

CDC seven

Digital Mixing Console

User Manual Hardware



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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.

Conformities

Declaration of Conformity

The Directives covered by this declaration: 2004/108/EC

The Products Covered by this Declaration: CDC seven audio mixing consoles

The Basis on which Conformity is being Declared: The products identified above comply with the requirements of the above EU Directive(s) by meeting the following standards:

BS EN 55103-1:2009 Product family standard for: audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 1 – Emission.

BS EN 55103-2:2009 Product family standard for: audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 2 – Immunity.

BS EN 61000-3 -2:2008 Electromagnetic Compatibility (EMC) Part 3. Limits. Section 2. Limits for harmonic current emissions (equipment input current ≤ 16 A per phase).

BS EN 61000-3 -3:2006 + A2:2009 Electromagnetic Compatibility (EMC) Part 3. Limits. Section 3. Limitation of voltage fluctuations and flicker in low voltage supply systems for equipment with rated current ≤ 16 A.

BS EN 60065:2002 + A1:2006 Audio, Video and similar electronic apparatus. Safety requirements.

BS EN 61000-4-2:2009 Electrostatic discharge immunity test.

BS EN 61000-4-6:2009 Immunity to conducted disturbances.

BS EN 61000-4-11:2004 Immunity to voltage dips, short interruptions and voltage variations.

Attention!

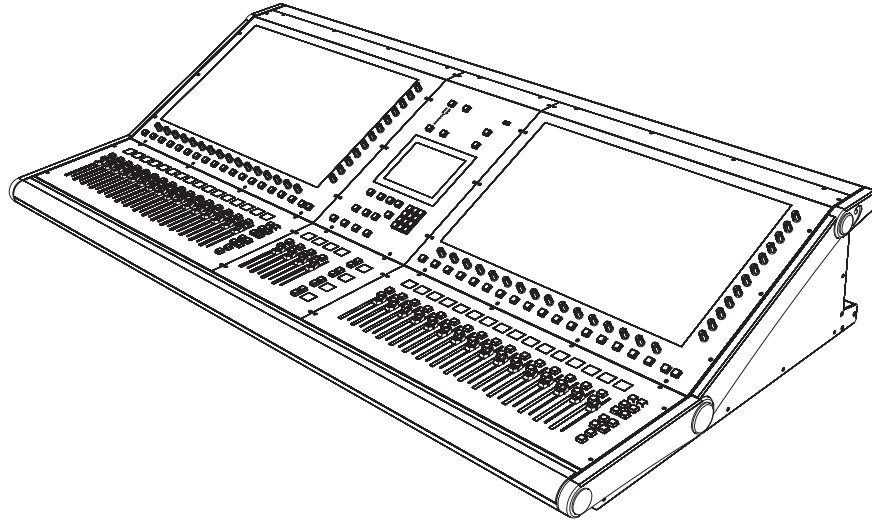
The attention of the specifier, purchaser, installer, or user is drawn to special measures and limitations to use which must be observed when these products are taken into service to maintain compliance with the above directives. Details of these special measures and limitations to use are available on request, and are also contained in this User Manual.

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Introduction



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

From its founding in 1968, Cadac's products have become the benchmark for sound reinforcement consoles. The CDC seven is one of Cadac's range of live performance digital production consoles and uses the same innovative user interface developed for the acclaimed CDC six console. It makes most of the features of our world-famous, large-scale theatre and touring analogue desks available in a compact, fixed-architecture, fully-digital system, using a "high-agility" user interface based on a wide-format touch screen. Professional sound engineers used to working on either traditional analogue consoles, or other digital consoles will find the transition to the CDC seven's operational system quick and easy. However, the attention to detail, high quality audio circuitry and reliability on which the reputation of the Cadac brand is built remains at the core of the CDC seven's design philosophy.

Overview

The CDC seven system comprises three physical components: control surface, control surface power supply, and remote MegaCOMMS I/O device(s). The control surface provides further (local) analogue and digital inputs and outputs; back-up (redundant) power supplies for the control surface and/or remote stagebox(es) are available as a standard option.

Shipping details

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

- One or two* PSUs for the control surface
- One or two* powerCON TRUE 1 cables
- One or two* PSU-to-control surface cables
- Dust cover for control surface
- Gooseneck console lamp
- User manual – hardware

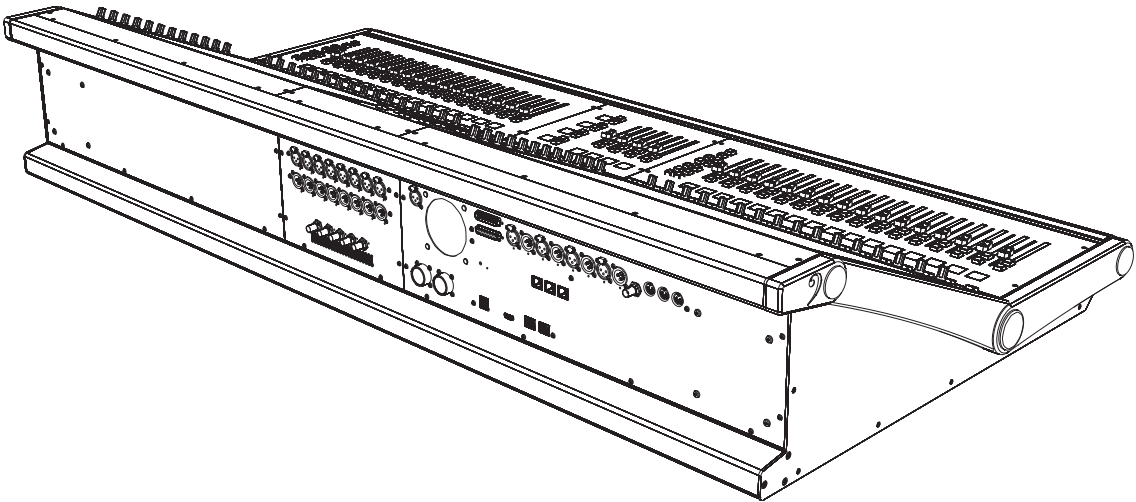
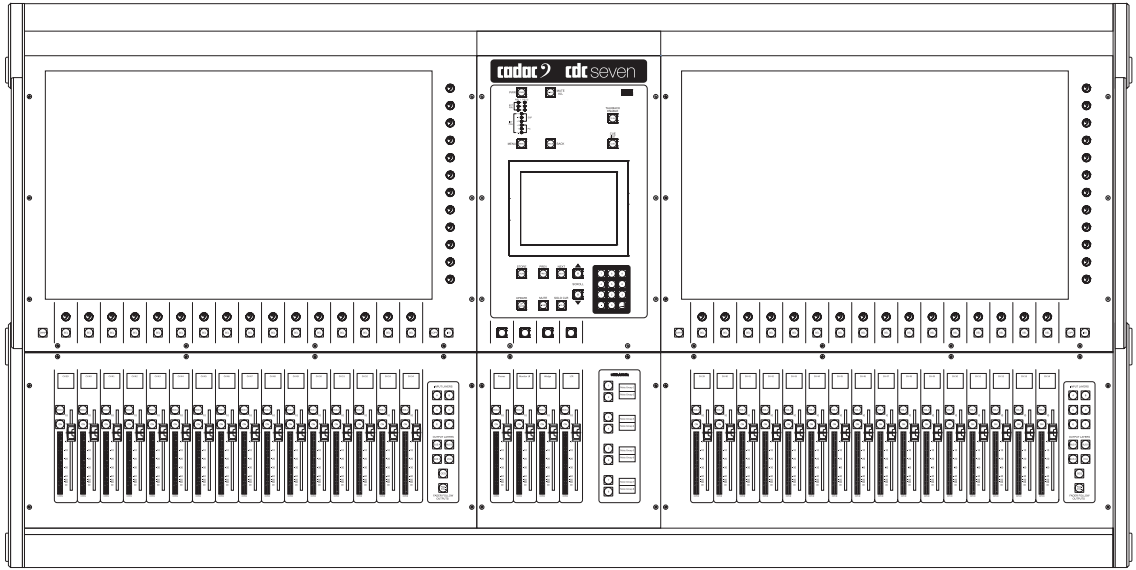
* A second (redundant) PSU may be ordered if required.

Control Surface:

The control surface is divided in four operational areas:

- two Channel Sections, each based around a 23.5", 16:9 (1920 x 1080 pixels) touchscreen display with two sets of rotary encoders mounted below and to the right of the screen;
- the Master Section, to the right of the Channel Section, with the CDC seven's 6.5" Control screen, fast access keypad, automation and other ancillary controls;
- the Channel Fader Bay, below the Channel Section, with 16 touch-sensitive, 100 mm motorised faders, OLED channel displays, stereo LED bargraph meters and other controls;
- the Master Fader Bay, below the Master Section, with four motorised faders, OLED displays and a set of user-assignable keys.

All connections to the surface (apart from headphones and three USB ports) are on the rear panel of the control surface: these include PSU inputs, MegaCOMMS ports (see following page), local analogue and digital audio I/O, network ports, further USB ports, etc.

