BEST PRODUCT
Abs. Top class
CAR&HiFi 3/2020

EMC TIP
Undisturbed radio reception
CAR&HiFi 3/2020

V Eight DSP MK2 and V Twelve DSP - multi-channel DSP power amplifiers from Helix

canal fullness

Immediately after the over-processor DSP Ultra, Helix has added two new DSP power amplifiers. We take a close look at V Eight DSP MK2 and V Twelve DSP.

If he needs a lot of channels, he chooses the V Eight from the Helix range. With its eight amplifier channels and two processed outputs, the Achtender is also able to supply larger sound systems. Introduced in 2016, the V Eight now has a successor, the MK2 version. The main reason for the generation change is the ACO platform introduced last year with the new 32-bit controller, which the V Eight DSP MK2 can now also enjoy. Of course, the completely new V Twelve DSP also has ACO on board, with her we are dealing with the 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 packages. If you have ordered the large sound package from the car dealership and are not satisfied, the car hi-fi dealer can help with this with the V Twelve. Because the premium factory packages usually work with actively controlled speakers and have nice things like runtime correction and/or all-pass filters. That doesn't exactly make it easy for an aftermarket system to generate a linear, in-phase stereo signal from the factory package. With the V Twelve you go a much simpler way: All factory channels are treated individually without summing, so each channel or speaker can be improved separately. Of course, the full range of Helix processors is available for this, including EQ and runtime correction on inputs and outputs as well as crossovers, and the DSP amplifiers still have powerful output stages.

Best integration

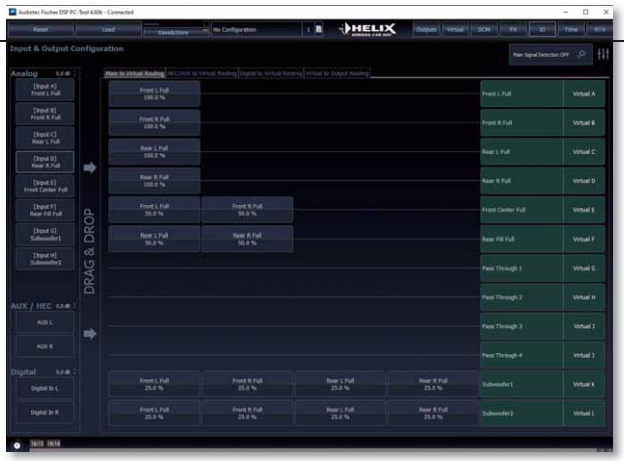
The above-mentioned ACO platform (Advanced COprocessor) enables an enormous expansion of the DSP capabilities with its powerful controller module. Since ACO there have been 10 memory slots for setups and the effect features front processing, bass processing and center processing, which can be used to optimize playback. The range of functions includes intelligent limiters and boosters for subwoofers, which tickle the maximum out of the existing sub, stage imaging and voice reproduction can be specifically influenced and a center channel can be generated that really fits. The ISA (Input Signal Analyzer) is also integrated, which carries out a frequency response measurement on all input channels (and their sums), so that you quickly get an exact impression of the type of music signal coming from the vehicle.

Advanced routing

Even if all existing channels are worked through 1:1 in the parade application of the V Twelve become, dominate both new Helix DSP end grade the VCP. This virtual channel processing opens up completely new possibilities in signal routing. By first routing the inputs to virtual groups such as front, center, rear and sub, which can be processed like normal output channels with all the trappings, running times and equalization can be easily created for entire groups. Only in the second step, for example, is the virtual front channel distributed to a three-way system, where crossovers, EQs and runtime correction are then available for each tweeter, midrange driver and woofer as usual. In this way, all loudspeakers installed in the system can be perfectly fixed and afterwards you can add any desired sound design with EQs and effect processing - perfect for complex active systems or multi-way center loudspeakers.

