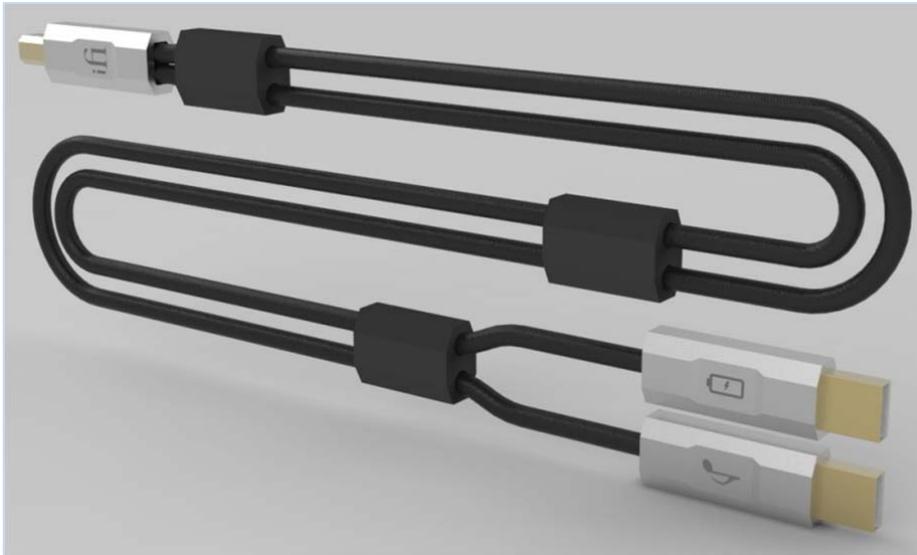


By Thorsten Loesch

iFi Gemini Dual-Headed USB Cable

London, U.K. – 31st December 2012



FEATURES

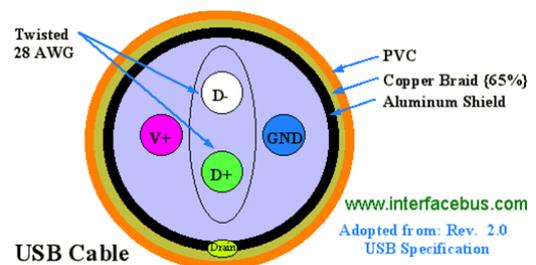
- Dual-Headed (Gemini) connection USB design
- Asymmetric Ground return and power line design (3 time more ground area)*
- Adjustable RF Filter to tune cable to environment*
- Multiple RF filters*
- Heavy OFHC continues cast copper (up to 5A)
- Double shields with different effective range
- Custom PE insulation

*: iFi exclusive, world first.

DESIGN

[What's wrong with the current USB cable design for audio use?](#)

Many cables combine power and data into a single cable, causing crosstalk between power and data (1).



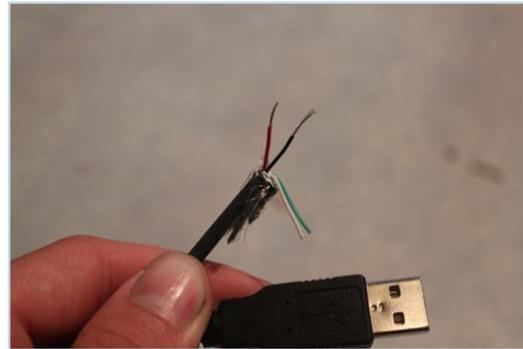
IFI SOLUTION

The key of course is the “twin connection” design. It separates the signal ground from power ground and shields the signal and power connections from each other. Combined with the design of the iUSB Power this separation of signal and power is taken to the absolute maximum.

CONDUCTORS

[What’s wrong with the conductors inside with the common USB cable?](#)

The cables used are thin, grounds have low cross-section causing poor ground connections, generic copper increases resistance and noise. Imperfect impedance matching is found with many cables and this makes operation at high sample rates unreliable (1, 2).



IFI SOLUTION

The signal connections use 2 gauge (appx. 150%) heavier OFHC continuous cast copper, with the geometry adjusted to keep the correct impedance. We also have very stringent requirements for impedance tolerance, much narrower than the USB 2.0 standard allows.

