



THE EDELWEISS STORY

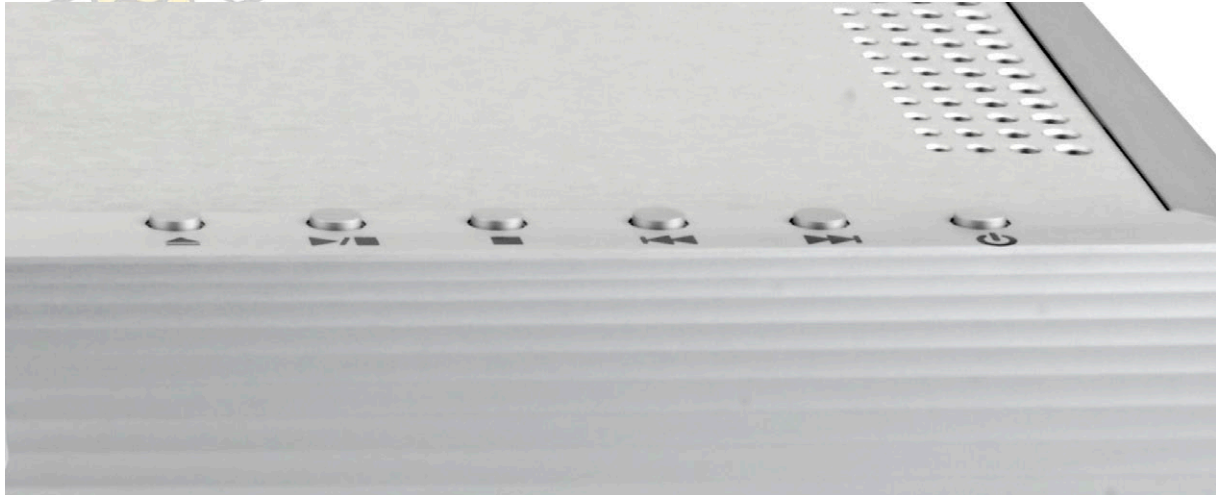
Every audiophile product strives for a certain degree of purity in audio quality, but what is purity, what constitutes purity? One of the many elements that make up purity is separation or isolation from other elements that negatively impact performance or any other characteristic. For instance, mountain air is always cleaner and purer than city air, because it is isolated from pollution that is typically associated with cities and civilization. City air doesn't fill our hearts with joy the way mountain air does.

There is a flower that is exceptionally beautiful, unique and particularly standing out from any other flower, actually from most other plants in the world. This is mostly because it grows in near perfect isolation, very high up in altitude, where the air is pristine, in one of the most beautiful surroundings: the Swiss Alps. The purity of that surrounding allows it to be one with nature and grow into a flower that has long been used as symbol for beauty, purity, strength and perfection. It is the Edelweiss - the national flower of Switzerland where the roots of Playback Designs are.

The literal translation of Edelweiss is „Noble White“. With all its attributes which it stands for it is indeed a very noble flower. And that is where the Edelweiss story connects with the design philosophy of our 6-series products:

The idea of separating and isolating each key element in a DAC design is not new at Playback Designs. Like with the Edelweiss flower we knew already with the Dream series that separation is key for pure and pristine performance and, therefore, was already a key design goal in our Dream series, where we physically separated analog from digital circuits, left channel from right channel, power supply for digital from power supply for analog etc. There are more details about this in our Dream Story which can be found elsewhere on our website.

With this we already knew that separation would have to be a top priority on our list of design goals for any new design. Just looking at an Edelweiss flower made that very clear to us. However, with a lower target budget than the Dream series we were challenged to find technologies and architectures that could achieve similar results at a significantly lower cost. It took many experiments and prototype trials over three years until we were satisfied with the result.



The Edelweiss series (6-series) borrows very heavily from the Dream series, but uses brand new designs and technologies in places where physical separation and isolation was not possible. These new technologies then still allow an „Edelweiss-like“ separation, purity and pristine perfection.

