

USB 2.0 High-Speed Isolator

Review by Srajan Ebaen of 6moons.com

Country of origin:	Germany
Reviewer:	Srajan Ebaen
Sources:	Retina 5K 27" iMac (4GHz quad-core with Turbo boost, 32GB RAM, 3TB FusionDrive, OSX Yosemite, iTunes 12.2), PureMusic 3.02, Qobuz Hifi, Tidal Hifi, Fore Audio DAISY1, COS Engineering D1, Aqua Hifi La Scala MkII, AURALiC Vega, Aqua Hifi Formula [on review], Resonessence Veritas
Preamplifier:	Nagra Jazz, Esoteric C-03, Vinnie Rossi LIO (DHT module)
Power & integrated amplifiers:	Pass Labs XA30.8; FirstWatt SIT1, F5, F6; Crayon Audio CFA-1.2; Goldmund Job 225; Gato Audio DIA-250; Aura Note Premier; Wyred4Sound mINT; AURALiC Merak
Loudspeakers:	Albedo Audio Aptica; Sounddeco Sigma 2; EnigmAcoustics Mythology M1; Soundkaos Wave 40; Boenicke Audio W5; Zu Audio Druid MkV & Submission; German Physiks HRS-120; Eversound Essence, Boenicke W11
Cables:	Complete loom of Zu Event; KingRex uArt, Zu and LightHarmonic LightSpeed double-header USB cables; Tombo Trøn S/PDIF; van den Hul AES/EBU; AudioQuest Diamond glass-fibre Toslink; Black Cat Cable redlevel Lupo; Arkana Research XLR/RCA and speaker cables
Power delivery:	Vibex Granada/Alhambra on all components
Equipment rack:	Artesania Audio Exoteryc double-wide 3-tier with optional glass shelves, Krion amp stands
Sundry accessories:	Acoustic System resonators, Verictum Silver X block on preamp and amplifier
Room:	Rectangular 5.5 x 15m open floor plan with two-storey gabled ceiling, wood-sleeved steel trusses and stone-over-concrete flooring
Review component retail:	€240 [incl.19% VAT] standard, €344 [incl. 19% VAT] industrial



Intona USB 2.0 Hi-Speed Isolator 7054, 7054-X-DK and bare pcb

Uncertain shaky biz. USB for short? Ha! That'd overreach. But it's certainly true that of late, the USB interface has been under heavy attack from a glut of black boxes whose users claim very audible improvements. What does that say about raw USB? Intona Technology GmbH from Germany would probably quip that it may be cleaned up. Their USB Isolator comes in standard and heavy-duty versions. It's meant for industrial automation systems, measurement devices, environments requiring safety insulation, machine protection, broadcast and studio and all applications that rely on clean and stable USB connections with separate grounds. If your inner hifi freak felt left out, here is the company's Sven Beck. "Our first real Hi-Speed Isolator for USB 2.0 gives huge benefits to audiophile-grade home systems." It's simplicity itself. In goes the USB feed from your computer, out comes the now galvanically isolated reclocked repacked DAC feed regardless of transmission speed.

If you've already read the tea leaves to think that our smartly called Intona was not originally developed for audio, spot on. It wasn't. It came about as an antidote to noise plaguing laboratory and industrial environments where clean measurements had to reach deep into the nanovolts domain. This mandate on required noise attenuation instantly nixed any external SMPS. Instead it led to a USB-powered design. The industrial version of the German isolator has higher-spec'd parts and at 2.5KV the higher isolation resistance (the standard box is rated for 1KV). Because Intona had previously worked on pro audio mixing consoles, they claim to have paid special attention to the frequency range which concerns our audiophile tribe. In short, the Intona operates as a receiver, isolator, reclocker and repacker. It uses buffers, a ULPI transceiver, field-programmable gate array logic on two Spartan chips, minimum-capacitance Silicon Labs Si8660 digital isolators, spread spectrum tech to eliminate 8kHz packet noise, a DC/DC converter and an Analog Devices linear regulator. If you want to get even nittier and grittier on the tech, download the firm's data sheet. And yes, you'll need two USB cables, one coming in, one going out. Whether the first one—between PC/Mac and Intona—can be a 'nasty' generic since the important stuff happens past it is a good question. It's something I'd have to try. Either way, drivers aren't required. Whilst USB of course claims to be plug'n'play yet is so susceptible to widely reported improvements from reclockers or ground isolators, the Intona means to really be plug'n'play. Which won't prevent the nuttiest of our tribe from slaving multiple Intonas (or their brothers from another mother) in series to get even mo betta. Fear not. Your scribe won't.

