

# HELIX DSP ULTRA

## Entering a new dimension

The name says it all – the new HELIX DSP ULTRA is anything but another signal processor with just more channels. Rather, it is the next technological milestone that impressively demonstrates Audiotec Fischer's expertise in the field of DSP technology.

## TwinDSP Power

Computing power can only be replaced by even more computing power – and that's why the DSP ULTRA is equipped with two of the most powerful 64 Bit audio signal processors from Analog Devices. Incredible 2.4 billion MAC operations per second make the twelve separately processed channels and the multitude of new sound features in combination with the high sampling rate of 96 kHz (resulting in an audio bandwidth of over 40 kHz) possible.

## ACO – Advanced 32 Bit CoProcessor platform

Rapid processing power not only in the signal path – the particularly fast 32 Bit ACO platform takes over all control tasks and ensures the decisive speed increase, especially for data communication with our DSP PC-Tool software, but also for the lightning-fast switching between up to ten possible sound setups. But ACO offers much more – fantastic sound effects such as Augmented Bass Processing or StageXpander are implemented as well as a channel-separated Input EQ including Input Signal Analyzer (ISA) for easy analysis and compensation of input signals of OE radios, which already include a sound setup ex works.

## Even further improved audio performance

The HELIX DSP ULTRA justifies its name not only in terms of functionality, but also with respect to sound quality. An extremely complex and newly designed analog input stage ensures phenomenal sound characteristics with full high-res audio bandwidth up to more than 40 kHz. But that's not all – tremendous effort was put into filtering out any unwanted interference in the power supply of the individual stages. In addition, only particularly low-noise operational amplifiers from TI / BurrBrown's legendary "OPA series" are now used.

## Virtual Channel Processing - a new era of signal routing begins

The adaptation to modern OE sound systems via an increasing number of inputs has a significant impact on the complexity of the signal routing inside the processor. Especially when several input signals are mixed together and then split again into multi-way systems, conventional routing concepts quickly reach their limits, both in terms of implementation and usability. Audiotec Fischer's new, multi-stage "Virtual Channel Processing", in conjunction with the recognized user-friendly DSP PC-Tool software, makes it easy to realize even highly complex system configurations. Besides that it allows to freely assign our proprietary FX sound features such as "RealCenter" or "StageEQ".

## Absolute connectivity

The simple adaptation to existing factory radios or multi-channel OE sound systems is more important than ever before – and that's why the DSP ULTRA is not only equipped with the latest generation ADEP.3 circuit, but also offers a particularly large adjustment range for the input sensitivity. The enormous range of 1 - 8 Volts (RCA) or 4 - 32 Volts (highlevel) allows the combination with almost any imaginable analog signal source, even with high-power OE amplifiers.

## Elegant, smart and compact

Despite its vast range of functions, the new HELIX DSP ULTRA inspires with its straightforward and timeless design that is still compact – ideal for a simple installation. The sum of its characteristics makes the HELIX DSP ULTRA the perfect "tool" for every uncompromising audiophile music lover with highest demands.

## Features

- TwinDSP Power – two extremely powerful “fixed point” Audio DSPs with 64 Bit resolution and 2.4 billion MAC operations per second
- State-of-the-art 32 Bit AD and DA signal converters from AKM
- Virtual Channel Processing (VCP) allows even more flexible configuration for highly complex sound systems
- ACO – Advanced 32 Bit CoProcessor platform for numerous new system and DSP features like:
  - ISA (Input Signal Analyzer) and InputEQ for easy analysis and compensation of input signals
  - SFX (DSP Sound Effects) – Augmented Bass Processing, StageXpander, RealCenter & Co.
  - 10 internal memory locations for sound setups
- HELIX Extension Card slot (HEC) for additional input / output modules like Bluetooth® Audio Streaming, High Resolution Audio Streaming via USB etc.
- Smart 8-channel highlevel input with ADEP.3 circuit
- Start-Stop capability down to 6V supply voltage
- “Ground lift” switch to avoid ground loops
- Control input for connecting remote controls and accessories
- Time alignment with up to 20 ms delay time per channel, additionally reverse time alignment for in-phase summation of the inputs
- Freely definable signal routing with separate matrices for line, SPDIF and HEC/AUX
- Inputs: 8 x RCA/Cinch, 8 x Highlevel, 1 x optical SPDIF and 1 x coaxial SPDIF
- Outputs: 12 x RCA/Cinch with max. 8 Volts output voltage

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## DSP features

### RealCenter

The "RealCenter" feature is an algorithm, developed by Audiotec Fischer, that emphasizes the music information which is present in both the left and right front channel to create a unique center signal. In contrast to common procedures, in which only the channels are summed up, the intensity of the center signal is also dynamically controlled by the stereophonic informational content of the left and right channel.

Sounds complicated but this effect is astonishing: That means if solely the left or right channel delivers an audio signal, the center channel will not reproduce a signal. In the case of common algorithms, the volume level of the center channel is only reduced by 6 dB (= half volume level). Audiotec Fischer's "RealCenter" allows a unique, broadened sound staging for both driver and co-driver at the same time! Therefore, the disadvantages of a conventional center channel, such as an intrusive, small sound stage, are things of the past.

### Augmented Bass Processing

Audiotec Fischer's proprietary "Augmented Bass Processing", consisting of the two revolutionary sound features "Dynamic Bass Enhancement" and "SubXpander", has been especially developed to dramatically improve the bass reproduction of subwoofers.

The "Dynamic Bass Enhancement" ingeniously combines maximum deep bass and highest sound pressure – regardless of the music style or the tone controls in the head unit.

Depending on the input signal, the "Dynamic Bass Enhancement" gains the lower frequency range and varies the cut-off frequency of the subsonic filter. The result is a significantly more powerful and deeper bass response at low and medium volume levels without the risk of overloading the subwoofer neither mechanically nor electrically at high volume levels. It is simply fascinating which bass performance is suddenly possible.

If you want an even lower and "darker" bass reproduction, the "SubXpander" can be additionally activated. Therefore, subharmonic tones are added to the fundamental tones in the frequency range between 50 and 100 Hz.

### StageXpander

Depending on the speaker arrangement in the vehicle, a more or less wide stereo sound stage can be created on the front seats. A center speaker may limit the spatial reproduction of the music additionally. This is where Audiotec Fischer's new "StageXpander" comes into play – a sound feature which seems to break the acoustic limitations and thus allows to create a way broader stereo base without negatively affecting the precision of the localization of voices or instruments!

The effect can be adjusted according to your personal preferences in four steps.

### ClarityXpander

You are looking for more transparency and substance in the treble reproduction? With the "ClarityXpander" Audiotec Fischer is now offering the right tool. Properly adjusted (and therefore selectable in three steps) the feature adds additional harmonics in the upper frequency range – this is especially useful if the original speakers lack some brilliance in the

treble response. The extra treble-kick is not only available for the two front channels but also separately adjustable for the center channel. Even better – the center channel allows to activate an automatic and dynamic control so that music with “loads” of treble doesn’t fatigue your hearing.