

**cdc** five

## **Cadac Digital Live Sound Mixing Console** Hardware Overview





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## **Important Safety Information**

**CAUTION:** These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the User Manual unless you are qualified to do so. Refer all servicing to qualified service personnel.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water. Do not expose this apparatus to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on this apparatus.
6. Clean only with a dry cloth.
7. Do not block any of the ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus that produce heat.
9. Only use attachments/accessories specified by the manufacturer.
10. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as the power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
11. To completely disconnect mains power from this apparatus, the power supply cord must be unplugged.

### ***For US and CANADA Only***

Do not defeat the safety purpose of the grounding-type plug. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. When the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.



The lightning flash with arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of an uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

## General Precautions

- Do not place heavy objects on the control surface, expose it to sharp objects or handle the console in any way that may cause damage, e.g., rough handling and /or excessive vibration.
- Do not subject the equipment to dirt, dust, heat or vibration during operation or storage. Never expose the console to rain or moisture in any form. Should the console become wet, turn it off and disconnect it from the mains without further delay. The console should be given sufficient time to dry out before recommencing operation.
- When cleaning the console, never use chemicals, abrasive substances or solvents.
- The console control panel should be cleaned using a soft brush and a dry lint-free cloth. For persistent marks, use a soft cloth and isopropyl alcohol. Switches and potentiometers do NOT require cleaning or lubrication.
- Keep these instructions for future reference. Follow all warnings in this manual and those printed on the console.
- The console must be connected following the guidance in this manual. Never connect power amplifier outputs directly to the console. Connectors and plugs must never be used for any other purpose than that for which they are intended.
- The console mains input must always be connected to correctly rated mains power as referred to in this manual. The mains input must, at all times, be connected to the local mains power supply using the supplied power cord. In cases where the supplied plug does not fit, a qualified electrician must be consulted.
- The power cord must be routed in such a way that the risks of accidentally stepping on it, stretching it or it being pinched are minimized.
- **WARNING! THIS EQUIPMENT MUST BE EARTHED!**
- Ventilation slots must never be covered or obstructed in any way, otherwise airflow required for safe operation may be restricted. Where the console is to be operated in its flight-case, then this must be located in such a way that it allows for proper ventilation.
- Refer servicing to qualified technical personnel only.

## Declaration of Conformity

We, SCC Audio Limited, of 1 New Street, Luton, Bedfordshire, LU1 5DX declare under our sole responsibility that the **CADAC CDC five** digital audio mixing console, as detailed below complies with the provisions of the following European Directives and is eligible to bear the CE mark:

Product Type Number	Product Description	Serial number
Cadac CDC five	Digital Audio Mixer	0000000000

### Object of the declaration:



The Cadac CDC five is a live sound audio mixing console with 48 input channels and 24 assignable busses. Based on an evolution of Cadac's 'high agility' operating system, the compact CDC five features a single, 23.5" 16:9 touch screen with encoders to the right and bottom the screen along with 16, 100mm motorised faders.

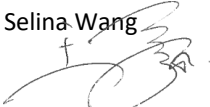
The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

EMC Directive: **2014/30/EU**  
 Low Voltage Directive: **2014/35/EU**

The following harmonised standards and technical specifications have been applied:

Electrical Safety (LVD): **EN60950-1:2006 + A2:2013**  
 Electromagnetic Compatibility: **EN55032:2015**  
**EN55013:2013+A1:2016**  
**EN61000-3-2:2019** **EN61000-3-3:2013**  
**EN61000-4-2:2009** **EN61000-4-6:2013**  
**EN61000-6-3:2007+A1:2011** **EN61000-6-2:2005**  
**EN55024:2010+A1:2015**

### Signed for on behalf of:

Name of Authorised Signatory	Selina Wang
Signature of Authorised Signatory	
Position of Authorised Signatory	FD SCC Audio Ltd
Date	01 December 2019
Date when first CE marked	01 March 2018
Place where signed	Luton, UK

## Introduction

Thank you for purchasing this Cadac CDC five digital audio mixing console.



From its founding in 1968, Cadac's products have become the benchmark for audio mixing consoles. The CDC five is one of Cadac's range of live performance digital production consoles using Cadac's innovative and acclaimed user interface.

It makes most of the features developed over a 50-year period of innovation within large-scale theatre and touring analogue desks and puts them within a compact, fixed-architecture digital system, using a "high-agility" user interface-based on a wide-format touch screen. Professional sound engineers familiar with other digital consoles will find the transition to the CDC five's operational system quick and intuitive.

Cadac's attention to detail and high-quality audio circuitry remains at the core of the CDC five's design philosophy.

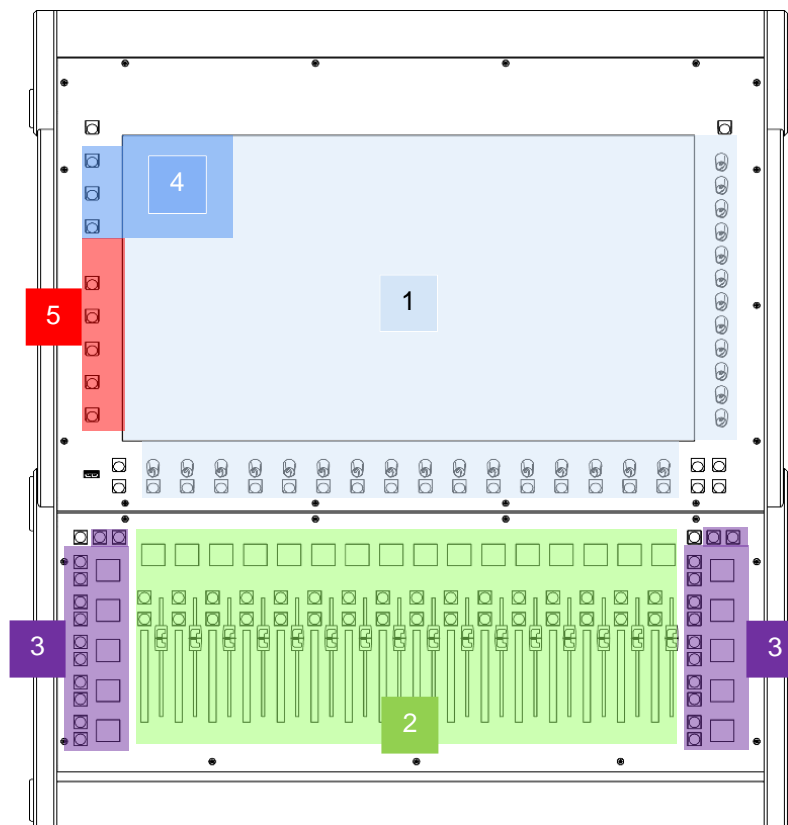


## Overview

The CDC five can be used as a stand-alone unit and also as part of a larger system comprising of multiple units: control surface and remote MegaCOMMS I/O device(s). The control surface provides local analogue and digital inputs and outputs, which can be expanded via a number of remote stagebox(es) options. An external back-up (redundant) power supplies can also be specified.

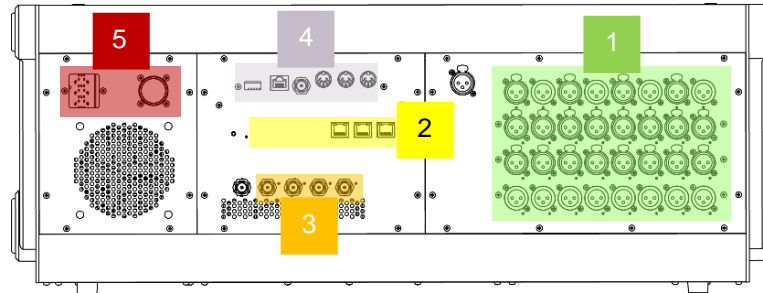
### Control Surface

The control surface is divided in five operational areas:



1. Graphical User Interface based around a 23.5", 16:9 (1920 x 1080 pixels) touchscreen display with rotary encoders mounted below and to the right of the screen
2. Channel Fader Bay with 16 x 100 mm motorised faders, OLED channel displays, stereo LED bar graph meters and other controls
3. User Assignable buttons with OLED displays
4. System Menu, a drop-down window providing access to the console's set-up functions
5. Quick Access Buttons to functions including GEQ, VCA and Fader Follow

All connections to the surface (apart from headphones and three USB ports) are on the rear panel of the control surface: these include PSU connectors, MegaCOMMS ports, local analogue and digital audio I/O, Waves® SoundGrid® card, MIDI, Word Clock In and Out, USB and Network ports.



1. Local I/O - digital and AES3
2. Waves® SoundGrid® card
3. MegaCOMMS ports
4. MIDI, Word Clock In, Network and USB
5. PSU connectors

For further detailed explanation of the control surface please see sections: Console Hardware Overview: Surface and Console Hardware Overview: Rear

## ***Shipping Details***

As well as the control surface and remote I/O device(s) specified at the time of ordering, the CDC five is shipped in a cardboard box with the following additional items:

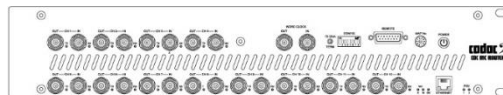
- Dust cover for control surface
- Gooseneck console lamp
- IEC power cable

## Remote MegaCOMMS I/O Devices

Various versions of remote MegaCOMMS I/O devices are available:

- CDC MC Router – up to 3,072 channels of MegaCOMMS routing, including gain compensation
- CDC MC MADI – 64 bidirectional channels of MADI I/O, including SRC
- CDC MC Dante – 64 bidirectional channels of Dante I/O, including SRC
- CDC MC AES3 – 18 x AES3 inputs, 18 x AES3 outputs (36 bidirectional audio channels)
- CDC MC Optical – up to 512 bi-directional audio channels via optical fibre; 2 km drive capability
- CDC I/O 6448 – 64 mic / line inputs and 48 balanced line outputs
- CDC I/O 3216 – 32 mic / line inputs and 16 balanced line outputs

CDC MC Router



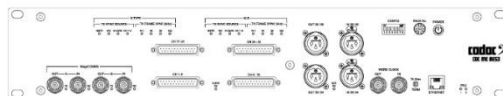
CDC MC MADI



CDC MC DANTE



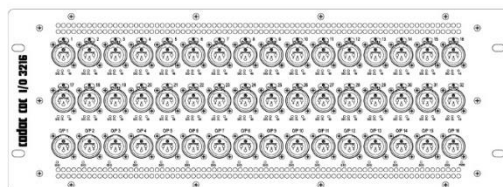
CDC MC AES



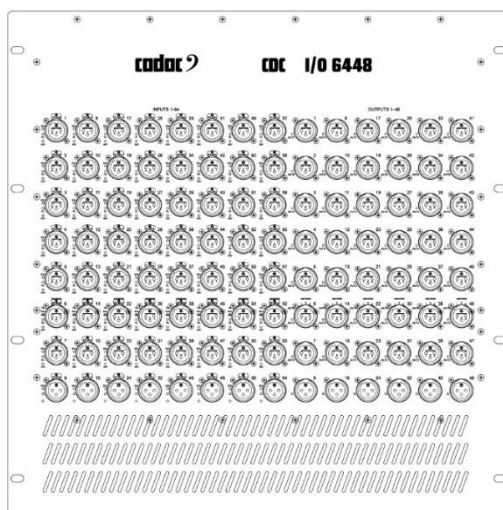
CDC MC Optical



CDC I/O 3216

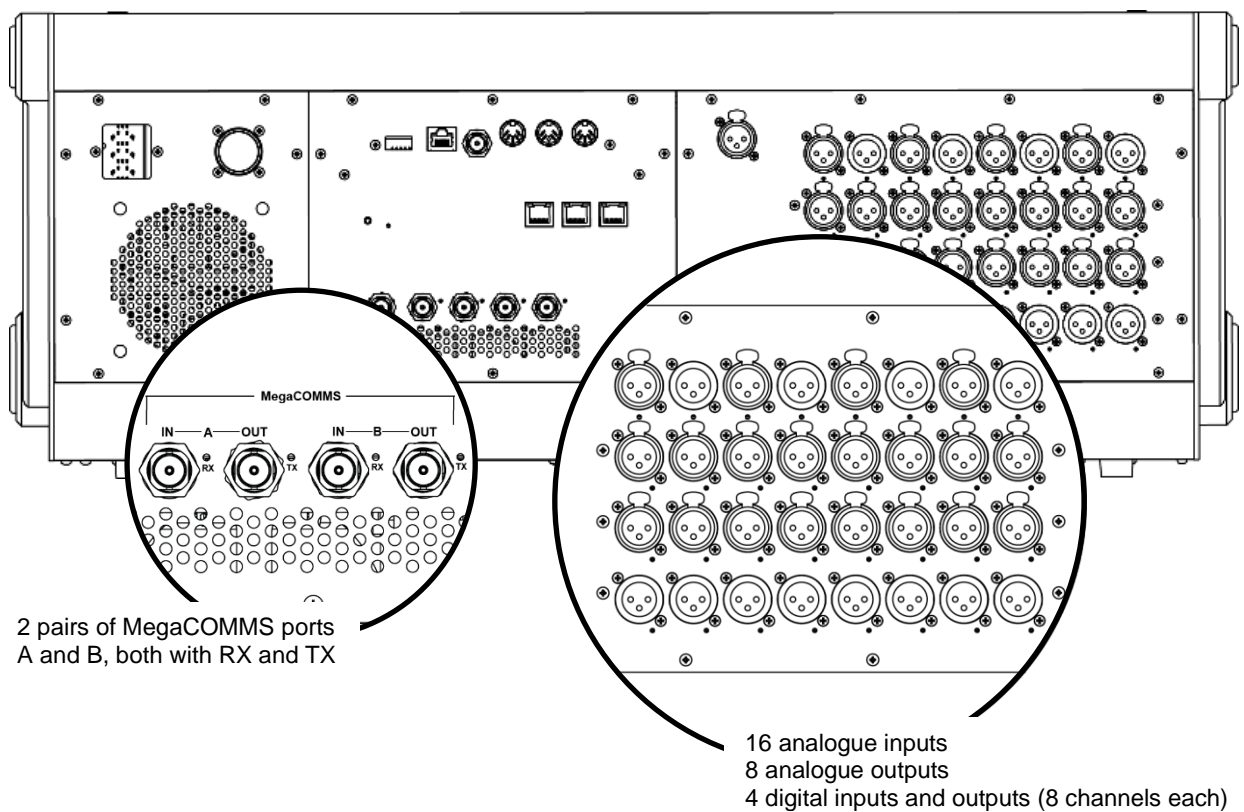


CDC I/O 6448



Up to two MegaCOMMS remote I/O devices can be connected directly to the console. The addition of a CDC MC Router allows up to 11 further MegaCOMMS units to be connected.

In addition to the I/O provided by the CDC MegaCOMMS remote I/O devices, the control surface is provided with sixteen analogue mic/line inputs, eight analogue line outputs (all balanced), four balanced AES/EBU inputs and four balanced AES/EBU outputs. The routing of this local I/O may be configured via the CDC five's software.



## ***Console System Overview***

The control surface contains all the system DSP, and apart from the local analogue I/O, all audio signal paths and processing are in the digital domain.

The stageboxes contain Cadac's high quality analogue microphone preamplifiers with their gain and other parameters being remotely controlled, together with 96 kHz, 24-bit A-to-D and D-to-A conversion.

The CDC five employs the now-familiar concept of "layering" to reduce the size of the control surface, with 16 motorised faders able to control a maximum console configuration of 48 input channels mixing into 24 assignable mix busses, plus left, centre and right master busses, and three monitor busses for PFL and AFL plus headphones.

The graphical interface on the 23.5" touchscreen screen has been designed to present as familiar a layout as possible, using large, intuitive controls with visual feedback.

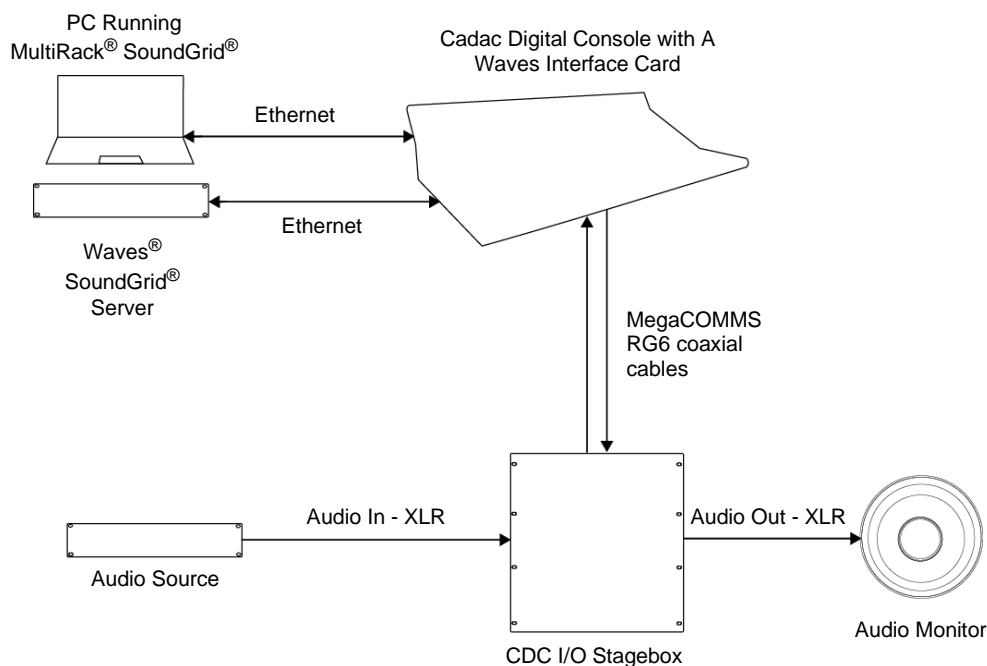
The rotary encoders at the edges of the screen map to the graphical interface on the screen and are used to make all parameter adjustments (levels, EQ parameters etc.)