From the previous page, the thinking reader recognized a living truth. Concern over USB-transferred noise is far from exclusive to our communal imagination-added audiophilia nervosa. Hi-tech labs which rely on measurements not polluted by computer-generated noise sweat the very same issue. Which reminds me of how I first learnt of the Vibex powerline cleaners from Spain's Cliff

Ormand. Nagra's sales & marketing manager Matthieu La-tour hipped me to them. He discovered them when their R&D department complained about their resident Swiss power delivery. It was too noisy. It interfered with their test gear. They couldn't see deeply enough into the noise floor to make important design decisions. Back to Intona, their original focus on industrial applications sidesteps the realm of imaginary diseases and their equally imaginary cures. Forget unscrupulous tech quacks who exploit our collective audiophile ignorance and real desire for better sound. The problem of noise contamination which migrates across the USB pipeline from our computers is very real. It can be measured. Whether that means you can hear it when that noise is removed; and whether you deem the improvement or change worth the associated expense... that's on a whole nutha page.

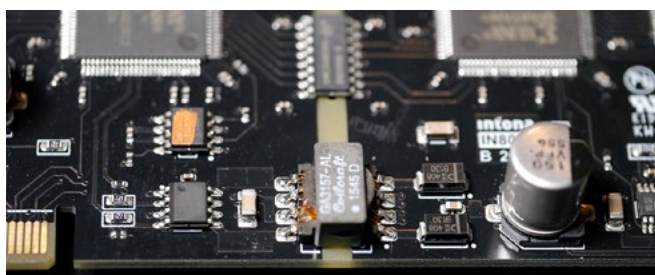


Two discrete PCB joined only by digital isolators to "cut the cord" between computer and DAC. Even visually the "dual everything" concept makes sense.

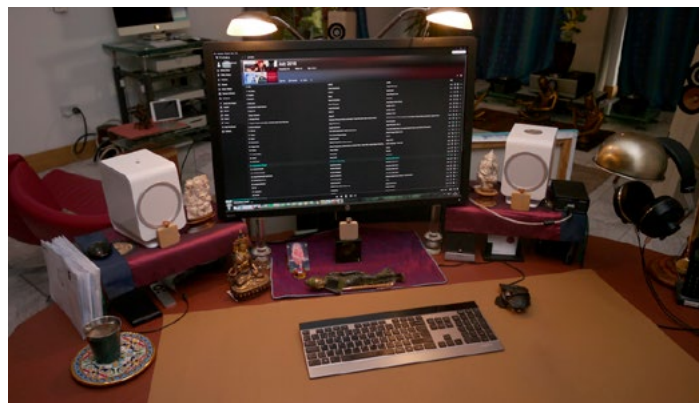
The thinking reader—hey, those do exist!—also wonders. Why is it that our audio designers at large seem incapable of building Intona-type solutions into their/our DACs? Why do we need external fixers? At what sell prices for D/A converters should we insist on total immunity to such aftermarket add-ons? It doesn't seem right that after years of USB Audio, our high-performance segment remains caught out as improvable by sub €500 USB isolators, reclockers and sundry doodads. Doesn't that make your blood boil?

One certainly expects that as DAC prices go up, the degree of improvements possible from Intona types diminishes to eventually matter naught. And, one expects that even betterment in the lower ranges occurs in the small-percentile range - far removed from upgrading speakers or amplifiers. But after the basics are sorted, the high-end pursuit soon does become one of incremental hard-won gains not dissimilar to Olympic wins of fractions of a second. Whilst a swimmer touching the last lane's stop by half a finger's reach sooner than a competitor seems little to brag about after doing so many lanes, it's often the difference between gold and silver medals. Given my assortment of DACs, by how much could the Intona secure a lead if at all?

