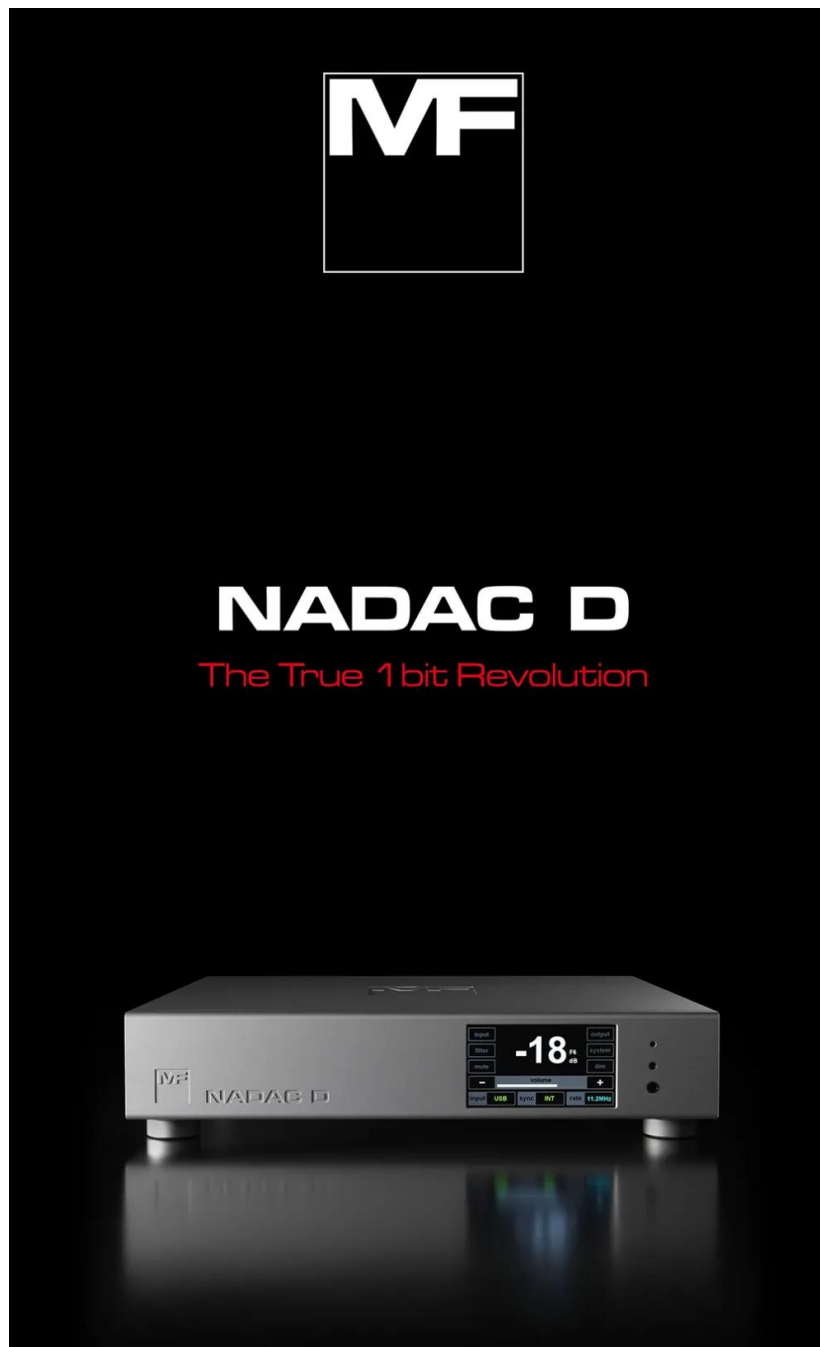


Four things about NADAC and two new products --- The new decoder with "True 1-Bit" technology is here!

Original Wu Tong Home Appliance Forum May 30, 2024 17:32

A music playback system with sound quality that will satisfy top recording engineers is here --- The latest NADAC D (DAC decoder) and NADAC C (Clock) are launched in Munich!



Before introducing NADAC's latest products, we have to talk about a few things that happened recently at Merging Technologies, a Swiss professional audio manufacturer founded in 1990.

1. Top brand for DSD recording and high-definition music playback in the professional field --- Merging Technologies

Merging Technologies is famous for its professional high-end audio equipment and software solutions. Founder Claude Cellier once worked at Nagra and presided over the development of Nagra reel-to-reel and recorders.

Since its inception, Merging Technologies has been pushing the boundaries of digital recording. This small company in Lausanne, Switzerland, worked with the two giants, Sony and Philips, to solve the complexity of editing recordings for SACD. SACD uses a 1-bit high sampling rate scheme called DSD, but the disadvantage is that it is extremely difficult to post-produce in any way.

So Merging invented DXD (Digital Extreme Definition), a PCM system running at 24-bit 352.8 kHz, allowing the transferred files to be edited and rendered back to DSD. This practical solution retains the best audio quality for the final result.