An important feature of the CDC five is that there is very little distinction between input channels and output channels in terms of features and facilities. The 24 mix busses are freely assignable as groups, auxiliary sends, matrix sends or FX sends: all of these have fundamentally the same facilities as the input channels and are displayed and controlled in the same way.

## Waves®

The CDC five control surface includes a Waves® SoundGrid® interface. This allows up to 64 channels of Waves® studio-grade plug-ins to simultaneously run alongside the console's own native effects. It requires the use of an external Waves® Server plus a PC running Waves® MultiRack® SoundGrid® with appropriate Waves® licenses, all available from Waves®.

An example of Waves® SoundGrid® Server and Cadac integration:



Audio is streamed from the console's integrated interface card to the SoundGrid® server, processed, and then streamed back to the console via Cat-5e.

The Waves processing is patched in the same way as the Cadac I/O racks and can be used as a send and return for effects processing, or alternatively it can be patched and used as inserts, giving great flexibility.

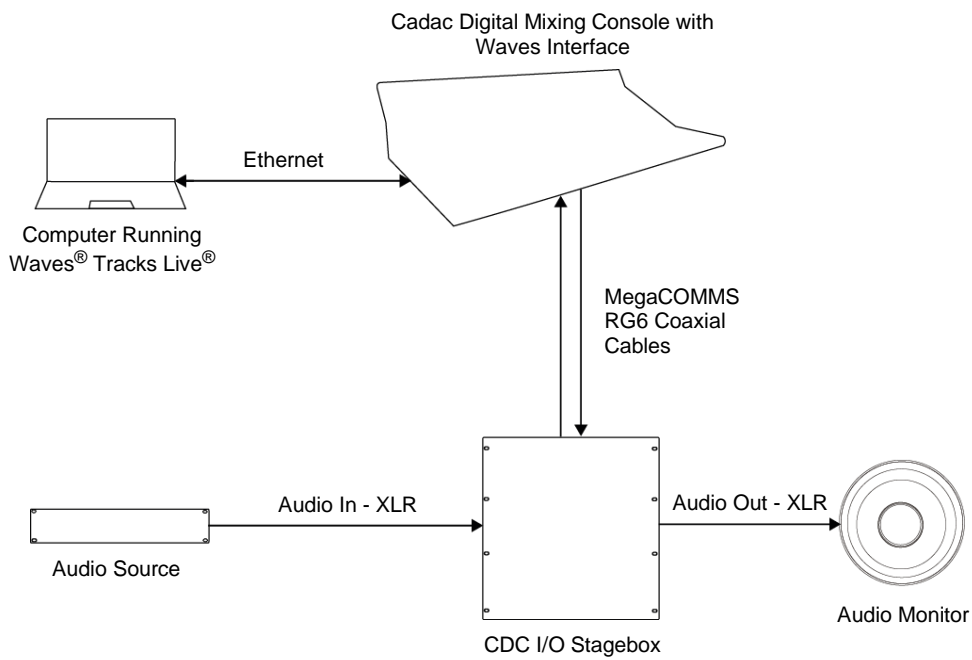
*More information about using Waves® effects please refer to the Waves® website.*

*See the section Waves® SoundGrid® Interface for details of the interface's connections*

See Section CDC five Local I/O Mapping and Waves

When the console's Waves® SoundGrid® interface is connected to a suitable laptop or desktop computer with Waves® "Tracks Live" installed, it can record up to 64 tracks of 24-bit, 96 kHz audio.

Example of a Waves® Track Live® integrated with a Cadac console:



For more information about using Waves® Tracks Live® please refer to the Waves® website.

## ***MegaCOMMS: Data Protocol***

Communication between the remote MegaCOMMS I/O devices and the control surface is via a proprietary Cadac high speed protocol called MegaCOMMS, using high-speed 75 Ohm coaxial cable terminated in BNC connectors.

MegaCOMMS is a robust, TDM (time division multiplex) system. Control data is embedded within the data stream, so that no audio channels are sacrificed for this purpose. The high bandwidth available means that the current implementation of MegaCOMMS can carry 128 channels of 24-bit, 96 kHz audio, plus control data, plus clock, bi-directionally, up to 150 metres (492 ft) via a pair of RG-6 coaxial cables.

In addition to audio and control data, MegaCOMMS provides for accurate, phase-aligned clock distribution, by embedding timing markers in the data stream. This allows reliable, low-jitter synchronisation of all hardware elements within a network.

The simplest implementation of a MegaCOMMS network is the straightforward console-stagebox configuration. In this application, the console provides the clock and the stagebox synchronises itself once the connections are made. Total through-system propagation delay for this system, including all console processing and A-D / D-A conversions is an astonishing 37 samples (@ 96 kHz), or just under 400us. This compares with the many millisecond propagation delays usually found in most other similar systems.

Two interconnection paths are provided, A and B, each of which requires a transmit and receive cable. The maximum capacity of each path is 128 audio channels in each direction.

MegaCOMMS can also be converted to an optical format from BNC via our converters, when distances over 150m are required. Maximum distance over optical is 2km via single mode fibre,



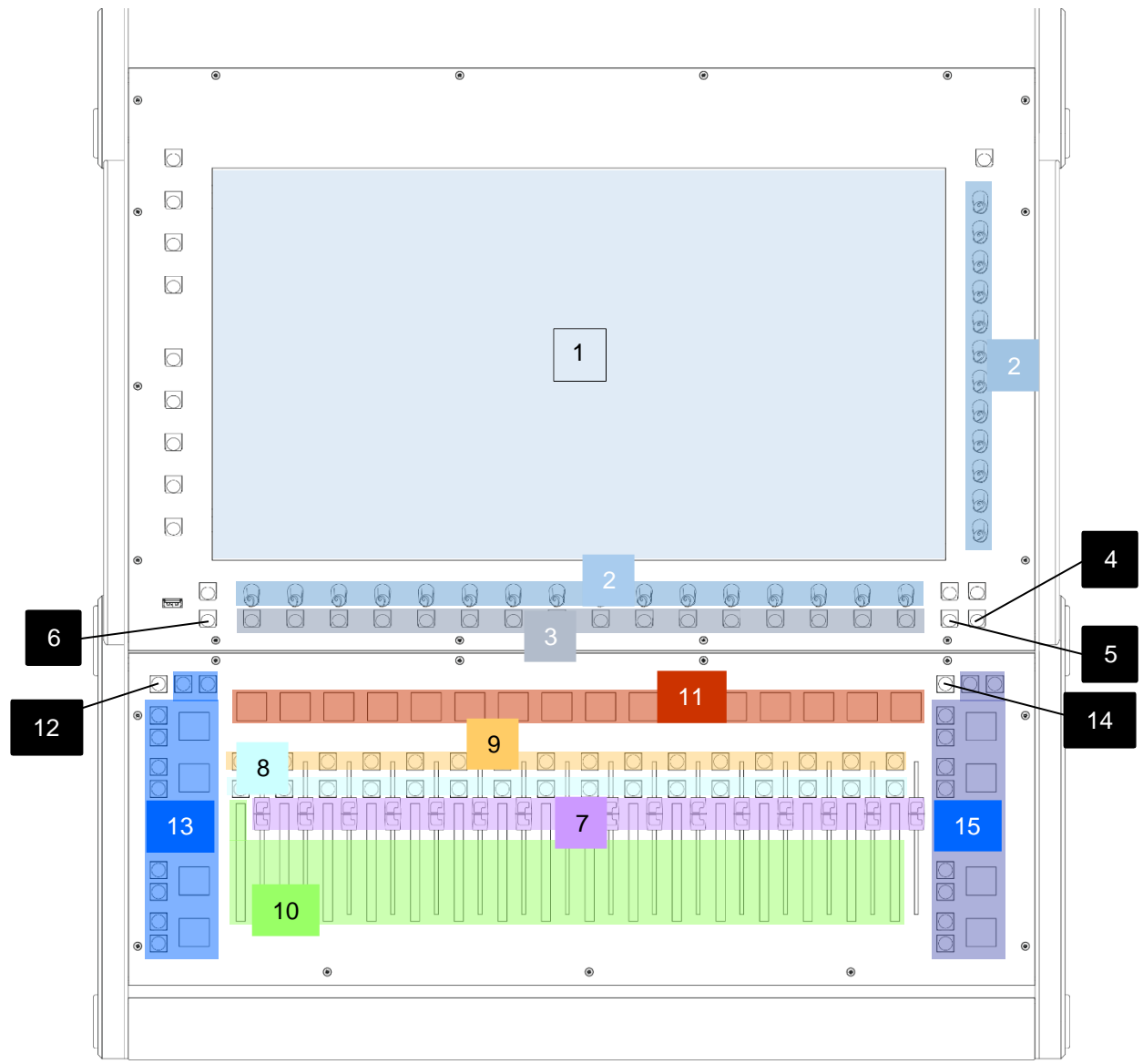
## Console Features

- Up to 48 simultaneous channels in the mix
- 24 mix busses, freely assignable as groups, aux sends or matrix sends, plus LCR main busses and monitor LCR
- 16 local analogue and 4 local AES3 inputs
- 8 local analogue and 4 local AES3 outputs
- Waves® interface card providing 64ch. multitrack recording, or for connection to a Waves® MultiGrid® server to access the full range of Waves® plug-in processing. Note: Requires the relevant Waves® Licenses
- Unrestricted allocation of physical I/O to input channels and group/aux/matrix outputs
- 16 VCA groups
- 40 user assignable buttons, with OLED displays (e.g., Mute group masters)
- Input channels may be linked or paired for stereo operation
- 100 mm motorised faders with OLED displays of current assignments
- All output types – groups, auxes or matrices - may be mono or linked for stereo operation
- Channel sends to outputs may be pre-EQ, pre-fade or post-fade (switchable pre or post VCA) and post-Mute
- Default display of all primary channel parameters
- Two physical inputs per input channel
- 4-band fully parametric EQ on all inputs and outputs
- Cadac EQ
- Variable-frequency hi and lo-pass filters on all inputs and outputs
- 1/3-octave graphic equaliser available on all outputs
- Compressor / limiter with sidechain filter, plus gate on all input channels
- Compressor / limiter with sidechain filter on all outputs
- Adjustable delay on all inputs and outputs
- 16 stereo (or 32 mono) FX processors – freely assignable

- Each FX processor provides reverb, delay and modulation, in any series/parallel combination
- Switchable inserts on all channels
- Switchable LR and LCR panning
- Channel copy and isolate functions
- Full Monitor, PFL and Talkback facilities
- 23.5" 16:9 touchscreen display
- Scene automation with fast keypad access
- 96 kHz, 24-bit Delta-Sigma A/D and D/A converters
- Low-noise, wide dynamic-range analogue mic pre-amps with remote gain control
- All channel functions immediately accessible by single touch
- Stereo bar graph meters, integrated in fader bays
- Gooseneck console lamp

# Console Hardware Overview: Surface

## Control Surface: Part 1



1. **Main Screen:** A 23.5", 16:9 high-definition touchscreen. The default display shows a block of 16 consecutively numbered channels; alternative sets of channels may be displayed by setting a GO TO button using one of the 40 USER ASSIGN [13,15] buttons, or by “swiping” the screen horizontally. Touching any area in a channel strip opens a virtual panel with controls for parameter adjustment and enhanced displays. Switch functions are actioned by touching the virtual “button”, rotary controls are mapped to the encoders to the bottom / right of the screen.



5. **COPY Button:** Used in conjunction with the SEL [3] buttons when copying channel settings from one channel to another.
  
6. **SWAP Button:** By default, the input blocks of the channel strips are displayed at the top of the virtual channel strip and the pan blocks at the bottom. The lower encoders control pan by default, but pressing SWAP exchanges the on-screen positions of the input gain blocks and pan blocks and reassigns the lower encoders as the channel input gain/trim controls. SWAP also performs the same function on the outputs.
  
7. **Faders:** 16, 100 mm motorised faders. The fader information is displayed directly above the fader on the OLED [11] screen. The fader is affected by any screen swiping or scrolling actions plus any functions related to the fader e.g. GEQ. As the channels displayed on-screen are changed, the faders reposition to follow the new channel set.
  
8. **ON Buttons:** Each fader has an ON button; when the button is unlit, the channel currently displayed on-screen above it is muted. All channels default to OFF on power-up. The ON button allows both 'soft' and 'hard' muting.
  - a. **'Soft' Mute:** a short press mutes the channel's output electronically at the fader; any pre-fade sends in use will remain active. The ON button is not illuminated.
  
  - b. **'Hard' Mute:** a long press mutes the channel and cannot be switched on via the automation. The ON button flashes red in this state.
  
9. **SOLO Buttons:** Perform either a PFL (pre-fade listen), AFL (after-fade listen) or SIP (solo-in-place) function, depending on settings made through the SOLO menu page on the MENU screen. The default mode for input channels is 'Auto' : if only one channel is solo'd it is PFL and if multiple channels are solo'd it is AFL; Stereo channels under auto are always AFL ; Output channels are AFL only. If the solo button illuminates pink it is in PFL, if it illuminates cyan it is in AFL. AFL is post the channel pan pot (if in circuit), so correctly reflects the stereo imaging of the channel being solo'd; if the pan pot is not in circuit, AFL is mono. SIP mode is also available, selected from the SOLO MENU page. As well as the master modes, the CDC five also features 'momentary' and 'latching' solo operation:
  - a. **'Momentary' Solo:** Press and hold the SOLO button; solo is active while the button is pressed and cancels when the button is released.
  
  - b. **'Latching' Solo:** A short press on a SOLO button activates solo mode and the button may be released. Press again to cancel.

- c. **'Block Latching'**: Press and hold one SOLO button and press another SOLO button while still pressing the first. This will solo the block of channels between the two buttons. Note: Press and hold of any SOLO when other solos are in place will cancel itself and all other solos when released

In use, the SOLO button illuminates in a colour that is mode dependent.

- 10. **Metering**: A 20-segment LED dual bar graph meter is fitted adjacent to each of the 16 faders in the fader bay. The meters display a single LED ladder when the selected channel (input or output) is mono, and dual LED ladder if stereo. The lowest segment acts as a 'signal present' LED and illuminates at -80 dBFS. The LEDs are colour coded: the signal present segment is green, the five highest segments are red, with the top one corresponding to 10 dBFS. The remaining segments are yellow.

A METER Options page on the MENU screen allows the user to select between pre and post fade meters for fader meters, screen meters and FADER FOLLOW output meters. There is additionally a green OPEN LED at the bottom of the meter which illuminates as soon as the fader is moved, and the channel is on. Moving a fader while channel is off does not switch it on. So, if it is off because of a VCA mute group for example is open, the OPEN LED will be off.

- 11. **OLED Alphanumeric Displays**: One per fader. The OLEDs display the name of the channel (input or output); this will either be the user-assigned name, or if the channel has not been renamed it will show the fader value if active, plus the default number e.g. Ch. 23. They are also colour-coded to match the channel type – stereo or mono, output bus assignment, etc.

12. **MUTE GRP:** Pressing this brings up the MUTE GROUPS SETUP page. This allows the input channels to be assigned to any number of the eight MUTE Groups.



