BEST PRODUCT
Absolute Top Class
CAR&HiFi 3/2020

BEST EMC
Undisturbed FM reception
CAR&HiFi 3/2020

V Eight DSP MK2 and V Twelve DSP –
Helix Multichannel DSP Amplifiers

Channel Abundance

▶ Immediately after the over-processor DSP Ultra, Helix introduces two new DSP amplifiers.
We are taking a closer look at V Eight DSP MK2 and V Twelve DSP.

Anyone who needs multiple channels can find the V Eight in the Helix product lineup. With eight amplifier channels and two processed outputs, the eight-end device is able to power even larger sound systems. The V Eight, introduced in 2016, now has a successor: the MK2 version. The main reason for the generation change is the ACO platform with the new 32-bit controller that was introduced last year, and now also includes the V Eight DSP MK2. Of course, the completely new V Twelve DSP also has ACO on board, so we are dealing with a new channel record holder. Twelve amplifier channels and two processed outputs should be enough. The background for the V Twelve is the sound enhancement of complex factory packs. If you have ordered a big sound package from the car dealership and you are not satisfied with it, a car hi-fi dealer can help you out with the V Twelve. Because the premium factory packages usually work with actively controlled speakers and have nice features such as time alignment and/or all-pass filters. This circumstance makes it difficult for a retrofit system to generate a amplitude and phase linear stereo signal from the factory package. With the V Twelve you are going an easier way: all factory channels are processed individually without summing, so each channel or speaker can be corrected separately. Of course, the full featuring of the Helix processors is available, including EQ and time alignment at inputs and outputs as well as crossovers and in case of DSP amps power amplifiers. And, of course, V Eight and V Twelve come with the latest features such as input measurements and virtual channels.

Best Integration

The aforementioned ACO-platform (Advanced COprocessor) enables a tremendous expansion of DSP capabilities with its powerful controller module. Since ACO, there have been 10 memory slots for setups and the effect features Frontprocessing, Bass Processing and Center Processing, which can be used to optimize the playback. For the subwoofers, there are intelligent limiters and boosters that tickle the maximum out of the existing sub, stage and voice playback can be specifically influenced and a center channel that really fits can be properly shaped. The ISA (Input Signal Analyzer) is also integrated, it performs a frequency response measurement on all input channels (and their sums), so that you can quickly get an accurate impression of what kind of music signal comes from the vehicle.
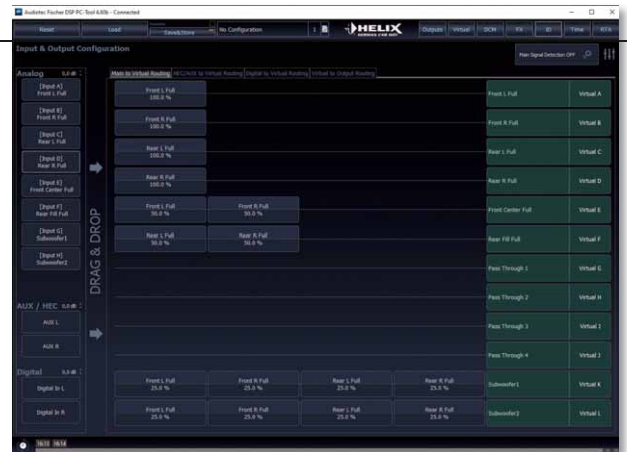
Advanced Routing

Even though all existing channels are worked through one by one during the prime applica-

tion of the V Twelve, both new Helix DSP amplifiers master the VCP. This virtual channel processing opens up completely new possibilities for signal routing. Firstly, the inputs are routed to virtual groups such as Front, Center, Rear and Sub, which can be processed like normal output channels with all the bells and whistles, you can easily create time alignments and equalizing for entire groups. Only in the second step, for example, the virtual front channel is distributed to a three-way system, where crossovers, EQs and time alignment are available for each tweeter, midrange and woofer. Thus, all the speakers installed in the system can be adjusted perfectly and afterwards you can push any sound design with EQs and effect processing — perfect for complex active systems or multi-way centre speakers.

