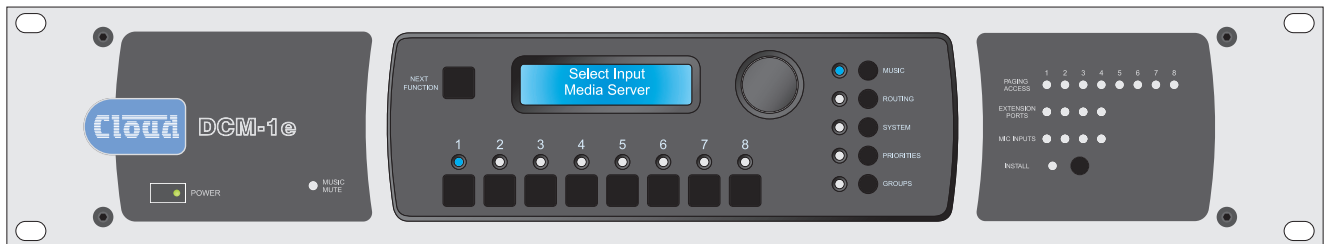




# DCMI & DCM1e Digitally Controlled Zone Mixers



## Installation and User Guide

# Contents

<b>Safety Information .....</b>	<b>4</b>
Safety Notes regarding Installation .....	4
Conformities .....	4
Safety Considerations and Information .....	4
Mains Fuse .....	4
Caution – Servicing .....	4
<b>Welcome .....</b>	<b>5</b>
Scope of this manual: .....	5
<b>Section 1: Overview .....</b>	<b>6</b>
Introduction .....	6
List of Main Features .....	6
System Components .....	7
DCMI/DCMIe .....	7
Optional components .....	7
CDR-I Series .....	7
LE-I Series .....	7
BE-I Series .....	8
ME-I Series .....	8
PM Series Paging Microphones .....	8
Cloud DCMI Utility Tool .....	8
System Capabilities .....	9
Music sources and routing .....	9
Microphone inputs .....	9
Paging mic facilities .....	9
Zone Outputs .....	9
Zone Groups .....	9
Priority and Logic .....	9
Remote Control .....	9
Misc .....	10
Applications and Examples .....	11
<b>Section 2: Installation .....</b>	<b>14</b>
Description of front panel .....	14
Description of rear panel .....	15
Hardware considerations .....	17
Power Supply .....	17
System Connections .....	17
Music Sources .....	17
Zone Outputs .....	18
CDR-I Remote Control Plates .....	19
Mic and Line Input Modules .....	22
Connecting Paging systems .....	23
Cloud PM Paging Microphones .....	23
Third-party paging systems .....	25
Music Mute .....	26
<b>Section 3: Configuration .....</b>	<b>27</b>
User Mode .....	28
Music menu .....	28

Groups menu.....	29
Installer Mode.....	30
Music Menu.....	30
Routing Menu.....	32
System Menu.....	35
Priorities Menu.....	40
Groups Menu.....	46
Other DCMI adjustments.....	46
Paging mic gain.....	46
PM Series paging microphone gain.....	46
Paging mic EQ.....	47
Zone Paging Levels.....	47
Setting up levels for best performance.....	47
Display Contrast adjustment.....	47
CDR-I Series Remote Control Plates.....	47
User Operation.....	47
Engineer Mode.....	48
Installer Mode.....	48
Combining Engineer and Installer Modes.....	50
<b>Section 4: Software control.....</b>	<b>51</b>
Controlling the DCMIe from the browser interface.....	51
Configuring the network.....	51
Initial Login – User Mode.....	52
Login – Installer Mode.....	53
Configuring the DCMI with the DCMI Utility Tool.....	58
Installing the Utility Tool.....	58
Connecting to the DCMI.....	58
Using the Utility Tool.....	59
<b>Section 5: Appendix.....</b>	<b>62</b>
Larger systems – cascading DCMIs.....	62
PCB jumper locations and settings.....	65
Serial Control.....	66
Abridged command set.....	66
Examples:.....	67
Configuring the Paging Access Connector as a GPIO port.....	67
PSU capability.....	69
RJ45 pinout.....	69
Fitting loudspeaker EQ cards.....	70
Firmware updates.....	70
Factory default settings – menu options.....	71
Factory default settings – network settings.....	71
Cloud DCMI Configuration Notes – to be left with User.....	72
To Change the Music Source in a Zone.....	72
To alter the Music Volume in a Zone.....	72
To Enable/Disable a Group of Zones.....	72
Cloud DCMI Installer configuration notes.....	73
EMC considerations.....	75
Specifications.....	75

## Safety Information

### Safety Notes regarding Installation

- Do not expose the unit to water or moisture.
- Do not expose the unit to naked flames.
- Do not block or restrict any air vent.
- Do not operate the unit in ambient temperatures above 35°C.
- Do not perform any internal adjustments unless you are qualified to do so and fully understand the hazards associated with mains-operated equipment.
- The unit has no user-serviceable parts. Refer servicing to qualified service personnel.
- If the moulded plug is cut off the mains lead for any reason, the discarded plug is a potential hazard and should be disposed of in a responsible manner.

### Conformities

This product conforms to the following European EMC Standards:

**BS EN 55103-1:2009**

**BS EN 55103-2:2009**



This product has been tested for use in commercial and light industrial environments. If the unit is used in controlled EMC environments, the urban outdoors, heavy industrial environments or close to railways, transmitters, overhead power lines, etc., the performance of the unit may be degraded.

The product conforms to the following European electrical safety standard:

**BS EN 60065:2002 (+A2:2010)**

## Safety Considerations and Information

The DCMI and DCMIe are powered by separate Power Supply Units (PSUs), which must be earthed. Ensure that the mains power supply provides an effective earth connection using a three-wire termination.

### Mains Fuse

The PSU is a sealed unit and contains no user-replaceable fuses. Mains over-current protection is provided by the fuse in the 13 A plug, which should be rated at 5 A.

### Caution – Servicing

The unit contains no user-serviceable parts. Refer servicing to qualified personnel. Do not perform servicing unless you are qualified to do so. Disconnect the power supply from the unit before removing the top panel and do not make any internal adjustments with the unit switched on. Only reassemble the unit using bolts/screws identical to the original parts.

## Welcome

Thank you for purchasing this Cloud DCMI/DCMIe, which combines the traditional simplicity of Cloud products with far greater functionality. We are confident that you will be pleased with its performance, features, flexibility and reliability.

The DCMI is Cloud's digitally controlled zone mixer. It combines traditional "installer-friendly" analogue I/O and signal path, with the flexibility and adaptability of digital control. The Ethernet-enabled DCMIe version allows the control and configuration of the unit to be performed remotely, using a standard Internet browser.


### Scope of this manual:

This manual provides a comprehensive guide to the features and functionality of the Cloud DCMI and DCMIe Digitally Controlled Zone Mixers. Please read through it to become fully acquainted with the many configuration and control functions it offers.

#### DCMI and DCMIe variants:

This Installation and User Guide covers two DCMI variants – the DCMI and the DCMIe.

Note that the DCMIe has various additional features not available in the DCMI; however, all DCMI functionality is provided by the DCMIe.

Certain sections of the Guide cover topics that are only relevant to the DCMIe; these are clearly indicated by this  logo. Otherwise, throughout the Guide, all text references to "DCMI", and all information and instructions may be taken as being applicable to either version, unless specifically stated otherwise.

It is recognised that the tasks of design/set-up, physical installation and day-to-day operation of an audio system based on the DCMI may be performed by as many as three different people. You will find, therefore, that this manual is divided into sections:

- **Overview – introduction to the DCMI and its options.** Everyone should read this.
- **Installation – wiring the DCMI in a practical situation.** This should be read by the engineer performing the installation and wiring.
- **Configuration – setting the system up.** This should be read by the systems designer/engineer who will configure the system to suit the user's particular requirements.
- **Software control.** Read this section if you want to use the Utility Tool to configure the DCMI, or use the Ethernet browser interface of the DCMIe to control the unit from an external computer, tablet or other device.
- **Appendix – additional technical information.** Includes notes about controlling the DCMI remotely via RS-232, and using multiple DCMIs to create larger systems.
- **User Templates – User's operating instructions.** A set of blank templates which can be completed and left with the user when the installation is finished, "personalising" the DCMI's menu system to the particular installation.

The manual includes details of the optional CDR-I remote control plates and the various optional remote input modules. This information is also supplied with each item when they are purchased separately.

Thank you again for placing your confidence in Cloud products.

## What's in the box

Unpack the DCMI and its accessories with care. It is always a good idea to store all packaging (if practical), in case you ever need to return the unit to your Cloud dealer for any reason.

As well as this manual, the shipping carton should contain the items listed below. Please contact your Cloud dealer immediately if any of them are missing or damaged.

- Cloud DCMI Digitally Controlled Zone Mixer
- Universal DC Power Supply Unit (100-240V), with DC cable
- IEC mains lead (AC cord)
- Set of mating plugs for all rear panel multi-pin screw terminal connectors

## Section I: Overview

### Introduction

The Cloud DCM1 is an analogue audio Multi-Zone Mixer. A digital control system, using a front-panel LCD display and a simple, minimal set of controls replace the relatively large number of switch and rotary controls found on conventional units, yet provide far greater flexibility of configuration than would be possible with such units. It provides a wide range of input and output connectivity possibilities to suit most practical situations. It also offers simple and flexible remote control in addition to front-panel operation.

The DCM1 has been designed to provide a simple, reliable and elegant method of providing audio in a number of different zones, typically the various areas of shops, bars, hotels, schools, conference centres, offices, factories and even private residences. Local (per-zone) remote control of music source and level can be simply provided in as many of the zones as necessary. The DCM1 has been designed to allow easy integration with mic and line external inputs, paging microphones and fire alarm systems. Once set up, the DCM1 allows zones to be combined (and separated) simply, as space utilisation of the building demands.

An important aspect of the DCM1's design is that it is completely self-contained, and can if wished, be completely configured and controlled without a computer interface of any kind. If a computer interface is preferred, the DCM1 Utility Tool software application may be downloaded free of charge from [www.cloud.co.uk](http://www.cloud.co.uk). The DCM1e variant includes the additional capability of being configured and controlled from an Internet browser running on any compatible device via an Ethernet connection.

The DCM1 allows connection of up to eight line-level sources such as CD players, audio jukeboxes, PC sound cards, radio or TV tuners, etc. In addition, both Cloud paging microphones (PM or CDPM Series) and third-party paging systems may be directly connected. Each of the eight outputs is intended to supply audio to a separate zone. Two of the zone outputs are available in stereo. Any one source can be routed to any zone, and the music level in each zone can be adjusted independently.

The capabilities of the DCM1 and DCM1e are explained in greater detail in System Capabilities on page 9.

### List of Main Features

- 8 stereo line inputs (1 balanced)
- 8 balanced line outputs (2 stereo + 6 mono)
- 4 dedicated ports for optional remote line input modules
- 4 dedicated ports for optional remote mic input modules
- Mic paging to all zones with fully programmable override logic
- Separate analogue paging mic input with zone selection by contact closure
- Paging access port may be reconfigured as 8-way GPIO port
- Separate RJ45 interface for PM or CDPM Series digital paging microphones
- Supports multiple CDR-1 Remote Control Plates (optional) in any wiring configuration
- CDR-1 provides local control of source, level, EQ and group enable
- 2 x 16 character LCD dot-matrix display (both DCM1 and CDR-1)
- 4 definable zone groups
- Any line input may have priority in any zone; operation also configurable per-zone
- Key-protected "Installer" mode (both DCM1 and CDR-1) prevents user access to configuration menus
- Inputs, zones and groups can be named
- Ethernet port for remote control from standard Internet browser (*DCM1e only*) **DCM1e**
- RS-232 interface for control by third-party control systems
- Transmission of RS-232 serial data for control of external equipment (*DCM1e only*) **DCM1e**
- Front-panel LEDs confirm remote access
- Accepts per-channel loudspeaker EQ cards
- PC-free control/configuration if preferred
- Multiple DCM1s may be cascaded for larger systems
- External Music Mute input for interfacing with emergency systems
- Any input (mic or line) may be assigned as Emergency Input, overriding Music Mute
- 2U 19" rack-mounting unit

## System Components

### DCMI/DCMIe

The DCMI (or DCMIe) is the system “core” and all the primary audio input sources, zone amplifier inputs, paging mics/control and all remote controls are connected directly to it. The DCMI mainframe should ideally be rack-mounted along with the audio sources and zone amplifiers, in a central equipment area.

A practical multi-zone audio system is perfectly realisable with a DCMI alone, but system flexibility and ease of operation will be greatly enhanced by the addition of optional Cloud remote controls and/or local input modules.

Installing a DCMIe will add the considerable advantage of external control from a laptop, tablet or other compatible device using a standard browser application.

## Optional components

### CDR-I Series



The CDR-I Series is a range of remote control plates specifically designed for use with the DCMI. They are available in formats suitable for surface mounting (CDR-I) or flush mounting (CDR-IF), and also in various finishes. They may be fitted into standard electrical back boxes in whatever location is convenient in each zone. Any zone may have one CDR-I, more than one, or none at all. The DCMI can support up to 100 CDR-I's. CDR-I's are interconnected with just one standard Cat 5 UTP cable; units may be daisy-chained at will and/or connected individually back to the DCMI's four CDR ports using almost any wiring topology convenient for the installation.

The DCMI's own PSU has the capacity to power up to 8 CDR-I's directly, via the Cat 5 connections. However, please note that the actual number that can be powered directly is also dependent on cable length. Full details are provided with each CDR-I; also see “Cable length and DC power considerations” on page 21.

The CDR-I provides the user with local source selection and level control for the zone in which it is fitted. It additionally allows selection of any zone groups to which the zone has been assigned, which gives simple and complete control over audio in multiple areas which may be split or joined in different ways at different times.

Once enabled on the DCMI and a local key code entered, zone EQ is also adjustable from the CDR-I, allowing audio optimisation from within the zone itself. An Installer Mode permits zone assignment and adjustment of other installation parameters.

#### CDR-I variants:

Throughout this manual, all references to “CDR-I” apply equally to the CDR-I and the CDR-IF.

### LE-I Series



LE-I version illustrated

The LE-I Series is a range of input connector modules which can be installed wherever required. Versions are available to fit standard UK (LE-I) or US (LE-IA) dual-gang electrical back boxes, or in a “Media” format (LE-IM), which fits a Euro-style 100 x 50 mm mounting frame. All versions are available in either black or white. They allow connection of a stereo unbalanced line-level audio source, such as a portable music player, laptop, radio mic receiver or similar, and connect to one of the DCMI's Extension Ports with a single screened Cat 5 cable.

Multiple LE-I's may be “daisy-chained” together to provide input points at different locations in the same zone. Signals applied to modules wired in this way will be summed together. An internal gating circuit on each module automatically “disconnects” any chained modules which are not in use, to minimise noise contribution.

The LE-I's inputs are electronically buffered to minimise noise and interference pickup, and input gain is locally adjustable with a preset control. Two types of input connector are provided for user convenience: dual phono sockets and a 3.5 mm stereo jack socket;  $\pm 12$  dB of gain trim adjustment is available on the faceplate.

Any audio connected to an LE-I is treated as any other source and can be routed to any zone in the same manner.



## BE-I Series



**BE-I version illustrated**

The BE-I Series is a range of input connector modules of similar type to the LE-I. They provide a stereo balanced line-level input, permitting professional audio equipment with balanced outputs such as mixing consoles or DI boxes to be connected. Like LE-I's, they connect to one of the DCMI's Extension Ports with a single screened Cat 5 cable.

BE-I's may be daisy-chained in the same way as LE-I's, and the two types of module may be intermixed.

Two industry-standard latching 3-pin female XLR connectors are fitted.

Any audio connected to the BE-I is treated as any other source and can be routed to any zone in the same manner.

## ME-I Series



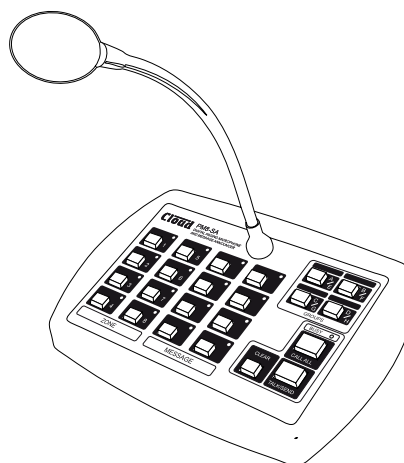
**ME-I version illustrated**

The ME-I Series of input connector modules provide one (ME-1M) or two (ME-1, ME-1A) balanced microphone inputs, and are useful in multi-purpose areas where mics are sometimes needed. ME-I modules have adjustable mic level and EQ per input, and connect to one of the DCMI's four dedicated Mic Inputs with a single screened Cat 5 cable. On the two-input versions of ME-I, the inputs are mixed together at the module, and the summed mic signal applied to the DCMI.

Any of the DCMI's mic inputs can be routed to any zone without restriction.

Inputs on the ME-I are via latching 3-pin female XLR connectors. 12V phantom power is available on either input if required (set via a jumper accessible from the rear of the module).

## PM Series Paging Microphones



The Cloud PM Series of paging microphones integrate directly with the DCMI and provide a simple and convenient method of adding multi-zone paging facilities to the audio system. Multiple PMs can be easily daisy-chained if more than one paging location is needed.

PM paging microphones are available in 4, 8, 12 and 16-zone versions. The 4- and 8-zone versions are also available as 'SA' versions, with internal digital sound stores for pre-recorded announcements. The PMI single-zone mic is also compatible with the DCMI.


Note that the earlier Cloud CDPM range of paging microphones is also directly compatible with DCMI mixers.

Full installation and operation instructions are supplied separately with each paging microphone.

## Cloud DCMI Utility Tool

This is a simple software application which allows the DCMI to be configured using serial data commands, either via its RS-232 port or Ethernet port\* from an external computer or other compatible device. Most of the unit's menu functions are available in the Utility Tool, and it provides a convenient method of pre-configuring a DCMI off-site, and then loading all the settings into the unit at a later time.

The Utility Tool is freeware, and can be downloaded from the Cloud website, [www.cloud.co.uk](http://www.cloud.co.uk).

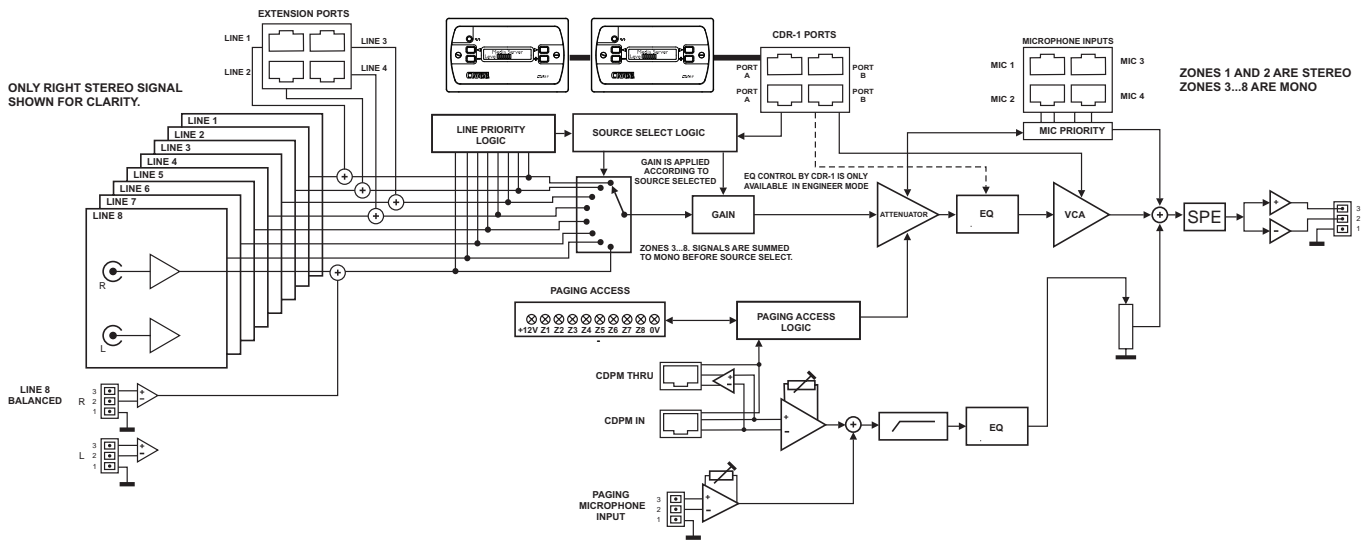
A description of each DCMI menu function can be found in the "Configuration" section of this manual: all corresponding Utility Tool functions are denoted here by the  UTILITY symbol.

A full description of the Utility Tool can be found on page 58.

\*An updated version of the Utility Tool additionally allowing serial-via-TCP/IP over an Ethernet connection will be available during 2014.



## System Capabilities



The simplified block diagram above illustrates the basic signal architecture of the DCMI. Only the routing and logic for one zone output is shown.

The main system and interfacing capabilities of the DCMI are listed below:

### Music sources and routing

- Provision for eight music sources. Inputs are stereo, line-level and unbalanced
- Input 8 also available as a balanced input
- Inputs 1 to 4 may be fed from LE-I or BE-I input modules (see above), which have a balanced connection via dedicated input sockets
- Any music source may be routed to any zone
- Inputs available for selection may be defined, per-zone

### Microphone inputs

- Provision for four ME-I mic input modules, each of which can accept two microphones (except the single-input ME-IM).
- Each mic input assignable to any zone in any combination

### Paging mic facilities

- RJ45 digital interface for PM/CDPM Series paging microphones
- Additional balanced input for third-party paging mic
- Per-zone contact closure routing for third-party mic
- Both PM and third-party systems may be used together; independent gain controls.
- HF/LF EQ adjustment of paging signal
- Paging level independently adjustable per-zone

### Zone Outputs

- Eight balanced line level zone outputs
- Zones 1 & 2 are stereo, 3 to 8 are mono

### Zone Groups

- Zones may be assigned in any combination to four Groups
- Groups can be enabled/disabled by user as required
- Groups have same source selection functions as zones

### Priority and Logic

- Any music source may be assigned as priority line input, per-zone/group. If enabled, a signal at the priority input overrides the source selection in the zone/group
- Priority music source may be a source normally unavailable to a zone
- One or more priority mic inputs may be similarly defined; an active mic signal causes the music level to reduce (“ducking”)
- During Paging, music ducking may be triggered by the paging signal or zone selection; it can also be disabled; these options are selectable per-zone/group
- Independently adjustable hold and release times for all priority types, plus music attenuation (ducking) level for mic and paging priorities

### Remote Control

- Optional CDR-I dedicated remote control for DCMI available separately
- Up to 100 CDR-I's may be connected to the four CDR-I Ports, using standard Cat 5 UTP cable
- CDR-I's can be daisy-chained and/or wired directly to the CDR-I Ports as cabling convenience dictates
- Multiple CDR-I's per-zone permitted
- CDR-I provides local (in-zone) user control of source selection and level control and key-protected EQ adjustment

- RS-232 serial remote control interface for integration with third-party control systems (Crestron, AMX, etc.)
- Software Utility Tool (free download) allows control and configuration of most unit functions from PC via RS-232 port
- Internal Web server provides control and configuration, plus additional functions, from a compatible Internet browser via network connection (*DCMIe only*) **DCM1e**

## Misc

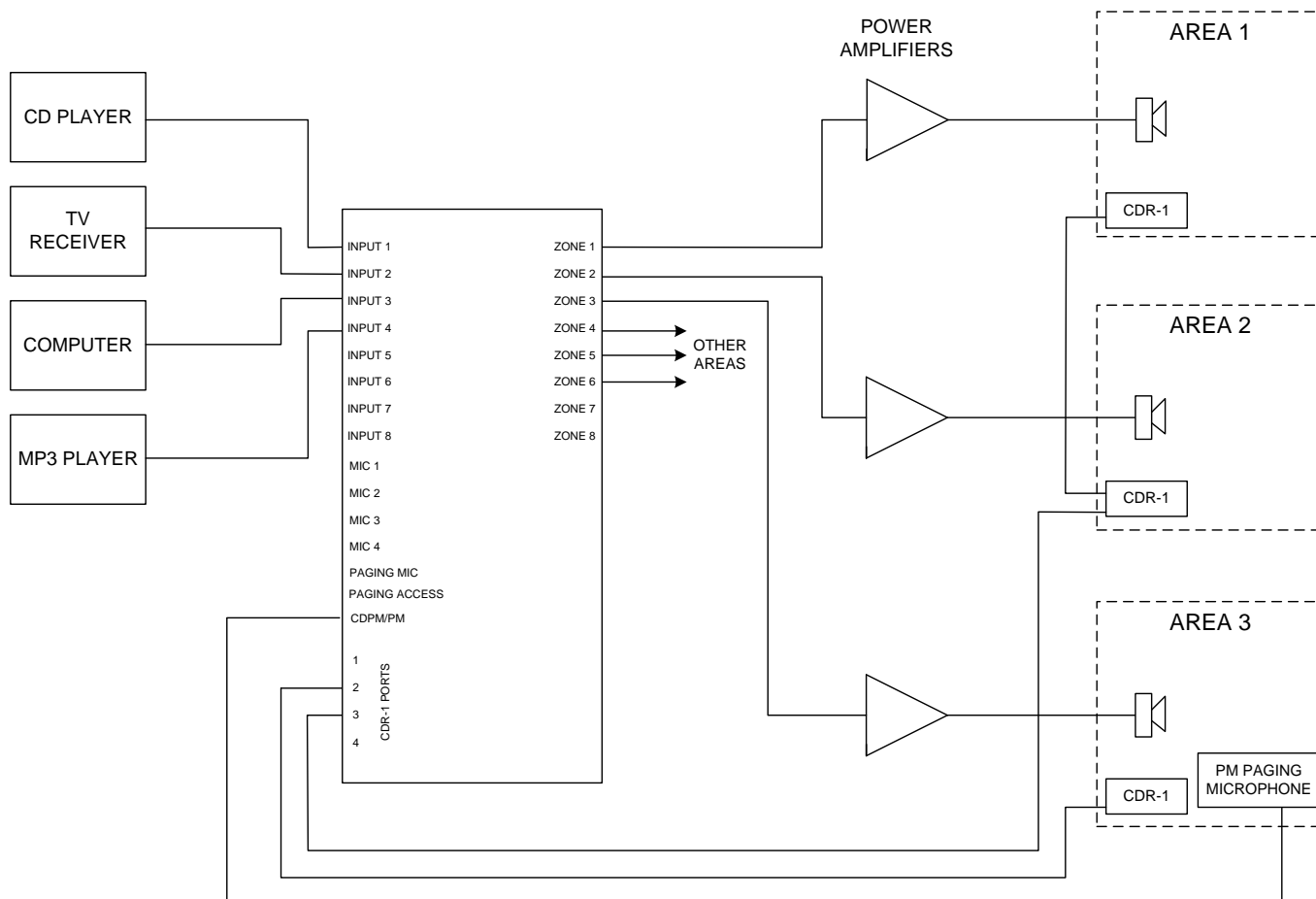
- Programmable external Music Mute input for fire alarm interface, etc.
- Paging access port can be reconfigured as 8-way GPIO port
- One input (mic or line) can be installer-configured to be protected from Music Mute (e.g., for evac message, emergency mic, etc.)
- Optional loudspeaker speaker EQ cards (per-zone)

## Applications and Examples

The DCMI will find applications in many types of premises, including shops, bars, hotels, schools, conference centres, offices, etc. The configurational flexibility of the DCMI means that it can be set up by the system designer to provide precisely the facilities the user needs.

A few simple examples are given below to illustrate typical installations.

### System I

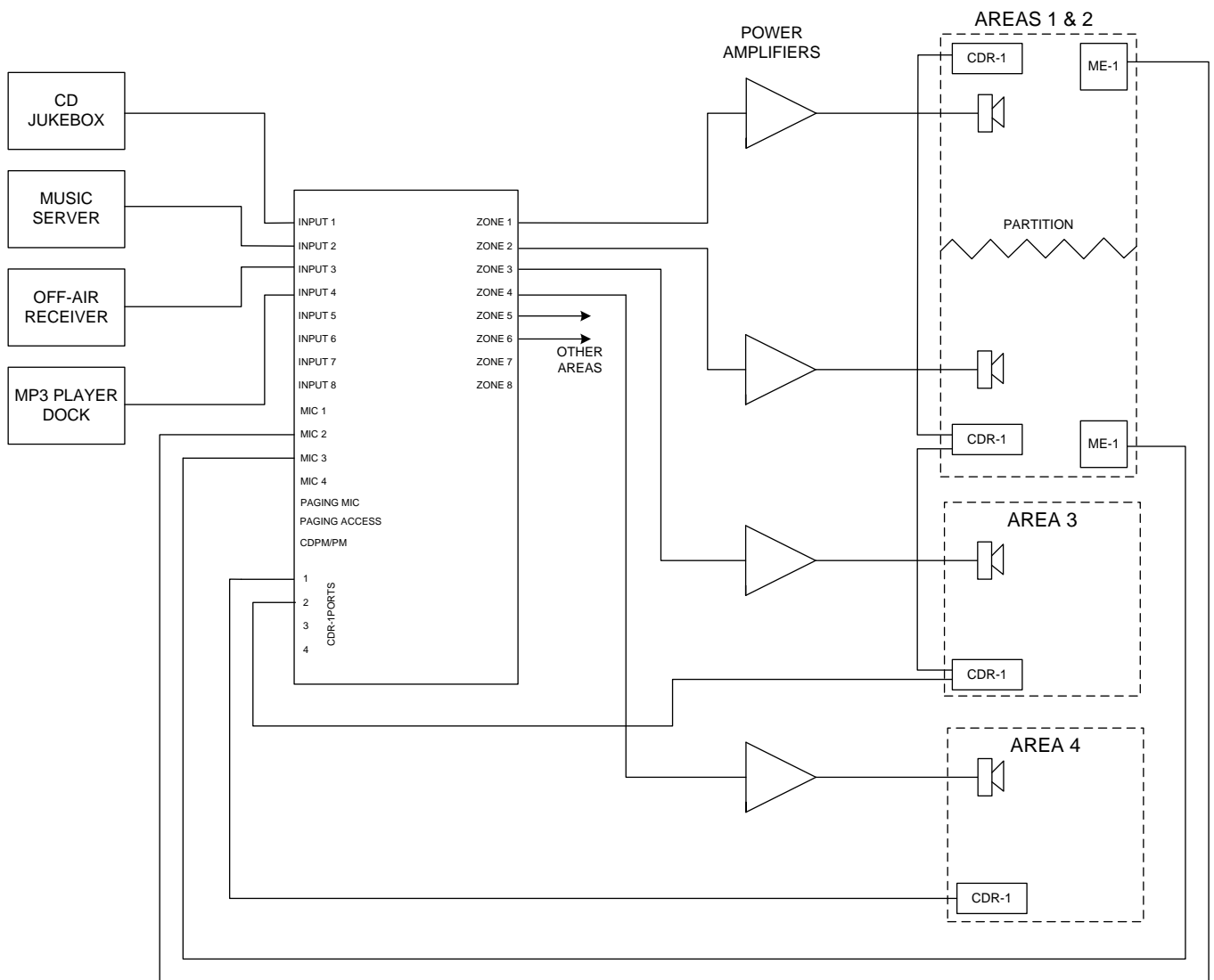


This depicts a simple system where four possible audio sources are made available to three or more zones (areas). Only three are shown for clarity. Points to note:

- Each of the three areas shown is equipped with a CDR-1 remote control. Note that Area 3's remote is wired directly back to the DCMI, while those in Areas 1 and 2 are daisy-chained together and wired back to the DCMI separately. This is possible because the DCMI/CDR-1 permit almost any wiring topology that is convenient for the building layout.
- Area 3 has a Cloud PM paging microphone, which would

be used to originate voice messages to any of the other areas. The paging level to Area 3 (if required) would be adjusted on installation to be at a level that does not cause feedback.