2: MUTE Group setup screen

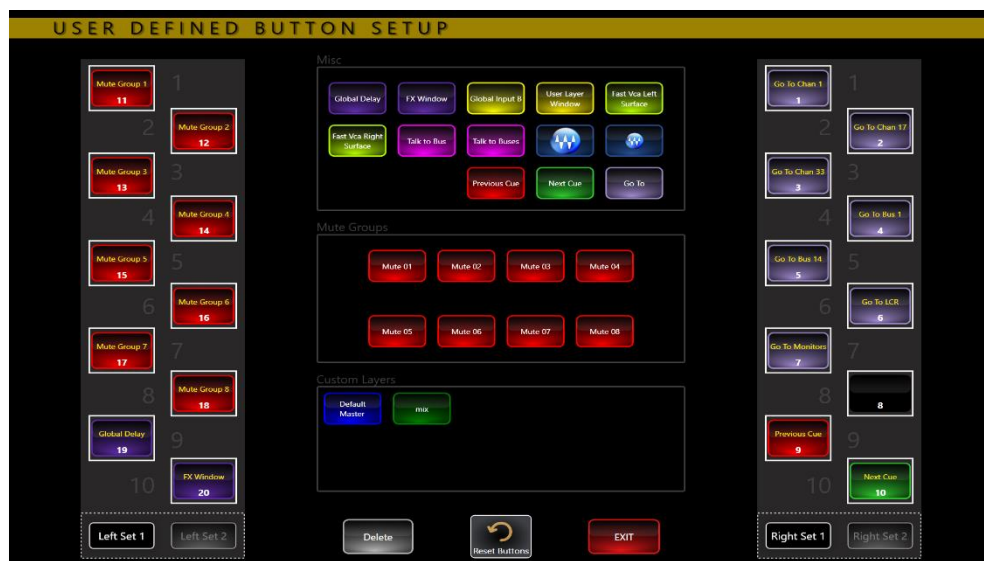
13. **USER ASSIGN 11 to 20 / 31 to 40:** Set 1 USER ASSIGN buttons are by default the masters for the CDC five's 8 MUTE GROUPS, plus the GLOBAL DELAY and FX WINDOW. The current functions are displayed on the adjacent OLED displays. There are two sets, or banks, of 10 buttons - selected by SET 1 and SET 2 (default empty) buttons at the top of the OLED display.

Other functions can be set for these buttons via the EDIT [14] button on the right-hand side above the right set of USER ASSIGN [15] buttons.

The user defined functions include GLOBAL DELAY for the effects section, fast access to the FX screen, GLOBAL INPUT, USER LAYER WINDOW, FAST VCA LEFT WINDOW, TALK TO BUS or BUSSES, Waves® SoundGrid® windows, STORE, UPDATE, PREVIOUS CUE, NEXT CUE and GO TO buttons. Assigning a MUTE GROUP to a button is done in this screen. CUSTOM layers are also set to a button here.

14. **EDIT:** Brings us the USER DEFINED BUTTON SETUP screen. This screen allows functions to be assigned to one of the 40 available USER ASSIGN BUTTONS [13,15] that are located to the left and right of the fader bank. The left and right USER ASSIGN buttons have 2 sets of 10 programmable buttons - 20 per side. SET 1 on both sides have a default allocation, SET 2 are by default empty.

Allocation of a function to a button is done by selecting the function, then the required SET and then the button within each SET, or bank.



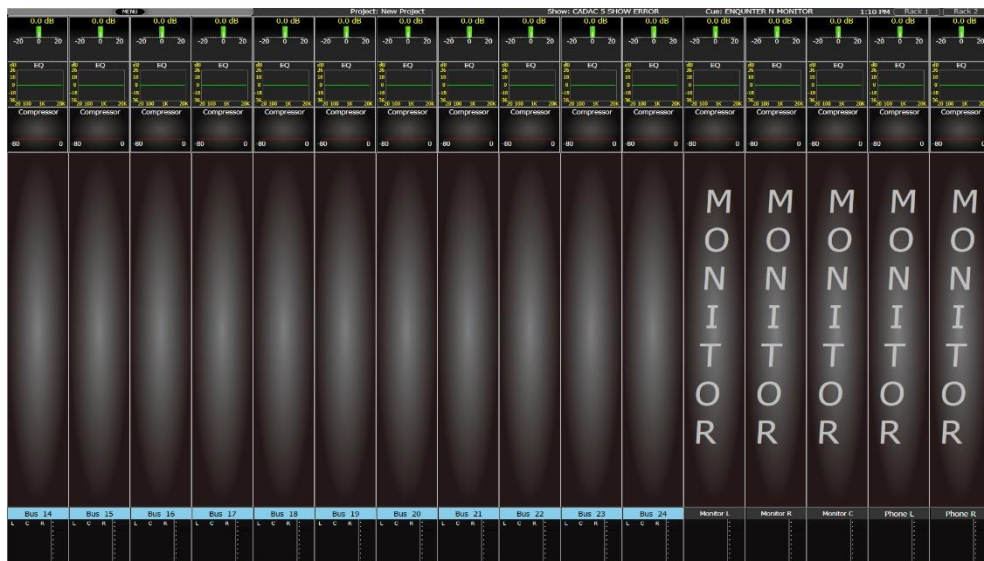
3: User Define Button Setup screen

The user defined functions include GLOBAL DELAY for the effects section, fast access to the FX screen, GLOBAL INPUT, USER LAYER WINDOW, FAST VCA LEFT WINDOW, TALK TO BUS or BUSSES, Waves® SoundGrid® windows, STORE, UPDATE, PREVIOUS CUE, NEXT CUE and GO TO buttons. Assigning a MUTE GROUP to a button is done in this screen. CUSTOM layers are also set to a button here.



15. **USER ASSIGN 1 to 20 / 21 to 30:** SET 1 of USER ASSIGN buttons are by default set to GO TO Channel 1, 17 and 33 on the first 3 buttons, giving quick access to the 3 groups / “layers” of 16 faders. The GO TO BUS 1 and 14 are on the next two buttons accessing the screens and faders for the bus outputs. The following buttons by default give access to LCR, GO TO MONITORS, DEFAULT MASTER, PREVIOUS and NEXT CUE. SET 2 are by default empty.

Other functions can be set for these buttons via the EDIT [14] button on the right-hand side above the right set of USER ASSIGN [15] buttons.

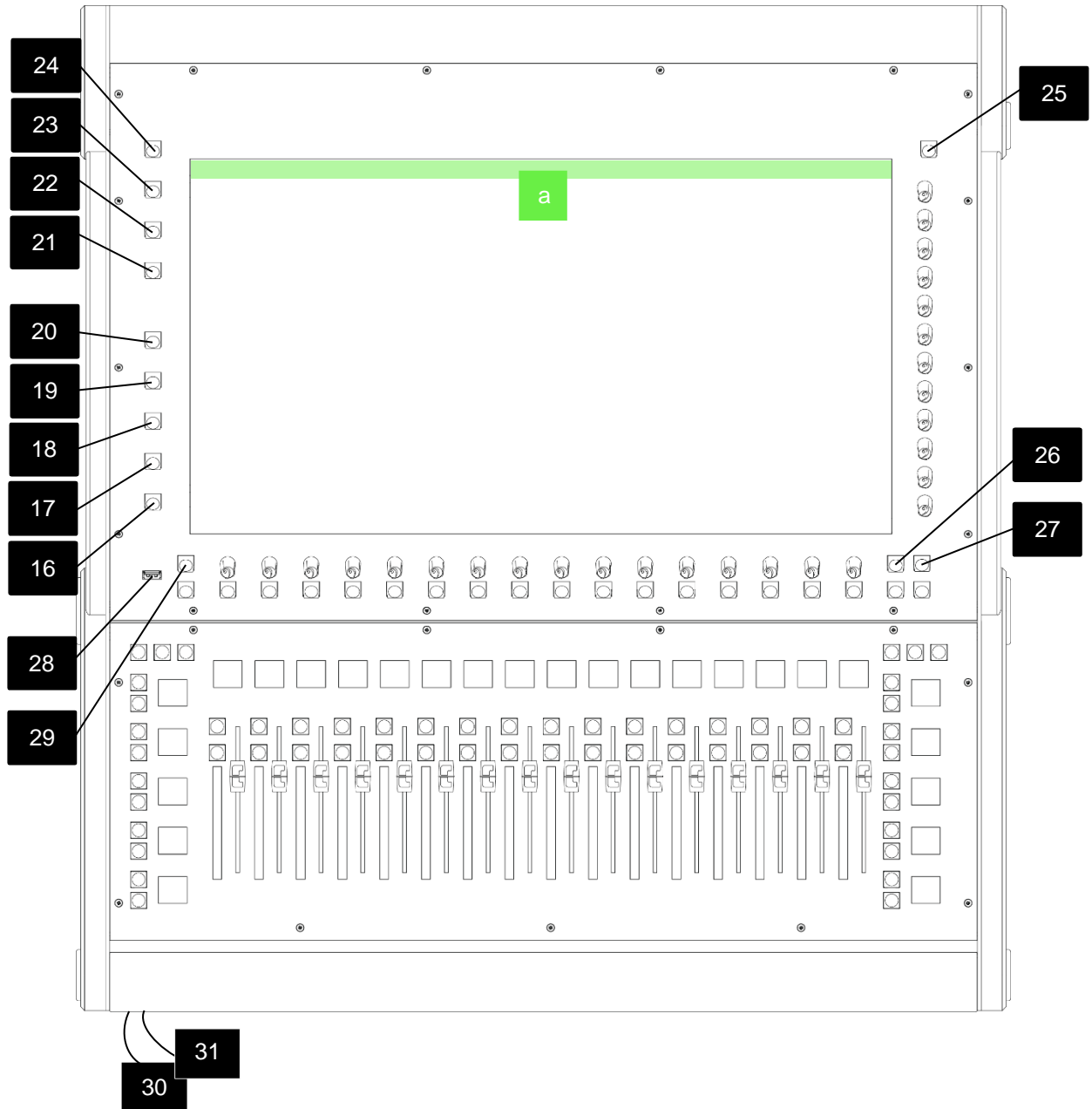


4: GOTO MONITORS - a default USER ASSIGN button



5: DEFAULT MASTERS - a default USER ASSIGN button. Four faders now act as PHONE LR, MONITORS LR, WEDGES and LCR

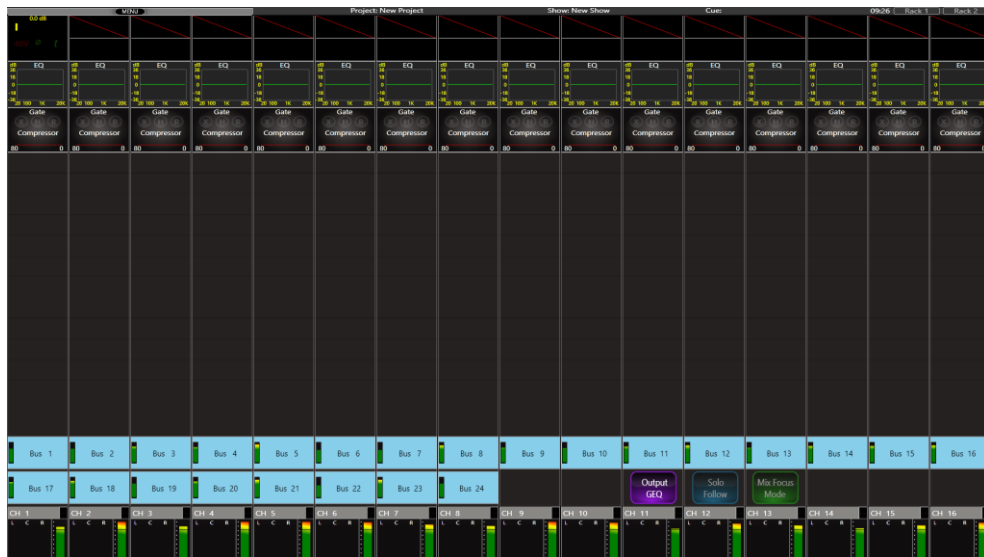
**Control Surface: Part 2**



16. **FAD FOL:** When active, the FADER FOLLOW Outputs function allows the operator to use the faders to control the bus send levels from the currently selected input channel. An input channel layer must be selected for FADER FOLLOW Outputs to be available. The left-most channel in the visible set, and busses 1 to 16 will be selected by default: the SEL [3] buttons select other channels, the left / right SCROLL [26, 27] buttons allow navigation both up and down the busses. While FADER FOLLOW Outputs is active, the screen display and rotary encoders continue to be active for input channels.

The **FAD FOL** button activates either FADER FOLLOW or MONITOR FOLLOW depending which has selected in the USER Option settings.

In MONITOR FOLLOW shortcuts to the busses appear on screen.



6: MONITOR FOLLOW Screen

Selecting one of the busses on screen allows you to control the send to it from every channel. The faders now become that particular bus send for each channel and the pan section on screen gives you access to any stereo bus pan.

The GEQ can be edited for the selected busses if the Output GEQ is onscreen. Pressing the GEQ [17] “flips” the console’s faders into GEQ mode. They will remain in this state until deselected.

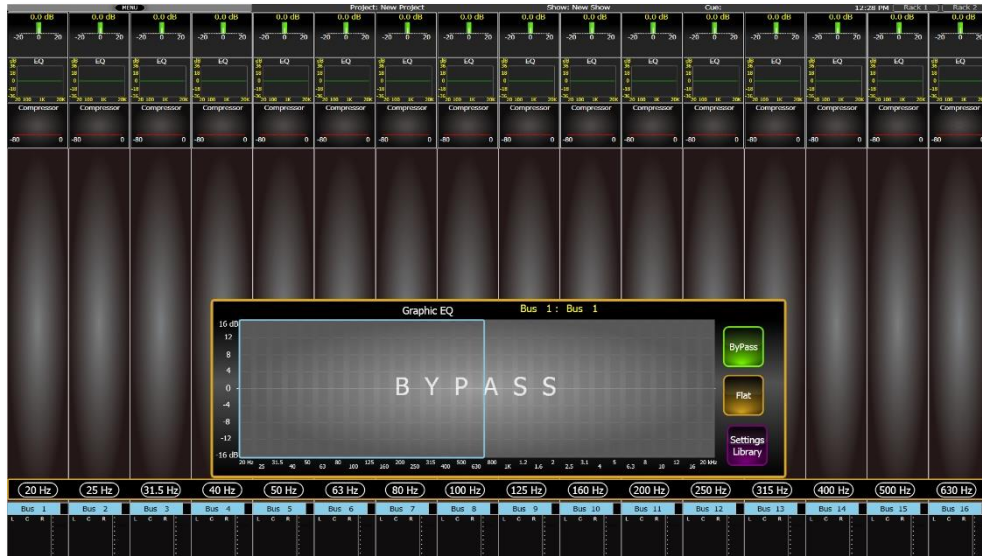


7: GEQ and MONITOR FOLLOW

Bus sends VCAs can also be accessed via this page. The members of each bus VCA remain the same as the normal VCA group membership, but the bus VCAs only attenuate the level of its members within the selected bus mix.

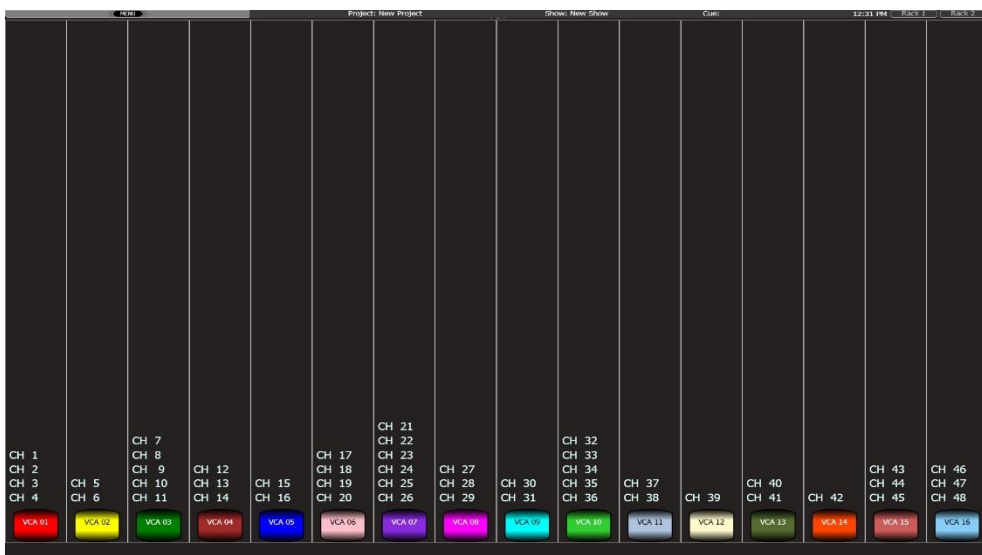
SOLO FOLLOW sends each bus mix, when selected, to your monitors / headphones.

17. **GEQ:** Press this when an output bus is selected (with the SEL [3] button illuminated) to allow the CDC five's graphic equaliser function for that bus. A 32-band graphic equaliser may be inserted in any or all output channels, in addition to the channel's standard parametric EQ. When GEQ is in use, the OLEDs [11] display the centre frequencies of each band.



