

ESX VE1300.11SP – High-end amplifier with DSP

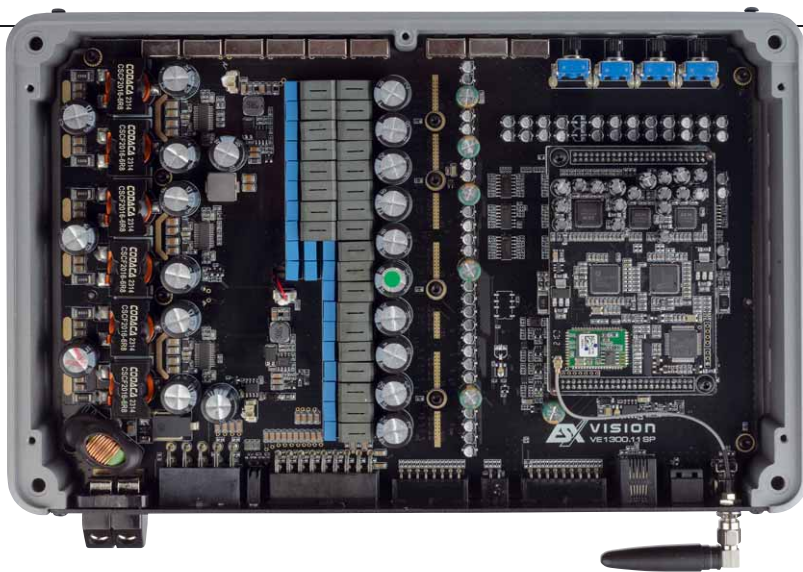
Powerhouse with 11 + 1 channels

► With the VE1300.11SP, ESX presents the highlight of its DSP family to date, an extremely powerful 11-channel power amplifier with 12-channel DSP.

The history of the latest generation of ESX DSP products has its origins in 2021 in two inconspicuous devices that themselves have nothing to do with a signal processor. The DLCs are high-low converters with the original version of the EPS Pro, with clipping LEDs, a huge amount of components and impedance matching front, back and in the middle. Then followed the small DSPs D66SP and D68SP and MW66SP, which offer the finest technology at an affordable price. Finally, ESX presented the high-end DSP QL812SP in 2022 (as QE812SP even with an integrated USB music player). Based on the QL812SP, the VE1300.11SP is now available, a DSP power amplifier with a built-in QL812SP including Bluetooth streaming. The integrated QL should be taken literally, because the VE does not contain a slimmed-down version, as is often the case on the market, but rather a 1:1 fully-fledged high-end DSP. Two ADAU1452 analog devices take over the DSP computing work, and a 32-bit ARM processor controls the whole thing. And the best 32-bit Velvet Sound types from AKM are used as converters, namely an AK5558 as ADC and two AK4458 as DA converters. The only difference here is the QL812SP, which uses the appropriate 6-channel chips for the 12 channels. The fact that 2 x 8 DACs are installed in the VE1300.11SP is probably for procurement reasons. Otherwise, the power amplifier has 8 analog inputs, either as low-level RCA or as high-level inputs. The latter are the most complex types on the market with the in-house EPS PRO (Error Protection System), which tricks diagnostic head units by simulating speakers and which, with a maximum input sensitivity of 40 volts, has no problems whatsoever with even the thickest factory amplifiers. With EPS PRO, not only the voltage range can be adjusted, but also the input impedance, i.e. the load that the source device sees. 10 ohms are for diagnostic head units, whose loudspeaker search does not trigger an error message, and there are also 150 ohms for special symmetrically transmitting factory amplifiers (e.g. VW), which otherwise function suboptimally



Except for the power terminals, everything runs via Molex connectors. The gain controls and switches of the EPS Pro are located behind a panel



Left the voltage supply, in the middle Reinforcement and right in the 1st floor the DSP and the Bluetooth Recipient

600 ohms for an "invisible" VE1300.1SP, generally the best in terms of freedom from interference and noise, so that all possible cases are covered. Perfect impedance matching is also the trump card in analog signal processing, because they can only sound perfect if the individual components are in perfect working conditions. The voltage switches adapt the signal optimally for the potentiometers, which then work in the linear range, and elaborately selected components with tight tolerances for controlling the armada of operational amplifiers that are found on the circuit board follow the same strategy. DSP is about controlling the AD converters, which is done symmetrically for the best possible measured values and sound quality. The circuit board looks very tidy and is neatly divided into power supply, amplification and signal processing. But that doesn't just have to do with the fact that decent people worked here, there's a practical purpose behind it, namely cooling. All power components are of course located on the back of the board on the housing, which is made of thick aluminum and acts as a heat sink. Sitting in the case base, which is also made of solid aluminum