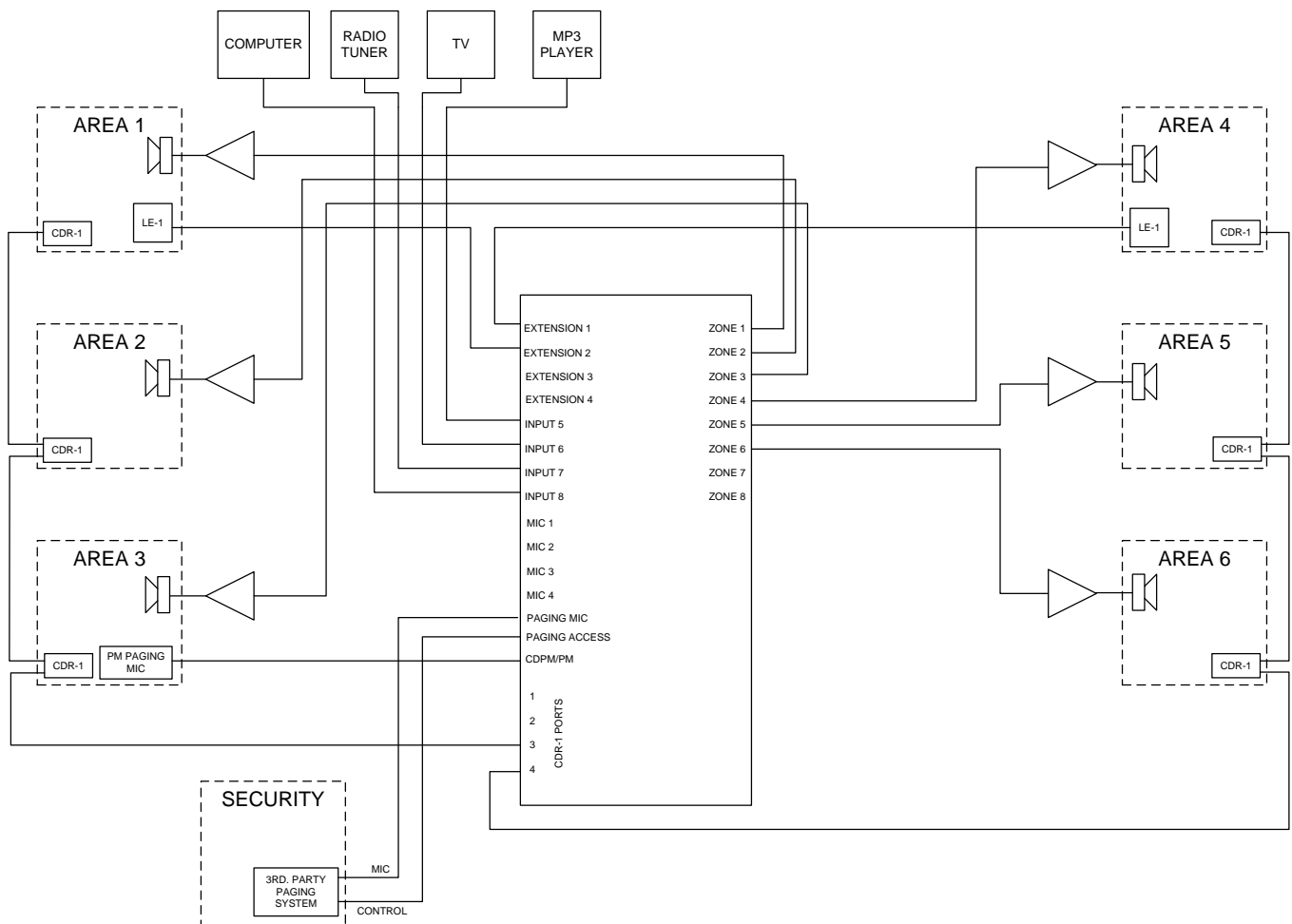
## System 2



This shows a more complex system, which illustrates some additional DCMU installation possibilities. Points to note:

- The large area has two CDR-1 remote controls in the same zone; typically, these might be adjacent to doors at opposite ends of the room.
- Two of the areas are separated by a folding partition which may be removed to create one large space. By assigning these two zones to a Group within the DCMU, the two zones can be treated as one for audio purposes when the partition is removed and return to two separate zones when it is reinstated.
- Each half of the partitioned area also has an ME-1 mic input module. Because these have been wired back to the DCMU independently, each can be made available to their respective room halves as and when required. Alternatively, it may be that they are only required when the partition is folded back; in this case they are activated for the Group instead.

### System 3

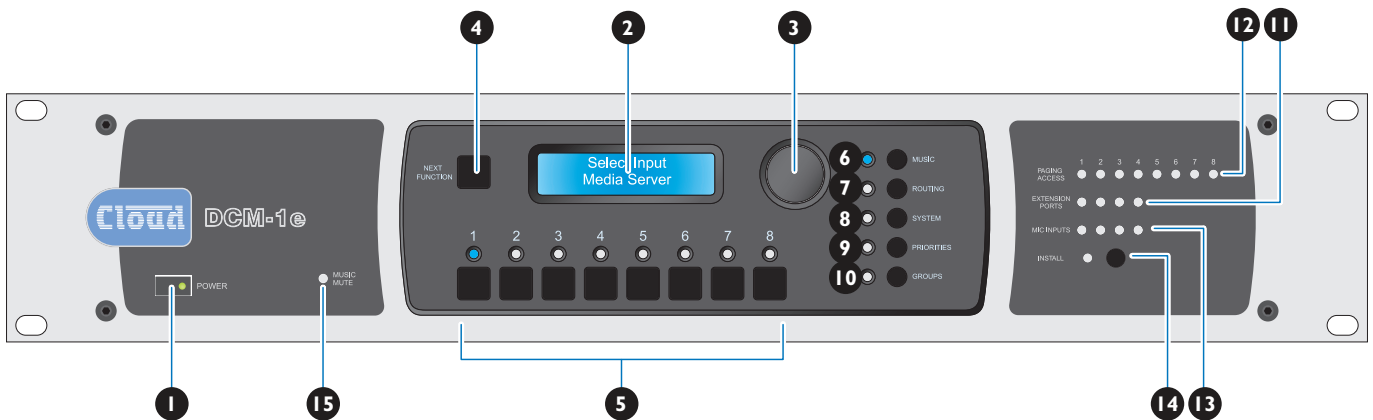


System 3 shows a system interfaced to two paging stations, a PM (which might be located at the building's reception desk) and a separate third-party system, which might typically be in a security office. Other points to note:

- The CDR-I remote control panels in each zone are wired in two chains, to suit the building layout.
- Two of the line inputs are from LE-I remote line input modules in two different zones. Other music sources have, in this case, been connected to Inputs 5 to 8.

## Section 2: Installation

### Description of front panel

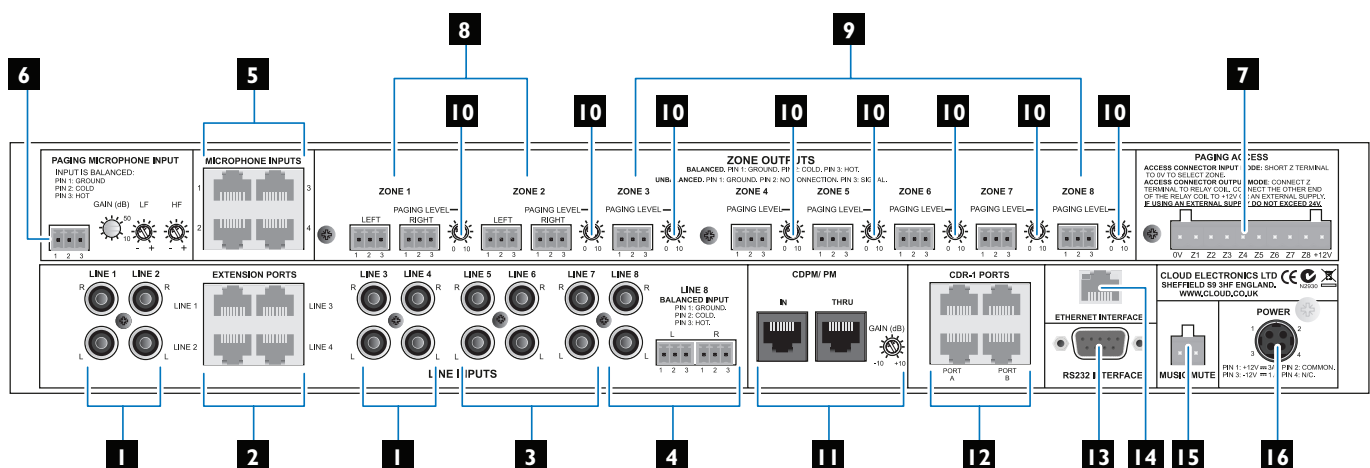


1. **POWER button:** applies DC power to the DCM1 (note external PSU).
2. **LCD display:** 2 x 16-character backlit blue LCD display used in all control and menu functions.
3. **Rotary control:** for adjusting unit parameters via the display. The control also has a “press” action, which is required for some front panel operations.
4. **Next Function button:** used to scroll through the various functions of each menu.
5. **Numeric buttons 1 - 8:** the operation of these buttons varies with the selected menu function. In many of them they represent Zones 1 to 8, each button selecting a zone that the menu function will apply to. In others, they may represent Inputs 1 to 8, for example. Each button has an associated blue LED to indicate the current status of that zone or input for the function.
6. **MUSIC:** gives access to per-zone source selection, level control, EQ, maximum and minimum levels, and input gain per-input.
7. **ROUTING:** Allows per-zone mic enabling and input masking, plus other installation-specific functions.
8. **SYSTEM:** system menu includes enabling of CDR-1 installer mode per-zone, mono/stereo selection for Zones 1 & 2, RS-232 port set-up, zone and input naming, security key set-up, etc.
9. **PRIORITIES:** allows assignment of priority inputs (including paging inputs) and adjustment of the DCM1’s operation when priorities are active.
10. **GROUPS:** the Group menu allows assignment of Zones to Groups, and defined Groups to be enabled.
11. **Paging Access:** eight LEDs (one per zone) which illuminate when a zone is selected for paging from an external paging microphone.
12. **Extension Ports:** four LEDs corresponding to the Extension Ports of Line Inputs 1 to 4. These LEDs illuminate when a LE-1 or BE-1 remote input module is connected, and the input to which it is connected is enabled for the currently selected zone.
13. **Mic Inputs:** four LEDs corresponding to Mic Inputs 1 to 4. These LEDs illuminate when an ME-1 remote input module is connected, and the input to which it is connected is enabled for the currently selected zone.
14. **Install button:** activates Installer Mode. Allows access to the menu functions which are intended to be unavailable to the user. A key needs to be entered on the numeric buttons for Installer Mode to be active.
15. **Music Mute LED:** illuminates when an external Mute is applied at the Music Mute connector (normally linked to Fire Alarm or other emergency system).

The menu system is divided into five groups, each of which is selected by one of the menu buttons 6 to 10. An associated blue LED indicates selection.



## Description of rear panel



1. **Line 1 to 4:** inputs for music sources 1 to 4, on phono sockets (unbalanced).
2. **Extension Ports 1 to 4:** These are alternative input connectors for Line Inputs 1 to 4. If Cloud remote line input modules (LE-I or BE-I) are being used, they should be connected here via screened Cat 5 cable and shielded RJ45 connectors. These ports each provide a stereo pair of electronically-balanced inputs, together with DC power for the active circuitry in the remote module. Do not connect a music source to the phono sockets (1 above) of a Line Input when its Extension Port is connected to a remote input module.
3. **Line 5 to 7:** inputs for music sources 5 to 7, on phonos only.
4. **Line 8:** Input 8 is available both as unbalanced on phonos and electronically-balanced on 2 x 3-pin 3.5 mm-pitch screw-terminal connectors. The balanced input allows connection of professional audio equipment such as mixing consoles, DJ desks, etc.
5. **Microphone Inputs 1 to 4:** four shielded RJ45 sockets for the connection of Cloud ME-I microphone remote input modules. Connection should be via screened Cat 5 cable. These inputs are balanced, and the connectors additionally provide DC power for the active circuitry in the input modules.
6. **Paging microphone input:** balanced input for the connection of an external paging microphone. This input is enabled via the access connector 7. Adjacent to the 3-pin 3.5 mm-pitch screw-terminal connector are preset controls for mic gain and HF/LF EQ. Phantom power is available at this input (enabled by internal jumper).
7. **Paging Access connector:** 10-pin 5 mm-pitch screw-terminal connector providing several functions. If the DCM1e is being used with a third-party paging system, this connector provides contact-closure selection of the zone(s) to be paged. If a Cloud PM Series is the only type of paging system being used, the connector can be used as an output port, the 8 pins becoming per-zone open-collector outputs which can be used (typically) for external level restoration. If the connector is not required for paging access, it can be configured as a GPIO port (with any combination of inputs and outputs), and used in conjunction with the RS-232 port to respond to serial commands (GPO) or report input status (GPI). 0V and +12V are also available on the connector. See page 33 for more information.
8. **Zone Outputs 1 and 2:** electronically-balanced outputs on 3-pin 3.5 mm-pitch screw-terminal connectors. Zone Outputs 1 & 2 are stereo; separate L and R connectors are provided. Stereo music sources routed to Zones 1 and 2 will remain in stereo. Either Zone Output can be reconfigured as mono via the menu system.
9. **Zone Outputs 3 to 8:** as Zones 1 and 2, but mono only, with a single connector. These zones will receive a mono L+R sum of stereo inputs routed to them.
10. **Paging level controls:** each Zone output has an adjacent preset control which sets the volume of the paging mic (either from PM or third-party systems) in that zone.
11. **CDPM/PM ports:** two RJ45 sockets, IN and THRU. IN is for the connection of Cloud PM Series (or CDPM Series) paging microphones; THRU is used when a system employs multiple DCM1s. DC power, zone selection data and the paging microphone signal are all catered for on the IN socket. The adjacent preset control adjusts the PM microphone level.
12. **CDR-I Ports:** four RJ45 ports for connection of CDR-I (or CDR-IF) remote control plates. Plates may be daisy-chained, and the installer may use one or more of the four ports for individual or daisy-chained plates as the building layout dictates.
13. **RS232 serial interface:** a 9-pin female Dsub connector providing a bi-directional RS-232 interface. This has several functions: it permits control of the DCM1's primary functions from an external system and can be used in conjunction with the Paging Access connector in GPIO mode.

**DCM1e** On the DCM1e only, it can transmit serial

commands to third-party equipment in response to Ethernet commands generated elsewhere (future firmware release).

14. **DCM1e ETHERNET INTERFACE:** standard RJ45 network connector allowing the DCM1e to be controlled and configured from an Internet browser. In a future firmware release, it will also accept control commands using RS-232 syntax, and be used as an Ethernet-to-serial bridge to pass TCP/IP commands from third-party control systems to the RS-232 connector **13**\*.

15. **Music Mute input:** 2-pin 5 mm-pitch screw terminal connector for interfacing the DCM1 to a fire alarm or other emergency system. The input is configurable for use with either Normally Open (N/O) or Normally Closed (N/C) contacts; shorting (or removing a short) will mute music in all zones (see “Configure Music Mute” on page 45). One input source may be protected from this mute if wished, permitting the input to be used for automatic or manual evacuation messages (see “Select Emergency Source” on page 44).

16. **POWER:** Locking 4-pin power mini-DIN type for connection of the DCM1’s external DC PSU.

\* Ethernet-to-serial bridge functionality will be available in a future firmware release. Please check [www.cloud.co.uk](http://www.cloud.co.uk) for additional product features.

## Hardware considerations

The DCM1 is built in a 2U-high 19" rackmount enclosure. **It is strongly recommended that the DCM1 is installed in a 19" rack wherever possible.** The DCM1 is approx. 160 mm deep, but 250 mm of rack depth should be available to allow for rear connectors and cabling.

The DCM1 has low power consumption and there are no thermal considerations other than ensuring that the ventilation grilles (one on each side, one on the bottom panel) are not obstructed once installed. Other equipment may be installed above or below the DCM1 within this constraint.

The choice of location will be dictated by the specifics of the system and building layout. It is recommended that wherever possible, the DCM1 should be mounted in an equipment rack along with as many of the music sources (CD players, music servers, TV receiver boxes, etc.) and audio power amplifiers (driving the zone loudspeakers) as practical.

When deciding the DCM1's location, bear in mind that access to it may be required, as there are some configuration settings that may need to be changed - occasionally or frequently - depending on the daily requirements of the building. This is more likely to be the case with a DCM1 than a DCM1e, as the latter allows many settings to be adjusted remotely from an external device.

## Power Supply

The DCM1 requires  $\pm 12$  V DC, which is supplied by the external DC Power Supply Unit (PSU) included with the unit. This has a 1 m captive cable with a moulded 4-pin plug for connection to the DCM1. The PSU is of the "Universal" type, and will operate on any AC supply voltage from 100 to 240V. Wherever possible, mount the PSU in a safe location within the equipment rack, securing both the DC cable and the IEC mains lead with cable ties to avoid inadvertent disconnection.

## System Connections

### Music Sources

Connect the system's various music sources to **LINE 1** to **8**. When allocating sources to inputs, bear in mind that if Cloud LE-1 or BE-1 remote modules also form part of the system, these can be connected to **LINE 1** to **4** only.

### Standard connection:

All eight line inputs offer unbalanced connection for stereo sources on a pair of standard phono sockets (RCA jacks). The sensitivity range available should allow most standard items of audio equipment such as CD players, PC-based music servers, TV tuners, etc., to operate at a satisfactory level. Such equipment will generally have stereo unbalanced outputs, and as long as the source equipment is adjacent to the DCM1, normal phono-phonos leads can be used.

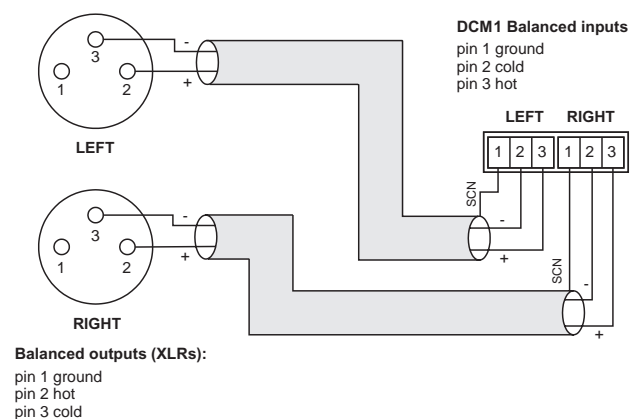
### Mono sources:

If connecting a source with only a single mono output to the DCM1, connect it to both the L and R sockets, using a Y-splitter lead or similar.

### Balanced sources:

**LINE 8** is additionally provided with electronically-balanced inputs, which may be used to connect source equipment with balanced outputs. Balanced connection is always preferable to unbalanced for situations involving long cable runs, and should be used if one of the music sources is remote from the DCM1 (a DJ mixing system is a common example).

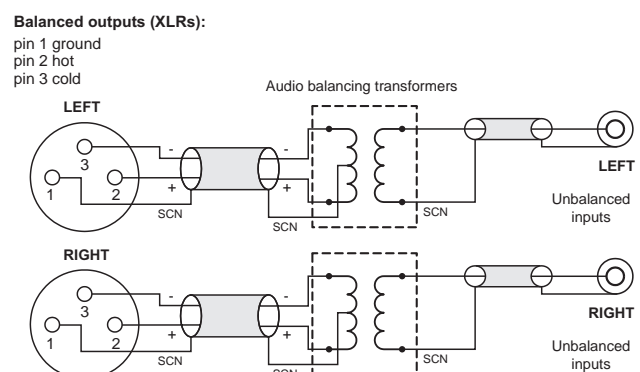
When connecting balanced sources to **LINE 8's** balanced input connector, wire as shown below. Note that the cables' screens are not connected at the source end.



Do not connect music sources to both the balanced and unbalanced connectors of **LINE 8**.

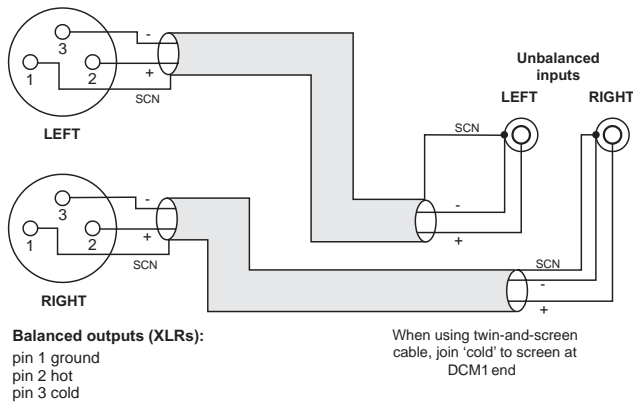
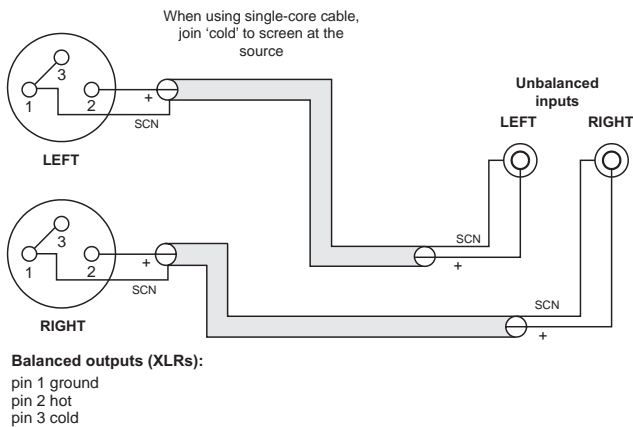
### Additional balanced sources:

If it is necessary to connect more than one balanced source to the DCM1, one of the unbalanced inputs 1 to 7 may be used, but the advantages of balanced connection will be lost unless a balancing transformer is connected between the source and the unbalanced input. Suitable audio transformers, which should have a ratio of 1:1, are readily available from major audio component suppliers. The transformer(s) should be mounted as close to the DCM1 as practical, and housed in a screened enclosure if they are not individually screened. The preferred connection method is shown below.



If transformers are not available, a balanced source may feed an unbalanced input directly as long as care is taken over how the connections are made. A variety of design techniques are in use to implement balanced outputs in audio equipment, and some designs require different wiring protocols to others. Installers are advised to check the manuals with each item for guidance on how the outputs should be connected to an unbalanced input.

However, the wiring methods shown below will work in a large number of cases. If hum or other distortion is found to result, try disconnecting the 'cold' leg of the balanced output (pin 3 on XLRs).



Always avoid using pre-made leads of an unnecessary length.

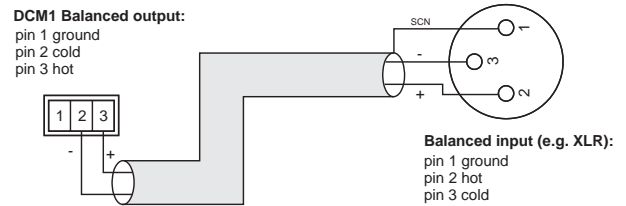
An alternative method of providing additional balanced sources is to use BE-I remote input modules connected to **EXTENSION PORTS 1** to **4**; these could be installed adjacent to the DCM1 in such a situation.

## Zone Outputs

Connect the inputs of the power amplifiers feeding the loudspeakers for each zone to **ZONE 1** to **8**. Note that zone outputs 1 and 2 are stereo; if only one set of speakers are being used in these zones, they may be connected to either connector.

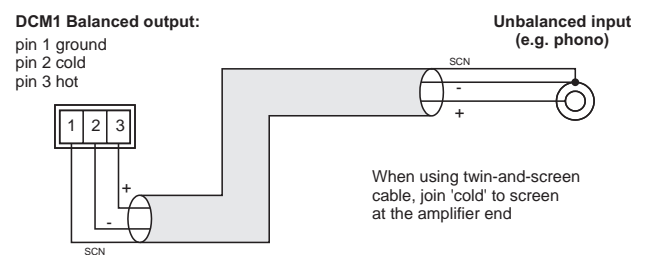
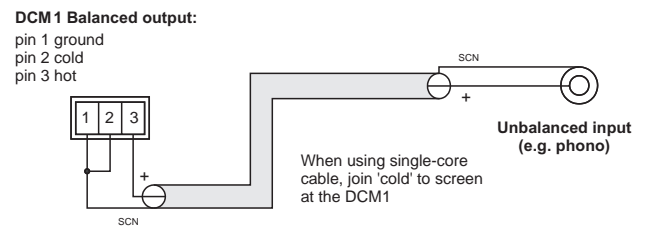
### Standard connection:

All eight outputs provide balanced connection for wiring to professional/industrial power amplifiers with balanced inputs (typically on XLRs). In this case, wire as the diagram below. Note that the cables' screens are not connected at the source end.



### Unbalanced inputs:

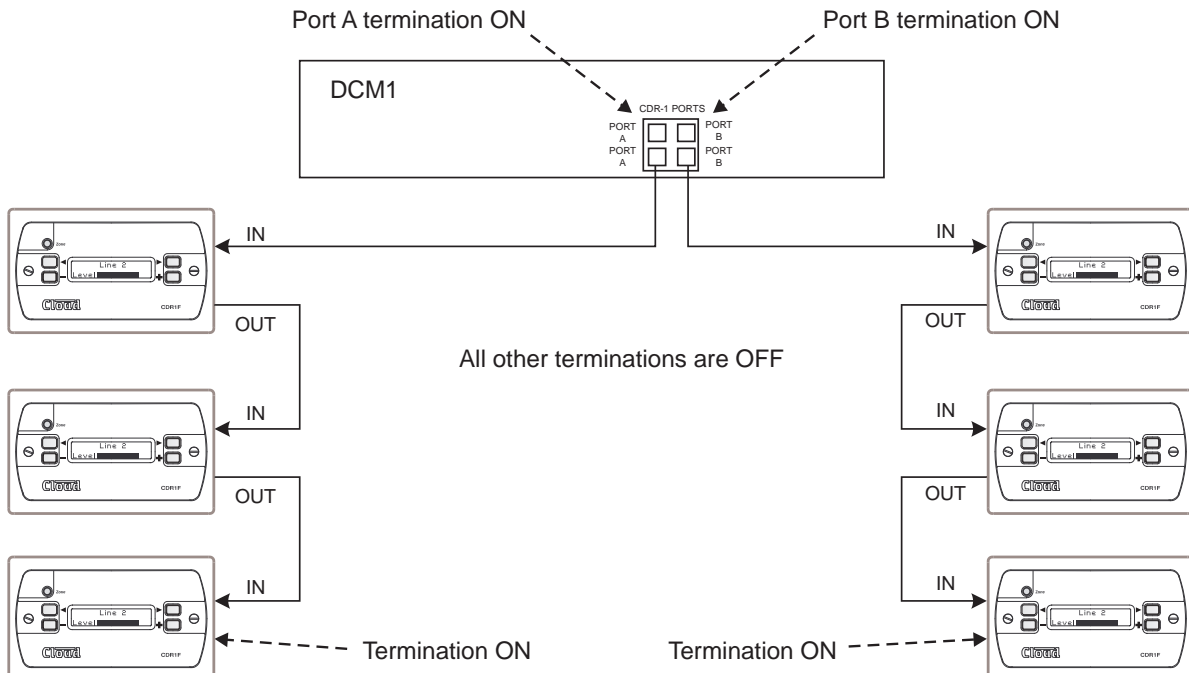
If audio amplifiers with only unbalanced inputs are being used (e.g., hi-fi amplifiers), the following wiring should be adopted:



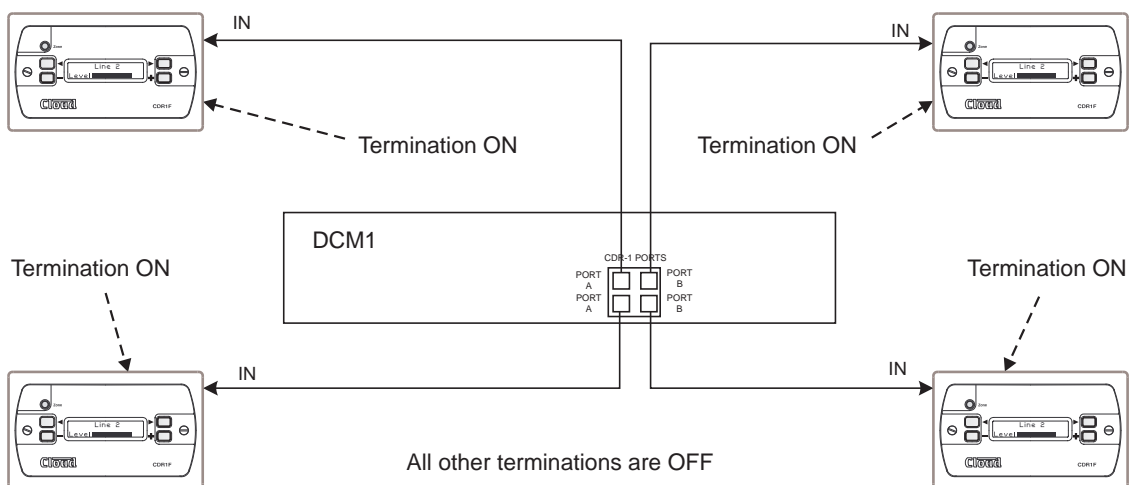
Always avoid using pre-made leads of an unnecessary length.

## CDR-I Remote Control Plates

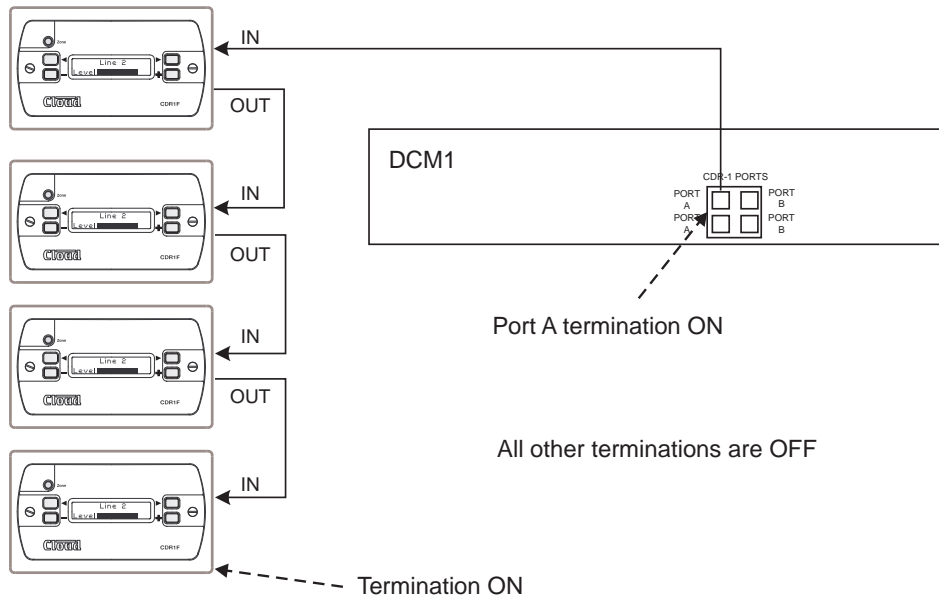
Multiple CDR-I or CDR-IF remote control plates may be connected to the DCM1 either by wiring them directly and individually, or by “daisy-chaining” them together. In most installations, a combination of these methods is likely to be the most convenient solution from the point of view of practical cabling. The diagrams below illustrate the types of wiring schemes that may be employed; almost any variation on these is permissible.



**Network Diagram 1**



**Network Diagram 2**



**Network Diagram 3**

Note that in the above diagrams there is deliberately no indication as to which zones any of the CDR-I's are in; this is because the system imposes no restriction on their physical location. Interconnection may be made purely on the basis of wiring convenience.

**Connections**

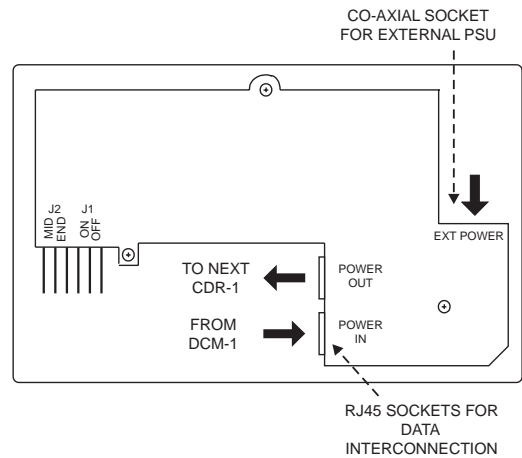
CDR-I's are connected to the DCM1's **CDR-I PORTS** using standard unscreened Cat 5 cable and RJ45 connectors. It may be possible to use pre-made Cat 5 "patch cables" to connect any CDR-I's installed close to the DCM1; otherwise Cat 5 cable and crimp RJ45 plugs should be used. **NOTE:** All Cat 5 cabling should be wired "pin-to-pin"; "crossed" or "null" cables will not work.

Wire the RJ45 connectors according to the pinout diagram on page 69.

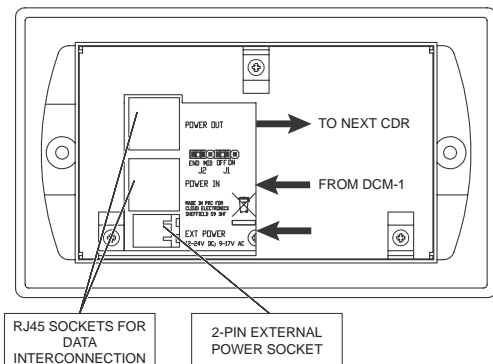
Note that the single Cat 5 interconnection provides DC power as well as data. A full pin allocation of the CDR-I ports can be found in the Appendix at the end of this manual.

Any of the four **CDR-I PORTS** may be used. Two of these are labelled **PORT A** and the other two **PORT B**, but the four are electrically identical. However, use of Port A or Port B has relevance to how terminations are set ("Network Terminations" on page 21).

The CDR-I and CDR-IF are equipped with two RJ45 connectors, labelled **POWER IN** and **POWER OUT**. The "first" CDR-I in a daisy-chain wiring system should be connected to the DCM1 using its **POWER IN** connector. The **POWER OUT** connector on this CDR-I should be connected to the **POWER IN** of the next CDR-I in the chain, and so on until the last CDR-I in the chain. Note that the locations of the RJ45 connectors differ on the two CDR-I versions:



**Data and external power connections on the CDR-I**



**Data and external power connections on the CDR-IF**



## Network Terminations

The Cat 5 wiring connecting the DCMI and CDR-Is is essentially a data network, and as such, must be correctly terminated. Both the DCMI and CDR-I are provided with means of setting their network terminations ON or OFF.

The rule governing terminations is:

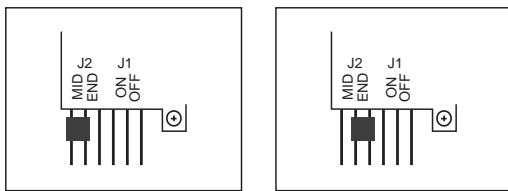
- Devices (DCMI or CDR-I) at the **ends** of a cable run must have their terminations set ON.
- All intermediate devices must have their terminations set OFF.
- If both connectors on the same DCMI **CDR-I PORT** (either **PORT A** or **PORT B**) are being used, the DCMI may be considered as an intermediate device, and its termination should be set to OFF.

The correct termination setting is indicated for each device in the three network examples illustrated on page 19 and page 20. Note that in Example 1, the DCMI's Ports A and B are both in use, but only one connector is used on each. The ports are thus at the ends of the chains, and their terminations must therefore be set ON. In Example 2, all four ports are in use, so the DCMI is "mid-chain" with respect to both ports, so both terminations should be set OFF.