The Edelweiss series architecture is the result of multiple prototype generations over the last three years where the experience of digital and analog algorithms and circuit designs from Andreas Koch's and Bert Vogt's expertise refined over many decades has been combined and perfected to create a truly no-compromise, flexible and programmable product platform that can deliver ultimate performance and can grow for many years as technology keeps evolving.

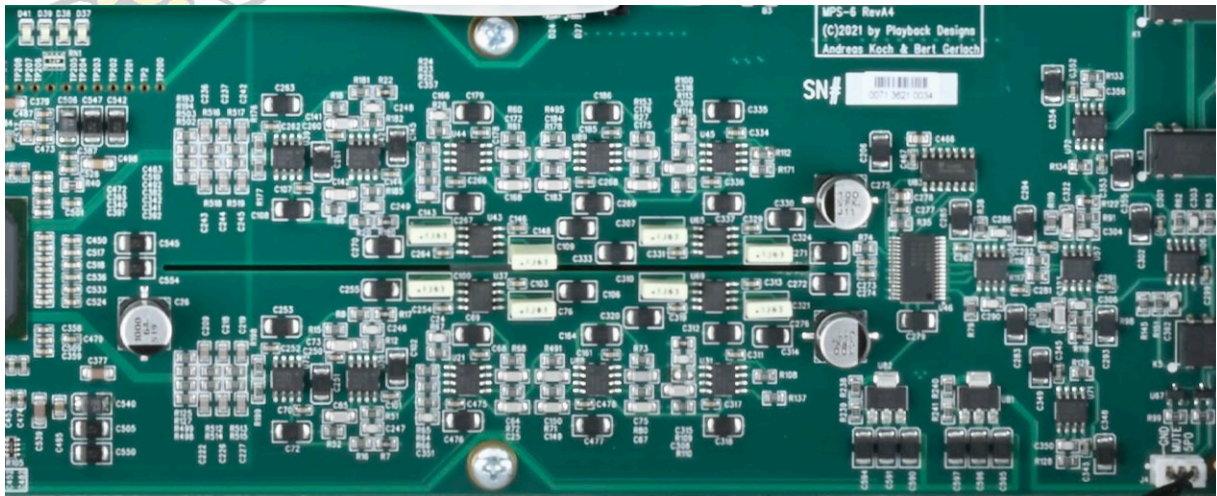
EXPANDABILITY

Playback Designs products are known for their expandable architecture. For instance, the MPS-5 SACD player received 20 free software and one hardware upgrade over its lifetime of ten years. The Edelweiss Series have been architected with the same philosophy in mind: software upgrades for performance improvements and also new features can be installed by the end user at no cost.

However, with the increasingly fast paced developments of high resolution audio via downloads and internet streaming, it is inevitable that hardware upgrades will become necessary. For this, all Edelweiss Series products are equipped with a high speed fiber optical interface (PLINK). It uses a proprietary protocol designed by Playback Designs that natively supports all PCM and DSD formats.

New external accessory boxes can then be added to existing products to expand their capabilities with new features. For instance, new streaming protocols (Tidal, Quobuz etc.) and encoding formats (MQA and others) are created every year. Some become successful, some disappear again. But with this modular approach of external hardware boxes, Playback Designs can quickly adapt and introduce new features to existing product lines, so they do not become obsolete for a long time.

This is the most important reason why Playback Designs products keep a high resale value.

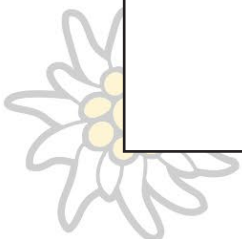


SEPARATION

It is well known that the core D/A circuitry and its associated analog output stage are one of the most sensitive links in the digital playback chain. They are susceptible to various influences from clocked circuits (such as processors, displays etc.), power supplies and external sources that are connected to it via galvanic (copper) cables. Only the slightest modulation of the digital sample clock will result in jitter and can contribute to what audiophiles often describe as „digital sound“. Often these subtle disturbances, especially related to clock jitter, are very hard or even impossible to measure. Only experience and tedious listening tests with prototype circuits can help the designer in optimizing the general architecture and detailed circuit design. This is exactly what the Playback Designs team did over the last few years after accumulating valuable experience over the last 30+ years.

