

Brax MX4 PRO – Four-channel power amplifier for perfectionists



Beyond the limit

► In the last issue we wrote about the Brax DSP „As Good As Can Be“. The same applies to the Brax MX4 PRO – the corresponding power amplifier for the highest-end DSP of all time.

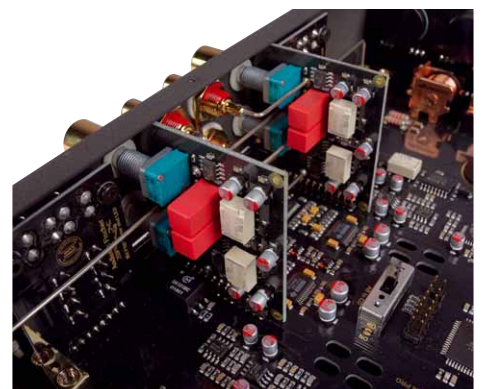
In our top list, the situation among the four-channel power amplifiers is pretty boring when it comes to the best-rated ones. For since 2012, the list has been headed by a technical work of art called Brax MX4. If now, with the MX4 PRO, an amplifier is launched on the market that promises further improvements, this really is exciting. The enormous task that lay ahead of the develop-

pers at the Sauerland manufacturers Audiotec Fischer is best divined when you have the amplifier sitting in front of you. For an MX is not just a mere power amp. Its appearance alone requires respect. The MX's physical presence alone creates the impression of indestructibility. The incredibly massive heat-sink made of a special alloy signals, just like everything about the MX4 PRO: More build



The digital inputs are equipped with the finest DAC components, optimally controlled thanks to DiSAC. For each channel pair, a PGA component regulates the volume analogously

quality is not possible. Still, the MX is by no means playful or styled, it is uncompromising without bric-a-brac, but just as well stands out thanks to its perfection down to the last detail. The heavy name plate with the serial number rests in a beautiful milled recess and turning one of the incredibly smooth-running channel-separated gain pots is sheer delight. In addition to the gilded connection block milled from solid material, leading to the power supply, there is a further set of terminals for receiving an IPC power stabilizer, so to speak as a tribute to the beginnings of the Audiotec Fischer company, but also because it is the optimum connection for a power cap. No compromises are made either on the inside of the MX4 PRO. Here of course, you will find only the best components available. The hand-wound power transformers are custom-made with highly permeable cores and correspondingly high saturation currents. Even the powerful electrolytic buffer capacitors with 4 x 3,300 microfarads for each of the two independent power supplies are custom-made for Audiotec Fischer. Just like the anti-interference capacitors at the power input, they are equipped with eight contacts for minimizing the internal resistance. And, of course, the by no means less impressive storage chokes - still a trademark of the Sauerland noble amplifiers - have not been forgotten. The driver stages have their own regulated power supply to by all means ensure operation free from any voltage fluctuations. For that mat-



Most sophisticated components on the input boards

The DiSAC system

Innovative thoughts on volume control

With DiSAC (Digital Signal Analog Controlled), Audiotec Fischer presents the first system for the perfect volume control of digital signal transmission.

