

Pro-Ject Pre Box S2 Digital

Smartphone users are spoilt for choice these days, but Pro-Ject's new S2 Digital brings things back home, providing an affordable, high quality preamp for desktop systems

Review: **Cliff Joseph** Lab: **Paul Miller**

There are more than 20 different products in Pro-Ject's 'Box Design' range of DACs, streamers, docks, phono stages and other components – an approach that some have likened to throwing things at the wall to see what sticks. However, that does allow the Austrian company to focus quite precisely on a number of different users and listening environments.

And focus is what the new Pre Box S2 Digital is all about, as – under the new guidance of John Westlake, the designer who was previously responsible for award-winning designs including the Audiolab M-DAC – this latest addition to the Pre Box range has its sights set firmly on your computer desktop.

USB POWER

With a competitive £300 price tag, the S2 Digital is aiming to provide an affordable, high-quality headphone preamp for use with desktop and laptop computers at home or in an office. Available in either silver or black, the Pre Box S2 Digital is a compact device that measures just 35mm high, 100mm wide and 105mm deep, so you can easily sit it on your desk while you're working, or just slide it under your computer screen to keep it out of the way.

A power adapter plugs into a micro-USB port on the back of the unit when you are driving the S2 Digital via coax or optical S/PDIF, but you won't need it when using a computer as there's also a larger USB-B connector that facilitates both audio data and hub power.

The use of the USB port also means that the S2 Digital isn't just restricted to sitting on a desk at home or in your office, as you can carry it around with a laptop computer and use it in a hotel or conference room just by plugging in a single USB cable. Admittedly, the S2 Digital isn't quite as

compact as some of the portable DACs and preamps that we've seen recently – and weight is relatively hefty too, at nearly 400g – but you can still carry it around in a backpack or briefcase along with your laptop without too much trouble.

You won't need to recharge it either, as you do with battery-powered rivals such as the Chord Mojo [*HFN* Jan '16], RHA Dacamp L1 [*HFN* Apr '17] and Oppo HA-2 SE [*HFN* Dec '16]. Note, however, that the S2 Digital's micro-USB port is for 5V power only so it won't connect to the micro-USB audio outputs on some tablets or smartphones.

But, to be fair, the S2 Digital quite clearly puts its emphasis on desktop use with Mac and PC computers, and it's certainly not designed for use while you're actually on the move, which is the case with the pocket-size Oppo and RHA. Moreover, with its coaxial and optical inputs for use with legacy sources, plus RCA stereo outputs on the back, the S2 Digital can also serve as a preamp with your

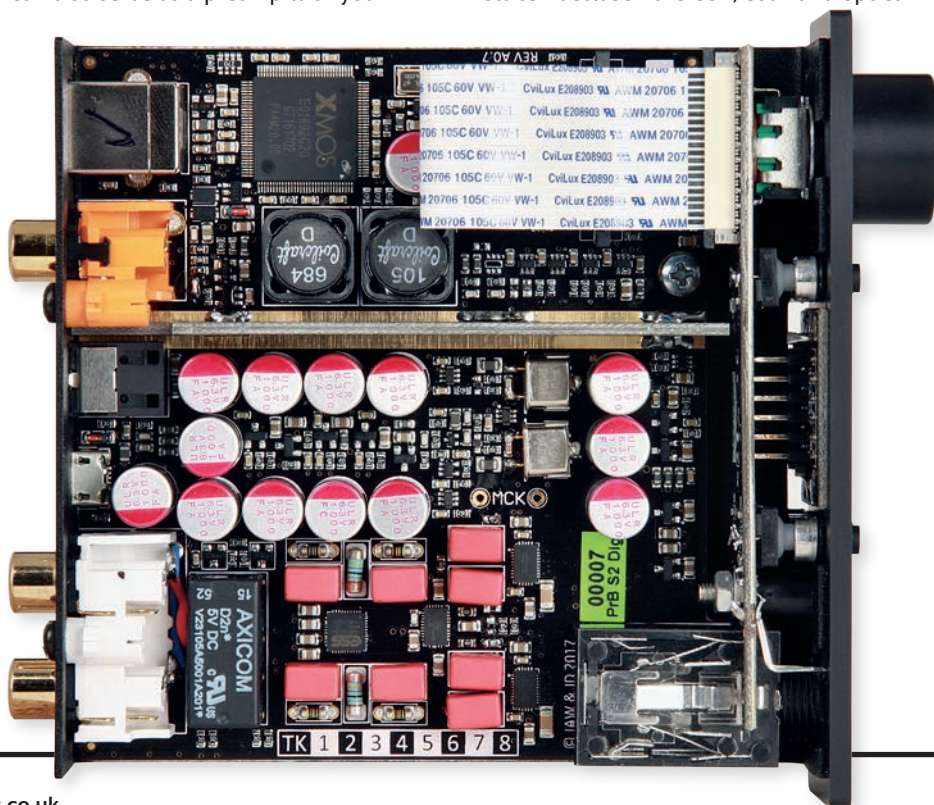
existing hi-fi set-up at home. That's more of an added extra as the primary output option is clearly the 6.35mm headphone socket that sits right up-front on the main control panel (and also takes priority over the RCA output if both are connected). There's no 3.5mm connector, and no adapter is provided with the S2 Digital.

