALKBACK A button:

No associated option on this page.

Commentator 1 TALKBACK B button:

No associated option on this page.

Commentator 2 ON AIR button:

Mode 1 Power and limit indicator brightness level 1 (minimum brightness).

Mode 2 Power and limit indicator brightness level 2.

Mode 3 Power and limit indicator brightness level 3 (default).

Mode 4 Power and limit indicator brightness level 4.

Mode 5 Power and limit indicator brightness level 5.

Mode 6 Power and limit indicator brightness level 6.

Mode 7 Power and limit indicator brightness level 7.

Mode 8 Power and limit indicator brightness level 8 (maximum brightness).

Commentator 2 TALKBACK A button:

No associated option on this page.

Commentator 2 TALKBACK B button:

No associated option on this page.

Commentator 3 ON AIR button:

No associated option on this page.



### Configuration option settings for page 6

Commentator 1 ON AIR button:

- Mode 1 ON AIR and TALKBACK button brightness level 1 (minimum brightness).
- Mode 2 ON AIR and TALKBACK button brightness level 2.
- Mode 3 ON AIR and TALKBACK button brightness level 3.
- Mode 4 ON AIR and TALKBACK button brightness level 4.
- Mode 5 ON AIR and TALKBACK button brightness level 5.
- Mode 6 ON AIR and TALKBACK button brightness level 6.
- Mode 7 ON AIR and TALKBACK button brightness level 7 (maximum brightness) (default).

Commentator 1 TALKBACK A button:

No associated option on this page. This button illuminates green to indicate button brightness level.

Commentator 1 TALKBACK B button:

No associated option on this page. This button illuminates amber to indicate button brightness level.

Commentator 2 ON AIR button:

- Mode 1 PPM display brightness level 1 (minimum brightness).
- Mode 2 PPM display brightness level 2.
- Mode 3 PPM display brightness level 3.
- Mode 4 PPM display brightness level 4.
- Mode 5 PPM display brightness level 5 (default).
- Mode 6 PPM display brightness level 6.
- Mode 7 PPM display brightness level 7 (maximum brightness).
- Mode 8 PPM display disabled.

Commentator 2 TALKBACK A button:

No associated option on this page. This button illuminates amber to indicate button brightness level.

Commentator 2 TALKBACK B button:

No associated option on this page. This button illuminates green to indicate button brightness level.

Commentator 3 ON AIR button:

No associated option on this page. This button illuminates red to indicate button brightness level.

### Configuration options for page 7

The last page allows you to save the current option settings to either of two available backup sets that are unaffected by subsequent changes to the option settings. The backup sets can then be reloaded when required. The load/save functions will only work whilst in page 7. Page 7 also shows the current firmware version by flashing the Limit LED in a recurring sequence i.e. 1 flash for version 1, 2 flashes for version 2 etc.



**To save the current option settings to backup set 1:** press and hold the Commentator 1 On Air and Talkback B buttons for 2 seconds. These buttons will then illuminate red to verify that the options have been saved to backup set 1.

**To save the current option settings to backup set 2:** press and hold the Commentator 2 On Air and Talkback B buttons for 2 seconds. These buttons will then illuminate red to verify that the options have been saved to backup set 2.

**To load backup set 1 and overwrite the current option settings:** press and hold the Commentator 1 On Air and Talkback A buttons for 2 seconds. These buttons will then illuminate red to verify that backup set 1 has been loaded.

**To load backup set 2 and overwrite the current option settings:** press and hold the Commentator 2 On Air and Talkback A buttons for 2 seconds. These buttons will then illuminate red to verify that backup set 2 has been loaded.

**To exit setup mode:** press and hold the Commentator 1 and Commentator 2 On Air buttons for 3 seconds. When the power indicator stops flashing, the On Air buttons can be released and the unit will enter normal operating mode.

In addition to being able to load and save options, it is also possible to return the setup options to their factory default settings. Please note: all changes made to the options settings will be lost. Loading of the factory defaults does not affect the options stored in the backup sets.

**To return the current option settings to factory defaults:** apply power to the unit whilst keeping Commentator 1 Talkback B and Commentator 2 Talkback A buttons pressed for 5 seconds. These buttons will then illuminate red to verify that the default options have been loaded. After the default options have been restored, the unit will return to normal operating mode.