When recording engineers record SACD records, they need a powerful DSD audio workstation. With its Pyramix Virtual Studio, Merging became one of the first companies to offer a production DSD recording system. Pyramix is known for its powerful editing functions and high-precision audio processing capabilities, supporting multi-track recording, mixing and mastering. Pyramix plays a role in high-end music production, audio post-production and mastering. The DXD format (Digital eXtreme Definition), developed by Merging Technologies in collaboration with Philips, operates at 352.8kHz/24bit, overcoming many of the difficulties of SACD post-editing.

Meanwhile, DSD has evolved into DSD256, which operates at four times the rate of the original DSD. This superior quality can be found on many popular download sites and is particularly popular in the classical music community.

At the same time, Merging also launched two modular products, Horus and Hapi, which are network audio interfaces based on the RAVENNA/AS67 protocol, providing high-quality audio input and output. Also included is ANEMAN, a software tool for managing and controlling network audio devices.

In addition, Merging also launched the Ovation playback system that supports multi-channel audio.

For audiophiles, the focus is on NADAC. As a DAC system for music playback, NADAC was originally requested by mastering and recording engineers because Horus and Hapi's professional DAC decoders have achieved widely acclaimed sound quality, transparency and precision, which is exactly what engineers are eager to provide to those who buy music.



So audiophiles who pursue high resolution and pure sound quality, DACs like NADAC can reproduce the same experience and transparency they enjoy when they are engineers creating master works in the studio.

NADAC is based on the Horus and Hapi architecture, and has made many improvements in the expectations of the audiophile market, such as channel aggregation, dedicated headphone DA, unique ergonomics, and of course, the first-class aluminum chassis.

Not only is it the best music listening experience, but it also introduces some radical design enhancements to NADAC, such as APP remote control applications, and the most commendable is RAVENNA's network audio communication. That is, the audio signal input of NADAC is input into NADAC's decoder in the form of a network through computer-specific software, and the mode supported by pure DSD audio brings excellent sound quality playback.

Later, NADAC also launched the NADAC Power independent power supply and clock for its DAC. A complete network playback system consisting of NADAC, PLAYER, POWER and CLOCK products was formed.

2. Merging Technologies was acquired by Sennheiser of Germany

In 2022, Sennheiser completed the acquisition of all shares of Merging Technologies and plans to closely cooperate with its original professional brand Neumann and Merging Technologies under the Sennheiser Group.



From left to right in the picture above: Neumann CEO Ralf Oehl, Sennheiser Co-CEO Dr. Andreas Sennheiser, Merging Technologies CEO Claude Cellier.

3. Merging Technologies announced the discontinuation of the NADAC series of products and announced that Master Fidelity will continue to develop new NADAC products.

After being acquired by Sennheiser, Merging Technologies announced on its NADAC product website that it would stop producing the original NADAC products. At the same time, Merging will maintain full support for the original NADAC series, including warranty and non-warranty repairs.

The new products are developed by partner Merging Fidelity under the name of Master Fidelity. Merging said that the development team of Merging Fidelity is a group of passionate and knowledgeable people who will continue the exploration of NADAC.

In fact, the development team of Merging Fidelity has been involved in the development of NADAC products for a long time.

Because the Pyramix workstation needs to develop new A/D and D/A tools to process higher-specification DSD signals, Merging started a plan to develop network audio products. In 2014, a smaller HAPI was launched, but it includes enough D/A conversion to handle multi-channel DSD/DXD.

Although HAPI is not very influential among music lovers, its sound quality and natural sound have been highly praised among professionals.

At the same time, Merging's long-term partner in Vancouver, Canada, believed that the market needed a product that was more compatible with other home audio equipment and more gorgeous in appearance, which could have the potential to be sold in the West and Asia. As a result, a Canadian company called Merging Fidelity was established to help the Swiss hardware team.

Therefore, MERGING+NADAC was officially released at the Munich Exhibition in 2015. Then came the MERGING+PLAYER, the first DAC embedding a Roon Server, followed by the optional independent power supply MERGING+POWER, and finally the high-resolution clock MERGING+CCLOCK.

Since joining of Merging in the Sennheiser Group, Merging Fidelity's Canadian company has started to work hard again.

<https://nadac.merging.com/>

3. Master Fidelity releases the newly designed NADAC D decoder and NADAC C clock

This is what digital audio needed all along!

"After 40 years, we come home"

True digital to analog conversion

"This technology will revive 40 years of acquired CD collections to an unprecedented quality level and show the full potential of high resolution content even more"

2024 Bert van der Wolf -Oude Avenhuis | The Spirit of Turtle | HQ|NORTHSTAR



The Spirit of Turtle | HQ|NORTHSTAR

fully endorses the groundbreaking "True 1-bit" technology of Master Fidelity

"For the first time a DAC reveals the true potential of our recordings, as if listening directly to the microphone signal"



The Spirit of Turtle





1. The Merging Fidelity team restarts the design of the new NADAC product line

Merging is a leading global manufacturer of AD/DA solutions and digital audio workstations. Since its founding, Merging has focused on the research and development of high-resolution audio. In collaboration with Philips, it created the DXD format for SACD record production. The DXD format can convert DSD64 (i.e. 2.8224 MHz, 1 bit) audio signals into DXD format (352.8 kHz sampling rate, 24-bit quantized high-resolution PCM), providing a solution that is easy to produce and edit. DSD and DXD can be converted to each other, providing audio engineers with more flexible production tools.

