

HELIX DSP MINI MK2

The next generation of the miniature DSP

The smallest HELIX signal processor gets a worthy successor with the DSP MINI MK2. Like its ancestor, this compact DSP is a real technology package. A powerful 64 Bit audio DSP and BurrBrown converters combined with 96 kHz sampling rate and high resolution audio bandwidth up to over 40 kHz provide exceptional sound quality. The MK2 is also at the top level in terms of measured values – a higher maximum output voltage of 6 Volts, significantly increased signal-to-noise ratio and reduced THD ensure the perfect sound. Of course, the DSP MINI MK2 is based on the ACO platform with 32 Bit CoProcessor, which not only handles all control tasks with incredible speed, but also enables proprietary sound effects such as Augmented Bass Processing or RealCenter and, last but not least, a channel-separated Input EQ including Input Signal Analyzer (ISA).

Seamless integration and maximum control even in the smallest spaces

As the installation space for sound systems in modern vehicles is becoming increasingly limited, the connection of individual components is getting more complicated and puts the durability of plugs and cables to the test. The Smart Control Port (SCP) of the DSP MINI MK2 allows the multifunctional connection of accessory products and now even takes over their complete power supply. The solid design with snap-in function guarantees a stable connection while helping to prevent plug and cable damage and thus facilitates compact, space-saving installation concepts.

All on board

The equipment package makes it clear that the name of the DSP MINI MK2 only refers to the dimensions as there are absolutely no compromises in terms of functionality. Our intelligent highlevel input with ADEP.3 circuit (Advanced Diagnostics Error Protection, 3rd Generation), the Auto Remote switch, an optical input as well as the HELIX Extension Card slot (HEC slot) for system add-ons like Bluetooth® HD or High Resolution audio streaming via USB are, of course, part of the basic features.

Features

- Extremely powerful 64 Bit “fixed point” Audio DSP with 1.2 billion MAC operations per second
- High Resolution audio bandwidth up to more than 40 kHz for unrivalled sound quality
- A/D and D/A signal converters from BurrBrown
- Advanced CoProcessor (ACO) for extended feature set
 - Input Signal Analyzer (ISA) and InputEQ
 - DSP Sound Effects (SFX) such as the “Augmented Bass Processing” which dynamically optimizes the bass response of the subwoofer, the “StageXpander” that significantly widens the stereo perspective, the

“RealCenter” function, which allows a perfectly focussed sound staging for both driver and co-driver and much more

- 10 internal memory locations for sound setups
- Smart highlevel input with ADEP.3 circuit and Auto Turn-On function
- Optical digital input in SPDIF format
- Compact, future-proof Smart Control Port (SCP)
- HEC slot for system expansions for additional input / output modules like Bluetooth® Audio Streaming, High Resolution Audio Streaming via USB etc.
- Freely definable signal routing with separate matrices for line, SPDIF and HEC/AUX
- Optimal signal path and power supply for further improved sound quality
- “Ground lift” switch to avoid ground loops
- Very compact dimensions for easy integration into the vehicle
- Easiest configuration via the intuitive DSP PC-Tool V4 software

Special features:

96 kHz sampling rate

The HELIX DSP MINI MK2 allows to handle all signals with the doubled sampling rate of 96 kHz. Thus the audio bandwidth is no longer limited to usual values like 22 kHz but allows an extended frequency response to more than 40 kHz. Doubling the sampling rate requires significantly higher DSP power as the number of possible arithmetic operations is halved. Only the implementation of the latest DSP chip generation allows raising the sampling rate to 96 kHz and adding new features at the same time.

ACO – Advanced 32 Bit CoProcessor

The HELIX DSP MINI MK2 incorporates an extraordinary powerful 32 Bit CoProcessor of the latest generation for all monitoring and communication tasks, both internally and externally. In opposite to the 8 Bit predecessor generation this MCU achieves way higher speeds with respect to setup switching and data communication with our DSP PC-Tool software. A further significant advantage is the integrated, native boot loader of the CoProcessor. It allows software upgrades of all components of the DSP in order to adjust the microcontroller-controlled ADEP.3 circuit for example at future modifications / changes in the diagnostic system of factory radios or if the device will be extended with additional interfaces. In addition, thanks to the new flash memory, the ACO offers 10 memory locations for sound setups instead of the common two.

Smart highlevel input ADEP.3

Modern, factory-installed car radios incorporate sophisticated possibilities of diagnosing the connected speakers. In particular the latest generation of car radios are equipped with additional monitoring functions so that failure messages and loss of specific features (e.g. fader function) quite often appear if a signal processor will be hooked up – but not with the DSP MINI MK2.

The new ADEP.3 circuit (Advanced Diagnostics Error Protection, 3rd Generation) avoids all

these problems without loading the speaker outputs of the OE radio during high volumes unnecessarily.

Start-Stop capability

The switched power supply of the HELIX DSP MINI MK2 assures a constant internal supply voltage even if the battery's voltage drops to 6 Volts during engine crank.

Power Save Mode

The Power Save Mode is incorporated in the basic setup. It allows to significantly reduce the power consumption of the amplifiers that are connected to the HELIX DSP MINI MK2 once there's no input signal present for more than 60 seconds. Please note that in many up-to-date cars with "CAN" or any other internal bus structures it may happen that the radio remains "invisibly" turned on for up to 45 min. even after locking and leaving the car! Once the "Power Save Mode" is active the remote output and therefore the connected amplifiers will be turned off. The HELIX DSP MINI MK2 will reactivate the remote output within a second if a music signal is applied. It is possible to either modify the turn-off time of 60 sec. or completely deactivate the "Power Save Mode" via the DSP PC-Tool software.

Automatic Digital Signal Detection

The HELIX DSP MINI MK2 allows signal-controlled switching between the analog inputs and the digital input. As soon as an input signal is detected on the Optical Input, the signal processor automatically switches to this input. This feature can be deactivated in the DSP PC-Tool software. Alternatively you can use an optional remote control for manual switching between analog and digital inputs.

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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 an 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.