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this good is
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to find.”**

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* The new LV1 80-channel expansion is now available as an optional software upgrade for LV1 64-channel consoles. Learn more at waves.com/lv1



ON TEST

Waves LV1 Classic

Simon Allen tests out the all-in-one digital mixing console that fully integrates the LV1 engine into a compact form factor . . .



**ABOUT THE EXPERT
SIMON ALLEN**

Simon is a freelance, internationally recognised engineer/producer and pro audio professional with two decades of experience. Working mostly in music, his reputation as a FOH and studio mix engineer continues to reach new heights.

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Waves is one of the best-known names in the industry when it comes to digital audio processing tools and plug-ins. It doesn't matter if you work in live sound, broadcast or the studio, it's hard to ignore at least some of the brand's offerings in one form or another. Many will be aware of - or have

perhaps even used - the Waves LV1 mix engine software, but this has only been possible via custom builds incorporating third-party host computers, DSP servers and various hardware options. That is, until now . . .

For those that have ventured into the LV1 ecosystem, the flexibility of building a digital mixing system to their own specification, or the ability to upgrade and update it over time, was and still is part of the attraction. However, others have perhaps been deterred by the knowledge and time required to build a solution, or the responsibility for reliability in a world where fail-safe solutions are considered crucial. Well, earlier this year Waves announced its first all-in-one, off-the-shelf LV1 solution, called eMotion LV1 Classic. I was sent the first LV1 Classic to hit the UK, and after a week with it, I was left with more to consider than I expected.

ARRIVING AT LV1 CLASSIC

This is effectively a brand-new console, in the sense there hasn't been a complete solution such as LV1 Classic before. However, it's hardly arrived from an unknown brand and the user interface will already be familiar to some. The LV1 software has been around for

about a decade, and like anything in the Waves portfolio, has benefitted from periodic updates and new features. So here is a 'new' console that already has its own legacy from an established brand under its faders.

Furthermore, being the well-known brand that it is, any investment made here 'should' be relatively safe, notwithstanding the natural progression of digital technology, of course. It should also be recognised that coming from a software background, this 'new' console will benefit from future updates and feature sets. Sure, we can all hanker after the greatest studio hardware, but in the world of digital mixing the ability to move with the times and install the latest developments is a real bonus.

However, some might be quick to comment that the Waves LV1 software hasn't been the greatest success story of the brand either. Heck, I'm a long-time user of Waves plug-ins and have witnessed the LV1 software on occasion before and yet, I too haven't used LV1 for a live show. The trouble is that previously, the only way to achieve a complete LV1 set-up was via a custom build with third-party hardware. There are of course recommended system specifications, but ultimately it was down to the user to configure their chosen hardware, which naturally raises anxiety over reliability and who to turn to for



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support. This release of the LV1 Classic, though, offers exactly what our industry almost expects; a complete solution provided off-the-shelf by the manufacturer itself with all the kinks ironed out. This could be the best move by Waves yet. It's similar to Apple, who designs and manufactures the computer hardware and the operating system as one package.

Having now spent time with the LV1 Classic though, I believe the lack of attention the LV1 software and the SoundGrid ecosystem may have previously received has left the industry overlooking some very clever design features and performance. This thing 'sounds' amazing. There, I said it; and how often does that get said when we discuss digital audio these days?

For the relative few that have delved into the world of LV1 before, this release may seem less notable at first, but even here the LV1 Classic could be very attractive. Being able to configure your own system to the specification and budget you require is, of course, very enticing. For example, some users have built LV1 rigs that are extremely compact and suit fly jobs, or users have held a base rig and added different I/O solutions or servers for more processing power when needed. Thanks to the architecture and SoundGrid ecosystem behind an LV1 system, this is all still possible with an LV1 Classic. You can still add any SoundGrid I/O device, add an additional touchscreen or FIT Controller for more faders, or more servers for additional or redundant processing power. Then, if you were to compare the cost of everything inside an LV1 Classic - the host computer, DSP server, onboard I/O, software licence, included plug-ins, touchscreen, and faders - it would be cheaper than building a similar system from the ground-up. What's more, you don't have any of the hassle setting it up, or any worries around reliability or who to turn to for support.