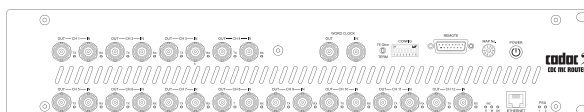


Remote MegaCOMMS I/O Devices:

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 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



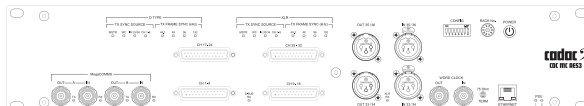
CDC MC MADI



CDC MC DANTE



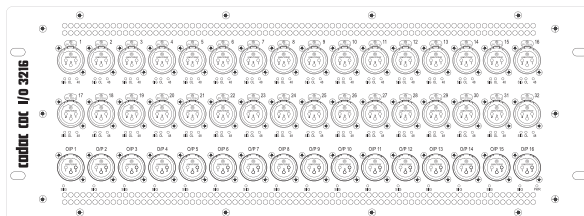
CDC MC AES



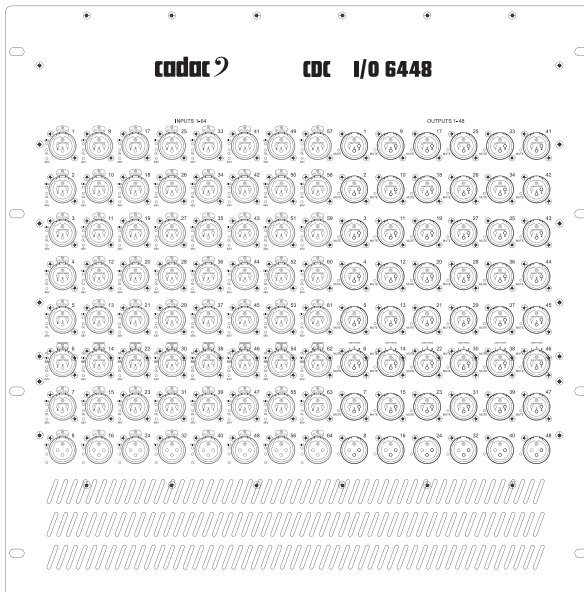
CDC MC Optical



CDC I/O 3216

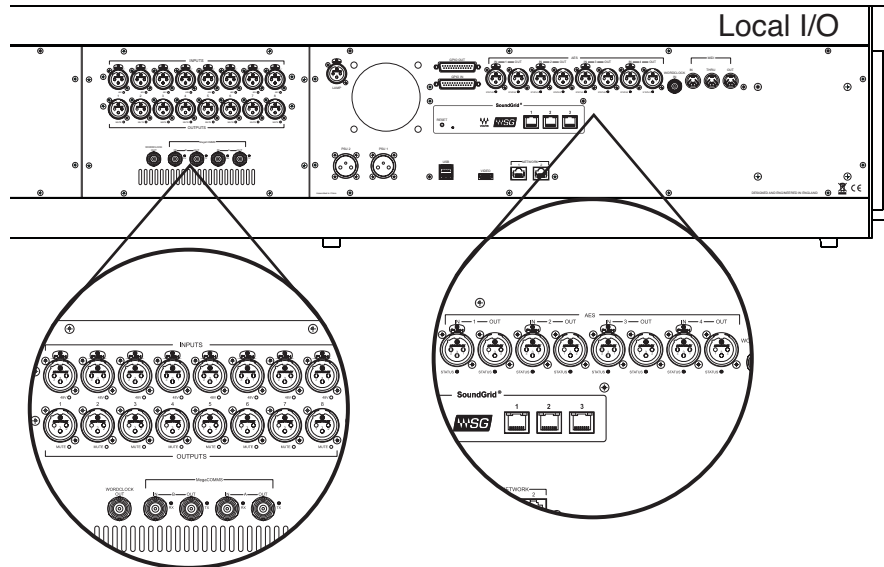


CDC I/O 6448



Either one or two MegaCOMMS remote I/O devices can be connected directly to the console: more may be connected by using the CDC MC Router.

In addition to the I/O provided by the CDC MegaCOMMS remote I/O devices, the control surface is provided with eight 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 seven's software.



System capability

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 seven employs the now-familiar concept of "layering" to reduce the size of the control surface, with 32 motorised faders able to control a maximum console configuration of 96 input channels mixing into 48 assignable mix busses, plus left, centre and right master busses, and two monitor busses for PFL and AFL. The touchscreen-based control screens have been designed to present as familiar a layout as possible to operators, using virtual control panels with large, colour-coded buttons and displays. The rotary encoders at the edges of the screen are used to make all parameter adjustments (levels, EQ parameters etc.)

An important feature of the CDC seven is that there is very little distinction between input channels and output channels in terms of features and facilities. The 48 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.

The CDC seven control surface includes a Waves® SoundGrid® interface. Three ports of the interface's integral Ethernet hub are available on the rear panel; any of these may be used to connect the CDC seven to a computer, allowing multitrack recording and playback. The mixer may also be connected to a Waves MultiGrid server running Waves plug-in signal processing, with the control panels for the plug-ins presented on the CDC seven's main screens. Alternatively, one or two HDMI-capable external screens may be fitted to the surface using the rear VESA mounts, to display the Waves functionality independently.

Data protocol: MegaCOMMS

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.

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.

The maximum recommended cable run between any two system components (i.e., surface to I/O device, or between I/O devices) is 150 m (492 ft).

CDC seven – Main Features

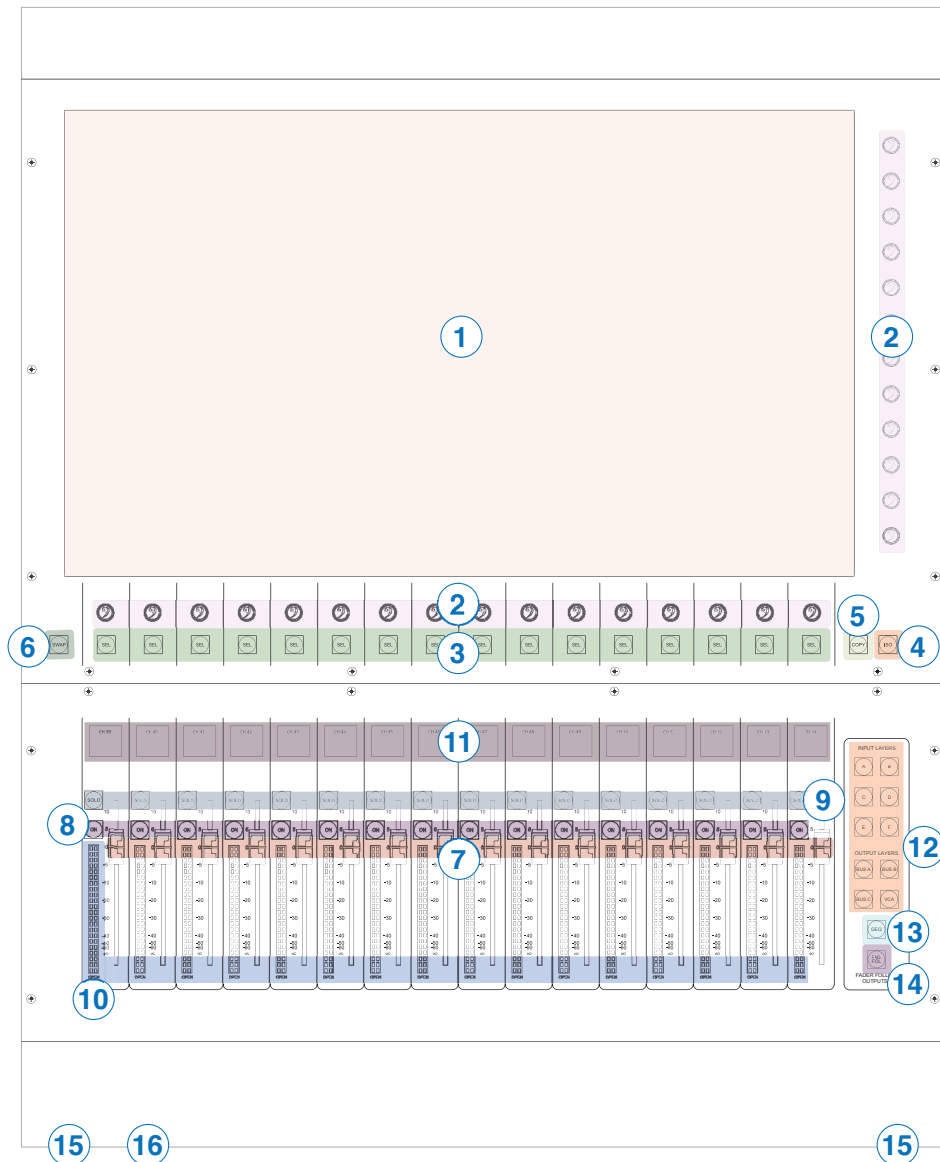
- Up to 96 simultaneous channels in the mix
- 48 mix busses, freely assignable as groups, aux sends or matrix sends, plus LCR main busses
- Busses may also be allocated as sends to internal FX processors with matching stereo returns
- Up to 192 simultaneous inputs and up to 192 simultaneous outputs
- 8 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
- Unrestricted allocation of physical I/O to input channels and group/aux/matrix outputs
- 16 VCA groups
- Eight 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 matrixes - 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)
- Default display of all primary channel parameters
- Two physical inputs per input channel
- 4-band fully-parametric EQ on all inputs and outputs
- Classic Cadac analogue EQ emulation
- 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 FX processors – each may be inserted or configured as send-return loops
- 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 swap functions
- Full Monitor, PFL and Talkback facilities
- 2 x 23.5" 16:9 touchscreen displays
- 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 bargraph meters, integrated in fader bays
- 9 control surface layers - 4 inputs, 3 outputs, VCAs, GEQ
- Gooseneck console lamp

Hardware components

Control surface

Top view

Channel Section and Channel Fader Bay:



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 using the **LAYER** [12] 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 adjacent to the screen.

