



MSB The Cascade DAC

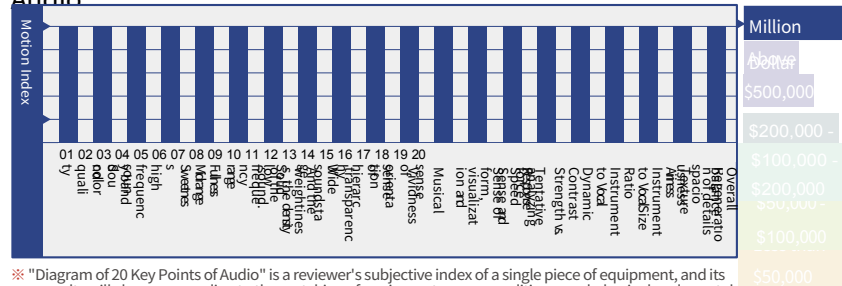
I'm only scared when I
see it.

Text | Liu Han

Sheng

Illustration of the Twenty Essentials of

Audio



※ "Diagram of 20 Key Points of Audio" is a reviewer's subjective index of a single piece of equipment, and its results will change according to the matching of equipment, space conditions, and physical and mental conditions. It will be biased if it is used as a comparison between two pieces of equipment.

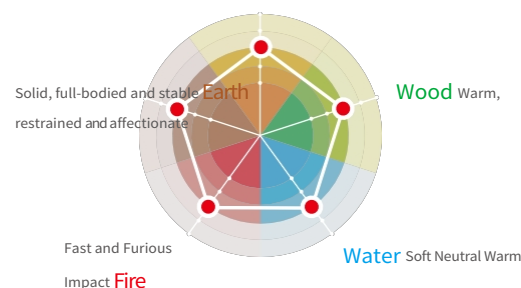
Audio Five

Gold, outgoing, active and bright.

Elements

Characterization

Chart



In the digital signaling market, there are two brands competing for the top spot, one is the British dCS, and the other is the

MSB (USA) and dCS (UK) launched the five-piece Varèse in August 2024, which included a User Interface piece, a Master Clock piece, left and right channel DACs, a Core piece, and in the future, a SACD/CD turntable. This approach is groundbreaking and has never been done before. Immediately after the news broke, it was also rumored that MSB may also launch a system in 2026 that is even more advanced than the current flagship Cascade. However, MSB has been very tight-lipped and has not revealed what kind of digital source it will be, but I believe it will be a refreshing change for audio fans, so let's wait and see.

Digital Director plays an important role

MSB used to have CD transports, but they are now discontinued. The former Reference DAC and Select DAC have also been discontinued, not to mention other earlier DACs. In terms of amplifiers, the can-type rears are also discontinued, and there are only the S202 and S500 stereo rears, as well as the M205 and M500 mono rears. As

for DACs, MSB currently has only three DACs online, the cheapest being the one-piece The Discrete DAC, then the two-piece The Premier DAC, and the top of the line is the three-piece The Cascade DAC, but there are also The Premier Digital Director, The Reference Digital Director, and The Select Digital Director in the accessories section. However, in the accessories section, there are The Premier Digital Director, The Reference Digital Director, and The Select Digital Director.

Three levels

What is the difference between the three? In terms of the number of internal DAC modules, the Discrete has two Prime DAC modules, the Premier has four Prime DAC modules, and the Cascade has eight Hybrid DAC MK II's. In terms of internal clocks, the Discrete has an On Board Clock, the Premier has a Femto 93, and the Cascade has a Femto 33 MkIII. Cascade uses a Femto 33 MkIII. I won't compare the digital inputs and analog outputs. In terms of display, the Discrete has 119 LEDs, the Premier has 560 LEDs and the Cascade has 1344 LEDs.

From these simple comparisons, it is clear that the Discrete is already good enough, and that the other two are better in terms of "precision". In fact, the cheapest Discrete can also be purchased with a separate power supply.