hardware

Everything that has been said so far applies equally to the V Eight and V Twelve, and there is also a close relationship on the hardware side. On the whole, the V Twelve one half lengthened V Eight, it is only four centimeters longer. We find the step-up power supply known from Helix, which works more efficiently than a transformer power supply. We also find power amplifier ICs, of which the V Eight houses eight and the V Twelve twelve. The Atmel controller and the Analog Devices DSP We are used to ADAU1452 from Helix, but the 1452 is only found in the V Eight. The V Twelve comes with the 1466, a kind of drilled version of the 1452 with expanded internal memory. So it becomes possible to use the 12 inputs,



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 the same as for the output channels, only without the crossovers. The virtual front EQ and FX front processing then affect all output channels that were routed from there

Any inputs and their sums can be measured in the ISA. EQ (with allpass) and delay correct the incoming signal

As usual, an extensive arsenal of crossovers, equalizers and runtime correction is available for all output channels

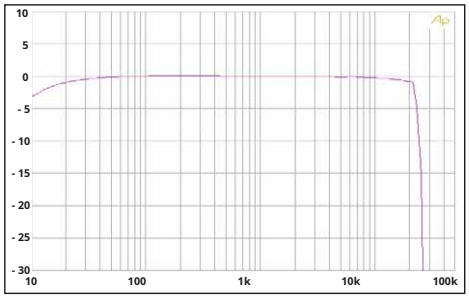
Processing 14 output channels and the virtual channels with just one DSP chip - a great achievement! You only have to make a few compromises with our V power amplifiers. As with the top DSPs of the house, the AD converters come from AKM and are very high-quality types, but one series lower than, for example, with the DSP Ultra. The DACs, on the other hand, are the same series, of course the number of channels is adapted to the application. The V Eight and V Twelve also had to do without the HighRes audio frequency range up to 48 kHz, because it costs twice as much computing power as compared to the normal CD frequency range of 22 kHz. Therefore, the DSP Ultra also has two DSP chips and costs more than a V Eight. Nevertheless, the V Eight and the V Twelve can confidently be called high-end; in terms of processing quality, structure and features, both are way ahead of the market.

The V Twelve is basically a V Eight extended by four channels, but it still has its own space-saving layout

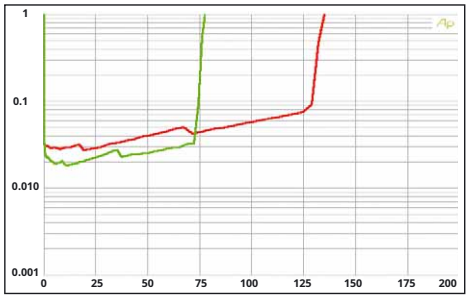
measurements and sound

The two Helix amplifiers are also way ahead when it comes to laboratory performance. Because of the technical similarity, it isn't

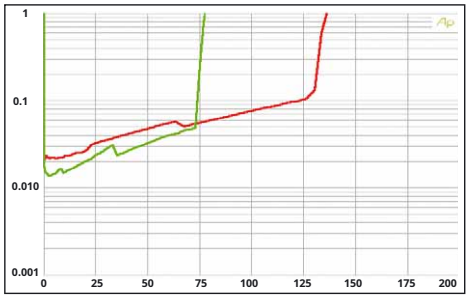
It's surprising that we get almost the same measurement results for both. So we measure exactly the same channel power on both



The DSP in the V Eight DSP MK2 and V Twelve DSP works with a sampling rate of 48 kHz, so the usable audio frequency response ranges theoretically up to 24 kHz, but in practice 22 kHz results because of the low-pass filter



The V Eight delivers its performance with extremely low distortion, at 4 ohms it always stays below 0.03%



The V Twelve delivers exactly the same channel performance as its eight-channel sister, with minimally more distortion under high performance requirements

Helix V Eight DSP MK2/V Twelve DSP

distribution	Audiotec Fischer, Schmallenberg
hotline	02972 9788 0
Internet	www.audiotec-fischer.com
Prize V Eight DSP	around 1,000 euros
Prize V Twelve DSP	around 1,500 euros

Technical specifications

Dimensions

V Eight DSP MK2	220x180x44mm
V Twelve DSP	220x220x44mm

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 level), two-stage hardware jumper

exits
- 2-channel RCA (8V)
- Remote out

DSP software (V 4.65b in test)

equalizer

Inputs:
- param., 5 bands per channel

Virtual Channels:
- param., 30 bands per channel
- Front Mid/Side EQ: param., 5 bands per channel