2. Rotary encoders – 28 encoders are provided, 12 on the right-hand side of the screen and 16 along the bottom (referred throughout this manual as “right” and “lower” respectively). By default, the lower set are the channel coarse mic gain controls, but may be changed to be channel pan controls by the **SWAP** button [6]. The right set is inactive until an on-screen panel is opened; the function of each active encoder is then clearly indicated. The function of the lower set may also change when certain channel panels are opened. This is part of the functionality of the audio channel paths, and is explained in greater detail in the CDC seven Software Manual.
3. **SEL** buttons – each displayed channel has a **SEL** button; these are used in conjunction with the **Copy** [5] and **Swap** [6] buttons.
4. **ISO** - used in conjunction with the **SEL** buttons [3] when placing one or more sections of a channel strip into **RECALL SAFE** mode.
5. **Copy** button – used in conjunction with the **SEL** buttons [3] 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 bottom of the virtual channel strip and the pan blocks at the top. The lower encoders are per-channel coarse input gain controls by default, but pressing **Swap** exchanges the on-screen positions of the the input gain blocks and pan blocks, and reassigns the lower encoders as the channel pan controls.
7. Faders – 16 touch-sensitive, 100 mm motorised faders; as with the **SEL** and **ON** buttons, the channel the fader controls will be that displayed directly above it on-screen, and will thus be affected by the currently selected layer and any screen swiping or scrolling actions. 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.
 - ‘**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.
 - ‘**Hard**’ mute – a long press activates mute relays in the stagebox for all physical outputs being fed by the channel. 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 Control page on the Control screen. The default modes for input channels are: mono channels are PFL, stereo channels are AFL; output channels are AFL only. AFL is post the channel panpot (if in circuit), so correctly reflects the stereo imaging of the channel being solo'd; if the panpot is not in circuit, AFL is mono. SIP mode is also available, selected from the Solo Control page. As well as the master modes, the CDC seven also features 'momentary' and 'latching' solo operation:

'Momentary' solo – press and hold the **SOLO** button; solo is active while the button is pressed and cancels when the button is released.

'Latching' solo – a short press on a **SOLO** button activates solo mode and the button may be released. Press again to cancel.

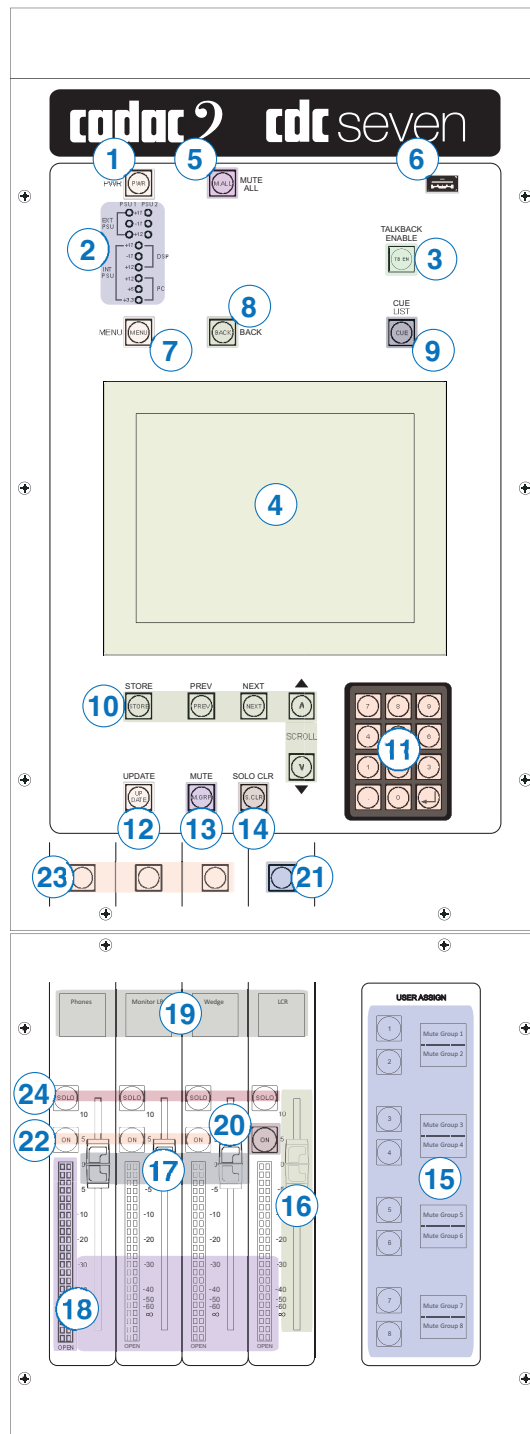
'Block latching' – press and hold one **SOLO** button and press another **SOLO** button while still pressing the first. This will solo the block of channels between the two buttons. Note that this mode is not available if "Auto Cancel" is selected on the Solo Control page.

In use, the **SOLO** button illuminates in a colour that is mode-dependent. See the Software Manual for more details of the Solo system.

10. Metering – a 20-segment LED dual bargraph meter is fitted adjacent to each of the 16 faders in the fader bay. The meters are single when the selected channel (input or output) is mono, and dual if stereo. The lowest segment acts as a 'signal present' LED, and illuminates at -70 dBFS. The LEDs are colour coded: the signal present segment is green, the five highest segments are red, with the top one corresponding to 0 dBFS. The remaining segments are yellow. A **Meter Options** page on the Control screen allows the user to select various meter source options, including fixed metering of selected layers or "follow" modes, switchable pre or post-fader. Full details are provided in the Software Manual. There is additionally an green **OPEN** LED at the bottom of the meter which illuminates as soon as the fader is moved from its "closed" position.
11. OLED alphanumeric displays – one per fader. These 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, the default name – e.g., **Ch. 23**. They are also colour-coded, to match the channel type – stereo or mono, output buss assignment, etc. The colours are consistent with the usage elsewhere in the software.
12. **INPUT LAYERS** and **OUTPUT LAYERS** buttons – a set of ten buttons controlling which channels are displayed on-screen. The faders, OLED displays and the **ON**, **SOLO** and **SEL** buttons below always follow the on-screen channel strips above. The VCA button displays the VCA assignment page, and the faders become VCA masters.
13. **GEQ** button – press this when an output bus is selected (with the **SEL** button illuminated) to allow the CDC seven'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.

14. **Fad. Fol.** button – 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 (Output Layer A) will be selected by default: the **SEL** buttons select other channels, and the Output Layer buttons select higher-numbered busses for control. While Fader Follow Outputs is active, the screen display and rotary encoders continue to be active for input channels.
15. Headphones – two ¼” stereo jacks are fitted under the front armrest; these carry the console’s Phones output. Each output has a volume control.
16. USB ports – two type ‘A’ USB sockets are fitted under the armrest for firmware upgrades, exporting/importing Projects/Shows or plugging in a keyboard. Many screen displays feature a “virtual” QWERTY keyboard, but a hardware keyboard may be plugged in here and used, if preferred.

Master Section and Master Fader Bay:



1. **PWR** button – this is a multi-function “soft” button for starting and closing down the console surface. See page 34 for more details.
2. Power rail indicators – six **EXT PSU** LEDs confirm the status of the incoming DC supplies from the external PSU’s six further **INT PSU** LEDs confirm the status of each internally-derived supply rail.
3. **TALKBACK ENABLE** – press to activate the console comms system. The CDC seven has a very flexible talkback system, which is configured through setup options on the Control Screen. Any of the local (rear panel) I/O may be assigned as a Talkback output or a Return Talkback input.
4. Control Screen – a 6.5” LCD touchscreen. By default the screen shows the Cue List, but it can also display the console configuration options, Show file management and provides access to numerous other user features.
5. **MUTE ALL** – pressing this button will apply a ‘hard’ mute to all physical 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.
6. USB port – a type ‘A’ USB socket; this has the same functionality as the two ports below the armrest; see [16] at page 18.
7. **MENU** button – when navigating the system menus, use this button to return the Control Screen display to the home page. The **MENU** button is disabled when the Cue List is in use.
8. **BACK** button – used in the menu system; navigates back one “level”. Illuminates red when available.
9. **CUE LIST** button – pressing this displays the currently loaded Cue List on the Control Screen.
10. Cue list controls – the five buttons **STORE**, **PREV**, **NEXT**, and **SCROLL** Δ/∇ are used in Cue List operations.
11. Numeric keypad – allows direct navigation to any cue in the Cue List.
12. **UPDATE** – updates the currently-selected Cue (in the Cue List).
13. **MUTE** – opens the channel assignment displays for the CDC seven’s Mute Groups in the Main Screen. This is a toggle function, and a second press reverts to the previously display.
14. **SOLO CLEAR** – used to clear **SOLO** selections from multiple channels
15. **USER ASSIGN 1 to 8** – these multi-function buttons are by default the masters for the CDC seven’s Mute Groups. Other functions are: global delay for the effects section, fast access to FX, VCA and Waves Soundgrid® windows, talkback functions and User layers. The current functions are displayed in the adjacent OLED displays, and are set up in **User Options** section of the Control Screen.
16. LCR master fader – a 100 mm fader controlling the main stereo or LCR output. This is a VCA master fader controlling all three master output channels; the levels of the individual L, C and R legs may be controlled by the **MixLeft**, **MixCentre** and **MixRight** faders of the master channels which are accessed by swiping the display to below Output Channel 1 or above Input Channel 64. This fader is not motorised.

