Master Fidelity NADAC D

The source is king, bringing tears to your eyes.
By Hong Ruifeng

Master Fidelity NADAC D
Type: USB DAC (with volume control)
DAC decoding: Advanced ASIC-based Discrete DAC.
Maximum sampling rate: 32-bit/384kHz, DSD 512
Inputs: USB Type-C x 1, Optical x 1, Coaxial x 1, AES x 1, 10MHz clock, Ravenna x 1 (not yet available)
Outputs: RCA x 1, XLR x 1, Headphone output x 2 (6.35mm, 4.4mm)
Dimensions (WHD): 435 x 95 x 390mm
Weight: 9.2 kg
Reference retail price: NT$900,000
Import distributor: Taiwan Gaokong (02-23631120)

Reference equipment:
Speakers: ELAC Vela FS407.2, Totem Tribe Tower
Source: SOtMs MS-2000 Music Server
Amplifier: Naim NAP 250 Power Amplifier
Cable: Van den Hul The Platinum Hybrid MKII XLR Balanced Cable

Caption:
Appearance: The NADAC-D's body is constructed from thick aluminum, the thickness of which is strikingly visible from this angle. The metal finish has the same exquisite finish as Swiss equipment. The touchscreen display clearly displays functions and fonts, making it easy to use at a glance. Two headphone amplifier outputs are located on the side.

Back Panel: The NADAC-D supports multiple digital inputs on the back, including USB Type-C, optical, coaxial, and AES. For the highest sample rate, the USB input is recommended with a 10MHz clock synchronization for optimal performance. The Ravenna connector is not yet available.

Internal: The NADAC-D's internal circuitry is remarkably simple, with its multiple power supplies, oven temperature control system, and core ASIC-based DAC circuitry all housed in a separate metal housing for noise shielding. The internal power supply

utilizes a hybrid design, combining a traditional linear power supply with a switching power supply. The clock, reclocking system, touchscreen display, DAC, and analog outputs are all independently powered.

Master Fidelity currently offers three products: the NADAC-D digital-to-analog converter, the NADAC-C external independent clock, and the NADAC-L audio preamplifier. All three are crafted from exquisite aluminum, creating a consistent visual aesthetic and aesthetically pleasing aesthetics.

The factory-installed 1-bit decoding ensures the most faithful, low-distortion, linear sound quality. The left side of the image shows a common multi-bit decoding chip, while the right side shows the 1-bit decoding circuitry used in this design.

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Seeing this diagram, I thought it was truly worthy of a professional digital manufacturer. With a single diagram, the NADAC-D clearly illustrates everything from the various digital interfaces, routing, signal processing, decoding, and power distribution within the NADAC-D.

Master Fidelity is a Canadian brand. Its company name is Merging Fidelity, founded in 2015. But what really piques the interest of audiophiles is Merging Technologies, the Swiss-based professional recording company that owns Master Fidelity. Their first DAC for the home market was the NADAC, a name that differs only by a single letter from the NADAC-D I'm listening to today, suggesting a connection. Since the parent company is Swiss, this might explain why the NADAC-D I'm listening to today has always struck me as a very "Swiss" sound. Don't get me wrong, I'm not saying Canadian brands aren't good, but rather that Swiss audio has always held a unique place in the audio world; the lines defined by the aluminum body exude an incomparable elegance. When it comes to sound quality, I think Swiss audio best exemplifies the concept of "restraint" in sound personality. This means being present when necessary and restrained when not, leaving space in the sound. Avoiding overwhelming the sound creates a sense of distance and beauty, resulting in a distinctly cool and clear sound. Looking at many classic Swiss audio brands on the market, almost all possess this gentle, non-intrusive quality, such as Goldmund, Soulution, and Weiss. Of course, this also includes the Master Fidelity I'm listening to (if you consider it Swiss audio).

The History of the NADAC-D

To discuss the history of the NADAC-D, we must first mention its parent company, Merging Technologies. They were founded in 1990 by Claude Cellier, who previously worked for another Swiss audio brand, Nagra, for ten years, responsible for developing many of Nagra's classic products, including the renowned Nagra T tape recorder, which he co-designed and developed. Later, Claude Cellier collaborated with Dominique Brulhart, another software design director within the company, to create the Pyramix digital recording workstation, which later became the industry standard for DSD recording. This brought Merging Technologies widespread fame. Renowned American mastering engineer Bob Ludwig's Gateway Mastering Studios, and even Taiwanese public television stations, used this system. Countless Grammy-winning albums produced using the Pyramix system established Merging Technologies as one of the world's leading manufacturers of digital recording systems.

Official Separation of Professional and Home Audio Systems
Given Merging Technologies' prestige in the professional recording field, when they decided to release their first DAC, the Merging+ NADAC, for the home market, it immediately caught the attention of many audiophiles. NADAC stands for Network Attached DAC, meaning it can connect to a network. However, being able to connect to the internet isn't surprising. A key selling point is that the NADAC uses Ravenna, a network protocol not typically used by other manufacturers, but rather the Ravenna protocol, originally developed to meet the stringent requirements of the professional broadcast market. Not only does it comply with AES67 and SMPTE ST 2110 standards, it also boasts low latency, high reliability, and high-quality transmission. It's said to be the world's first audio-grade DAC to utilize the Ravenna protocol. Subsequent releases like the Merging+Clock system, Merging+Power standalone power supply, and Merging+Player streaming media player all demonstrate a commitment to enriching its product line and expanding into the home audio market. In 2022, Sennheiser of Germany officially acquired all shares of Merging Technologies, hoping to clearly differentiate its professional recording brand from its home audio offerings. Subsequently, the company launched subsequent home audio products under the Master Fidelity brand, including the NADAC-D I'm listening to today. Production of the original Merging+NADAC has officially ceased.