ALL ONBOARD

The Waves LV1 Classic is described as offering 64 input channels, in stereo or mono, which provides you with 128 possible sources. It can mix up to 44 busses, also in stereo or mono. The console's mix engine operates at dual 32-bit floating, just as any SoundGrid network, at sample rates 44.1kHz - 96kHz. More on this later. There are 16 original-design Waves Signature Preamps, 12 line outputs, two AES3 outputs and an AES3 input with SRC. There are four SoundGrid switch ports; two via Ethercon and two via RJ45 sockets, which enable connectivity with external I/O or additional processing servers. On the rear are also a number of USB ports, a HDMI port and a network port as well as dual redundant power supplies.

The screen is a beautifully clear 21.5" multi-touch screen that boasts 1,000-nit brightness for daylight use. The brightness of the screen is controlled by a hardware rotary knob on the rear of the screen, so it can be adjusted without needing to dive into a menu. There are 16 + 1 full-size 100mm faders on the surface below the screen that not only line up well with the software, but also boast their own LCD scribble strip complete with rotary controls, mute, solo and select buttons. This is a brand-new tactile surface design by Waves, which is notably higher in quality than its FIT Controller. There are also a number of layer and function buttons as well as a touch-and-turn control, which works well. Although a computer keyboard can be connected, it's not necessary as the second shortcut key defaults to be an 'ALT' key, which I found really useful for zeroing parameters.

The LV1 Classic comes complete with the LV1 software, licensed up to the 64-channel variant, but the lower 16-channel and 32-channel options are still available via the set-up menu. This is to help users organise the processing power available should you need a high number of effects but fewer channels. There are also 16 well-selected Waves plug-ins included to get most shows up and running. These are: F6, Waves Tune Real-Time, X-FDBK, PSE, eMO D5, eMO Q4, eMO F2, GEQ 30-band EQ, R-Comp, Magma Tube, H-Delay, R-Verb, TrueVerb, Doubler, GTR3, and R-Bass. To power all this processing, Waves has built in one



“Amazingly, for a console with this level of specification, it is really compact...”



At this point I could write a complete instruction manual for all of the LV1 Classic's features and controls, but instead I'll highlight a handful of my personal likes and dislikes. Firstly, I don't think other manufacturers should overlook how useful it is to simply drag-and-drop the processing on each channel. There are up to eight slots per channel for any processing (plug-ins) you wish. Loading a process is fast and moving the order around is really powerful, not to mention the novelty of doing all this with recognisable plug-ins, on the same screen, within the same software of a single system.

The LV1 software interface is well laid out and easy to use. The quality of the multi-touch screen makes using the console via the screen surprisingly natural, and in some cases quicker to operate than the dedicated faders. The faders are of a really good quality though, and when up and running it's really powerful to have the screen showing a different layer to that on the faders, effectively giving you 32 + 1 faders in easy reach. Is this the only desk that offers this ability? The rotary knobs above the faders are useful to have and help with fine-tuning, particularly the touch-and-turn control, but it can be slower navigating all the parameters this way. For example, only three bands of the eMo Q4 parametric EQ are visible.

On stereo monitor auxiliaries you can enable 'IEM' mode, which loads the Waves eMo IEM 360 panner (available at an additional cost). This then provides the ability to pan elements in a 360° fashion for IEM mixes, in a similar way to other industry solutions for immersive in-ear mixing. This is really powerful to have onboard without any additional hardware required, and is considerably cheaper. Again, is there another console that offers this? Providing you have the processing resources available for the mix you're working on, the LV1 Classic really is like having everything in one box.

- ① The console features a 21.5" multi-touch screen that boasts 1,000-nit brightness for daylight use
- ➔ Facing page: eMo IEM software offers immersive 360° panning for in-ear mixing

of its SoundGrid servers, which is said to be of a similar specification to its Extreme Server. In reality, I found that the built-in server was capable of running a full-size 64-channel mix set-up, but you would have to be mindful of the resources available. It felt suitable for modern levels of processing at the 32-channel format, which is nice to have all within one system. Larger, more demanding mixes would benefit from the ability to add additional SoundGrid servers. Up to three can be added for extra power, and up to a further four can be added for redundancy.