Outputs:
- parametric, 30 bands per channel, +6 – -15 dB
- 20 – 20kHz, 1Hz steps, Q 0.5 – 15
- Shelf 25 – 10kHz, Q 0.1 – 2
- 1st or 2nd order all-pass filter, f and Q adjustable

crossovers

Outputs:
- 20 – 20kHz, 1Hz steps
- Bessel, Butterworth, Chebychev, Linkwitz, User, 6 – 42 dB/oct.

time and level

Sample rate 48 kHz, 7 mm steps (0.02 ms)

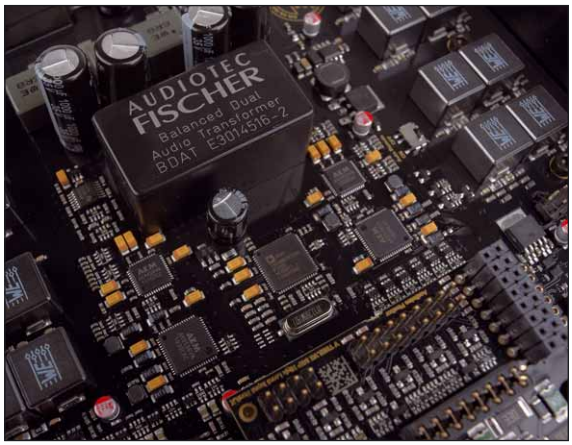
Inputs:
- 0 - 5.19ms, 256 samples

Virtual Channels:
- 0 – 354 cm (10.40 ms), 512 samples
- Phase 0, 180° (full range), 0 – 360° (22.5° steps)
- Adjustable level steps 0.1 – 1 dB

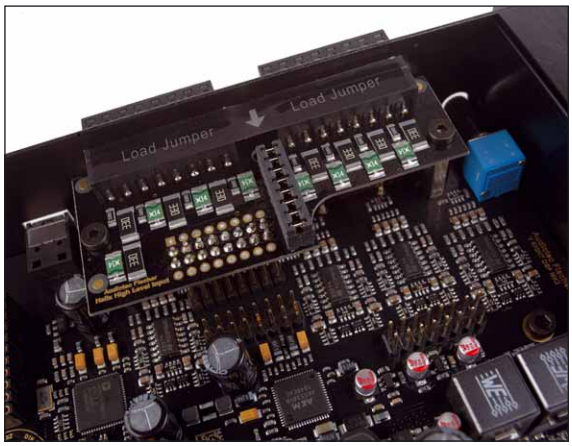
Outputs:
- 0 - 708 cm (20.82 ms), 1024 samples
- Phase 0, 180° (full range), 0 – 360° (22.5° steps)
- Adjustable level steps 0.1 – 1 dB

Furnishing
- 10 setups with fast switching
- Inputs and outputs can be routed as required
- Control port for programmable remote controls and accessories
- Start-stop capability up to 6 V
- Signal-dependent switching to digital or AUX inputs
- Automatic switching through all vehicle sounds
- Power save mode
- ADEP.3 Error Protection Circuit for factory radios with speaker detection
- Ground switch against hum interference
- RTA real-time frequency response measurement (with optional microphone)
- FX menu with dynamic bass, center and front processing
- ISA for measuring, summing and correcting the inputs
- Time Machine to undo and redo settings
- VCP (optionally activated), 8 virtual channels, freely routable, with EQ, LZK and FX processing

Optional accessories
- Inputs and outputs HEC HD-AUDIO USB-INTERFACE (HiRes audio up to 32 bit/192 kHz), HEC BT (Bluetooth aptX audio streaming + additional S/PDIF out), HEC AUX IN (3.5 mm jack input + additional S/PDIF out), HEC OPTICAL IN (optical S/PDIF input)
- Cable remote control (programmable)
- Director display remote control with memory, USB etc.
- WIFI Control (wireless programming)
- MTK1 measurement microphone set



For 12 channels does it need one DSP and two each six channel ADCs and DACs



With the very complex level inputs is ADEP.3 integrated, using jumpers can the sensitivity set to

77 or 134 watts into 4/2 ohms (rated at a strict 13.8 V and 0.7% THD-N). This happens with extremely low distortion, even at half load the chips only distort 0.022 and 0.025% respectively. Such clean power development at 12 x 77 watts (ie over 900 watts) is impressive. Likewise the crisp signal-to-noise ratio of 97 dB, determined by analogue inputs and the DSP!