Today, DSD has developed to DSD256 and even DSD512, with a transmission rate four or eight times that of DSD64. This high-resolution audio file is now available for purchase or download in many record companies' online stores and music websites, and is particularly popular in the classical music community.

True 1bit DSD is a pulse density modulation encoding technology that has long been considered the most accurate digitization format for analog audio, which is indeed true in theory. However, it is not easy to actually implement this technology. In 1988, Philips launched a chip that supports true 1-bit (TDA1547), but no other company has tried true 1-bit DSD solutions since then. DAC technology on the market has always been a compromise between price and performance. Although many of these components sound excellent, most of them are compromises that apply FPGA or multi-bit DSD technology.

After Merging was acquired by Sennheiser and decided to terminate the development and production of Hi-End products, the Merging Fidelity team that had worked closely with Merging changed its name to Master Fidelity and registered a new company in Canada under this name to continue the development, production and sales of the NADAC series of products.

2. Native Sound True 1-Bit

The newly designed NADAC D uses Master Fidelity's own dedicated chip (ASIC) and selects passive capacitors and resistors to build a discrete composite DA component. This is the first true 1-bit decoder to be mass-produced 35 years after Philips launched the chip that supports true 1-bit (TDA1547) in 1988. With the advancement of technology, True 1bit DSD has once again attracted attention. Master Fidelity takes advantage of today's semiconductor chip technology, while avoiding the weakness of the chip's inability to provide passive precision capacitors and resistors, and builds a true 1bit DSD to Analog conversion component based on chips and precision discrete components. This innovative design not only improves the accuracy of digital audio decoding, but also provides audio enthusiasts and professionals with a purer and more realistic audio experience.

NADAC C is a new generation of constant temperature crystal audio master clock launched by Master Fidelity based on MERGING+CLOCK technology. To achieve true 1 bit DSD technology, providing accurate clock is the key. NADAC C uses SC-cut crystals that have been pre-aged and screened for 120 days, and uses high-performance hydrocarbon ceramic printed circuit boards and resistors and capacitors designed for pulse applications to ensure high-precision and low-jitter transmission of 10 MHz signals. Both the crystal oscillator and the signal distribution circuit use a constant

temperature system to ensure signal purity. The multi-level phase-locked structure enables the 10 MHz frequency to maintain extremely high accuracy and low jitter when converted to word clock, ultimately achieving excellent audio performance.

The Master Fidelity team is determined to apply this uncompromising philosophy to other products, so expect more announcements in the near future. It is certain that these products will also provide performance levels that exceed expectations.

On May 9, 2024, the Munich High-End Audio Show in Germany was held at MOC. Before the show, I received an invitation from Master Fidelity to attend the launch of two new products from NADAC. Mr. Xu Weisheng of Master Fidelity invited me to another small exhibition in Munich, hifi deluxe, which was held in Studio 3 of the Marriott Hotel at the same time as the MOC exhibition.

I will do a separate report on the hifi deluxe exhibition. In the Studio 3 exhibition hall of the Marriott Hotel, I saw the newly designed NADAC D and NADAC C.



On the one hand, it is the correct direction of the design principle, and on the other hand, it is the strong strength of the engineers of the design team. This time at hifi

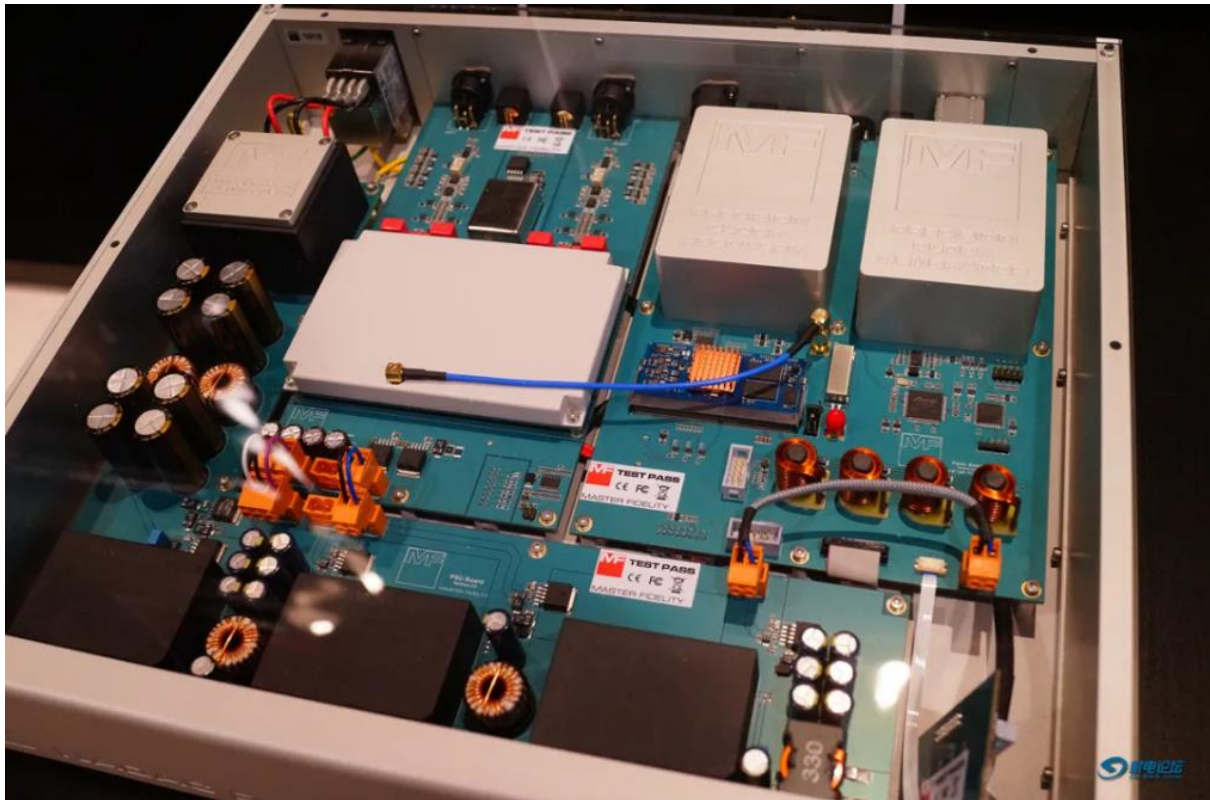
deluxe, I also met members of the three main design and development teams of Master Fidelity. I put the character introduction at the end of the article.