Plasticity. Where Intona minimize annoyance over the inherent pimp-my-costly-DAC prospect is forgoing casing bling. Hifi can be notorious for style over substance. Last century's guts may repack in glam threads. Likely because Intona's first customers were laboratories and industrial safety apps, their plastic cases bypass all bling pretensions. Remembering that in hifi, the case is routinely the costliest part, Intona would seem to go straight for performance. Even posh hifi customers won't care. As a USB Isolator, this box should end up behind their DAC out of sight and mind. And unlike the wall-wart brigade with their cheesy Chinese switch-mode supplies which inject the power line with HF noise, the Intona neither creates such noise nor eats up yet another power socket. By the same token, it can't be upgraded with a linear power supply to drive up cost and complexity. Whilst its mere existence might still irk reasonable people because it wags a finger at our USB DACs, at least the degree of irk is contained including the price. Given the type of percentage-chasing hifi user who'll be most interested, at a fraction of the cost of their designer power cords, Intona's sticker is low. For a final intonal blessing by an imaginary hifi pope, consider Dennis Morecroft's research on the ill effects of metal casings on audio circuit performance. His DNM Design brand has long since championed acrylic boxes. Along his line of reasoning, today's USB Isolator might actually work better for sitting inside a cheap plastic box than costlier metal cage. Which about covers all the introductory angles I can think of. Time to audition!



Act One. My work desk emphasizes work. That's a multi-tasking circle jerk. At any one time, my HP Workstation Z230 will co-host Photoshop, DreamWeaver, Adobe PDF reader, Word, IpSwitch, Opera, Internet Explorer, Chrome, Outlook, the SD card reader, MalwareBytes and other security services plus Tidal or Qobuz. This runs massively paralleled threads and processes to load down the CPU. It's the antithesis of the music-only server/renderer which, whilst still a computer in disguise, runs nothing but playback-specific programs with hardware tweaked for just audio. In short, it's an infected breeding ground for compromised USB audio. Or so the propaganda claims. Of course if things did sound too swell, I might get no work done. But to test the Intona, work would mean critical listening on the desktop for a change. This made it the perfect real-world test bed. It runs the Swiss Eversound Essence active speakers which since were rebranded Feniks Audio to now sell direct. Their Polish designer commissioned his 24/96 USB DAC, pre-amp and headphone amp from PCfi's god father Gordon



Rankin. ICEpower runs a custom 4.5" coaxial in a compact precision-cast aluminium enclosure whose port fires down into an integral plinth. Until KEF's launch of the LS50 Wireless—which I haven't heard yet—the Essence was the highest-performing dedicated desktop speaker I'd come across. At its original £2760/pr price, it'd better have been. Think small, pretty and wow. The usual USB cable here is a 50cm Curious. For the second, enter not oxycodon but the oxymoron of an upscale generic: a clear plastic jobbie with braided silver shield and two small ferrite clamps. It's what local mass merchants hawking computers, printers, cellphones, hifi, TV, washers, dryers, shavers and kitchen appliances call their best option. It's two steps up from a freebie throwaway packed with a new printer. But propaganda still sees it as an amoeba to humans on the evolutionary ladder of proper audio USB cables. I'd swap cable positions to track impact. Music source was my Tidal subscription to stream 16/44.1 from a personal playlist; and a few RedBook-and-higher files stored on the HP and processed via J.River Media Centre for just these occasional desktop kit reviews.

Very *demonstrably*, the Intona removed splashiness, etch and glare. Think of those as constant spittle flying off a singer's lips rendered in macro closeup. You really don't want to see that. Yet with typical close-mic'd productions, that's quite routine. One hears this spittle-like effect coming off plucked strings, plosives, transients in general. It sizzles like an image oversharpened in Photoshop. Not only are edges in crisper relief, one begins to see 'noise' surrounding items as pixel flecks that shouldn't be there. By simply pausing Tidal and reseating cables—and when the Intona was in the loop, waiting for the signal lock lights to stop flashing—I could contrast with/without in seconds. Without doubt, the Intona removed that pixilated noise. This improved the quality of tone which no longer suffered the injection of whitish nervy hash. It became richer and calmer and a certain hollowness filled out. If you imagine it without loss of detail, it'd move a microphone away a bit from a string instrument's bridge or a singer's lips to not highlight the spitty metallic bits. This away-moving effect—really, the elimination of artificial glare—shifted tonal emphasis a bit more on the bloom than rise portion. Subjectively, the music felt weightier and more relaxed. An unnatural hype or striation which only newbies would mistake for higher resolution had been bled out.