There are two fans slightly off-center, the position of which is chosen so that they create a kind of air roller in the housing. That's exactly why the capacitors and coils are placed close together as a partition in the middle of the board. The system is so sophisticated that the air under the circuit board is also moved. A carefully designed gap was left here and air guide bars are even cast into the housing cover! This ensures optimal cooling of the power components and, as the icing on the cake, there is an "Ext.Fan 12V" pin, a fan output that is switched high if necessary and controls external fans if the power amplifier is installed in tight spaces. In order to minimize waste heat, a new power supply is used in the VE. For the first time, an output stage in ESX works with a step-up converter instead of a transformer power supply, in which the incoming direct current from the 12 V on-board network is inverted, then stepped up and then rectified again must become. The step-up converter bypasses the AC episode and directly creates a higher DC voltage, which means better efficiency. But there is not just a thick flat wire coil in the system,

Technical data

Entrances

- 8-channel high level
- 8-channel RCA
- Sensitivity 6V (RCA), 45V (High Level)
- 1 x digital S/PDIF optical
- 1 x digital S/PDIF coax
- 1 x digital Bluetooth
- 1 x mode ("convertible pin")
- 2 x USB (media and remote control)

Exits

- 12-channel RCA
- Remote out
- Video out (music player)

DSP channels

- 8 inputs, 12 outputs (+ 4 staging)

DSP software

(PC V4/Android V1.0.15 in the test)

Equalizer

Inputs:

- param./shelf/allpass, 31 band per channel, 8-channel + digital (standard)
- param./Shelf/Allpass, 31 bands per channel, 4-channel + digital (Expert)

Staging (Expert only):

- param., 31 bands per channel, 4-channel

Outputs:

- parametric, 31 bands per channel, +12 - -12dB
- 20 - 20k Hz, 1 Hz steps, Q 0.3 - 15
- optionally shelf 25 - 10k Hz, Q 0.3-2

Crossovers

- 20 - 20k Hz, 1 Hz steps
- Bessel, Butterworth, Linkwitz, 6-48 dB/Oct.

Time and level

- Sample rate 96 kHz, 3.5 mm steps (0.01 ms)

Outputs:

- 0 - 680 cm (20.00 ms), 2048 samples
- Level steps 0.5 dB, Main: 1 dB

Furnishing

- Automatic switch-on according to DC or signal
- EPS PRO (Error Protection System) for diagnostic function with 4 x gain controls, input sensitivity and impedance adjustment
- 8 presets
- Inputs and outputs can be routed as desired
- Signal-dependent switching to Bluetooth or S/PDIF
- Coupling of channels (gain and EQ) absolutely and relatively possible
- Setup change via mode pin
- Level meter and software gain for all inputs and outputs
- Expert Mode with staging channels and EQ
- Bluetooth (audio streaming and app control of all functions)

Optional accessories

- RC-DQ remote controller (volume, bass level, setups)



Equalizers and crossovers are set in the main screen. Master and channel levels are available and absolute or relative linking of channels is possible

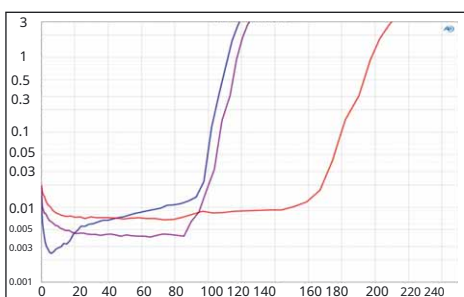


The running time of the outputs is set here. The speakers are beautifully placed in the vehicle - here Mercedes with footwell woofers