These two machines are actually the new NADAC series launched by Master Fidelity, with the focus on NADAC D, which introduces several major technological innovations based on the MERGING+NADAC tradition, the most prominent of which is the True 1-bit DSD technology, which can achieve unparalleled decoding accuracy. The launch of NADAC D and NADAC C not only demonstrates Master Fidelity's leading position in the field of audio technology, but also foreshadows the development direction of future audio equipment.

3. Technical framework of NADAC D

Master Fidelity's design team built a discrete composite DA component in NADAC D with self-developed ASIC chips and high-precision passive capacitors and resistors, and integrated advanced technologies such as high-precision local clock, external clock recovery, oversampling processing, self-developed DA chip clock array technology and fully balanced analog channels. The DA unit is also equipped with a constant temperature power supply to ensure excellent sound quality. Master Fidelity claims that NADAC D may be the first device to realize Native True 1-bit DAC, bringing a significant breakthrough in high-end audio technology.

There was a NADAC D transparent case sample machine on display at the exhibition site.



Video explanation of NADAC D's technical route:

I recorded the video explanation of the main designers Dominique Brulhart and Xu Weisheng on site:

We are in the process of post-editing the video and will upload it later...

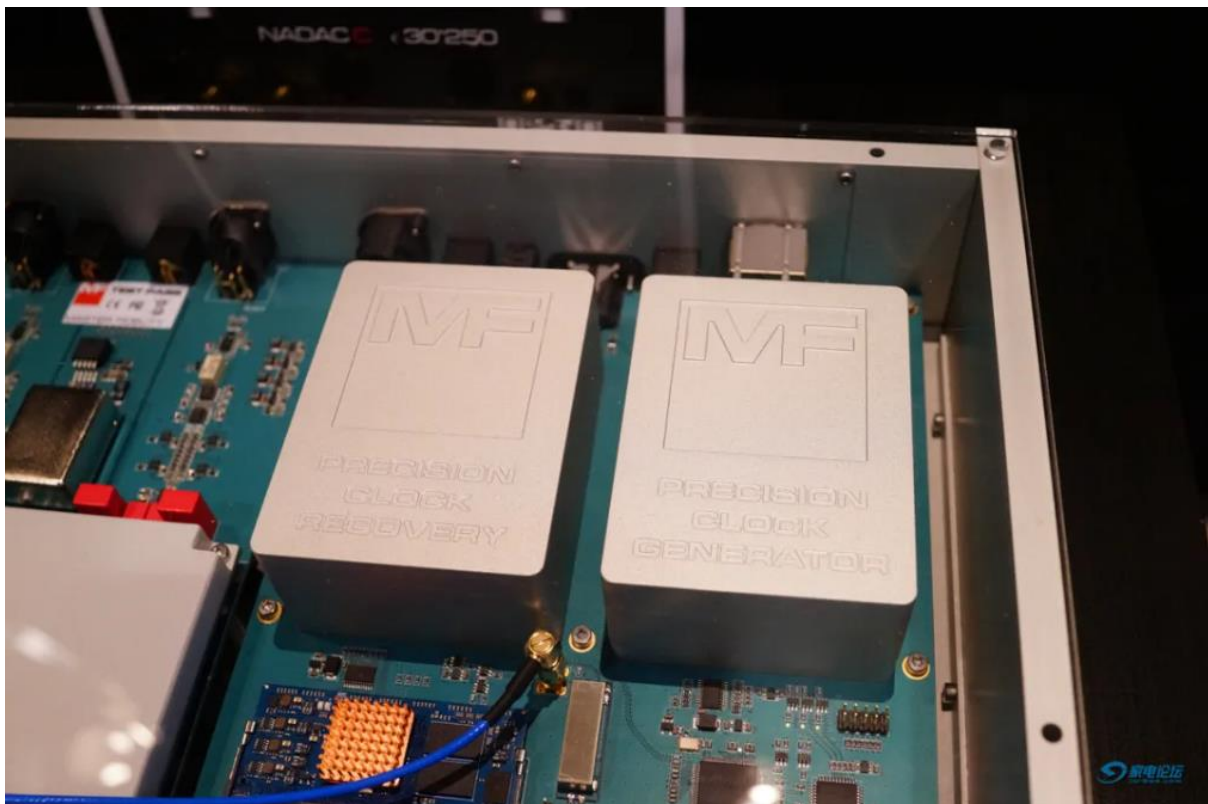
Please refer to the official product information for the future. I will share with you my limited understanding:

(1) Three signal line input paths



NADAC D's digital signal input can be divided into three types: AES, USB and Network. At the exhibition site, I heard a CD transport through AES input and a digital player through USB input music playback.

(2) Clock Data Recovery

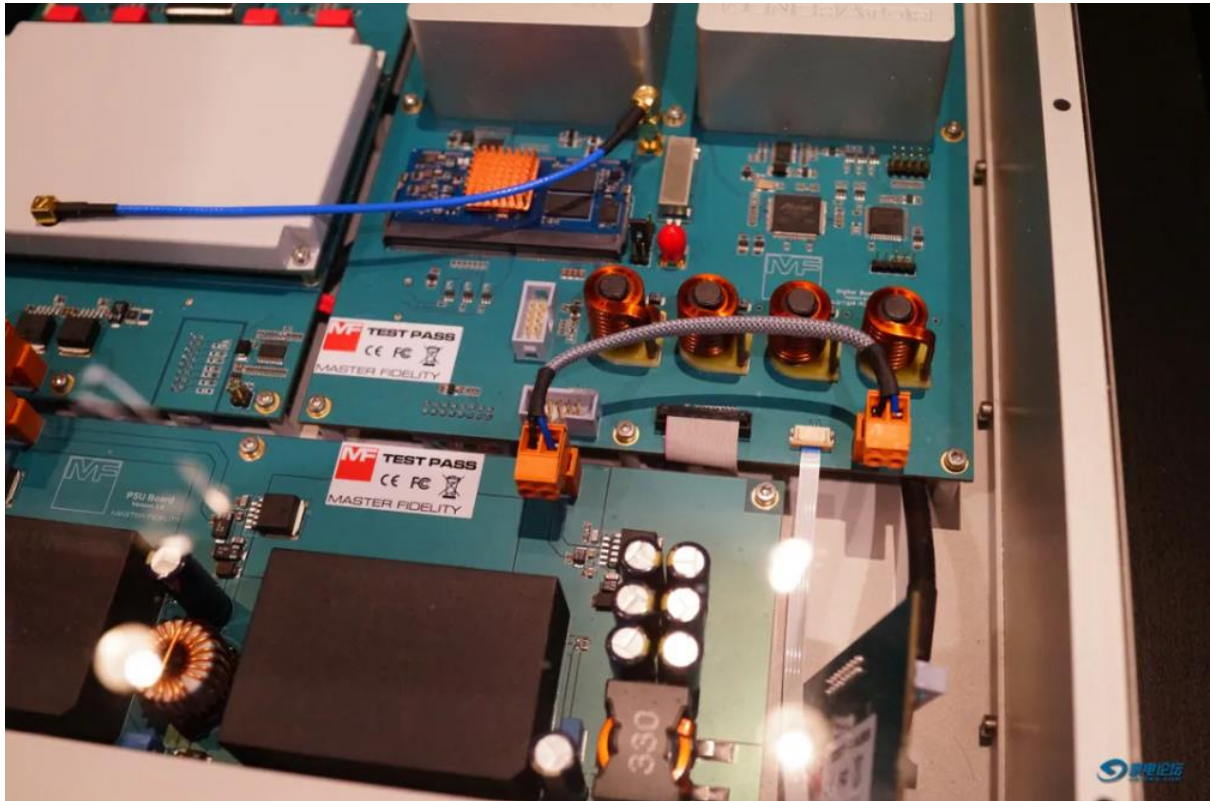


Whether it is from AES or USB input, NADAC D will recover the clock data attached to its digital audio signal to minimize clock drift and jitter, and lock the relationship between 44.1kHz and 48kHz from the beginning to avoid errors introduced when converting sampling rates.

