

SPDIF iPurifier2

Restore the balance.



S/PDIF. A short history.

Everything started in the second half of the 1980s when the Sony/Philips Digital Interface (S/PDIF) entered the audio-visual scene. This new interface was designed to transport digital audio data from and to hi-fi components in a single-channel module, utilising encoding via a bi-phase-mark data stream. S/PDIF transmits data in frames, so that the elements of the bit-stream could be better identified.

Back then, as one of the first interfaces transmitting a digital signal available for consumer and professional markets, S/PDIF enjoyed significant success. Fast-forward to today and S/PDIF remains a default connection type for sources such as Apple TV, Google Chromecast, PS4, Xbox or your CD transport. Another reason behind this standard's enduring popularity is a lack of an electrical connection between a transmitter and receiver, which prevents ground loops.

However, establishing a closer relationship with this interface, comes at a cost. Timing accuracy (or should we say inaccuracy) often detracts from the S/PDIF experience. Jitter as the parameter of timing inaccuracy is what impacts the data stream the most.

Jitter. What complications does it carry?

Jitter is the degradation of the audio signal when converting from analogue to digital and vice versa. Jitter is an audible deviation of the signal on the time spectrum, between the time when an event occurs and when it should take place. It affects data and clock signals, and if left unmitigated, it then manifests itself in a significantly lower audio quality.

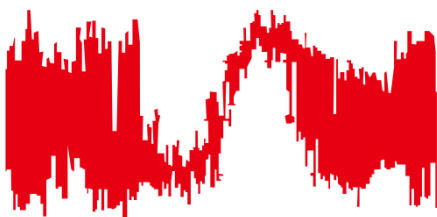
Jitter causes deficiencies in two audio domains; conversion and digital interference. When the audio conversion is exposed to this phenomenon, sampling jitter may induce errors, distortion and noise, whereas data corruption and loss of lock are a result of the digital interference. These obstacles turn an audiophile experience into an empty promise.

iFi audio. How do we solve the jitter issue?

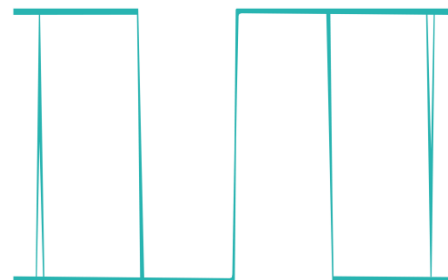
After nearly four decades of research experience by our Chief Designer Thorsten Loesch, iFi audio created an elegant and highly effective solution to eliminate jitter once and for all - the SPDIF iPurifier2. This petite accessory is here to stamp out S/PDIF jitter, fully restore the compromised signal's integrity, rejuvenate sound quality, and create an increased warmth, depth and dynamic contrast.

SPDIF iPurifier2 challenges jitter on four levels:

- 1) Reclocks with the 10MHz Global Master Femto Clock – lower jitter
- 2) Regenerates with the full galvanic isolation of the source device from the DAC – lower jitter
- 3) Restores with the reduction of the ambient and power-related electromagnetic interference – lower jitter
- 4) Revitalises with the ultra-clean iPower supply – lower jitter



Before



After

Design Highlights

10MHz Global Master Timing clock

When an audio source transmits the signal, the receiver should know when every sample arrives. A word clock is necessary to perform it correctly. S/PDIF carries an embedded word clock signal within the digital data, which allows a receiver to match the clock with the source and interpret data correctly. Sadly, that enclosed clock information can be of low quality or degraded by physical properties of a cable in the pipeline. Even the tiniest frequency difference of 1ppm may translate into a complete disaster when sending heavy files.

At the heart of SPDIF iPurifier2 lays 10MHz Global Master Timing clock, which allows for full signal reclocking. This superior Femto clock regenerates a stable, high-quality signal coming from a source device. Thanks to restored timing integrity the signal delivered to a receiver is not degraded by physical properties of a source product or a cable in-between. It also serves as an internal buffer to perfectly time the bitstream.



Galvanic Isolation

The optical/Toslink input boasts the premium galvanic-isolation technology, where electrical circuits are separated to eliminate stray currents. Audio signals can pass between galvanically isolated circuits to block i.e. differences in ground potential or currents induced by AC power.