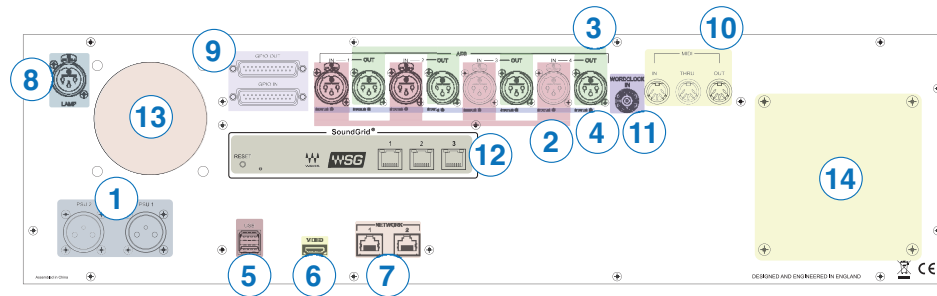
17. Monitor faders – three 100 mm (non-motorised) faders controlling: i) the headphones output, ii) left and right stereo monitor outputs, iii) the mono wedge feed. These outputs are available on the rear panel of the control surface.

NOTE: The functions of the four faders [16] and [17] are reassignable in software; the descriptions above are of the default assignments.

18. Metering – a 20-segment LED dual bargraph meter is fitted adjacent to each of the four faders in the fader bay. These have the same characteristics as the meters in the Channel section.
19. OLED displays – these indicate the functions currently assigned to the four master faders – by default, these will be **Phones**, **Monitor LR**, **Wedge** and **LCR**.
20. LCR **ON** button – when this button is unlit, the main LCR output is muted.
21. LCR **SEL** button – pressing this button changes the Main Screen (and the faders, **SEL** and **ON** buttons below the Main Screen) to Busses A Layer, but with the three channels of the master output (L, R and C) at the left, and Busses 1 to 13 to their right. This allows gain trim, EQ, dynamics and other functions to be applied to the individual channels of the master output, as well as providing access to the master faders.
22. Monitor outputs **ON** buttons – master ON buttons for each of the monitor outputs.
23. Monitor outputs **SEL** buttons – these become functional if the monitor faders are reassigned for other uses.
24. **SOLO** buttons – perform an AFL (after-fade listen) function. SIP mode is also available, selected from the Solo Control page. As well as the master modes, the CDC seven also features ‘momentary’ and ‘latching’ solo operation as per the input channels.

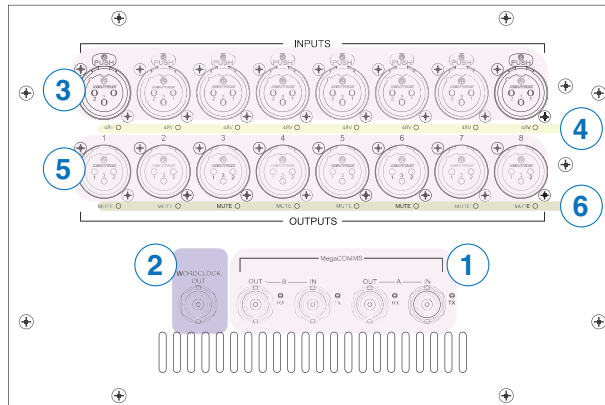
Rear view

Channel Section (LH only):



1. **PSU 1** and **PSU 2** – two 12-pin Jaeger connectors for primary (**PSU 1**) and backup (**PSU 2**) power supplies.
2. **AES IN 1** to **4** - four 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.
3. **AES OUT 1** to **4** - 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 Control Screen.
4. **STATUS** – 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.
5. **USB** – 2 x type 'A' USB 2.0 ports.
6. **VIDEO** – HDMI connector for external display of the CDC seven's various screens; this port is not currently implemented.
7. **NETWORK 1** and **2** – two standard RJ45 Ethernet ports for the connection of peripheral Ethernet accessories.
8. **LAMP** – XLR socket for a 12 V DC gooseneck console light.
9. **GPIO IN** and **GPIO OUT** – two 25-way D-sub female connectors; **IN** has eight opto-isolated inputs and **OUT** carries eight sets of isolated relay contacts (both N/O and N/C available).
10. **MIDI IN**, **OUT** and **THRU** – the CDC seven can receive commands from external MIDI devices to trigger Cues, for example. The console can also send MIDI data on a per-Cue basis to external MIDI-controlled devices for purposes such as triggering a sound effect or changing a program setting on an effects device.
11. **WORDCLOCK IN** – a TTL level (0 to +5 V) clock signal applied here can be selected to synchronise the AES outputs.

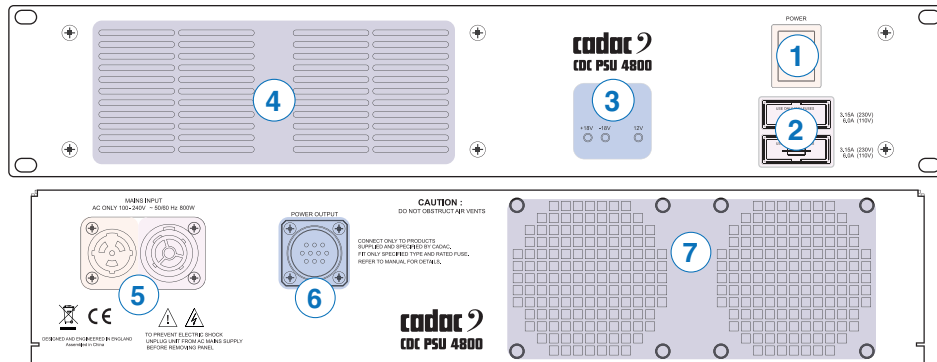
-
12. Waves SoundGrid® interface – three RJ45 network connectors carrying 64 bidirectional channels of audio. The interface allows multitrack recording on an external computer, or may be connected to a Waves MultiGrid server for FX processing by the full range of Waves plug-ins. Control for the external processing is available on the main screen. The **RESET** button resets the Waves interface.
 13. Fan – for internal cooling; do not block. The fan speed is controlled automatically and will vary according to the internal ambient temperature.
 14. VESA mount – an industry-standard VESA monitor mount is enables an additional display to be fitted using the appropriate hardware (see [6]). Note that there is a second identical VESA mount to the rear of the RH channel section.

Master Section:

1. Cadac MegaCOMMS data – 4 x BNC connectors carrying all audio and control data between the control surface and the stage rack(s). See “Connecting the hardware” on page 28 for full details.
2. **WORD CLOCK OUT** – a 96 kHz clock signal is always available at this connector, at TTL level (0 to +5 V).
3. **INPUTS 1 to 8** – eight balanced “local” analogue audio inputs to the CDC seven, on XLR sockets. These may be the sources for any input channel 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.
4. **48V** – eight red LEDs; illuminate when 48 V phantom power is enabled at the associated input connector.
5. **OUTPUTS 1 to 8** – eight balanced “local” analogue audio outputs from the CDC seven, on XLR male connectors. Any output channel may be routed to these, to enable the connection of FX processors, recorders, etc. The talkback/comms output from the CDC seven may also be available here; this is configured in software via the Control Screen. Characteristics are identical to the outputs on the stageboxes.
6. **MUTE** - 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. See [8] at “**ON** buttons” on page 16 and [5] at “**MUTE ALL**” on page 20 for more details.

Power supplies

The CDC PSU 4800 is a 2U unit supplying all DC voltages required by the control surface via a single multiway cable terminating in a 12-pin Jaeger connector. There are three DC power rails: +17 V, -17 V and +12.5 V.



Front panel

1. **POWER** – the on/off switch is the mains disconnect device for the console.
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. Connect to the control surface with the cable supplied.
7. Air exhaust vents – do not obstruct.

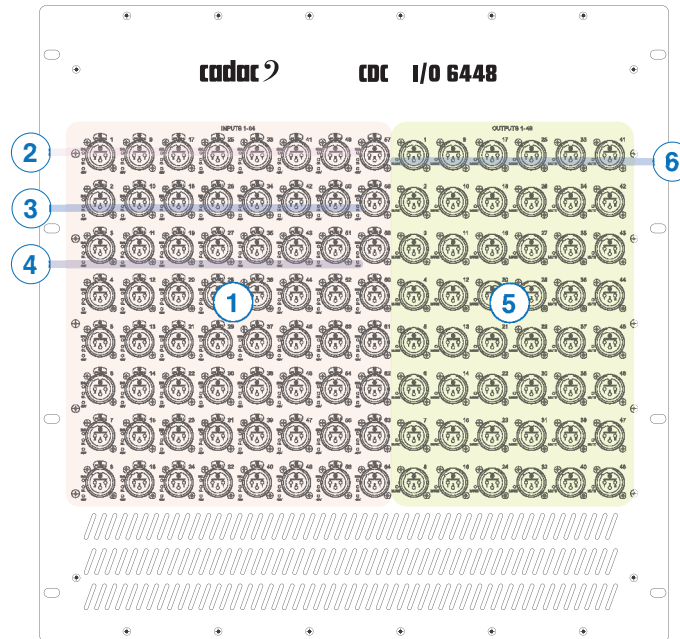
The PSU is of the “Universal” type, and will operate on all mains voltages from 90 to 250 V, 50/60 Hz. The PSU is rated at 1200 W AC.

