Tech Notes

Southport, UK – April 2018
xDSD

xDSD – Measuring Time!

MQA vs non-MQA streams – how iFi does it.

This official iFi audio tech release is here to explain one thing and one thing only:

MQA and non-MQA streams are very much alike!

We're here to show that firmware 5.3 does not change behavior of a DAC with non-MQA signals.

And we like our non-MQA signals unchanged.

The marketing department requested we share our measurements to illustrate that for non-MQA signals there is no audible difference in audio signals output between firmware versions 5.20 and 5.30. Currently, there is no agreed standard measurement that has been correlated with audible differences. Hence, we elected to perform a set of basic tests for ourselves as described below.

We feel our work below illustrates that electrically the test signals used are handled identically by both firmware versions; 5.20 and 5.30. As we also have access to internal firmware test versions that implement upsampling for all sample rates, though not actually using an MQA filter but our own proprietary experimental filter, we elected to show what the result WOULD BE, if (as has been queried) MQA processing was applied to all audio signals.

METHODOLOGY:

1. We selected a random micro iDSD Black Label from the units available in R&D.

2. The unit was set to Eco Mode, Positive Polarity and direct output.

3. The unit's RCA outputs were connected to our Audio Precision System 2 model 2322.

4. Rigol DS2302A 300MHz oscilloscope was connected to the System 2's monitoring outputs to capture a precise waveform reading to digital files.

5. The USB input was connected to the PC hosting the System 2.

6. The iFi Driver Version 2.26 was used, in order to support the System 2 this PC operates Windows XP SP3.

7. Wavegene V1.5 by efu was used as digital signal generator, using ASIO sound subsystem.

8. White noise at 44.1kHz sample rate and 24Bit word length was used as test signals. This clearly illustrates the actual shapes of the digital filters. This method was popularised by John Atkinson of Stereophile and originates with Jürgen Reis of MBL, in which the device under test decodes 44.1kHz data representing white noise. Additionally, an FFT of a -3dB 1kHz sinewave was performed. For contrast and to minimize time spent testing only standard and Bitperfect digital filters were tested.

9. All settings in System 2 were unchanged, the only change was which version firmware was flashed onto the micro iDSD Black Label.

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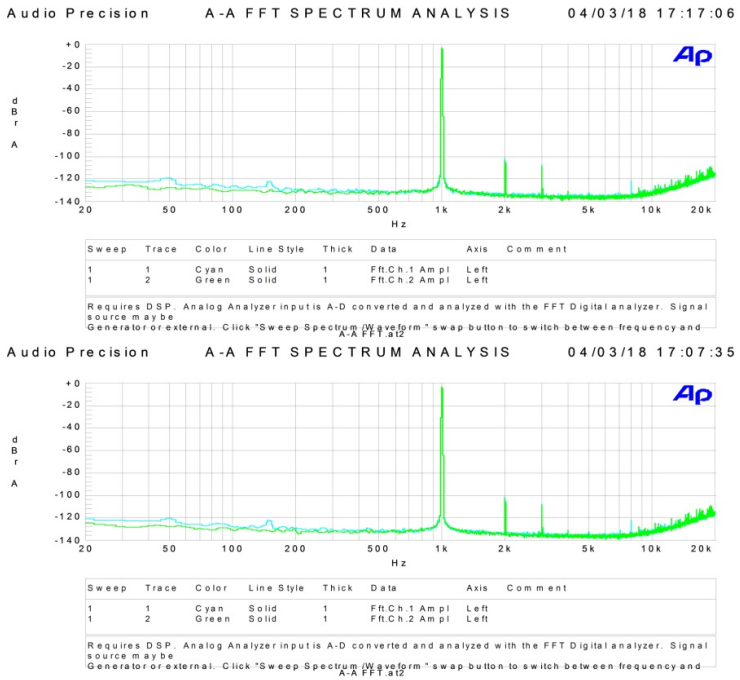
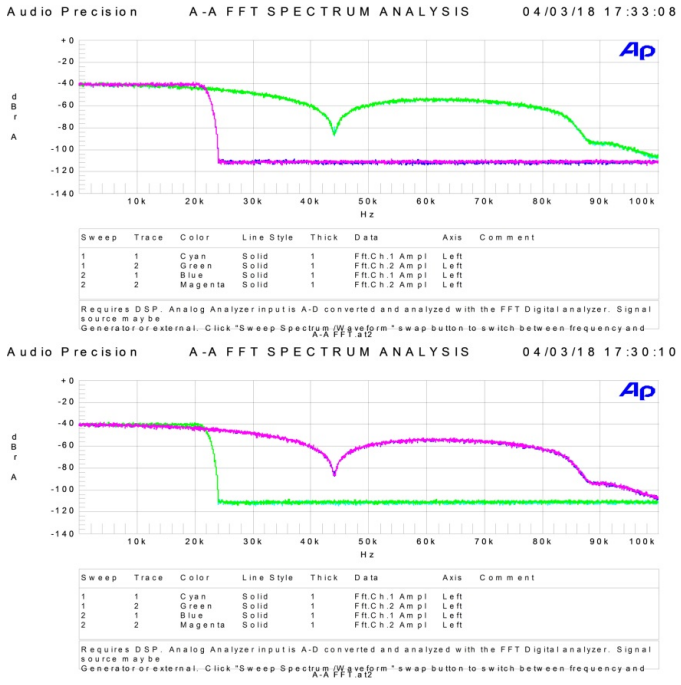
Below we present each set of graphs side by side, version 5.2 (left screen) and version 5.3 (right screen).