Removable Input Module

All three digital inputs are also removable modules, including a standard USB DAC (384k Hz, 4xDSD, MQA decoding), a Network Renderer V2 (32/768kHz, 4xDSD, MQA decoding, Roon endpoint), an RCA/Optical/BNC (S/PDIF, 24/192kHz, 1xDSD via DoP), an AES/EBU (with Word Sync. Output, 24/192kHz, 1xDSD via DoP), and an AES/EBU (with Word Sync. Output, 24/192kHz, 1xDSD

Report, one AES/EBU (with Word Sync. Output, 24/192kHz, 1xDSD via DoP), one ProISL Interface (optimal transmission module for glass fiber optic transmission), one ProUSB Input (for use with PCs. 24/768k Hz, 8xDSD).

With such a variety of input modules, users can choose from a wide range of inputs to suit their needs.

Instrumental Vocal Scale

Reference Materials

Source: Esoteric K-01XD SE SACD/CD
Turntable Speakers: ATC SCM 100ASL
Dual Active Speakers

MSB The Cascade DAC	
Product Type	Three-piece Digital Signal Source
Launch Time	2024
Digital Input	4 digital module slots
Decoding Specifications	Up to PCM 32bit/3,072kHz, 8X DSD
Decoder Module	Hybrid DAC MK IIx8
Analog Input	RCAx2, XLRx2
Analog Output	XLRx1
weights	Digital Director 13.7 kg, Analog Concerter 14.5 kg, Powerbase 19.5 kg
External Dimensions (WHD)	444x216x394mm
Reference Price	3,800,000 dollars.
Import Agent	Shangrui (02-86424269)

Buy what you need. For example, if you only listen to streams, then just buy Network Renderer V2 streaming module; if you only listen to CDs, then buy RCA/BNC module or AES/EBU module, so you don't need to waste your money on 費 useless inputs.

Three-piece design logic

MSB launches Digital Director in 2022.

	dens e	mas sive mas
Violin Lines	Fiber Neutral	壯碩
Female vocal form	Slim Neutral	豐滿
Female voice maturity	Young Neutral	成熟
Male voice maturity	Neutral	壯碩
Female voice maturity	Young Neutral	成熟
Cello Forms	精鍊	Neutral Large
Feet on a drum	緊密	Neutral fluffy
Bass form	緊密	Neutral fluffy
Piano Bass	Fresh Neutral	龐大
Keysting Vibration		
Orchestral Regularity	Fresh Neutral	龐大



Reference Software

Sibelius "Violin Concerto" by Hafez. (Walter Hendl conducting the Chicago Symphony Orchestra) is truly a classic version and serves as ample testimony to the tuning of the sound system. Whenever a violin sounds "bad", it means the sound system has not been tuned to 60 points.

focus

- ① Three-piece design of input module, DAC, and external power supply.
- ② Block the noise at the input.
- ③ Allows the DAC to process music signals in the most accurate and lowest noise manner. The boost is scary.

Recommendation

It makes an instant impact with any sound system.

First used on the Select DAC and Reference DAC. This is a standalone digital input that also has playback capabilities, allowing any device that can bleed through and create noise to be used as a playback device.

(The Cascade DAC (including the display) is in one chassis and can be used with other DACs in the house. The three-piece The Cascade DAC will be launched at the Munich Audio Show in 2024.

The design logic of MSB Cascade is very clear, it is a three-machine design, firstly, all the source inputs, playback functions, and noise-generating displays are centrally accommodated in the Digital Director housing.

(Secondly, the digital signal from Digital Director is connected to Analog Converter via SFP fiber optic network cable to prevent the noise from entering

into the digital analog converter line. Secondly, the digital signals from the Digital Director are connected to the Analog Converter via SFP fiber optic network cable to eliminate noise infiltration, so that the digital signals can be converted to digital analog in a particularly low noise environment, which is the mission of the Analog Converter body. Third, an external

The power supply that provides stable and pure power to the Analog Converter is the Powerbase. note that the Powerbase only provides power to the Analog Converter, the Digital Director is self-powered. In this way, even the power supply is protected from the noise of the digital circuits, so that the digital converter and the analog output stage circuits are supplied with the purest power possible.

