TECH

CADAC's CDC seven

Sound engineer Simon Allen gets to grips with Cadac's latest digital live sound console . . .

ABOUT THE EXPERT
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Cadac holds one of the best reputations for sound quality in the audio industry. This is thanks to a heritage of high-end studio and live consoles, beginning as early as 1968. It's no surprise then, that expectations ran high as Cadac developed their digital desks. Perhaps unsurprisingly, the company has approached its digital live sound consoles with some key differences to others players in the market. Though perhaps not receiving much of the technical spotlight, until now, thankfully they have continued working on the basis of their key principles.

This means that now is a good time to look into the offerings from Cadac. The release of this CDC seven, the latest console to join the CDC family, marks several combined updates and lessons learnt in producing these high-end digital solutions. Hopefully, this desk will represent a good balance between a functional design, specification and, of course, cost. This should be the best they've produced so far.

ON SHOW

The CDC seven has much to thank the CDC six for. In fact, they share many of the same features and their specifications are very close, the main differences being the 36 faders and the dual 23", 16:9 format HD touchscreens that the CDC seven sports. Processing-wise, the total number of available fully processed input channels on the CDC seven is 96, compared to the CDC six's 64. Both desks, however, offer a pool of up to 192 available inputs. There are 48 configurable busses, plus the dedicated LCR, monitor LR, headphones LR and talkback. These numbers are more in line with competitors in this price range, which was one area in which the CDC six struggled.

The user interface, which we've seen on most of the CDC product line, consists of a wonderfully large touchscreen and a neat array of hardware controls. The CDC seven offers 16 + 4 + 16 faders which can be used in a number of ways. We'll look at how fader layers can be customised later, but it's interesting to see how Cadac have used this vast touchscreen surface area. Rather than have two screens continually following one another as many desks do, this console lends itself to separate workflows, i.e. a single user can pull up very different sections of their mixer on each screen, or two engineers can work on the console more independently than on most other digital desks today. I believe this feature in itself could appeal to a number of scenarios such as theatre and festivals.

Cadac's CDC seven

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The channels can be navigated in all the usual ways we've come to expect (except population groups, perhaps), but complete channel scrolling can be done via the usual hardware buttons, or a simple swipe across the touchscreen. After the console boots up, the first time you scroll through the channels the desk is a little slow to build up its cache. Once you've visited all channels, however, swiping across the touch screen is really effective and quite accurate to operate.

From there, the user interface follows a very instinctive approach, harking back to a traditional analogue console layout. Of course, many manufacturers will say the same, but in reality they're all slightly different. On a CDC console, a blank mix leaves the screens fairly clear. A large proportion of the channel strip is designed to show all of the busses that channel is assigned to, but only once that bus has been turned on. This is unusual and might initially look like a waste of screen area. However, once you start opening pop-up windows it seems to make sense. A FOH mix, for example, might look quite clear, while ia monitor engineer will be provided with a lot of visual feedback.

This concept of only seeing what you need to see, is something that continues throughout the design of this desk. The only disappointment being that there are high-res scribble strips with quite a large screen area. In a future update, it would be great to see Cadac making more use of this area to show you essential information besides just the channel name. Also on the subject of usability, is the single press required to alter anything, such as an EQ or a compressor etc. This is an example of where the dual screens are worth the cost of the CDC seven over the CDC six. It allows you to leave a channel's EQ open and editable on one, whilst navigating channels or monitoring output levels on the other.

The meters on the console, both on screen and via the LED meters on the fader strips are very clear. However, I learnt that the meters only show a post-process level at all times. This is a general trend I've noticed in a lot of digital audio platforms today. Perhaps this is because headroom is so much greater today with processing taking place at higher resolutions. While I see this makes sense from a mix point of view, particularly when looking at groups and VCAs, I worry what's happening at the pre-amp. For example, the pre-amp could be clipping, but thanks to some EQ and compression the meters aren't showing you this. If the console was managing the gains on the stage box which also had a split to a monitor or recording desk, some issues could go unnoticed. This post-processing metering point runs throughout the console and can't be altered via the main menu. One solution could be metering the pre-amp level on the LED fader meters, and a post-processed level on the screen.

Looking at the EQ display for any channel, here again the console displays on a "need to know" basis. There are 4 parametric bands plus high-pass and low-pass filters. Interestingly though, the 4 bands have their own graphical display, rather than the usual combined view: a combined view is available, but another button press is required. This for me is a very analogue vibe, which I quite like, making you work with your ears and knowledge of some numbers, instead of making an EQ curve 'look' nice. However, the next generation of engineer might not be so comfortable with this, or the lack of an RTA display which has become so common today. Is that a good or a bad thing? I'll let you decide.