There are two network terminations in the DCMI, one for each port. These are set by internal jumpers J6 (Port A) and J13 (Port B). See page 65 for details of jumper locations.

The port termination is ON when the jumper is in place. Remove the jumper carefully, with a pair of long-nosed pliers, to set the port termination OFF. (We suggest the jumper is left on one of the two pins in case it is required in the future.)

On the CDR-I and CDR-IF, the network termination is set by jumper J2. This has two possible positions, marked **MID** (termination OFF) and **END** (termination ON).



Diagrams showing CDR-I jumper settings for :  
a) termination OFF (MID), b) termination ON (END).  
Note Jumper J1 not shown.



Diagrams showing CDR-IF jumper settings for :  
a) termination OFF (MID), b) termination ON (END).  
Note Jumper J1 not shown.

## Cable length and DC power considerations

As far as correct data communications are concerned, the maximum recommended cable length of the CDR-I network is 1 km. This figure applies either to the total cable run between the "farthest" CDR-I and the DCMI if a single daisy-chain of CDR-Is has been employed (see Network Diagram 1, page 19), or to the total run between the most remote CDR-Is if the DCMI is in the "middle" of the chain (i.e., multiple daisy-chains of CDR-Is, see Network Diagram 2, page 19). Cable runs longer than this may work satisfactorily, but this cannot be guaranteed. The probability of correct operation is a function of cable length, the number of CDR-Is daisy-chained, and how many of them are at a distance from the DCMI close to the maximum cable length.

**IMPORTANT:** The 1 km limit referred to above ONLY applies to the digital data carried by the Cat 5 cable; a DCMI will NOT successfully supply DC power over this cable length. Systems with long cable runs and/or several CDR-Is on the same run will need external power supplies, whose location and system connection will depend on the topology and cable lengths involved.

The DCMI has sufficient capacity to power eight CDR-Is and/or CDR-IFs (i.e., nominally one plate per zone) via the Cat 5 connections. However, in addition to the limitation above, one or more external PSUs will be required if any of the following apply:

- If the system requires more than eight CDR-Is in total;
- If the "first" CDR-I on a daisy-chain is more than 250 m cable run from the DCMI;
- If several CDR-Is are in a "cluster" (i.e., close together in cable run terms) on a single daisy-chain.

The DCMI's power supply capability can be maximised by using as many **CDR-I PORT** sockets as possible when wiring CDR-Is.

As with data communication, the probability of satisfactory operation is a function of DCMI-to-CDR-I cable run, the number of CDR-Is on each daisy-chain and the number of **CDR-I PORT** sockets used. If any CDR-Is in a system are found to operate unreliably, it is likely that some will need to be powered independently; as outlined above, this will probably be the case with longer cable runs and/or several CDR-Is on the same daisy-chain. The Cloud CPM-PSU is a suitable external power supply, and should be connected to the **EXT POWER** socket in the rear of the CDR-I. Note that any further CDR-Is connected to the **POWER OUT** connector will be powered by the external PSU.

If a third-party external PSU is to be used, it should be rated at either 12 – 24 V DC or 9 – 17 V AC. Each CDR-I/CDR-IF takes 50 mA at 12 V, so the current capability of any PSU should also be checked. See page 69 for details of PSU and current ratings.

## Mic and Line Input Modules

Remote input modules from the Cloud ME-I, LE-I and BE-I ranges may be connected to the DCMI in a similar manner to that described for the CDR-I remote controls, except that *screened* Cat 5 cable should be used.

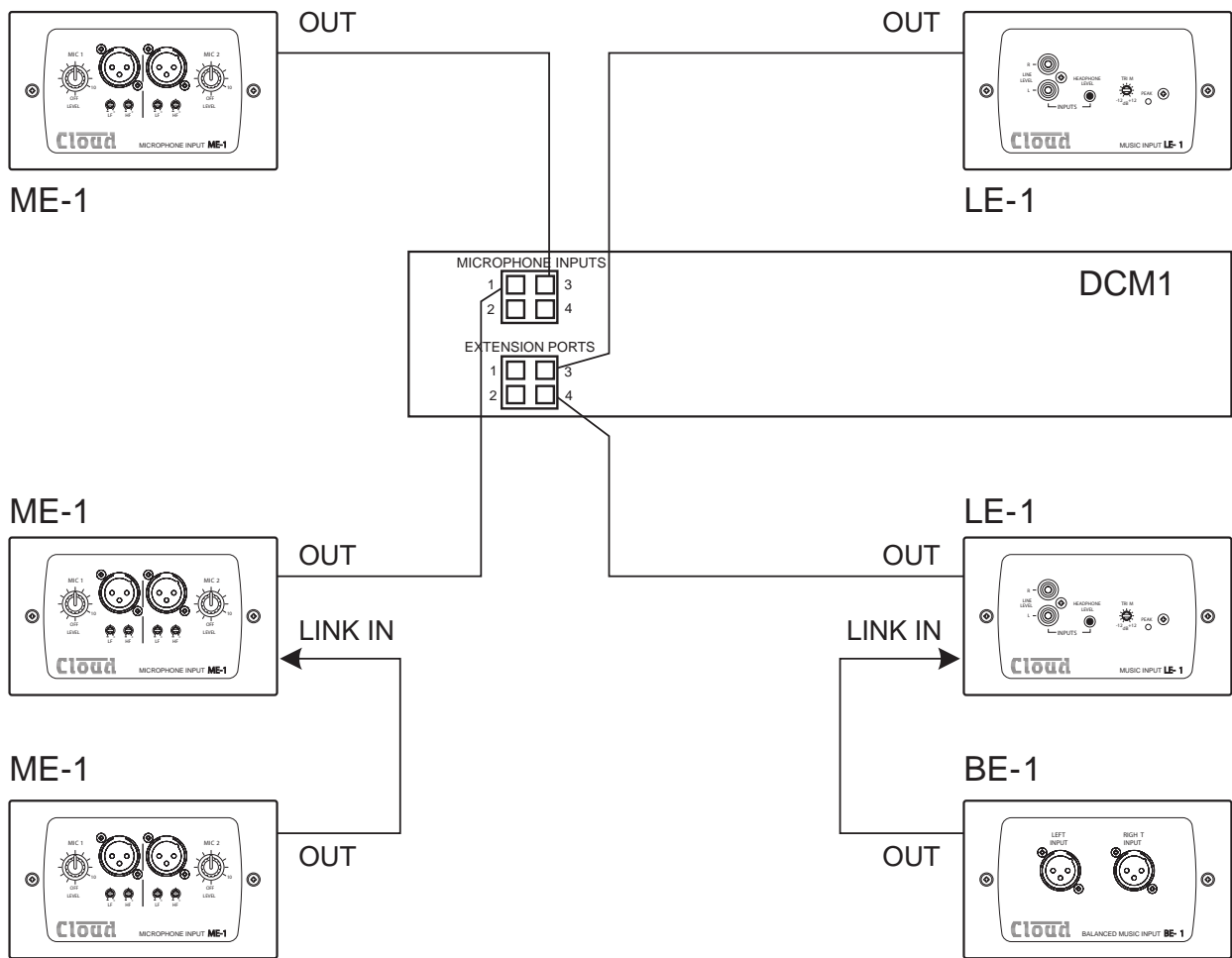
Remote modules may be “daisy-chained” for wiring convenience, providing that the following guidelines are observed:

- ME-I mic input modules cannot co-exist on the same “daisy-chain” as LE-I line input modules or BE-I balanced input modules.
- LE-I and BE-I modules can co-exist on the same “daisy-chain”.
- If more than one module is used for remote inputs simultaneously, a mixed sum of all sources will be presented to the DCMI input.

Note that the two mic inputs on the ME-I and ME-IA remote modules are summed together and passed to the DCMI as a mono signal. The ME-IM has a single mic input.

The two inputs on all versions of the LE-I and BE-I are intended for stereo use, and these modules’ connections to the DCMI maintain the stereo image of the source.

The diagram below illustrates some of the connection possibilities. Three ME-I, two LE-I and one BE-I modules are shown. **MICROPHONE INPUTS I & 3** and **EXTENSION PORTS 3 & 4** are chosen for reasons of drawing clarity; any could be used in practice.



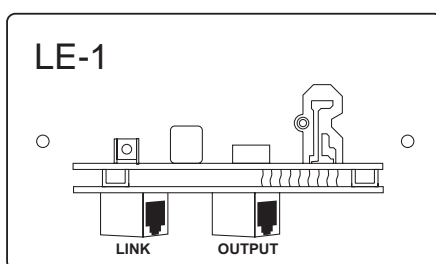
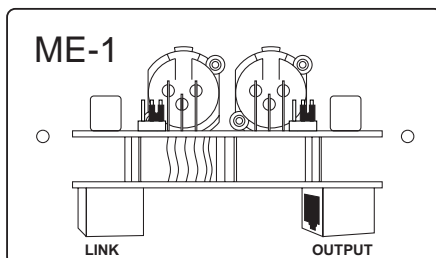
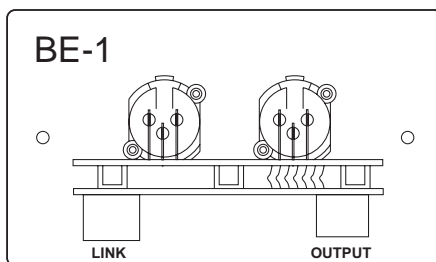
## Connections and wiring

Cat 5 cables used to interconnect remote input modules carry low-level audio. To minimise noise and interference from outside sources, *only screened Cat 5 should be used*. Only use shielded RJ45 plugs when wiring this part of the system, bonding the foil screen of the cable to the metal screening can of the plug.

ME-1 mic input modules should be connected to the RJ45 connectors labelled **MICROPHONE INPUTS** on the DCMI.

LE-1 line input modules and BE-1 balanced line input modules should be connected to the RJ45 connectors labelled **EXTENSION PORTS** on the DCMI. Do not connect any music sources to the phono sockets corresponding to the Extension Ports being used.

The remote modules all have two RJ45 sockets, labelled **OUTPUT** and **LINK**. The “first” module in a daisy-chain wiring system should be connected to the DCMI using its **OUTPUT** socket. The **LINK** socket on this module should be connected to the **OUTPUT** of the next module in the chain, and so on until the last module in the chain.



Refer to Installation Guide for the Module

Note that the single Cat 5 interconnection provides DC power as well as audio. A full pin allocation of the Microphone Inputs and Extension Ports can be found in the Appendix at the end of this Guide.

The DC power consumption of the active circuitry is quite low, and no PSU capacity problems should be experienced in the vast majority of installations. Refer to page 69 for PSU and current ratings.

## Connecting Paging systems

### Cloud PM Paging Microphones

The DCMI fully supports the Cloud Paging Interface Buss implemented across the Cloud PM range. (The Cloud Paging Interface Buss is also used by the earlier Cloud CDPM paging microphone range.)

### Connections and wiring

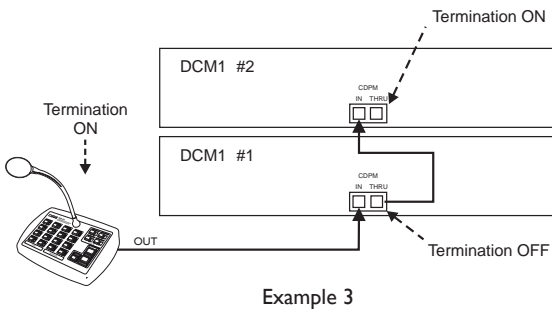
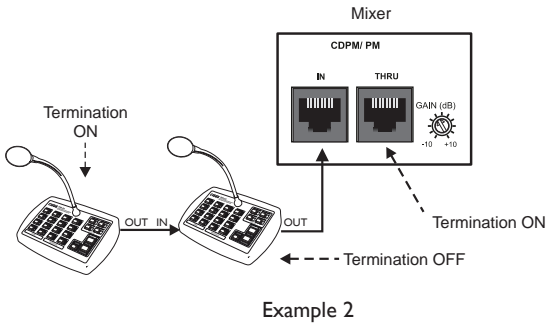
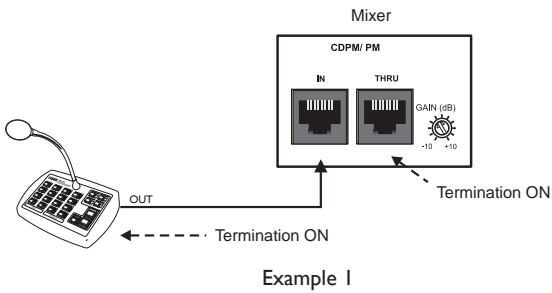
The DCMI is equipped with two RJ45 sockets for connection of Cloud PM Series paging microphones. The sockets, marked **CDPM/PM**, are labelled **IN** and **THRU**. PM paging microphones are similarly equipped with two RJ45 sockets, labelled **IN** and **OUT**.

If the system being installed includes one microphone, its **OUT** socket should be connected to the **IN** socket on the DCMI.

If the system requires more than one microphone, the additional microphones should be “daisy-chained” together. For example, two microphones would be wired by connecting the **OUT** socket of one to the **IN** socket on the DCMI as above, and then connecting the **OUT** socket of the next microphone to the **IN** socket of the first.

The diagram below illustrates the various methods of connection. Note that the third example illustrates the method of interfacing a PM16 to two DCMI's. In this case, the **CDPM/PM THRU** connector on the first DCMI is connected to the **IN** on the second, and the PM Zone Offset of the second would be set to +8. This would allow it to correctly interpret commands from paging buttons 9-16 on the PM16. See page 34 for full details of how to set **PM Zone Offset**.

NOTE: The **CDPM/PM THRU** connector is only intended for connection of additional DCMI units, not for additional PM paging microphones.



PM paging microphones can be connected to the DCMI and each other using standard Cat 5 cable. If crimping RJ45 plugs to install cabling, use the pinout in page 69. A full pinout of the PM Paging Interface Buss can be found in the appendix at the end of this manual.

## PM Terminations

The rules that apply to terminating a network of CDR-I remote control panels also applies to multiple PM paging microphones. The DCMI and a set of microphones should be considered as a “daisy-chain”, and buss terminations should be set ON in the two devices at the “ends” of the chain, and OFF in all others. The interconnection diagram above indicates how these rules are applied in the various possible wiring schemes.

- In the simplest implementation of just one paging microphone, the terminations should be set ON at both the DCMI and the microphone.
- If two or more microphones are daisy-chained to the DCMI's **IN** socket, terminations must be ON at the DCMI and the “end” microphone only.
- If two DCMI's are daisy-chained using the **IN** and **THRU** connectors, terminations at the “ends” of the chain should be ON. In Example 3 above, this will be at the paging microphone and DCMI #2. The termination in DCMI #1 should be set to OFF (as it is in the “middle” of the chain).

Refer to the PM Setup and Installation Guide (supplied with each PM paging mic) for information on setting the buss termination in the microphones.

The DCMI's PM buss termination is set by internal jumper J2. The termination is set ON when the jumper is in place. Remove it to set the termination OFF. (We suggest the jumper is left on one of the two pins in case it is required in the future.) See also page 65.

## PM DC power

The DCMI can supply DC to power one PM paging microphone. Powering of a microphone in this way is enabled with the internal jumper J14, which is set ON as the factory default. If the microphone connected to the DCMI's **CDPM/PM IN** port is self-powered, or powered from elsewhere in a PM network, this jumper should be removed. (We suggest the jumper is left on one of the two pins in case it is required in the future.) See page 69. for details of PSU and current ratings.

## Adjusting paging levels

Separate controls are available at the rear panel for setting PM microphone sensitivity and the paging level sent to each Zone. Full details on adjusting these can be found at page 46.

## Zone paging outputs

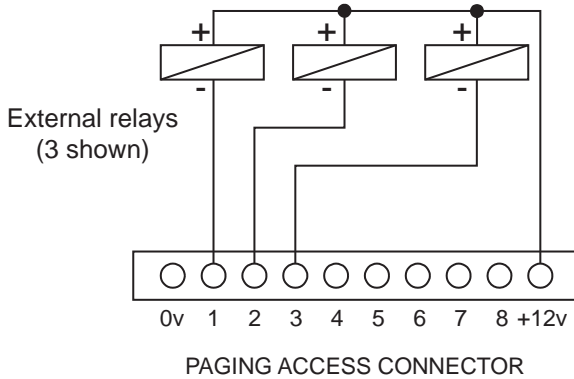
If a PM paging microphone system is the only one being used with a DCMI, the DCMI's **PAGING ACCESS** connector may be used to provide per-zone paging control outputs. These can be used, for example, to activate level restoration in 100 V line systems where local speaker volume controls are installed. When a zone is paged from the PM system, the control output for that zone activates (pulls down to 0V).

The **PAGING ACCESS** connector's default configuration is as a zone input connector for use with third-party paging systems. Re-assignment as an output connector is made via the menu system. See “Configure Access Connector” on page 33 for details.

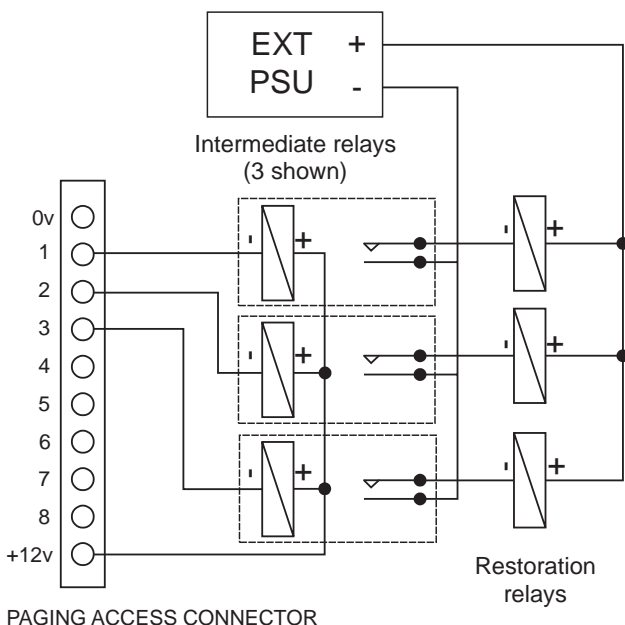
The connector is a 10-way screw-terminal type. The pinout is given in the table below:

PIN	FUNCTION
1	0V
2	Zone 1 active
3	Zone 2 active
4	Zone 3 active
5	Zone 4 active
6	Zone 5 active
7	Zone 6 active
8	Zone 7 active
9	Zone 8 active
10	+12V

For many systems, the DCM1's internal PSU will provide sufficient current to activate an external relay in each zone. Relays used in this way should have a coil voltage of 12V DC and draw less than 60 mA. The "Zone active" pins (2 - 9) should be wired to one side of the level restoration relay coils in the relevant zones. The other side of the relays should be commoned together and connected to the +12V pin (10). The diagram below illustrates this.

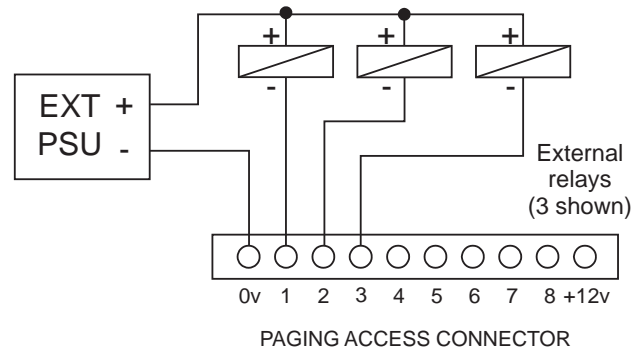


If the level restoration relay coils draw more than 60 mA per zone, additional intermediate relays and an external PSU must be installed. The basic wiring scheme shown above is used, but now the "External relays" will be the intermediate relays instead of the restoration relays themselves. The restoration relays are then wired via the intermediate relays' contacts to the external PSU, providing full electrical isolation between the DCM1 and the external level restoration system. This is shown in diagram a) below:



**Level Restoration relay wiring: a) using intermediate relays for isolation**

An external PSU should also be used in systems using relays with a coil voltage higher than 12 V. The "Zone active" pins are rated up to 24 V, so relays of up to 24 V may be switched directly as long as the current drawn remains below 60 mA. If either the maximum current rating of 60 mA or the maximum voltage rating of 24V is exceeded, intermediate relays must be installed as shown in diagram b).



**Level Restoration relay wiring: b) using external PSU for relays with a higher coil voltage than 12 v.**

With all wiring schemes, attention must be paid to relay polarity when wiring such a system, as the external relays will almost certainly have a diode in parallel with the relay coil to limit voltage spikes when the relay releases. Ensure that the positive (+ve, or red) terminal of the relay coil is commoned to the +12V pin (pin 10) of the **PAGING ACCESS** connector, or the positive terminal of an external PSU. The negative (-ve, or black) terminal of the relay coil should always be wired to the "Zone active" pin (2 - 9).

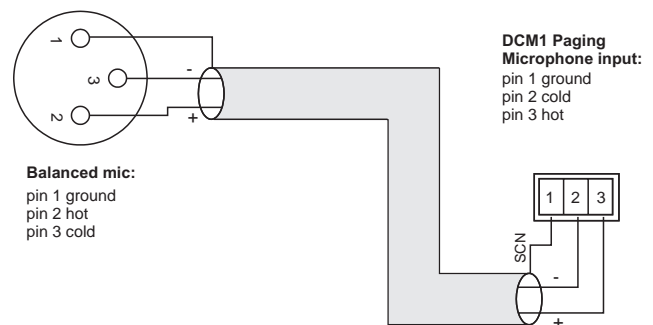
See page 69 for details of the DCM1's PSU capabilities.

### Third-party paging systems

The DCM1 may be integrated with any paging system which is able to provide a microphone feed and zone selection by contact closure.

#### Paging microphone input

A 3-pin screw terminal connector provides an electronically-balanced input for an external paging microphone. This should be connected to the external microphone using good quality low-noise microphone cable, using the wiring shown below:



12V phantom power is available at the input for microphones requiring it (e.g., electret mics). Phantom power is enabled by the internal jumper J24. The default setting for this jumper is with phantom power OFF; move the jumper to the other position to set phantom power ON. See page 65 for details of jumper locations.



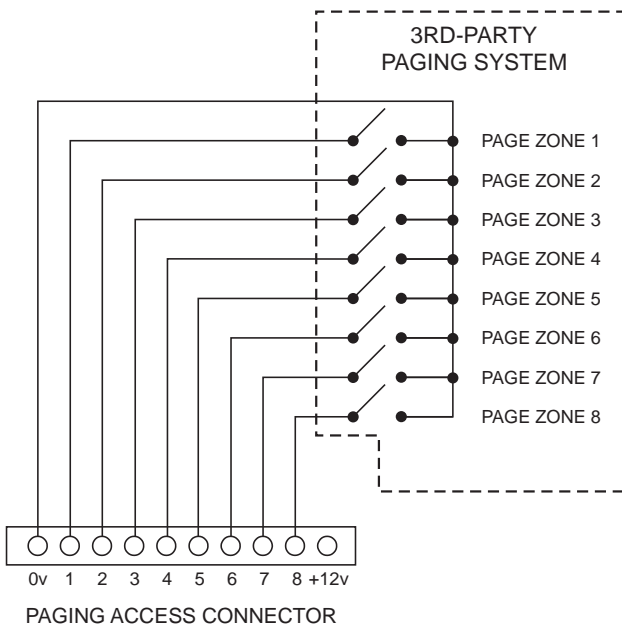
## Adjusting paging levels

Separate controls are available at the rear panel for setting microphone sensitivity and the paging level sent to each Zone. Full details on adjusting these can be found at page 46.

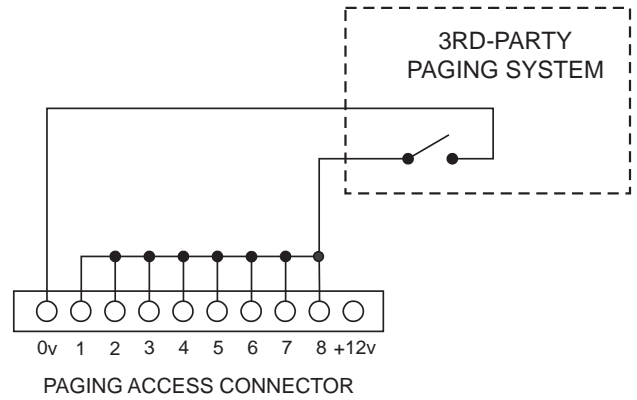
## Paging Access Connector

The **PAGING ACCESS** connector is used to activate the paging microphone and to select the zone(s) to which it is to be routed. It performs this function by default, though it can be re-defined in the menu system to provide per-zone control outputs when used with Cloud PM paging microphones (see page 24). (Should a system require the use of both PM and third-party paging systems, control outputs will not be available if the connector is to be used in its “input” mode.)

Zone activation occurs when one of the “zone active” pins (2 - 9) is shorted to 0V (available on pin 1). Third-party paging systems providing per-zone contact-closure on zone selection can thus be easily interfaced by wiring the external unit to the **PAGING ACCESS** connector as shown below:



The pinout is the same as that given in page 24. Multicore control cable should be used for the interconnection.



Some third-party paging systems have a single “page-all” command output, which activates all zones in use. In this case, use the wiring scheme shown above.

Visual indication that paging is taking place is given by the Paging Access LEDs on the front panel. The LED(s) illuminate to confirm the Zones being paged.

## Music Mute

External muting of music is available at the **MUSIC MUTE** connector. National or Local Authority regulations governing such systems may require that normal programme material (i.e., music) should be muted in an emergency, to ensure that any emergency messages are clearly audible.

The **MUSIC MUTE** input is on a 2-pin screw terminal connector. It should be connected to the appropriate alarm output on whichever building management system registers the alarm (typically the Fire System). The alarm output must be volt-free; if no such output is available, an intermediate relay or other isolation device must be installed between the alarm output and the Music Mute input.

The Mute input can be programmed to operate on either normally open (N/O) or normally closed (N/C) contacts via the menu system (see page 45). The factory default setting is N/O, thus requiring a short-circuit to be applied across the two pins of the connector for muting to occur.

Visual indication of muting being activated is given by the **MUSIC MUTE** LED on the front panel.

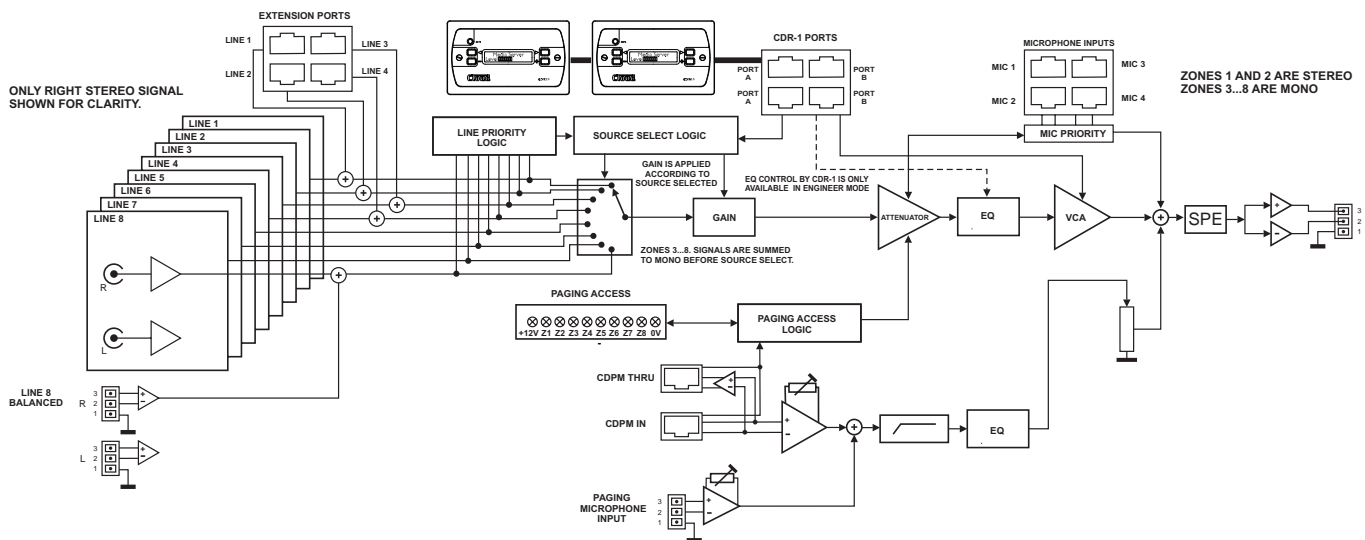
If the audio system itself is to be used to provide voice alarm and/or evacuation messages, the DCMI can be programmed to not mute one particular line input when Music Mute is made active. This input can be permanently connected to a sound store or emergency evacuation microphone, so that when activated, all inputs will be muted except the emergency source. If this facility is being used, care should be taken to ensure the emergency source is not made available to any zones in normal operation.



## Section 3: Configuration

The DCMI can be configured in a variety of ways to suit all installed situations. Most configuration functions are accessed through the menu system.

For convenience, the DCMI's basic block diagram is repeated here:



The menu system has two modes: User Mode and Installer Mode.

### User Mode:

User Mode is the default menu system mode which is available at all times. It provides the user with the system control functions needed on an everyday basis: music source selection and level control for each zone, and group activation.

### Installer Mode:

Access to Installer Mode is key-protected. The user should ensure that only authorised staff who have been trained in the DCMI's configuration functions know the key. Installer Mode allows adjustment of zone EQ, maximum and minimum levels, microphone assignments, paging and priority parameters, group membership and all other system setup parameters.

Installer Mode is selected by pressing the **INSTALL** button, and entering the key code via the numeric buttons below the display in response to the prompt **Enter Key**. The key is always a 4-digit number; only digits 1 to 8 are allowed. The factory default key can be found in the Appendix; users are strongly urged to change the key as soon as the system is commissioned. A time-out applies to Installer Mode; if no keys are pressed within 45 seconds, Installer Mode will cancel and the unit returns to User Mode.

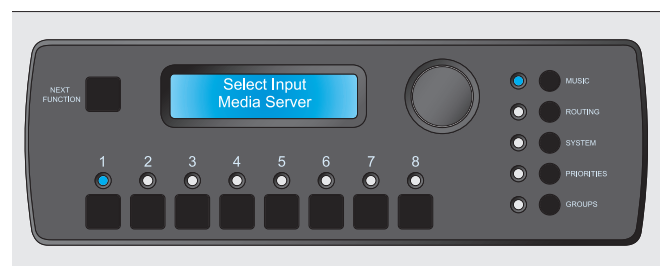
### Navigating the menu system

The menu structure is divided into five submenus:

- Music
- Routing
- System
- Priorities
- Groups

Each submenu is entered by pressing its dedicated button; selection is confirmed by its adjacent LED.

The Routing, System and Priorities submenus are only available in Installer Mode, as are most of the functions in the Music and Groups submenus.



Navigation within all the submenus is performed with the **NEXT FUNCTION** button, the rotary control and the eight numeric buttons. In general, **NEXT FUNCTION** button steps through the selected submenu one function at a

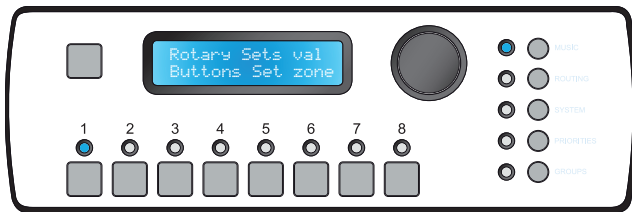
time and the rotary control changes the value of the function's parameter. Some submenu functions also make use of the "press" action of the rotary control. Entry to each submenu is always at the submenu's first function, and each submenu "loops round" its set of functions, with the first reappearing after the last.

The eight numeric buttons are used in various ways, and may refer to the eight zones, the eight music inputs, the four microphone inputs and so on, depending on the menu function currently selected. With most functions, the numeric buttons' adjacent LEDs confirm current status.

## Context-sensitive Help messages

The DCMI's menu system is equipped with simple Help text for user guidance. If no adjustment is made within 10 seconds of selecting a menu function, text appears on the display advising the operation of the rotary control and numeric buttons for the particular function. This text is maintained for 5 s, after which time the display reverts to the selected menu function.


An example is shown below:




## Timeout

The menu system has a time-out period. If no adjustment is made within 45 s, the menu system reverts to User Mode, Music Menu, Select Input.

## Accessing the menu system via the Utility Tool

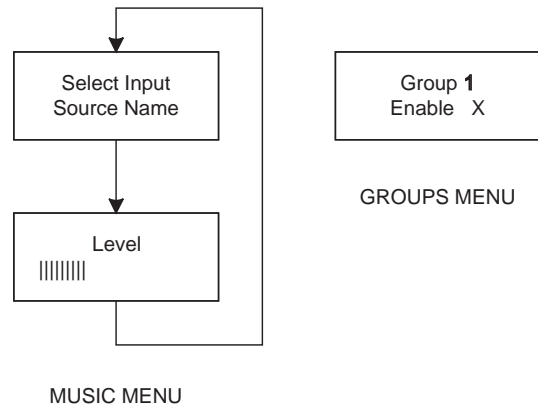
If a menu function is also available from the Cloud DCMI Utility Tool (see page 58), this is indicated by the  logo.

## Accessing the menu system via a browser (DCMI e only)

Where a menu function is also available on one of the DCMI's browser pages (see page 51), this is indicated by the  logo.