As with any critical part in any product design, it needs to be well shielded from any harmful influences and embedded in an environment that lets it perform at its best. In order to control negative cross talk and inter modulation effects between the stereo output channels the core D/A and associated analog output circuitry of the Edelweiss Series has been carefully separated from the digital side with new state-of-the-art technology.

Direct connection of all digital sources to back of MPD-6





Connection of all digital sources to back of MPS-X



PLINK
optical link



MPS-X / MPD-6 combination for best performance and separation between digital and analog circuits

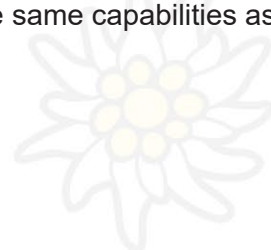
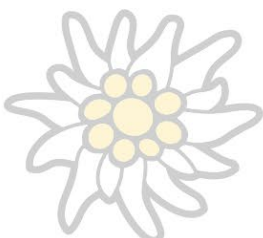
A DAC product wouldn't be complete without a digital front end, digital inputs and a front panel display. These are all purely digital circuits that can have a significant negative impact on the DAC's overall performance if not carefully laid out and integrated into the product.

It was already our experience in earlier products from Playback Designs that it is best to physically isolate all digital circuitry and power it by a separate power supply. We took this same proven philosophy for the Edelweiss Series and drove it even further by powering the display with its own separate supply. Front panel displays are a significant source of power consumption and therefore should be isolated even further.

In addition we make extensive use of mechanical shielding between power supplies, analog and digital circuits. The newly developed octal power supply is housed in a solid metal cage that shields the sensitive analog circuits from any electric field.

While the Edelweiss DAC MPD-6 and Player MPS-6 have their own digital inputs and digital signal processing built-in, they can also be combined with the MPS-X streamer that offers the same digital inputs, plus a network bridge interface. The link between MPD-6 / MPS-6 and MPS-X is via a fiber optical cable (PLINK) that natively supports all digital formats and sample rates. This is a proprietary technology by Playback Designs that is a vital element in the separation between digital sources and the DAC. By connecting all your digital sources to the MPS-X and then connecting the MPS-X with a single fiber optical cable to the MPD-6 / MPS-6 we achieve the most significant separation between analog and digital.

For increased flexibility and simpler setup the Edelweiss DAC and Player can also have an internal option of the streaming interface (Stream-X2) that has the same capabilities as the MPS-X external version.





AUDIO SAMPLE CLOCK GENERATION AND DISPLAY

It may not appear empirical to group these two subjects into the same paragraph, but unfortunately, they are very much related, and in a negative way. Most available displays are driven by internal processors or refreshing circuits with simple built in clock generators that run freely at frequencies that are not related or coupled to any audio sample rate.

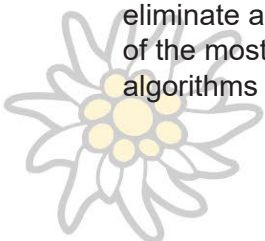
It is also well known that two independent clock generators within the same product that are not coupled or synchronized in any way, will „beat against each other“ and create inter modulation distortion. This doesn't matter so much for the display clock, but for the audio sample clock it does very much.

Therefore, it is Playback Designs' strict design rule to only use one single clock generator in the most critical element, the DAC. But this limits the choice of front panel displays drastically. Where most competing products show off fancy graphic color displays, all Playback Designs products use somewhat simpler displays that can be driven with an external clock that we can then synchronize with the audio sample rate. This eliminates a significant performance issue right at the source.

The Edelweiss products use a single clock source to drive every circuit from control processor, to signal processor, to digital input, to display.