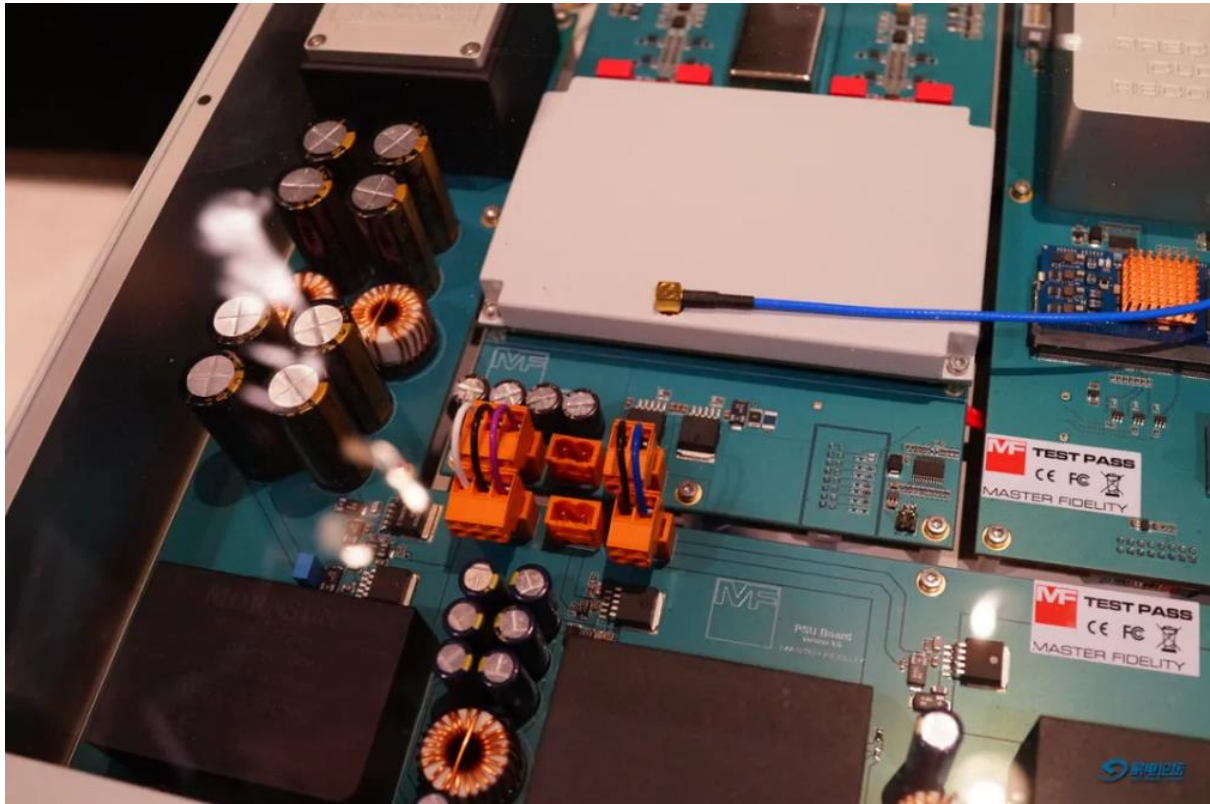
(3) Oversampling Processing

The oversampling processor will identify the format of the input digital audio signal, upconvert 1-bit DSD and DoP to DSD256, and then send it to the next stage for D/A conversion. For multi-bit PCM, the sampling rate of 44.1 to 96kHz is converted to

DSD128, and the sampling rate of 176.4 to 384kHz is converted to DSD256, and then sent to the next stage for D/A conversion.



(4) DAC chip developed by Master Fidelity



This is the core of NADAC D. NADAC D is called a native true 1-bit DAC based on this module. Its structure is a discrete DAC based on advanced ASIC, which is independently developed by Master Fidelity.

(5) Each module uses a separate power supply:

In the transparent glass case of NADAC D, you can see at least four independent power modules, which provide independent power supply for DAC conversion, upscaling and various clocks. In particular, the DA conversion module has a specially designed constant temperature power supply.



(6) High-quality headphone amplifier output

An independent balanced headphone output jack is built in, and the built-in headphone amplifier provides a 4.4mm balanced headphone output and a 6.35mm single-ended headphone output. While satisfying the monitoring needs of recording engineers, it is also supported by headphone enthusiasts.



4. NADAC C clock:

NADAC C is a second-generation clock based on the extraordinary performance of MERGING+CLOCK. The crystal components used are very precise and expensive, but are becoming increasingly difficult to obtain. NADAC C adopts a series of revolutionary design features and supports pre-aged SC-cut crystal. Attention to detail in component design and selection ensures extremely low jitter levels and achieves extremely high frequency accuracy.



5. How is the sound quality of NADAC D?

Let me first talk about the equipment matching at the exhibition:

- Decoder: NADAC D
- Clock: NADAC C
- Speaker: Suesskind Audio Kronos
- Amplifier: 2 x Naiu Laboratory ELLA mono
- CD turntable: Lector Strumenti TL3 (CD transport)
- MusicStreamer streaming server: Euphony Audio SUMMUS & STYLUS
- Decoupling platform: ESECI Design AEQUILIBRIUM (decoupling base)
- Cable: Brandt Audio cables
- Equipment rack: Quadraspire rack



If you comment on the sound quality or sound effect subjectively, it can be summed up in one word: "Infinitely close to the scene"! Because the sound I heard that day is still vivid in my mind, with complete transparency and meticulous details, and a real sense of air!