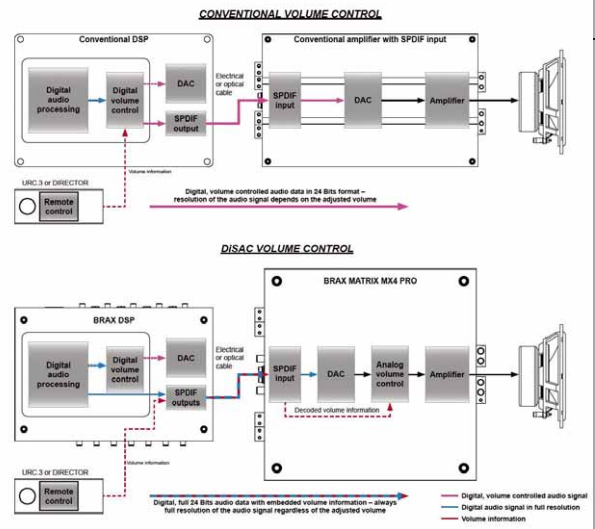
In an analog audio chain, the volume control is not that critical. Here, a potentiometer, i.e. nothing else than an adjustable resistor, controls the voltage of operational amplifiers in the source, and the power amplifier once again amplifies this analog music signal. In digital signal processing, instead of voltage, the digital level is down-regulated. This usually works without problems in practice, but it is no perfect solution. The reason is that the converters between analog and digital (ADC and DAC) and also the actual DSP work optimally only at full scale. For example, a CD stores the music with 16-bit word width or bit depth, that is, there are 2 to the power of 16 different volumes, i.e. 65,536 levels. That is a lot to start with, but applies only at full scale. For quiet passages or with the necessary volume control, the 16 bits are reduced to 8 bits, for example, so that we only have 256 levels left. This significantly reduces the dynamics, namely by 48 dB. And these 8 bits then apply just to the loudest portions of the music; during quiet passages, our dynamic range shrinks further still. At this point, it immediately becomes apparent why HiRes music with 24 instead of 16 bits has clear advantages. The sound processor bears the same „thought in mind“. It usually converts with 24 bits internally and ideally calculates with even more bits. (By the way, the only models on the market that consistently work with 32 bits – even for conversion – are the Brax DSP and the Helix DSP PRO MK2.)

The ideal case

From what has been said, it is apparent that every DSP works best at full scale, that is, the music signal has to pass through the processor without volume control with its full bit depth, and only then will it be optimally processed. But even if you want to do particularly well and digitally wire from the source to the amp, there will be shortcomings. Even with a volume control in the DSP via its remote control. Namely, when the signal runs from the DSP to the power amplifier digitally, for a digital input normally does not allow any level control. That is, the DSP must provide the amp with a down-leveled digital signal – unfortunately with reduced bit depth. The final digital-to-analog conversion in the power amplifier can thus not be effected at full scale.

DiSAC can do it

At this point, the new and exclusive DiSAC comes into play. For, the Brax technicians have done what is to be found nowhere else: They have embedded the volume information into the digital music stream so that the signal transmission can take place at full scale. For this purpose, the Brax DSP on the sending end encodes the volume information in the S/PDIF data stream, and then it goes into the MX4 PRO, where its DAC is operated at full scale. The DiSAC circuit as a receiver again gathers the volume information and after the conversion completely analogously controls the volume for the output stage. This is the perfect solution because this is the only way in which the entire digital signal processing can occur with maximum dynamics. The situation has only one drawback: DiSAC is only available with Brax DSP and MX4 PRO. Equipment for the bread-and-butter processors and power amps is not in sight, because the DiSAC solution requires a lot of effort on the hardware side, and it is accordingly expensive.



ter, the MX4 PRO is a prime example of the amplifier wisdom that a power supply can never be taken seriously enough. 8 power transistors per channel, which are not only high-end types, but have been selected by hand, provide power in abundance. Where else are the transistors selected with the help of self-developed measuring equipment in over 300 classes and then installed in perfect ensembles? Pure perfection is also found with respect to load stability. The MX4 PRO works with 4, 2, or 1 ohm loads, wherein the same power is yielded in each case. In order to achieve perfect behavior with all loads, the amplifier is adjusted to the load by means of a sensing device - once more, no room for compromises. Further sensing devices regulate the operating states stereo or mono-bridge for the two channel pairs, which is known from other Brax amplifiers, only that here this is controlled electronically. And there is plenty of electronics in the MX4 PRO, and adding to this, a number of relays click satisfactorily upon operation.