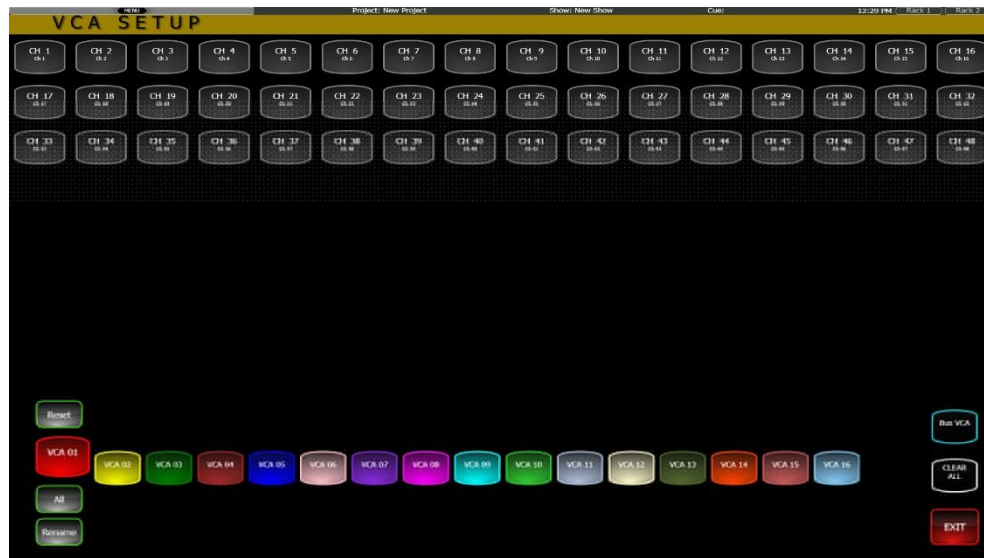
8: GEQ screen

18. **VCA:** Displays the VCA assignment page, and the faders become VCA masters.



9: VCA Assignment screen - image shows assigned VCAs

By pressing a blank VCA name (the example on the previous page has VCAs named and assigned) it will bring up the VCA setup page. Here channels can be assigned to a VCA and VCAs named:



10: VCA Setup screen

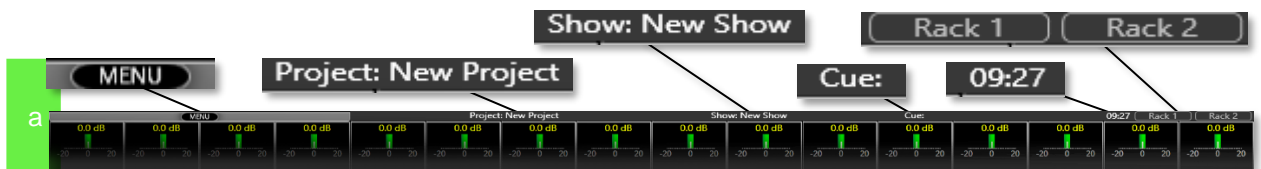
19. **TALKBACK ENABLE:** This button is not active until a TALKBACK channel has been assigned to the input channels. The CDC five has a very flexible talkback system, which is configured through setup options on the MENU screen. Any of the local (rear panel) I/O may be assigned as a Talkback output or a Return Talkback input.
20. **SOLO CLEAR:** Used to clear SOLO selections from a single to multiple channels.
21. **CUE:** Pressing this will bring down the MENU screen showing the currently loaded CUE LIST. Press CUE again and the MENU screen will slide back into the STATUS bar.
22. **BACK:** Used in the system menu; navigates back one “level” within the MENU screen menu, if available, or returns to the default CUE list. A further press will close the MENU screen. Illuminates red when available.

23. **MENU:** This brings down on the main screen the console's MENU screen. The MENU screen menu can also be brought down by pressing MENU in the STATUS bar at the top of the screen. By default, the MENU screen displays the console's configuration options, plus the CUE list. Pressing MENU again will close the MENU screen.



11: MENU screen opened on the 23.5" main screen

a. **STATUS bar:**



STATUS bar: Linked with the MENU button is the STATUS bar. Pressing MENU in the STATUS bar will also allow access to the MENU screen. The STATUS bar also displays the PROJECT name, SHOW name, the CUE as well as the TIME and the Rack configuration.

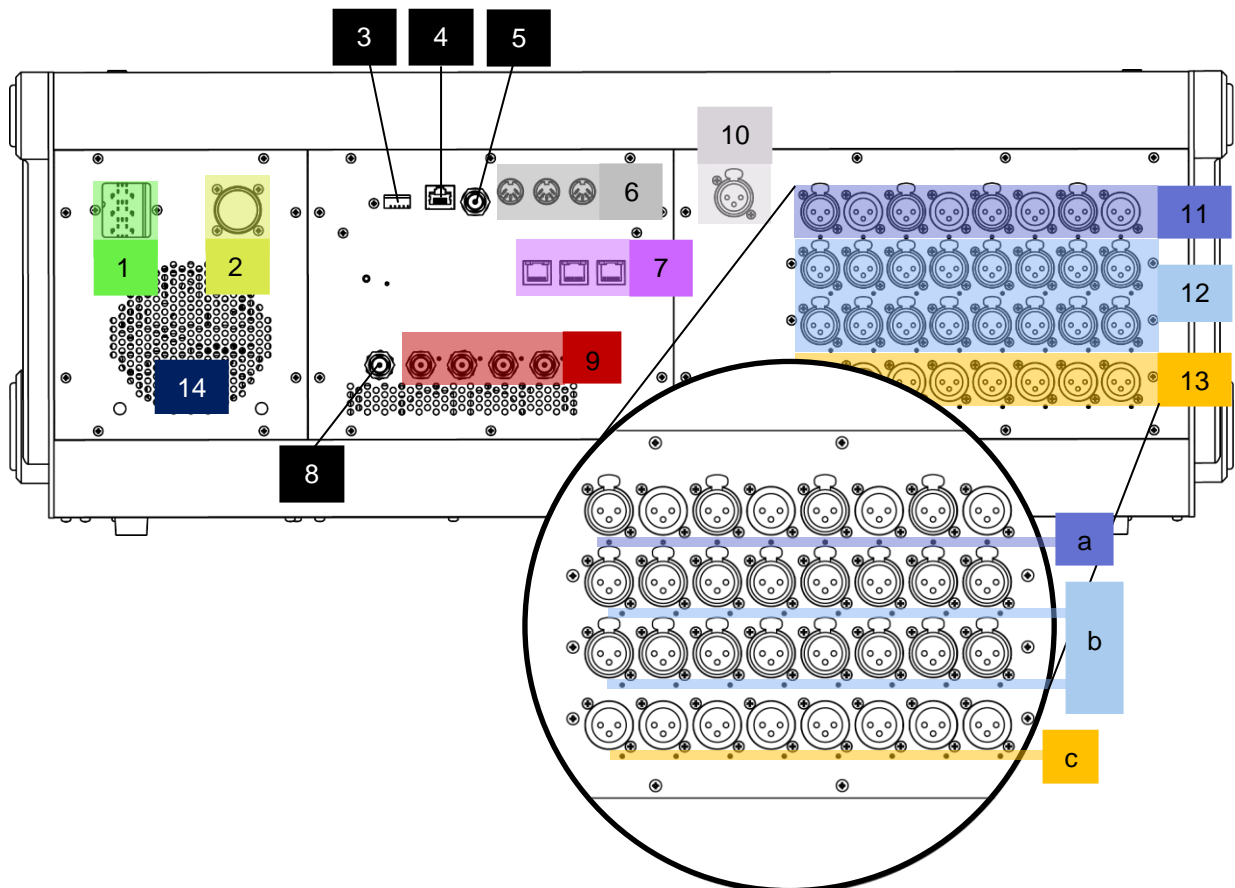
24. **MUTE ALL:** Pressing this button will apply a 'hard' mute to all analogue outputs from the console. The button is not illuminated during the console's normal operation, and flashes red when active. Note that MUTE ALL is automatically active when the surface powers up and must be released by pressing the button.
25. **PWR button:** This is a multi-function "soft" button for starting and closing the console surface. There is also a physical power switch on the rear of the console that shuts power off to the PSU in the console.

26. **SCROLL LEFT:** Scrolls the inputs and busses (both screen display and faders) to the left by 8 channels at a time
  
27. **SCROLL RIGHT:** Scrolls the inputs and busses (both screen display and faders) to the right by 8 channels at a time
  
28. **USB Port:** A single 'A' USB socket is fitted to the surface for firmware upgrades, exporting / importing Projects / Shows or plugging in a keyboard. Main screen displays feature a "virtual" QWERTY keyboard, but a hardware keyboard may be plugged in and used, if preferred.
  
29. **SHIFT:** Enables the SCROLL RIGHT and SCROLL LEFT buttons to scroll by one rather than default eight channels when pressed and held.
  
30. **Headphones:** One ¼" stereo jack is fitted under the front armrest for the console's Phones output with a volume attenuator.
  
31. **USB Ports:** Two type 'A' USB sockets are fitted under the armrest for firmware upgrades, exporting / importing Projects / Shows or plugging in a keyboard / mouse. The screen can display a "virtual" QWERTY keyboard, but a hardware keyboard may be plugged in here and used, if preferred.



## Console Hardware Overview: Rear Panel

### Rear Panel Connectors



1. **Mains Input:** A switched IEC socket for the internal power supply
2. **Backup PSU:** A 12-pin Jaeger connector for a backup power supply; a PSU 4800 (sold separately).
3. **USB:** A type 'A' USB 2.0 ports
4. **Network:** RJ45 Ethernet ports for the connection of peripheral Ethernet accessories.
5. **Word Clock IN:** a TTL level (0 to +5 V) clock signal applied here can be selected to synchronise the AES outputs.

6. **MIDI: IN, OUT and THRU.** The console can send MIDI data on a CUE basis to external MIDI-controlled devices for purposes of triggering a sound effect or changing a program setting on an Effects device.
7. **SoundGrid®:** Waves® SoundGrid® interface – three RJ45 network connectors carrying 64 bi-directional channels of audio. The interface allows multitrack recording on an external computer or connected to a Waves® MultiGrid® server for the full range of external Waves® FX plug-ins (dependent upon your Waves® license.) The RESET button resets the Waves® interface.
8. **Word Clock OUT:** A 96 kHz clock signal is always available at this connector, at TTL level (0 to +5 V).
9. **MegaCOMMS:** 4 x BNC connectors - in 2 pairs - carrying all audio and control data between the control surface and other MegaCOMMS devices such as stageboxes and network bridges.
10. **Lamp:** XLR socket for a 12 V DC gooseneck console light.
11. **AES IN 1 to 4 and OUT 1 to 4:** Four female XLR sockets providing eight AES3 format digital inputs to the mixer. The inputs are fitted with Sample Rate Converters (SRCs) and will accept sample rates between 44.1 and 192 kHz. The mixer's internal clock frequency is 96 kHz. Four male XLR connectors providing eight AES3 format digital outputs from the mixer. The default sample rate for the outputs is 48 kHz; this can be changed in the AES3 Configuration page on the MENU Screen to 44.1 kHz, 48 kHz and 96 kHz



12: Access to the AES3 Configuration Screen



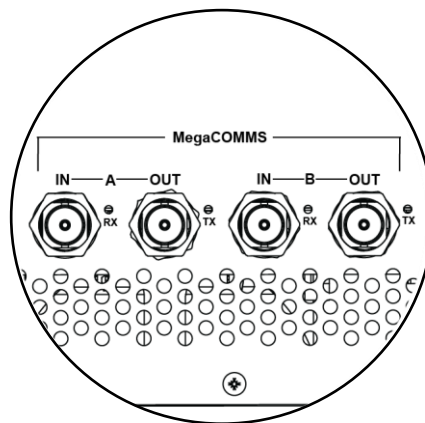
13: AES3 Configuration Screen

- a. **Status LEDs:** Eight RGB (multi-colour) LEDs which illuminate green to confirm the presence of a valid AES3 input signal in the case of the inputs, and other colours to indicate the selected sample rate in the case of the outputs
12. **Inputs:** 16 balanced “local” analogue audio inputs to the CDC five, on XLR sockets. These may be the sources for any input channel or insert return in the same way as the remote stagebox inputs. They may be used for connection of FOH sound sources, FX processing, talkback mic, etc. Characteristics are identical to the inputs on the stageboxes.
    - b. **48 V LEDs:** 16 red LEDs; illuminate when 48 V phantom power is enabled at the associated input connector.
  13. **Outputs:** Eight balanced “local” analogue audio outputs from the CDC five, on XLR male connectors. Any output channel, insert send or direct out may be routed to these, to enable the connection of FX processors, recorders, etc. The talkback/comms output from the CDC five may also be available here; this is configured in software via the MENU Screen. Characteristics are identical to the outputs on the stageboxes.
    - c. **MUTE LEDs:** Each analogue output connector has an adjacent red LED. This illuminates when the physical output is ‘hard’ muted by the internal relay, either during power-up, when the MUTE ALL button is pressed, or if a ‘hard’ mute is applied to an output from a channel ON button.
  14. **Fan:** For internal cooling; do not block. The fan speed is controlled automatically and will vary according to the internal ambient temperature.

## Connecting the Hardware

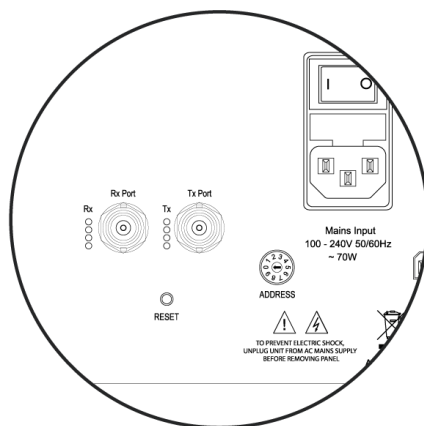
### MegaCOMMS

Cadac's proprietary MegaCOMMS hi-speed data protocol is used to interconnect the CDC five's control surface and stage rack(s). The control surface has four BNC sockets to provide the main system data interconnection, labelled IN (RX) A, OUT (TX) A and IN (RX) B, OUT (TX) B.

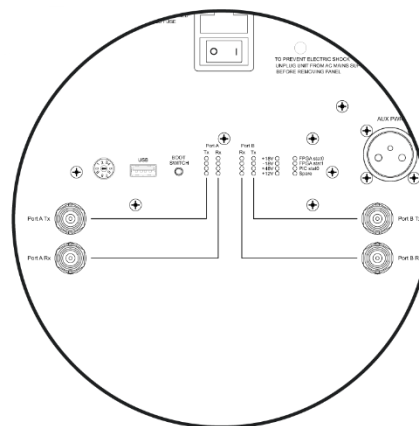


14: CDC five - 2 pairs of MegaCOMMS ports

The current stage boxes - CDC I/O 3216 and CDC I/O 6448 - have either two (1 pair) or four (2 pairs) BNC sockets.



15: CDC I/O 3216 - 1 pair of MegaCOMMS ports

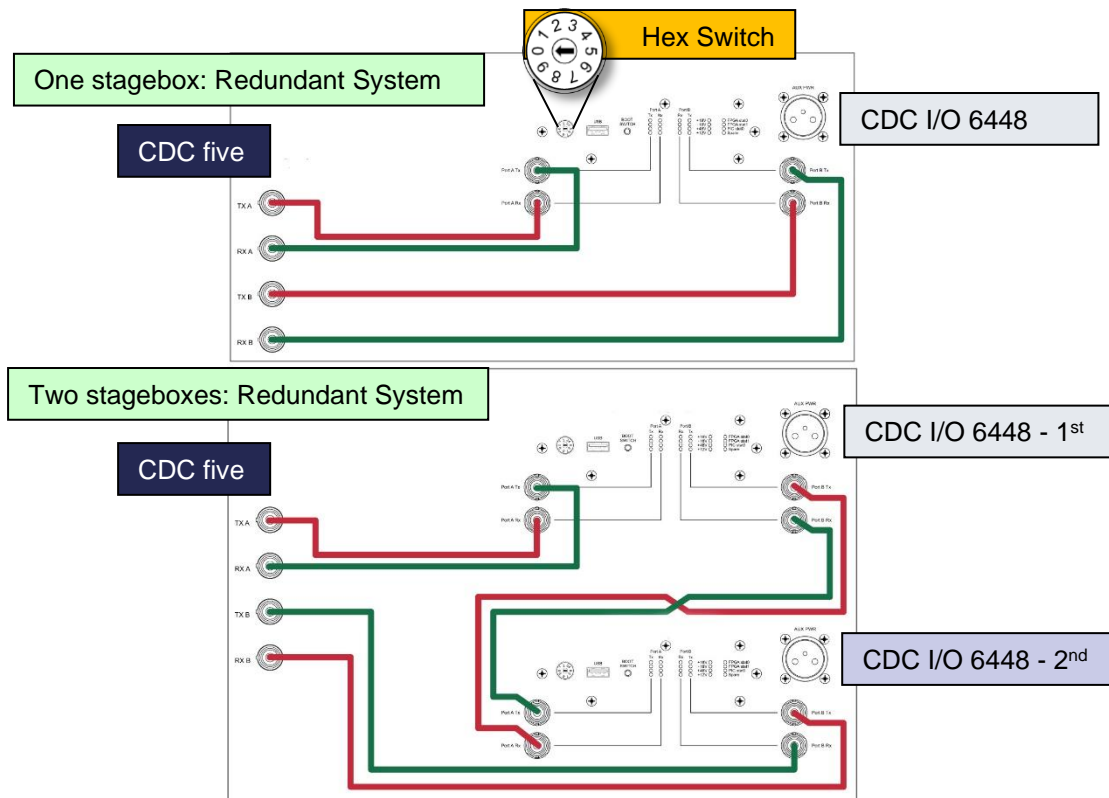


16: CDC I/O 6448 - 2 pairs of MegaCOMMS ports

The two paths A and B carry identical and synchronous data, and can be used in various ways, depending whether system redundancy is required. Providing a redundant path gives greater system robustness, as the CDC five will automatically switch its comms to Path B if communication is lost on

Path A, such as might occur if a cable is damaged. Note that the CDC five system is fully functional in all respects if only one TX / RX path is connected.