The MPS-X is designed to allow multiple clock generators: streamer, network bridge etc. but then re-clocks all digital signals through Playback Designs' proprietary high precision clock generator before sending the signal out to the DAC via its fiber optical interface (PLINK). This prevents any inter modulation effects from reaching the DAC and achieves the best possible separation between analog and digital circuits. However, the MPS-6 and MPD-6 also allow an internal streaming option (Stream-X2), but we have taken great care to separate this source from the analog circuit to minimize any negative intermodulation effects.

For the audio sample clock Playback Designs uses a proprietary generator designed to eliminate any correlated jitter that can negatively impact the sonic performance. This is one of the most critical technologies in a DAC and Playback Designs is constantly innovating new algorithms on the same basic concept that was started already 20 years ago.





Special attention was given to the analog circuitry for the clock generator by refining it with the lowest noise linear regulators available in the market today. The result is the cleanest clock generator we have ever designed and its performance cannot easily be matched with any competitor's design.

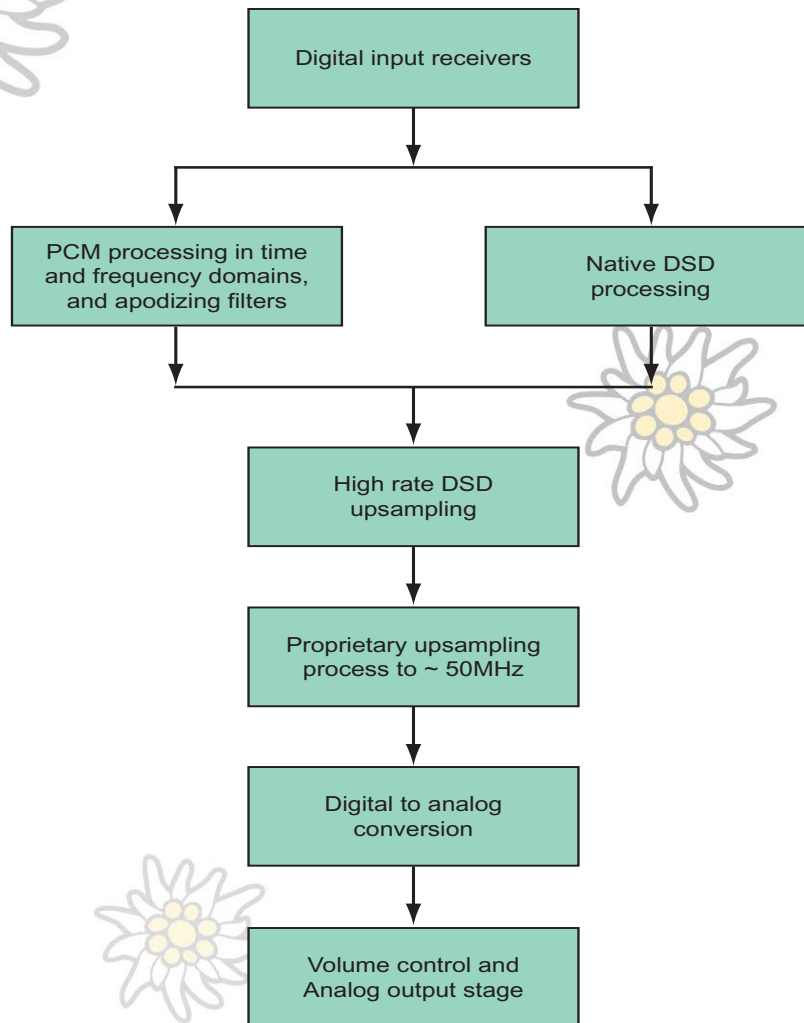
DIGITAL INPUT PROCESSING AND D/A CONVERSION

The Edelweiss Series DACs incorporate the same basic digital signal processing algorithms that made Playback Designs' earlier products famous and well liked all over the world already. New frequency and time-based filters are working in concert to optimize performance during transients in the music signal - and the music signal is generally full of such transient signals. This helps bring out performance of red-book CD's that is normally hidden when using conventional DAC chips and algorithms. On top of that an apodizing filter is used which can remedy some of the side-effects caused by the A/D converter used in the studio during production. A recently launched music format makes similar claims about this feature, but Playback Designs has implemented this filter already in 2010 and has constantly been improving it since then.