I listened to many classical music and audiophile records played by recording master Bert van der Wolf on site, most of which were played CD discs, output by AES to NADAC D decoding. As recording master Bert said, if the Master files can give such good sound quality, it would be fine. The key is that what we hear now is an ordinary CD record with 16/44.1 specifications, which is indeed a subversive and even revolutionary technological leap!



In the few classical music pieces I heard, each instrument was real and physically present in front of me, and at the end, not only Nadac, but also the speakers in that system, Suesskind Audio Kronos, I pay tribute to!



This pair of speakers is another Hi-End brand created by speaker designer Joachim Gerhard after he left German Audio Physics. Suesskind Audio Kronos is its sub-flagship speaker. Its structure specially makes the mid-high frequency and bass into two completely independent boxes, while the treble and mid-range parts are equipped with a 26mm beryllium tweeter, two 75mm beryllium mid-ranges and a 320mm bass, forming a modular 3.5-way structure. I think I will take the time to share more about this speaker with you later.



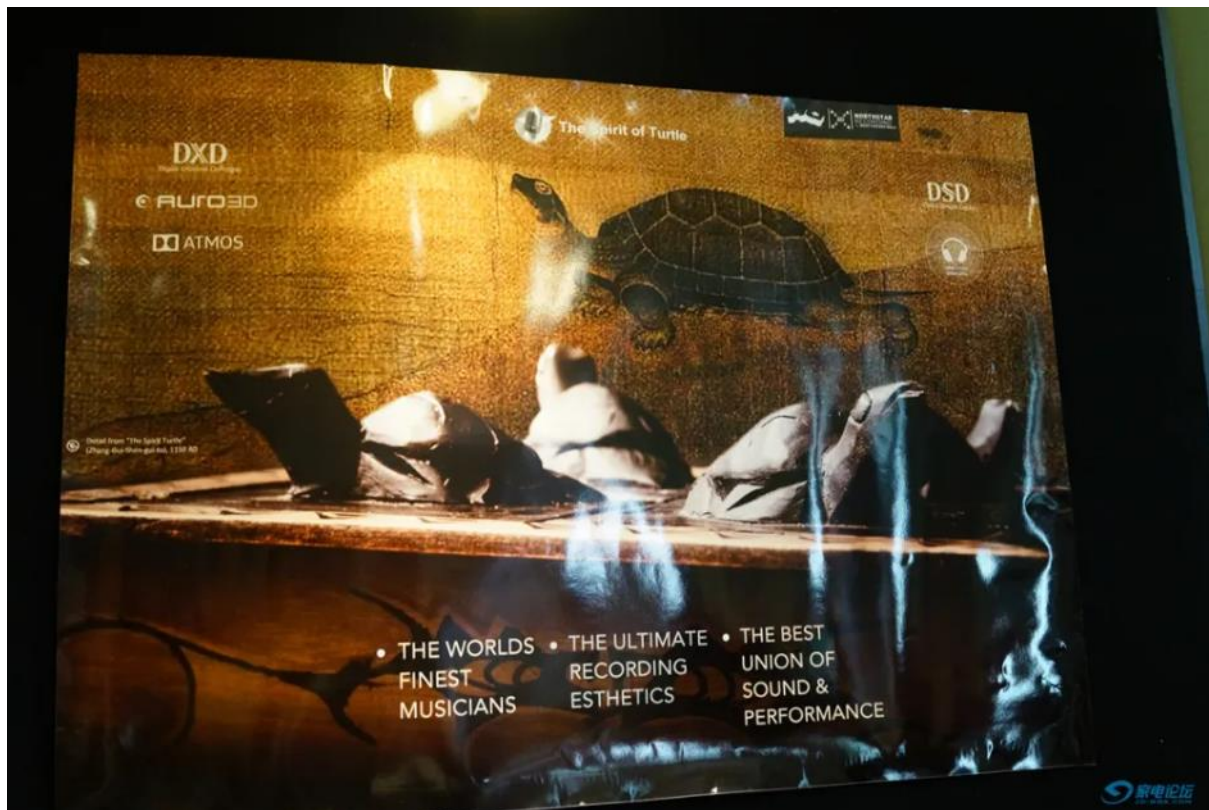
7. Summary of NADAC D and C:

NADAC D offers True 1-Bit technology for the first time with its custom-designed discrete DAC based on advanced ASIC. This level of accuracy can only be achieved if the solution is perfectly matched with hardware components, extreme clock quality, high-precision power supply and other key audio components.

NADAC D is the ultimate in all aspects. Apart from "far ahead", I can't think of any other words.

8. Ancient paintings from the Ming Dynasty in China:

I took a picture of this picture on the wall of the exhibition room. Bert explained that this is an ancient painting from the Ming Dynasty in China.



The record brand founded by recording master Bert is called Turtle Records. He has been a pioneer in high-resolution recording in recent years.