The control surface and CDC I/O 6448 (the CDC I/O 3216 only has one set of MegaCOMMS connectors) should be interconnected using one of the configurations shown below, depending whether there are one or two stageboxes in the system, and whether redundancy is deemed necessary.



**IMPORTANT:** The hex switch on the rear of the stagebox (highlighted above) must be set according to how the unit is to be connected:

- Set to '1' when connecting the stagebox to a CDC MC Router
- Set to '2' when connecting the stagebox to a console surface, and it is to be used as RACK 1
- Set to '3' when connecting the stagebox to a console surface, and it is to be used as RACK 2

All other hex switch positions are unused.

**NOTE:** Only RG6 video cable suitable for 3G HD-SDI (High Definition Serial Digital Interface) should be used for the Cadac MegaCOMMS connections. The cables should be terminated in BNC connectors of the appropriate type, and no cable run should exceed 150 m (surface-to-stagebox or stagebox-to stagebox). An example of a suitable cable is Kramer bulk Type BC-1X.

### ***Word Clock In***

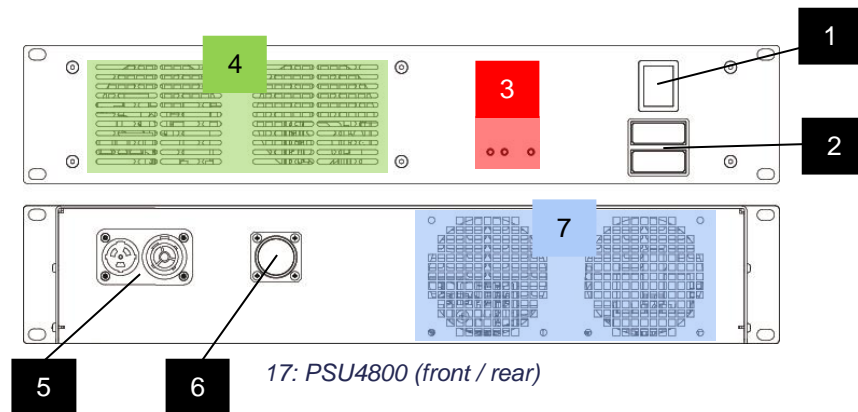
The CDC five caters for digital audio I/O in the form of eight AES3 inputs and eight AES3 outputs, accessible on the rear of the control surface. The AES3 outputs have Sample Rate Converters (SRCs) and can operate at any frequency required by applying an external clock source to the WORD CLOCK IN connector. The external clock must be selected on the AES3 Configuration Page on the MENU Screen.

### ***Word Clock Out***

The CDC five's internal word lock is fixed at 96 kHz, and a clock signal is always available at the rear of the console at the WORD CLOCK OUT connector.

## Optional Power Supply

If an optional external CDC PSU 4800 power supply is being used it should be connected using the supplied cable to the 12-pin Jaeger connector fitted to the rear of the surface. There are three DC power rails: +17 V, -17 V and +12.5 V.



### Front Panel

1. **POWER:** The on/off switch for the supply
2. **Mains Fuses.** One each in the line and neutral of the AC input. See table below for ratings
3. **DC output LEDs:** One red LED for each DC output
4. **Air intakes:** Do not obstruct

### Rear Panel

5. **Mains Input:** Neutrik® powerCON® TRUE1 male connector for AC mains. Max rating 16 A. A female powerCON® connector is also provided; this is paralleled to the input connector. It may be used to link AC mains to a second PSU or other equipment. Total AC current consumption when linking units in this way must not exceed the input connector's current rating of 16 A.
6. **Power Output:** Locking 12-pin Jaeger connector. Use the supplied cable to connect CDC five.
7. **Air exhaust vents:** Do not obstruct

The PSU is of the "Universal" type and will operate on all mains voltages from 90 to 250 V, 50/60 Hz. The PSU is rated at 1200 W AC.

### Fuse Data

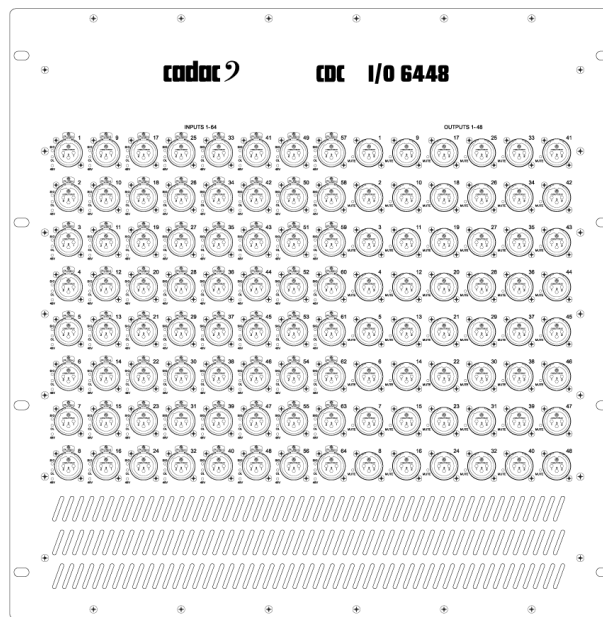
Voltage	Rating	Type
230 V	3.15 A	20 mm T3.15AL 250V
115 V	6.3 A	20 mm T6AL 250V

## Remote Stagebox Connections

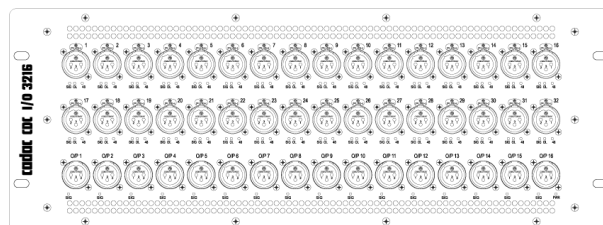
### Audio Connections

The stageboxes provide the (non-local) audio inputs and outputs for the system and are intended to be located remotely from the control surface, typically stage-side. Audio equipment to be used at the FOH position can be connected to the control surface's local I/O (when fitted) on the rear panel.

The CDC I/O 6448 stagebox has a total of 64 inputs and 48 outputs, while the CDC I/O 3216 stagebox has 32 inputs and 16 outputs. The CDC five can support one or two stageboxes of any type via direct connection; in these circumstances the maximum remote I/O connectivity the system can provide is 128 inputs and 96 outputs, using two CDC I/O 6448 stageboxes. These totals are increased further by the local I/O on the rear of the control surface (see “[Surface and Local I/O: Audio Connections](#)”).



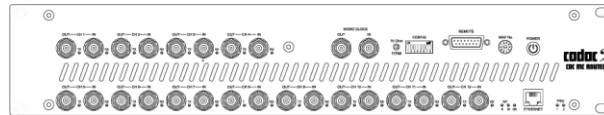
18: CDC I/O 6448 Stagebox



19: CDC I/O 3216 Stagebox



It should be noted that higher I/O counts are possible by using more than two MegaCOMMS units; this can be achieved with a Cadac CDC MC Router. The CDC MC Router can handle up to 3072 channels.



20: CDC MC Router

Note that the number of any connector on a stagebox is unrelated to its function. Any input (or output) connector can be assigned in software to a system input (or output) of any type – channel input, aux send, channel insert, matrix output, etc. – anywhere in the console’s architecture. It should also be noted that the overall I/O physical connectivity provided by the system is unrelated to the CDC five’s maximum processing capacity of 48 simultaneous input channels mixing onto 24 assignable output busses. Some additional connectors will be required in all installations for channel or bus insert sends and returns, and for ‘B’ inputs to input channels.

## Routing

Routing is done using the on-screen Input and Output Assign functions.



21: CDC five Routing Screen

## Connector Details

**Analogue Inputs:** 3-pin female XLR connectors. The inputs are electronically balanced and are suitable for connection of either microphones or line level sources. Input impedance is 1.2 kohms in Mic Mode, or 10 kohms in Line Mode, Mic or Line mode being selected from the assigned channel's Input Gain panel. The maximum input level is +40 dBu (with pad enabled). When an input connector is assigned as the input of a channel in Mic mode, 48 V phantom power is available, also switched from the channel's Input Gain panel. The connector should be wired as follows:

Pin	Connection
1	Screen
2	Signal 'hot' (phase)
3	Signal 'cold' (antiphase)

**Analogue Outputs:** 3-pin male XLR connectors. The outputs are electronically balanced with a source impedance of 50 ohms. The maximum output level is + 21 dBu. The connector should be wired as follows:

Pin	Connection
1	Screen
2	Signal 'hot' (phase)
3	Signal 'cold' (antiphase)

## Surface and Local I/O: Audio Connections

**Analogue inputs:** The connector and characteristics of the local analogue inputs are identical to those on the remote stageboxes:

Pin	Connection
1	Screen
2	Signal 'hot' (phase)
3	Signal 'cold' (antiphase)

**Analogue outputs:** The connector and characteristics of the local analogue outputs are identical to those on the remote stageboxes:

Pin	Connection
1	Screen
2	Signal 'hot' (phase)
3	Signal 'cold' (antiphase)

**AES3 digital inputs:** Four AES3 digital audio inputs are available at the rear of the control surface on 3-pin XLR female connectors. The AES3 format carries two independent audio channels. In accordance with the AES3 spec, the inputs are balanced, with a characteristic impedance of 110 ohms. Connections to these inputs should always be made using cable specifically designed for digital audio.

The digital inputs are equipped with Sample Rate Converters (SRCs) and can accept sample rates between 44.1 kHz to 192 kHz.

Connector pinout is the same as XLRs for analogue audio:

Pin	Connection
1	Screen
2	Chs A & B 'hot' (phase)
3	Chs A & B 'cold' (antiphase)

**AES3 digital outputs:** Four AES3 digital audio outputs are available at the rear of the control surface on 3-pin XLR male connectors. The outputs are balanced, with a characteristic impedance of 110 ohms. Connections to these outputs should always be made using cable specifically designed for digital audio.

The digital outputs are equipped with Sample Rate Converters (SRCs), which may synchronise to other digital audio equipment using the WORD CLOCK IN connector.

Connector pinout is the same as XLRs for analogue audio:

Pin	Connection
1	Screen
2	Chs A & B 'hot' (phase)
3	Chs A & B 'cold' (antiphase)

## Other Control Surface Audio I/O

### Headphones

The stereo monitor signal is also available on one ¼" (6.35 mm) 3-pole (TRS) jack socket for the connection to a pair of headphones. The socket is under the front armrest along with a volume attenuator for the headphones. The socket is wired as follows:

Pin	Connection
Tip	Left monitor output
Ring	Right monitor output
Sleeve	Screen (common)

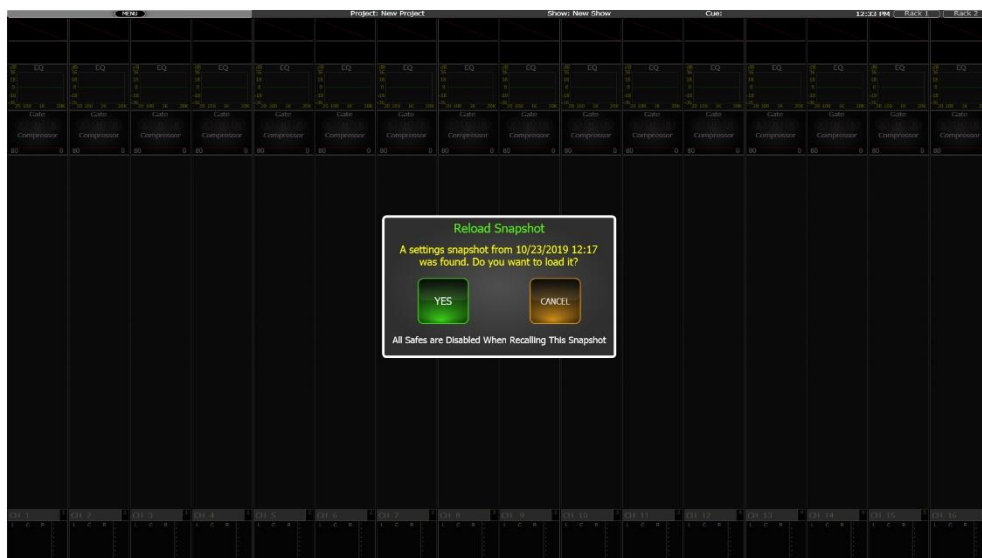
### Waves® SoundGrid® interface

The CDC five is fitted with a Waves® SoundGrid® interface card. Access to this is via three RJ45 connectors on the rear panel. These may be used for multitrack recording on an external computer or connected to a Waves® SoundGrid® server.

## Principles of Operation

### Switching the CDC five ON

The PWR [25] button is a “soft” button for starting and powering-down the surface. When the surface is not operative but connected to power and the rear switch is on, the button illuminates red. A short press initiates the console boot sequence, the internal computer runs standard BIOS and diagnostics routines and power is applied to the internal audio DSP section. The PWR button then illuminates green. At the end of the power-on sequence, a dialogue box appears on the screen as shown below:



22: Power ON Dialogue

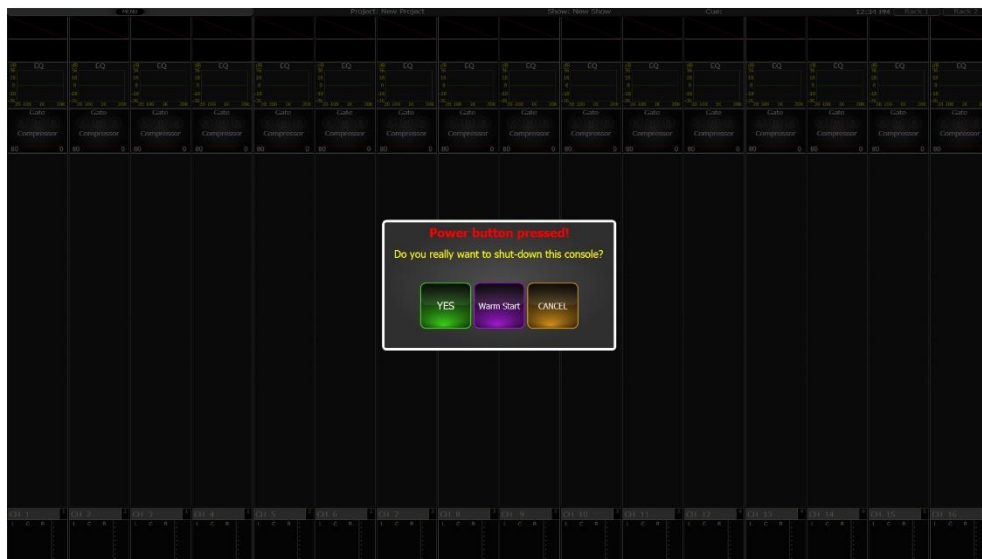
Touching YES in answer to the question will reload the snapshot saved during the last power-down and reinstate the console to the last-known settings. Pressing YES also ignores all SAFES to allow the console to start in its previous state. Touching CANCEL will result in the console operating in its ‘default’ state, without a scene loaded – i.e. no channel names, routing or processing will be active. If you press CANCEL and want to recall a CUE without safes, press-and-hold the ISO button [Button 4 shown in Control Surface: Part 1] until the cue has fully recalled to ignore safes

A ‘long’ press on the CUE LIST button at any point after the initial boot-up will re-invoke the power-on snapshot window: this is useful if the CANCEL button has been pressed inadvertently.

For safety reasons, the CDC five boots up with the MUTE ALL function active: all console outputs from both the stagebox(es) and the local analogue I/O are ‘hard’-muted. Press the MUTE ALL [24] button to cancel this mode and activate the outputs.

## Switching the CDC five OFF

To shut the surface down, ‘short-press’ the PWR [25] button again, and a dialogue box will be displayed asking if the console should be shut-down (YES), or restart (WARM START) while continuing to process audio or CANCEL. Selecting YES initiates a power-down sequence, ensuring that the computer is shut down correctly. When the surface shuts down, a snapshot is taken of the current console status: this includes all input and output channel settings.



23: Power OFF screen

Alternatively, the surface can be powered down via the MENU screen using the SHUTDOWN button in the SETTINGS menu, which opens the same dialogue box.

The internal computer may be ‘forced’ to reboot by pressing the PWR [25] button for approx. 1 – 3 secs. This function may be useful in the unlikely event of a major computer crash; audio continues during the reboot.

If the PWR button is held pressed for at least 5 secs., a complete shutdown of all console functions is forced.

## Touch Operation

This section of the manual describes the basic principles of screen navigation and parameter controls. All audio operations on the CDC five are performed using the touchscreen. The display shows sixteen consecutive virtual channel strips and includes the most important information about the channels' configuration and parameters. More detailed information and access to controls for any channel is obtained by a single touch on the appropriate area of the screen.