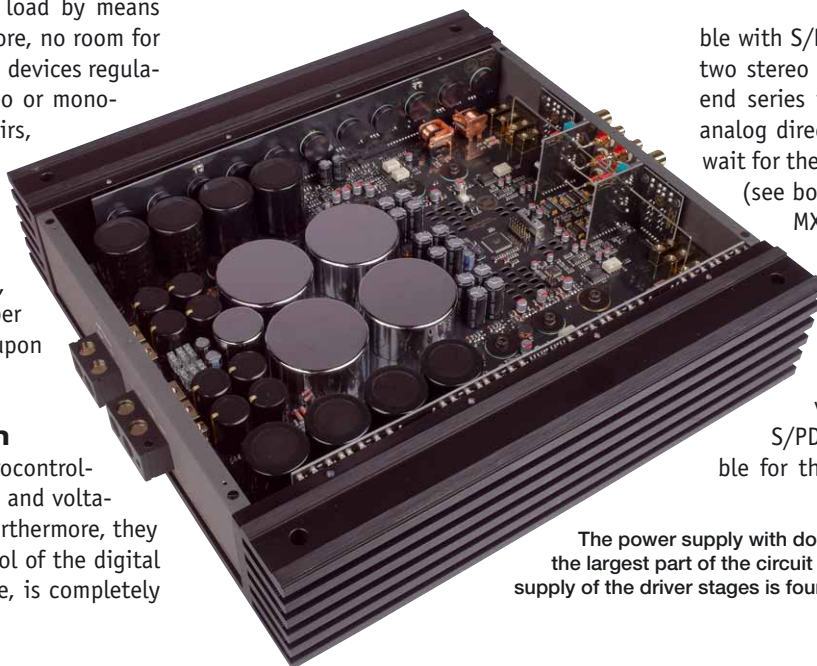
New digital section

But essentially, the two microcontrollers monitor all the functions and voltages of the power amplifier. Furthermore, they of course take over the control of the digital section. The latter, to be sure, is completely

new in the PRO and of course offers solutions that you will not find anywhere else. Not only is the MX4 PRO a high-end class AB power amp, but it is also a firework of advanced digital technology. In addition to the analog RCA inputs, the MX4 PRO has one set of digital inputs per channel pair. If you only want to install one S/PDIF line, you can also use all four channels via a switch. Otherwise, an optical (according to specifications up to 96 kHz) and a coaxial digital input are available so that the MX4 PRO can process digital signals up to 24 bits/192 kHz (more is not possi-



Specially produced buffer capacitors, hand-wound transformers and the storage chokes typical for Brax



The power supply with double main power supply takes up the largest part of the circuit board; in its middle, the own power supply of the driver stages is found

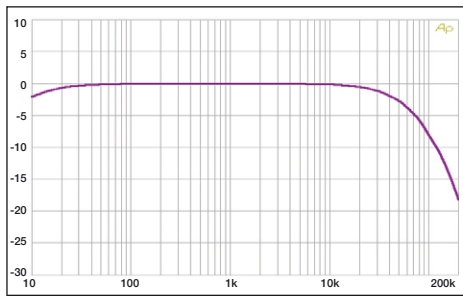


At the top, there are the digital inputs, which are available per channel pair in the form of optical and coaxial S/PDIFs

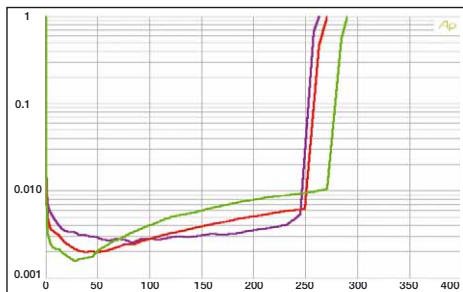
chain from source to output stage without any digital volume control. For this is done analogously following the DA conversion. The volume information is decoded in the MX4 PRO and passed on to special controller ICs. These PGAs (Programmable Gain Amplifiers) are operational amplifiers, the analog output of which can be adjusted by means of a digital control signal. It goes without saying that in the MX4 PRO only the finest types of Burr Brown with an enormous dynamic range of +31.5 to -95.5 dB are employed.

Measurements and sound

In the measuring lab, the MX4 PRO easily beats everything that has happened before and pushes our metrology to its limits. Every one of our measurements compels us to show our deepest respect to the Brax technicians. The distortion curves are a dream, the factor sometimes lying below .002% and leaving the range below .01% only at the power limit. Thanks to the impedance matching, the latter is slightly under 300 watts per channel



Even when the measuring range is extended, the MX4 PRO has an impressive frequency range, which of course is unconditionally suitable for HiRes music



The MX4 PRO's performance is breathtaking even into 2 and 1 ohms. At 4 ohms, the distortion even drops below .002%. There is plenty of power, which is almost independent of load

at our 13.8 volt supply voltage, independent of load. The excellent low distortion values even into 2 and 1 ohms are simply outstanding and unrivalled. But also dampening factors beyond 1000 or the outstanding low noise contribute to the fact that the MX4 PRO is simply the best amp that has ever seen our test lab from the inside. The situation has only one drawback: The MX4 PRO is no poor eater, for as befits a high-end class AB amp, it wants to see amperes, and major amounts of it. The extra connection for the power stabilizer is certainly also justified.