Fuse data

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

Remote Stageboxes

CDC I/O 6448 – front panel



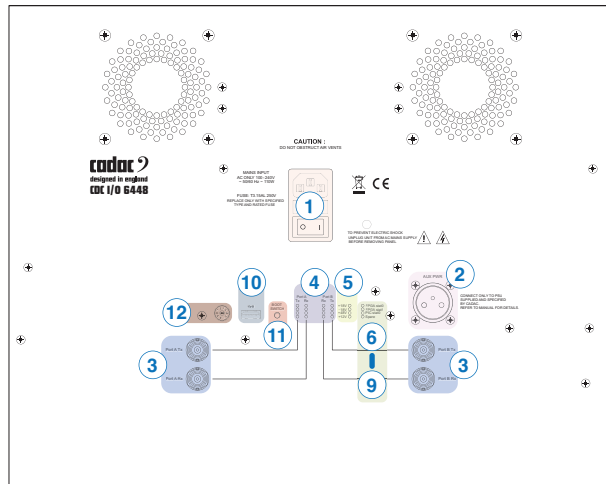
1. Analogue Inputs 1 to 64 – 64 x 3-pin female XLR connectors. See “Remote stagebox – audio connections” on “Remote stagebox – audio connections” on page 30 for connector details.
2. **SIG** – a green LED which illuminates when the input signal level exceeds -70 dBFS.
3. **OL** – a red LED which illuminates when the input signal level exceeds -3 dBFS.

The operation of the **SIG** and **OL** LEDs is independent of the assigned channel’s input gain setting.

The **SIG** and **OL** LEDs flash alternately when an input assignment is made to the connector on the Input Assign panel (see Software Manual); this is to aid on-stage input identification while connecting up the console.

4. **48V** – an orange LED, illuminates when phantom power is available at the connector.
5. Analogue Outputs 1 to 48 - 48 x 3-pin male XLR connectors. See “Remote stagebox – audio connections” on page 30 for connector details.
6. **MUTE** – 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. See [8] at “**ON** buttons” on page 16 and [5] at “**MUTE ALL**” on page 20 for more details.

CDC I/O 6448 – rear panel



1. **MAINS INPUT** – IEC receptacle with an integral fuse and rocker switch.
2. **AUX POWER** – 12-pin connector for external backup CDC PSU 4800.
3. Cadac MegaCOMMS data – 4 x BNC connectors carrying all audio and control data between the control surface (or MC Router) and the stagebox. See “Connecting the hardware” on page 28 for full details.
4. Port status LEDs – one yellow and three green LEDs per port. In normal operation one or more green LEDs per port should be illuminated; the number will vary, and depends on the bandwidth in use. The yellow LED flashes when no MegaCOMMS signal is present at the port. Unconnected ports will have no indication on the corresponding LED bank.
5. Power rail status LEDs – four green LEDs, one per internal voltage rail (**18V**, **-18V**, **+48V**, **+12V**). All must be lit for correct operation.
6. **FPGAstat0** – red LED; used in factory testing only, should be unlit in normal operation.
7. **FPGAstat1** – red LED, illuminates to indicate loss of lock to the incoming MegaCOMMS signal. Should be unlit in normal operation.
8. **PICstat0** – red LED, flashes during power-on and firmware updates only. If on otherwise, a boot failure is indicated.
9. **Spare** – red LED; not currently implemented
10. **USB** – type ‘A’ USB 2.0 port, used for firmware updates. **NOTE:** this port is **ONLY** intended for the connection of memory sticks. Do not connect any other type of USB device to this port.
11. **BOOT SWITCH** – for factory use only. Do not press.
12. Hex switch – set according to how the stagebox is being connected:
 - Set to ‘1’ when connecting the stagebox to a CDC MC Router.
 - Set to ‘2’ when connecting the stagebox to a CDC seven surface, and it is to be used as RACK 1.
 - Set to ‘3’ when connecting the stagebox to a CDC seven surface, and it is to be used as RACK 2.

All other hex switch positions are unused.

Connecting the hardware

Power supplies – control surface

The external CDC PSU 4800 power supply (or supplies) for the control surface should be connected using the supplied cable(s). Two 12-pin Jaeger connectors are fitted to the rear of the surface master section. If only one PSU is being used, either connector may be used.

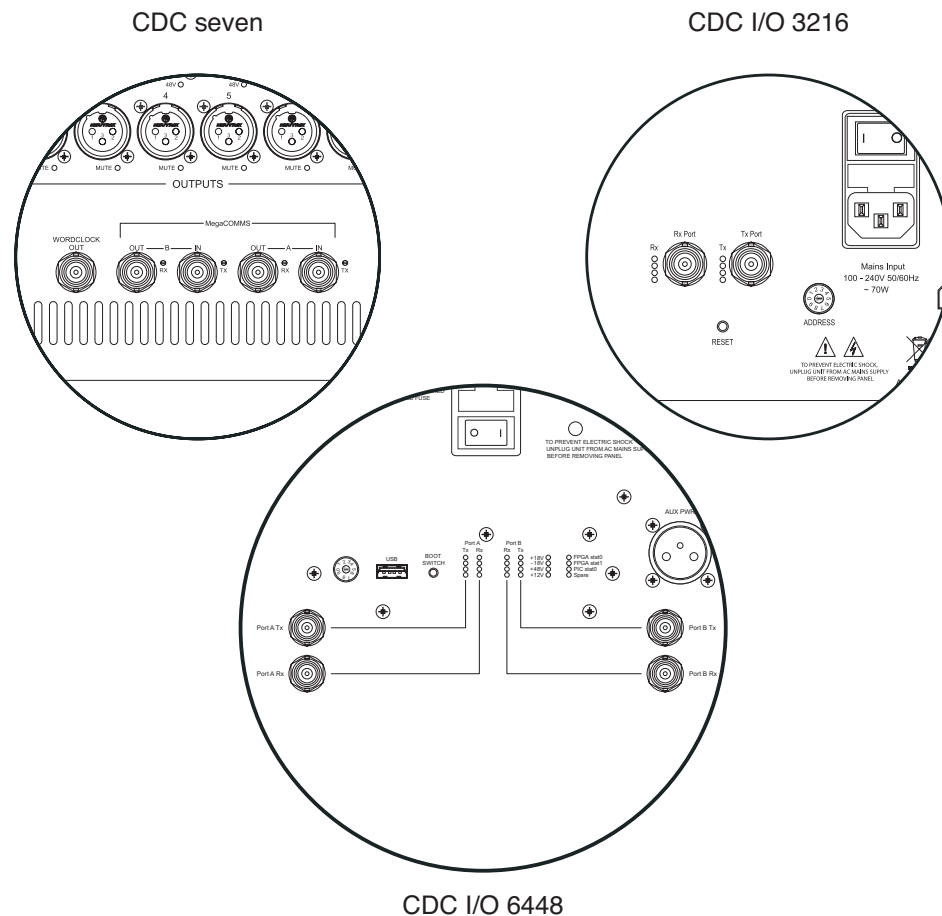
Power supplies – remote stageboxes

Each remote stagebox has an internal power supply. Connect the rack to AC mains via the supplied IEC cable. The internal power supply is a 'Universal' type, and will operate on any AC mains voltage between 100 and 240 V, 50/60 Hz.

The CDC I/O 6448 rack may have a second (redundant) power supply (CDC PSU 4800); this is connected to the dedicated **AUX POWER** connector on the rear panel. Note that there is no provision for a redundant power supply on the CDC I/O 3216 remote stagebox.

Data communications: MegaCOMMS

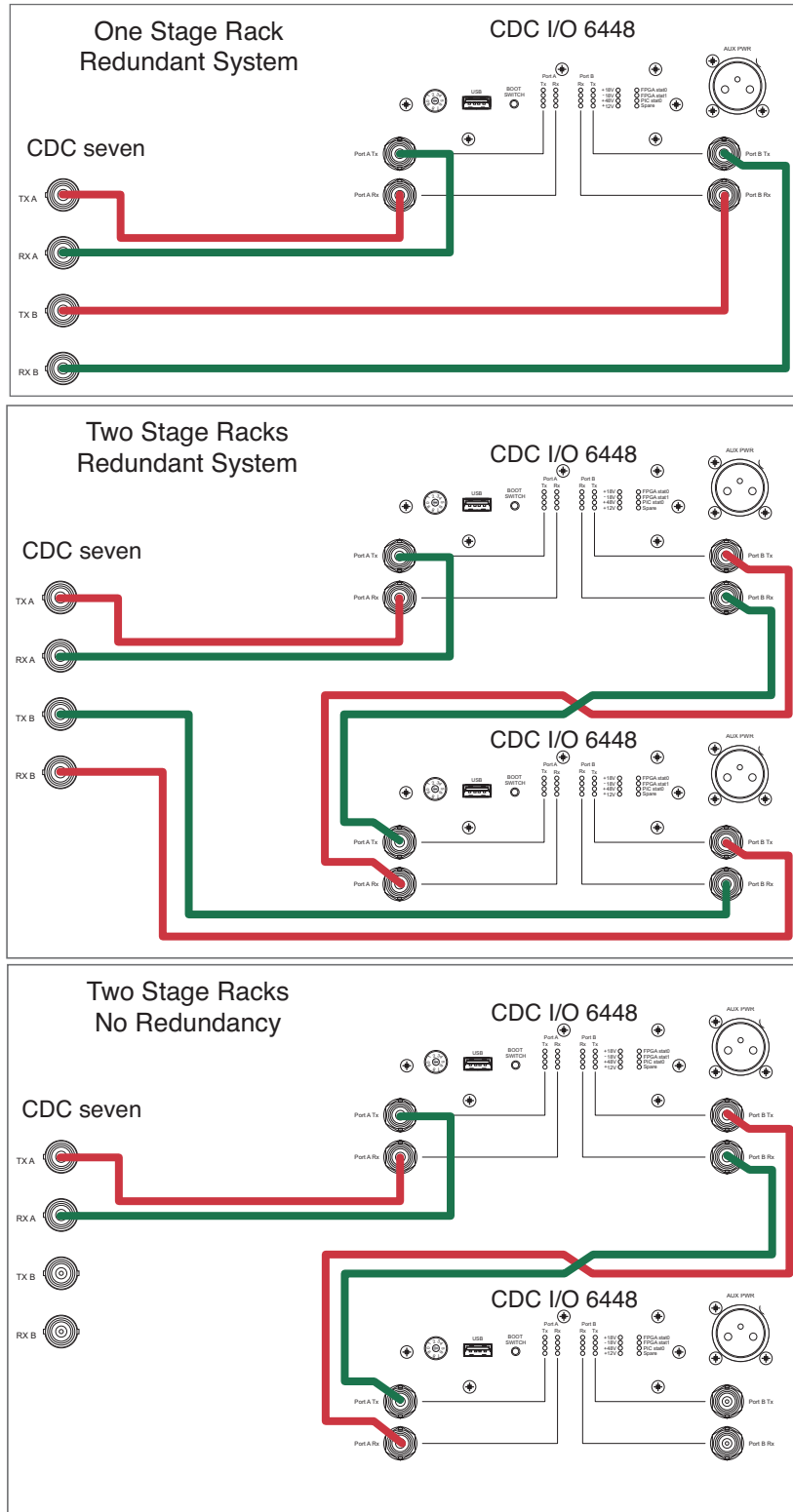
Cadac's proprietary MegaCOMMS hi-speed data protocol is used to interconnect the CDC seven's control surface and stage rack(s). The control surface and each stagebox each have four BNC sockets to provide the main system data interconnection, labelled **TX A**, **RX A**, **TX B** and **RX B**.