24: EQ controls populate the screen when the EQ on the "channel" strip is pressed



25: DYNAMIC interface populates the screen when the DYNAMICS on the "channel" strip is pressed



## EXIT

The EXIT button will, as the name implies, exit the current function on the screen.

This will close the function - e.g. EQ or DYNAMICS - plus it will remove all the mapping to the encoders for that function.



*26: EXIT closes the function, or window, and removes any mapping to the encoders*

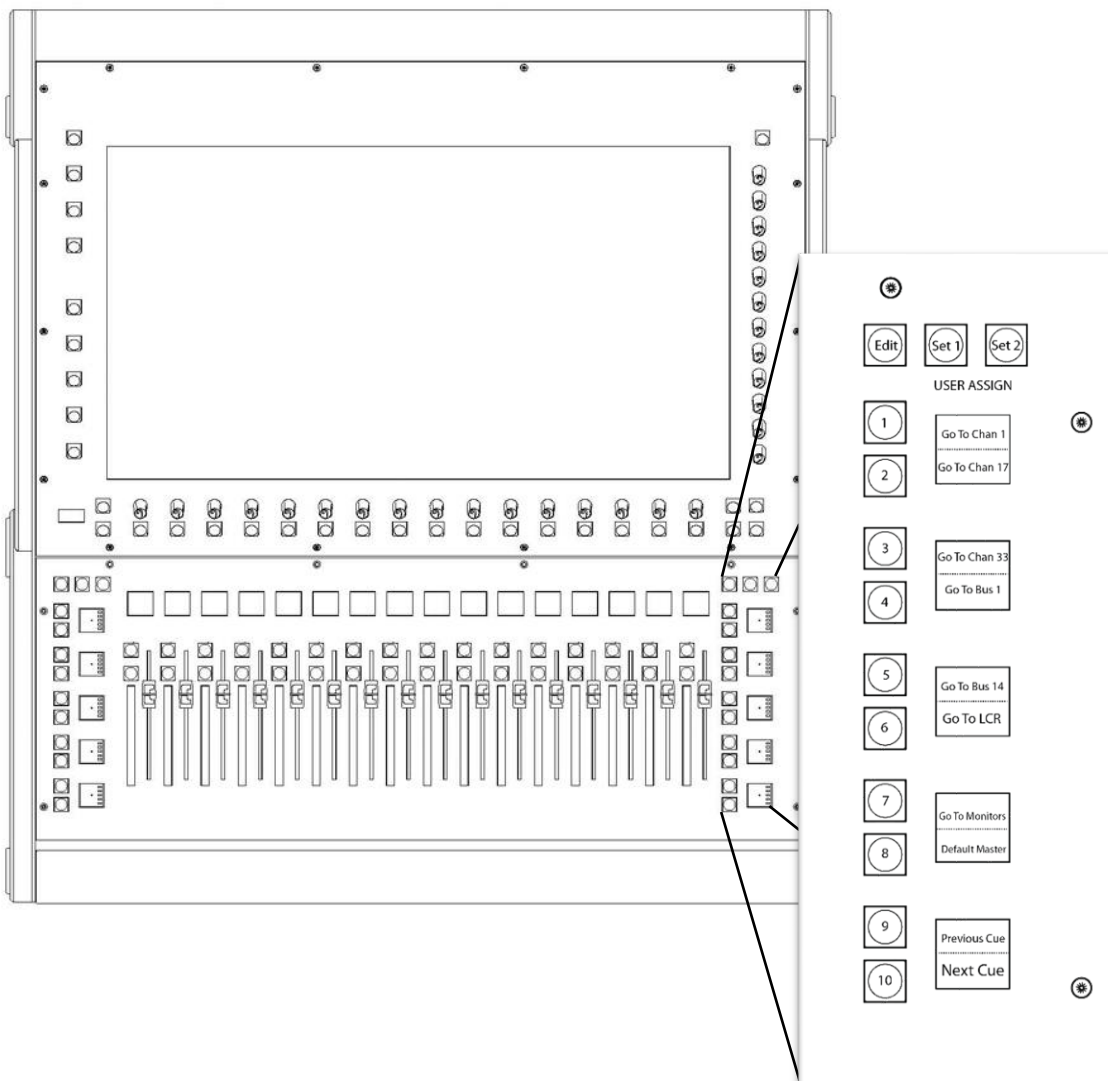
It is possible to have more than one function open on the screen, as some functions will map to the vertical encoders and others to the horizontal by default.

NOTE: The functions can also overlap, hiding portions of the GUI of the second function - including the EXIT button.

## GO TO or “Layers”

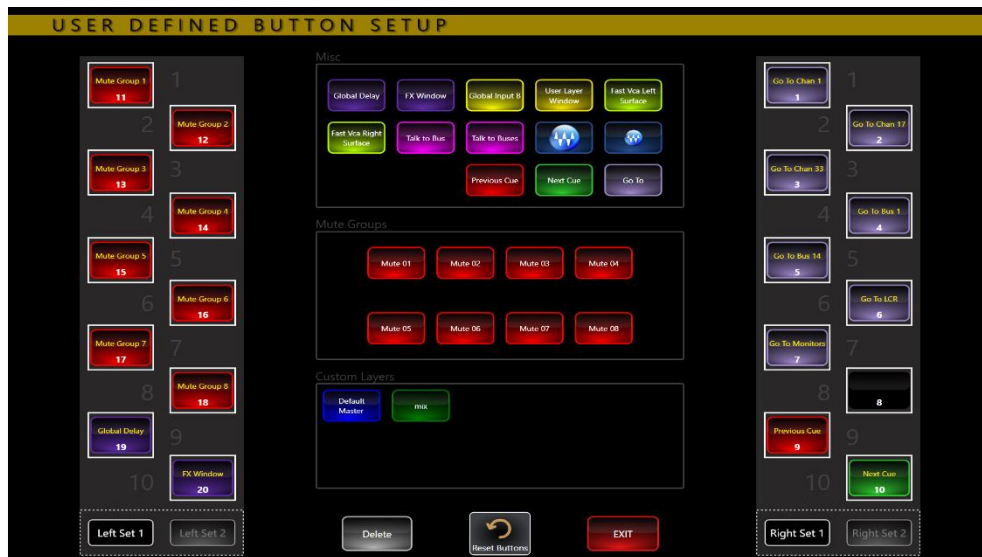
The CDC five provides three methods of changing “layers” or GO TO to channels:

1. **USER ASSIGN buttons:** The first three USER ASSIGN buttons to the right of the fader tray are by default set to GO TO Channel 1, 17 and 33. The GO TO Bus 1 and 14 accessing the screens and faders to the bus outputs are on the next two buttons by default. All can be reassigned via the **USER DEFINED BUTTON SETUP** screen to other buttons.



27: Default USER ASSIGN buttons

These can be resigned to any of the 40 USER ASSIGN buttons via the USER DEFINED BUTTON SETUP screen accessed via the EDIT button.



28: USER DEFINE BUTTON SETUP screen

2. **Swiping:** A “swipe” action horizontally across the screen will shift the displayed set of channels by a number of channels proportional to the “length” of the swipe. This is a very powerful feature of the CDC five, and allows very rapid access to channels not currently displayed.



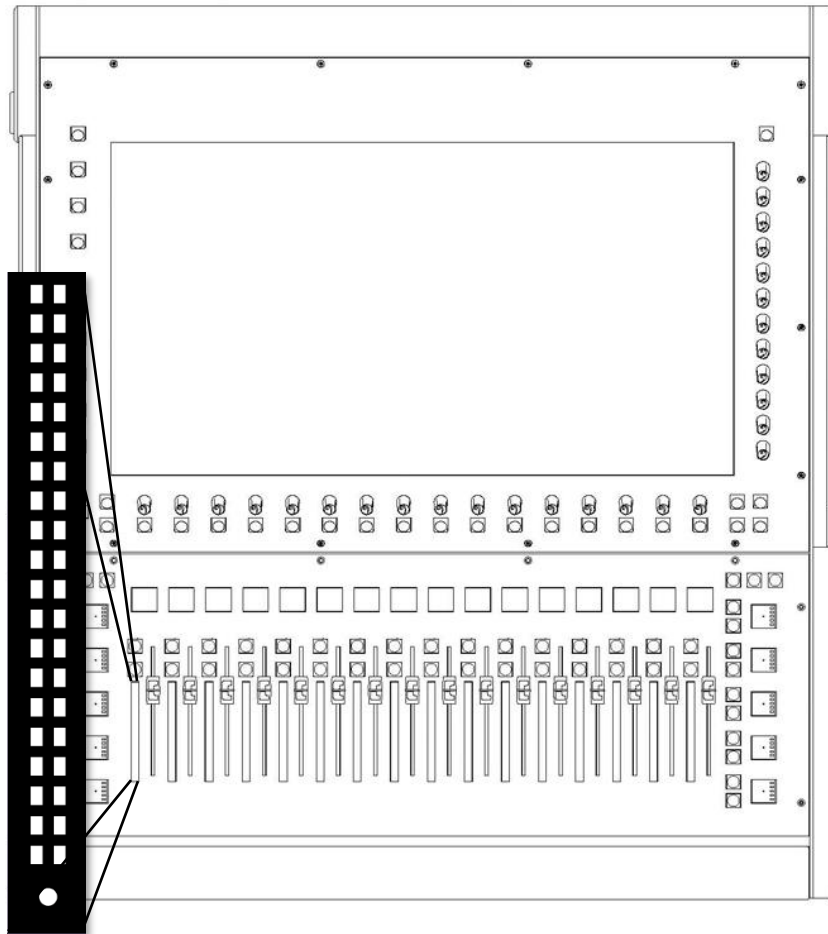
29: Swiping Left or Right will move channels “up” or “down”. The inputs will scroll underneath the “fixed” MASTER channels without affecting the MASTER faders in the above example

3. **SCROLL [26,27] Buttons:** Scrolls the inputs and busses (both screen display and faders) to the left by 8 channels at a time. By pressing SHIFT [29] this scroll can be reduced to one channel at a time.

NOTE: Swiping or using the SCROLL buttons to go “beyond” INPUT channel 48 will display the main MIX BUSSES, followed by the 24 OUTPUT channels. Similarly, swiping or scrolling “above” OUTPUT channel 48 displays the MONITOR channels. Swiping and scrolling does not “loop” below INPUT channel 1 or above the MONITOR channels.

## Channel Meters

The CDC five has 16 dual bar graph meters located in the fader bay, one per fader. The source for each meter will always be the signal in its channel; the identity of this will be confirmed by the OLED immediately above. If an input layer is selected, the meters will display input levels; if an output layer is selected, they will show output levels.



30: Bar Graph - 20 Segment

The bar graphs have 20 segments: the lowest segment illuminates green at a signal level of -80 dBFS and the top segment illuminates red at 10 dBFS, indicating digital clipping. The four segments below are also coloured red and the remainder yellow. An additional LED below the meter (OPEN) illuminates green when the fader is moved from its fully closed position.

If the channel is mono, only the left meter ladder is used. If the channel (input or output) has been defined as stereo, two meter ladders will show the signal level in the left and right legs of the stereo channel.

The default source for the bar graph meters is POST FADER, but this may be changed to PRE FADER on the MENU screen's METER OPTIONS page. By default the on-screen meters and the BUS FOLLOW are both set to PRE FADER.

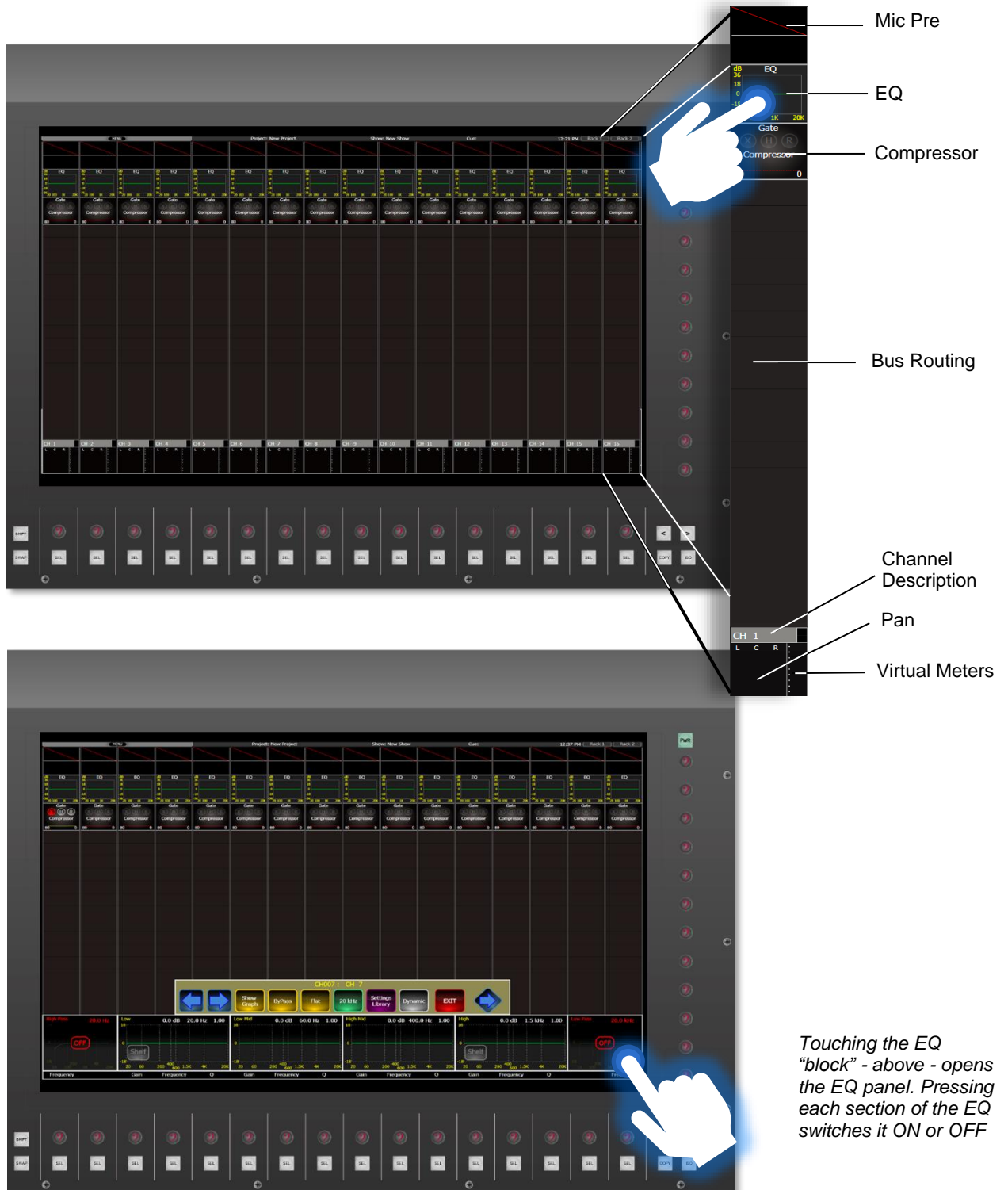
In addition to the fader bay meters, each channel strip - input or output - on the screen includes a small virtual bar graph - dual on stereo channels - complete with a 0 dB reference point. The source for these may also be selected as PRE FADER or POST FADER on the METER OPTIONS page as described above, so the engineer can see both pre fade and post fade signal levels simultaneously. The meters are at the bottom of the channel strip, immediately above the lower encoders (unless SWAP has been pressed and they will appear at the top of the screen).



31: Virtual Meters show at the bottom of the Channel Strip.  
Meter Options can be found in the USER OPTIONS in the MENU Screen.

## Channel Blocks

Touching a channel block opens a virtual panel with all controls relevant to the block.



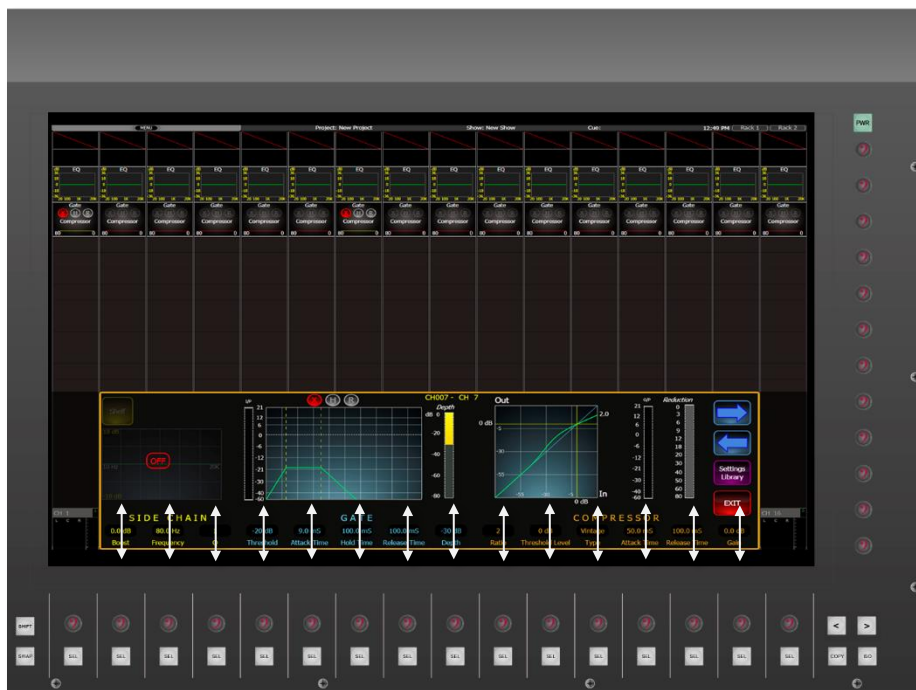
Touching the EQ "block" - above - opens the EQ panel. Pressing each section of the EQ switches it ON or OFF

32: Touching the EQ panel with open the EQ with all the relevant controls

## Using the Encoders

The main screen has 28 rotary encoders around its perimeter – 16 horizontally below the screen and 12 vertically to the right of the screen. The encoders also have a push and push / hold function for certain operations.