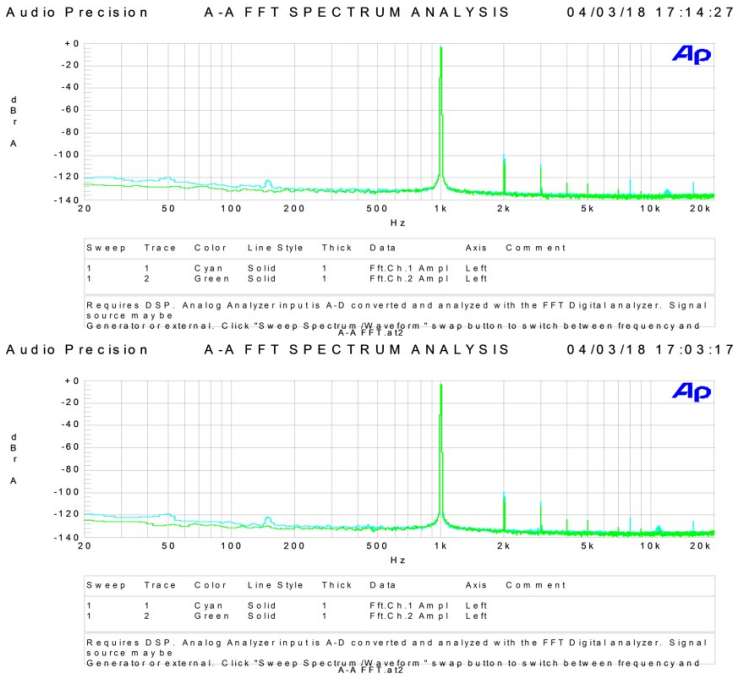
- *BitPerfect*



- *Filter response: Standard vs Bitperfect*

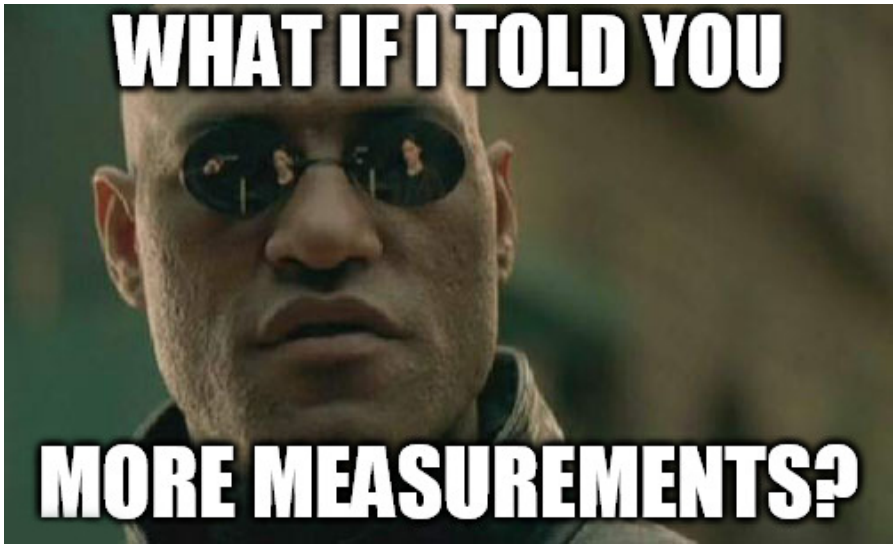


- *Standard*



No measurements for MQA streams are presented as we have no MQA encoded test signals available to us.

It can be observed that the audio output for non-MQA signals is identical between 5.20 and 5.30 firmware within the limits of the test setup. We conclude that there is no measurable difference between the ways audio signals are handled in case of both versions. There are no differences in levels, noise-floor, distortion or digital filter responses.