Four times the computing power

Digital Director has two internal DSPs, each with a computing power of 12 billion cycles per second. In addition, each DSP is paired with an FPGA, making the entire computing power more than four times that of the previously introduced DACs. In addition, Cascade also uses the latest Digital Filter, which has been developed over the past decade, to allow digital to analog conversion to return to a state close to the original analog signal, increasing the margin of processing, resulting in a better soundstage performance and more realistic instrumental vocal quality.

As we all know, as long as it involves computers, wireless transmission, servers, and even LED displays, etc., noise will definitely be generated. Although these noises are locked in the Digital Director, but after all, it is necessary to transfer the digital signals to the next level of the Analog Converter, at this time, the transmission method is very important, and we must not allow noise to be transmitted along with the music signal. MSB has developed the Cascade-Link transmission method, which uses a diode laser fiber to transmit signals without noise and with a large bandwidth to meet the needs of the Analog Converter's internal eight Hybrid DAC MK IIs, which MSB considers to be an industry innovation.

Even the monitors are elaborate.

Then there's the LED display. The LED display is mounted on the panel of the Digital Director cabinet, not on the Analog Converter, and is user-friendly as it can be seen clearly even from the listening position. Not only that, but the 1,344 LEDs display all kinds of information at a very fast refresh rate, as the Femto 33 MkIII also controls the accuracy of the display.

Report
Equipment
Reviews
the LED display is assembled, it is sealed in a CNC machined metal box to seal out the digital and EMI noise.

In the Analog Converter, the eight Hybrid DAC MK IIs take in the huge amount of information from the Digital Director and precisely perform the digital-to-analog conversion work. Instead of active analog amplifiers, the internal passive analog amplifiers are used in a fully balanced architecture to send the analog signals to the 75-ohm sound control system and output them to the amplifiers.

Precision is the key.

As we all know, MSB has been engaged in the research and development of R2R split Ladder DAC since 1999. While others buy a single off-the-shelf DAC chip to complete the digital analog conversion, Analog Converter uses eight extremely precise R2R split DAC modules. The difficulty lies in the precision required, which MSB achieves with extremely precise resistors. In addition, each DAC module has one positive and one negative phase, which is a truly balanced architecture, and this is something that other manufacturers can hardly match.

In Hybrid DAC MK II module, there is no general DAC current-voltage conversion, the output is the voltage, do not need to go through another layer of I / V conversion, there is no general buffer circuit, the music signal path there is no active transistor, in short, is in the digital analog conversion, there is no active components, the music signal is directly transmitted to the 75 ohm passive attenuation volume control system. In this way, the highest purity of the music signal can be maintained. The volume

control system is composed of precision resistors and sealed relays that remain grounded when no music signal passes through, avoiding noise generation. The volume control system is also balanced to prevent any subtle noise from seeping through the ground loop.

What's more, each Hybrid DAC MK II module has the ability to handle native multi-bit PCM and native 1 Bit DSD with dynamic assignment conversion. Each DAC module is sealed in a metal case using thermal bonding technology to maintain a stable temperature. In addition, the eight DAC modules form a two-channel configuration, which is equivalent to four DAC modules per channel.



- The Cascade DAC is a three-piece design, with the Digital Director at the top, where the inputs and noise-ridden circuits are centered. In the middle is the Analog Converter, which is purely for digital to analog conversion and analog output. At the bottom is the DAC's external power supply, Powerbase.



- This is a three-piece backboard.

The eight DAC modules have to be measured and matched one by one before they can be installed in the Analog Converter. The eight DAC modules must be individually measured and matched before they can be installed in the Analog Converter.