Bert van der Wolf is a legendary producer in the European audiophile classical world. dCS invited him to produce an album called "The Spirit of Turtle". Bert has been engaged in the field of classical audiophile recording since 1996. From the initial 24/96 specifications to the later DSD system, he is the world's first engineer to perform 96kHz/24Bit recording. He is also the technical director of Philips' first eight-channel DSD recording equipment. He can be said to be a pioneer in the world's classical digital audiophile recording and SACD format.



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V. The first demonstration of NADAC D decoder and NADAC C clock in China

The news I got in Munich was that there were only 5 of these two machines released in the world, and when I returned to Beijing from the Munich exhibition, I immediately started preparing for the exhibition at the Beijing Music Industry Park from May 31 to June 3. I didn't expect to hear the demonstration of these two NADAC products at the Beijing Audio Exhibition, but good news came:

Mr. Chen Qinan, the technical consultant of Master Fidelity in China, told me that he had obtained a set of NADAC D and C prototypes. Although they were experimental machines during research and development, they could also be demonstrated to everyone at the Beijing Audio Exhibition. So, we will have a feast for our ears this week.

Location: 10-40, Building 10, Beijing Music Industry Park (Molong Acoustics)

First release time: 10:00-11:00, May 31, 2024

Demonstration time: May 31 to June 3, 2024

Guest: Chen Qinan

Demonstration equipment:

Decoder: NADAC D

Clock: NADAC C

CD/SACD turntable: Esoteric K1X

Monitoring system: Dynaudio Acoustics M4

I was the main team engineer for the development of the two products NADAC D and C. I also met them all this time. I will upload the video for everyone to see later:



From left to right in the picture above are: Dominique, Bert, Xu Weisheng and Wu Tong

1. Dominique Brulhart (Swiss nationality) is a world-renowned audio software expert:



Chief Technical Director CTO and Software Development Director of Merging Technologies in Switzerland, 33 years of Merging Technologies work experience. Successful products and related positions, Pyramix audio workstation chief designer Ovation Show Sequencer multimedia broadcast control designer, VCube hard disk

reference video recorder, designer, R&D director Merging Technologies product process design, High Resolution Audio streaming project general manager Merging chief technical director, software chief engineer Master Fidelity brand founder, director, high-end audiophile product department director.

2. Bert van der Wolf-Oude Avenhuis Bert van der Wolf Producer, recording and balance engineer (Dutch nationality)



Recording director Bert van der Wolf - Oude Avenhuis (born in 1964) is a practitioner of recording engineering and production in the Netherlands, and has run his own audio recording facility since 1996. He trained in electronics at the Higher Technical School in Enschede from 1982 to 1985 and after a year in the army, studied and practiced music recording, piano and classical guitar at the Royal Conservatory in The Hague, obtaining his internationally recognized Sound Master qualification in 1990.

Bert worked for the Dutch recording company Channel Classics from 1989 to 1996 and for Kompas CD Multimedia from 1996 to 2000, producing hundreds of recordings for numerous international labels. He also worked as a consultant and "promoter" for

many studios and manufacturers of professional audio equipment. Bert has been making high-resolution recordings since 1996, initially in 24/96 format, then moving on to 24/192 and DSD. He engineered the world's first 24/192 recordings for Samsung in 1996. As a technical consultant, he was responsible for the assembly and delivery of the first three prototype 8-channel DSD recorders to Philips, working with their NATlab on the specifications. Hundreds of the first SACDs released in the early 2000s were produced with these systems. Bert specializes in acoustic recording technology and has numerous award-winning recordings. In 1997, he co-founded the high-end audio brand Turtle Records®, and since 2008 he has been the sole owner of Edison Production Company BV, which owns Turtle Records® and its derivative brand "The Spirit of Turtle". The latter is a fusion of Turtle Records® and HQ|NORTHSTAR brand recording production.

3) Xu Weisheng (Canadian) Senior audio expert, recording engineer, sound director:

Former sound engineer/chief recording engineer of the General Political Department Song and Dance Troupe of the Chinese People's Liberation Army/China Theater (1972-1988), immigrated to Canada in 1988, worked for Canada's national broadcaster CBC Broadcasting (1989-1997), and is currently the founder and executive director of Merging Fidelity Inc. Canada. Merging Fidelity Inc. is a long-term strategic partner of Merging Technologies, responsible for the research and development and production of the Merging NADAC series of high-end audio products.

In 2022, Sennheiser acquired Merging Technologies. Xu Weisheng and Dominique independently created the (Master Fidelity brand) to continue the Merging NADAC series of products.

Xu Weisheng has been committed to the research and promotion of high-resolution audio formats (High Resolution Audio), Audio over IP, as well as audio streaming, audio panoramic sound recording and playback, and interactive control of large-scale new media performances for nearly ten years. He was an expert member of the digital audio DSD/DXD format research led by Philips and has published many professional papers.

He is the main recording engineer and recording director of the 1987 version of the TV series "Dream of Red Mansions", the classic Chinese music. Among them, 13 original songs have become classics. In 2018, as a music creator, he attended CCTV's "Music

Life" as a guest with composer Wang Liping and lead singer Chen Li. He served as the music director of the 30th anniversary concert of the 1987 version of "Dream of Red Mansions" held at the Great Hall of the People on June 17, 2017.

