ESX QE812SP - High-End Sound Processor
with Music Player

DSP with comprehensive features

▶ After ESX unveiled the excellent QL812SP,
a high-end DSP, it's hard to believe it can
be topped. But watch out, here comes the
QE812SP.

A year ago, ESX released the QL-812SP, a sound processor that was a hoot for sound enthusiasts with the finest hardware and software aimed at sound tinkerers. However, the QL812SP doesn't neglect practice and everyday life, especially since music streaming is already built in. Wireless streaming from a mobile device in the best Bluetooth 5 quality – what more could you want? The QE812SP has the answer in the form of another way to feed music into the DSP: HiRes audio streaming! This was already possible before, namely with one of the two digital inputs (and, of course, analog). But if you don't have a head unit with a corresponding playback option, e.g., if the DSP is connected to the factory radio, that's it. Not so

with the QE812SP; it has a built-in music player so that it can play music on its own, so there's a small head unit inside. The music is stored on a USB storage directly connected to the DSP. Two advantages: firstly, it works without a smartphone, and secondly, it offers unrestricted Hi-Res audio playback. Theoretically, Bluetooth audio streaming also provides that, e.g., a Qualcomm aptX HD certified connection can transmit HiRes quality at least with 24 bit/48 kHz. But with Bluetooth, it is always a problem because it automatically varies the data rate dynamically depending on the quality of the connection. Only with wired streaming can you be sure that true HiRes quality is transmitted. Therefore, connecting a USB stick or an

SSD is the preferred means. And the QE812SP still offers Bluetooth streaming, so you can play music from your smartphone in no time. The QE812SP provides three options for playing music via USB/music player. Firstly, controlled via a mobile app (currently only iOS) or one of the two remote controls. There's the display remote control RC-QE for 200 EUR, which is also connected via USB cable, and the steering wheel remote control included in the box, which even works wirelessly (USB dongle). A second wireless connection is available for smartphone control, which does not work via Bluetooth but via WIFI. Then, you can control the music with the ESX Player app. Folder and source selection, setup change, and the usu-

al like track skipping and pausing (strangely, no forward/rewind) can be controlled via the app, and there is also a nice cover display. The display remote offers the same range of functions except for the latter. It is similar to the steering wheel remote control, except that fishing in the mud is the order of the day here without a display. However, as a remedy, the QE812SP has a video output that displays the music player on the car radio's screen when the corresponding input is available on the head unit. The whole thing works excellently. The player finds all folders and tags and plays the corresponding files in the best HiRes qua-

