

# ElectroTos

Info



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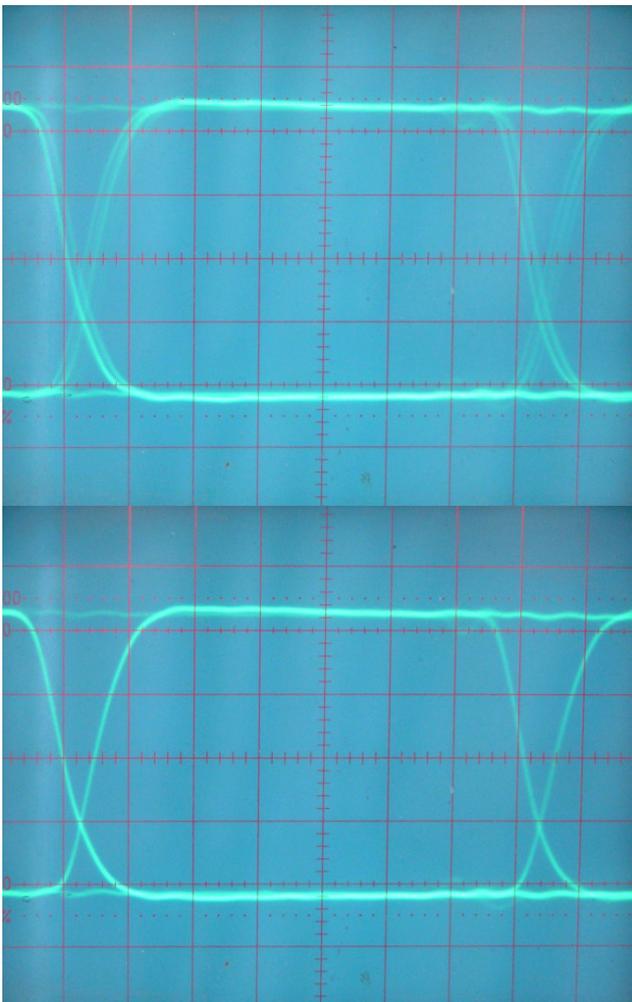
## New digital audio interface and protocol

Backwards compatible with Toslink interface and S/PDIF protocol. Our new electro-optical digital audio interface and low jitter protocol eliminates -unwanted- jitter in digital audio source, digital audio interlink, and all DAC circuits even when significant crosstalk is present. It has to be generated directly by software (UPL96ETL and U192ETL).

This new digital audio interface maintains low noise and low jitter. It can be used to improve the sound quality of all existing Toslink DACs. The transmitter side (digital audio source) is connected to a coaxial cable through a RCA connector. At the end of the coaxial cable there is an optical connector compatible with the Toslink input on the DAC. So this is a combination of an electrical interface (low jitter) and an optical interface (low noise, elimination of ground loops). The required signal level is higher compared to existing coaxial S/PDIF interlinks, so a suitable translator or source are required. We offer a USB to ElectroTos translator and a very clean USB memory stick-based player that outputs ElectroTos. ElectroTos can operate with standard S/PDIF protocol (compatible with existing DACs), or it can be set to ElectroTos low jitter protocol for elimination of unwanted jitter. ElectroTos protocol only works with our new Fractal DAC. The low jitter protocol has to be generated directly by software in order to be effective.

# Measurements

Below you can see two oscilloscope screen captures.



This measurement compares a high quality Toslink interlink (top) and the new ElectroTos interlink (bottom). The signal is measured inside the DAC at the Toslink optical receiver chip output. sample rate equals 96 KHz, standard S/PDIF protocol. The Toslink optical fibre interlink causes time distortion (jitter). This is visible as unsharp and not clearly defined vertical green lines (X-shape on this picture). This Toslink jitter problem is well known.

The new ElectroTos interlink offers significantly lower time distortion (jitter). This is visible as sharp, clearly defined vertical lines (X-shape in this picture). Good coaxial S/PDIF interfaces can offer similar low jitter, but fail to block RF ground loop noise and very large bandwidth noise in general.

ElectroTos offers low jitter, blocks RF ground loop noise and offers a clean, band-limited output signal.

Time distortion (jitter) cannot be fully blocked inside the DAC as we have no perfect circuits. So as long as jitter is allowed to enter a DAC, its effects, however small, always remain audible. It is important to know that time distortion (jitter) comes in 3 major types:

- 1) Random jitter, this can be compared with noise.
- 2) Periodic jitter, this can be compared with tones or repeating signal patterns.
- 3) Deterministic jitter, this can be compared with complex non-random signals like music or digital audio data (information).

Number 3 causes most audible degrading by far, so it makes most sense to tackle this type of jitter in particular.

The combination of both, ElectroTos low jitter protocol and the fundamentally different DA96ETF fractal multi-pattern DAC design, ensure close to zero deterministic jitter levels.