Customized Clock

In the Analog Converter, there is also

an important Femto 33 MkIII clock, which is the result of the customization of clocks started by MSB in 2011. This clock is made of customized parts and hand-tuned. Each sealed clock consists of two hand-tuned, ultra-low phase noise Oven Controlled Crystals, one at 44.1kHz and the other at

High Precision or Low Jitter?

There is another question that is often discussed by audio enthusiasts: should we use a high precision clock or a low jitter clock? Usually high precision clocks are designed for long distance communication, so that the two endpoints can be synchronized, such as GPS, etc. However, these high precision clocks usually do not make much effort to maintain low jitter. However, this kind of high-precision clocks usually don't put much effort on continuous low jitter, but low jitter is what we need when we listen to music, because music is continuous, it must be maintained in a stable low jitter state all the time, and MSB clocks are especially focused on the requirement of stable low jitter.

There's another question that plagues audio enthusiasts: Should I use an external clock or a built-in one? Or an internal clock? There are various kinds of external clocks available in the market for audio enthusiasts to choose from, but MSB has always insisted on not producing external clocks. They believe that although external clocks can be very accurate, there is a high probability of degradation of accuracy and noise during port buffering or transmission, and that it is better to place the clock closest to the digital-to-analog converter circuitry.

If the user purchases an analog input module, this module contains both XLR and RCA inputs, so when not in use, the inputs are isolated from the rest of the wiring and the ground is disconnected to fully isolate them from noise. In addition, each analog

48kHz, allowing the entire digital system to achieve the most accurate clock with the lowest possible time base error. Since each Femto 33 MkIII clock has two clocks, one at 44.1kHz and the other at 48kHz, one clock is activated before the music signal is fed into the system, and the other clock is activated at

The clock is stationary to avoid interference. Because of this, the clock does not require PLL, SRC, ASRC or frequency synchronization for conversion.

Why does MSB use two clocks instead of one? Traditionally, a 10MHz or 27MHz clock can also handle 44.1kHz or 48kHz digital signals simultaneously, but it will reduce the accuracy when using PLL or ASRC to do the conversion, resulting in an increase in the time base error. Therefore, MSB adopts two sets of clocks to improve the accuracy on one hand and simplify the clock related circuits on the other hand.

You may ask why the clock is so important. Because the clock controls the timing of the various digital signals, and if the timing is messed up, it will result in a serious time base error, and the digital signals will be messed up, and the conversion to analog signals will not be accurate and clear.

The inputs are buffered for low noise and low distortion, with 0dB to +6dB gain adjustment, and then connected to a 75 ohm volume control system to maintain maximum signal purity.

Power is very important.

All of the above is not possible without a high quality power supply, and the Powerbase is responsible for this important task, providing the Analog Converter with a pure, stable and sufficient power supply. First of all, the power cables, MSB specially commissioned Fischer Connectors in Switzerland to customize the power cable connectors to ensure the reliability of the power cable connection.

Let's talk about the inside of the power supply. Nowadays, all kinds of computers, wireless transmission, servers and other 3C equipments seriously affect the purity of AC power supply, so Powerbase arranges AC power filtering line at the input side.



- The Cascade DAC's Digital Director is modular, with modules for different inputs, such as the Network Renderer V2 module for streaming.



- This is inside the Powerbase.



This is the analog input circuit.

The power supply noise is filtered out. Three customized electric and magnetic shielded toroidal transformers are used to convert AC power to DC. With the Silicon Carbide rectifier circuit, the AC power supply is converted to DC, and then into the inductor and capacitor filtering network to filter out the noise or ripple in the DC power supply. Finally, the DC power supply is stabilized and divided into five independent DC power supplies to supply the Analog Converter.

Whole Aluminum Cutting

All of MSB's enclosures are made in-house. They use 70-pound Kaiser Select Precision Plate high-grade aluminum blocks to build 17-pound enclosures with their own CNC equipment, which is equivalent to removing 75% of the aluminum blocks, and then anodizing the surfaces. Some of the internal components are assembled using robotic arms to ensure the best possible assembly quality. It's rare to find an "ultra-precision" audio factory like MSB.