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 seven 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 seven system is fully functional in all respects if only one Tx/Rx Path is connected.

The control surface and stage rack(s) 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.



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

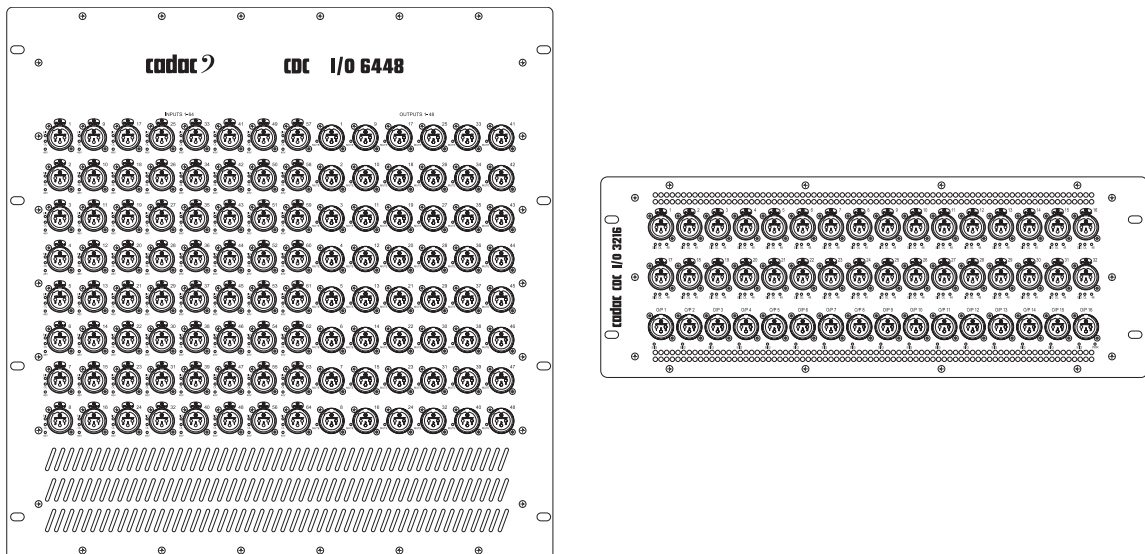
The CDC seven caters for digital audio I/O in the form of eight AES3 inputs and eight AES3 outputs, accessible on the rear of the control surface. The AES3 outputs have Sample Rate converters (SRCs) and can operate at any frequency required by applying an external clock source to the **WORD CLOCK IN**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

Word Clock Out

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

Remote stagebox – 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 seven 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 in the control surface (see “Surface and Local I/O – audio connections” on page 32).

It should be noted that higher I/O counts are possible by using more than two stageboxes; this can be achieved with a Cadac 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 seven’s maximum processing capacity of 96 simultaneous input channels mixing onto 48 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. See the Software Manual for more information.

Default routings

By default, Input A of Input Channels 1 to 32 (3216 I/O rack) or 1 to 64 (6448 I/O rack) are assigned to **Rack 1 Inputs 1 to 32** or **1 to 64** respectively, in numerical order. Similarly Outputs 1 to 13 (3216 I/O rack) or 1 to 45 (6448 I/O rack) are assigned to **Rack 1 Outputs 1 to 13** or **1 to 40**. The LCR Master channel outputs are assigned to the three highest-numbered output connectors: 46, 47 & 48 in the case of the 6448 I/O Rack, or 14, 15 & 16 on a 3216 I/O Rack.

Any of the above default routings may be modified at will using the on-screen Input and Output Assign functions.

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 an 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 be synchronised 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 two ¼” (6.35 mm) 3-pole (TRS) jack sockets, for the connection of a pair of headphones. The sockets are under the front armrest, and each has its own volume control. The sockets are wired as follows:

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

Waves SoundGrid® interface – The CDC seven 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 (available from Cadac as an option). See the SoundGrid User Manual for more details.

Principles of Operation

Switching the CDC seven on

The **PWR** button ([1] at page 20) is a “soft” button for starting and powering-down the surface. When the surface is not operative but connected to its PSU 4800 power supply (supplies) with the PSU(s) powered 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 Main Screen as shown below:



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. 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.

A ‘long’ press on the **CUE LIST** button at any point after 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 seven 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** button ([5] at “Master Section and Master Fader Bay:” on page 19) to cancel this mode and activate the outputs.

Switching the CDC seven off

To shut the surface down, ‘short-press’ the **PWR** button again, and a dialogue box will be displayed asking if the console should be powered down (**Shut Down**), or restarted (**Restart**) while continuing to process audio. Selecting **Shut Down** 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.

Alternatively, the surface can be powered down via the Control 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** 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.

Main screens – touch operation

All audio operations on the CDC seven are performed using the two main touchscreens. Each 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.



This section of the User Manual describes the basic principles of screen navigation and parameter control in general. Full operational details are available in the Software Manual.

Layers and metering

The CDC seven uses the now-familiar concept of “layers” to allow a relatively small number of faders and virtual channel strips to control a much larger number of audio channels. The CDC seven’s 96 input channels and 51 output channels (busses, including the LCR masters) are arranged into nine layers of 16 (adjacently-numbered) channels. Each of the two main screens has its own set of layer buttons, and thus each can display whichever layer is required, allowing great flexibility in operation, particularly in two-engineer situations. The currently selected layer determines which set of channels is displayed on-screen; the faders, **ON** and **SEL** buttons in the fader section are always related to the virtual channels immediately above them on the screen:

- Input Layer A: Input channels 1 to 16
- Input Layer B: Input channels 17 to 32
- Input Layer C: Input channels 33 to 48
- Input Layer D: Input channels 49 to 64
- Input Layer E: Input channels 65 to 80
- Input Layer F: Input channels 81 to 96
- Output Layer Busses A: Output channels 1 to 16
- Output Layer Busses B: Output channels 17 to 32
- Output Layer Busses C: Output channels 33 to 48
- Output Layer VCA: VCA group masters 1 to 16

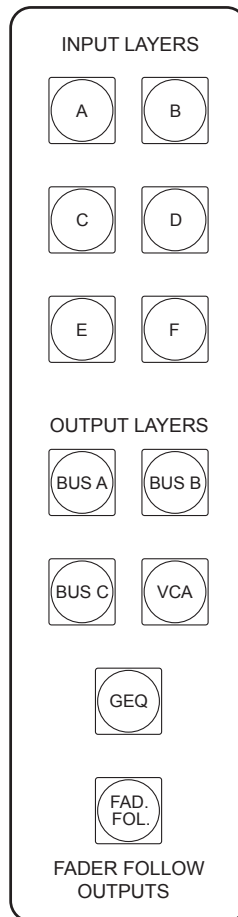
Note that the Input channel layers listed above will be modified when stereo input channels are in use, as the even-numbered channel of a stereo pair is not

displayed on-screen. This does not apply to stereo output channels however, where both left and right “legs” are displayed.

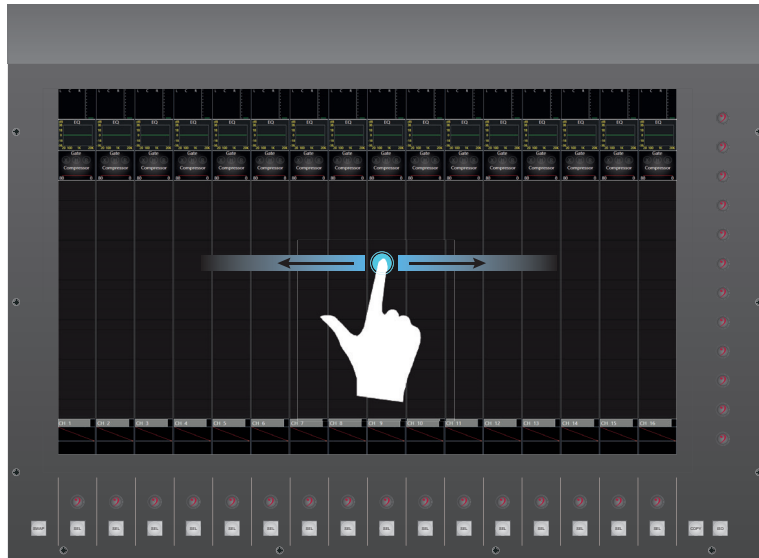
Note also that the layers defined as above do not include the LCR master output channels. These may be displayed on the main screen either by “swiping” (see below), or pressing the LCR output’s **SEL** button (see [21] at “LCR **SEL** button” on page 21).

