DIGICO SD8

Digico has stormed into the affordable mid-range digital console market with a black & gold special!

Text: Christopher Holder

Here's something a bit different: an affordable Digico console. When I say 'affordable', we're still talking about tens of thousands of dollars, but certainly the SD8 is really wading into Yamaha's heartland with its M7CL and PM5D. As most will be aware, Digico is more accustomed to dealing in the upper reaches of the production and broadcast market, so the SD8 comes as – maybe not a bolt out of the blue – but somewhat of a surprise.

Last year, Digico unleashed the SD7. It's an absolute beast, a Colossus of the Road (256 channels, loads of processing on every bus, channel, aux etc) designed for big shows needing loads of grunt. The SD8 raised a few eyebrows, largely because it employs a FPGA chip at the heart of its audio engine rather than the traditional DSP. According to the SD7's designer and Digico/Soundtracs stalwart, John Stadius, the FPGA chip is far better suited to the task of dealing with the mundane number-crunching of digital audio – where processes like EQ and dynamics get applied in a 'set then forget' fashion. Which is why the SD7 and SD8 require only one Super FPGA chip, with floating point Tiger SHARC DSP chips taking care of the stuff their good at – such as dynamic effects like reverb etc. In effect, the FPGA represents a totally different paradigm and Digico is the only show in town when it comes to employing them in this way (Fairlight does a similar thing, albeit in post production).

GILT TRIP

As with all Digico's consoles, the SD8 comprises a 'stage' box connected to a mix surface via a BNC copper connection transmitting MADI (56 channels). In fact, there are two MADI connections so the rack can be shared among multiple consoles, or you can double up to the console for redundancy's sake. The SD8 has 48 fixed mic/line inputs, while the outputs can be mixed, matched and user-defined – eight analogue outputs come as standard but that can be expanded to 24 analogue outputs, AES outputs, or an Aviom module. There are dual power supplies, so if one supply or feed fails the other will take over.

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TALKING SHOP

An interview with Digico Managing Director, James Gordon & Technical Director John Stadius.

AT: FPGA is definitely flavour of the month.

John Stadius: We've been using FPGA chips for years, but they were small and only used for MADI and PC interfaces and the like. But even when they were small we could begin to see their potential.

AT: What makes FPGA so good?

JS: The way the audio industry was using DSP like the SHARC was really a bit of waste of a very powerful chip. Audio is really just a 'repetitive state machine' – processing lots of EQ, lots of dynamics, lots of buses, all at the same time. The DSP isn't working on anything radically different or dynamic – like an effects algorithms which it's particularly suited to doing. So it's far more efficient to hard code the audio grunt work in logic – and do it on the chip. We couldn't do that back in 2002 when we released the D5, but we saw these massive, big number-crunching devices on the horizon and we knew they'd be ideal for processing audio. Saying that, you still need a DSP at the side to do all the dynamic interpolation and for effects as well, but an FPGA could far more efficiently take care of the donkey work.

AT: Right. But now it's becoming a bit like 'Low GI'… FPGA is the buzzword.

JS: Everyone says: 'oh, we use FPGA', when they don't – not for the audio engine at least, they still in fact have a DSP engine. On the other hand, we use one FPGA for the engine and we use DSPs for what they're good at. That's a totally different approach, and the other players are nowhere near where we are with the complexity and channel count.

AT: What's the holdup with the competition properly adopting FPGA then?

JS: It's harder to program than a DSP and there are fewer engineers conversant with the programming – it takes time for the education system to catch up with the manufacturers.

AT: So now FPGA joins the other key pillars of a Digico console, namely the use of touchscreens, MADI, and fibre-optics. Is that a fair assessment?

James Gordon: I think so. And using fibre-optics to run multi-channel audio wasn't the easiest approach but we started talking to [fibre-optic specialists] Opticore very early on. But the advantages of fibre – longer cable runs and more channels – were too good to ignore.

AT: Although it's comparatively pricey.

JS: It's expensive if you're only running 56 channels but when you're sending 256 ins and outs it's a very elegant cost-effective solution. The fact we can run fibre in a redundant loop is also a big advantage.

AT: What's a redundant loop?

JS: Every node – every console and I/O rack – is connected to fibre, and it's looped back in a ring. So you can cut the fibre at any point and it'll still work because the data is going in both directions. That's saved a few shows, what with fibre occasionally being slammed in doors etc.

AT: Right. Because fibre has a reputation for being a bit delicate.

JS: Not if you buy the right fibre. We use something called an 'expanded beam'. As you know, fibre is about the width of a human hair. But we use precision optics that expand it up to 3mm in diameter between connectors. This makes the transmission a lot more robust. With standard fibre, if you've got one tiny particle on the end of the fibre, you're buggered. Ours has been designed for military use. As for its strength, it's very hard to cut – I've even towed my car with it!

AT: And Digico must take some credit for the rebirth of MADI, I'd suggest.