But then the MX4 PRO will reward your ears, and in a way that is as unique as its construction. Not so much that the MX4 PRO somehow had a sound of its own or sounded recognizably like an MX4, it just sounds like perfection. Words cannot describe how fast it moves from total silence to the loudest blast. At any point in time, the music is simply there, with a matter of course attitude nipping any reflection on the technology in the bud. This aptitude of making the most gentle subtleties and bass sounds at the pain threshold alike equally accessible to the listener - ingenious! And then this flow of music, always relaxed and without any effort, but always nice and groovy, making your foot tap along. When rendering distinctive voices, the MX4 PRO regularly turns into a goose bumping machine; it plays up with a level of authenticity that is second to none. This mix of power and sensitivity, of feastful colors and perfect neutrality makes its sound thoroughly unique, but not distinct. If there is any untoppable amp on the market, it is certainly called MX4 PRO.

Conclusion

If an amp succeeds the best amp ever that had been unchallenged for years, you can hardly expect anything more than just gradual improvements. But the developers have not only managed to further advance the best power amplifier, they have also equipped the MX4 PRO with a real innovation: DiSAC. You cannot help but take your hat off to it!

Elmar Michels



Brax MX4 PRO

Distributor	Audiotec Fischer, Schmallenberg		
Hotline	02972 9788 0		
Internet	www.audiotec-fischer.com		

Sound	40 %	0,7	■■■■■■■
Bass	8 %	0,5	■■■■■■■
Neutrality	8 %	1,0	■■■■■■■
Transparency	8 %	0,5	■■■■■■■
Spatial imaging	8 %	1,0	■■■■■■■
Dynamics	8 %	0,5	■■■■■■■

Lab	35 %	0,8	■■■■■■■
Power	20 %	1,0	■■■■■■■
Damping factor	5 %	0,5	■■■■■■■
Signal-to-noise ratio	5 %	0,5	■■■■■■■
Noise	5 %	0,5	■■■■■■■

Practice	25 %	1,1	■■■■■■■
Features	15 %	1,5	■■■■■■■
Build quality electronics	5 %	0,5	■■■■■■■
Build quality mechanics	5 %	0,5	■■■■■■■

Specifications

Channels	4
Power 4 Ohm (x4/x2)	286
Power 2 Ohm (x4/x2)	276
Power 1 Ohm (x4/x2)	268
Bridged Power 4 Ohm (x2/x1)	552
Bridged Power 2 Ohm (x2/x1)	536
Sensitivity max. mV	1440
Sensitivity min. V	11,5
THD+N (<22 kHz) 5 W	0,003
THD+N (<22 kHz) Half Power	0,005
Signal-to-noise ratio dB(A)	99
Damping factor 20 Hz	1118
Damping factor 80 Hz	1118
Damping factor 400 Hz	1121
Damping factor 1 kHz	896
Damping factor 8 kHz	898
Damping factor 16 kHz	717

Features

Low pass	-
High pass	-
Band pass	-
Bass boost	-
Subsonic filter	-
Phase shift	-
High-level inputs	-
Separate gain control (Autosense)	-
RCA outputs	-
Start/stop capable	• (6,5 V)
Dimensions (L x W x H in mm)	360 x 360 x 79
Others	S/PDIF in, DiSAC

Ratings

Price	um 4.900 Euro		
Sound	40 %	1+	■■■■■■■
Lab	35 %	1+	■■■■■■■
Practice	25 %	1,1	■■■■■■■

Brax MX4 PRO

Absolute Top Class
 Top Class
 Upper Class
 Middle Class
 Entry Level

1+
 Price-Performance:
 very good



Issue 2/2019

„Unprecedented perfection and innovation.“