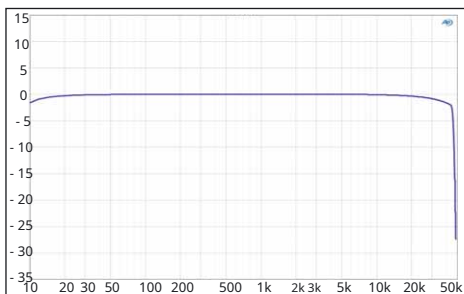


In expert mode, a new staging level with its own EQ is added between inputs and outputs

but their six. By dividing it into six smaller units, these can be switched on gradually depending on power requirements. So at low outputs the VE runs with only one of six units, then with two, and so on until all six are running at full steam at maximum load. This is also a measure for efficiency that plays a major role in the development of all electronics today - especially in the age of electromobility. As with all multi-channel power amplifiers, amplification is done via amplifier ICs, and the VE1300.11SP has a lot of them. Its 11 amplifier channels are divided into 9 small, 4 ohm stable and two large, 2 ohm stable. Two-channel chips from Texas Instruments are used, of which two small channels share one chip, while the 2 Ohm channels have a chip on their own in a kind of parallel connection that enables double current flow. The 26 go well with this



Extremely little distortion overall, in the small channels (blue) as well as in the large channels (purple and red). There are approximately 200 watts at 2 ohms



The VE1300.11SP uses the resources of its dual-core DSP for a HiRes frequency range of over 40 kHz



Like here the initial EQ will be too Input EQ and Staging EQ set

Inductors and capacitors for output filtering, so that a small channel uses two of them, while the large channels have four each. If you do the math carefully, you'll realize that with the amplifier chips there could have been 10 small channels instead of 9. It can be assumed here that the VE1300.11SP is intended for a system à la BMW and Mercedes, for example with two paths per door, two woofers and a center. A processed output is available for an additional subwoofer, so that the DSP has 12 channels like the QL.

Measurements and sound

The VE1300.11SP is the first power amplifier that was measured according to our new measurement procedure, namely channel or stereo performance on the one hand and system or overall performance on the other. If you let the channels run loosely in stereo, 112 (1 - 9) and 117 (10 and 11) watts come out at 4 ohms, making the VE1300.11SP one of the strongest chip power amplifiers on the market and, with 11 channels, certainly the strongest of all. At 2 ohms there is also 2 x 196 watts of powerful power for the woofer. When determining the system performance with 9 x 4 ohms and 2 x 2 ohms, we are more than just astonished because the ESX, at 1200 W, is damn close to the calculated sum of the channel powers; it still delivers 80% at full load(!) the "theoretical" performance in the resistors. This speaks for an extremely powerful power supply that has not been skimped on. The whole thing is delivered with record-breakingly few distortions: the distortion curve of the small channels goes down to 0.0025%, especially at low powers, while the large channels remain below 0.005% up to the power limit. These are such excellent results that they are rarely seen. Almost nothing changes with the analog inputs - certainly a credit to the careful signal chain. This is ultimately supported by the excellent roughness given the mass of components.

BEST PRODUCT
Absolutely top class
CAR & HiFi 1/2024

EMC TIP
Undisturbed radio reception
CAR & HiFi 1/2024

ESX VE1300.11SP

Price around 1,500 euros
 distribution Audio Design, Kronau
 Hotline 07253 9465-0
 Internet www.esxaudio.de

Evaluation

sound	40%	1.0	-----
Bass foundation	8th %	1.0	-----
neutrality	8th %	1.0	-----
transparency	8th %	1.0	-----
spatiality	8th %	1.0	-----
dynamics	8th %	1.0	-----
laboratory	35%	0.9	-----
Performance	20%	1.0	-----
Damping factor	—	—	—
signal-to-noise ratio	5%	1.0	-----
Harmonic distortion	10%	0.5	-----
Practice	25%	0.6	-----
Furnishing	15%	0.5	-----
processing electronics	5%	0.5	-----
processing mechanics	5%	1.0	-----

Technical data

channels	11
Channel power 4 ohms W	9x112 + 2x117
Channel power 2 ohms W	9x0 + 2x196
Bridge power W	-
System performance W	1124
Sensitivity max. mV	720
Sensitivity min. V	6.0
THD+N (<22kHz) 5W%	0.003/0.007
THD+N (<22 kHz) half load %	0.008/0.004
S/N ratio dB(A)	96/95
Damping factor 20 Hz	22/15
Damping factor 80 Hz	22/15
Damping factor 400 Hz	22/16
Damping factor 1 kHz	22/15
Damping factor 8 kHz	10/11
Damping factor 16 kHz	4/7

