Ferrofish A32

A-D/D-A & Digital Format Converter

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With a whopping 32 analogue inputs and outputs, there's more to this stand-alone converter than meets the eye.

Ferrofish were formed in 2012 by Juergen Kindermann, a hardware designer who'd previously worked with Creamware. He bought the company's IP when it folded, so he could continue to develop products like the B4000+ organ module and the A16 Ultra A-D/D-A converter under his new Ferrofish brand. I reviewed the Ferrofish A16 Ultra MkII in *SOS* October 2012 (http://sosm.ag/ferrofish-a16mk2), and noted a worthwhile performance improvement over its predecessor. The A32 has grown naturally from the success of the A16, and offers double the analogue inputs and outputs.

Connectivity

The 32 analogue I/O can all be routed between 64 MADI and 32 ADAT digital I/O in a fully assignable way, and headphone monitoring facility allows the user to check any individual or stereo pair of channels, or any of seven headphone mixes of any channel combinations.

The A32 is surprisingly easy to set up and control using just a rotary encoder knob and a couple of buttons, working in concert with a quartet of crisp colour TFT screens (double the number on the A16 Ultra MkII for obvious reasons!). Most of the complexity is on the back of the slim rackmounting unit, which extends around 270mm behind the rack ears. Rows of TRS sockets, as on the A16, aren't viable for 32 I/O in 1U of rack space, so the A32 has adopted 25-pin AES59 (Tascam D-sub) sockets. As each socket carries eight balanced inputs or outputs, eight sockets are provided in two rows of four.

The ADAT I/O are presented on four pairs of F05 'lightpipe' sockets, with the inputs and outputs distinguished by coloured 'dust-doors' (black for inputs, white for outputs). The S/MUX2 protocol allows ADAT operation of 16 channels at double sample rates, but quad sample rates aren't supported over ADAT — these optical ports are all turned off automatically when operating at 176.4 or 192 kHz. The fourth pair of ADAT connectors (channels 25-32) can be reconfigured via the unit's operating system to accommodate a stereo optical S/PDIF signal, and an automatic sample-rate converter then becomes available to accommodate a non-synchronous or different sample-rate input signal.

MADI connectivity is catered for by both dual BNC sockets and a duplex SC-Plug, for multimode optical fibres. The A32 also has various automatic switchover modes to support redundant backup connection configurations. A second pair of BNC sockets accepts an external word-clock input and provides a clock output, and firmware updates can be delivered via a USB B-type port. Apparently, this will soon enable remote control from a computer (there are no plans for USB audio-interfacing, though a Dante-enabled version was announced as we were going to press). MIDI control and transport is catered for with a pair of five-pin DIN sockets, as well as the MIDI-over-MADI format, and there are options to route MIDI signals between them.

This vast array of connectivity doesn't leave much room for an IEC mains inlet, so the Ferrofish A32 ships with an external universal line-lump power unit (providing 3A at 12V DC, and accepting AC mains between 100 and 240 Volts). I'm not usually a fan of line-lumps, but two factors mitigate any initial dismay: first, the coaxial DC connector is a secure, stable and reliable screw-locking type; and second, there are two DC power inlet sockets, allowing a second PSU (not included) to be attached, to create a dual-redundant power source — a *very* useful feature for live sound or broadcast!

A wise precaution, given the amount of audio connectivity, is that each

power supply is a Class-2 (double insulated) type, using a two-core C7/C8 (figure-of-eight style) mains cable connector, neatly avoiding any risk of creating a ground loop via the mains safety earth.

Operation

On the front panel, there's little to describe. A lone headphone socket sits on the left, and the centre is dominated by four, square-ish, colour TFT screens. The default display provides the analogue input signal levels on the two left screens, with 16 channels on each, while the two right screens carry 16-channel blocks of bar-graph meters for the analogue output channels. All four screens carry various status labels along the bottom, indicating the clock source, sample rate, and which digital inputs are active. Various other display modes re-allocate these screens to show things like digital signal levels, I/O routing, headphone mixes, and all the usual setup and configuration menus.