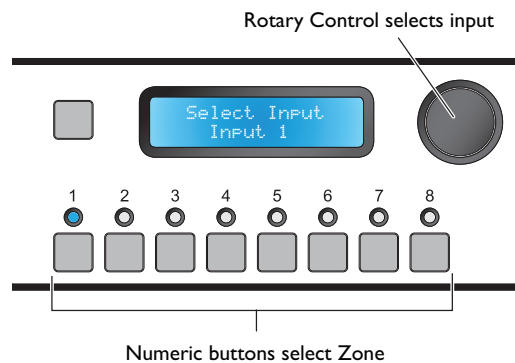
## User Mode

Only three menu functions are available to the User – two in the Music menu and one in the Groups menu. The required menu is selected by pressing the **MUSIC** or **GROUPS** buttons. The two functions in the Music menu are accessed by pressing the **NEXT FUNCTION** button adjacent to the display.



## Music menu

### Select Input



The **Select Input** function is where the user selects which music input source is to be routed to each Zone.

The eight numeric buttons correspond to the eight Zones; select the one to have an input assigned. If a Group is enabled, selecting any Zone that is a member of that Group selects all the Zones in the Group (see page 29); this is indicated by multiple LEDs being illuminated.

The rotary control scrolls through the available inputs; these will be displayed as **INPUT n** unless the inputs have been renamed, in which case the names will be displayed (see page 36 for details of renaming inputs). Selection is restricted to those inputs which have been enabled for the zone (the default is for all inputs to be enabled. See page 33).

Assignment of the music source takes effect as soon as the input name is displayed; no additional "presses" are required for the routing to change.

Note that this menu function is the default, and that all other menu functions time out after approx. 45 seconds of no activity. The menu system then reverts to Music Menu, **Select Input**.

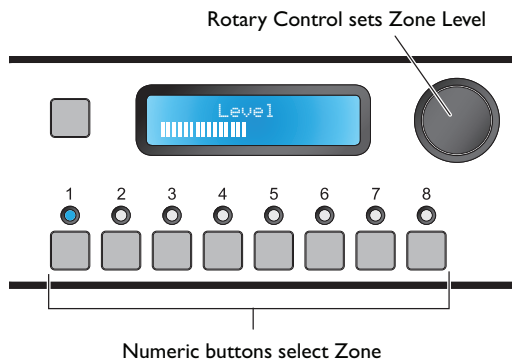
**UTILITY**

**Select Input** may be configured by clicking the **OUTPUTS** tab, selecting the **Zone** in the left-hand drop-down list, and then choosing the music source in the **Select Input** drop-down list. Click **Send Output** to transmit the new setting.

**DCM1e**

**Select Input** may be configured by selecting **Music**, followed by the **Zone** name (or number), and then choosing the music source in the **Line Input** select box.

**Level**



The **Level** function sets the volume of music in each Zone. The eight numeric buttons correspond to the eight Zones; select the one to have its level adjusted. If a Group is enabled, selecting any Zone that is a member of that Group selects all the Zones in the Group (see below). The rotary control adjusts the audio level in the selected Zone (or Group). An indication of relative level is given on the lower row of the display in the form of a bargraph.

**UTILITY**

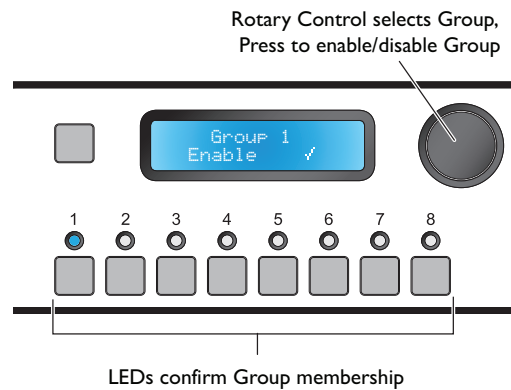
**Level** may be set by clicking the **OUTPUTS** tab, selecting the **Zone** in the left-hand drop-down list, and then setting the music volume (in dBs) from the **Level** drop-down list. Click **Send Output** to transmit the new setting.

**DCM1e**

**Level** may be set by selecting **Music**, followed by the **Zone** name (or number), and then setting the music volume, range 0 (mute) to 25 (max.) in the **Level** select box.

**Groups menu**

**Group Enable**



The **Group Enable** menu function allows Groups of Zones to be enabled or disabled. The Groups must have been previously defined – see page 46).

The rotary control selects the Group (1 to 4) to be enabled/disabled. These will be displayed as **GROUP n** unless they have been renamed, in which case the names will be displayed (see page 37 for details of renaming Groups).

Press the rotary control to enable or disable the Group. The lower row of the display will show either a cross (X) or a tick (✓) to confirm that the Group is disabled or enabled respectively.

The LEDs above the numeric buttons illuminate in this menu function to confirm Zone membership of the selected Group. The buttons themselves are not used.

**UTILITY**

**Group Enable** may be configured by clicking the **OUTPUTS** tab, selecting the **Group** in the left-hand drop-down list (below Zone 8), and then clicking in the **Enabled** checkbox in the **Group Members** area. Click **Send Output** to transmit the new setting.

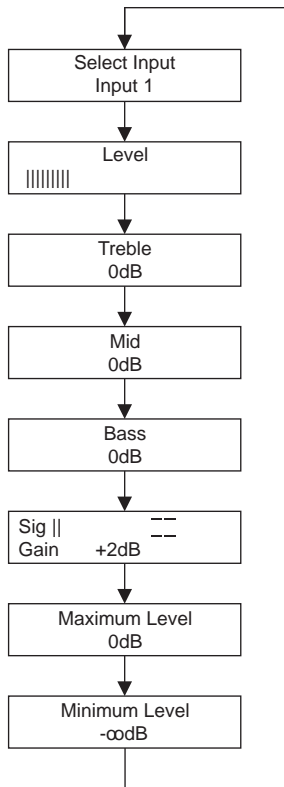
**DCM1e**

**Group Enable** may be configured by selecting **Grouping**, followed by the **Group** name (or number), and then clicking on the symbol adjacent to the **On/Off** select box (✓ = enabled; X = disabled).

## Installer Mode

The remainder of the DCMI's menu system is only available in Installer Mode; this is accessed by pressing the **INSTALL** button and entering the key in response to the display prompt. Installer Mode self-cancels after 45 seconds if no further adjustments are made.

## Music Menu



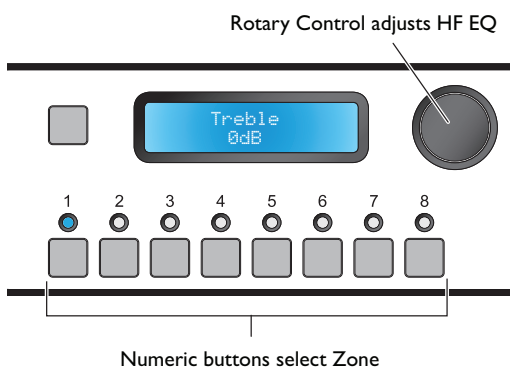
### Select Input

This function is described above, in User Mode.

### Level

This function is described above, in User Mode.

### Treble



This adjusts the music high-frequency EQ in each Zone. The equaliser is a 6 dB/octave shelving filter with a 3 dB point at 10 kHz.

The eight numeric buttons correspond to the eight Zones; select the one to have its EQ adjusted.

The rotary control adjusts the HF EQ in the selected Zone. The range of adjustment available is  $\pm 14$  dB in 2 dB steps.

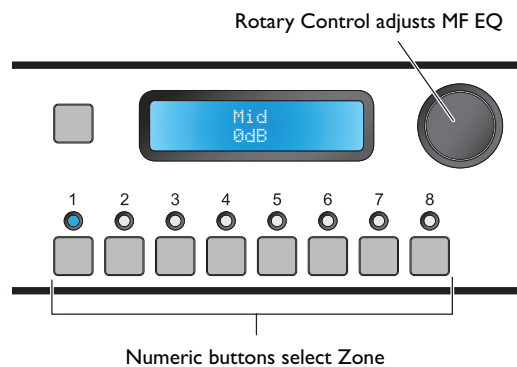
#### UTILITY

**Treble** may be adjusted by clicking the **OUTPUTS** tab, selecting the **Zone** in the left-hand drop-down list, and then setting the HF EQ ( $\pm 14$  dB) from the **Treble** drop-down list in the **EQ** area. Click **Send Output** to transmit the new setting.

#### DCMIe

**Treble** may be adjusted by selecting **Music**, followed by the **Zone** name (or number), and then setting the HF EQ ( $\pm 14$  dB) in the **Treble** select box.

### Mid



This adjusts the music mid-frequency EQ in each Zone. The equaliser is a simple bell filter with a centre frequency of 1.2 kHz.

The eight numeric buttons correspond to the eight Zones; select the one to have its EQ adjusted.

The rotary control adjusts the MF EQ in the selected Zone. The range of adjustment available is  $\pm 14$  dB in 2 dB steps.

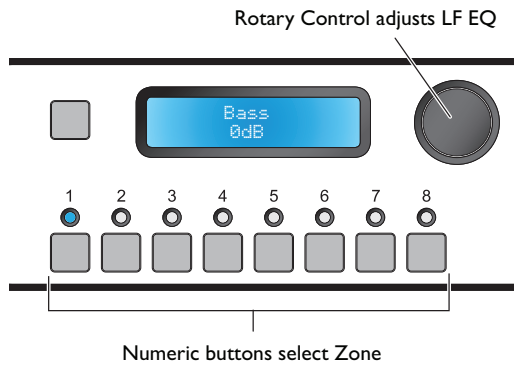
#### UTILITY

**Mid** may be adjusted by clicking the **OUTPUTS** tab, selecting the **Zone** in the left-hand drop-down list, and then setting the MF EQ ( $\pm 14$  dB) from the **Mid** drop-down list in the **EQ** area. Click **Send Output** to transmit the new setting.

**DCM1e**

**Mid** may be adjusted by selecting **Music**, followed by the **Zone** name (or number), and then setting the MF EQ ( $\pm 14$  dB) in the **Mid** select box.

**Bass**



This adjusts the music low-frequency EQ in each Zone. The equaliser is a bell filter with a centre frequency of 50 Hz.

The eight numeric buttons correspond to the eight Zones; select the one to have its EQ adjusted.

The rotary control adjusts the LF EQ in the selected Zone. The range of adjustment available is  $\pm 14$  dB in 2 dB steps.

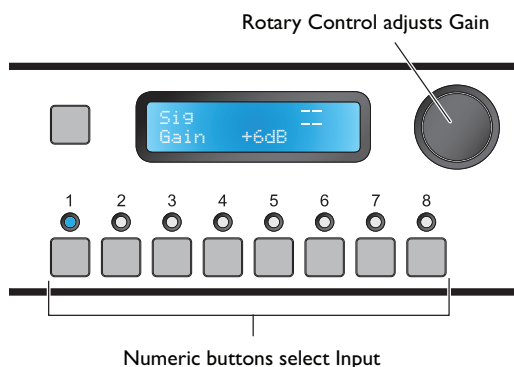
**UTILITY**

**Bass** may be adjusted by clicking the **OUTPUTS** tab, selecting the **Zone** in the left-hand drop-down list, and then setting the LF EQ ( $\pm 14$  dB) from the **Bass** drop-down list in the **EQ** area. Click **Send Output** to transmit the new setting.

**DCM1e**

**Bass** may be adjusted by selecting **Music**, followed by the **Zone** name (or number), and then setting the LF EQ ( $\pm 14$  dB) in the **Bass** select box.

**Input Gain**



The **Input Gain** function allows adjustment of the level of each music input, so that sources with different output levels can be matched in volume. This adjustment will affect the audio level of the selected source in all Zones.

The gain control range is deliberately restricted to  $\pm 12$  dB, but it should permit input levels to be adjusted to suit most sources. Should it prove inadequate, the output level of the source should be adjusted instead.

Adjustment of input gain is not available for sources connected via LE-I and BE-I remote input modules. The presence of these modules at the Extension Ports is detected, and the gain on inputs in use is then fixed at -6 dB. In the case of the LE-I, input gain should be adjusted with the controls provided on the input module itself; on the BE-I, which is normalised for 0 dBu operation, the signal level will need to be adjusted at the source.

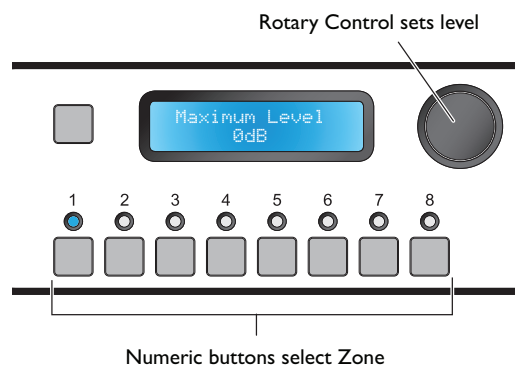
The eight numeric buttons correspond to the eight line inputs; select that to be adjusted.

The rotary control adjusts the input gain. The range of adjustment available is  $\pm 12$  dB in 1 dB steps.

A bargraph meter is displayed on the top row of the LCD. It indicates input signal level; the gain should be adjusted so that the deflection reaches the “target area” at the right-hand end, indicated by horizontal lines.

**Input Gain** may be set by clicking the **INPUTS** tab, selecting the **Input** in the **LINE INPUT** drop-down list, and then setting the gain ( $\pm 12$  dB) from the **Input Gain** drop-down list. Click **Send Input** to transmit the new setting.

**Maximum Music Level**



This menu function allows a maximum music level to be set for each Zone. This is useful when audio amplifiers of similar ratings are being used for each Zone, but different music volumes are required in the various Zones. Once set, users will not be able to raise the volume for a Zone above the preset maximum either from a CDR-I remote control in the Zone or from the DCM1 itself.

The eight numeric buttons correspond to the eight Zones; select that to be adjusted. The Maximum Level setting is *per-Zone* only; the function is disabled if a Zone which is

a member of a currently-enabled Group is selected. If the Maximum Level setting cannot be altered, check the settings in the **Group Enable** function (in the Music menu).

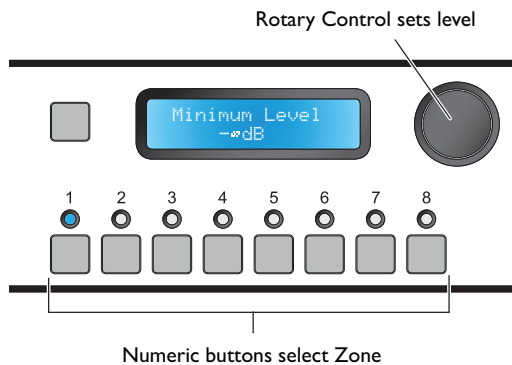
The rotary control sets the maximum output level for the selected Zone. The range of adjustment is from 0 dB (the default) to -62 dB in 1 dB steps, where 0 dB means that no restriction on maximum level is applied.

Note that it is not possible to set the Maximum Level equal to or lower than any Minimum Level which has been set (see below). Thus if the Minimum Level for a Zone has been set to -30 dB, the Maximum Level must be in the range 0 dB to -29 dB.

**UTILITY**

**Maximum Music Level** may be adjusted by clicking the OUTPUTS tab, selecting the Zone in the left-hand drop-down list, and then setting the maximum level from the **Max Level** drop-down. Click **Send Output** to transmit the new setting.

### Minimum Music Level



This menu function allows a minimum music level to be set for each Zone. This prevents users from lowering the music volume in a Zone below a preset minimum (or turning it down completely) either from a CDR-I remote control in the Zone or from the DCMI itself.

The eight numeric buttons correspond to the eight Zones; select that to be adjusted. As with Maximum Level, this function is disabled for Zones belonging to enabled Groups.

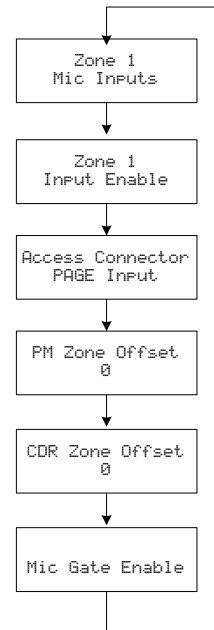
The rotary control sets the minimum output level for the selected Zone. The range of adjustment is from -∞ dB (the default) to -1 dB in 1dB steps, where -∞ dB means that no restriction on minimum level is applied, and that the volume in the selected Zone can be reduced to zero.

Note that it is not possible to set the Minimum Level equal to or higher than the Maximum Level which has been set (see above). Thus if the Maximum Level for a Zone has been set to -10 dB, the Minimum Level must be in the range -∞ dB to -11 dB.

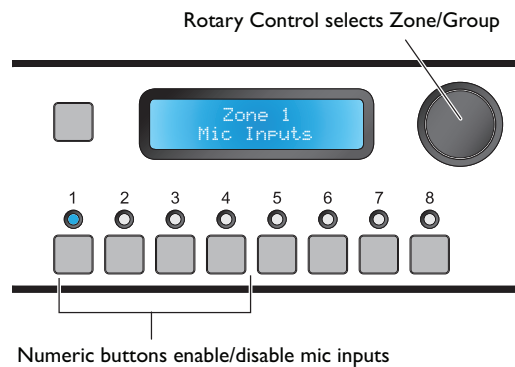
**UTILITY**

**Minimum Music Level** may be adjusted by clicking the OUTPUTS tab, selecting the Zone in the left-hand drop-down list, and then setting the minimum level from the **Min Level** drop-down. Click **Send Output** to transmit the new setting.

### Routing Menu



### Enable Mic Inputs



If ME-I remote mic input modules form part of the system, it is likely that they will not be used all the time, and that any mics connected to them will not necessarily need to be heard in the same Zone(s) on every occasion. The **Enable Mic Inputs** menu function allows the operator to activate each of the DCMI's microphone inputs as required, and to determine which Zone(s) each is routed to.

The DCMI imposes no restrictions on mic routing, and it is important to note that any of the four Mic Inputs may be routed to any Zone, regardless of the physical location within the installation of the ME-I modules connected to a particular input.



In practice, many installations will only ever require a microphone input to route to the Zone where that microphone is physically connected. The rotary control selects the Zone; these will be displayed as **Zone n** unless the Zones have been renamed, in which case the names will be shown (see page 37 for details of renaming Zones).

Note that rotating the control “beyond” Zone 8 allows Groups 1 to 4 to be selected as well. This permits use of microphones to be enabled in some areas only when a Group is in use.

The first four numeric buttons correspond to Mic Inputs 1 to 4. Default assignment is for all Mic Inputs to be OFF. Pressing a key enables that Mic Input for the selected Zone or Group; a second press disables it. Note that the key LEDs indicate current Mic Input-to-Zone/Group assignment at all times.

Because ME-I remote mic input modules can be “daisy-chained”, enabling one of the DCMI’s Mic Inputs will enable all ME-I modules connected to that input.

No separate mic level control is available on either the DCMI or CDR-I. Adjustment of microphone volume should be made from the controls on the ME-I modules themselves.

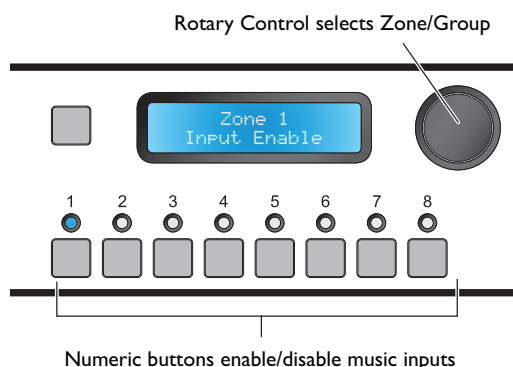
### UTILITY

**Enable Mic Inputs** may be configured by clicking the **OUTPUTS** tab, selecting the **Zone** in the left-hand drop-down list, and then clicking in the appropriate **Mic** checkbox in the **Mic Inputs** area. Click **Send Output** to transmit the new setting.

### DCM1e

**Enable Mic Inputs** may be configured by selecting **Inputs**, followed by the **Zone** or **Group** name (or number), and then clicking on the symbol adjacent to the **Mic n** select box (✓ = enabled; X = disabled).

### Input Enable



In some installations, it may be desirable to restrict the range of music inputs which can be selected in one or more zones. The **Input Enable** menu function allows the operator to determine which Music Inputs are available for selection

in each Zone. The default setting is for all Music Inputs to be available in every Zone. If some inputs are disabled for a particular Zone, they will no longer appear on-display to the user in the **Select Input** function of the Music menu in either Installer or User modes for that Zone. It will also be removed from the display on any CDR-I remote controls assigned to that Zone.

The rotary control selects the Zone in which music inputs are to be enabled or disabled. Note that rotating the control “beyond” Zone 8 allows Groups 1 to 4 to be selected as well to permit source to be enabled for Groups independently from Zones.

The eight numeric buttons correspond to the eight Music Inputs. Default assignment is for all inputs to be enabled for all eight Zones and all four Groups. Pressing a key disables that Music Input from selection in the currently-displayed Zone or Group; a second press enables it. Note that the key LEDs indicate the current per-Zone availability of inputs at all times.

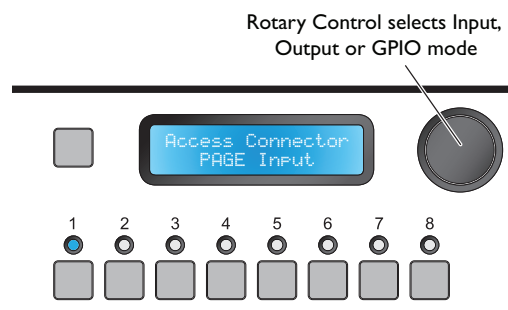
### UTILITY

**Input Enable** may be configured by clicking the **OUTPUTS** tab, selecting the **Zone** in the left-hand drop-down list, and then clicking in the appropriate **Line** checkbox(es) in the **Input Enable** area. Click **Send Output** to transmit the new setting.

### DCM1e

**Input Enable** may be configured by selecting **Inputs**, followed by the **Zone** or **Group** name (or number), and then clicking on the symbol adjacent to the **Input** select box(es) (✓ = enabled; X = disabled). Note that if the inputs have been renamed, the names are displayed instead of **Input n**.

### Configure Access Connector



This menu function configures how the rear panel **PAGING ACCESS** Connector (see page 15, 6) is to be used. There are three options: it can operate as an input or an output in conjunction with the DCMI’s paging facilities, or as an 8-way GPIO port. Use the rotary control to change the setting.



The default setting is **PAGE Input**. This configures the connector to be used for Zone selection with a third-party paging system. The next option, **PAGE Output**, should be used when the DCMI is connected to a Cloud PM or CDPM paging microphone(s), and per-zone contact closures are required as tallies, normally for volume restoration purposes. See page 23 for full details of how to wire the **PAGING ACCESS** connector when used for these purposes.

The third option configures the **PAGING ACCESS** connector as a GPIO (General-purpose Input-Output) port. In this mode, it cannot be used in conjunction with paging microphones for either zone selection or zone tally outputs. When set as a GPIO port, serial data received at the **RS232 INTERFACE** (and/or **ETHERNET INTERFACE** in the case of the DCMIe) can set individual channels logic-high or logic-low (outputs), or the status of channels can be interrogated and reported using RS-232 serial data (inputs).

The default allocation is with all eight channels of the port as outputs, denoted on the lower row of the display as **GP 00000000**. Turning the rotary control further clockwise re-assigns each channel in turn as an input, e.g., **GP 10000000**, **GP 11000000**, and so on. Note that channels set as inputs must always form a consecutive block numbered 'up' from pin 1; likewise channels set as outputs must always form a consecutive block numbered 'down' from pin 8. See page 67 for more details of how to use the **PAGING ACCESS** connector as a GPIO port.

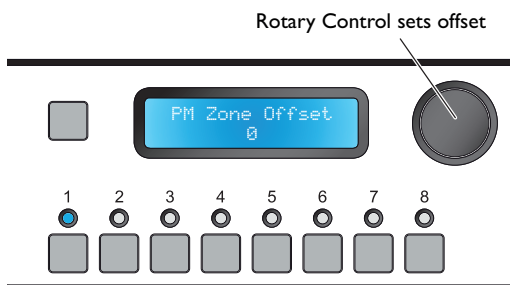
The numeric buttons are not used in this function.

### UTILITY

**Configure Access Connector** may be accessed by clicking the **SYSTEM** tab, and setting **Access Contacts** to either **Input** or **Output\*** in the **Paging Mic** area. Click **Send System** to transmit the new setting.

\*An updated version of the Utility Tool including GPIO configuration of the Access Connector will be available during 2014.

### PM Zone Offset



The purpose of the PM Zone Offset menu function is to permit Cloud PM and CDPM paging microphones to address more than 8 zones.

Cloud PM and CDPM systems can address up to 16 Zones (model-dependent). To permit paging of Zones 9 and higher in a system utilising two DCMI's, a fixed numeric offset of 8

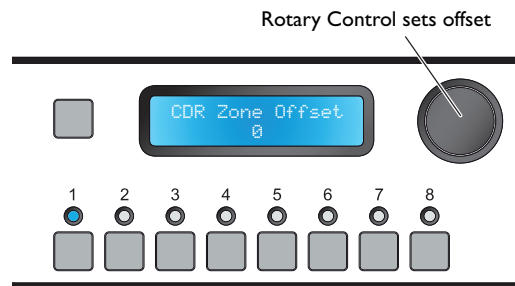
should be set in the "second" DCMI (and left at the default value of 0 in the "first"). With the first DCMI feeding audio to Paging Zones 1 to 8 and the second to Paging Zones 9 to 16, correct paging of the higher-numbered Zones will result.

The rotary control is used to adjust the offset value in the range 0 (the default) to 15. Values other than 0 or 8 will only be applicable to hybrid systems composed of a DCMI and mixers of some other type, or when a "zone overlap" is required for operational reasons. The numeric buttons are not used in this function.

### UTILITY

**PM Zone Offset** may be accessed by clicking the **SYSTEM** tab, and selecting the required offset value in the **CDPM Offset** drop-down list in the **Paging Mic** area. Click **Send System** to transmit the new setting.

### CDR Zone Offset



DCMI's may be linked together via the CDR-I buss to allow systems with more than eight zones to be configured. To maintain the freedom of CDR-I network wiring, a CDR Zone Offset is applied to the second (and subsequent) DCMI's, in order that the CDR-I's are able to recognise that the system comprises 16 (or more) zones.

Use the rotary control to set the CDR Zone Offset on the second (and subsequent) DCMI's. The offset is in multiples of 8.

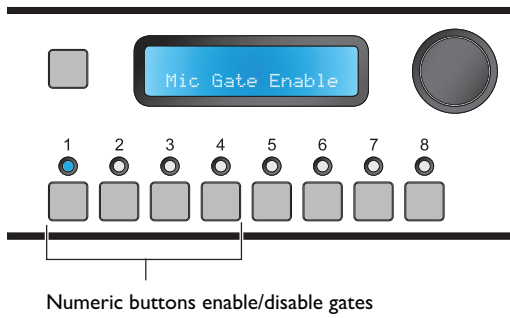
For a 16-zone system using two DCMI's, an offset of +8 is applied to the "second" DCMI, whose outputs feed Zones 9 to 16. The "first" DCMI, whose outputs feed Zones 1 to 8 is left with an offset of zero. With the CDR-I network connected to both DCMI's, all 16 zones will now be available to each CDR-I for assignment.

CDR Zone Offset need not be altered from zero if each DCMI in a multiple system has its own independent "daisy-chains" of CDR-I's, and there is no CDR link between the units.

### UTILITY

**CDR Zone Offset** may be accessed by clicking the **SYSTEM** tab, and selecting the required offset value in the **CDR Offset** drop-down list. Click **Send System** to transmit the new setting.

### Mic Gate Enable



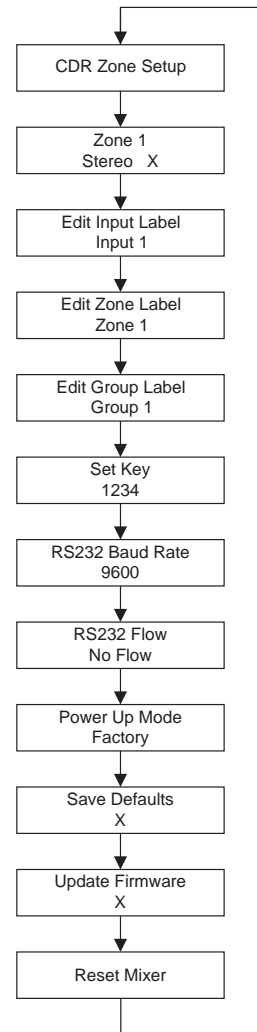
The ME-I remote input module incorporates a noise gate to reject unwanted background noise when the microphone connected at the module is not in use. The **Mic Gate Enable** menu function allows the noise gate to be switched on or off. The first four numeric buttons correspond to the four **MICROPHONE INPUTS** on the rear panel; the default setting is for the noise gates to be active, and this is indicated by the LEDs being illuminated.

The rotary control is not used in this function.

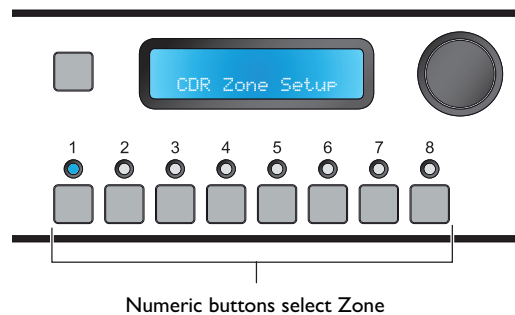
**UTILITY**

**Mic Gate Enable** may be configured by clicking the SYSTEM tab, and then clicking in the appropriate Mic checkbox(es) in the Mic Gates area. Click Send System to transmit the new setting.

### System Menu



### CDR Zone Setup



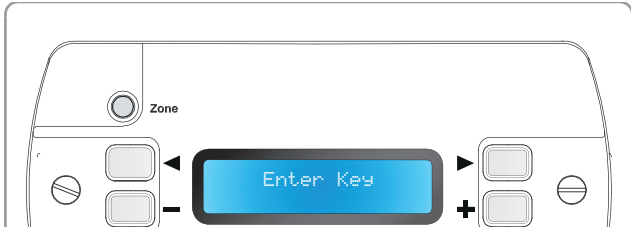
The **CDR Zone Setup** menu function lets the operator put the CDR-Is in a system into **Engineer Mode**. In this mode, per-Zone output EQ can be adjusted locally, in the zone itself. This permits much faster and easier optimisation of the sound as the adjustment is made from the CDR-I(s) rather than from the DCMI.

The eight numeric buttons correspond to the eight Zones; select the Zone(s) where EQ is to be adjusted by pressing the appropriate key(s). The default is for EQ Setup Mode to

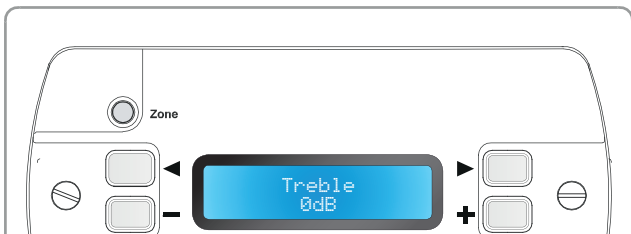
be OFF for all Zones. A second press exits the mode. Note that the keys' illumination indicates current Zone status at all times.

The rotary control is not used in this function.

Once a Zone has been enabled, pressing the ZONE button twice on the CDR-1(s) in the Zone will bring up the **Enter Key** request (see note below).

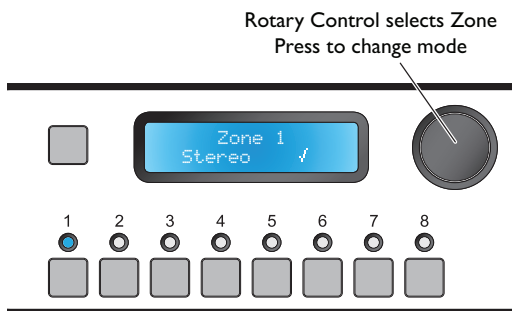


When the CDR-1 key has been entered, the first EQ adjustment screen (Treble) opens. Adjustment of HF EQ can be made with the + and - buttons. The available range is  $\pm 14$  dB, in 2 dB steps.



Further presses of the **Zone** button allow the MF (Mid) and LF (Bass) EQs to be adjusted similarly. Pressing the **Zone** button from the Bass screen returns the display to the level adjustment screen. EQ Setup Mode times out after a short period, after which time the key will need to be re-entered.

### Stereo/Mono Zone selection



This menu function configures Zone outputs 1 and 2 as either stereo or mono. (Note that Zone outputs 3 to 8 are always mono.)

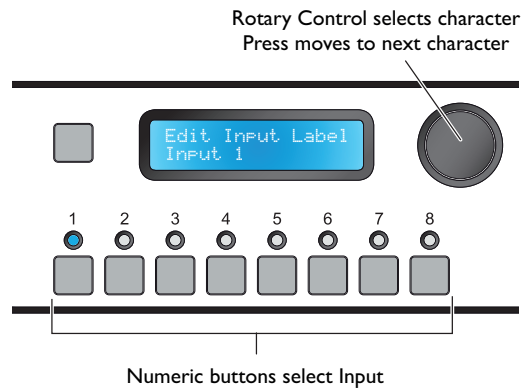
The rotary control selects Zone 1 or Zone 2 (by name if they have been renamed). Pressing the control inwards sets the Zone output to stereo (✓) or mono (X). The numeric buttons are not used in this function.

Stereo music sources will be reproduced in stereo in Zones 1 and 2 if they are configured for stereo. Stereo is the default setting for both Zones 1 and 2.

### UTILITY

**Stereo/Mono Zone Selection** may be made by clicking the **OUTPUTS** tab, selecting **Zone 1** or **Zone 2** from the drop-down list on the left-hand side, and selecting Stereo or Mono in the **Output Type** window. Click **Send Output** to transmit the new setting.