To use this digital source, connect the Powerbase to the Analog Converter with an external power cable, followed by the original SFP fiber optic cable.

(Connect the Digital Director (Cascade Link) to the Analog Converter, and finally connect the source (CD, streaming, USB, etc.) to the Digital Director, and you're ready to turn on the sound. Of course, you will need to use the volume control, input switch, etc. at the top of

the Digital Director to control it.

On the back panel of the Analog Converter, there are two sets of RCA and two sets of XLR analog inputs, allowing users to use analog sources. In addition, one XLR analog output can be used to drive the rear stage directly, with the Digital Director controlling the volume, which is set to 70 by default, and of course, can be connected to the preamplifier as well.

To set Preamp Off in the menu, the volume is controlled by the preamp.

Menu Settings

On the top panel of the Digital Director there is a Menu button, a set of left and right arrows (to select inputs and control the Menu), a circle (Mute), and a large volume knob. Does the menu need any special settings? If you don't need any special settings, the factory settings will allow you to play music. If you want to set it up by hand, you can do it easily by following the instructions in the manual. The menu items are Display Brightness, Display Mode, Display Info, Startup Volume, Input Select, Renderer Remote, Analog Input, Port A, Port B, Port C, Port D. The menu is divided into two parts: Display Brightness, Display Mode, Display Info, Startup Volume, Input Select, Renderer Remote, Analog Input, Port A, Port B, Port C, and Port D, Product Identification

I'm not sure if I want to set up any of these items. Among these items, except for Startup Volume (to be fed directly to the rear stage or to the front stage) and Analog Input (to activate the analog input), I think it's okay to leave them alone.

Scared to death.

When listening to the Cascade, I used an Esoteric K-01XD SE SACD/CD turntable as the RCA coaxial.

Digital output to Cascade, which is supposed to be the most luxurious reading system. Music files can also be played via USB. Since SRE does not have the Network Renderer V2 module installed on the Cascade, it is not possible to listen to streaming music. In fact, just listening to a CD would scare you to death, but nothing else. Listening to the Cascade directly into the ATC SCM 100 ASL dual active speakers,

with the Cascade controlling the sound.

Volume.

When I played Interpreti Veneziani's Vivaldi's "The Four Seasons" on Dragon Chase, I was literally scared out of my wits within a minute. Why? Although it was only a nine-piece arrangement, Cascade gave me a superb sound quality that I had never heard before, and that was the first thing that scared me. The second thing that surprised me was the clarity, embossment, positioning, and layering of each instrument, especially the harpsichord's shape, position, and droning texture, which was unheard of. The third thing that scared me was that although all the instruments were clear, direct and invisible, there was no aggression or noise at all, as if a small orchestra was playing in front of me. The fourth thing that scared me was that the shape of the strings was not a flat, thin line, but had a solidity to it.

The violin is beautiful.

After listening to "The Four Seasons", I immediately pulled out the 1:1 VIP bonus CD from Hi End Asia 2024 in Singapore, which I remembered saying was the best sounding CD I've ever heard at an audio show, and how does it sound on the Cascade now? Oops! I can't help but eat my hands again, the overall acoustic performance has really gone up again. I can't tell what level of acoustic performance the people involved in the making of this 1:1 copy of the CD heard when it was made. But I guess I probably didn't hear the more moving and beautiful sound that I'm getting with the Cascade.

Let's just say that the three

violin solos recorded by Sung Man Seng (a small part of the Sibelius Violin Concerto played on different famous instruments) are so beautiful!



- Digital Director and Analog Converter are connected by their Cascade-Link.



- This is The Hybrid DAC MKII.



This is the Femto Clock MKIII.