The CDC seven provides two methods of changing layers:

1. **Layer buttons** – the current layer is selected by the Input Layer and Output Layer buttons to the right of the fader block ([12] at “**INPUT LAYERS** and **OUTPUT LAYERS** buttons” on page 17):



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

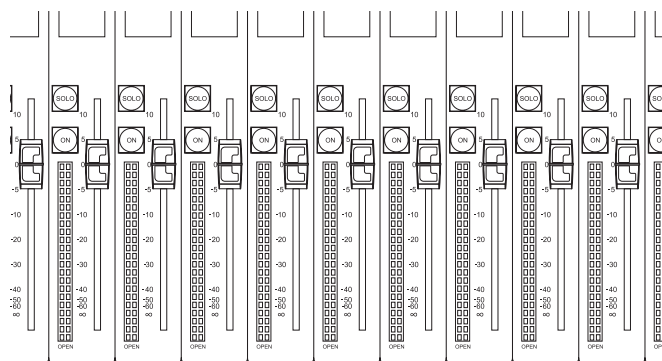


Note that swiping “beyond” Input Channel 96 will display the main mix busses, followed by the 48 output channels. Similarly, swiping “above” Output Channel 48 displays the monitor channels. Swiping does not “loop” below Input Channel 1 or above the monitor channels.

Note that two **LAYER** buttons will be lit simultaneously (with a change of colour) if the layer boundary has been moved on-screen by swiping to indicate that members of two adjacent layers are currently displayed.

Channel meters:

The CDC seven has 16 dual bargraph 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.



The bargraphs have 20 segments: the lowest segment illuminates green at a signal level of -70 dBFS and the top segment illuminates red at 0 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, both meters are used and will show the same level. If the channel (input or output) has been defined as stereo, the two meters will show the signal level in the left and right legs of the stereo channel.

The default source for the bargraph meters is Post Fader, but this may be changed to Pre Fader on the Control Screen's **Meter Options** page; where alternatives to **Auto** mode may also be found. From here, it is possible to select the meter source to be fixed to any of the input or output layers, independent of the layer selected. See the Software Manual for full details.

In addition to the fader bay meters, each channel strip - input or output - on the Main Screen includes a small virtual bargraph (again, dual on stereo channels). 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.

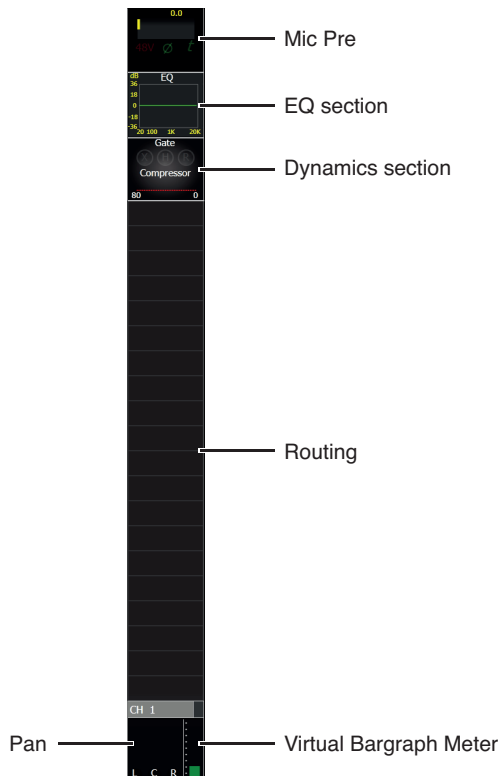
Using the encoders

Each 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 have a push function, which is used in certain console operations.



Channel blocks:

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



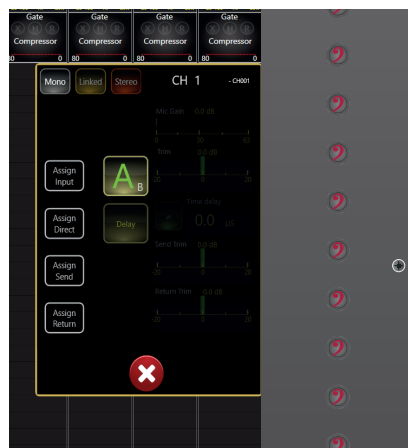
Touching in any of the areas shown above will open the corresponding virtual panel. The specific channel functions are described in the Software Manual.

Panels open on the right-hand edge of the display so that the functions in the panel are controlled by the adjacent right encoder set.

The vertical (right) set of encoders has no function until a panel is opened. However, the horizontal (lower) set of encoders is always active, and by default, are assigned to act as the coarse input gain controls for the currently displayed channel set. If a digital input is patched to an input channel, its lower encoder acts as a gain trim control. By default, opening an EQ panel will re-assign them as EQ controls while the panel is open, but it is possible to move the EQ panel to the right-hand side of

the screen so that EQ adjustment can be made by the vertical encoder set. By pressing the **Swap** button, the lower set of encoders may be reassigned as input channel pan controls (or matrix output time delays), though in this case, panning (or delay) has to be enabled for the channel before its lower encoder is active. Note that opening a dynamics panel will always reassign them as controls for the channel dynamics section while the panel is open.

Example – Input Gain block:



The various panels are designed so that each variable parameter is displayed immediately next to the encoder that adjusts it. The diagram above shows how five of the 12 encoders are assigned to the five parameters available for control. All switch functions are actioned by directly touching the screen. Any function which is unavailable for some reason (e.g., an input needs to be assigned to an input port before it can be used) is greyed-out. All panels are closed by the familiar red button with a white cross.

Further information:

For full details of all other audio operations on the CDC seven console, please refer to the accompanying Software Manual.

Control Screen menus

During performance, the Control Screen will normally be used to display the Cue List, which is the default display on power-up. Pressing **MENU** (see [7] at page 20) will display the Home Page; pressing **CUE LIST** ([9] at page 20) will revert the display to the Cue List.



The Control Screen Home Page provides four menus – **Projects**, **Config**, **Settings** and **User Options**. Touching any of the icons at the top of the screen opens a further menu at the bottom. Press **MENU** from within any of the menus to return to the Home Page; 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.

The **Projects** menu is effectively part of the CDC seven’s automation system: it enables file creation and management functions, and is used when starting a new project or loading a previously stored one.

The **Config** menu is used to configure the basic architecture of the mixing console. Four options are provided:

- **Channel** – selecting this option opens the **CHANNEL SETTINGS** page on the Main Screen. This page is used to define Input Channels as Mono, Stereo, or Linked, and to name the channels.
- **Bus** – selecting this option opens the **BUS SETTINGS** page on the Main Screen. This page 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.
- **Solos** – this option opens a Control Screen page allowing adjustment and settings to be made to the console’s Solo system.
- **TalkBack** – this option opens a Control Screen page allowing adjustment and settings to be made to the console’s talkback systems.

Full details of all the above screens, and of the **Settings** and **User Options** menus can be found in the CDC seven Software Manual.

System functions

Waves SoundGrid® interface

Waves SoundGrid® is a proprietary high-speed digital audio transport protocol with a capacity of 64 bidirectional channels. The CDC seven 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 and playback.

A range of optional Waves servers is also available which can be used to host the full range of Waves plug-in signal processing. The control screens for the external software processors can be accessed via the CDC seven's Main Screen.

See the Software and SoundGrid Manuals for full details.

USB ports

The CDC seven is equipped with five Type 'A' USB 2.0 ports. These are located as follows: one socket in the meter bridge of the Master Section, two sockets under the armrest and two sockets on the rear panel.

The location of the ports is illustrated at page 18 (Item [16]), page 20 (Item [6]) and page 22 (Item [5]).

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 also for performing software upgrades. They also allow the connection of a standard USB QWERTY keyboard for channel name entry, etc., if this is preferred to the on-screen "virtual" keyboards.

Ethernet Ports

The Channel Section of the CDC seven is equipped with two standard RJ45 Ethernet Ports. They are both standard PC network Gigabit Ethernet port for connection to a network, for purposes such as updating firmware.

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

The location of the ports is illustrated at page 22 (Item [7]).

Video ports (HDMI)

This port carries a video signal which may be defined in software; typically this will be the main screen display or the Waves screen display.

Note that the Video Port is not currently implemented.

GPIO ports

These are two 25-way D-sub female connectors; IN has eight opto-isolated inputs and OUT carries eight sets of relay contacts. These may be used in conjunction with the Cue List; external equipment may be triggered on specific Cues, or Cues may be recalled by external commands. Configuration of these functions is performed via the Control Screen: see the Software Manual for details.

The GPIO outputs are in the form of eight fully isolated changeover relays. Common (C), normally open (N/O) and normally closed (N/C) contacts for each relay are available. The relay contacts are rated at 30 V and 1 A DC.

The GPIO inputs are rated at +/- 25 V maximum; a voltage > 5 V (of the correct polarity) is required to activate the input.