## 6 Technical Specification For CM-CU21 Commentator Unit

### Microphone Input

Gain Range: +20dB to +80dB.

Maximum Input Level: -6dBu.

Equivalent Input Noise: 130dB Ref. 80dB gain with 150 $\Omega$  termination.

Equivalent Input Noise: 128dB Ref. 50dB gain with 150 $\Omega$  termination.

C.M.R.R.: >60dB.

Frequency Response:  $\pm 0.5$ dB 20Hz to 22kHz Ref 50dB gain @ 1kHz.

### Electronically Balanced Line Input

Gain Range: -83dB to +10dB.

Maximum Input Level: +25dBu.

C.M.R.R.: >70dB.

Frequency Response:  $\pm 0.2$ dB 20Hz to 22kHz Ref 0dB @ 1kHz.

### Transformer Balanced Monitor Inputs

Gain Range: -70dB to +7dB measured @ Headphone output.

Maximum Input Level: +25dBu.

C.M.R.R.: >60dB.

Frequency Response:  $\pm 0.5$ dB 20Hz to 22kHz Ref 0dB @ 1kHz.

### Transformer Balanced Main Outputs

Maximum Output Level  
(limiter off): +24dBu.

Frequency Response:  $\pm 0.5$ dB 20Hz to 22kHz Ref 0dB @ 1kHz.

Noise: -94dB Average weighting Ref +8dB Line input.

THD & N: <0.02% Ref. 1kHz @ +8dBu.

THD & N: <0.065% Ref. 1kHz @ +18dBu.

1% Distortion Point: +18dBu @ 24Hz.

## Transformer Balanced Talkback Outputs

Maximum Output Level Limited:	+8dBu.
Frequency Response:	$\pm 0.5\text{dB}$ 20Hz to 22kHz Ref 0dB @ 1kHz.
Noise:	-94dB Average weighting Ref +8dB Line input.
THD & N:	<0.02% Ref. 1kHz @ +8dBu.

## Electronically Balanced Comm Outputs

Maximum Output Level Limited:	+25dBu.
Frequency Response:	$\pm 0.2\text{dB}$ 20Hz to 22kHz Ref 0dB @ 1kHz.
Noise:	-98dB Average weighting Ref +8dB Line input.
THD & N:	<0.002% Ref. 1kHz @ +8dBu.

## Headphone Outputs

Gain Range:	-70dB to +7dB.
Maximum Output Level:	+19dBu.
Frequency Response:	$\pm 0.5\text{dB}$ 20Hz to 22kHz Ref 0dB @ 1kHz.
Noise:	-85dB Average weighting Ref +8dB Line input.
THD & N:	<0.005% Ref. 1kHz @ +8dBu.

## Connections

Headphone Outputs: 3 x ¼" (6.35mm) A/B gauge 3-pole stereo jack socket  
- locking for positions 1 and 2.

Microphone/Line Inputs: 3 x XLR-3 pin female latching (electronic balanced).

Return Audio Inputs  
(Prog, A, B & C): 4 x XLR-3 pin female latching (transformer balanced).

Commentator Outputs  
(Comm 1-3): 3 x XLR-3 pin male (electronic balanced).

Talkback A & B Outputs: 2 x XLR-3 pin male (transformer balanced).

# 6 CM-CU21 COMMENTATOR UNIT



## TECHNICAL SPECIFICATION

Mix 1 & 2 Outputs:	2 x XLR-3 pin male (transformer balanced).
GPIO Port:	15-way 'D'-type socket.
Mains Input:	Universal filtered IEC, continuously rated 85-264VAC, 47-63Hz, 10W.
Fuse Rating:	Anti-surge fuse 1A 20 x 5mm.
DC Input:	XLR-4 pin male. 12V DC, 650mA Typical, 850mA Maximum. 24V DC, 325mA Typical, 425mA Maximum.
Earth Point:	M4 stud.

### Dimensions

Dimensions:	270mm (W) x 230mm (D) x 70mm (H - front) x 95mm (H - rear) 10.6" (W) x 9" (D) x 2.8" (H - front) x 3.74" (H - rear)	
Weight:	Nett: 3.4kg    Gross: 4.2kg	Nett: 7.5lbs    Gross: 9.24lbs



NOTES

## NOTES



## NOTES



NOTES

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