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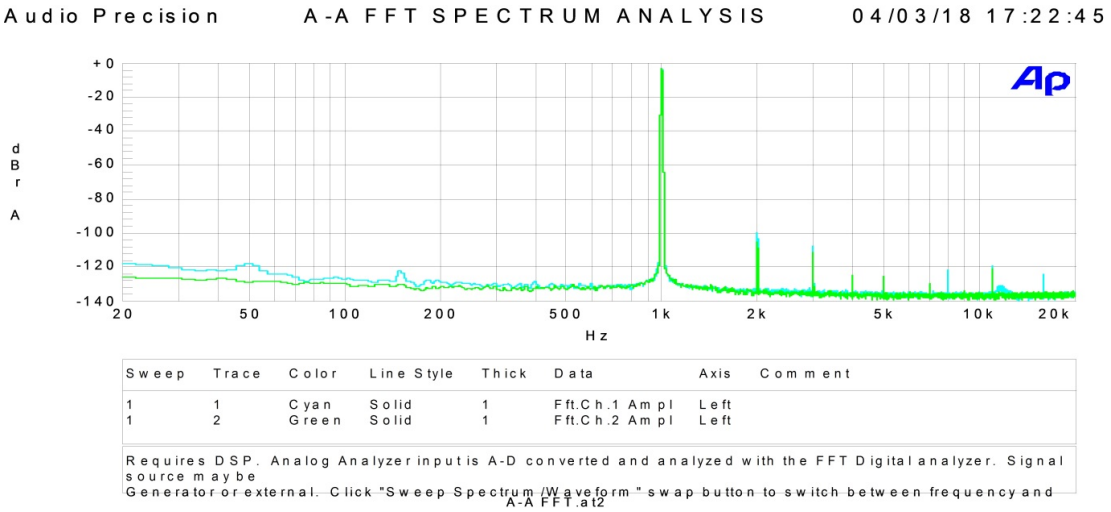
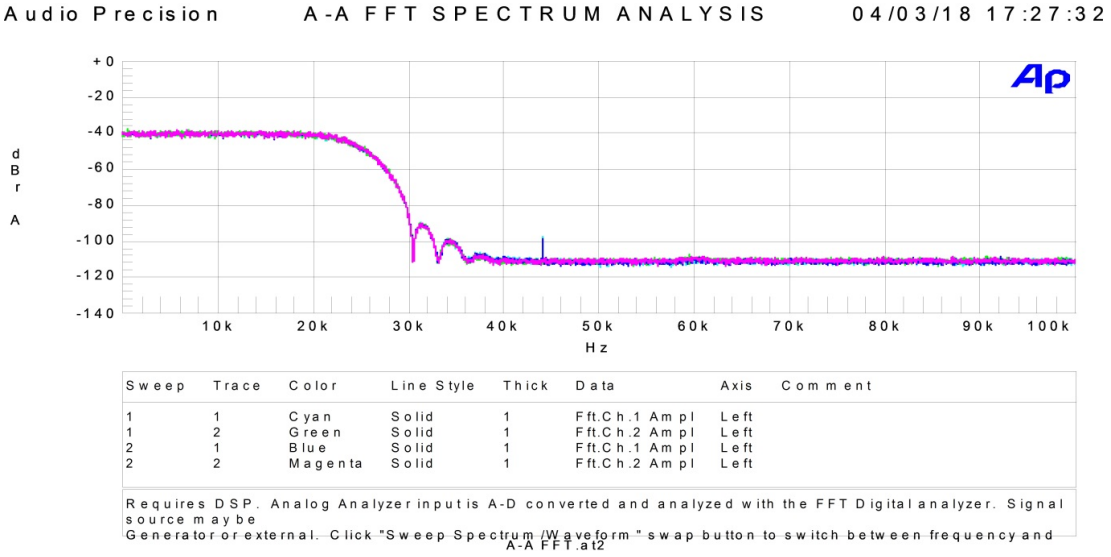
Separately we present the **"What if the experimental firmware is applied?!?"** scenario, in which oversampling to 352.8/384kHz is performed and an experimental set of digital filter coefficients is used.





It is clearly observable that the filter response using white noise is dramatically different from any of those presented for 5.20 & 5.30. Other than the precise waveform and filter response differing if MQA processing is engaged, these results parallel those expected if MQA processing was engaged for non-MQA streams.

SUMMARY

1. No measurable difference between the ways audio signals are handled in case of both version firmware v5.20 and v5.30.
2. There are no differences in levels, noise-floor, distortion or digital filter responses.

We hope you do not mind this 'super dry' technical measurement note as we have been short-staffed over Easter and we have been responding to a small rise in customer enquiries.

About iFi
iFi audio is headquartered in Southport, UK. It is the sister brand of 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.

Full product info: http://ifi-audio.com/
High-resolution photos & official logos: http://mediaportal.ifi-audio.com/

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