### Rename Inputs



By default, the eight music inputs appear in the display as **Input 1** to **Input 8**. This menu function allows the operator to rename them (typically to confirm the source, e.g., MP3 dock, DAB, Jukebox, Server, TV, etc.)

The eight numeric buttons correspond to the eight Music Inputs; select that to be renamed.

The current name of the selected Input is shown on the lower row of the display, with the first character flashing. Rotating the rotary control changes the character. Clockwise rotation advances through the alphabet, anticlockwise reverses. When the required character is flashing, press the rotary control to select it and advance to the next character.

As well as upper- and lower-case letters of the alphabet, many non-alphabetical characters are also available. The full set, in the order in which they are presented, is shown below.

```
(sp)!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN
OPQRSTUVWXYZ[¥]^_`abcdefghijklmnopqrstuvwxyz{|}
```

Note the first character (obtained by rotating the control fully anticlockwise) is the *space* character. The software automatically interprets two adjacent space characters to mean the end of the text string; this saves overwriting part of a long name with multiple spaces when replacing it with a shorter one.

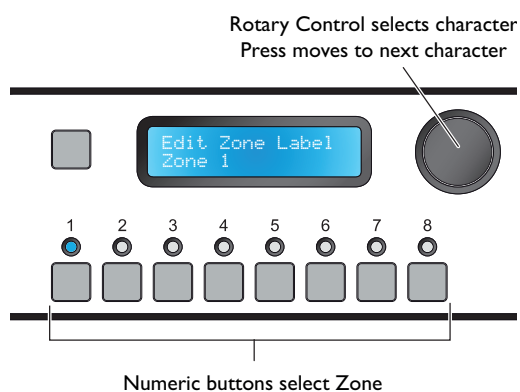
## UTILITY

Inputs may be renamed from the Utility Tool by clicking the **INPUTS** tab, selecting an input from the **Line Input** list and changing the default name for the input (**Input n**) in the **Name** field. Click **Send Input** to transmit the new setting.

## DCM1e

Inputs may be named from the browser by selecting **Config**, then **Labelling**; select the text field containing the current name of the required input (the default name will be **Input n**), and enter the new name. Click the **Upload** button to confirm the change; click the **Refresh** button to download the DCM1e's current labels into the browser interface.

### Rename Zones



By default, the eight output Zones appear in the display as **Zone 1** to **Zone 8**. This menu function allows the operator to rename them (to confirm the area being controlled, e.g., Bar, Restaurant, Reception, etc.)

The eight numeric buttons correspond to the eight Zones; select the one to be renamed.

The procedure used to rename the Zones is otherwise identical to that described above for Music Inputs.

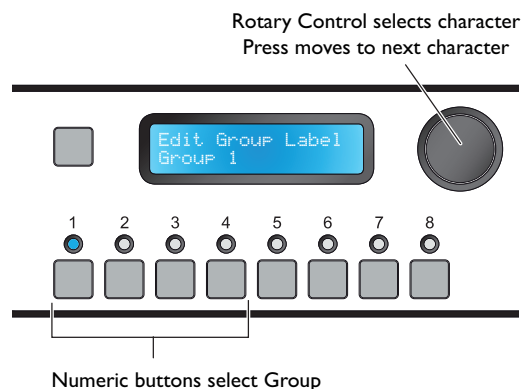
## UTILITY

Zones may be renamed from the Utility Tool by clicking the **OUTPUTS** tab, selecting a zone from the drop-down list on the left-hand side and changing the default name for the zone (**Zone n**) in the **Zone Name** field. Click **Send Output** to transmit the new setting.

## DCM1e

Zones may be named from the browser by selecting **Config**, then **Labelling**; select the text field containing the current name of the required zone (the default name will be **Zone n**), and enter the new name. Click the **Upload** button to confirm the change; click the **Refresh** button to download the DCM1e's current labels into the browser interface.

### Rename Groups



By default, the four Zone Groups appear in the display as **GROUP 1** to **GROUP 4**. This menu function allows the operator to rename them (i.e., to distinguish them more readily from their component Zones).

The first four numeric buttons correspond to the four Groups; select the one to be renamed.

The procedure used to rename the Groups is otherwise identical to that described above for Music Inputs.

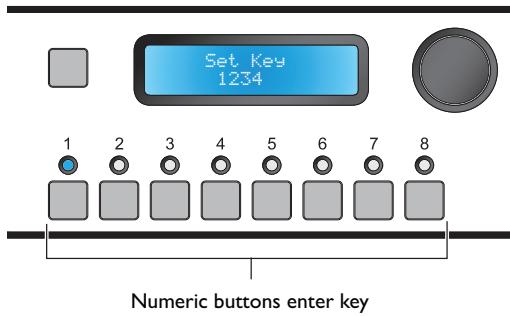
## UTILITY

Groups may be renamed from the Utility Tool by clicking the **OUTPUTS** tab, selecting a Group from the drop-down list on the left-hand side (Groups follow Zone 8) and changing the default name for the Group (**Group n**) in the **Zone Name** field. Click **Send Output** to transmit the new setting.

## DCM1e

Groups may be named from the browser by selecting **Config**, then **Labelling**; select the text field containing the current name of the required group (the default name will be **Group n**), and enter the new name. Click the **Upload** button to confirm the change; Click the **Refresh** button to download the DCM1e's current labels into the browser interface.

## Set Key



This menu function enables the DCM1 Installer Mode key to be changed from the factory default setting of 1234. Changing the key from the default to one “less obvious” is strongly recommended.

The key may be any 4-digit number, but comprised of digits 1 to 8 only.

Enter the new 4-digit key using the eight numeric buttons. No additional actions are required for the new key to become active.

### UTILITY

The Installer Mode key may be changed from the INSTALLER KEY tab. Enter the current key in the **Old Key** field, then enter the new key in both the **New Key** and **Repeat New Key** fields. Click **Send Key** to transmit the new setting.

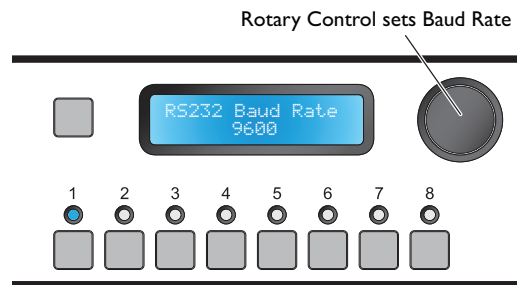
### DCM1e

The Installer or Power Keys may be changed from the browser window by selecting **Config**, then **Change PIN**. Enter the current key in the **Enter your current PIN** field, then enter the new key in both the **Add a new PIN** and **Confirm your new PIN** fields. Click the **Reset** button to confirm the change. The key changed will be that corresponding to the original PIN entered.

**NOTE:** There may be occasions where it is necessary to access Installer Mode to change the Installer key, without knowing the current Installer key. This typically happens some time after a system has been installed, when the original installer is no longer available.

In this situation, turn the DCM1 off, remove the top cover and move jumper J8 to its alternative position. (See page 65 for details of jumper locations.) This forces the Installer Key to the original factory default. Power the DCM1 on, and enter Installer Mode, using the default key. Set a new key in the **Set Key** menu function. Then go to the **Save Defaults** menu function (see page 39) and press the rotary control to save the current settings. Turn the DCM1 off, replace J8 to its original position and refit the top cover. On re-powering the DCM1, the new key will be required to access Installer Mode.

## RS232 Baud Rate



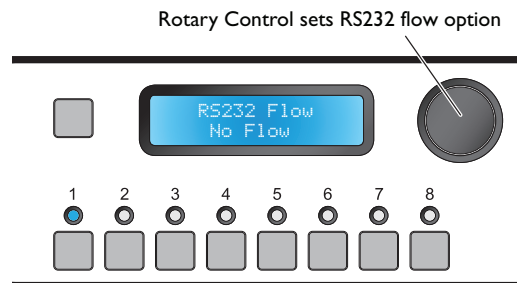
This menu function sets the data rate (baud rate) of the DCM1’s RS-232 Control Port. If no external control system or other equipment is connected to the RS-232 port, the setting can be ignored.

Most control systems and other equipment using RS-232 are able to operate with a wide range of baud rates. It may be simpler to set the baud rate at the controller and leave the DCM1’s setting at the default.

The default setting is 9600 baud (displayed as ~~9600~~). Use the rotary control to change the setting. Alternative baud rates are 300, 1200, 2400, 4800 and 19200. The baud rate applies to both data transmit and receive.

The numeric buttons are not used in this function.

## RS232 Flow



Some external equipment requires the RS-232 ports of devices to which they are connected to be configured in a certain way, particularly in regard to the way data flow between the transmitting and receiving device is managed. The two most common methods of data flow control are **Xon/Xoff** and **RTS/CTS**, alternatively referred to as software control and hardware control respectively.

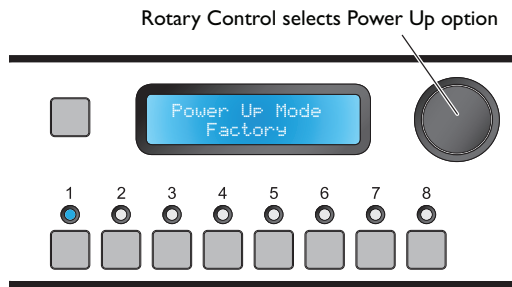
The rotary control selects which of these control methods is applied to the port. A third option, the default, is for no flow control to be applied.

The numeric buttons are not used in this function.

Note that hardware flow control requires additional pins on the RS-232 port to be connected. See page 66 for more details.



## Power Up Mode



It will often be desirable for the DCMI's settings, such as input selections, levels, etc., to be automatically restored to a known state when it is re-powered after being off for a period (intentionally or otherwise). The **Power Up Mode** function determines the state the DCMI "wakes up" in when it is powered-up.

The rotary control selects the active Power Up option from the three available: **Factory**, **Default** and **Last Known**.

With **Factory** set, the DCMI will always return to its original factory settings on power-up; a list of the factory settings can be found at page 71. If **Power Up Mode** is set to **Default**, the settings which have been saved by the user in the **Default** memory (see below) are restored.

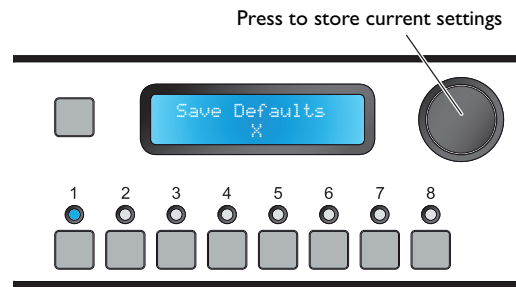
The third option, **Last Known**, will restore the DCMI to the settings they were in when the unit was last powered off. This is the option that **Power Up Mode** is set to have when the unit is first shipped from the factory, but the unit's actual settings at this time will be the factory default set. Until some changes are made, both **Last Known** and **Factory** will result in the factory default settings being restored.

The numeric buttons are not used in this function.

### UTILITY

The **Power Up Mode** function can be selected from the **SYSTEM** tab of the Utility Tool. Select the required setting from the drop down list at **Power Up Mode**. Click **Send System** to transmit the new setting.

## Save Defaults



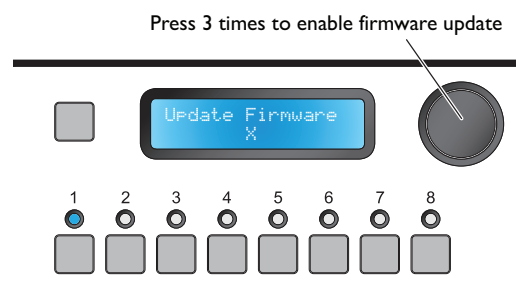
When the rotary control is pressed in, all the unit's current settings are stored in power-safe memory. The contents of this memory are then re-loaded on power-up, if **Default** or **Last Known** is set as the option in the **Power Up Mode** function (see above).

The numeric buttons are not used in this function.

### UTILITY

Clicking the **Set Defaults** button in the lower pane of the Utility Tool window corresponds to the **Save Defaults** function described above.

## Update Firmware



This menu function is used when a firmware update is installed. See page 70 for full details of firmware Updates.

Pressing the control knob three times in quick succession prepares the DCMI for the firmware update. The **X** in the display changes to a **✓**. At this point a further press cancels the procedure. Otherwise, the DCMI will expect to install the new firmware next time it is reset (see **Reset Mixer** below), or re-powered.

Neither rotation of the control knob nor the numeric buttons are used in this function.

The **Update Firmware** menu function also lets you check the versions of firmware and software versions currently installed in the DCMI. If no controls are touched, the Help text will appear after approximately 10 seconds, after which the firmware and software versions will be displayed for a few seconds.

## DCM1e

First download the DCM1e firmware update from [www.cloud.co.uk](http://www.cloud.co.uk); check the update notes to confirm that the update is applicable to your device. Connect to the DCM1e using a web browser. Click **Menu**, then **Login**. Enter the Installer PIN to log in as installer.

Click **Menu**, then **Config** then **Device Info**. Click **Upload**. Enter the Installer PIN again.

The DCM1e will now enter bootloader mode.

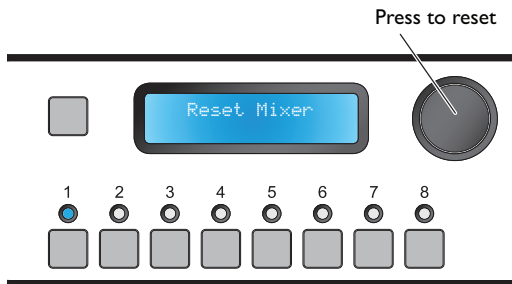
Run the Firmware Update application on a Windows® PC connected to the same network.

Click **Discover**. Click the IP Address listed in **BOLD** font. Check and confirm which settings you would like to overwrite on the Update interface. Click **Update**.

Wait for the **Firmware updated successfully** dialogue

Click **OK**, then close the Updater.

## Reset Mixer



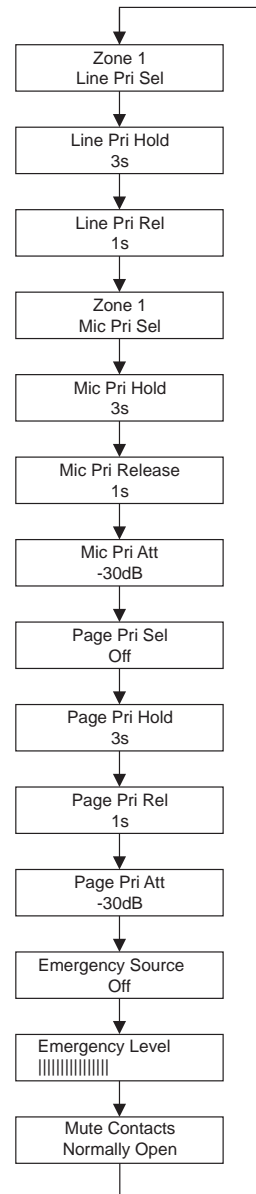
This menu function can be used to perform a hardware reset. This is equivalent to powering the DCM1 off and back on again.

Press the rotary control to perform the reset. The unit exits Installer Mode and the display returns to the User Mode default. No other front panel controls are used in this function.

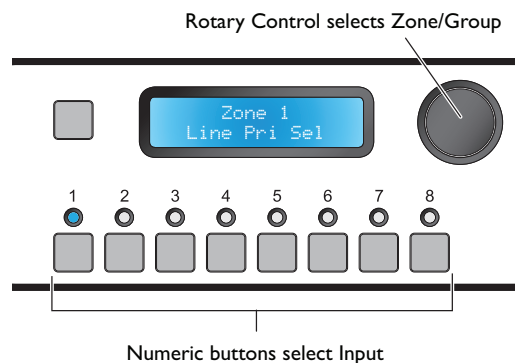
## UTILITY

Clicking the **Reset DCM1** button in the lower pane of the Utility Tool window corresponds to the **Reset Mixer** function described above.

## Priorities Menu



## Select Priority Line Input



Any of the zones can be assigned a Priority Line Input; this assignment can be made independently for each zone. The presence of an audio signal on this input activates the priority



routing for the zone, changing its input selection to the Priority Line Input. This forced priority continues for as long as the audio signal remains. When the signal is removed, the original Music input returns, after an adjustable time period (see following menu functions). This feature can be used to allow a jukebox to override TV sound in some areas, for example; it is also useful for playout of timed-interval messages from a sound store.

The threshold for priority activation is -24 dB below the input's nominal level.

The rotary control selects the Zone in which the priority is to be set (displayed by name if they have been renamed). Note that rotating the control "beyond" Zone 8 allows Groups 1 to 4 to be selected as well to permit assignment of a priority source for each Group as well as each Zone.

The eight numeric buttons correspond to the eight Music Inputs. The default assignment is for no priority input to be assigned for any Zone or Group. Pressing a key assigns that Music Input as the Priority Line Input for the currently-displayed Zone or Group; a second press de-assigns it.

The choice of Priority Line Input for a Zone/Group can be made from any of the eight Music sources, including any which have been deliberately disabled for that Zone/Group in the Input Enable function of the Routing menu (see page 33).

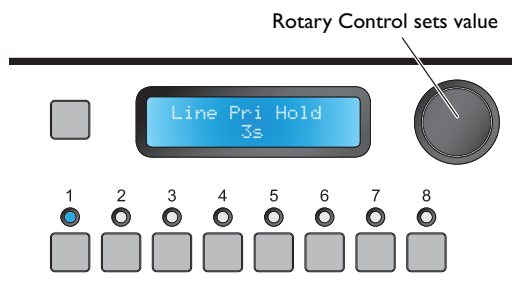
Only one Music Input may be assigned as Priority Line Input for each Zone or Group. However, any one Music Input may be assigned to every Zone and/or Group, if wished.

NOTE: When a Priority Line Input overrides an existing source selection, visual indication of the changed source is given on both the DCMI (if it is displaying the zone where the override is occurring) and any CDR-Is in the zone.

### UTILITY

The **Priority Line Input** can be selected from the **OUTPUTS** tab of the Utility Tool. Select the relevant zone from the drop down list on the left-hand side, and then select the input to have priority in that zone from the **Priority Input** drop-down list. Click **Send Output** to transmit the new setting.

### Line Priority Hold Time



The **Line Pri Hold** parameter sets the time for which the Line Priority Input (enabled in the **Line Pri Sel** menu function above) remains the source after the audio signal has been removed.

The rotary control sets the Hold value in the range from 1 s to 12 s, in 1 s increments. The default value is 3 s. It may be necessary to increase this value if the Line Priority feature is being used with a conventional music source such as a CD player or CD jukebox, to prevent the source selection temporarily reverting to the original selection between tracks, for example.

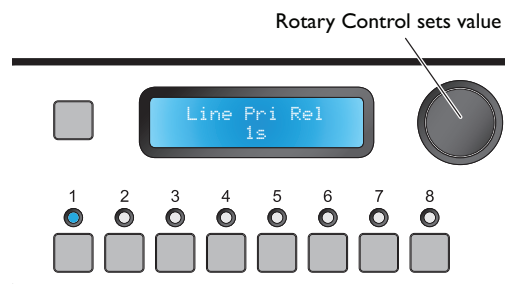
Note that the Line Priority Hold Time is global – it applies to all Zones/Groups and Music Inputs.

The numeric buttons are not used in this function.

### UTILITY

The **Priority Line Hold Time** can be set from the **SYSTEM** tab of the Utility Tool; select the required value from the **Hold** drop-down list in the **Line Priority** area. Click **Send System** to transmit the new setting.

### Line Priority Release Time



At the end of the Line Priority Hold Time (see above), it would be disconcerting if the audio level of the original programme (the currently selected Music source) were to immediately resume its previous level. Instead it ramps back up to its previous level from zero over the Release Time period.

The rotary control sets the Release value in the range from 1 s to 12 s, in 1 s increments. The default value is 1 s.

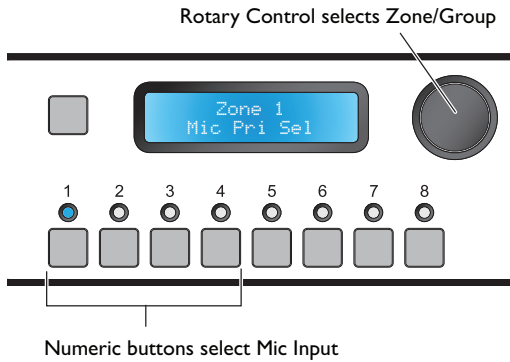
Note that the Line Priority Release Time is global – it applies to all Zones/Groups and Music Inputs.

The numeric buttons are not used in this function.

### UTILITY

The **Priority Line Release Time** can be set from the **SYSTEM** tab of the Utility Tool; select the required value from the **Release** drop-down list in the **Line Priority** area. Click **Send System** to transmit the new setting.

## Select Mic Priority Input



When a microphone is in use in a Zone (or Group) as well as a music source, it may be desirable for the music (the line input) to be reduced in volume, to allow the microphone signal to be more readily heard; this process is often called “ducking”. The **Mic Pri Sel** menu function configures the DCMI to do this.

The rotary control selects the Zone in which Microphone Priority is to be set (displayed by name if they have been renamed). Note that rotating the control “beyond” Zone 8 allows Groups 1 to 4 to be selected as well to permit assignment of a priority microphone for each Group as well as each Zone.

The first four numeric buttons correspond to the four Microphone Inputs. If multiple ME-I remote input modules are daisy-chained to a Microphone Input, selecting that Input effectively selects all the modules connected to it, and any or all mics plugged into them will activate the Priority.

The default assignment is for no priority mic to be assigned for any Zone or Group. Pressing a button assigns that Microphone Input as a priority mic for the currently-displayed Zone or Group; a second press de-assigns it.

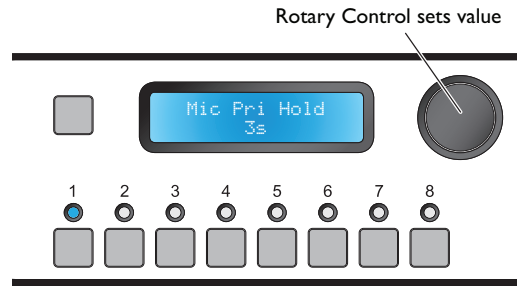
A mic must be enabled for the Zone or Group for it to be available as a Mic Priority Input (see page 32 for details).

Note that more than one Mic Input may be assigned as the Priority Mic Input for each Zone or Group, if wished.

### UTILITY

The **Select Mic Priority Input** function may be configured by clicking the **OUTPUTS** tab, selecting the **Zone** in the left-hand drop-down list, and then clicking in the appropriate **Mic** checkbox in the **Mic Priority** area. Click **Send Output** to transmit the new setting.

## Mic Priority Hold Time



The **Mic Pri Hold** function operates in the same way as **Line Pri Hold** (see above), except that it applies to the Priority Microphone instead of the Priority Music Input. It determines how long the music will remain reduced in volume (or “ducked”) once the priority mic signal has stopped.

The rotary control sets the Hold value in the range from 1 s to 12 s, in 1 s increments. The default value is 3 s.

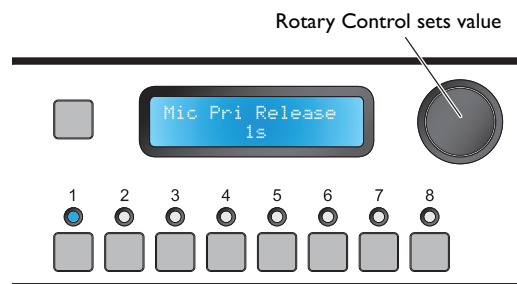
Note that the Mic Priority Hold Time is global – it applies to all Zones/Groups and Mic Inputs.

The numeric buttons are not used in this function.

### UTILITY

The **Mic Priority Hold Time** can be set from the **SYSTEM** tab of the Utility Tool; select the required value from the **Hold** drop-down list in the **Mic Priority** area. Click **Send System** to transmit the new setting.

## Mic Priority Release Time



At the end of the Mic Priority Hold Time (see above), the level of the music programme ramps back up from its attenuated level to its previous level over the Release Time period.

The rotary control sets the Release value in the range from 1 s to 12 s, in 1 s increments. The default value is 1 s.

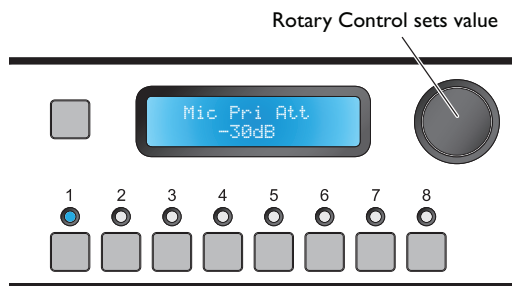
Note that the Mic Priority Release Time is global – it applies to all Zones/Groups and Mic Inputs.

The numeric buttons are not used in this function.

**UTILITY**

The **Mic Priority Release Time** can be set from the SYSTEM tab of the Utility Tool; select the required value from the **Release** drop-down list in the **Mic Priority** area. Click **Send System** to transmit the new setting.

**Mic Priority Attenuation**



**Mic Pri Att** sets the amount of volume reduction to be applied to the music programme when the priority mic becomes active – i.e., the degree of “ducking”.

The default setting is -30 dB, which should be satisfactory for most situations. The rotary control can be used to set any attenuation from -46 dB (the quietest) to 0 dB (no reduction at all), in 1 dB steps.

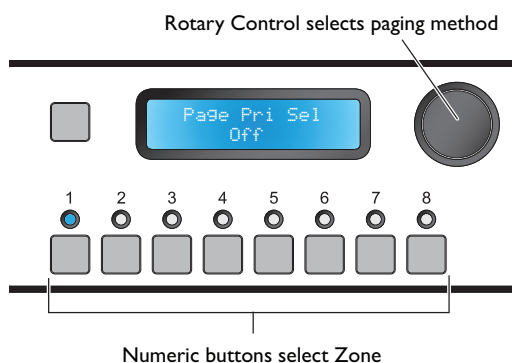
Note that the **Mic Priority Attenuation** is global – it applies to all Zones/Groups and Mic Inputs.

The numeric buttons are not used in this function.

**UTILITY**

**Mic Priority Attenuation** can be set from the SYSTEM tab of the Utility Tool; select the required value from the **Attenuation** drop-down list in the **Mic Priority** area. Click **Send System** to transmit the new setting.

**Page Priority Select**



This function (and the following three) are concerned with how the DCMI handles paging from an external PM Series or other paging microphone system. In principle, any page

received by the DCMI will be routed to its intended zone(s) with the music programme in that zone(s) being temporarily attenuated (“ducked”).

The **Page Pri Sel** function determines how a paging microphone controls the paging access to the selected Zone. The three possible settings are **Off**, **Vox** and **Access**. Each of the eight Zones can have its own setting.

- **Off** – the paging microphone is routed to the zone(s), but the music programme does not attenuate. The announcement message is mixed with the music programme at full level.
- **Vox** – the paging microphone has priority access to the zone(s) as soon as an audio signal from the microphone itself is received. Pressing zone selection buttons on the paging microphone before the announcement is made will thus not cause the music programme to attenuate immediately.
- **Access** – priority access to the zone(s) is made as soon as a zone routing button on the paging microphone is pressed. With this setting, the music programme will attenuate immediately.

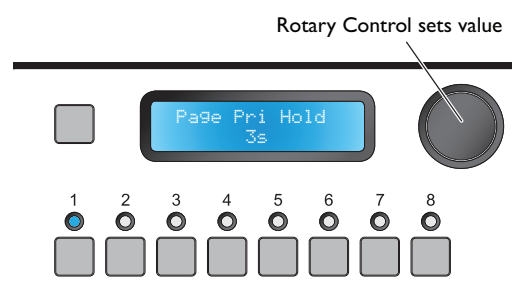
The numeric buttons select the Zone in which the setting is to be applied.

The rotary control selects the function to be applied to the selected Zone. The default setting for all Zones is **Off**.

**UTILITY**

The **Page Priority Select** function can be set from the OUTPUTS tab of the Utility Tool; select the relevant zone from the drop-down list on the left-hand side, and then select the paging mode from the **Paging Priority Select** drop-down list (**Off**, **Vox** or **Access**). Click **Send Outputs** to transmit the new setting.

**Page Priority Hold Time**



The **Page Pri Hold** parameter determines how long the music will remain reduced in volume (or “ducked”) once the paging priority has been removed.

The rotary control sets the **Hold** value in the range from 1 s to 12 s, in 1 s increments. The default value is 3 s.

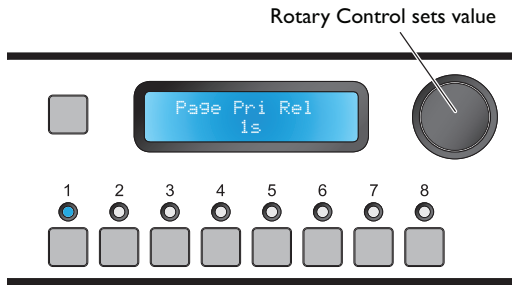
Note that the Page Priority Hold Time is global – it applies to all Zones. The setting has no relevance to Zones that have **Page Pri Sel** set to **Off**.

The numeric buttons are not used in this function.

**UTILITY**

The **Page Priority Hold Time** can be set from the SYSTEM tab of the Utility Tool; select the required value from the Hold drop-down list in the Paging Mic/Priority area. Click Send System to transmit the new setting.

**Page Priority Release Time**



At the end of the Page Priority HoldTime (see above), the level of the music programme ramps back up from its attenuated level to its previous level over the Release Time period.

The rotary control sets the Release value in the range from 1 s to 12 s, in 1 s increments. The default value is 1 s.

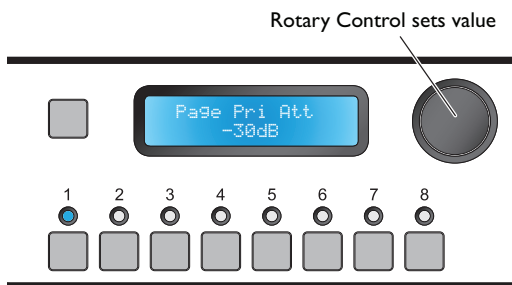
Note that the Page Priority Release Time is global – it applies to all Zones. The setting has no relevance to Zones that have **Page Pri Sel** set to Off.

The numeric buttons are not used in this function.

**UTILITY**

The **Page Priority Release Time** can be set from the SYSTEM tab of the Utility Tool; select the required value from the Release drop-down list in the Paging Mic/Priority area. Click Send System to transmit the new setting.

**Page Priority Attenuation**



**Page Pri Att** sets the amount of volume reduction to be applied to the music programme when paging priority becomes active – i.e., the degree of “ducking”.

The default setting is -30 dB. The rotary control can be used to set any attenuation from -46 dB (the quietest) to 0 dB (no reduction at all), in 1 dB steps.

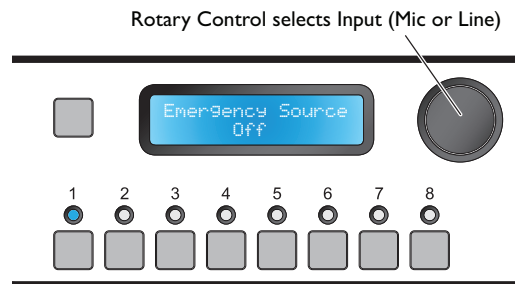
Note that Page Priority Attenuation is global – it applies to all Zones. The setting has no relevance to Zones that have **Page Pri Sel** set to Off.

The numeric buttons are not used in this function.

**UTILITY**

**Page Priority Attenuation** can be set from the SYSTEM tab of the Utility Tool; select the required value from the Attenuation drop-down list in the Paging Mic/Priority area. Click Send System to transmit the new setting.

**Select Emergency Source**



An external emergency mute applied at the Music Mute rear connector will normally mute all eight Music Inputs and all four Microphone Inputs. Paging remains operative. Some installations may require that one input is reserved as an emergency audio input, for a Fireman’s Mic or Emergency Evacuation message. The **Emergency Source** menu function determines which input this will be.

Any input may be nominated as the emergency source. Either a Line or Mic Input may be chosen, making it possible to interface either microphones directly or line-level devices such as sound stores.

The rotary control selects the input to be used for emergency access. Turning the control clockwise scans through Line 1 to Line 8, then Mic 1 to Mic 4. If the Music Inputs have been renamed, the names are displayed. The default setting is Off. The menu function can be exited when the required input is displayed; no additional button presses are necessary.

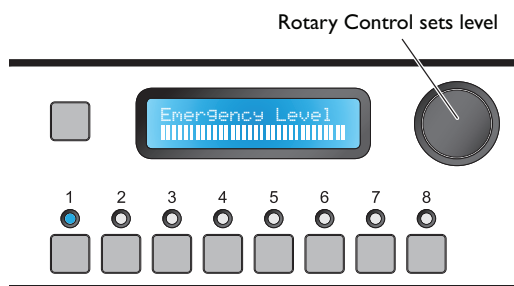
Once an input is selected, that input will remain live when Music Mute is active. With the default setting of Off, all inputs will be muted when Music Mute is active.

The numeric buttons are not used in this function.

**UTILITY**

The **Emergency Source** can be set from the SYSTEM tab of the Utility Tool; select the input to be used from the **Source** drop-down list in the **Emergency** area. Click **Send System** to transmit the new setting.

**Emergency Level**



Any emergency messages routed through the system using the Music Mute/Emergency Source outlined above should be at a higher volume than normal music programme material. (This is likely to be a requirement of Statutory Regulations.)

This menu function allows adjustment of the audio level of the Emergency Source (see previous menu function) when Music Mute is active. It applies only when a Line Input is assigned as the Emergency Source. If a Mic Input has been selected as the Emergency Source, the mic level should be set on the ME-I module to which the Emergency microphone is connected.

The default setting is maximum, but if this level causes problems with system overloading and inadequate intelligibility, it can be reduced with the **Emergency Level** menu function.