With the first V Eight four years ago, we were still amazed at how well a power amp with amplifier ICs can play, but today we have gotten used to the fact that modern, highly efficient circuitry is by no means at the expense of the sound. And so V Eight and V Twelve play just as loosely fluffy as their sisters. It gets down to business with precision and the amps can really grab it. Bass drums come dry and to the point and you never miss detail resolution down to the finest harmonics. The finely sorted spatial reproduction with a spacious stage and enough "air" between the musical actors is also impressive. V Eight and V Twelve don't take anything away from each other, forgetting to choose a winner here. Both impress with an enormous sound level that does not have to hide from any large power amplifier.

Conclusion

With V Eight DSP MK2 and V Twelve DSP, Helix sets the standard for multi-channel amplifiers. With spotlessly clean technology and the most comprehensive integration and sound features on the market, the two are top. Whether enhancing premium factory rigs or simply being compact, powerful DSP amps, the V Eight and V Twelve are the ones to beat from now on.

Elmar Michels

power amplifiers		*helix V Twelve DSP*	*helix V Eight DSP MK2*
distribution		Audiotec Fischer Schmallenberg	Audiotec Fischer Schmallenberg
hotline		02972 97880	02972 97880
web www.		audiotec-fischer.com	audiotec-fischer.com
sound	40%	1.1	1.1
bass foundation	8th %	1.5	1.5
neutrality	8th %	1.0	1.0
transparency	8th %	1.0	1.0
spatiality	8th %	1.0	1.0
dynamics	8th %	1.0	1.0
laboratory	35%	1.0	1.0
perfomance	20%	1.0	1.0
damping factor	5%	–	–
signal-to-noise ratio	5%	1.0	1.0
distortion factor	5%	1.0	1.0
Practice	25%	0.6	0.6
Furnishing	15%	0.5	0.5
Ver. electronics	5%	0.5	0.5
Ver. mechanics	5%	1.0	1.0

Technical specifications	8th	8th
channels	8th	8th
power 4 ohms	12x77	8x77
power 2 ohms	12x134	8x134
power 1 ohm	0	0
Bridge power 4 ohms	0	0
Bridge power 2 ohms	0	0
Sensitivity max mV	var.	var.
Sensitivity min. V	var.	var.
THD+N (<22kHz) 5W	0.015	0.019
THD+N (<22 kHz) half load	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

Furnishing		
low pass	10-20kHz	10-20kHz
high pass	10-20kHz	10-20kHz
bandpass	10-20kHz	10-20kHz
bass boost	- 15-6dB/10-20kHz	- 24-20dB/10-20kHz
subsonic filter	via HP	via HP
phase shift	0, 180°/LZK via DSP	0, 180°, LZK via DSP
High Level Inputs	•	•
automatic switch-on (Autoscythe)	• , DC or signal	• , DC or signal
RCA outputs	• , stereo, processed	• , stereo, processed
start-stop capability	• (< 6V)	• (< 6V)
Dimensions L x W x H (in mm)	220x220x44	220x180x44
Miscellaneous	14 channel DSP	10 channel DSP

valuation			
Price		around 1,500 euros	around 1,000 euros
sound	40%	1.1	1.1
laboratory	35%	1.0	1.0
processing	25%	0.6	0.6
Price-performance		very good	very good
		Abs. Top class	Abs. Top class
		top class	top class
		upper class	upper class
		entry level	entry level
CAR&HiFi Edition 3/2020 grade		0.9	0.9

"Optimal for improving the sound of complex factory systems."