JS: Yes, I think we can. It was always an awesome system. And it leant itself perfectly to our system at the time. When we released the D5, 48 inputs was normal, and thanks to MADI, we were able to offer 56.

The only issue was that, at the time, MADI was limited to about 50m cable runs – the chipset wasn't suitable for transmitting that sort of bandwidth over long cables. We now have line drivers, line equalisers and we can stretch MADI up to almost 200m, if you get good Van Damme cables [from VDC Trading].

AT: Did you foresee the explosion in channel counts when you released the D5 back in 2002?

JG: No. We launched the D5 and thought everyone would have just one stage rack. Three months later, everyone's buying two! We thought 56 inputs would be fine but the moment you told people you could have 112 they all went out and bought two.

AT: So 'more' is always going to be 'more'?

JG: Well, one thing we're noticing is the sharing of hardware that's going in installations. Installs have realised that if you share racks it's more cost effective than buying a cheaper console and installing analogue cable infrastructure. We can get rid of running analogue splits, with breakout boxes on stage etc. It costs less, because installation is expensive; copper is expensive. And the fewer cables and connections you have, the less susceptible you are to problems and gremlins down the track.

AT: And where do you see the live production market headed?

JG: More integration, I reckon. The three elements of a concert – sound, video and lighting – will need to communicate better with each other, because shows have become increasingly complex.

Around the back of the console you'll find eight mic/line inputs, eight line outputs and eight AES connections – all by way of some local I/O. Where the stage rack connects to the rear panel, you'll find two connections. This means you can have that redundant cabling mentioned earlier or you can use one of the sockets for sending 56 channels of audio to your favourite recorder – it's set to record post the preamp but pre everything else. Then when it comes to playback (when you're doing your virtual soundcheck in the next venue, for example), one button on the console switches everything over such that all the recorded tracks come up the same channels on the console from the previous night. You'll also find a wordclock BNC for clocking to/from other digital gear, and an ethernet port so you can plug in a laptop or tablet PC. Completing the back panel picture is a USB connection (there's another on the surface) for saving setups to a thumb drive, connecting a keyboard, mouse, or an overview screen (showing you all your ins/outs simultaneously).

ONE CHIP WONDER

As mentioned, a single FPGA chip runs the audio core. And, as also alluded to, the FPGA removes some of the restrictions we're used to with traditional DSP-based systems. For example, the desk has 60 channels but any of them can be mono *or stereo* – i.e. you could have 60 stereo channels without sacrificing performance elsewhere. There are 24 buses (again, mono or stereo), so you could conceivably run 24 in-ear mixes from the SD8. And, along with the stereo master bus, that adds up to 25 stereo buses. All the buses have full EQ and dynamics processing.

Talking of bussing, there are two solo buses, which is a pleasant surprise for a desk at this price point. It means you could have a solo bus for wedge feeds and a solo bus for in-ears, for example. Furthermore there's a 12 x 12 matrix.

The user interface is vintage Digico. A single 15-inch TFT touch panel takes care of things, and it's gorgeous. You can clearly read the screen from almost every angle. There's a real familiarity in getting around the console. Digico's 'channel strip on a screen' approach to assignability is intuitive and the SD8 is surely one of the easiest digital consoles to navigate. Digico hasn't scrimped on the knobs and faders either – there are 37 touch-sensitive faders, an abundance of encoders, and everything feels very self-assured.

As you'd expect from a Digico console, there's plenty of automation features. Just about everything is automatable, while 'Safe' buttons drop individual elements out of the snapshot automation as required. There's even an Offline page. So if you're unexpectedly told there will be an alteration to the next song mid-set, then hit Offline and the whole work surface is completely offline allowing you to fire the next song's snapshots, tweak it as required and then click on 'Return To Audio' to go back to the 'here and now'.

SPARES & ALTERNATIVES

Each input has a spare – two routing paths, in effect. Which means the main input might be Mic 20 and the alternative (backup) might be Mic 24. In the event of something going awry, switching to the backup mic is as easy as hitting the Alt Input button. The beauty of this is, you're not tying up two channels for the one source, and all the tweaks you've made to the EQ, dynamics and automation of the main channel remain valid when you make the switch.

Speaking of alternatives: you can easily switch the order of the EQ and dynamics around – push one button and the default order of EQ before dynamics is switched. There are also two inserts (A & B) on every channel. This means you can have a compressor inserted before or after the EQ, or you can insert one of the six effects or 12 graphics.

The SD8 is neat, looks resplendent in its black and gold livery and has more power and features than we've any right to expect at this price point. Rental companies with existing Digico inventory will snap up the SD8 sight unseen, I'd suspect. All the D1/D5 hardware is interchangeable and interconnectable with the SD7 and SD8, which is a big consideration in that sector. But the real growth will be in the fixed install market. Churches, auditoria, clubs and pubs… they'll all find plenty of reasons to love the SD8. It's sounds great, it's enormously powerful, cost effective, lightweight, easy to use… Hard to go wrong really. ■

NEED TO KNOW

Price
$61,900

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