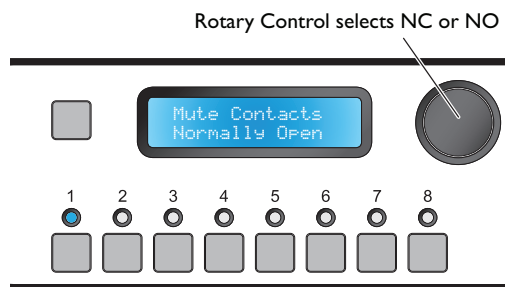
Turn the rotary control anticlockwise to reduce the level. The relative level is shown on the display as a bargraph.

The numeric buttons are not used in this function.

**UTILITY**

The **Emergency Level** can be set from the SYSTEM tab of the Utility Tool; select the required value from the **Mute Level (dB)** drop-down list in the **Emergency** area. Click **Send System** to transmit the new setting.

**Configure Music Mute**



The Music Mute input's trigger mode may be configured as a pair of normally-open (N/O) or normally-closed (N/C) contacts.

The rotary control selects either **Normally Open** (the default setting) or **Normally Closed**.

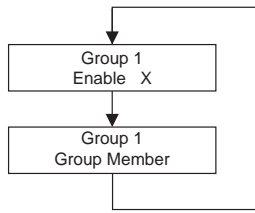
Set the function required by the emergency system being interfaced to. Select **Normally Closed** if the external equipment maintains a short-circuit in place at the Music Mute connector pins, removing it only when an emergency condition arises. Select **Normally Open** if the external equipment signals an emergency condition with a contact closure.

**UTILITY**

The choice of Music Mute N/O or N/C operation can be set from the SYSTEM tab of the Utility Tool; click the appropriate **Mute Contacts** checkbox in the **Emergency** area. Click **Send System** to transmit the new setting.



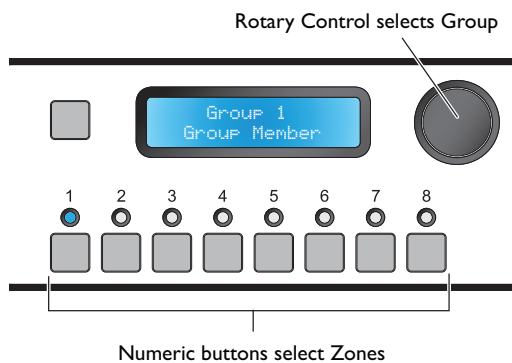
## Groups Menu



### Group Enable

This function has already been described, as it is available in User Mode. See page 29.

### Define Groups



The **Group Member** menu function allows the operator to define which Zones should be combined to form Groups. Four Groups can be defined, with no restriction on Zone membership. A Zone may be a member of more than one Group, but if so, only one Group which includes that Zone may be enabled at a time. Once set up, a Group may be enabled or disabled at will by the user, via the **Group Enable** function of the Groups Menu.

The rotary control selects the Group to have Zones assigned. The Groups will be displayed as **GROUP 1** to **GROUP 4** unless they have been renamed, in which case the names will be displayed.

The eight numeric buttons correspond to the eight Zones; they select Zone membership of the currently-selected Group. Press the numeric buttons to select or deselect Zones from the Group. Confirmation of Group membership is given by the LEDs above the numeric buttons.

It should be noted that if a system uses multiple DCMIs, Groups can only comprise Zones within each DCM1; Zones from different DCMIs cannot be combined.

### UTILITY

**Group Member** may be defined from the Utility Tool by clicking the **OUTPUTS** tab, selecting the **Group** in the left-hand drop-down list (below Zone 8), and then clicking the checkboxes for the relevant **ZONES** in the **Group Members** area. Click **Send Output** to transmit the new setting.

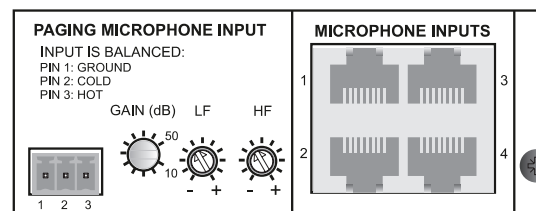
### DCM1e

Group membership may be defined from the browser by selecting **Grouping** followed by the Group to be defined and then clicking on the symbol adjacent to the **Zone** select box(es) (✓ = enabled; X = disabled). Note that if the zones have been renamed, the names are displayed instead of **Zone n**.

## Other DCM1 adjustments

In addition to the settings and adjustments made via the menu system, the DCM1 has a number of adjustments which are made elsewhere. Most are concerned with paging and are located on the rear panel; they are intended to be set at the time of installation and not subsequently altered by the user. All the controls are recessed trimpot types, and should be turned carefully with a trimming tool. Attempting to adjust them with an oversize screwdriver will cause damage.

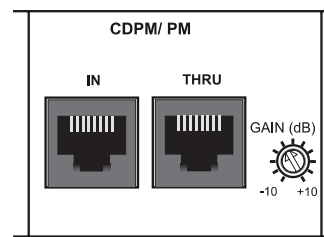
### Paging mic gain



This control sets the sensitivity of the Paging Mic Input, for third-party paging systems. The gain range is 10 dB to 50 dB; installers should check the mic signal level available from the paging system, and initially set this control accordingly.

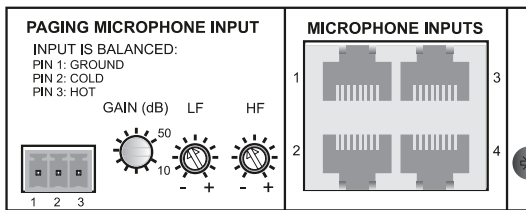
Its setting will affect the paging mic level in all zones being paged.

### PM Series paging microphone gain



This control sets the mic level for a PM Series (or CDPM) paging system interfaced to the DCM1. Like the Paging mic level (above), its setting affects all zones being paged, and its adjustment is made in the same way. The gain range is ±10 dB.

## Paging mic EQ

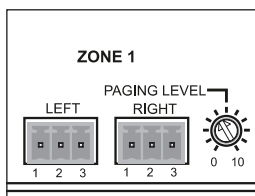


HF and LF EQ controls for paging mics are provided. These may be adjusted to reduce any extraneous noise in the vicinity of the paging mic, or to compensate for any undesirable colouration of the mic itself. The controls are adjacent to the (third-party) Paging Mic Input, but they affect *both* microphones connected to the Paging Mic Input *and* mic signals from a PM Series paging mic (or CDPM) connected to the **CDPM/PM** ports.

The HF control provides up to 10 dB cut or boost above 5 kHz, and the LF control 10 dB cut or boost below 100 Hz. Again, these controls should be adjusted using a test message, ideally to the zone where the DCMI is installed so that the effect of the adjustment can be heard by the person making it.

As the controls affect both the CDPM/PM ports and third-party paging mic inputs, a degree of compromise may be necessary if a system requires both inputs to be used.

## Zone Paging Levels



Each zone output connector has an adjacent preset control which sets the volume for paging in that Zone. The **PAGING LEVEL** adjustment for a Zone is completely independent of the music level adjustment for that Zone, the latter being set by the user.

## Setting up levels for best performance

To optimise signal levels through the DCMI and obtain the best signal-to-noise performance, we recommend the following procedure is followed for adjusting music and paging levels. (Numbers in squares refer to the rear panel diagram on page 15.)

1. Choose a suitable music source, and set the **Input Gain** of its input to 0 dB, via the Music menu in Installer mode.
2. Route this music source to a convenient Zone, and adjust the **Level** in this Zone to 0 dB (i.e., maximum), again via the Music Menu.
3. Adjust the gain of the power amplifiers feeding the loudspeakers in that Zone so that the sound level in the Zone is as loud as is likely to be required.
4. While making a paging call, adjust the rear panel Zone

Paging Level control **10** to achieve a sensible level in the Zone. The message should be clear and undistorted.

5. If necessary, adjust the **PAGING MICROPHONE GAIN** control **6** as well. If at all possible, the test message should be made by the person who will normally use the microphone, as some people speak much louder than others.
6. Repeat Steps 2 to 5 for the other Zones.
7. Repeat Step 1 for the other music sources.

## Display Contrast adjustment

The display should be easily readable in most normal situations. If it is necessary to alter the display contrast to improve readability under extreme ambient lighting conditions, remove the top cover (8 screws) and locate the trimpot at the left-hand end of the PCB mounted directly behind the front panel. This can be adjusted as required. Replace the cover using the same screws.

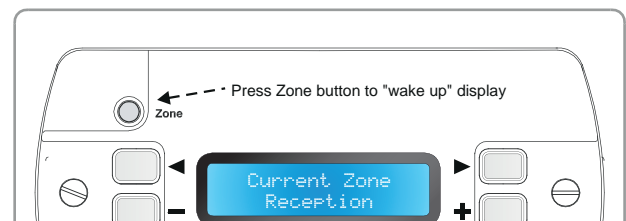
## CDR-I Series Remote Control Plates

Most audio systems based around the DCMI will include one or more CDR-I Series remote control plates to permit in-zone selection of music source and level.

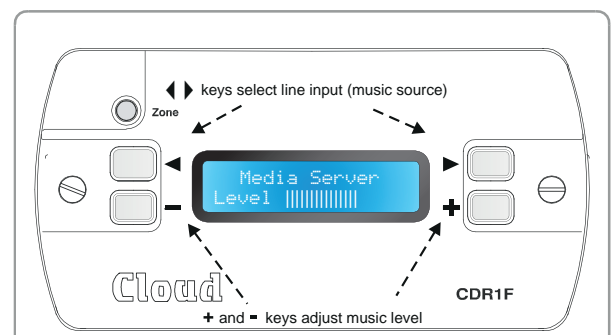
An overview of the CDR-I can be found on page 7 and notes on installation and wiring at page 19.

## User Operation

The backlight in the CDR-I's display automatically times-out after a few seconds (the actual time is programmable) to minimise power consumption. The display is "woken up" by pressing the ZONE button, and the unit confirms the Zone it has been assigned to, either as Zone n, or by name if the zones have been renamed (see diag i) below).



CDR-I User Mode: i) wake-up display

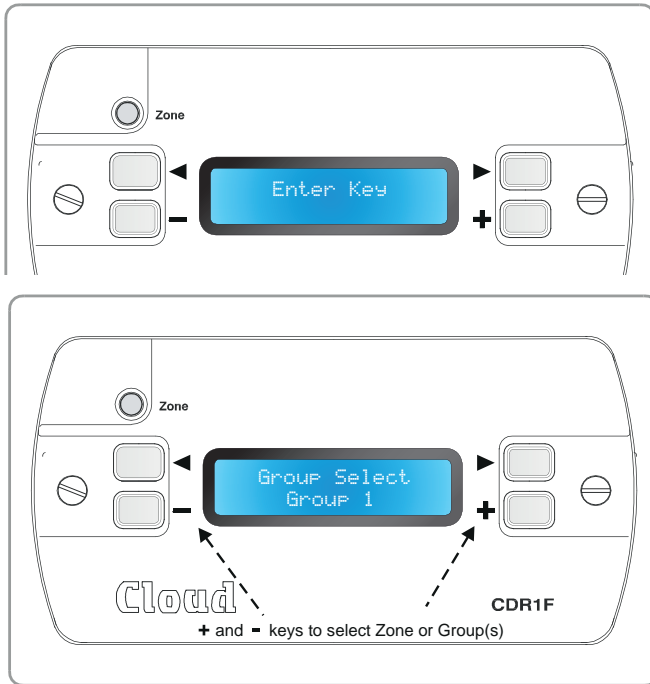


CDR-I User Mode: ii) adjustment display



The CDR-I will change to the adjustment display shown at ii) above after approx. 10 seconds, or immediately if either the + or - buttons are pressed. The ◀ and ▶ buttons can now be used to scroll through the inputs available to the zone. Only those inputs which have been enabled in the DCMI menu system at ROUTING > **Input Enable** will be displayed. The + and - buttons adjust the volume.

This sequence is modified if the Zone has been defined as a member of a Group. If so, the next press of ZONE after the panel “wakes-up” displays the Engineer Mode Enter Key screen. This gives the user the option of entering the key, after which the display will show the Group Select screen.



The + and - keys may now be used to change enable or disable any Groups of which the Zone has been defined as a member. If the Zone is only a member of one Group, the lower row of the display will toggle between Zone n and GROUP n where n and m are the Zone and Group numbers respectively. If the Zone belongs to more than one Group, the additional Groups will be displayed in turn; pressing ZONE when a Group is displayed will enable that Group; pressing ZONE when the Zone is displayed will disable a Group and return to normal operation.

## Engineer Mode

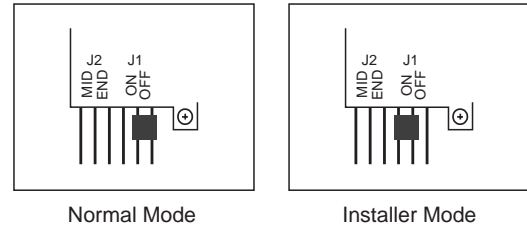
The CDR-I may be placed in Engineer Mode to allow EQ adjustment to be performed from within the zone itself. Engineer Mode is fully described on page 35.

## Installer Mode

Installation of a CDR-I necessitates the activation of a further mode, Installer Mode, to allow some additional parameters to be set, including zone assignment. (NOTE: CDR-I Installer Mode, described here, is not to be confused with DCMI Installer Mode.)

### To activate Installer Mode:

If the CDR-I has already been installed, remove it from its back box and disconnect the power supply, either by unplugging the POWER IN RJ45 connector if the CDR-I is being powered from elsewhere in the system, or by unplugging the local PSU if it is being powered locally. Move the jumper J1 as shown below.

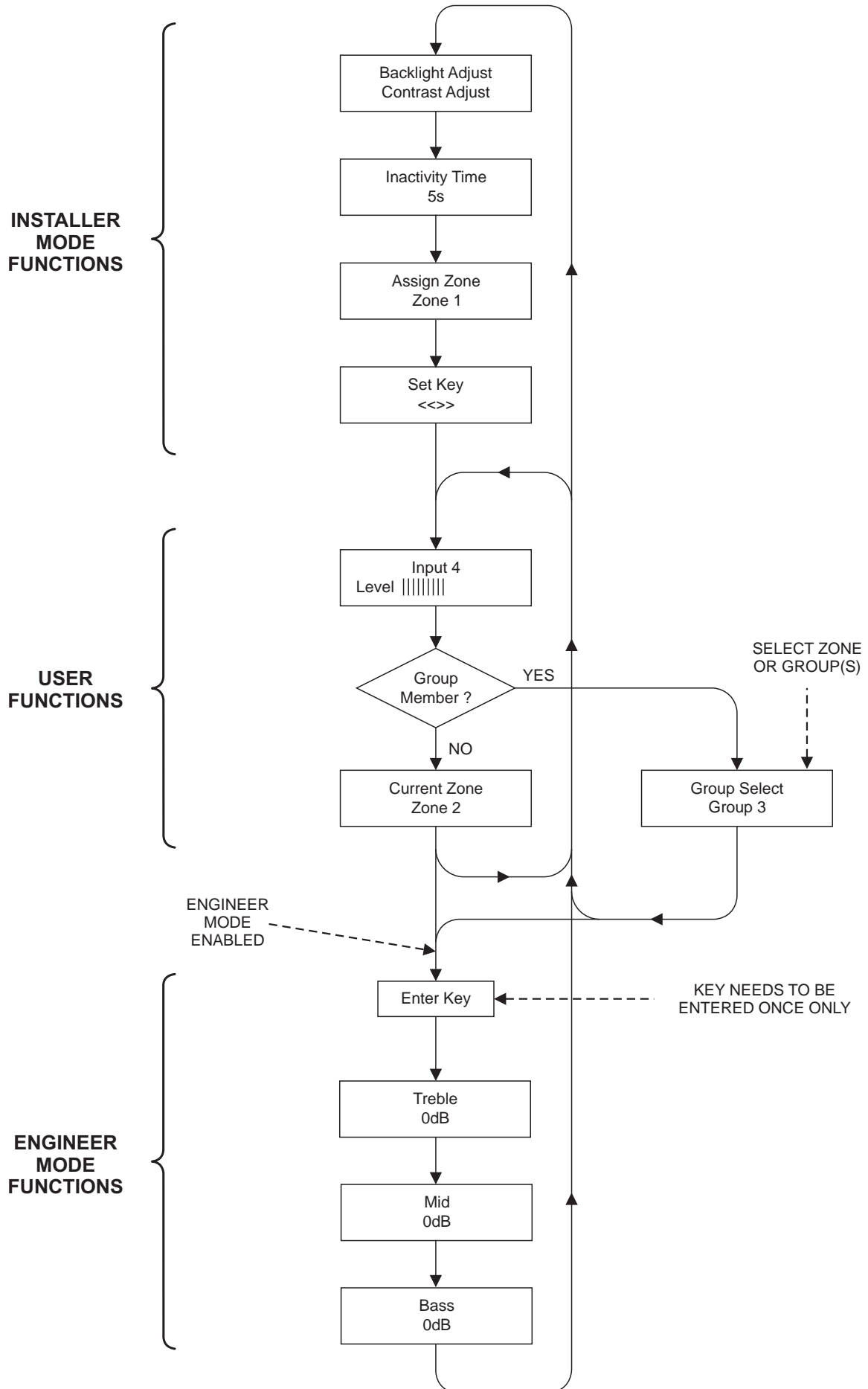


Reconnect the CDR-I to its power supply, and the display will change to the first of the four menu functions available in Installer Mode. Pressing ZONE steps through each function in turn (in the same manner as the NEXT FUNCTION button in the DCMI's menu system). The two User Mode screens are also presented before the menu loops around.

The ◀, ▶, + and - buttons are used to adjust the parameters in each function.

Note that the display time-out is disabled in Installer Mode.

Remember to remove the power from the CDR-I and put J1 back to its “normal” setting after configuration is complete.



## Display adjustments

The first menu function allows adjustment of the display contrast and backlight to suit different ambient lighting conditions. The ◀ and ▶ buttons adjust the backlight level and the + and – buttons adjust the contrast.

## Inactivity Time

This function sets the display time-out. Use the + and – buttons to set a value of between zero and 30 s the default is 10 s. The display backlight will turn off after this delay, following the last CDR-I button press. If the delay is set to zero, or jumper J1 is left in the Installer Mode position, the backlight remains on at all times.

## Assign Zone

This assigns the CDR-I to a particular Zone. The + and – buttons scroll through the eight Zones; note in this function they are displayed as Zone n even if they have been renamed. The default setting is Zone 1.

Once a CDR-I has been assigned to a Zone with the **Assign Zone** function, all operations on that CDR-I will affect all the speakers being driven from that Zone Output.

It is possible for more than one CDR-I to be assigned to the same Zone in a system. This will be useful in some situations, such as in large rooms. All CDR-I's assigned to the same Zone will be able to control operation in that Zone.

## Set Key

This lets the installer set the 4-character key code used to access CDR-I Engineer Mode, once the CDR-I(s) in a particular Zone have been enabled in the DCMI System Menu (with the **CDR Zone Setup** function).

The bottom row of the LCD first displays the current key; the factory default is <<>>. Any permutation of the four characters <, >, + and – may be used (except four identical characters); as soon as any of the four buttons is pressed, the existing key is erased. The key must have 4 characters.

If a key consisting of four identical characters is entered, the bottom line of the display will show None. This overrides the requirement for a key to be entered to use Engineer Mode, and the EQ adjustment and Group Selects screens will be available to the User as soon as the Zone is enabled in **CDR Zone Enable**.

## Combining Engineer and Installer Modes

It may be convenient to enable CDR-I Engineer Mode as each CDR-I is being installed, as this will allow the Zone EQ to be set at the same time. When Engineer Mode is enabled, the three EQ adjustment functions are presented in sequence after the User functions, as shown in the flowchart on the previous page.

## Section 4: Software control

DCM1e

### Controlling the DCM1e from the browser interface

The DCM1e has a server function, which makes control pages available to a browser running on a device connected to the DCM1e's Ethernet port. This permits simple and elegant real-time control from any convenient device on the same network.

#### Configuring the network

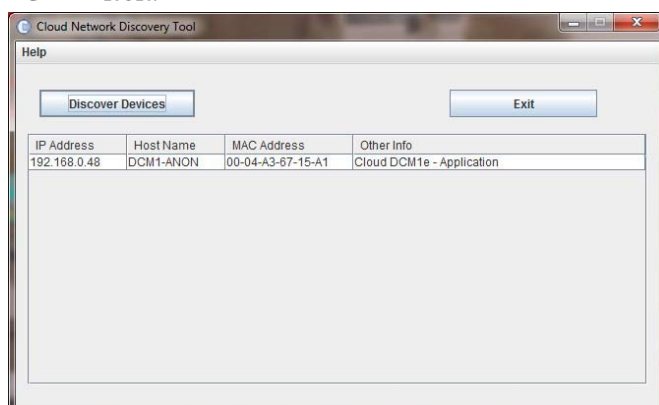
**NOTE:** This section of the manual is intended for those with a working understanding of basic computer network configuration and the terminology involved.

The Ethernet connection to the DCM1e can be simplified by the use of the CloudNetworkDiscoveryTool. There are two versions (Windows & Java) These can be downloaded from [www.cloud.co.uk](http://www.cloud.co.uk); navigate to 'Products' and select 'DCM1e Ethernet Digital Control Zone Mixer'; the Tools are available in 'Documents>Downloads' panel. The Windows® Tool is a ZIP file containing a Windows® exe file and is recommended for Windows users. The Java Tool is in the form of an executable JAR file, and will run on Linux, Windows® or Mac® systems within a Java Runtime Environment (available from [www.java.com](http://www.java.com)). Save it in any convenient location.

Connect an Ethernet cable between the socket marked ETHERNET INTERFACE on the DCM1e rear panel and a spare port on your network switch. Connect your device to the same network.

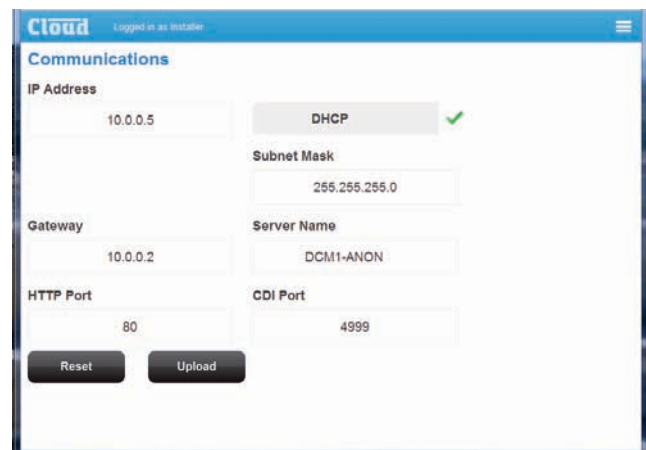
Run the Discovery Tool, this will open the window shown below, which should contain an entry with the host name

**DCM1-ANON.**



Single-click on the **DCM1-ANON** entry. This should open your default browser and make the DCM1e's server pages visible. The first page to be displayed on initial connection will be the PIN entry page; enter the Installer PIN to authorise the device. When this has been done, you will see the Security Settings page for the device. (This sequence only occurs on initial connection of a new device or browser.)

Click the menu icon at the right hand end of the blue Cloud banner and now select **Config**, followed by **Network**.



We recommend that the DCM1e should be set with a static IP address (i.e., DHCP disabled) or uses a reserved address on your routing hardware. It will then have a fixed IP address on the network for other devices to browse to. Ensure that a suitable IP address is reserved on the network to which you intend to connect the device. If the DCM1e changes IP address, client security settings will not be preserved. (Installers may need to consult the IT Manager of the installation premises for guidance.)

#### Security

Each new client using the network needs the Installer PIN to allow access and configuration of the interface. Each client's security settings - except for the PINs - are stored on the client device itself. Clearing browser history will cause the device to be reset, and will become a "new" client. The installer PIN is then required to reconfigure the device correctly.

Security PINs for Installer and Power privileges are the same for all clients. The Installer PIN is the same PIN that is used to access additional configuration functions from the DCM1e's front panel. Installer and Power PINs can be changed using the web interface.

The factory default PINs are:

- Installer = 1234
- Power = 5678

If the DCM1e changes its IP address, all clients will be treated as new clients.

## Browser compatibility

The DCM1e server pages use HTML5 and CSS3, which are only implemented by recent browser versions. The HTML features used by the DCM1e are listed below:

- Storage
- Localstorage
- Sessionstorage
- Forms
- Input type=number
- Elements
- Section elements
- Hidden attribute

The easiest way of checking your browser's compatibility is to go to [html5test.com](http://html5test.com), and carry out the test available there.

## Quick Troubleshoot

- **I can't download or run the Discovery application.**  
Download an IP scanning application (such as ezNetScan or Fing) on to your device. Run the scanning application. DCM1e hardware will show with a Microchip Technology Inc. MAC address registration and a MAC address starting with 00:04:A3... or 00:1E:C0... Enter the corresponding IP address in to your browser address bar.
- **I want to connect to the DCM1e directly from a PC or Mac.**  
The DCM1e should first be connected to a DHCP serving router to then configure a static IP address for direct communication.
- **I can't browse to the DCM1e on my network.**  
Check all settings on the client device to ensure that you are on the same network.  
  
Run the Discovery Tool. The DCM1e may change IP address if DHCP is enabled.  
  
If the entry in your Discovery Tool declares the unit with a - `Bootload` suffix, the unit is expecting a firmware update. You can exit this mode in two ways:
  - Apply a firmware update to the unit. Utilities and details of how to do this are on the Cloud website [www.cloud.co.uk](http://www.cloud.co.uk).
  - Turn the DCM1e off, and then hold the front panel "Next Function" down while turning the DCM1e back on. Enter Installer mode, go to the System menu and select the **Update Firmware** menu option. Push Enter (the rotary encoder) and ensure that the display shows an 'X'.
- **Web pages don't display correctly or run slowly**  
See the browser compatibility notes above for details of how to check that the client is suitable for use with the DCM1e web pages.  
  
If using Internet Explorer®, make sure that "Compatibility mode" is turned off. Details of how to do this will be in

the Internet Explorer Help options.

- **I can't swipe/drag the level controls**  
These controls are button activated. There is no drag or swipe feature.
- **I have configured my network settings, but it still continues to use DHCP**  
Check the Power On Mode from the front panel of the DCM1e. If this is set to "Factory", user configured settings will be ignored.
- **I can't remember the settings for my DCM1e!! How do I connect now?**  
Adjust the Power On Mode to Factory from the front panel of the DCM1e. This will then revert the network settings to their defaults until this setting is changed or new network settings are applied.


Further FAQs are available at [www.cloud.co.uk](http://www.cloud.co.uk).

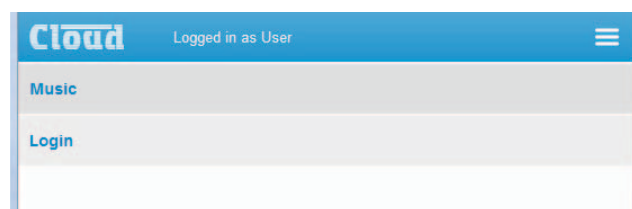
## Initial Login – User Mode

Once the client has been authorised, the first page to be displayed will be that shown below. Note that the default login will always be as User; this means the DCM1e is in User Mode and only User Mode menu functions will be available.



**Level** and **Line Input** controls for Zone 1 are displayed. Use the '-' and '+' controls to alter the settings. Any renamed inputs will be correctly displayed in the Line Input field.

To control music level and source in different Zone or Group, select the Menu icon  from the blue Cloud banner, which will change the display to that below:



Select **Music**....



...and then select the Zone to be controlled. If any Groups have been defined and enabled, the Zones comprising a Group will not be listed individually, but the enabled Group will be added to the list.

The User Mode functions above correspond directly to the **Select Input** and **Level** menu functions; see page 28 & 29.

### Login – Installer Mode

To access the much wider range of controls available in Installer Mode, select **Login** from the “top” page:



Enter the Installer Mode PIN (the factory default PIN is 1234) and select **Login**.

NOTE: The following descriptions of Installer Mode options assume that the default factory access settings on the **Security** Page have not been changed. As explained below (see **Config** menu, **Security**), access to other unit configurations and settings can be defined by an Installer on a three-level basis – User, Power and Installer. The factory default settings allow a User to control music source and level only, and an Installer to have access to all other functions.

Logging in as Installer always displays the extended control set for the current page. The extended version of the Music Menu is shown here:



On this page, Zone EQ may also be adjusted. The EQ controls directly correspond to the **Treble**, **Mid** and **Bass** menu functions; see page 30 & 31.

**Note** – As on the DCMIe itself, Installer Mode on the browser interface will “time-out” and return to User Mode after a period (approx. one minute) if no buttons are pressed

Selecting the Menu icon now shows that three further options are available: **Grouping**, **Inputs** and **Config**.



### Grouping

This menu allows Groups to be defined and enabled/disabled. Select **Grouping** and then select the Group to be configured (**Group 1** to **Group 4**). The display changes to the **Group n** Page:





The default state is for all Groups to be unassigned and disabled. To assign a Zone to the selected Group, tap/click on the red cross; it will turn into a green tick. Similarly, to enable the Group, tap/click on the red cross against the Group name.

The functions on this page correspond to the menu functions **Group Enable** and **Define Groups** respectively. See page 29 and page 46 for full details.

## Inputs

This menu allows definition of which Line Inputs are available to each Zone and/or Group, and enabling/disabling of Mic Inputs.

Select **Inputs** and then the Zone to be configured (Zone 1 to Zone 8). If any Groups have been defined and enabled, the Zones comprising a Group will not be listed individually, but the enabled Group will be added to the list. The display changes to the **Zone n (or Group n) Page**:

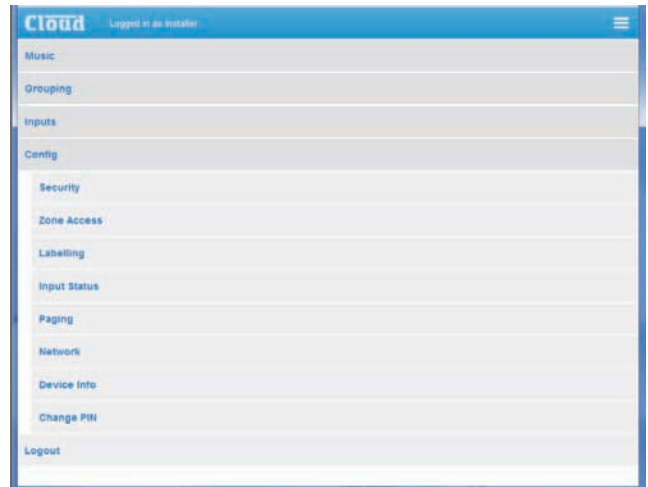


To make a Line Input unavailable to the selected Zone/Group, tap/click the green tick against its name; it will turn into a red cross. The default state is for all Line Inputs to be available to every Zone and Group. This function corresponds to the menu function **Input Enable**; see page 33 for full details.

To activate a Mic Input for the selected Zone/Group, tap/click the red cross against its name. The default state is for all Mic Inputs to be Off in all Zones and Groups. This function corresponds to the menu function **Enable Mic Inputs**; see page 32 for full details.

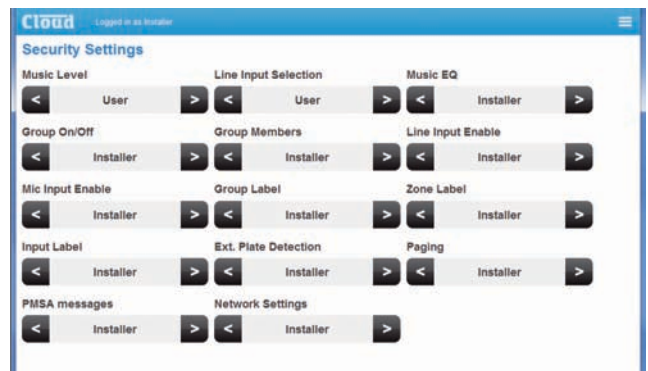
## Config

This menu has eight options, allowing access to various DCMIe System and other configuration functions.



## Security Page:

Tap/click **Security** to open the **Security Settings** Page.



This function is specific to the browser and gives the installer much greater control over how the DCMIe is configured in terms of who has access to which controls than is possible from the DCMIe itself. As described elsewhere in this manual, the standard hardware security settings provide two Modes: User and Installer.

- User Mode allows immediate control of music level, music source selection and enabling/disabling of any Groups which have been defined.
- Installer Mode allows access to all other menu functions.

The DCMIe browser interface allows for a third, “intermediate” level of operator – “Power”. The DCMIe’s functions are presented as a set of categories, and the installer can assign an access level – User, Power or Installer – independently to each category. This gives the facility in which the DCMIe is installed improved control over which staff members can access which audio and system functions.



For example, in a typical bar or hotel installation, bar staff might only have control over music source and level, but the Duty Manager, with Power privileges, would additionally be able to configure Groups and Mic Inputs. Remaining system configurations would remain with the installer. A user with Power privileges has a 4-digit PIN; this should not be the same PIN that is used to access Installer Mode. The factory default Power PIN is 5678.

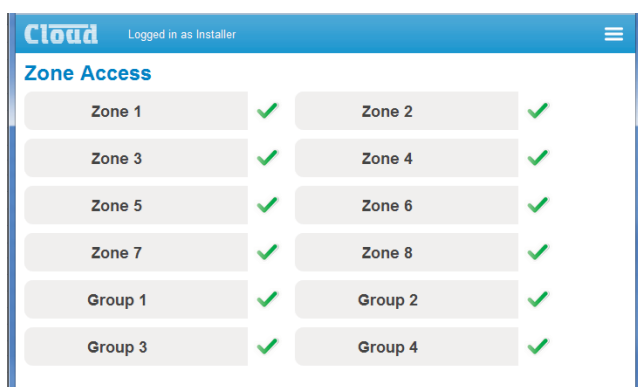
Tap/click on the arrowheads to alter the access privileges for any of the categories. Using the example above, if a Power User needs to be able to configure Groups and enable Mic inputs, set **Group Members** and **Mic Input Enable** to **Power**.