A green square indicator on each end of the Intona confirms signal lock when steady; and no lock when blinking.

This effect became even more pronounced when the better Curious cable connected the Intona's output to the Essence DAC's input. If your two cables are of different quality, the better one should tap the DAC not computer. Don't know which the better cable is? This A/B might just settle it. So, Act One ended in a standing ovation. For €344, my inner hifi accountant called it a most worthwhile upgrade. Would the victory lap extend to the big rig?

Acts Two - Four. In the main system, the Intona fed a number of converters which supplied analog to the Pass Labs HPA-1 preamp which fed the Pass Labs XA30.8 power amp which drove a pair of Boenicke W11. The first DAC on deck was Aqua's Formula. It's a flagship discrete R2R affair which seemed blessedly intona deaf. As a €13'800 formula, that would have fit. Repeat A/Bs simply teased out that the same changes still factored if admittedly at lesser magnitude. That was but a small relief given how a statement converter could still be pimped. If I had to sum up what the isolator did for this setup, I'd pick juicier as though a colour saturation slider had been moved up a notch or two. My inner judge wasn't happy but the ears insisted: the German plastic box still was in business. I prepped for more beatings of audiophile pride. In moved the new \$2'850 Resonessence Veritas. Same difference. Despite ESS Tech's claims that their Sabre chips are jitter immune, the audible evidence disagreed. Needless to say, this also applied to the €3'300 AURALiC Vega which runs on the earlier ES9018 where the Veritas goes ES9028Pro. The sad upshot? Price wasn't exclusionary. None of my digital kit was immune to the Intona's charms. Audibility of its inclusion increased with poorly recorded (overcooked) software where the removal of etch was more readily apparent that just the increase in tone saturation on premium productions. At first that was harder to spot until I knew where to look. Then it was plain. Score 4:0 for the German.

Intona-tion. Beginner's talk focuses on quantity. More treble, more bass, more SPL stability. As we grow into more sophisticated listeners, we learn of areas beyond basic more-ness. Some of those deal in gestalt. The quantitative basics don't change. Still, there's a difference we care

about, be it in feel, flavour, lighting or mood. The music might feel more driven or chilled; drier or wetter; firmer or softer; aloof or enveloping. Different listeners use different descriptors; or key into different aspects of a shift. Eventually one might mature into favouring naturalness over all else. If one hears naturalness as an absence of artifice aka reminders of playback tech, that's when words tend to fail. Instead of saying what naturalness is, one defines it by what it isn't. The implication is that once we strip away the false or artificial, what remains can't be described as such. It just is. Once I moved the Intona from desktop to main rig, that's the realm in which it operated. The music sounded more natural. Despite being a soft term like 'musical', it's the road one now travels, leaving the basics as sorted and in the rearview mirror. Beyond the desktop, this became the stuff not very obvious during quicker swaps. It relied on sinking fully into the music and inspecting the experience; how the experiencer responded to it.



When USB improvements talk of noise reduction, it's not about transformer hum, ground loop buzz or slightly hissy tweeters that betray power supply noise. It's not about hearing anything during pause. It's about the effects the interference of noise has on specific processes. The mantra "work smarter not harder" implies better results when a certain stress lifts. This would seem to apply to USB audio as well. The injection of computer-generated electrical noise migrating across the USB ground connection adds stress to the hardware responsible for the conversion process. Why that should be audible is for the proper engineers to sort. That it is audible even subjectivists can determine. Invoking lower "audible stress" isn't just a cute extension of the tech reasons. So, the Intona 7054 USB Hi-Speed Isolator is a no-nonsense little box. It does exactly what it says; at the highest potency I've yet heard from its type. All that remains is wishing that DAC makers started to license Intona's tech to build this small circuit board into their machines. Being most unlikely of course, the second best thing is adding an Intona to what we already own. On the cost versus effectiveness scale, it's actually a steal. As such, it remains on my desktop. Working smarter not harder might just mean listening to better-sounding tunes? Cheers to German engineering!

Srajan Ebaen