The pinouts of the two connectors are as follows:

Pin	GPIO IN	GPIO OUT
1	Input 1 +ve	Relay 1 CO
2	Input 1 -ve	Relay 1 N/O
3	n/u	Relay 2 N/C
4	Input 3 +ve	Relay 3 CO
5	Input 3 -ve	Relay 3 N/O
6	n/u	Relay 4 N/C
7	Input 5 +ve	Relay 5 CO
8	Input 5 -ve	Relay 5 N/O
9	n/u	Relay 6 N/C
10	Input 7 +ve	Relay 7 CO
11	Input 7 -ve	Relay 7 N/O
12	n/u	Relay 8 N/C
13	GND	GND
14	n/u	Relay 1 N/C
15	Input 2 +ve	Relay 2 CO
16	Input 2 -ve	Relay 2 N/O
17	n/u	Relay 3 N/C
18	Input 4 +ve	Relay 4 CO
19	Input 4 -ve	Relay 4 N/O
20	n/u	Relay 5 N/C
21	Input 6 +ve	Relay 6 CO
22	Input 6 -ve	Relay 6 N/O
23	n/u	Relay 7 N/C
24	Input 8 +ve	Relay 8 CO
25	Input 8 -ve	Relay 8 N/O

MIDI I/O

Used for sending or receiving MIDI data for control of external hardware, or for receiving MIDI data from an external source to control various parts of the control surface, such as scene management. Configuration of these functions is performed via the Control Screen: see the Software Manual for details.

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 system software

The CDC seven'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 automatically by connecting the console to the Internet (via a hard-wired connection as opposed to a wi-fi link) at boot-up; if a new software version is available, an alert will be presented on the main screen.

See the Software Manual for full details.

System expansion

Adding a second Stagebox

This is a simple and transparent procedure. Observe the appropriate MegaCOMMS network wiring method to be followed – see page 28 for details.

Each stagebox must have a unique address; this is set by the hex switch on the rear panel. On a second stagebox, this switch should be set to '3'. Note that the first stagebox's hex switch should be set to '2'.

Adding Redundant Power Supplies

A second surface PSU may be added to provide redundancy. The surface is fitted with two rear panel PSU connectors; the second PSU is simply connected to the second socket.

A CDC I/O 6448 remote stagebox may also have second PSU added for redundancy purposes. The stagebox has an internal PSU; a second PSU is connected to the rear panel multi-way connector. Note that the PSU used in this case is the same PSU as used to power the control surface.

Appendix

Technical Specifications

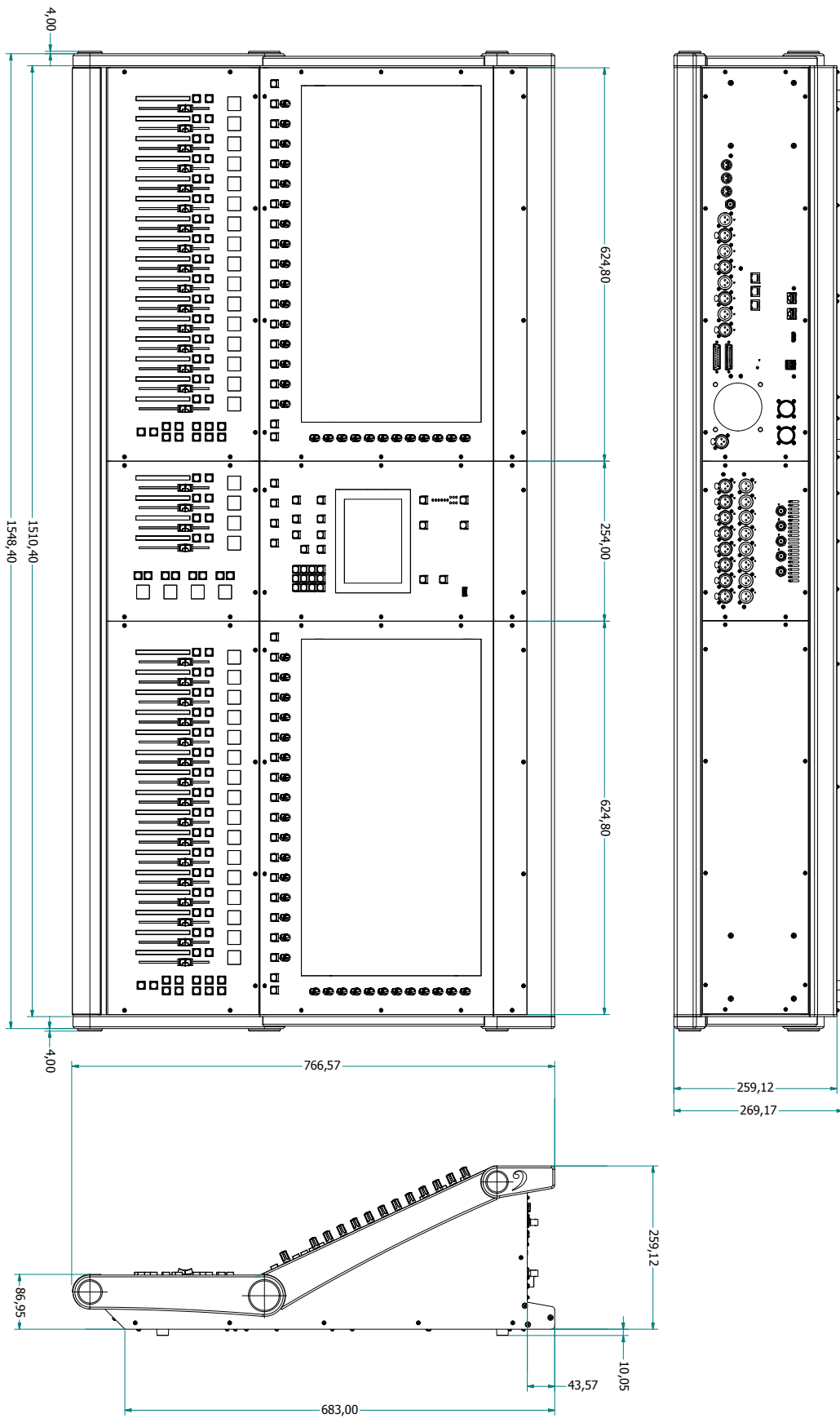
General Specifications CDC seven – channel section	
Faders	36 x 100 mm motorised faders (32 x Channel, 4 x Master)
Meters	2 x 20-segment multi-colour LED bargraph, per fader
OLEDs	RGB display (16-bit colour depth), 96 x 96 pixels, per channel
Screens	2 x 23.5" 16:9 touchscreens (Main); 1 x 6.5" touchscreen (Control)
PSU	One or two external 19" 2U rackmount PSUs with full redundancy
Inputs	Up to 192 (inc. Local I/O)
Channels	96 with full DSP processing
Busses	56 mix busses total (inc. LCR and solo); 48 busses have full DSP processing, freely assignable as groups, aux sends or matrix sends.
Matrix	Any configuration from 1 x 47 to 47 x 1 available, with full processing
Outputs	Up to 192 (inc. Local I/O)
Graphic EQ	32 band +/- 16 dB on all busses
Internal FX	Up to 16 stereo FX units
Local I/O	8 x analogue mic/line inputs 8 x analogue line outputs 4 x AES3 inputs (8 chs.) 4 x AES3 outputs (8 chs.)
Comms	2 x Cadac MegaCOMMS

Audio Specifications	
Sample Rate	96 kHz
Processing Delay	<0.4 ms through complete signal chain
Internal Processing	DSP: 40-bit floating point Mixing: 48-bit floating point
ADC/DAC	24 bit
Frequency Response	20 Hz to 44 kHz +0.5/-1.5 dB
THD+N	<0.005% @ unity gain, 10 dB input at 1 kHz
Channel Separation	>90 dB
Residual Noise Output	<-90 dBu (20 Hz – 20 kHz)
MIC EIN	<-127 dB with 200 ohm source impedance
Maximum Output	21.5 dBu
Maximum Input	21.5 dBu

Dimensions and weights

System Component	Description	Dimensions (w x d x h)	Net Weight (approx.)
CDC seven	Control surface	1555.7 x 735.55 x 262.97 mm	60 kg (132 lb)
CDC PSU 4800	External PSU	482.6 x 400.0 x 88.0 mm	10 kg (22.05 lb)
CDC I/O 6448	64/48 remote stagebox	482.6 x 259.1 x 398.3 mm	13.5 kg (29.76 lb)
CDC I/O 3216	32/16 remote stagebox	482.6 x 435.9 x 177.8 mm	10.9 kg (24.03 lb)
CDC MC MADI	MADI network bridge	482.6 x 253 x 44.45 mm	4.5 kg (9.92 lb)
CDC MC Dante	Dante network bridge	482.6 x 253 x 44.45 mm	4.5 kg (9.92 lb)
CDC MC AES3	AES3 stagebox	482.6 x 253 x 88.9 mm	5.5 kg (12.13 lb)
CDC MC Optical	Optical Bridge	482.6 x 253 x 44.45 mm	4.5 kg (9.92 lb)
CDC MC Router	MegaCOMMS network router	482.6 x 253 x 88.9 mm	5.5 kg (12.13 lb)

CDC seven control surface



Connecting the CDC seven to unbalanced sources and destinations

Although the CDC seven will generally be used exclusively with balanced (analogue) audio sources and destinations, it may be occasionally be necessary to connect unbalanced devices. Cadac recommends that the following wiring protocols are followed:

Unbalanced sources – connect to a balanced input by joining pins 1 and 3 of the mating XLR connector. The signal ‘hot’ should go to pin 2, and the cable screen to pins 1 and 3.

Unbalanced destinations – connect signal ‘hot’ to pin 2 and the cable screen to pin 3. Do not connect pin 1.