Hardware

All said above applies equally to V Eight and V Twelve, and hardwaresided side there is also a close relationship. All in all, the V Twelve is a V Eight extended by half, but it is physically only four centimeters longer. We find the step-up power supply known by Helix, which works more efficiently than a transformer power supply. We also find fully integrated chip power amplifiers, of which the V Eight houses eight and the V Twelve twelve. We are used to the Atmel controller and the ADAU1452 analog devices DSP, but the 1452 is only found in the V Eight. The V Twelve comes with the 1466, virtually a enhanced version of the 1452 with extended internal memory. This makes it possible to process the 12 inputs, 14 output channels and the virtual channels with just one DSP chip — a mature performance! Only few minor tradeoffs can be found in our V power amplifiers. As with the top DSPs of the house, the AD converters come from AKM and are very high quality types, but a step inferior to, for example,

Routing Step 1: The inputs are routed to the virtual channels, as usual for main/analog, HEC and digital inputs. The virtual channels are subtly highlighted in green

The setup of the virtual channels is similar to that of the output channels, only without crossovers. The virtual front EQ and FX front processing then affect all output channels routed from there.

In the ISA, any inputs and their sums can be measured. EQ (with Allpass) and time alignment are adjusting the incoming signal.

As usual, an extensive arsenal of crossovers, equalizers and time alignment is available for all output channels.

the DSP Ultra. On the other hand, the DACs are the same highes grade types, of course in the number of channels adapted to the application. In addition, V Eight and V Twelve had to do without the HighRes audio frequency range up to 48 kHz, which costs twice the processing power compared to the normal CD frequency range of 22 kHz. Therefore, the DSP Ultra has two DSP chips and, incidentally, costs more than one V Eight. Nevertheless, the V Eight and the V Twelve can be confidently described as high-end; in terms of craftsmanship, construction and features, both are very well ahead of the market.
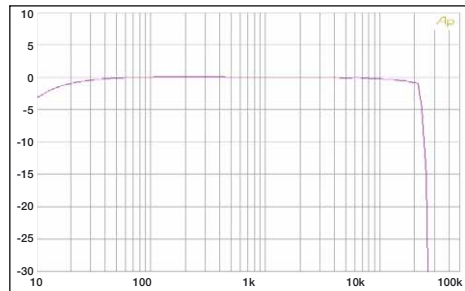
Measurements and sound

The two helix amplifiers are also far ahead in terms of laboratory performance. Because of the technical similarity, it is no wonder that we get almost the same measurement results on both. So we measure exactly the same channel power of 77 or 134 watts at 4/2 ohms on both
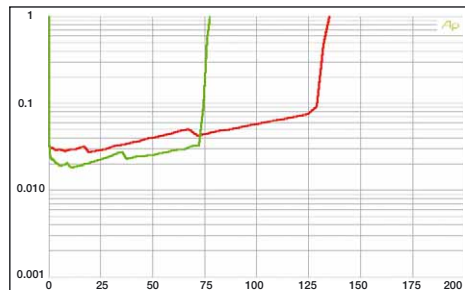

The V Twelve is basically a four-channel extended V Eight, yet it has its own space-saving layout.

devices. This happens at extremely low distortions, even at half load the chips distort only 0.022 or 0.025% THD+N. Such a clean power
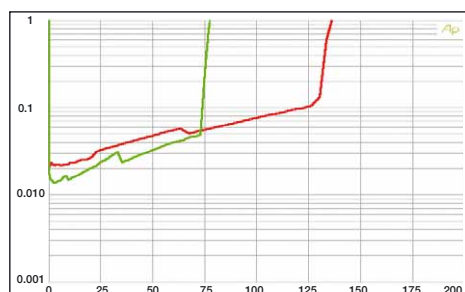
supply at 12 x 77 watts (i.e. over 900 watts) is impressive. The crisp noise ratio of 97 dB, determined by analog inputs and the DSP!