BRIGHT AND CLEAR

The headphone socket sits on the left-hand side, with a chunky volume dial over on the right and a small LCD screen in-between. The screen measures just 20x15mm, but it's bright and clear and I had no trouble viewing the various menu options, including the comprehensive array of eight digital filters, while the S2 Digital was sitting on my desk [for more on these filters see PM's boxout, facing page].

Some of the controls are a little confusing, though. The two Input buttons on the left of the screen are straightforward enough, allowing you to switch between the USB, coax and optical

RIGHT: Galvanically-isolated USB XMOS solution [top left] with latest firmware supports LPCM to 768kHz/32-bit and DSD512 while two ESS Sabre ES9038Q2M 'mobile' DACs [lower middle] feed an ESS9602 headphone amp [lower left]





LEFT: The 6.35mm headphone socket betrays the diminutive scale of this DAC. The input, digital filter selection and menu operations are all revealed on the tiny colour display as is the output volume

inputs. There's also a single button that you can use to select the digital filters. The main Menu button displays settings, such as distortion compensation and sound quality modes, which can be altered via the click-to-select volume knob or via the separate hand-held remote control [see p73].

The playback controls on the remote do double duty when controlling the on-screen menus, so even after several days' use I still found myself randomly stabbing at buttons before having to reach for the user manual!

Despite its compact design and competitive price, the S2 Digital is equipped for some heavy lifting, with twin (surface-mount) Sabre ESS9038 DACs that support a 768kHz/32-bit input, built-in hardware decoding for the MQA high-res format, and even support for DSD512 – which is directly accommodated

'Brian May's power chords struck like a thunderbolt'

by Macs and Linux computers, although the instructions provided by Pro-Ject for playing DSD files on a PC may seem rather daunting to less technical users. The S2 Digital is compatible with the Roon player software, and the remote control even allowed me to control iTunes playback on my office iMac, which is where my main collection of lossless files resides.

EPIC QUEEN

Using the USB connection on the iMac, the S2 Digital clearly provided a real improvement in sound

quality on the Sennheiser headphones that I also tend to use in the office. It delivers a clear, precise sound that might seem a little clinical if it didn't manage to retain such warmth and texture as well.

Feeling a little biblical on a wet, stormy weekend, I was impressed by the almost

crystalline clarity of the intertwining vocals in Queen's vast, *a cappella* rondo on 'The Prophet's Song' from the 2005 reissue of *A Night At The Opera* [Parlophone 00946 3 38457 2]. It's particularly effective at delving into the sound and isolating voices and details that – on my naked headphones – would normally just merge together as a rather undifferentiated 'wall of sound'.

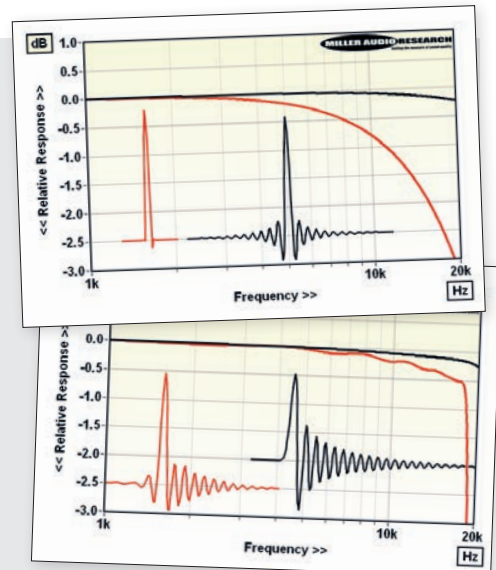
There's a strong sense of space too, with very precise left/right separation helping to create a widescreen soundstage that befits Queen's epic production, and when Brian May's power chords finally come crashing in they really do strike like a thunderbolt and lightning. But for real biblical overload even Queen can't compete with the polyphonic motets of Thomas Tallis, and it's here that the S2 Digital earns its wings.