Furnishing

Low pass	20 - 20k Hz
High pass	20 - 20k Hz
Band pass	20 - 20k Hz
Bass boost	- 12 - 12 dB/20 - 20k Hz
Subsonic filter	via HP
Phase shift	0, 180°/LZK via DSP
High-level inputs	•, mono
Automatic switch-on(Autosense)	•, DC or signal
RCA outputs	•, mono, processed
Start-stop capability	• (4.8V)
Dimensions(L x W x H in mm)	284x181x54
Miscellaneous	12 channel DSP, Bluetooth

ESX VE1300.11SP

Absolutely top class 1+



Price/performance: excellent

"Masterpiece with a rare good price-performance ratio."

scraping distance. Finally, the frequency range of over 40 kHz must be praised, which is possible thanks to a high sampling rate of 96 kHz. As a nice by-product, one is pleased with the small steps of 0.01 milliseconds or 3.5 millimeters. In terms of sound, the ESX has a well-known and popular phenomenon: it sounds much bigger than it is. If you don't expect the world from a multi-channel chip amplifier, the VE1300.11SP will immediately prove you wrong with its incredibly powerful performance. It's bursting with power and really accelerates with fat basses or drum attacks. It can also be quiet, as it bubbles out of the speakers with a delicately melting sound and details are brought out of the music with such clarity that it is a pure joy. The spatial reproduction is also one of the finest with generous space on the stage and precision in depth and positioning. The VE is indeed an audiophile masterpiece – only with bite!

Conclusion

Not only does it stand there with its touch quality like a solid block of metal, it also impresses with the finest components, incredible performance with 11 channels and, last but not least, perfect features. And the fact that Bluetooth is included for the price is amazing - a masterpiece with a rarely good price-performance ratio.

Elmar Michels

software

The ESX Toolkit is available as an app (Android and iOS) and as desktop software (Windows) with equivalent functionality. The app also has the option of setup sharing with other users, e.g. via WhatsApp. You immediately feel at home on the user interface, everything is logically arranged and largely self-explanatory. The settings are housed in four windows so that each one doesn't get too crowded. There is of course routing in the I/O area and there is an input EQ with 31 bands per channel and full functionality. Names can be assigned to the inputs and outputs, e.g. tweeter front left, these names can then be found in other places and the speakers are even placed correctly in the car diagram during the runtime. This also applies to the prefabricated BMW and Mercedes setups with the corresponding underseat and footwell woofers. In addition to the standard functions, there are a number of niceties. For example, the channels designated as subwoofers (no matter which ones) are automatically assigned to the subwoofer level of the remote control. In the setups you can see which ones are active, full or empty, and you can also set a start setup that is always active after switching on. The marking active/used/unused is also present in the main window, for example in the EQ bands, of which there are 31 per output and which can be either shelf, all-pass 1st and 2nd order or parametric EQ. The running time is in fine 3.5 millimeter increments or 0.01 millisecond increments. The crossovers can be Butterworth, Bessel and Linkwitz up to 48 dB/octave. The digital inputs or Bluetooth can be prioritized in the software, which means it automatically switches to S/PDIF or Bluetooth when music is played. If you don't want to do without vehicle sounds, you can mix them in the mixer, meaning digital and analog sources can be mixed together. A great feature is the meter window, where we find level displays for all 8 analog inputs and 12 outputs. This is helpful for becoming aware of what signal is present where. The correct level can not only be read, but also adjusted for all channels using level controls. The auto-save function, which automatically saves the entire setup in the device every 20 seconds, can also save your nerves. The additional staging level opens up even more coordination options. If the expert mode switch is activated, the programming changes fundamentally. The number of analog inputs is reduced from 8 to 4, but a completely new channel level emerges. There are then 4 staging channels that lie between the input channels and the outputs. A multi-way front system can be assigned to a staging channel, which then receives its own 31-band EQ in the staging area. In the output area, the individual speakers are separated and time-corrected and the output EQ is adjusted to the needs of the speaker. From now on, this remains untouched, as the sound design is then done via input EQ and via staging EQ for, for example, the entire front left. To simplify settings, channels can also be linked so that levels and EQs can be changed either absolutely or relatively for the group. The staging EQ also has the balance link as a special feature. It works like a balance controller and, when linked right-left, takes away from one side what it adds to the other side. Of course, for each individual EQ band, which allows the stage image of the system to be fine-tuned.