The DSP in V Eight DSP MK2 and V Twelve DSP works with a sampling rate of 48 kHz, therefore the usable audio frequency range is theoretically up to 24 kHz; in reality, because of the low pass filter, we get to 22 kHz at best.

The V Eight delivers a performance with extremely little distortion, at 4 ohms, it always remains below 0.03%

The V Twelve delivers exactly the same channel performance as its eight-channel sister, with minimal added distortion under high power requirements.

◗ Helix V Eight DSP MK2/V Twelve DSP

Distributor	Audiotec Fischer, Schmallenberg
Hotline	02972 9788 0
Internet	www.audiotec-fischer.com
Price V Eight DSP	**1.000 Euro**
Price V Twelve DSP	**1.500 Euro**

◗ Specifications

Dimensions

V Eight DSP MK2	220 x 180 x 44 mm
V Twelve DSP	220 x 220 x 44 mm

Inputs
• 8-channel high level (V Twelve DSP: 12 channel
• 6-channel RCA
• 1 x digital S/PDIF (optical)
• Sensitivity 8 V (RCA), 32 V (high in), two hardware steps (jumper)

Outputs
• 2-channel RCA (8 V)
• Remote-out

DSP-Software (V 4.65b im Test)

Equalizer
Inputs:
• param., 5 bands per channel
Virtuelle Kanäle:
• param., 30 bands per channel
• Mid/Side-EQ (front): param., 5 bands per channel
Outputs:
• parametric, 30 bands per channel, +6 – -15 dB
• 20 – 20k Hz, 1 Hz increments, Q 0,5 – 15
• Shelf 25 – 10k Hz, Q 0,1 – 2
• Allpass filters 1st or 2nd order, f and Q adjustable

Crossovers
Outputs:
• 20 – 20k Hz, 1 Hz increments
• Bessel, Butterworth, Chebychev, Linkwitz, User, 6 – 42 dB/Oct.

Time and level
Samplerate 48 kHz, 7 mm increments (0,02 ms)
Inputs:
• 0 – 5,19 ms, 256 samples
Virtual channels:
• 0 – 354 cm (10,40 ms), 512 Samples

• Phase 0, 180° (fullrange), 0 – 360° (22,5° increments)
• Adjustable level increments 0,1 – 1 dB
Outputs:
• 0 – 708 cm (20,82 ms), 1024 Samples
• Phase 0, 180° (fullrange), 0 – 360° (22,5° increments)
• Adjustable level increments 0,1 – 1 dB

Features
• 10 Setups with fast switchover
• User-defined routing of in- and output ports
• Control connector for programmable remote controls and accessories
• Start-stop capability up to 6V
• Signal-dependent switching to digital or Aux inputs
• Automatic putting through of all vehicle tones
• Power save mode
• (configurable) ADEP.3 error protection circuit for factory radios with speaker recognition
• RTA real-time frequency curve measurement (with optional microphone)
• FX menu with dynamic bass, center and front processing
• ISA for measuring, summing and correcting inputs
• Time Machine for taking back and restoring adjustments
• Standard programming or VCP, 8 virtual channels, user-defined routing, EQ, time alignment and FX processing

Optional accessories
• In- and output ports HEC HD-AUDIO USB-INTERFACE (HiRes audio up to 32 bits/192 kHz), HEC BT (Bluetooth aptX audio streaming + add. S/PDIF out), Aux-in (3.5 mm jack input + add. S/PDIF out), HEC Optical-in (optical S/PDIF input)
• Wired remote control (programmable)
• Display remote control director with memory, USB, etc.
• WIFI Control for wireless programming
• Measurement microphone MTK1

For 12 channels it requires a DSP and two six-channel ADCs and DACs

With very complex high-level inputs there is an integrated ADEP.3, the sensitivity can be adjusted with a jumper.
A jumper serves for the optimal adaptation to factory radios and plant amplifiers up to 32 volts

As we tested the first V Eight four years ago, we were still amazed at how well an amplifier can play with amplifier ICs, today we have become accustomed to the fact that a modern, highly efficient circuit is not achieve at the expense of sound quality. And so V Eight and V Twelve play as fluffy as their sisters. It goes precisely to the point and the amps are quite capable of packing. Bass drums come dry and accurate and down to the finest harmonics, so you never miss detail resolution. Similarly, the finely sorted spatial reproduction impresses with a generous stage and enough "air" between the musical actors. V Eight and V Twelve are delivering equally fine performance, you can forget about choosing a winner here. Both impress with an enormous sound level that can keep up with one of a larger amplifier.