Even with my closed-back Sennheisers it felt as though the soaring vocals of Pro Cantione Antiqua's 'Spem In Alium' [*Thomas Tallis*; Alto ALC1082] were taking flight and ↪

MOOD MUSIC

Pro-Ject's choice of ESS's Sabre ES9038 DAC defines the core performance of the Pre Box S2 Digital, but it's *your* selection of its eight bespoke filter algorithms that tailors the sound with LPCM inputs. The 'Brickwall' and 'Fast Rolloff' filters are typical FIR types, and linear phase like the 'Apodising' option, their impulse responses showing pre- and post-ringing but achieving a superior rejection of alias images (84dB, 79dB and 84dB, respectively) while also offering the flattest responses. The other five filters are optimised for transient performance with progressively reduced acausal pre-ringing at the expense of poorer HF extension and a weaker suppression of alias distortions.

The 'Slow Rolloff' and 'Hybrid' filters have just one or two pre-echoes, and reduced time domain distortion, but with a steeper treble cut-offs of $-3.7\text{dB}/20\text{kHz}$ and $-12.5\text{dB}/20\text{kHz}$. The 'Hybrid' filter offers a superior 84dB alias rejection (14dB for 'Slow') but its response shows obvious rippling. 'Minimum Phase' (Fast and Slow) show no pre-ringing but have increased phase distortion, with 'Fast' trading increased post-ringing for good alias rejection and a flatter response (74dB vs 18dB and -0.3dB vs $-3.7\text{dB}/20\text{kHz}$, Fast and Slow respectively). The most extreme is 'Optimal Transient' – essentially no filter at all – which has no pre or post-ringing but also no suppression of alias distortions. Coupled with an early $-1\text{dB}/11\text{kHz}$ to $-3.4\text{dB}/20\text{kHz}$ treble roll-off ($-4.4\text{dB}/45\text{kHz}$ and $-6.5\text{dB}/90\text{kHz}$ with 96kHz and 192kHz media), this filter may be preferred with 96kHz+ files where aliasing is pushed well outside of the audioband. PM



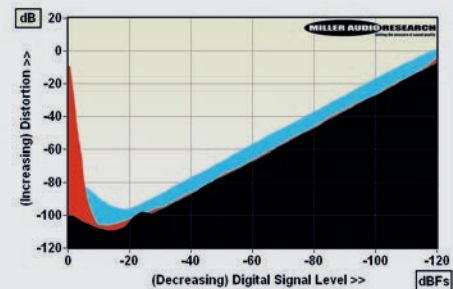
ABOVE: Time and treble frequency response of Fast/Optimal Transient (black/red, top) and Minimum Phase Fast/Hybrid (black/red, lower)

LAB REPORT

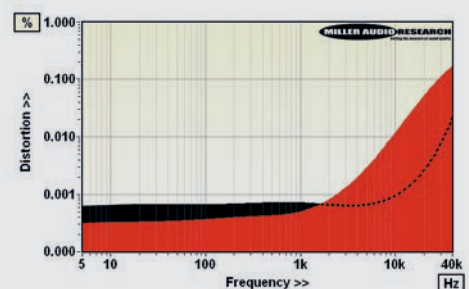
PRO-JECT PRE BOX S2 DIGITAL

This latest 'digital box' should not be confused with Pro-Ject's earlier miniature DAC/network solutions – a new designer (John Westlake) and new chip technologies mark out the Pre Box S2 Digital as a vastly superior offering. A standard 2.1V maximum output is offered at 0dBfs via the RCAs but at a rather 'better-than-average' 110dB A-wtd S/N ratio and vanishingly low 0.25ohm source impedance. Long or reactive interconnect types will not cause the Pre Box S2 Digital pause. Low-level linearity also benefits from the wide S/N, as resolution is true to ± 0.2 dB over a full 110dB range. Stress on the analogue stage causes an increase in distortion at 0dBfs, particularly at HF, of 0.0015-0.03% but this drops to between 0.00035-0.00075% over the top 30dB of its dynamic range [20Hz-20kHz – Graph 1, below]. The Pre Box S2 Digital has separate 44.1/48kHz-centric clocks and jitter is fabulously low at ~ 10 psec with all sample rates through all inputs. Frequency response, rejection of stopband images and time domain behaviour all hinge on your choice between the eight digital filters [see boxout, p71].