To the right of the displays are a rotary encoder labelled Select, and Menu and Power buttons— the last serves both as a 'Home' button when navigating the menus, and switches the unit in and out of standby. There's no mains-isolator function because of the external line-lump power supply. A white LED near the power button illuminates when the unit's powered up.

When the default analogue meter screens are displayed, the Select encoder governs the headphone level, and a headphone volume display and meter instantly appear on the right-most screen. The two left-hand screens are then re-purposed to display all 32 input and output channels, while the other right-hand display provides a useful 'help' screen, with information about the control functions available in this menu mode.

While the headphone screen is shown, pressing the Menu button selects either the monitoring source or the channel number, and the encoder knob can be used to change the selection. Source options include analogue input, analogue output, MADI in, MADI out, ADAT in, ADAT out, and Mix 1-7. The channel numbers can be selected individually or in pairs, while the Mix 1-7 options select previously user-configured mixes (stored as presets) of any or all source channels. A brief press of the Power button exits the headphone menu.

Pressing the Menu button from the default analogue I/O display accesses the main menu structure, with seven options arranged as icons in a circle. The required menu is selected with the encoder knob, and the first in the ring opens the 'Clock' menu. This appears on the right-most screen, with options to change the sample rate (32 to 192 kHz), as well as the clock source, and the S/MUX modes for the MADI and ADAT interfaces.

The second menu option accesses the preset headphone 'Mix' pages mentioned above. Any input or output channel can be dialled into the mix with any desired level and pan. It is an amazingly powerful feature, though if you want to combine a lot of sources you'll need the patience of a saint to scroll and click around each source fader and pan-pot to build a monitoring mix! During this process the two right-hand screens show 32 mixer source channels, while the centre-left screen shows the currently selected bank of source channels (analogue, MADI, ADAT, etc.).

Creating new mixes should be rather quicker and easier when the remote-control computer app is released — I do hope so! Thankfully, the system does allow seven different mix configurations to be stored and recalled, which should satisfy most situations and minimise the time spent setting up new mixes!

The Digital menu employs the two right-hand TFT screens to indicate signal levels across all of the digital I/O (64 channels of MADI in and out, and 32 channels of ADAT in and out). Usefully, the two left-hand screens continue to show the 32 analogue input and output levels on bar-graphs, too. However, there isn't space for bar-graph meters for all the digital channels, so each one's allocated a virtual LED whose colour changes according to the signal level: grey below -60dBFS, green above -60dBFS, yellow above -16dBFS, and red above -3dBFS. This clever, if unusual, arrangement works extremely well.

The Setup menu accesses seven sub-menus, arranged in another circle. The first two options control the nominal analogue input and output levels (aligning 0dBFS anywhere between +4 and +20 dBu in 1dB increments, but with presets for +20, +13 or +4 dBu). Next comes the internal I/O routing matrix, then selecting the MADI interface (optical or coax) and associated redundancy modes, and the MIDI source format and priority modes. The Settings sub-menu offers functions including a 75Ω termination for the external word-clock input, the MADI frame format (64 or 56 channels), dual-redundant power supply, switching ADAT-4 into S/PDIF, MADI delay compensation, and enabling a key-click noise for the encoder and buttons (which sounds very like relays clicking). The final option is to lock the front-panel controls with a (factory-set) PIN number.

The DSP menu is perhaps the most intriguing: although, at the time of writing, it currently does nothing, Ferrofish say the unit will run various native DSP plugins, to »

Ferrofish A32 £1906

PROS

- Massive I/O count, with analogue, MADI and ADAT interfacing.
- Flexible I/O routing, and comprehensive stereo headphone monitor mixing.
- Two A32s can be daisy-chained to fill all 64 MADI channels, with latency correction.
- Simple setup and clear metering.
- Remote control via MIDI and, soon, a computer app.
- Promise of future DSP processing plug-ins.

CONS

- Converter performance very slightly inferior to the A16 Ultra MkII (but well up to the required standard, and a fair compromise for the channel count in 1U of rack space).

SUMMARY

This is a remarkably compact converter with a huge I/O count and superb routing versatility. The ability to chain two units to fill the 64 channels of MADI, its coax/fibre redundancy and dual power-supply redundancy make this a very serious option for live sound and broadcast. While the converter performance isn't state-of-the-art, it's more than good enough.