Conclusion

With V Eight DSP MK2 and V Twelve DSP, Helix sets a benchmark for multi-channel amplifiers. With squeaky clean technology and the most comprehensive integration and sound features on the market, these two are top class. Whether to upgrade premium factory systems or to use simply as compact, powerful DSP amplifiers, V Eight and V Twelve are the beat right now.

Elmar Michels

▶ Endstufen

		Helix V Twelve DSP	Helix V Eight DSP MK2
Distributor		Audiotec Fischer Schmallenberg	Audiotec Fischer Schmallenberg
Hotline		02972 97880	02972 97880
Internet www.		audiotec-fischer.com	audiotec-fischer.com
▶ Sound	40 %	1,1	1,1
Bass	8 %	1,5	1,5
Neutrality	8 %	1,0	1,0
Transparency	8 %	1,0	1,0
Spatial imaging	8 %	1,0	1,0
Dynamics	8 %	1,0	1,0
▶ Lab	35 %	1,0	1,0
Power	20 %	1,0	1,0
Damping factor	5 %	–	–
Signal-to-noise ratio	5 %	1,0	1,0
Noise	5 %	1,0	1,0
▶ Practice	25 %	0,6	0,6
Features	15 %	0,5	0,5
Build quality electronics	5 %	0,5	0,5
Build quality mechanics	5 %	1,0	1,0

Specifications

	V Twelve DSP	V Eight DSP MK2
Channels	8	8
Power 4 Ohm	12 x 77	8 x 77
Power 2 Ohm	12 x 134	8 x 134
Power 1 Ohm	0	0
Bridged Power 4 Ohm	0	0
Bridged Power 2 Ohm	0	0
Sensitivity max. mV	var.	var.
Sensitivity min. V	var.	var.
THD+N (<22 kHz) 5 W	0,015	0,019
THD+N (<22 kHz) Half Power	0,025	0,022
Signal-to-noise ratio dB(A)	97	97
Damping factor 20 Hz	84	84
Damping factor 80 Hz	85	85
Damping factor 400 Hz	81	81
Damping factor 1 kHz	80	80
Damping factor 8 kHz	20	20
Damping factor 16 kHz	6	6

Features

	V Twelve DSP	V Eight DSP MK2
Low pass	10 – 20k Hz	10 – 20k Hz
High pass	10 – 20k Hz	10 – 20k Hz
Band pass	10 – 20k Hz	10 – 20k Hz
Bass boost	-15 – 6 dB/10 – 20k Hz	-24 – 20 dB/10 – 20k Hz
Subsonic filter	via HP	via HP
Phase shift	0, 180°/LZK via DSP	0, 180°, LZK via DSP
High-Level inputs	•	•
Separate gain control (Autosense)	•, DC oder Signal	•, DC oder Signal
RCA outputs	• , stereo, prozessiert	• , stereo, prozessiert
Start/stop capable	• (< 6 V)	• (< 6 V)
Dimensions L x B x H (in mm)	220 x 220 x 44	220 x 180 x 44
Others	14-Kanal-DSP	10-Kanal-DSP

▶ Ratings

		V Twelve DSP	V Eight DSP MK2
Price		**1.500 Euro**	**1.000 Euro**
Sound	40 %	1,1	1,1
Lab	35 %	1,0	1,0
Practice	25 %	0,6	0,6
Price-Performance		very good	very good

Issue 3/2020

	Absolute Top Class	Absolute Top Class
	Top Class	Top Class
	Upper Class	Upper Class
	Middle Class	Middle Class
	Entry Level	Entry Level
Note	**0,9**	**0,9**

„Best for upgrading complex factory systems."