Operating the EQ with the knobs around the screen took some getting used to. It doesn't seem to matter how fast you turn them, it will scroll through the values in turn. Other interfaces

↑ Cadac's CDC seven, rear panel

we have today are proportional, so as you turn it faster, it scrolls faster. Perhaps that's less natural, but we're all getting used to this modern world of technology, where even moving a computer mouse isn't a linear proportion. The HP and LP filters are locked at 12dB/Oct (and sound great, by the way), but having 24dB/Oct would be really helpful on occasion.

The dynamics section of the channel strip is as you would expect. There are two dynamics engines per channel, one gate and one compressor. On the default screen, though, the gain reduction range displayed for the compressors is around 80dB. Personally, I think that's too much, as a typical gain reduction of, say, 1-6dB, is therefore very small on what is already becoming a very small section of the home screen. However, once in the expanded view, the compressors present all the usual professional grade parameters and behave almost as you would expect. The default compressor is quite digital and 'reactive', but the CDC seven is shipping with the new CDC firmware which offers a 'vintage' style compressor which sounds great, almost like an RMS detection compressor.

The built-in effects engine offers up to 16 stereo effects, which is ideal for IEM mixing. I felt the effects sounded great for live sound applications, being detailed but not too cloudy. The reverbs in particular offered enough variety for the stage, but I wondered if they were coloured enough for broadcast and studio-style scenarios. The most exciting feature of the effects engine is the ability to build your own effects chains, with a choice of modulation, delay and reverb in any arrangement.

However, there aren't many effects to choose from. There are enough for most shows, but anything unusual would require additional hardware. Some consoles these days offer a multitude of dynamic and saturation effects. These can then be inserted in channels or groups, but that isn't the story here. Thankfully, Cadac offers a Waves SoundGrid card in the CDC seven as standard for any special processing required - the consequence being an additional cost. I appreciate, however, that Cadac are producing something of which they can be confident of its performance. I wonder if the developers made the bold decision to trade off the lack of processors available, for a benefit elsewhere, including, perhaps, the phenomenal system latency value, for example. Cadac's tradition and heritage speaks volumes here, almost making a statement that third party hardware is still the choice of professionals.

There are a couple of small details about the console's interface which I could really get used to. For example, simple copy-and-paste functionality is very comprehensive. Unlike the default being all parameters on most consoles, the CDC requires you to select each section - for example, just the EQ or compressor. I typically find this approach quicker as part of my workflow. However, to turn on a bus send across 8 channels needs to be done on a per channel basis. The VCA screen is really useful and presents a layout I'd love to see other brands learn from. Tallying up from the bottom of the screen are the members of each VCA with their respective post-fade metering. Therefore, if a whole mix utilises the VCAs, this page offers a great overview of what your mix looks like.

From top:

Faders

The Waves Interface

Cadac's iPad App

Finally, another selling point coming with the release of the CDC seven is Cadac's new 'sticky layers'. These are user layers which can divide either screen to leave a selection of input or output channels, VCAs or groups, permanently on the surface. The remaining part of the screen can be used as normal to scroll though all the channels. This works really well on the CDC seven with its dual screens, allowing items such as the lead vocal to be present at all times.

CADAC CDC SEVEN
TECH SPEC

FEATURES

- Inputs: Up to 192 (inc local I/O)
- 56 busses, of which 48 are configurable
- Outputs: 96 with full processing
- Matrix: Up to 67 x 48 with full processing
- 36 x 100mm motorised faders
- 2 x 23.5" 16:9 HD + 1 x 6.5" touchscreens
- 1 x external 19" 2U rackmount PSU
- Weight: 60kg/132lb (approx)
- Size: W: 1555mm x D: 766mm x H: 259.12mm
- Sub 0.4ms latency
- Unique Cadac Monitor Mode
- Custom Fader Layers
- 4 band fully parametric EQ
- Extensive dynamics

BEHIND THE SCENES

Underneath the user experience are some really key points which add up to Cadac's sonic performance. The console operates at 96kHz with 40bit floating point processing on SHARC powered FPGA DSP. Part of the reason for going to 96kHz, although other manufacturers are also taking the same path to 96kHz, is Cadac's own AoIP protocol called MegaCOMMS. All these technologies and Cadac's own processing algorithms add up to a latency of 0.4ms through the complete signal chain, including both A-D and D-A conversions and a comprehensive three-stage latency management system. I'm not aware of any other console that can boast a figure even close to that. This is exceptionally low and results in the sound remaining audibly clear from phase anomalies induced by processing. If sonics and digital artefacts are your biggest concern, then this is a desk to try.