Exquisitely designed with a Swiss-inspired aesthetic. Merging Fidelity was the obvious choice to take over the original NADAC series. The team that originally developed the home NADAC series for Merging Technologies is the same team that

best understands the original NADAC designer's creative intent. Master Fidelity currently offers three products: the NADAC-D digital-to-analog converter, the NADAC-C external independent clock, and the NADAC-L audio preamplifier. All three are crafted from exquisite aluminum, each boasting a beautiful finish. The smooth, silky feel and scratch-free finish give the impression of premium quality. The NADAC-D also demonstrates exceptional industrial design. At first glance, there aren't any striking design elements to catch the eye, but the overall visual proportions create a uniquely harmonious aesthetic. From the brand logo placement, the model font size, the display interface design, to the body's craftsmanship, all exude the same refined sophistication and refinement as Swiss audio, a characteristic similarity to Japanese audio, which shares a sense of restraint and restraint.

The NADAC-D's touchscreen display is located on the right side of the body. Again, it doesn't look particularly impressive at first glance, but intuitively, its controls quickly become apparent; everything is straightforward and simple. For example, key functions, including input, output, filter, mute, and system, are arranged on both sides. Below the volume number is a positive/negative volume control, while the current sample rate and sync status are displayed at the bottom of the display. Putting the unit into standby mode is also convenient: simply touch the screen to turn it off. The screen then goes black, leaving only a faint NADAC-D logo, which is equally beautiful. The DAC still functions normally at this point; only the display is off. The NADAC-D's UI design is visually intuitive and, overall, tastefully designed.

The biggest difference from previous NADACs is that the new NADAC-D's Ravenna network port is no longer standard, but is currently unavailable. For example, the unit submitted for review lacks streaming functionality and is instead a simple USB DAC. The USB input connector used on this device is also quite unique, using the Neutrik mediaCON USB Type-C instead of the more common Type-B. This requires a Type-A to Type-C USB cable, but fortunately, one is included in the box, eliminating the need for a separate purchase.

Market-Leading DAC Technology

Like all top-tier DACs on the market, the NADAC-D's DAC technology is unique. It incorporates the culmination of years of digital R&D with parent company Merging Technologies. On their website, they even boast that this is an uncompromising digital-to-analog converter. Many audiophiles are aware that there are two main DAC

technologies in the current DAC market. The mainstream is the Delta-Sigma DAC. Common chips from brands like AKM, ESS, and CS all utilize this architecture. Its advantages are that the latest DAC chips are compact and feature comprehensive internal functionality. They offer excellent linearity and low distortion, while also excelling at handling the high bit rates and sampling rates of high-resolution music files. However, the disadvantage is that these globally mass-produced industrial chips must be manufactured with strict cost controls. This often results in a compromise between price and performance, making them incapable of achieving the most comprehensive performance for a single design application. Furthermore, Delta-Sigma DACs exhibit relatively high noise levels and require low-pass filtering to output an analog waveform, which increases the potential for coloration.

The second DAC technology is the discrete DAC, built using FPGA-programmable logic arrays. This approach is more sophisticated. These discrete DACs typically lack a standard DAC chip and are instead custom-built by the manufacturer using numerous passive components and resistors. The advantages of a Discrete DAC lie in its low noise and wide dynamic range. Since the music signal is processed only through passive resistors, high-quality, precision-calibrated resistors minimize signal contamination, enhance fidelity, and achieve extremely fast transient response. Crucially, it outputs an analog waveform without requiring low-pass filtering, eliminating the potential for further distortion—a highly sought-after feature for audiophiles. Major audio companies, including dCS, MSB, Chord, and Playback Designs, all utilize this discrete design. However, Discrete DACs also have several drawbacks. The first, of course, is their high cost. Obtaining precisely matched, high-quality resistors is a challenging task. If the resistor matching isn't done to a certain level of precision, the resulting distortion can be even greater than with a typical Delta-Sigma DAC. Next, the manufacturer also mentioned that the final stage of converting general audio signals to analog signals typically requires low-density, yet high-performance logic circuits. However, typical IC manufacturers do not develop specialized audiophile-grade ICs specifically for audiophile design, which ultimately limits the quality of the playback. The decoding technology used by the NADAC-D is considered the best solution currently available. This digital-to-analog conversion technology is based on true 1-bit decoding. Furthermore, they collaborated directly with a professional IC manufacturer to custom-develop a dedicated audiophile-grade IC, creating a unique ASIC-based DAC decoding circuit.

Advanced 1-bit ASIC decoding technology

ASIC stands for Application-Specific Integrated Circuit. It is an integrated circuit designed for specific application requirements, or simply a customized chip. Customizing an ASIC with a specific IC manufacturer is typically very costly. Given the NADAC-D's pricing, I don't believe it can achieve high-volume production. Furthermore, if the order quantity is too small, typical manufacturers may be reluctant to accept it. I guess the reason why they were able to customize the ASIC this time is because their parent company is Merging Technologies, which gives them some advantages. In fact, the so-called 1-bit decoding is not new. Some audio manufacturers have used similar technology in the past, but it is not easy to do it well.