Ferrofish have crammed an astounding amount of connectivity in 1U of rack space. As well as the profusion of DB25 connectors for the analogue I/O, there are colour-coded ADAT ports, both optical and coaxial MADI, and, very unusually, two power inlets, allowing for a dual-redundant power supply configuration.

» process channels in various ways — which have yet to be announced. (Reverb and compression for cue-mixing would be a useful starting point, but I'm sure many other processes *could* be included.)

The sixth menu accesses six user-configuration presets, which can be saved and recalled to change all of the unit's signal levels, clocking and routing setups. The final menu brings up a help page, with display-language options (German or English), details of the analogue and digital signal paths, and identification of the firmware version (1.02 in the review unit).

In Use

Internally, the A32's beating heart is a Sharc ADSP-21489 DSP chip running at 400MHz, and it's this which manages the routing of 128 separate inputs to 130 separate outputs, adjusts signal levels and mixes as necessary and will, in the future, run plug-ins too.

The converters are built around Cirrus Logic CS5368 (A-D) and CS4365 (D-A) chips, both of which are eight-channel low-latency devices with a claimed 114dB dynamic range. This performance is below the current state of the art (which exceeds 120dB), but that's largely because of the multi-channel nature of these chips. The supporting analogue circuitry uses Texas Instruments RC4580 dual and OPA1664 quad op-amps throughout. On my bench tests with an Audio Precision test set (and using the +20dBu maximum analogue level settings), I obtained an AES17 dynamic-range performance (analogue input routed to ADAT output) of 105dB (A-weighted), which is a little disappointing — the A16 Ultra MkII managed 109dB (A-weighted) using AKM converter chips. The THD+N and crosstalk figures were also slightly inferior, at 0.002 percent and -102dB (at 10kHz), respectively. The noise level measured -102dBFS (all figures measured with a +20dBu input level). The low-frequency -3dB roll-off was at 8Hz, which is 5Hz higher than the A16 MkII.

For the D-A, things measured a little better, with an AES17 dynamic-range of 111.5dB (A-weighted), which is 2dB below the A16 Ultra MkII. The THD+N figure of 0.001 percent is the same, and the -87dBu noise level and -104dBu crosstalk (at 10kHz) are similar. Again, all figures were obtained with a 0dBFS input signal and the +20dBu analogue output level.

While these converter performance figures won't trouble the market leaders, it's important to recognise that they're entirely adequate for the kinds of applications for which the A32 is intended — there aren't too many recording environments where the noise floor is 105dB below the peak level, and the same goes for analogue sources, such as synths. Perhaps more importantly in a device like this, the digital filter latency at base sample rates is extremely low. The delay from an analogue input, through the A-D and D-A, to an analogue output measures below 0.5ms, which is very good.

Alternatives

The only broadly comparable 1U product is **Antelope**'s **Orion 32**. That offers MADI, ADAT and USB interfacing and, like the Ferrofish, boasts 32 analogue I/O — but it offers fewer ADAT channels, doesn't support coaxial MADI, and lacks the dual power-supply option. The forthcoming 32-channel **Lynx Aurora** could be interesting.

Verdict

The Ferrofish A32 offers a huge amount of connectivity for the money, in a much smaller unit than might be expected. The user interface is clear and easy to navigate, especially if regular configurations and monitor mixes are saved as presets for instant recall. While it can't be denied that setting up headphone mixes and alternative I/O signal-routing schemes involves a great deal of scrolling and button-pressing, the promised computer software should make this much easier, quicker, and more enjoyable! The intention to offer bespoke DSP plug-ins is also an intriguing thought.

For situations where it's necessary to get a lot of analogue channels back to a recorder via MADI or ADAT interfacing, or to convert from MADI to ADAT format (or vice versa), the A32 delivers conveniently and at an attractive price. It is similarly attractive as a means of sending a large number of source channels from a DAW out to an analogue mixer or outboard processors and back again.

Overall, then, Ferrofish have come up with a usefully expanded alternative to the A16. While it's technical performance might give a small margin away to its older sibling, it promises a lot more connectivity and future processing power, and boasts some very useful redundancy options. ■■■

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