This surprisingly low latency value also lends itself well to the creation of personal monitoring and

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IEM mixes. Cadac have played on this advantage and offer a selection of features which turn the CDC seven into a great monitor desk. Via a single 'Monitor Follow' selection in the console's menu, the screen presents 48 direct-access buttons across the bottom of the screen for all 48 configurable busses. Once pressed, the console will then show any one of these configurations: channels that have that bus turned on; channels that are up; channels which are on and/or up; and, of course, all channels. This is called 'Bus Focus' in the user menu. Add in solo follows bus selection and easy access to the GEQ, and any monitor engineer is bound to smile. While this sounds quite simple to implement, it's only really possible thanks to the large 23" touchscreen.

MODERN EXPECTATIONS

So how does the CDC seven compare with other modern consoles? I've already mentioned a few differences such as the choice of effects that are on offer and the display employed on the EQ window. I don't necessarily consider these as issues. In some respects, they present a more traditional approach to mixing, which is a pleasure to see in today's market. However, I can't help but wonder how other engineers, particularly the generation walking into our industry now, will perceive these features. I wonder if Cadac will need to offer more as time goes on. I just hope that they can retain the simple, menu-free operation and low latency performance that they have now.

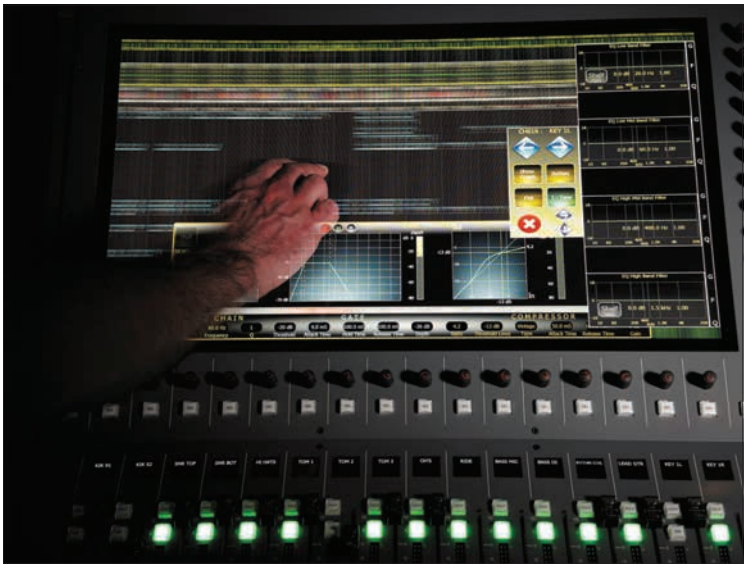
There are still some features which Cadac is working on, including offline editing. Although this does not directly relate to the console's performance, it has become a feature which today's industry expects as standard. Less warehouse prep time is given to digital setups these days, which is good news. The flip side however, is that offline editing has become a necessity.

It's commonplace for live consoles today to use colour for fast recognition. This is particularly important on work surfaces where hardware controls change their function depending on the process shown on screen. The colour scheme of the on-screen CDC software is pretty good, with the knobs that follow the on-screen parameters clearly lining up alongside. It's a small detail, but I think it's a shame these controls don't light in the corresponding colours - green for EQ, yellow for Dynamics etc. In fact, the only hardware which changes colour are the channel on/mute buttons. Even here, there are limited colours with tasks such as GEQ-on-faders having no colour at all. These things add to the operational speed of a desk which is so important in high-pressure environments. I also found that you could quickly end up with multiple windows open on the screen, potentially hiding the next channel you want to get to. Remembering to press exit on each function window is a habit you would soon fall into, but perhaps a 'home' or 'clear' button would be useful in this respect?

CONCLUSION

The CDC seven is a welcome member to the CDC family, bringing Cadac's exciting technical achievements in a versatile and cost-effective package. The dual 23" touchscreens are a luxury and offer complete control from either side of the desk, opening up some flexible workflows. Cadac's heritage from the analogue world is apparent through the usability and structure of these desks, which experienced engineers will appreciate. Monitor engineers in particular are likely to find other digital desks frustrating, after realising how simple this console can make what is otherwise a challenge.

Cadac has some highly commendable achievements at play with their CDC technologies, which the CDC seven benefits from. These include the lowest latency value I've come across until now, leaving the sound of this desk free from the usual phase issues and digital artefacts. A very simple workflow environment with very little in the way of sub-menus is rare at this level in the market. This is a mixing board which I believe should allow an engineer to keep two eyes on the stage and deliver a fluid and engaging result.



Top: The CDC seven's centre section

Above: Navigation