I'm afraid that the performance of these three violin solos is very close to the "original" sound, isn't it? If you are lucky enough to own this CD, and when you listen to these three violin solos, you feel that the sound quality is not that great, the realism of the performance is not that great, and you even feel that the sound is not good, then you really need to buy the Cascade, so that you can have a chance to listen to the beautiful sound of the original recordings by Sung Man Seng.

It's a good show and it's scary.

When I listened to the Taipei Percussion Ensemble's "The Greatest Show Ever Played", I was shocked again, this time because I heard an excellent low frequency performance that I have never heard before, the drum sound was so real that it sounded like we were listening to a thunderstorm. I don't mean that the drums sounded like thunder, but the drums sounded so real that it was like we were listening to the low-frequency sound effect of thunder. Also, the texture and sound of the cymbals, gongs and chimes were so real that it is not an exaggeration to describe them as "too real to be true".

When I listened to "Belafonte At Carnegie Hall", after the first track, "Introduction/Darlin ♥ Core", only four words came to my mind:

It's "live". I used to think that what I heard was just like the scene, but listening to the Cascade now, I realized that what I heard now is "just like the

scene", especially in the low frequency, and I think it's the richness of the low frequency details that makes it sound just like the scene. I think it is the richness of details in the low frequency that makes it sound like a live performance. In fact, the word "live" has already covered all the audio performances, so I don't need to say more about it.

Who says CDs don't sound good?

Listen to Hafez's Sibelius "Titi" again.

In the "Concerto for Violin" (Walter Hendl conducting the Chicago Symphony Orchestra), the beauty of Hafez's instrument was fully realized, a warm, shapely violin sound rather than a sharp, flat, metallic sound. Especially in the fast playing, the bow rubbing back and forth against the strings produced such a subtle noise that it was really real. The accompanying orchestral sound was much higher in quality, and the texture of the inner voices was very real. I can't help but exclaim: "Who says CDs don't sound good? It's your own fault for not utilizing even 50% of the CD's power. I thought I had reached a very high level of sound performance in my home, but the Cascade immediately broke down, so it's really something!

I've never heard of that.

Listening to "Faust, Carmen" by Alexander Gibson conducting the Royal Opera House Covent Garden Orchestra, I was taught another lesson by Cascade. Never before have I heard such beautiful sound quality on this CD, and never before have I heard such good layering, depth and localization, as well as low-frequency sustain on this CD. I mean, when I listened to this CD, I thought I was hearing the best I could hear. Now that I listen to it with the Cascade, I realize that there is no limit to what I can hear. There is no limit to audio performance, not only in terms of equipment, but also in terms of sound effects! Only better, not the best; only better sound, not the best sound!

Listen to Andris Nelsons conduct the Boston Symphony Orchestra in Richard Strauss' Don Quixote.

(Yo-Yo Ma's cello), the orchestral playing was beautiful, very delicate and sweet, especially the warmth and sweetness of the woodwinds was very comforting. The brass sound was not too shabby either, especially in the bass section where the texture of the brass was really superb. When the cello appears, I have to marvel at the beauty of the cello again. Listening to the whole piece, I can only use four words to describe it:

"Everywhere is beautiful.

While listening to the Cascade DAC, I only listen to CDs, not even music files. Why? I'd like to listen to the music files, but I'm in a hurry to find the CDs I listen to and listen to them all over again, and that takes up all my time. While the Cascade DAC is still in my house, I'm going to re-establish the top standard of good sound in my mind. In the future, I'm going to use this new standard to measure the sound performance of other equipment.

The Digital Source That Scared Me

The MSB The Cascade DACs on my home stereo system produce a sound that is sweet and glossy, warm and transparent, rich and soft, full and bouncy, spacious and big, clear and invisible, well-defined, and broad. I don't know how it will sound in your home. But I can say for sure that if you don't hear what I'm describing, you haven't heard the Cascade's beautiful sound. Now that the standard of beautiful sound in my mind has been overtaken by the Cascade, it's really an amazing digital source!