The table below summarises the functions an operator is able to configure if he/she has the appropriate privileges:

CATEGORY	DEFAULT	ACCESS PRIVILEGES ALLOWS:
Music Level	User	Control of music level
Line Input Selection	User	Selection of music source
Music EQ	Installer	Adjustment of Zone EQ
Group On/Off	Installer	Defined Groups to be enabled/disabled
Group Members	Installer	Definition of Group Membership
Line Input Enable	Installer	Barring use of some line inputs per Zone
Mic Input Enable	Installer	Enabling of mic inputs per Zone
Group Label	Installer	Groups to be renamed
Zone Label	Installer	Zones to be renamed
Input Label	Installer	Music sources to be renamed
Ext Plate Detection	Installer	Monitors external plate detection
Paging	Installer	Paging settings to be monitored
PMSA Messages	Installer	Message selection within PM-SA paging mics

### Zone Access:

Tap/click **Zone Access** to open the **Zone Access** Page.

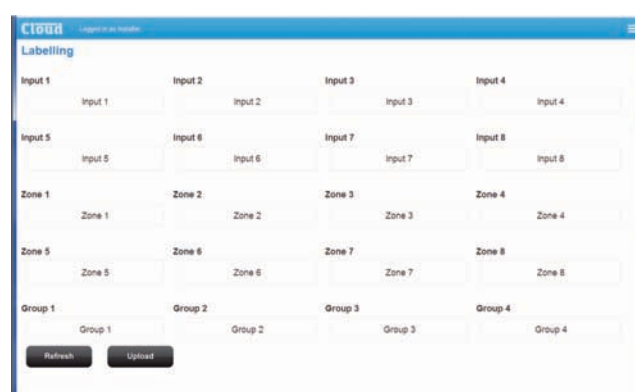


This function is specific to browser control; it allows some Zones or Groups to be removed from other control pages. For example, it may be desirable to restrict control of facilities in some Zones, making control only available through the DCMIe front panel or any installed CDR-I plates.

The default setting for full access; to disallow control of a Zone or Group via the browser interface, tap/click the green tick to turn it into a red cross. The Zone or Group will now not appear in the lists of Zones available for control.

### Labelling:

The **Labelling** page allows Inputs, Zones and Groups to be renamed.



Tap/click in any field and enter the new name. Tab will advance data entry to the next field. When all the required changes have been made, tap/click the **Upload** button to transfer the new names to the DCMIe. The new names will be visible on the DCMIe as soon as a front panel control is touched.

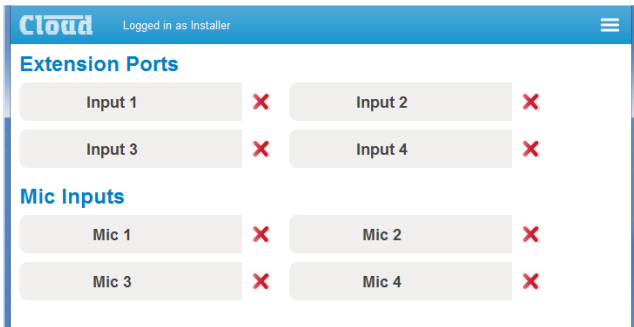
The **Refresh** button downloads the Input, Zone and Group names currently resident in the DCMIe onto the browser page.

The functions on the Labelling Page correspond to the menu functions **Rename Inputs**, **Rename Zones** and **Rename Groups**. See page 36 and page 37 for full details.

Note that only those items (Inputs, Zones, Groups) to which the current operator has been granted access by the Security Settings will be displayed.

## Input Status:

Tap/click **Input Status** to open a browser Page where the status of the Mic Inputs and Extension Ports can be viewed.



This page is a status display only, and has no active controls. It confirms the connection of any LE-I or BE-I remote modules to the **EXTENSION PORTS**, or ME-I modules to the **MICROPHONE INPUTS** of the DCM1e. A tick against the input indicates that a remote module has been detected. See 12 and 13 on page 14.

## Paging:

Tap/click **Paging** to open the Paging control Page.

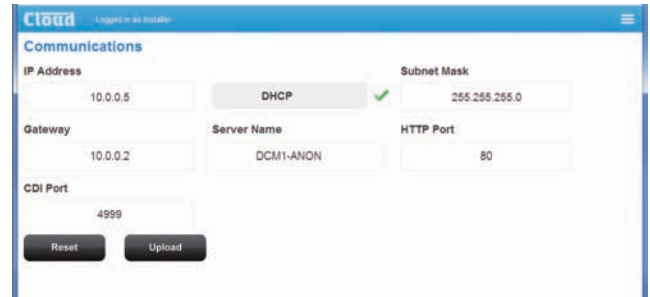


This page is partly a status display; only the **PMSA Message** buttons are active controls. The page is divided into three areas:

- **Paging** – indicates to which Zones an announcement is currently being made.
- **Access Contact** – this is a mimic of the PAGING ACCESS LEDs on the DCM1e’s front panel. See 11 at page 14.
- **PMSA Messages** – these buttons will trigger the messaging groups stored in a PMSA paging microphone, if one is connected.

## Network:

Tap/click **Network** to open the **Communications** Page.



This page displays the current network settings for the network. **IP Address**, **DHCP Status**, **Subnet Mask**, **Gateway** address and **Server Name** are given, and may be changed.

Tap/click the **Reset** button to reset the page to the previous state if any changes have been made but not uploaded. Tap/click the **Upload** button to transfer any changes to the DCM1e.

**HTTP Port** and **CDI Port**: in the vast majority of installations, these network parameters will not need adjustment. However, they are likely to become relevant if the DCM1e system is connected to an existing building IT network. The correct settings for these items will vary from one installation to another, and we recommend that the network administrator is consulted as to the appropriate values.

## Device Info:

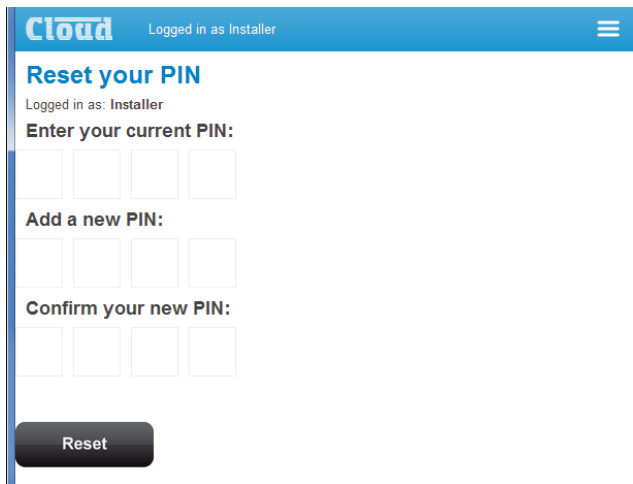
Tap/click the **Device Info** button to open the **Device Information** Page.



This is an “Engineering” page which gives details of the versions of the various firmware elements within the DCM1e. This page is also used to update the unit’s firmware. See page 70 for details of DCM1e firmware update procedure.

## Change PIN:

Tap/click the **Change PIN** button to open the **Reset your PIN** Page.



The screenshot shows the 'Reset your PIN' page in the Cloud application. The page has a blue header with the 'Cloud' logo and 'Logged in as Installer' text. Below the header, the title 'Reset your PIN' is displayed, followed by 'Logged in as: Installer'. The page contains three input fields for PINs: 'Enter your current PIN:', 'Add a new PIN:', and 'Confirm your new PIN:'. Each field consists of four square input boxes. At the bottom of the page, there is a dark grey button labeled 'Reset'.

This page lets you change the Installer PIN or Power PIN if you are currently logged in as an Installer. In either case, you will need to confirm the current PIN in the **Enter your current PIN field** before proceeding to enter a new one in both the **Add a new PIN** and the **Confirm your new PIN** fields, and tap/click the **Reset** button.

The Installer Key aspect of this function corresponds to the **Set Key** menu function; see page 38 for full details.

## Configuring the DCMI with the DCMI Utility Tool

Almost all DCMI configurations and settings may be made remotely using serial commands through the rear panel **RS232 INTERFACE** connector\*. A simple software application, the DCMI Utility Tool, uses this feature to permit the DCMI to be configured remotely on a laptop, tablet or other Windows-compatible device. This allows an installation engineer to pre-configure a DCMI off-site, and then upload the unit's core configuration and settings from the device with a single mouse click. Further adjustments to individual settings may be made in a similar manner.

**DCM1e** \*A version of the Utility Tool which can use an Ethernet connection between the device running the Tool and a DCM1e as well as an RS-232 serial link will be available during 2014. This will allow devices without either serial or USB ports to use the Tool, provided they have network capability. Please check [www.cloud.co.uk](http://www.cloud.co.uk) for details.

### Installing the Utility Tool

The DCMI Utility Tool may be used with either the DCMI or DCM1e. At the time of publication, the application has been tested with Windows XP (+SP3), Windows Vista, Windows 7 and Windows 8; please check [www.cloud.co.uk](http://www.cloud.co.uk) for any updates to this list. Note that there is no Mac version.

The Utility Tool may be downloaded free of charge from the Cloud website, [www.cloud.co.uk](http://www.cloud.co.uk). From the Home page, select Products, then the DCMI or DCM1e. Select Technical Notes

the DCMI, please check your device's port settings.

from the options list on the right; download the two Utility Tool files – the application itself is a .zip file, the other is a .pdf ReadMe file. Save the files to a suitable location.

The ReadMe file gives information about DCMI OS compatibility; see page 39 for details of how to check which firmware version is installed.

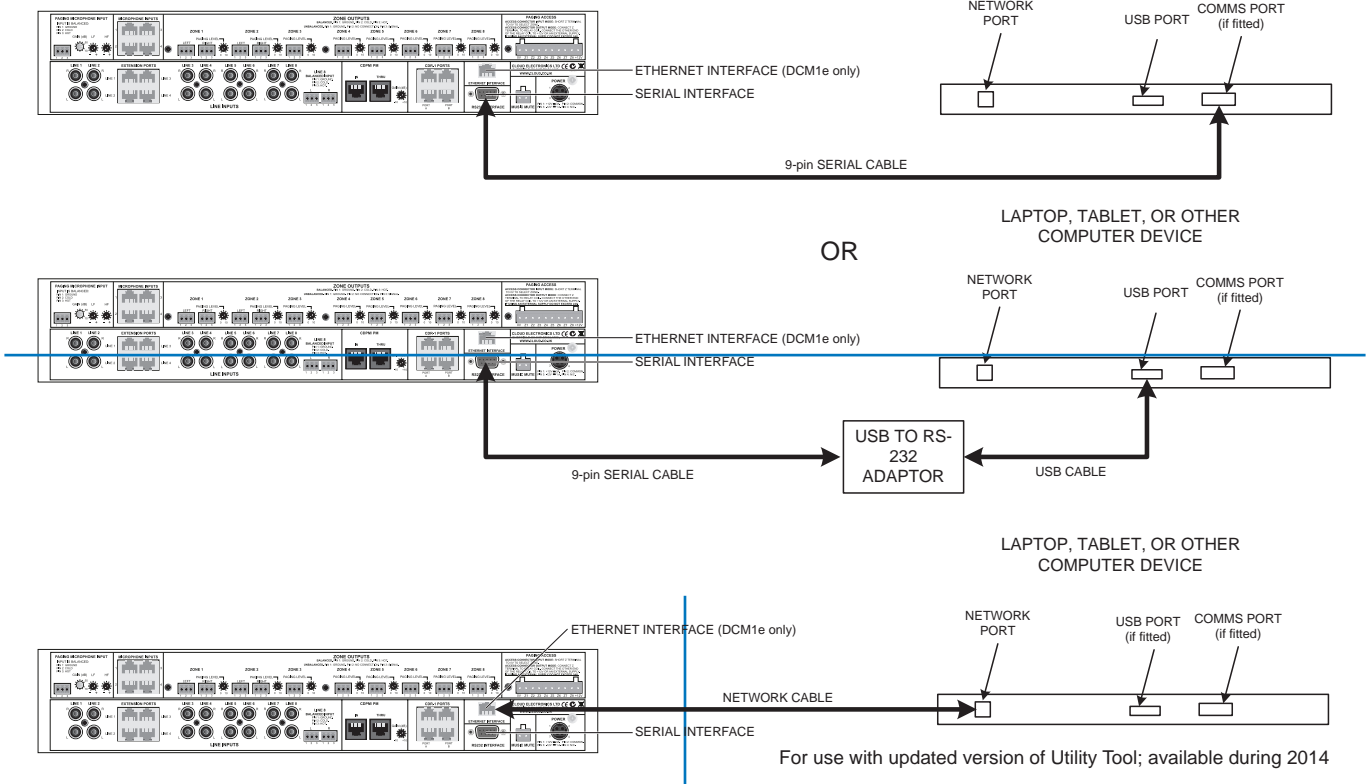
Navigate to the .zip file, and unpack it. The zip contains a single .exe file, DCM1Utility Tool Vn\_m.exe (where n.m is the version number). Save this file to any convenient location.

### Connecting to the DCMI

Serial communication between the Utility Tool and a DCMI uses one of the device's Comms ports. If the device does not have a 9-pin serial port, obtain a USB to RS-232 convertor and connect to a USB port. Use a standard, male-to-female, 9-pin serial cable to between either the native serial port or the USB convertor and the DCMI's **RS232 INTERFACE** connector. See page 66 for further information regarding the interface and cable.

The Utility Tool operates at 9600 baud, which is the default baud rate of the DCMI's serial port. If the baud rate has been altered, it will be necessary to reset it to 9600 baud. See page 38 for details on how to do this.

Launch the Utility Tool by clicking on its .exe file icon. The Tool defaults to the Comms port in use last time the application was run; at the first launch, this will be Com 1. If the serial (or USB) port being used is different, it can be chosen by selecting **Port** in the Menu bar and choosing the correct one. If you have a problem establishing communication with



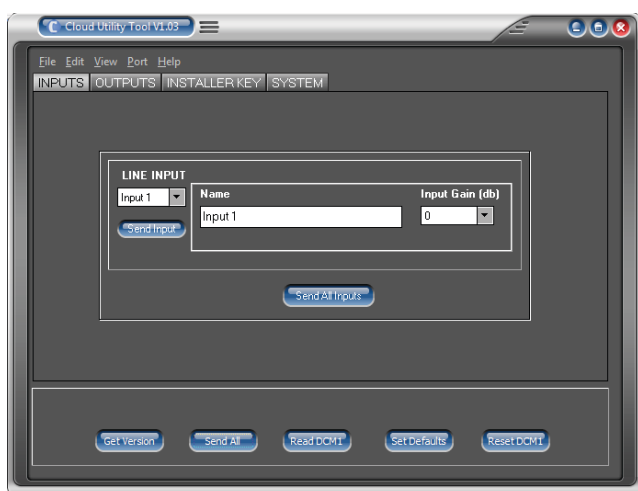
## Using the Utility Tool

The Utility Tool window is arranged in four tabs – INPUTS, OUTPUTS, INSTALLER KEY and SYSTEM. Additional functions are available from the Menu bar options and from the five buttons in the lower pane, which remain visible whichever tab is active.

The various controls on the four tabs replicate most of the DCMi's internal menu functions; this manual section cross-references each control to a menu function, please see the manual section on Configuration for full details of each function. Tool tip text is provided when the cursor is hovered over each control.

When a control or setting has been altered, the change must be transmitted to the DCMi by selecting a Send button. The INPUTS and OUTPUTS tabs have two Send buttons; **Send Input** (or **Send Output**), which transmits the settings for the currently selected input (or output), and **Send All Inputs** (or **Send All Outputs**), which transmits the settings for all inputs (or outputs).

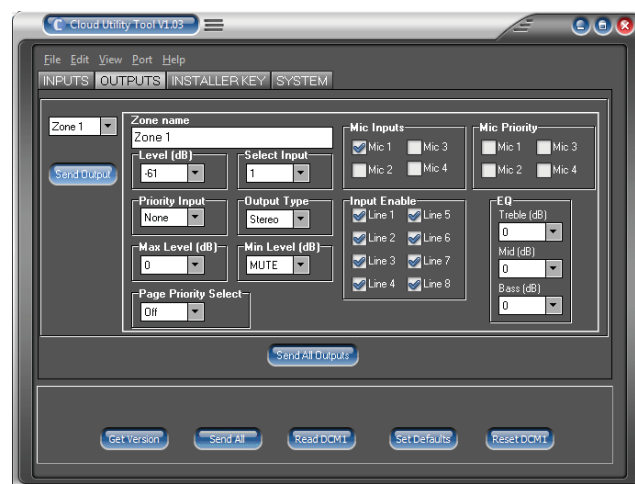
## Inputs Tab



This page lets you rename line inputs and set the input gain of each.

- **LINE INPUT** – select a line input from the drop-down list.
- **NAME** – enter a name for the selected input; this corresponds to the **Rename Inputs** function in Installer Mode, System menu; see page 36.
- **Input Gain (dB)** – adjust the input gain for the selected input; this corresponds to the **Input Gain** function in Installer Mode, Music menu; see page 31.
- **Send Input** – transmits all INPUTS tab settings for the currently selected line input.
- **Send All Inputs** – transmits all INPUTS tab settings for all eight line inputs.

## Outputs Tab

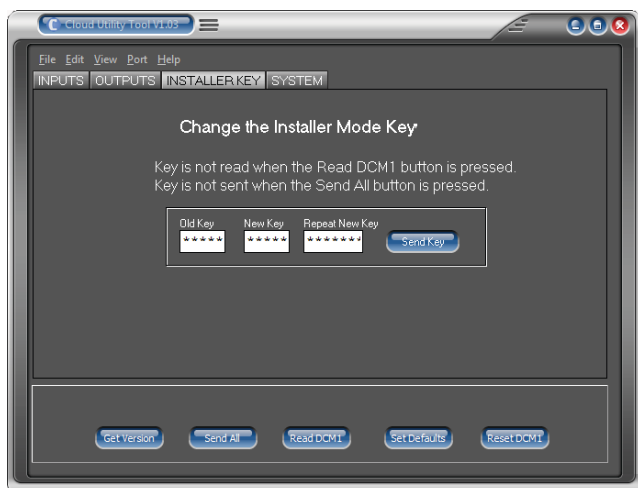


- **Zone/Group** drop-down list – select a Zone or a Group from the drop-down list (scroll down for Groups).
- **Zone Name** – enter a name for the selected Zone or Group; this corresponds to the **Rename Zones** and **Rename Groups** functions in Installer Mode, System menu; see page 37.
- **Level (dB)** – set the volume in the selected Zone/Group; this corresponds to the **Level** function in User Mode, Music menu; see page 29.
- **Select Input** – select the music source to be routed to the selected Zone/Group; this corresponds to the **Select Input** function in User Mode, Music menu; see page 28.
- **Priority Input** – assign a line input as the priority input for the selected Zone/Group; this corresponds to the **Select Priority Line Input** function in Installer Mode, Priorities menu; see page 40.
- **Output Type** – Zones 1 and 2 may operate in mono or stereo modes; this corresponds to the **Stereo/Mono Zone selection** function in Installer Mode, System menu; see page 36. If any of Zones 3 to 8, or a Group is selected, this field is greyed-out.
- **Max Level (dB)** – sets the maximum level for the volume in the selected Zone or Group; this corresponds to the **Maximum Music Level** function in Installer Mode, Music menu; see page 31.
- **Min Level (dB)** – sets the minimum level for the volume in the selected Zone or Group; this corresponds to the **Minimum Music Level** function in Installer Mode, Music menu; see page 32.
- **Page Priority Select** – sets the method of selection for paging for the selected Zone or Group – **Access** or **Vox** (default is **OFF**); this corresponds to the **Page Priority Select** function in Installer Mode, Priorities menu; see page 43.
- **Mic Inputs** – enables any or all of the four **MICROPHONE INPUTS** for the currently-selected Zone or Group; this corresponds to the **Enable Mic Inputs** function in Installer Mode, Routing menu; see page 32.



- **Mic Priority** – enables mic-over-music priority (music “ducking”) for the selected Zone or Group. The priority mic must first be enabled for the Zone or Group in **Mic Inputs** above for **Mic Priority** to have effect. This corresponds to the **Select Mic Priority Input** function in Installer Mode, Priorities menu; see page 42.
- **Input Enable** – this allows the installer to define which line inputs are available to the selected Zone or Group as music sources; the default is for all eight to be enabled. This corresponds to the **Input Enable** function in Installer Mode, Routing menu; see page 33.
- **EQ** – three (Bass/Mid/Treble) drop-down lists allowing EQ adjustment in the selected Zone or Group; these correspond to the **Treble, Mid** and **Bass** functions in Installer Mode, Music menu; see page 30 & 31.
- **Send Output** – transmits all OUTPUTS tab settings for the currently selected Zone or Group.
- **Send All Outputs** – transmits all OUTPUTS tab settings for all eight zones and all four Groups.

## Installer Key Tab

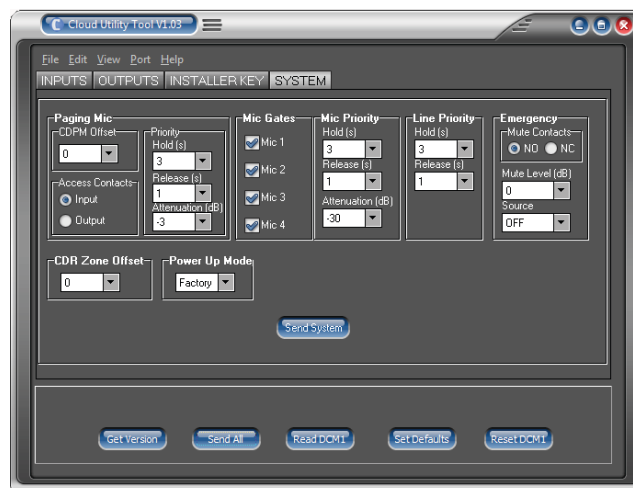


This tab is solely concerned with resetting the four-digit key allowing access to Installer Mode.

To change the Installer Mode Key, enter the existing key into the **Old Key** field, and then enter the new key into both the **New Key** and **Repeat New Key** fields. The change will take effect when the **Send Key** button is pressed.

This procedure corresponds to the **Set Key** menu function, in Installer Mode, System Menu; see page 38.

## System Tab



- **Paging Mic: CDPM Offset** – allows PM and CDPM paging microphones to access more than eight zones when using multiple DCMIs. This setting corresponds to the **PM Zone Offset** menu function, in Installer Mode, Routing Menu; see page 34.
- **Paging Mic: Priority Hold (s), Release (s) and Attenuation (dB)** – these three related controls determine how the ducking operates during paging. They correspond to the **Page Priority Hold Time, Page Priority Release Time** and **Page Priority Attenuation** menu functions respectively; see page 43 & 44.
- **Paging Mic: Access Contacts** – radio buttons selecting whether the **PAGING ACCESS** connector will operate as an input port (for zone access during paging) or an output port (to provide zone tallies)\*. This corresponds to the menu function **Configure Access Connector** in Installer Mode, Routing Menu; see page 33.
- **Mic Gates** – enables noise gates on ME-I remote input modules; this control corresponds to the menu function **Mic Gate Enable** in Installer Mode, Routing Menu; see page 35.
- **Mic Priority: Hold (s), Release (s) and Attenuation (dB)** - these three related controls determine how music ducking operates when the priority microphone is in use. They correspond to the **Mic Priority Hold Time, Mic Priority Release Time** and **Mic Priority Attenuation** menu functions respectively; see page 42 & 43.
- **Line Priority: Hold (s) and Release (s)** - these two related controls determine how music fades during operation of the Priority Line Input. They correspond to the **Line Priority Hold Time** and **Line Priority Release Time** menu functions respectively; see page 41.
- **Emergency: Mute Contacts** – set whether the **MUSIC MUTE** input responds to external N/C or N/O contacts. This corresponds to the menu function **Configure Music Mute** in Installer Mode, Priorities Menu; see page 45.



- **Emergency: Source** – selects the line or mic input that will remain active during Music Mute. This corresponds to the menu function **Select Emergency Source**, in Installer Mode, Priorities Menu; see page 44.
- **Emergency: Mute Level (dB)** – sets the level of the Emergency Source, when one is enabled (above). This corresponds to the menu function **Emergency Level** in Installer Mode, Priorities Menu; see page 45.
- **CDR Zone Offset** – allows the CDR-I network to encompass more than eight zones with multiple DCMIs. This corresponds to the menu function **CDR Zone Offset** in Installer Mode, Routing Menu; see page 34.
- **Power Up Mode** - determines how the DCMI resets itself after power cycling. This corresponds to the menu function **Power Up Mode**, in Installer Mode, System Mode; see page 39.
- **Send System** – transmits all SYSTEM tab settings.

\*An update to the Utility Tool due for release in 2014 will add the GPIO port option to the Configure Access Connector menu function.

## Global controls



Five further buttons are always visible in the lower pane:

- **Get Version** – clicking this button will display the unit's Version information adjacent to the button.
- **Send All** – clicking this button transmits the settings of all controls on all the tabs of the Utility Tool to the DCMI.
- **Read DCMI** – this button sends a request to the DCMI for its current settings to be downloaded to the Utility Tool. The download takes a few seconds, but when it is complete, the Utility Tool will display all the unit's current settings.
- **Set Defaults** – clicking this button loads the DCMI's the current settings into the Default memory. This memory may be set as the option in the **Power Up Mode** menu function; then when the unit is power-cycled, previously-defined settings are restored.
- **Reset DCMI** – this button performs a hard reset, and corresponds to the **Reset Mixer** menu function, in Installer Mode, System Menu; see page 40.

## Menu bar options

### File Menu:

Standard Windows **New**, **Open**, **Save**, **Save As** and **Exit** commands are available from the **File** menu. Selecting **New** resets the Configuration Tool to its default settings. The native file format is \*.dcf (DCMI Config File), and DCMI configurations may be saved in the standard manner for subsequent recall (**Open**) and uploading.

- **Export Text** – selecting this option lets you save the Utility Tool's current DCMI settings as a text (\*.txt) file. A standard File Save dialogue box provides opens for filename entry and navigation (but see below). The file saved consists of the RS-232 strings that would be sent by the **Send All** button, in ASCII format. Refer to the Appendix section "RS-232 Serial Interface", and also the RS-232 serial protocol available from the Cloud website [www.cloud.co.uk](http://www.cloud.co.uk) for more details.
- **Export Text As** – once the settings have been saved as a text file, subsequent **Export Text** commands will overwrite the initial file. To save as a different text file, use **Export Text As**, which allows you to enter an alternative filename.

### View menu:

- **Log Window** – this command opens a **Communication Log** window which displays the serial strings that the Utility Tool transmits each time a **Send** button is pressed, in ASCII format. Refer to the Appendix section "RS-232 Serial Interface", and also the RS-232 serial protocol available from the Cloud website [www.cloud.co.uk](http://www.cloud.co.uk) for more details.
- **Log Window On Top** – this command has the same effect as **Log Window**, except that the Log Window will be permanently on top of the Utility Tool window. Note that in either case, the Log Window must be closed by de-selecting the command in the Utility Tool **Edit View** menu.
- **Show Skin** – the Utility Tool and Log Window may be displayed either in normal Windows style, or with a contemporary "skin". Skin "on" is the default.

### Port Menu

This menu will display a list of the device's available Comms ports. If you have a problem in communicating with the DCMI, you should check which Comms port you have used to connect to the DCMI (either directly, if your device has a 9-pin serial port, or via an external USB-to-RS-232 convertor).

### Help Menu

The standard Windows **Help** and **About** commands are available. The Help file gives advice on how to reset the DCMI serial port's baud rate.

## Section 5: Appendix

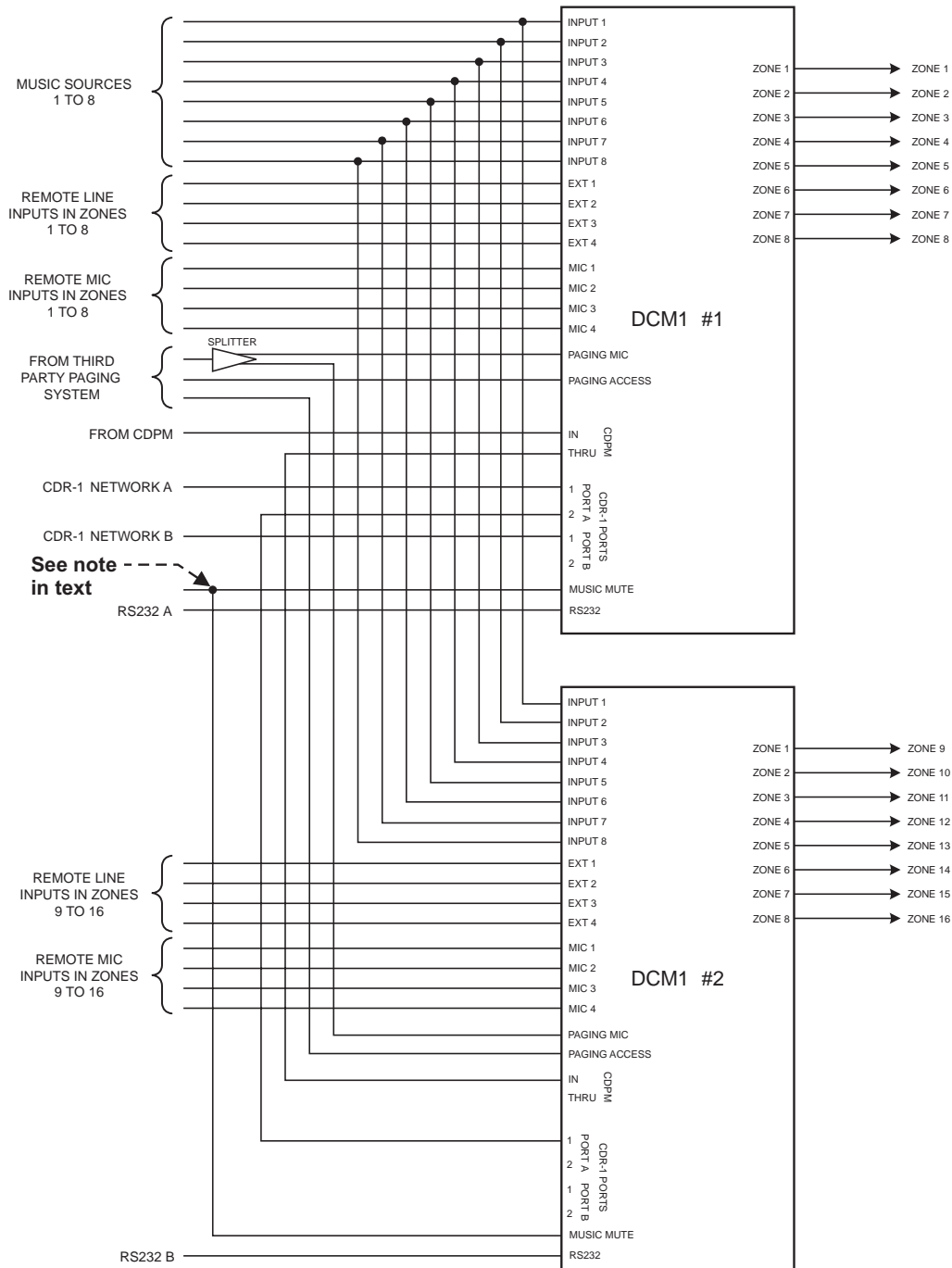
### Larger systems – cascading DCMI's

If an installation requires more than eight Zones, multiple DCMI's may be interconnected to provide a system with a larger number of outputs. For example, two DCMI's will provide 16 zones, three DCMI's 24 zones, and so on.

### System Interconnections

In order to provide a transparent system which can be operated with the same ease as one with a single DCMI, interconnections between multiple DCMI's must follow a few rules. The range of possibilities afforded by using multiple DCMI's is extremely large, and each installation will be guided by the user's requirements and the building layout.

The example given is for a simple 16-zone system comprising 2 DCMI's, with a CDR-1 in each of the 16 zones. The block diagram below shows how the various inputs are – or are not – interconnected. All possible connections have been depicted, though it is recognised that most systems will not use all of a DCMI's connectivity simultaneously.



Two DCMI Units forming a 16 Zone system

## Line Inputs

It will generally be possible to directly parallel the outputs of music sources to the Line Inputs of several DCMI's using suitable adaptors, splitter cables or junction boxes. Installers should satisfy themselves that the output of each music source is not reduced in level or frequency response by such a multiple connection; for most equipment, five is the upper limit of unbalanced inputs which can be paralleled in this way.

A more satisfactory solution is to use a stereo audio distribution amplifier (DA) for each source, with as many outputs as the number of DCMI's being fed. Connect the amplifier input to the source and the outputs to the same-numbered input of each DCMI.

## Extension Ports

The Extension Ports cannot be paralleled, but this is unlikely to be a system requirement as the use of remote line input modules (LE-Is and BE-Is) will be limited to the Zones in which they are located. They will thus be wired to the Extension Ports on the DCMI feeding those Zones, and not to any other.

## Mic Inputs

ME-I remote mic input modules cannot be paralleled to multiple DCMI's, but their use will also be limited to the Zones where they are installed. Any ME-Is in a system should be connected to the Mic Inputs of the DCMI feeding the Zones where they are located.

## Zone Outputs

Each DCMI's Zone outputs will feed a separate set of power amplifiers for those Zones. Thus in the example shown, DCMI #1's outputs will feed the amplifiers driving the loudspeakers located in Zones 1 to 8, while DCMI #2's outputs will feed the amplifiers driving the loudspeakers located in Zones 9 to 16.