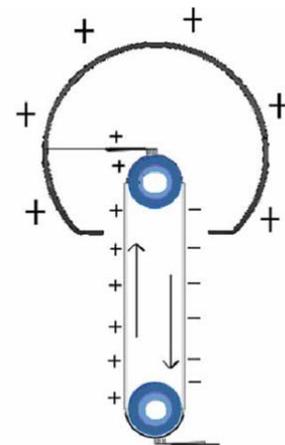
For grounds and power lines we have 5 gauge (appx. 300%) heavier pure copper connections than common. Keeping cable resistances low, this allows for excellent power delivery to the USB audio device from our iUSB Power. The iFi Gemini Dual Headed USB Cable cuts power supply resistance in the USB link threefold compared to “textbook spec” cable!

INSULATION

[What’s wrong with the insulation used within the common USB cable?](#)

Common cables use PVC insulation. PVC not only has poor dielectric behavior, the softeners in the plastic can also cause the copper in the cable to oxidise... PVC is very cheap to make though.

Some claim that Teflon® insulation is the non plus ultra of isolators. Yet combined with the metal conductors in cables it causes triboelectric discharges often into the tens of millivolts creating high frequency interference (3,4).



IFI SOLUTION

Instead we combined PE insulation with the copper conductors; PE and copper combine to produce some of the lowest triboelectric discharges in cables available today. (3)

SHIELDING

[What's wrong with the shielding on the common USB cable?](#)

Often only one shield is used; aluminum metalized foil is commonly used instead of copper shield.

IFI SOLUTION

Dual heavy shielding, use of both aluminum foil and copper braid shields, each work for different frequency range and the best shielding ever.

We also employed custom designed metal connectors (not just for looks) to provide impeccable shielding from end to end.

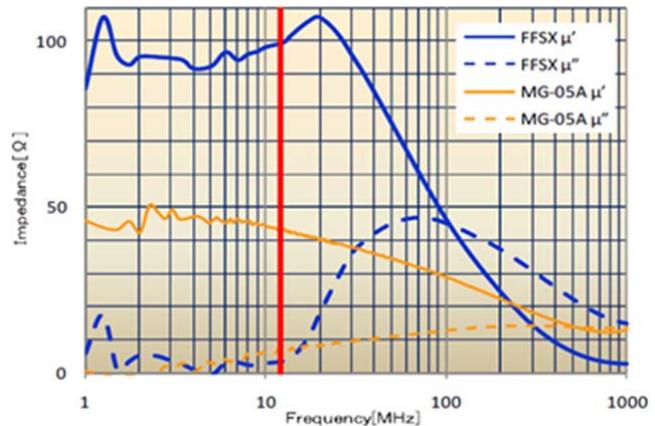
RF FILTERING

[What's wrong with the RF filtering on the common USB cable?](#)

Often RF filtering is non-existent, even if filters are fitted, working over too narrow a range, too few are fitted and commonly RFI filtering is placed at the ends of the cables, leaving the whole length of the cable to act as effective antennae (5).

IFI SOLUTION

We fit multiple filters all with a different effective range. Further the middle filter may be adjusted (moved along the length), to “detune” the antennae formed by the cable.



FINAL WORDS

All this means our Gemini Dual Headed USB Cable objectively produces much improved results for power and data transmission via USB.

How does it sound?

Well, once you try such an optimised and proper USB cable design (i.e. iFi Gemini Dual Headed USB cable), you realise just how much compromise generic and other so-called audiophile USB cables bring to the system.

Perfect match with the iUSB Power

The iFi iUSB Power's Super-Regulator not only has super low noise, but also super low output impedance (around 0.00015 Ohm at 1KHz, as low as 0.00003Ohm at 100Hz to DC !).

It would be a shame to degrade this with generic cables, the iFi Gemini Dual Headed USB Cable cuts power supply resistance in the USB link threefold! This allows as much as possible of the extremely low output impedance of the iUSB Power to be delivered to your USB audio device, rather than being degraded by substandard wire.

Welcome to better Computer Audio playback by iFi.

REFERENCES

- 1) Universal Serial Bus Specification (http://www.gaw.ru/pdf/interface/usb/usb_2.0_english.pdf)
- 2) Sound on Sound - Solving Computer Audio Problems (<http://www.soundonsound.com/sos/nov04/articles/computerproblems.htm>)
- 3) The TriboElectric Series – AlphaLab Inc. (<http://www.trifield.com/content/tribo-electric-series/>)
- 4) Micro Discharges of the Interface – Dr. Pierre Henri Raymond Johannet EDF – Presentation Notes (personal archive)
- 5) RFI, Unintentional Antennas and Ferrites (<http://audiosystemsgroup.com/RFIHamNCCC.pdf>)



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