The headphone output, driven by an ES9602 chip, is capable of delivering a maximum 92mW/25ohm (<1% THD), with sufficient voltage for 6.0mW/600ohm, but distortion does climb over the top 6dB of this output [see red trace, Graph 1]. There's also a difference in THD with loading, most obviously at HF where, for the same *voltage* output, distortion can be x20 higher into low impedance 'phones [red trace, Graph 2 below]. But there are advantages too – the compact chip format and excellent PSU smoothing result in a fabulously wide 109.5dB A-wtd S/N ratio and exceptionally low -109dBV (2.5 μ V) unweighted hum and noise. PM



ABOVE: Distortion vs. 24-bit/48kHz digital signal level over 120dB range (pre out, 1kHz, black; 20kHz, blue; headphone out/25ohm, red, 0dBfs = 92mW)



ABOVE: Distortion vs. extended freq. from 5Hz-40kHz, headphone (1V/600ohm, black; 40mW/25ohm, red)

HI-FI NEWS SPECIFICATIONS

Maximum output level (RCA)	2.14Vrms at 0.25ohm
Maximum output (headphone)	6.0mW/600ohm / 92mW/25ohm
A-wtd S/N ratio (S/PDIF / USB / headph)	110.0dB / 110.0dB / 109.5dB
Distortion (1kHz, 0dBfs/-30dBfs)	0.0015% / 0.00035%
Dist. & Noise (20kHz, 0dBfs/-30dBfs)	0.030% / 0.00075%
Freq. resp. (20Hz-20kHz/45kHz/90kHz)	+0.0dB to -0.23dB/-1.4dB/-3.5dB
Digital jitter (48kHz/96kHz/USB)	12psec / 6psec / 10psec
Power consumption	3W
Dimensions (WHD) / Weight	103x37x122mm / 0.37kg



LEFT: USB, coax/optical digital ins join variable analogue outs on RCAs. Note micro-USB port (5V PSU)

echoing around the cavernous nave of St Paul's Cathedral, where this recording originated.

Back down to earth, the S2 Digital can also dig impressively deep. The electronic depths of Max Richter's 'Shadow Journal' from *The Blue Notebooks* set from 2015 [DG 479 4443] take on a new dimension, with a rumbling, roiling boom that echoes into the distance while still remaining threateningly taut and focused.

BOUNCING BASS

Thankfully, the S2 Digital can handle gentler sounds too. And this allows the simple, wistful refrain of 'The Blower's Daughter' by Damien Rice, from his 2003 self-produced/engineered album *O* [14th Floor Records 5050466-4788-5-6], to linger almost painfully, clinging on to the final, fading notes as though it can't quite bear to let go.

Ironically, perhaps, that attention to detail can be a little irksome at times, emphasising every little finger scratch on Rice's guitar playing to an almost distracting degree. However, the rich backing timbres and Rice's own voice are so affecting that they overcome the flaws in the recording.

It's inevitable, when listening to music on a computer, that you'll come across lower resolution formats online, but the S2 Digital acquits itself well here too. It was able to hang on the deep bass when listening to 'Shadow Journal' on Spotify – streaming at a mere 160kbps – albeit with a less tightly focused sound, as you might expect.

Of course, headphones aren't the only option when using the S2 Digital. The UK distributors at Henley Designs admit that the S2 Digital isn't really intended for use as a preamp with your primary hi-fi set-up, but it did still make a noticeable difference when used with some

of the (relatively) high-end desktop speakers that I use with my office computer. With Westlake's pre-Pro-Ject, pre-Audiolab tenure at Cambridge Audio in mind, I used the unit's RCA connectors to hook it up to my Cambridge Air 200 speakers whose built-in subwoofer really benefited from the extra reach of the S2 Digital.

In fact, the bass on 'Shadow Journal' now clearly stretched the Air 200 to its limits, and I could almost hear the compact cabinet straining at the seams to contain the sound. Switch to something a little less apocalyptic and the bass line on Blondie's 'Rapture', from the 1998 compilation *The Very Best Of Blondie* [EMI 7243 4 99288 2 4], bounced along like a playful puppy, overcoming its tendency to get lost in the mix.

Results with the Thomas Tallis were less dramatic, but with the aid of the S2 Digital the Air 200 did manage to retain much of the vocal clarity that I could hear on my headphones, and created a more dynamic, spacious sound than it normally manages. Clearly, even as an interim DAC/preamp, the S2 Digital can still provide a genuinely attractive audio upgrade, both with 'phones and with a decent set of desktop speakers that you might use with your computer. ☺

HI-FI NEWS VERDICT

Pro-Ject's Pre Box S2 Digital offers a wealth of audiophile tweakery but its emphasis on USB ties it primarily – but not exclusively – to desktop and laptop PCs. On the other hand, USB hook-up means the S2 is still a *portable* option for laptop users, and it doesn't need a battery. For the price, its sound performance is impeccable, combining clarity and precision with an attractive warmth and impressive sense of space.

Sound Quality: 85%