Gold-plated copper EMI/RFI shielding

To enhance the audiophile experience, SPDIF iPurifier2 features for the first time the gold-plated copper EMI/RFI shielding, as found in the top-notch audio products. Electromagnetic interferences (EMI) in the audio range manifest themselves from signal distortion to a complete data loss and system failure. SPDIF iPurifier2's shielding provides adequate protection against the ambient electromagnetic fields in the radio frequency (RFI) spectrum (the part of the electromagnetic spectrum from 3 kHz to 300 GHz), significantly reducing the





compounded electrical noise. Moreover, it guarantees full resistance to corrosion or oxidation, so that you can easily bequeath this little genius to your grandkids in a few decades.

'Quieter than battery' with the ultra-clean iPower 5V

iFi audio SPDIF iPurifier2 demands the ultimate power supply. We can optionally upgrade your regular switch-mode wall-wart PSU to our own iPower 5V. It will feed your system's circuits with clean, audiophile-grade power and address issues at both the output and input stages. The iPower uses 'Active Noise Cancellation' to cancel all incoming EMI/RFI noise. It is at least 10x quieter when compared to our previous power adapters, 20x quieter than audiophile linear power supplies and up to 1000x quieter than standard SMPS wall adapters.



Tantalum capacitors

Four large tantalum capacitors (100 uF) reduce the EMI interference even further by improving the power supply signal. This is due to their very thin and relatively high permittivity dielectric layer. These components have gained significant recognition in audiophile circles. Tantalum capacitors also set themselves apart from their ordinary electrolytic counterparts by having high capacitance per volume (high volumetric efficiency).



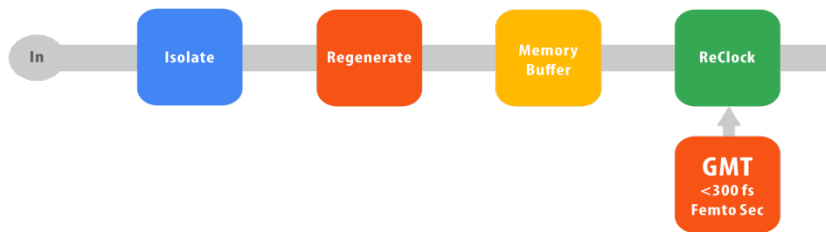
Bit Perfect

iFi audio SPDIF iPurifier2 employs 'Bit Perfect' technology, hence it doesn't involve the over/upsampling of the signal. In other words, we appreciate the natural palette of sounds, which is why we purposely avoid digital processing. Both PCM and DSD signals are not altered in any way. In case of PCM stream, this approach is effectively called 'non-oversampling' or 'zero-oversampling', whereas for DSD it means that data retains its original format and is directly converted to analogue. The SPDIF iPurifier2 is compatible with MQA, DTS, Dolby Digital and DoP (DSD) signals and offers full HD support up to 192kHz.



MCU firmware

The top-notch logical microcircuit designed by our programmers speeds up the processes of incoming data readout and monitoring the current data stream. In addition, the circuit generates a package of outgoing information through reclocking, regenerating and restoring the data stream., finally sending the outgoing stream in a consistent format.



Simply elegant design & sturdy built

SPDIF iPurifier2 is packed with the latest generation of audiophile-grade components, including two separate PCBs, each loaded with an advanced technology trickled-down from AMR's multi-thousand-dollar DP-777SE DAC/preamp. This standalone, petite device plugs directly into either coaxial or Toslink inputs (via the supplied optical fly-lead and mini-Toslink adaptors) of the receiving device. Both sockets adhere to 75Ω for optimum connectivity.

The SPDIF iPurifier2 removes jitter and means your audio system will give you even more enjoyment out of your music – all at a very wallet-friendly price.





SPDIF iPurifier2

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About iFi

iFi audio is part of AGL and is headquartered in Southport, UK. It owns the hifi brand Abbingdon Music Research (AMR). They respectively design and manufacture portable and desktop 'ultra-fidelity' audio products and high-end audio 'home-based' components. The combined in-house hardware and software development team enables iFi audio and AMR to bring to market advanced audio products.