The encodes will map to the relevant functions of the GUI - EQ, DYNAMICS etc - allowing the parameters to be changed via turning. By pressing and holding the encoder it will zero any trim or return values back to the default position.

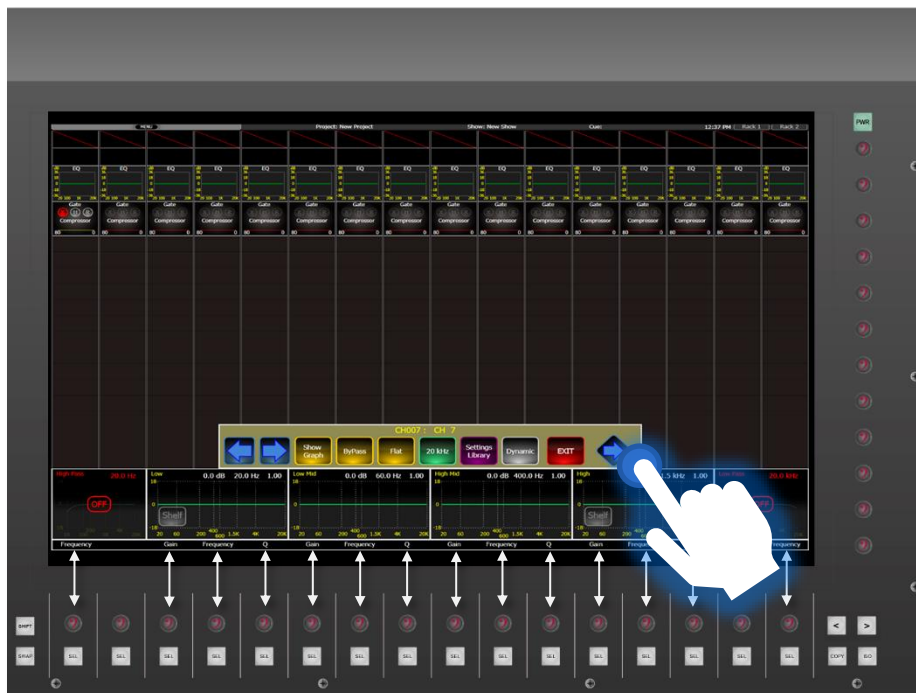


The white arrows in the following images indicate the mapping of the GUI to the encoders

33: DYNAMICS - The DYNAMICS GUI has the functions mapped to the bottom 16 encoders.

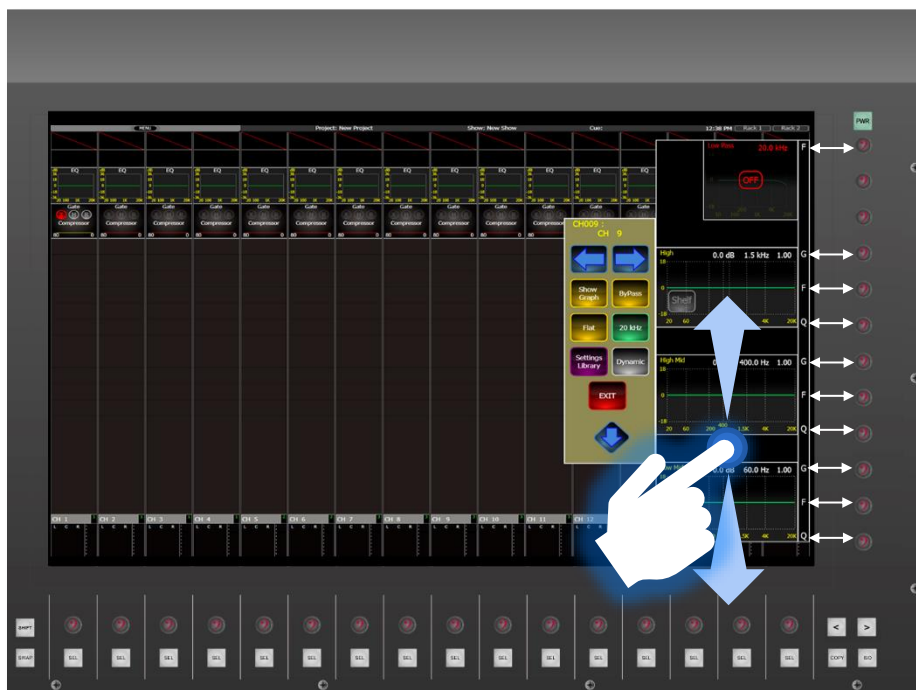
Some functions, for example EQ, can be used either on the horizontal or the vertical. The GUI will remap to the relevant horizontal or vertical encoders. In the case of the EQ the GUI can also be scrolled to give access to the “missing” LOW and HIGH PASS filters when in the vertical. Again, the mapping to the encoders will follow the GUI. (See over page)





Touching the Blue direction arrow will put the EQ on the vertical - see below

34: EQ - The EQ GUI is on the horizontal and the functions are mapped to the bottom 16 encoders.

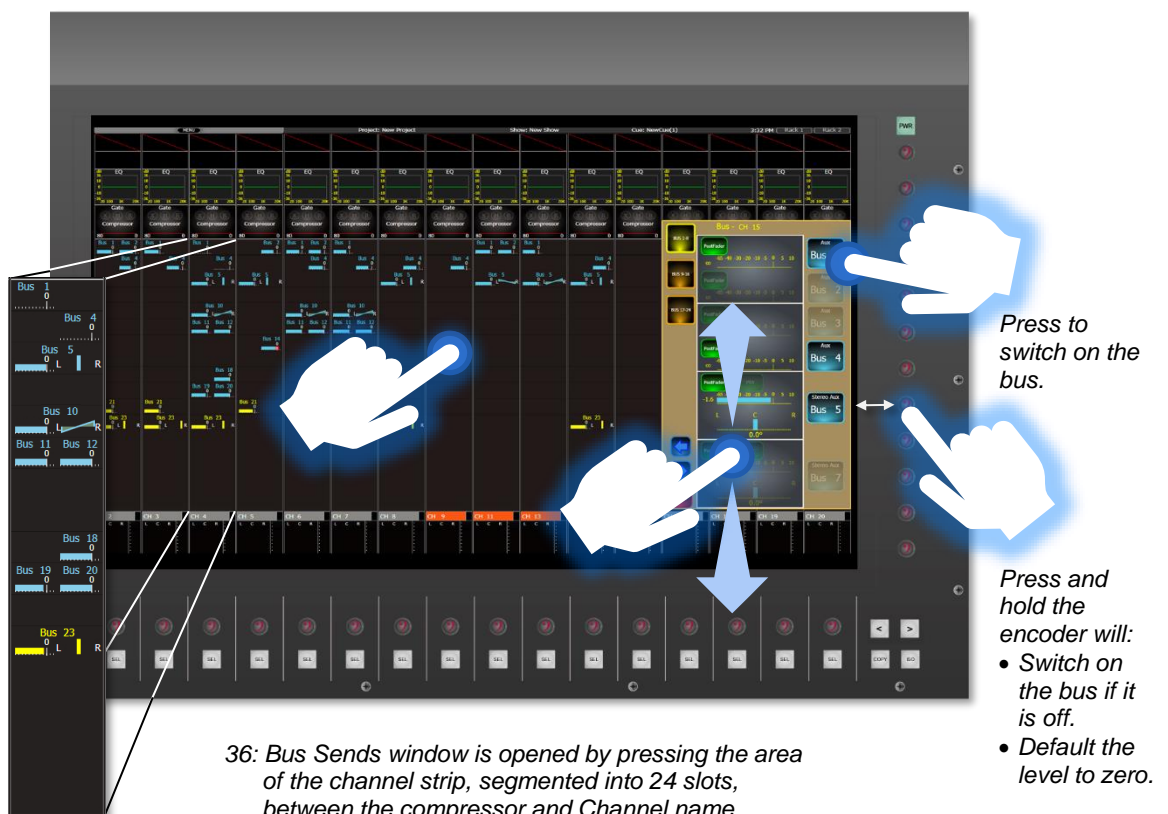


35: EQ - The GUI is now on the vertical and the functions are now mapped to the 12 vertical encoders on the right. The EQ GUI can also be scrolled up or down by touching and dragging the blank areas found in between the EQ graphs. Touching the graphs themselves will switch that function ON or OFF.

## BUS Sends

The CDC five is equipped with 24 assignable busses, which can be configured as AUX SENDS, AUDIO GROUPS or MATRICES, all of which can be configured individually and can be operated in mono or linked in stereo. Individual channels can be routed to any bus type directly, and both AUX and GROUPS can then be routed to either the MASTER L&R or a MATRIX, and the MASTER L&R can also be routed to any MATRIX BUS.

It is worth noting that all CDC consoles employ a comprehensive latency management system, meaning that routing through the console will not alter the phase alignment of the outputs. An example would be to route an INPUT DIRECT to a MATRIX output, as well as routing the same INPUT to GROUP, then ROUTING the GROUP to the MASTER L&R and then route the MASTER L&R to the same MATRIX. The result would still be phase coherent down to sample level.

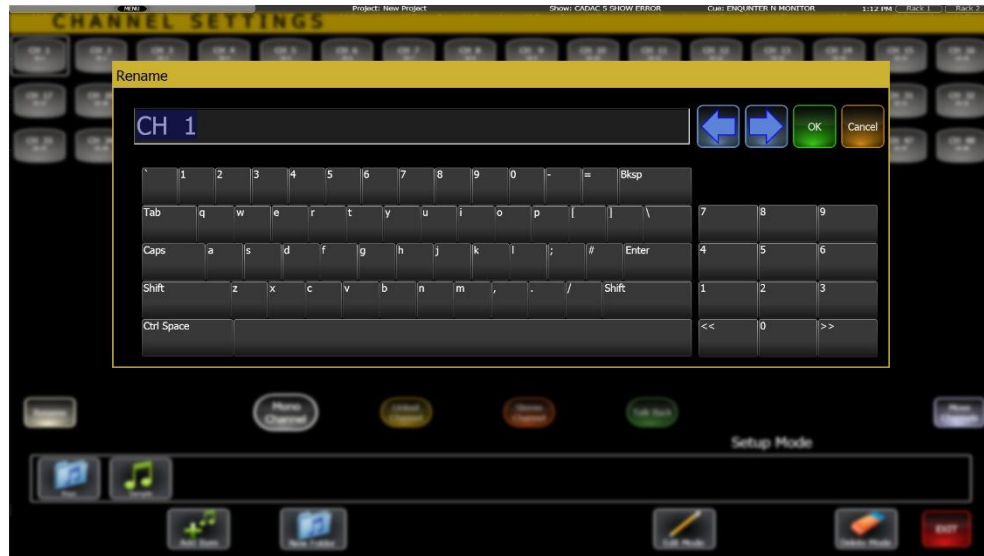


37: Bus sends will only populate the screen once routed. The horizon bar graph indicates the level of the input going to the bus. The vertical line shows the amount of pan: L to R. The balance control shows the balance of a stereo send to a stereo bus. The Bus sends are also colour coded: **Blue** = Aux, **Pink** = Group, **Yellow** = Matrix, **Green** = Stereo

Turning the encoder will change the level.

## Keyboard

The CDC five allows the naming of a number of functions e.g. INPUTS, BUSSES, VCAs and USER LAYERS. This can be done via accessing the required SETTINGS screen. Once in the SETTINGS screen select the INPUT / OUPUT / VCA etc for renaming and then press RENAME and this will bring up the virtual QWERTY keyboard on the screen.



38: QWERTY keyboard

An external USB keyboard can also be used via one of four USB ports on the console - one is located to the bottom left of the screen, two under the left side of the arm rest next to the Headphone connector plus the fourth on the rear panel.

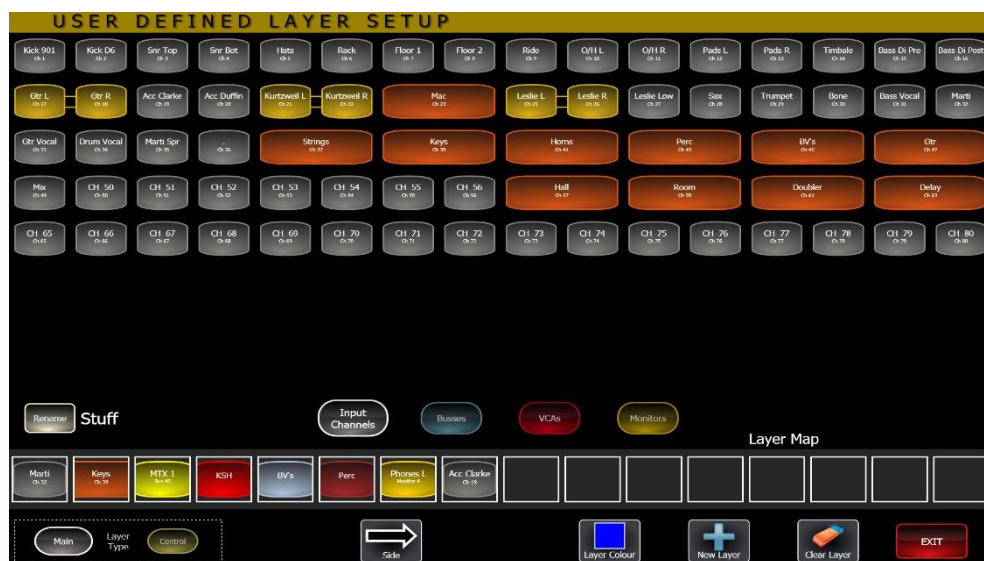
## User Layers

The CDC five also allows input channels, busses and VCAs to be pinned / stuck to the screen in any combination in a USER LAYER or custom layer. These will remain on the screen - with the associated fader (s) also pinned in the fader tray - whilst the remainder of the channels can be navigated as normal (unless all 16 channels are used).



39: CUSTOM LAYERS: Inputs with 2 x VCAs and 2 x Busses pinned to the screen

USER LAYERS can be accessed through the MENU screen menu via USER OPTIONS menu and LAYERS. Any combination of INPUTS, BUSSES, VCAs and MONITOR functions can be allocated to a layer. The USER LAYER can be saved, named, coloured coded and pinned to either side - left or right - of the screen and be allocated to a USER ASSIGN button.



40: USER DEFINE LAYER SETUP screen

## Effects

There are 16-stereo on-board effects units including various types of reverb, delay and modulation effects.

The 16-stereo effect “slots”, each with reverb, modulation and delay elements, can be used simultaneously and freely configured by the user.

*Pressing the FX Configuration window opens the user configuration screen for the on-board effects*



*The FX functions map themselves to the relevant encoders - shown by the white arrows.*

41: FX units page - functions map to the encoders

The 3 elements within each effect slot can be arranged in either series or parallel, and in any order, using a simple ‘drag and drop’ method. Effects can be patched as inserts on any channel or bus, or in-line on an aux send/return basis.

All the controls will map themselves to the relevant horizontal and vertical encoder. Turning the encoder will increase or decrease the value. Press and hold the encoder will reset the values to default levels.

Pressing the FX Configurations screen at the top left will bring up the screen to “build” the FX.

In the screen below the 3 elements within each effect slot can be arranged in either series or parallel, and in any order, by simply 'dragging and dropping' the required component. By default the effects are stereo units, however by pressing STEREO deselects the stereo mode and reconfigures the effects to mono, allowing the Left and Right to be used as separate units.

*STEREO by default, deselect this for MONO*

*The FX element is selected from 3 choices at the bottom of the FX configuration window*



*42: FX build screen - select the element (a choice of reverb, delay and modulation) and drag and drop into it one of the possible 9 "slots"*

A Waves® interface card is also fitted as standard which provides direct, low latency connectivity to the Waves® MultiRack® server, allowing additional effects to be used in conjunction with the console's own DSP effect options.