All PCM inputs are upsampled through this series of algorithms to a very high sample rate from where they are converted to DSD at an even higher sample rate. All DSD inputs are also upsampled to this intermediate sample rate.

What follows then is a proprietary digital process that further increases the bit rate of the signal to around 50MHz. At that point the sample rate is so high that a conversion to analog becomes quite trivial. The significant advantage of this is not only a drastic simplification of the analog part of the DAC, but also the prevention of any non-linear distortions that are common with most other DAC structures.

While the core DAC is built with discrete components (i.e. no off-the-shelf chip sets), just like all previous products by Playback Designs, the DAC of the Edelweiss Series is built with a much more elaborate architecture and layout, more precise and powerful components, and with strict separation between sensitive circuits and anything that could impact its performance negatively.



VOLUME CONTROL AND ANALOG OUTPUT STAGE

The analog output stage of the DAC is designed with the finest components of 0.1% metal film resistors and film capacitors combined with lowest noise precision impedance converters. This from-ground-up new design features a true differential structure which means, that one channel of audio is actually built out of two fully differential digital signals that are driven by a FPGA dedicated to the analog section only! The data transfer to this FPGA from the digital board is also differential without any galvanic ground connections.

Again, the concept of maximum separation and isolation is applied to the analog section of the DAC to achieve maximum performance.

The Edelweiss Series incorporates a very high-quality analog volume control which has been developed and refined over many years. This way, the output of the Edelweiss Series DAC can be adjusted to any level from zero to an amazing level of almost 25 volts peak in fine steps without compromising noise and distortion performance. This design is very similar to the Dream Series products.

A critical part in any analog circuit is its power supply. So we gave it our special attention too and applied the same principles again of separation by designing it with the lowest noise linear regulators. No expense was spared to achieve the highest performance the most transient friendly power for the analog output stage.



POWER SUPPLY

All power supplies used in the Edelweiss Series products are linear and a new from ground-up development. The power supply is actually eight-in-one as it has 4x2 parallel circuits to help further separating individual power domains. It is driven by a transformer that is custom built for Playback Designs with integrated Mu-metal shielding.

THREE PRODUCTS

The Edelweiss series consists of a CD/SACD player with internal DAC, the MPS-6, and a stand-alone DAC, the MPD-6. Both products can have an internal streaming option Stream-X2, which is almost identical to the Stream-X option for the Dream Series, except that Stream-X2 now supports PCM sample rates up to 384kHz and DSD sample rates up to 4x. In addition, there is also the external streaming product MPS-X which uses the same Edelweiss chassis. The MPS-X is also compatible with any other Playback Designs product or non-Playback branded products.

MPS-6

- CD/SACD player
- fully differential discrete DAC
- up to 384kHz PCM and 11.2MHz DSD
- digitally driven analog volume control (can be bridged)
- digital inputs: USB, PLINK, AES, Coax, Toslink, network (with Stream-X2 option)
- digital outputs: PLINK
- analog outputs: XLR (differential), RCA (single ended)
- remote control via IR (included)
- optional Stream-X2 streamer built-in





MPD-6

- DAC-only
- fully differential discrete DAC
- up to 384kHz PCM and 11.2MHz DSD
- digitally driven analog volume control (can be bridged)
- digital inputs: USB, PLINK, AES, Coax, Toslink, network (with Stream-X2 option)
- digital outputs: PLINK
- analog outputs: XLR (differential), RCA (single ended)
- remote control via IR (included)
- optional Stream-X2 streamer built-in

MPS-X

- streaming bridge (no internal DAC)
- digital inputs: USB, PLINK, AES, Coax, Toslink, network
- digital outputs: PLINK, AES, Coax
- supports streaming from Tidal, Qobuz, Deezer, vTuner, NAS / USB local storage
- can be controlled by mconnect control app, also supports any other DLNA based app
- remote control via IR