Amazingly, for a console with this level of specification, it is really compact. You can lift the console without any assistance, and even flight-cased it is compact and light enough to take on a plane. The console alone comes in at 17.2kg and measures 560mm x 402mm x 561mm. I found the fixed screen angle to be great for standing or sitting, and although it isn't as compact as a separate screen might be on a traditional LV1 set-up, this is a well-packaged solution that looks the business.



The LV1 Classic generally feels like a complete solution too. There are a host of other aspects that make up the system, from small elements like custom colours, custom layouts, grid-style patching across the whole system, and then even bigger topics like virtual gain tracking when sharing pre-amps across two consoles, and the remote control apps for FOH mixing and personal monitoring - something that other brands don't always have available at the first release. You could even install the Waves Dugan Automixer and have all 64 channels running through a Dan Dugan mixer for corporate work if needed.

HEARING IS BELIEVING

Earlier I mentioned that I thought we as an industry might have overlooked some of the LV1 features and the associated SoundGrid performance specifications. Hopefully the features I've mentioned begin to demonstrate this. I also mentioned we would come back to the processing operating at dual 32-bit floating. Well here's the thing; it turns out this is more significant than I, and I believe many other people, had realised. We are now used to 32-bit floating digital audio files and digital audio processing, and the benefits of additional headroom as well as a lower noise floor are well understood and appreciated. This is twice that! You could say 64-bit floating, which is mathematically 'a lot' of headroom.



Desperately avoiding the conversation around how much headroom this results in and what the equivalent noise floor would measure against real-world perception, let's just agree that there are analogue consoles that couldn't perform this well. What matters here, however, is that this is truly dual 32-bit floating throughout the signal path. While it can prove expensive to interface another protocol onto a SoundGrid network, once on the SoundGrid network, all devices are passing dual 32-bit floating, end to end. Furthermore, the LV1 system carries out all its processing at dual 32-bit floating too.

In recent times, some of the latest digital consoles claim to operate at 32-bit floating, but this may only be the transfer of a signal. The audio processing, or even the summing of multiple signals within a mixer is typically calculated at 24 bits and then merely transmitted at 32 bits. I'm not one to get hung up on the inner workings of digital mixers, but we have all experienced even some modern digital consoles falling apart when close to the limit.

I am convinced I heard this higher level of processing for myself. One test I carried out with the console was to pass a multi-track through the mixer that I know very well from having worked on it previously in the studio. Without any processing applied and just the summing of a handful of channels, I already loved the way this console sounded. Add in some basic processing and I wanted to do the mix all over again with the LV1 Classic.

Thankfully, I believe Waves has carefully considered the other extremes of the signal

chain too. The Waves Signature Preamps on the LV1 Classic and the Ionic series of stage boxes sound awesome too. They have a nice tone to them when driven, low noise floor and a large dynamic range. It's not the most scientific test, but I like to ramp up the gain on a preamp and measure the noise floor when nothing is connected to the input, to see if there is any 'colour' on a spectrograph. The spectrograph was virtually flat on these pre-amps. At the other end, Waves has managed to keep latency figures down as low as 0.8ms without any processing. With processing in play, Waves has built-in multiple outputs per channel with the ability to user-manage alignment within groups.

CONCLUSION

This is a far more exciting release than I had first imagined. Not only does this answer the common concern around the LV1 mixing solution, but I believe the LV1 Classic will demonstrate some of the benefits of SoundGrid to a wider audience. Here we have the first off-the-shelf, all-in-one solution that the live and broadcast industry want to see from a well-known manufacturer. However, this isn't its first endeavour into live mixing and there's a lot on offer with this compact but serious mixer.

I sincerely hope this paves the way for more developments in digital audio consoles from Waves, and hopefully other manufacturers will sit up and listen to the performance on offer here. A new console at the cutting edge of mixing, but with the legacy and support required by our industry. ☒

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