## GEQ

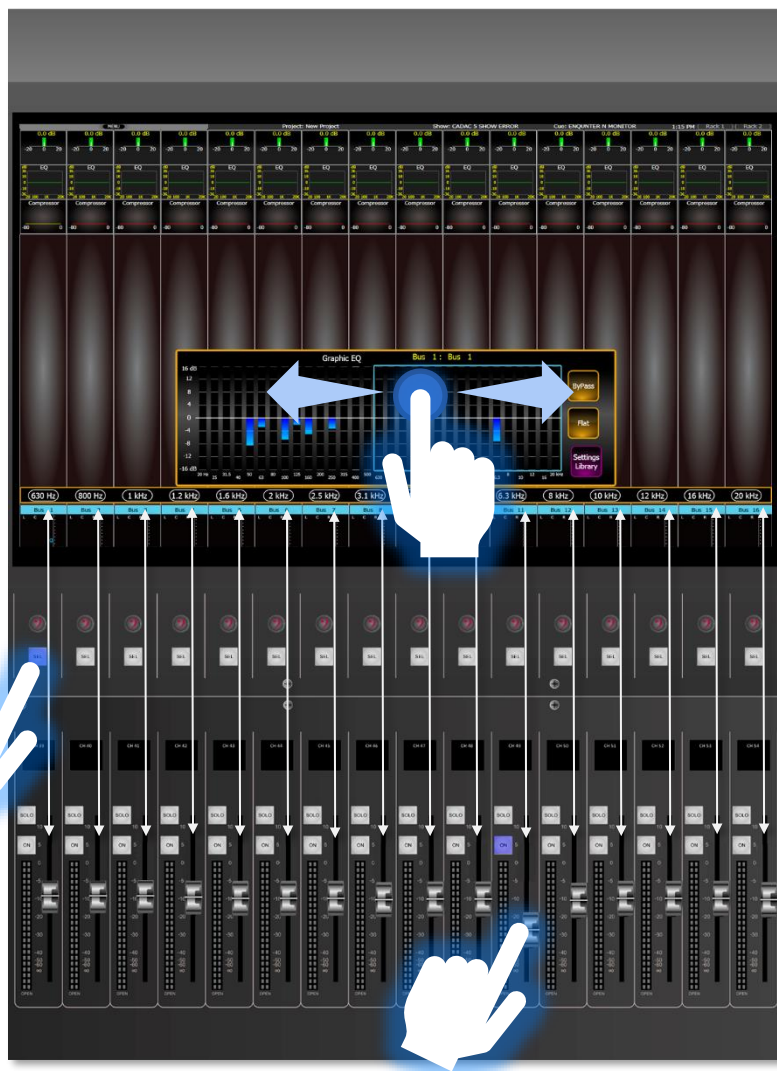
All output busses feature 4-band fully parametric EQ, variable HPF and LPF plus a 1/3 octave GEQ.

By pressing the GEQ [17] button - to the left of the screen - when the busses are selected, the GEQ screen will open. This shows 31 bands in BYPASS mode (press BYPASS to take it out of bypass) on the screen.

The GEQ is split into active bands highlighted by the blue box which can be cut or boosted by the faders. The bands outside the blue box are inactive. The faders are now mapped to the active bands (16 bands will be active) with the frequencies shown both on the screen and the OLEDs above the faders. Pressing the SELECT button under the BUS will activate the GEQ for that individual BUS. Once a fader is moved, the ON light will illuminate blue and the applied boost or cut will displayed on the GEQ screen. By pressing the ON button, the boost or cut will be zeroed for that GEQ band.

The EQ bands map to the faders for adjustment - highlighted by the white arrows

The SEL button selects the BUS that the GEQ is active on



The active area of the GEQ can be changed by moving the highlighted blue area.

16 bands are always visible.

By cutting or boosting the band using the fader, the ON button will light blue indicating the band has a cut or boost

43: With the GEQ open on the outputs, the faders will be mapped to the relevant frequency

All parametric and graphic EQ's can be used simultaneously, without any concern about available processing power or tonality compromise.

Additional features include GEQ in / out, an "instant flat" switch plus a bypass function for individual GEQ filters.



## Control Screen Menus

During a performance, the MENU screen will normally be used to display the CUE list. Pressing the CUE [21] button, will bring up the CUE list.



44: MENU SCREEN displaying the CUE list



45: MENU SCREEN displaying the CUE options displayed by double taping a CUE or pressing the STORE button

The MENU SCREEN HOME page provides five menus – PROJECTS, CUES, CONFIGURATION, USER OPTIONS and SETTINGS. Touching any of the tabs opens a further menu at the side.

**PROJECTS** menu is effectively part of the CDC five's automation system: it enables file creation and management functions and is used when starting a new project or loading a previously stored one.



46: MENU SCREEN displaying the PROJECTS menu

**CUES** give access to FILTERS, CUE EDITOR and CUE EVENTS



47: MENU SCREEN displaying the CUES menu

**CONFIGURATION** menu is used to configure the basic architecture of the mixing console.

- CHANNEL SETTINGS page opens on the screen and is used to define Input Channels as Mono, Stereo, or Linked, and to name or move the channels.
- BUS SETTINGS page opens on the screen and is used to set up the basic bus structure of the console; busses may be defined as GROUPS, AUXILIARY SENDS or MATRIX SENDS, as MONO or STEREO, and named. GLOBAL channel send types can also be set.
- SOLOS page opens a MENU page allowing adjustment and settings to be made to the console's Solo system.
- TALKBACK configuration, the 16 DELAY Groups and the AES3 configuration can also be set up from this menu.



48: MENU SCREEN displaying the CONFIGURATION menu

**USER OPTIONS** menu provides access to RECALL SAFES, USER LAYERS set up screen, the USER ASSIGN button setup screen and METERING configuration.

- RECALL SAFES menu provides the options of taking the I/O Patching, Channels Modes, Channel Head Amp, I/O Patching Outputs, Bus Modes, Outputs, Brightness, VCA Fader and VCA Mutes globally out of the automation
- SETTINGS menu provides access to options to customise the console. There are options for showing fader values, VCA colours, Assign VCA Auto On / Off, Bus Focus, Auto Save, Monitor Follow and Solo Select plus Global Input B.



49: MENU SCREEN displaying the USER OPTIONS menu

**SETTINGS** menu allows access to a number of parameters of the console including controls for the brightness of the screen and LEDs, plus this is where the screen and console can be locked. It also provides access to the information regarding the console - serial number, software version along with SYSTEM that monitors the power status of the console.

- BRIDGE SERVER SETTINGS provides access to the REMOTE and NETWORK PORT. NETWORK PORT allows the selection of which port a Router, or network, is attached to the console. This should be always be an external port. REMOTE allows an iPad to control the console, or accept any iPad controlling the console.

NOTE: The BRIDGE SERVER must on start-up be set to running for these services to work.

- SYSTEM MAINTENANCE page gives options of EMAILING CONSOLE LOGS, CLEAR LOGS plus access to both the SURFACE DATA and STAGBOX DATA, Waves® CENTRAL and the KEYBOARD.
- RESET brings up the options of resetting USER SETTING, SAFE SETTINGS and a FACTORY RESET



50: MENU SCREEN displaying the SETTINGS menu

Press MENU again closes the MENU screen; the MENU button illuminates green when it is available. Press the BACK button to go back up the menu “tree” one level only. The BACK button illuminates red when it is available.

## System Functions

### Waves® SoundGrid® Interface

Waves® SoundGrid® is a proprietary high-speed digital audio transport protocol with a capacity of 64 bi-directional channels. The CDC five is fitted with a SoundGrid® interface card, accessible on the rear panel via three RJ45 network connectors. Any one of these may be connected to an external computer (with the appropriate Waves® drivers loaded) to perform multitrack recording (with Waves® SoundGrid® Studio installed on the external computer and appropriate Waves® license) and playback.



51: Waves® SoundGrid® Interface

A range of optional Waves® servers are also available from Waves® which can be used to host the full range of Waves® plug-in signal processing.

See the Waves® website [www.waves.com](http://www.waves.com) for further information regarding Waves®, SoundGrid®, Waves® Tracks Live®, servers and installation.

### CDC five Local I/O Mapping and Waves®

In the Input / Output tables, shown over the page, all the “slots” in blue are shared.

Only one item out of each pair can be selected at a time. Once an item is selected the alternative option will be greyed out in the assignment window.

Note: There are no Waves® outputs on slots 63 and 64, these slots are dedicated to the headphone output by default - however these can be re-allocated to Waves®.

Input			Output		
<u>Waves</u>	<u>Local IO</u>		<u>Waves</u>	<u>Local IO</u>	
1	Waves 1	-	1	Waves 1	-
2	Waves 2	-	2	Waves 2	-
3	Waves 3	-	3	Waves 3	-
4	Waves 4	-	4	Waves 4	-
5	Waves 5	-	5	Waves 5	-
6	Waves 6	-	6	Waves 6	-
7	Waves 7	-	7	Waves 7	-
8	Waves 8	-	8	Waves 8	-
9	Waves 9	-	9	Waves 9	-
10	Waves 10	-	10	Waves 10	-
11	Waves 11	-	11	Waves 11	-
12	Waves 12	-	12	Waves 12	-
13	Waves 13	-	13	Waves 13	-
14	Waves 14	-	14	Waves 14	-
15	Waves 15	-	15	Waves 15	-
16	Waves 16	-	16	Waves 16	-
17	Waves 17	-	17	Waves 17	-
18	Waves 18	-	18	Waves 18	-
19	Waves 19	-	19	Waves 19	-
20	Waves 20	-	20	Waves 20	-
21	Waves 21	-	21	Waves 21	-
22	Waves 22	-	22	Waves 22	-
23	Waves 23	-	23	Waves 23	-
24	Waves 24	-	24	Waves 24	-
25	Waves 25	-	25	Waves 25	-
26	Waves 26	-	26	Waves 26	-
27	Waves 27	-	27	Waves 27	-
28	Waves 28	-	28	Waves 28	-
29	Waves 29	-	29	Waves 29	-
30	Waves 30	-	30	Waves 30	-
31	Waves 31	-	31	Waves 31	-
32	Waves 32	-	32	Waves 32	-
33	Waves 33	-	33	Waves 33	-
34	Waves 34	-	34	Waves 34	-
35	Waves 35	-	35	Waves 35	-
36	Waves 36	-	36	Waves 36	-
37	Waves 37	-	37	Waves 37	-
38	Waves 38	-	38	Waves 38	-
39	Waves 39	-	39	Waves 39	-
40	Waves 40	-	40	Waves 40	-
41	Waves 41	AES In 1L	41	Waves 41	AES Out 1L
42	Waves 42	AES In 1R	42	Waves 42	AES Out 1R
43	Waves 43	AES In 2L	43	Waves 43	AES Out 2L
44	Waves 44	AES In 2R	44	Waves 44	AES Out 2R
45	Waves 45	AES In 3L	45	Waves 45	AES Out 3L
46	Waves 46	AES In 3R	46	Waves 46	AES Out 3R
47	Waves 47	AES In 4L	47	Waves 47	AES Out 4L
48	Waves 48	AES In 4R	48	Waves 48	AES Out 4R
49	Waves 49	Mic In 1	49	Waves 49	Line Output 1
50	Waves 50	Mic In 2	50	Waves 50	Line Output 2
51	Waves 51	Mic In 3	51	Waves 51	Line Output 3
52	Waves 52	Mic In 4	52	Waves 52	Line Output 4
53	Waves 53	Mic In 5	53	Waves 53	Line Output 5
54	Waves 54	Mic In 6	54	Waves 54	Line Output 6
55	Waves 55	Mic In 7	55	Waves 55	Line Output 7
56	Waves 56	Mic In 8	56	Waves 56	Line Output 8
57	Waves 57	-	57	Waves 57	-
58	Waves 58	-	58	Waves 58	-
59	Waves 59	-	59	Waves 59	-
60	Waves 60	-	60	Waves 60	-
61	Waves 61	-	61	Waves 61	-
62	Waves 62	-	62	Waves 62	-
63	Waves 63	-	63	-	Headphones L
64	Waves 64	-	64	-	Headphones R

## **USB Ports**

The CDC five is equipped with four Type 'A' USB 2.0 ports. These are located as follows: one socket bottom left of the screen, two sockets under the armrest on the left and one socket on the rear panel.

The USB ports are intended for the connection of an external memory device (USB stick or similar), on which Show files can be saved or backed-up, and for performing software upgrades. They also allow the connection of a standard USB QWERTY keyboard and / or mouse.

## **Ethernet Ports**

The CDC five is equipped with 2 RJ45 Ethernet Ports. These are standard PC network Gigabit Ethernet ports for purposes of connecting the console to the CDC MC Router, adding a wireless network router when using the iPad. It can also be used to connect to an internet connection for emailing the console's logs back to Cadac.

Cat 6 cable suitable for 1000base-T use is recommended for network connections.

## **MIDI I/O**

Used for sending MIDI data for control of external hardware.

## **Lamp**

A 3-pin female XLR connector providing 12 V DC for a gooseneck console light.

Pin	Connection
1	0 V
2	+12 V DC
3	0 V



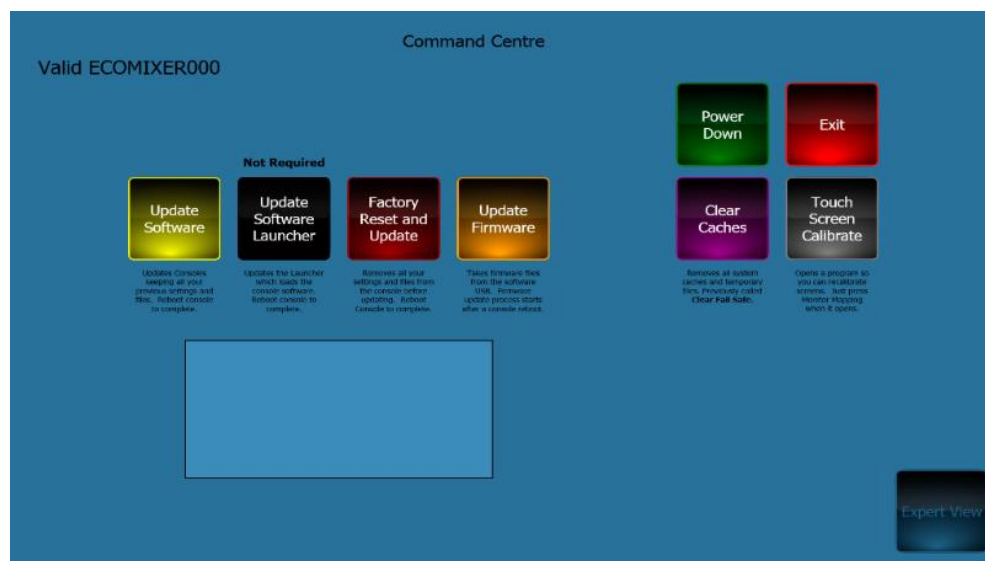
## Updating Software

The CDC five's operating system undergoes a programme of continuous development. The console may be updated by loading new versions of software as they become available.

This can be done by inserting a USB key containing the latest software. Download the latest version from [www.cadac-sound.com](http://www.cadac-sound.com) (software is on the Support / Software Download page), then unzip the software on the root of a clean / empty USB key. Then insert the key into one of the four USB ports on the console and then follow the on-screen instructions.

### CDC five Console Software Upgrade Procedure

1. **Important: Backup all show files** that are on the console
2. Download the Console Software file from [www.cadac-interfaces.com](http://www.cadac-interfaces.com)
3. Then unzip this file, and copy into an **empty** USB stick
4. Plug the USB stick into a USB port on the console
5. The **Simple Command Centre Screen** will appear on the main screen



52: Simple / Novice Setup Screen

6. Press **Update Software** then wait till done
7. **Update software launcher** if required (button will be highlighted green)
8. Press **Clear Caches** then wait till done
9. Press **Power Down** and remove USB
10. Make sure the console is completely off then **Power Up** the console

## Appendix

### Technical Specifications

#### General Specifications

Faders	16 x 100mm motorised faders
Screen	23.5" 16:9 HD
PSU	1 x internal PSU  (option to add second external 19" 2U rackmount PSU with full redundancy)
Inputs	Up to 192 (inc local I/O)
Channels	48 with full processing
Busses	24 configurable in pairs as group/aux/st aux plus dedicated LCR, monitor LR, headphones LR and talkback
Matrix	Up to 67 x 48 with full processing
Outputs	Up to 192 (inc local I/O)
Graphic EQ	32 band +/-16 dB on all 55 outputs
Internal FX	16 high-resolution 96 kHz stereo effects processors
Local IO	16 x XLR Mic Inputs (inc 48 V, PAD and 1 dB gain steps), 8x XLR Balanced outputs, 4 x XLR AES/EBU inputs and 4 x XLR AES/EBU outputs
Comms	2 x Cadac MegaCOMMS

### Audio Specification

Sample Rate	96 kHz
Processing Delay	Sub 0.4 millisecond latency through complete signal chain
Internal Processing	40-bit floating point
ADC/DAC	24-bit
Frequency Response	20 Hz to 44 kHz + 0.5 / -1.5 dB
THD+N	better than 0.005% @unity gain, 10 dB input at 1 kHz
Channel Separation	better than 90 dB
Residual Output Noise	< -90 dBu (20 Hz – 20 kHz)
MIC EIN	< -127 dB with 200 Ohm source impedance
Maximum Output	21 dBu





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