## CDR-Is

Using more than one DCMI in a system does not greatly compromise the flexibility of CDR-I network wiring. The Installation section of this manual gives examples of the various wiring topologies which may be adopted (see xxx); that used in any particular installation will be dictated by building layout and wiring convenience.

The example above shows two chains of CDR-Is – called 'network A' and 'network B' for reference, connected to two of the CDR-I Ports on DCMI #1, one to **PORT A**, the other **PORT B**. Only one CDR-I interconnection is needed between multiple DCMI's. Either of DCMI #1's two remaining ports may be used to connect the CDR network to DCMI #2, and any of DCMI #2's four ports may be used. In the diagram, the second **PORT A** socket on DCMI #1 is connected to one of the **PORT A** sockets on DCMI #2. In this case, the **PORT A** CDR-I termination would be set OFF

in DCMI #1 and ON in DCMI #2. The **PORT B** termination would be set ON in DCMI #1, and the corresponding jumper setting in DCMI #2 is unimportant. It is important to recognise that the CDR-Is on each of the two chains in this example can be anywhere in the building, in any Zones.

So that any CDR-I in this system is assignable to any of the 16 Zones, the **CDR Zone Offset** function must be set to +8 on DCMI #2. This is set in the menu system; see page 34 for full details. With this setting made and the two DCMI's interconnected as shown, all CDR-Is in the system will offer all 16 Zones in their **Assign Zone** function when CDR-I Installer Mode is activated (see page 48).

The restriction placed on CDR-I network wiring by multiple DCMI's results from the necessity of using one CDR-I Port on DCMI #1 to route the network through to DCMI #2. In the example shown, the building network wiring would be limited to six chains, three on each DCMI.

It should be recognised that neither a CDR-I network interconnection between multiple DCMI's, nor the use of CDR Offsets may be necessary at all, if a network topology can be installed which limits the CDR-Is on any one chain to Zones which are being controlled by a single DCMI. Thus in the example, if the CDR-Is in Zones 1 to 8 were on a single chain, and those in Zones 9 to 16 on another, the first could be connected only to DCMI #1 and the second to DCMI #2, providing a simpler wiring system.

When planning the CDR-I network, the DC power supply capability of each DCMI must also be taken into account. As each DCMI can only supply sufficient current to operate 8 CDR-Is, it may be that an external PSU(s) will be required at some position(s) in the chain(s) when multiple DCMI's are being used. Although interconnecting two DCMI's as shown in the example permits full access to all zones in operation, it does not mean that 16 CDR-Is can be powered by using two DCMI's. If the system in the example was connected to a single chain of 16 CDR-Is (with Port B being ignored), an external PSU would need to be added to the chain at the CDR-I #9, to power the "farthest" 8 CDR-Is.

## PM Series paging mics

In order for a PM (or CDPM) system to access all 16 Zones, the two DCMI's should be interconnected as shown, with the **CDPM THRU** connector of DCMI #1 connected to the **CDPM IN** of #2. The CDPM termination in DCMI #1 should be set OFF, and that in DCMI #2 should be set ON. See also page 23.

## Third-party paging system

The microphone of a third-party paging system will need to address all Zones, so it must be connected to the **PAGING MICROPHONE INPUT** of both DCMI's. Paralleling a microphone signal is not recommended, and a microphone splitter, of either active or passive type, should be used as shown.

Interfacing a third-party paging system to a 16-zone system will require separate connections to the **PAGING ACCESS**

connectors of the two DCMI's. The paging commands for Zones 1 to 8 should be wired to the **PAGING ACCESS** connector of DCMI #1, and those for Zones 9 to 16 to that of DCMI #2. The general wiring procedures described at page 26 should be followed.

## Music Mute Input

The **MUSIC MUTE inputs** on the two DCMI's can be paralleled together, though this is not ideal. A preferred solution, if available, is to use a separate set of emergency system contacts for each DCMI making up the system.

## RS-232 Control

If the DCMI's are to be controlled via RS-232 by an external control system, the two DCMI's should be treated independently. Connect each DCMI's **RS232 INTERFACE** to a separate RS2-32 port on the system controller. The controller should be programmed to address each unit independently.

## Ethernet interface

Two DCMIe's should each have their **ETHERNET INTERFACE** port connected to two separate ports on the network switch. Ensure that the units have different IP addresses. Each unit can then be controlled via the browser interface independently.

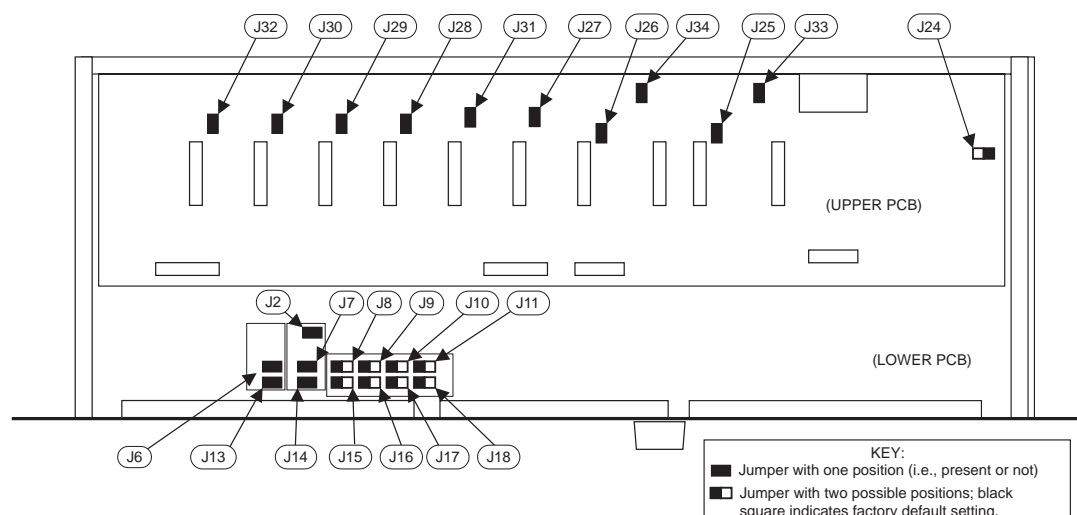
## PCB jumper locations and settings.

The DCMI has various internal jumpers, the setting of which may require alteration during installation. The table below lists each jumper and its purpose, together with the factory default setting.

The diagram below the table shows the locations of the internal jumpers (not to scale). In the case of the jumpers having two possible positions, the black square in the symbol indicates the default setting. If any jumpers need to be changed, undo the eight screws securing the top cover of the DCMI, and remove it. Use a pair of snipe-nosed pliers to gently remove the jumpers, and to reposition them if necessary. Refix the top cover using the original screws.

JUMPER	NAME	PURPOSE	DEFAULT
J2	PM/CDPM bus termination	ABSENT = PM/CDPM termination OFF PRESENT = PM/CDPM termination ON	Present
J6	CDR-I Port A bus termination	ABSENT = CDR-I Port A termination OFF PRESENT = CDR-I Port A termination ON	Present
J7	CDPM ground link	ABSENT = PM/CDPM signal ground "lifted" PRESENT = PM/CDPM signal ground connected	Present
J8	Reset Installer PIN	Reinstates original factory key for enabling Installer Mode. Replace after use.	Off
J9	Force Factory Defaults	Reinstates original factory settings except Input/Zone/Group names. Replace after use.	Off
J10	Bootloader baud rate: select 1	Changes baud rate for firmware updates. See table page 70.	Off
J11	Bootloader baud rate: select 2		Off
J13	CDR-I Port B bus termination	OFF = CDR-I Port B termination OFF ON = CDR-I Port B termination ON	Present
J14	PM/CDPM power link	OFF = PM/CDPM power off ON = DC power for PM/CDPM is available at <b>CDPM/PM IN</b> connector.	Present
J24	Paging mic phantom power	OFF: paging mic phantom power OFF ON: paging mic phantom power ON	Off
J25	EQ Module: Zone 1 R	Must be present if no EQ module is fitted	Present
J26	EQ Module: Zone 2 R		
J27	EQ Module: Zone 3		
J28	EQ Module: Zone 5		
J29	EQ Module: Zone 6		
J30	EQ Module: Zone 7		
J31	EQ Module: Zone 4		
J32	EQ Module: Zone 8		
J33	EQ Module: Zone 1 L		
J34	EQ Module: Zone 2 L		

**NOTE:** J15, J16, J17 and J18 are reserved.



## Serial Control

The DCM1 is equipped with a bi-directional RS-232 serial interface.

As a receiver, the interface permits external control of almost every DCM1 function, parameter and setting. The DCM1 appears as a DCE (Data Communications Equipment) device to controlling equipment.

The DCM1e is additionally able to receive the same serial commands in the form of TCP/IP data via the **ETHERNET INTERFACE** connector.

**NOTE:** A future firmware release for the DCM1e will permit the RS-232 interface to be programmed to transmit serial data to external equipment, thus additionally acting as an Ethernet to RS-232 bridge for equipment which does not have Ethernet capability.

The full RS-232 protocol is beyond the scope of this manual, but can be downloaded from [www.cloud.co.uk](http://www.cloud.co.uk).

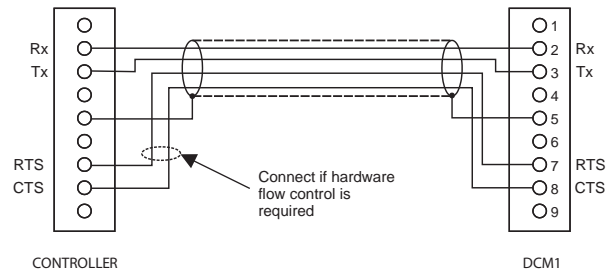
This section provides only details of the port parameters and an abridged serial command list, which comprises the normal User controls.

### Pinout

The rear panel **RS232 INTERFACE** connector is a D9F. The pinout is shown in the table:

PIN	FUNCTION
1	n/u
2	Data receive
3	Data transmit
4	DTR
5	0v
6	DSR
7	RTS
8	CTS
9	n/u

Not all control systems interpret “Tx” and “Rx” the same way, and the installer should check whether pins 2 and 3 (and 7 and 8 if used) should be “crossed” within the cable. The installer should also check whether the control system being used requires RS-232 flow control to be implemented, and if so, whether hardware control or software control is used. Hardware flow control (sometimes called RTS/CTS) requires pins 7 and 8 (at the DCM1 end) to be connected.



### Port parameters

PARAMETER	VALUE/SETTING
Data type:	RS-232C serial
Data speed	300/1200/2400/4800/9600/19200 baud, software-selectable
Word length	8 bits
Parity	None
Stop bits	One

### Abridged command set

The commands listed in the table below are the equivalent of the operating controls available in User Mode. For all other commands, data requests and responses, please refer to the DCM1’s full RS-232 protocol document.

GENERAL FORMAT	
FUNCTION	COMMAND (ASCII)
Route Input x to Zone y	<Zy .MU , Sx />
Set audio level in Zone y to -m dB	<Zy .MU , Lm />
Reduce audio level in Zone y by p dB	<Zy .MU , LDp />
Increase audio level in Zone y by q dB	<Zy .MU , LUq />
Enable Group z	<Gz , E />
Disable Group z	<Gz , D />
Enable paging to Zone y (see Example 4)	<PM , PAy />
Release paging	<PM , PR />



## Examples:

### 1. Input Selection:

The values of x and y in the general format are the Input No. (1 to 8) and the Zone No. (1 to 8) respectively.

EXAMPLE	COMMAND	
Select Input 3 in Zone 6	ASCII	<Z6.MU,S3/>
	HEX	3C 5A 36 2E 4D 55 2C 53 33 2F 3E

### 2. Zone Levels:

Levels can either be set to an absolute value (in dBs), or increased/decreased by a specified number of dBs.

For absolute levels, the number of dBs corresponds to attenuation rather than gain, thus 0 dB is maximum level and at -62 dB the zone is muted. The values of y and m in the general format are the Zone No. (1 to 8) and the attenuation level in dBs (0 to 62) respectively.

To alter the Zone level by a specified amount, the additional ASCII characters 'U' (up) or 'D' (down) are added to the string. The values of y, p and q in the general format are the Zone No. (1 to 8), the level increase in dBs (0 to 62), or the level decrease in dBs (0 to 62) respectively. A command to increment the level by a number of dBs greater than the current attenuation will set the level to maximum. Similarly, a command to decrement the level by a number of dBs greater than (62 minus the current attenuation) will mute the Zone output.

EXAMPLE	COMMAND	
Set level in Zone 2 to -12 dB	ASCII	<Z2.MU,L12/>
	HEX	3C 5A 32 2E 4D 55 2C 4C 31 32 2F 3E
Reduce level in Zone 1 by 10 dB	ASCII	<Z1.MU,LD10/>
	HEX	3C 5A 31 2E 4D 55 2C 4C 44 31 30 2F 3E
Increase level in Zone 5 by 6 dB	ASCII	<Z5.MU,LU6/>
	HEX	3C 5A 35 2E 4D 55 2C 4C 55 36 2F 3E

### 3. Enable/Disable Groups

Zone membership of Groups must first be defined in the menu system (at Groups > Group Member).

The value of z in the general format is the Group No. (1 to 4).

EXAMPLE	COMMAND	
Enable Group 3	ASCII	<G3,E/>
	HEX	3C 47 33 2C 45 2F 3E
Disable Group 1	ASCII	<G1,D/>
	HEX	3C 47 31 2C 44 2F 3E

### 4. Enable/Release Paging

RS-232 control of paging applies only to third-party paging systems connected to the Paging Mic Input.

This command differs from the others in that the value of y in the general format is in the form of an 8-character mask of ASCII "X's" (select) and "O's" (don't select), with the character position in the mask denoting the Zone number.

EXAMPLE	COMMAND	
Enable paging to Zone 2	ASCII	<PM,PAOX000000/>
	HEX	3C 50 4D 2C 50 41 4F 58 (4F 4F 4F 4F 4F) 2F 3E
Enable paging to Zones 4 to 7	ASCII	<PM,PAOOOXXXXO/>
	HEX	3C 50 4D 2C 50 41 4F 4F 58 58 58 58 (4F) 2F 3E
Cancel paging	ASCII	<PM,PR/>
	HEX	3C 50 4D 2C 50 52 2F 3E

Note that it is not strictly necessary to transmit the "O" character (4Fh) for channel numbers above the highest being paged. Thus <PM,PAOX/> (ASCII) would suffice in the first example above, and <PM,PAOOOXXXX/> in the second. However, the full eight characters are shown in the table for completeness, with the extra characters in brackets in the hex version.

## Configuring the Paging Access Connector as a GPIO port

By default, the rear panel **PAGING ACCESS** connector is configured to select the zones to which paging will be routed when the DCM1 is used with a paging system other than a Cloud PM (which use the digital PM paging interface). If this functionality is not required, the connector may be reconfigured to provide per-zone output tallies; see page 33 and page 23 for full details.

A third option is to use the **PAGING ACCESS** connector as an 8-way GPIO (General Purpose Input/Output) port. In this mode, any of the eight "zone" pins may be configured as a logic input or output, and they will no longer have any direct relevance to the DCM1's paging functions. The main use of this mode is in conjunction with an external control system (e.g., Crestron, AMX, etc.). The control system can be programmed to interrogate the DCM1 to evaluate the logic status of input pins, or to set the logic status of output pins. The commands will be via RS-232 strings sent to the **RS232 INTERFACE**, or in the case of the DCM1e, via TCP/IP serial commands to the **ETHERNET INTERFACE**.

The **Configure Access Connector** menu function permits a slightly restricted set of I/O configurations of the eight pins: inputs and outputs must be in consecutive “blocks”, e.g., pins 1 to 4 may be inputs with pins 5 to 8 as outputs. However, using serial commands allows any combination of inputs and outputs (up to a total of eight) to be set up. Examples are given below.

### Inputs:

In Input mode, the logic level present at a pin will be evaluated as “high” (>2.55 V) or “low” (<0.75 V), and logic “active” = “low”. The most common use of the GPIO port in Input mode is to connect a pin to an external SPST push-button or other type of N/O switch, with 0V being applied to the other contact. In Input mode, the pins are pulled-up internally to +12V, so an external switch closure will register as a low level on interrogation, and this is interpreted as “active”.

### Outputs:

In Output mode, the pins may be assigned to be “high” (nominally +12V) or low (nominally 0V). External equipment requiring a logic input may be connected to output pins, provided the inputs are rated at not more than 24V and do not draw more than 60 mA.

### Using Serial commands with the GPIO port:

RS-232 serial commands via either the **RS232 INTERFACE** (DCMI or DCMIe) or **ETHERNET INTERFACE** (DCMIe only) may be used to set the configuration of the **PAGING ACCESS** connector.

GENERAL FORMAT	
FUNCTION	COMMAND (ASCII)
Configure Connector for paging	<PM,x/>
Configure Connector as GPIO port	<SY.AC,Dxm/>
Set GPO(s) active	<SY.AC,BSy/>
Clear all GPOs	<SY.AC,BPy/>

The results of these commands broadly correspond to the options provided by the **Configure Access Connector** menu function: the connector can be set for use with a paging system, either as an input (Paging Zone Select) or output (zone tallies), or as a GPIO port.

### 1. Configure for use with Paging mics

The value of x in the general format command <PM,x/> is either ASCII “I” or “O”, configuring the connector for paging zone selection or as a set of eight zone tallies respectively.

### 2. Configure as GPIO port

The value of x in the general format command <SY.AC,Dxm/> is again either ASCII “I” or “O”, with m defining a number of pins on the connector to be GPI(s) or GPO(s) respectively (where 1 ≤ m ≤ 8). In this mode, note that pins set as inputs will always form a consecutive block numbered ‘up’ from pin 1; likewise pins set as outputs will always form a consecutive block numbered ‘down’ from pin 8. Thus in the third example below, pins 1 to 3 will be set as GPIs, while pins 4 to 8 will remain as GPOs. A command setting a pin to the same I/O state as its current state will have no effect.

### 3. Set GPOs active

Once pins have been defined as outputs in GPIO mode, each may be set “active” or reset “inactive” at will, using the general format command <SY.AC,BSy/>. Here, y is an 8-bit string consisting of either ASCII “X”s or “O”s. An “X” will set an output “active”, and its in-string position refers to the the pin number, as shown in fourth example below.

EXAMPLE	COMMAND	
Configure Access Connector for paging zone selection	ASCII	<PM,O/>
	HEX	3C 50 4D 2C 4F 2F 3E
Configure Access Connector as zone tallies	ASCII	<PM,I/>
	HEX	3C 50 4D 2C 49 2F 3E
Configure Access Connector as GPIO port with 3 inputs	ASCII	<SY.AC,DI3/>
	HEX	3C 53 59 2E 41 43 2C 44 49 33 2F 3E
Configure Access Connector as GPIO port with 3 outputs	ASCII	<SY.AC,DO3/>
	HEX	3C 53 59 2E 41 43 2C 44 4F 33 2F 3E
Set GPO 3 (pin 3) as active	ASCII	<SY.AC,BSOOXOOOOO/>
	HEX	3C 53 59 2E 41 43 2C 41 53 51 51 58 51 51 51 51 51 2F 3E
Clear all outputs	ASCII	<SY.AC,BPXXXXXXXX/>
	HEX	3C 53 59 2E 41 43 2C 41 50 58 58 58 58 58 58 58 58 2F 3E

## PSU capability

In addition to supplying the DCM1's internal circuitry, the PSU has the capacity to power some additional items which may form part of a complete system. These include CDR-I remote control panels, remote mic and line input modules, PM Series paging microphones and any level restoration relays which may be connected at the Paging Access Connector in Output mode.

The maximum current capacity of the PSU available for powering external items is 470 mA on each of the +12 V and -12 V rails. This should be used as the guide figure when calculating whether any external PSUs will be required in a system.

Current consumption of the various items is listed in the table below.

ITEM	CURRENT @ +12V	CURRENT @ -12V	MAX. NO.
CDR-I Series remote control panel*	50 mA	nil	8
PM-4 paging microphone	72 mA	nil	1
PM-8 paging microphone	83 mA	nil	1
PM-12 paging microphone	95 mA	nil	1
PM-16 paging microphone	107 mA	nil	1
PM-4SA paging microphone + message store	220 mA*	nil	1
PM-8SA paging microphone + message store	250 mA*	nil	1
BE-I Series remote line input modules (bal.)	24 mA	24 mA	
LE-I Series remote line input modules	22 mA	22 mA	
ME-I Series (except ME-IM) remote mic input modules	43 mA	43 mA	
ME-IM remote mic input modules	30 mA	30 mA	
Restoration relays	(see below)	nil	

\*Please also see page 21 regarding power distribution via the CDR network.

\*Max current consumption during message recall

The installer should ensure that the total current drawn by all the external items in a system does not exceed 470 mA. If the **PAGING ACCESS** connector is being used as an output to operate level restoration relays (either directly or indirectly – see page 23), the current taken by the relay coils must also be taken into account. The open-collector outputs at this connector are limited to 60 mA per zone.

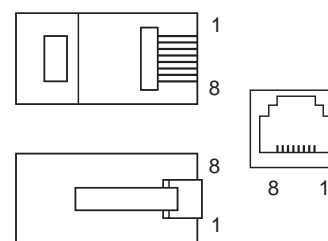
If the total current required by external items does exceed 470 mA on either rail, additional PSUs will need to be added to the system. The Cloud CPM-PSU is suitable for powering CDR-I remote control panels and PM Series microphones and can be readily interfaced with the respective networks.

PSU performance will be degraded at ambient temperatures in excess of 35°C.

## RJ45 pinout

The standard RJ45 wiring convention is as shown below:

PIN	CAT5 CORE
1	White + Orange
2	Orange
3	White + Green
4	Blue
5	White + Blue
6	Green
7	White + Brown
8	Brown



The table below lists the pin allocation of the various RJ45 sockets on the DCM1's rear panel (The DCM1e's **ETHERNET INTERFACE** pinout is not included here; this is wired to the normal Ethernet standard).

PIN	CDPM/ PM	CDR-I PORTS	EXTENSION PORTS	MICROPHONE INPUTS
1	Mic (hot)		Left (cold)	Mic sum (cold)
2	Mic (cold)		Left (hot)	Mic sum (hot)
3			Sense	Sense
4	DC +ve	DC +ve	DC +ve	DC +ve
5	0v	0v	0v	0v
6			DC -ve	DC -ve
7	Data H	Data H	Right (hot)	
8	Data L	Data L	Right (cold)	

## Fitting loudspeaker EQ cards

Each output channel of a DCM1 may be optimised for use with certain makes and models of installed sound loudspeakers; a single-channel equalisation module may be fitted to as many Zone outputs as necessary.

To install equalisation modules, first remove the top cover from the DCM1 (8 screws). The modules plug into the white 12-pin connectors on the upper PCB. Note the header connectors on the PCB have two notches on one side only; these engage with lugs on the equalisation module's mating connector to ensure correct orientation.

After fitting equalisation modules to any channel(s), the corresponding module bypass jumper(s) *must* be removed in order for the module to function. These are J25 to J34; see the Appendix section "PCB jumper locations and settings" page 65 for full details. Replace the top cover with the original screws after fitting.

## Firmware updates

This section describes the process for upgrading the DCM1's firmware.

As a responsible manufacturer, Cloud Electronics adopt a policy of continuous product development. As with all software-based products, it may be desirable from time to time to update the firmware in the DCM1 with a more recent version. Update files are available as downloads from the Cloud website [www.cloud.co.uk](http://www.cloud.co.uk). Alternatively, please contact your Cloud dealer or distributor.

### DCM1 only:

The new firmware is transferred from a PC to the DCM1 via the latter's RS-232 port. The PC used for the transfer should either have a 9-pin COM port or a USB-to-COM convertor should be used. A straight-through, fully-populated D9 cable should be used. The default baud rate for transfer is 115200 baud, but this can be altered by changing the positions of jumpers J10 & J11 (see page 65 for jumper locations). The table below gives the alternative baud rates available:

J10	J11	BAUD RATE
OFF	OFF	115200
OFF	ON	57600
ON	OFF	19200
ON	ON	9600

Firmware update is initiated by selecting the **Firmware Update** function in the System menu (see page 39). The DCM1 should then be powered off and back on again, or reset with the **Reset Mixer** function. At this point, a bootloader routine will be entered, indicated by the front panel LEDs 1 to 8 flashing in an odd/even sequence. The display will indicate

details of recovery procedure (should bootloader be entered accidentally) and how to change the baud rate.

The new firmware can now be transferred. Should the transfer fail, turn the DCM1 off, and hold the NEXT button down while powering it back on again. Go immediately to the **Firmware Update** menu function, and turn the bootloader off.

Full instructions on how to perform an update will be provided with the update file, including details of the PC software application for handling the file transfer.

### DCM1e only:

**DCM1e** See also page 53 for information about updating DCM1e firmware using the browser interface.

1. Download the DCM1e firmware update from [www.cloud.co.uk](http://www.cloud.co.uk).
2. Read the update notes to check that the update is applicable to your unit.
3. Establish the Ethernet connection between the DCM1e and your network switch. Launch your usual web browser and connect to the DCM1e in the usual way.
4. Click **Menu > Login**.
5. Enter the Installer PIN to log in as Installer.
6. Click **Menu > Config > Device Info**.
7. Click **Upload**.
8. Enter the Installer PIN again.
9. DCM1e will now enter **bootloader mode**.
10. Run the Firmware Update application on a Windows® PC connected to the same network.
11. Click **Discover**.
12. Click the IP Address listed in **BOLD** font.
13. Check and confirm which settings you would like to overwrite on the **Update** interface.
14. Click **Update**.
15. Wait for the "**Firmware updated successfully**" message.
16. Click **OK**, then close the Firmware Update application.

## Factory default settings – menu options

The table below lists the default factory settings for all DCMI menu options. These are the settings which the unit will assume on power-up if **Power Up Mode** is set to **Factory**.

The factory default key for enabling Installer Mode is included in the list at System Mode > **Set Key**.

MUSIC MENU:	
Select Input	Input 1 routed to all Zones; no other assignments
Level	All Zones at minimum (muted)
Treble	0 dB
Mid	0 dB
Bass	0 dB
Input Gain	All Inputs 0 dB
Maximum Music Level	All Zones 0 dB (max.)
Minimum Music Level	All Zones -62 dB (muted, min.)
ROUTING MENU:	
Enable Mic Inputs	No Mics assigned to any Zone
Input Enable	All Inputs available in all Zones
Configure Access Connector	Input
CDPM Zone Offset	0
CDR Zone Offset	0
SYSTEM MENU:	
CDR Zone Setup	All Zones OFF
Stereo/Mono Zone Selection	Zones 1 and 2 stereo
Rename Inputs	Input 1 to Input 8
Rename Zones	Zone 1 to 8
Rename Groups	Groups 1 to 4
Set Key	1234
RS232 Baud Rate	9600
RS232 Flow Control	OFF
Power Up Mode	Factory
Save Defaults	n/a
Update Firmware	OFF
Reset Mixer	n/a
PRIORITIES MENU:	
Select Priority Line Input	No Input assigned to any Zone
Line Priority Hold Time	3 sec.
Line Priority Release Time	1 sec.
Set Mic Priority Input	No Input assigned to any Zone.
Mic Priority Hold Time	3 sec.
Mic Priority Release Time	1 sec.
Mic Priority Attenuation	30 dB
Page Priority Select	Off
Page Priority Hold Time	3 secs.
Page Priority Release Time	1 sec.
Page Priority Attenuation	30 dB
Select Emergency Source	No Input assigned
Emergency Level	Maximum
Configure Music Mute	Normally Open (N/O)
GROUPS MENU:	
Group Enable	No Groups enabled
Group Member	No Groups defined

Note that restoring the factory default settings (either by setting **Power Up Mode** to **Factory**, or by moving jumper J9) does not overwrite any Input, Zone or Group names that have been assigned.

### DCMI1e

## Factory default settings – network settings

The following network settings are applicable to the DCMI1e only:

Network Item	Setting
IP Address	DHCP enabled
NETBIOS Name	DCMI-ANON
MAC Address	00:04:A3:xx:xx:xx 00:1E:C0:xx:xx:xx

## Cloud DCMI Configuration Notes – to be left with User

Complete this form when installation is complete and leave with User.

MUSIC SOURCES - NAMES	
INPUT	SOURCE
1	
2	
3	
4	
5	
6	
7	
8	

ZONES - NAMES	
ZONE	LOCATION
1	
2	
3	
4	
5	
6	
7	
8	

GROUP SETUP								
GROUP	LOCATION & FUNCTION	CONNECTS ZONES (tick)						
		1	2	3	4	5	6	7
1								
2								
3								
4								

### To Change the Music Source in a Zone

- If top line of display does not show **Select Input**, press MUSIC button.
- Press the button (1 to 8) which corresponds to the Zone.
- Turn the knob until the bottom line of the display shows the music source required.

### To alter the Music Volume in a Zone

- If top line of display does not show **Select Input**, press MUSIC button.
- Press the NEXT FUNCTION button so that the top line of the display shows "Level"

- Press the button (1 to 8) which corresponds to the Zone.
- Adjust the volume in the Zone with the knob.

### To Enable/Disable a Group of Zones

- Press the GROUPS button
- Turn the knob until the required Zone Group is displayed on the top line
- Press the knob in to enable (or disable) the Group.



# Cloud DCMI Installer configuration notes

MENU	ZONE	1	2	3	4	5	6	7	8
<b>NAME</b>									Enter Name of Zone
<b>MUSIC</b>									
Treble									Record settings
Mid									
Bass									
Maximum Level									
Minimum Level									
<b>ROUTING</b>									
Input Enable									Tick enabled Inputs in each Zone
	Input 1								
	Input 2								
	Input 3								
	Input 4								
	Input 5								
	Input 6								
	Input 7								
	Input 8								
<b>Zones 1/2 Stereo?</b>									Tick if stereo
<b>PRIORITIES</b>									
Priority Line Input									Enter Priority Line Input No. for each Zone
Hold Time									Record settings
Release Time									
Priority Mic Input									Enter Priority Mic Input No. for each Zone
Hold Time									Record settings
Release Time									
Attenuation									
Page Priority Select									Enter Paging method set: OFF/VOX/ACCESS
Hold Time									Record settings
Release Time									
Attenuation									
<b>GROUPS</b>									
Group Membership									Tick Zones assigned to each Group
	Group 1								
	Group 2								
	Group 3								
	Group 4								

MENU	ZONE	1	2	3	4	5	6	7	8
<b>REMOTE INPUT PLATES</b>	<b>NAME</b>								Enter Name of Zone
	LE-1	Extension Port 1							Tick Zones with LE-1 Plates connected to each Extension Port
		Extension Port 2							
		Extension Port 3							
<b>BE-1</b>		Extension Port 4							
		Extension Port 1							Tick Zones with BE-1 Plates connected to each Extension Port
		Extension Port 2							
		Extension Port 3							
<b>ME-1</b>		Extension Port 4							
		Mic Input 1							Tick Zones with ME-1 Plates connected to each Mic Input
		Mic Input 2							
		Mic Input 3							
<b>INPUT SETTINGS</b>		Mic Input 4							
	<b>NAME</b>								Enter Name of Input
		Input Gain							Record settings

GLOBAL SETTINGS	SETTINGS	
<b>ROUTING MENU</b>	Access Connector	Input or Output
	CDPM Zone Offset	Record value (if used)
	CDR Zone Offset	
<b>SYSTEM MENU</b>	RS232 Baud Rate	Record settings
	RS232 Flow Control	
	Power Up Mode	Factory/Defaults/Last
<b>PRIORITIES MENU</b>	Emergency Source	Record Input assigned
	Emergency Level	Estimate % level
	Music Mute Input	NO or NC

## EMC considerations

Cloud DCMI fully conforms to the relevant electromagnetic compatibility (EMC) standards and is technically well behaved; you should experience no operational problems, and under normal circumstances, no special precautions need to be taken. If the unit is to be installed in close proximity to potential sources of RF disturbance such as high power transmitting stations, radar facilities, etc., the performance of the mixer may be reduced; we suggest that particular attention is paid to screening of audio cables – especially microphone cables, and that all cables are kept as short as possible.

## Specifications

Line inputs	
Frequency Response	20 Hz – 20 kHz $\pm 0.5$ dB
Distortion	<0.05%, 20 Hz – 20 kHz
Sensitivity	195 mV (-12 dBu) to 3.1 V (+12 dBu)
Input Gain Control	24 dB range
Input Impedance	47 kohms
Headroom	>+10 dB
Noise	-90 dB A weighted (0 dB gain)
Equalisation	HF: $\pm 14$ dB @ 10 kHz MID: $\pm 14$ dB @ 1200 Hz LF: $\pm 14$ dB @ 50 Hz
Paging Microphone Input	
Frequency Response	100 Hz / -3 dB (filter) 20 kHz $\pm 0.5$ dB
Distortion	<0.05% 20 Hz – 20 kHz
Gain Range	10 dB – 50 dB
Input Impedance	>2 kohms (balanced)
Phantom power	+12V (PCB jumper for on/off)
Headroom	>20 dB
Noise	-120 dB EIN 22 Hz – 22 kHz (150 ohms)
Equalisation	HF: $\pm 10$ dB @ 5 kHz LF: $\pm 10$ dB @ 100 Hz
Outputs	
Balanced Zone Outputs	775 mV (0 dBu)
Minimum load impedance	600 ohms
Maximum output level	+10 dBu (2.6 V)
External Power Supply	
External Supply Input	100V-240 V AC; 47-63 Hz; 1.35 A
Power supply	+12V, 3 A; -12V 1 A
Physical	
Dimensions (w x h x d)	2U 19" rackmounting unit: 482.6 x 88 x 170 mm (19 x 3.46 x 6.69 in.) Dimensions do not allow for rear connectors/cabling.
Net weight	3.12 kg (7 lb)











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