DSP at its best: 2 DSP cores ADAU1452 and 32-bit converter from AKM
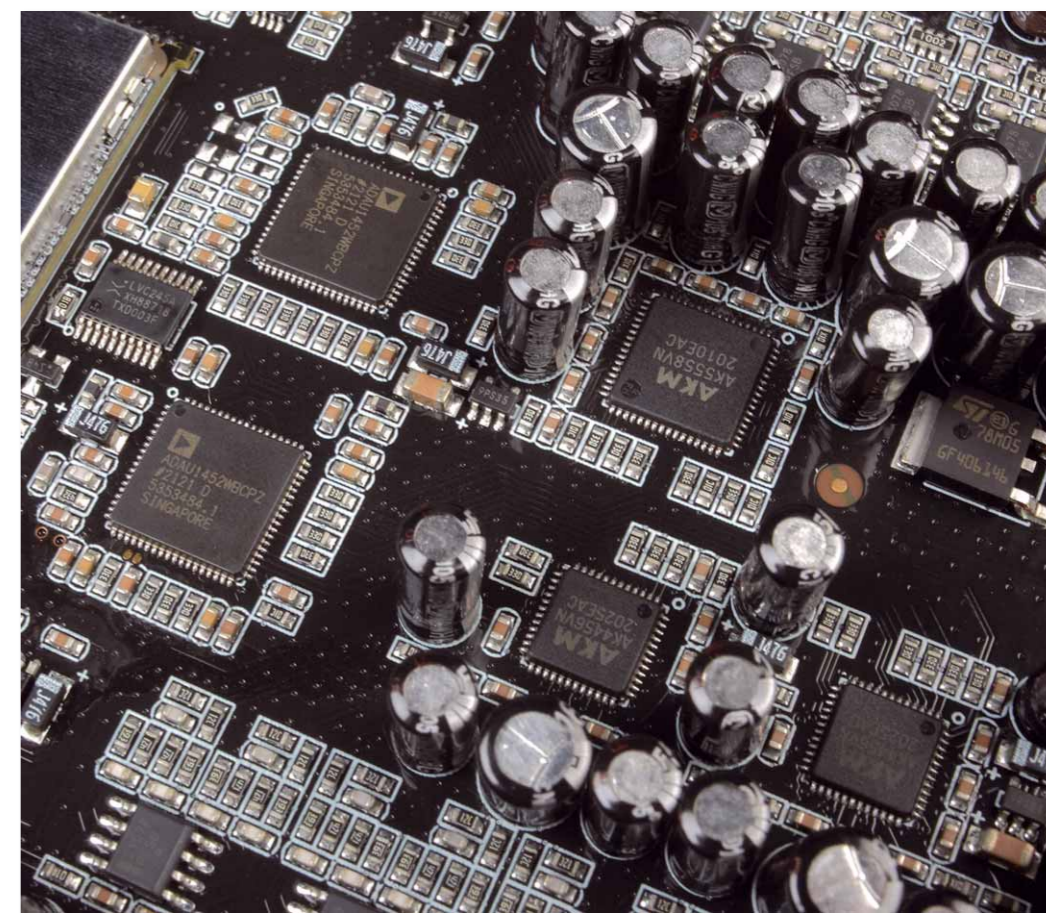
The music player sits in the middle of the board under a metal cover
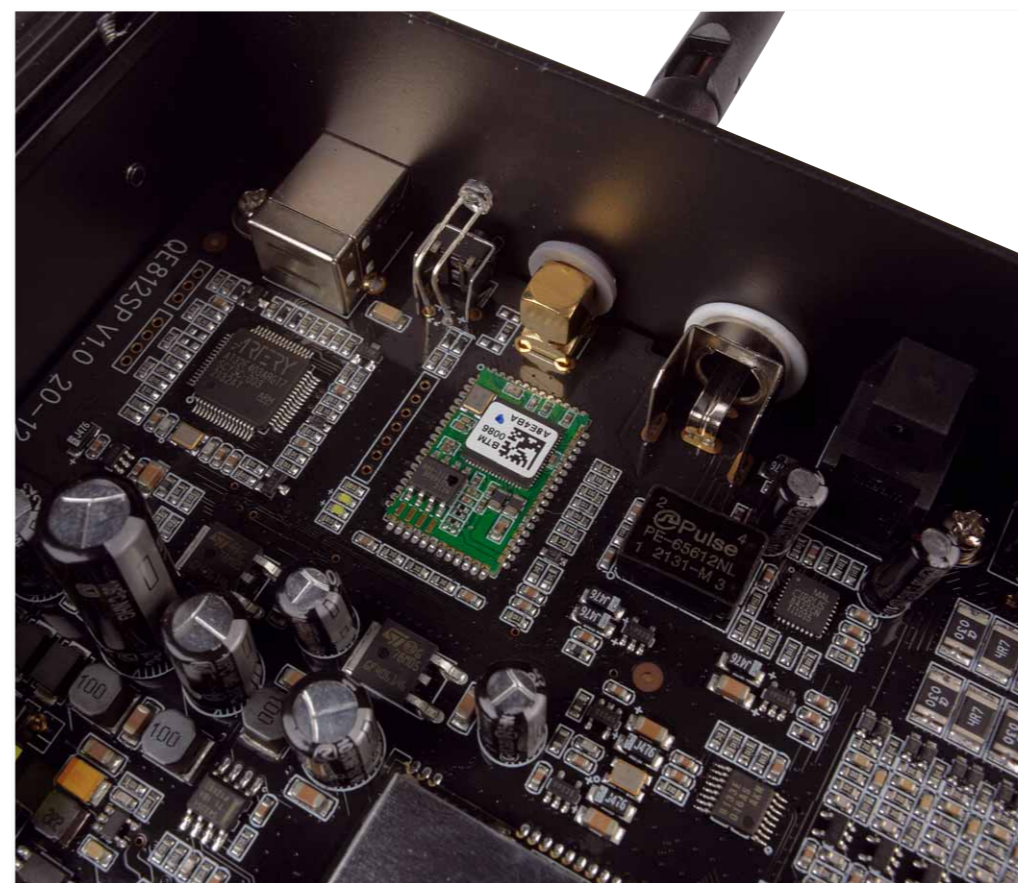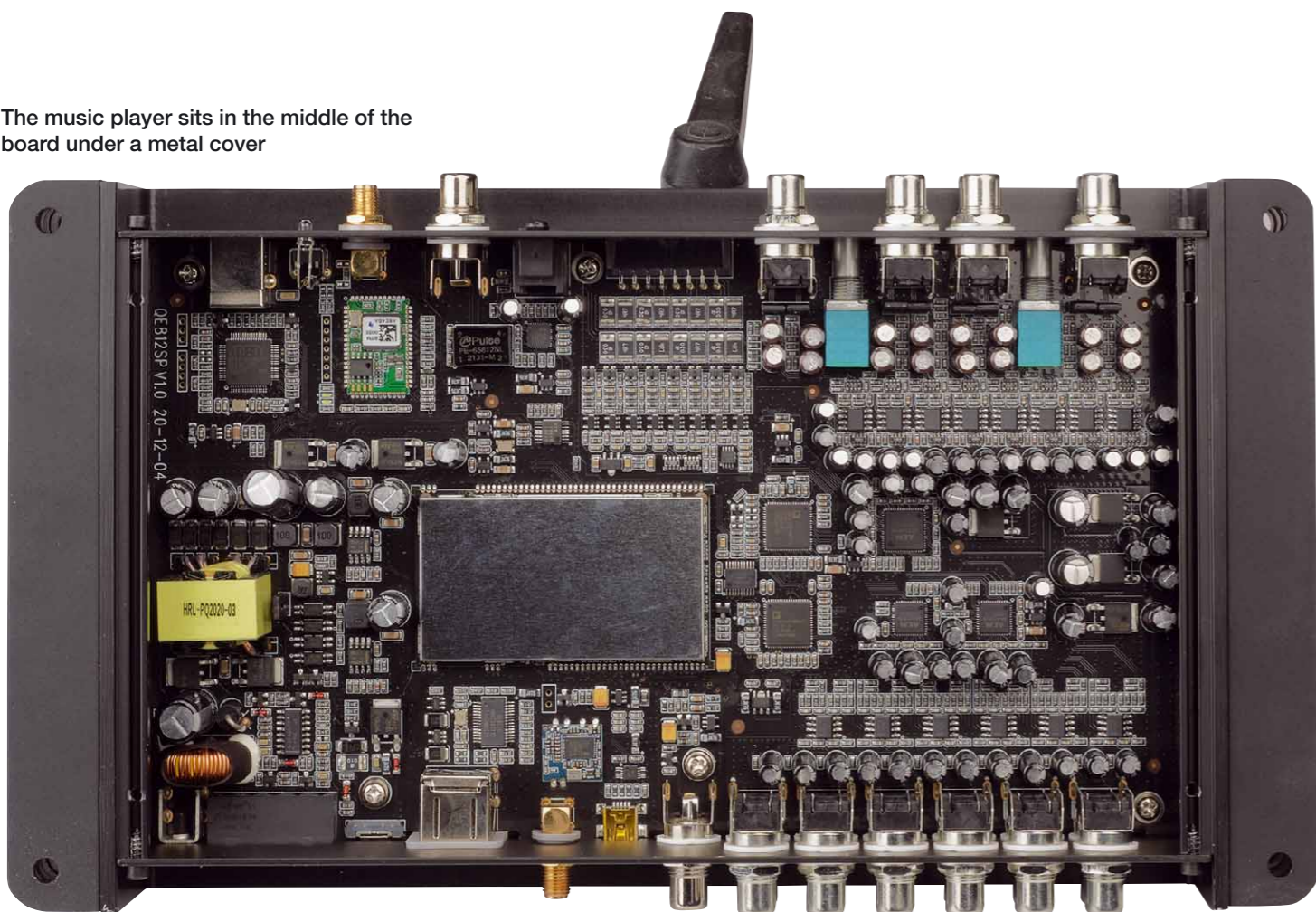
lity. The compatibility is convincing and includes DSD up to DSD256 and FLAC of any sampling rate and bit depth. This is an excellent thing with only one drop of bitterness: The extra price of 500 EUR must be worth the HiRes music player on the hardware side.

Hardware
The signal processor is technically the same as the smaller sister model QL812SP. This means, first of all, that the QE812SP also contains some of the best components that can be given to a car audio DSP. The twelve DSP channels are processed at a sample rate of 96 kHz, so two processor cores of the type

32-bit controller, Bluetooth board, and the digital inputs

Lots of connections, including two digital inputs, two USBs, and two antennas for Bluetooth and WIFI, and the video output for the music player

In expert mode, a new staging channel with a dedicated EQ emerges between inputs and outputs

The SPL of all eight analog inputs and 12 outputs is displayed and directly adjusted

ADAU1452 from Analog Devices are installed. The analog-to-digital conversion of the inputs, like the digital-to-analog conversion of the outputs, is handled by the finest 32-bit converters from AKM's Q5 series – it doesn't get any better than that if you use automotive-specification components correctly. A 32-bit ARM processor controls the whole thing, and the excellent Bluetooth 5 has already been mentioned. Finally, we find a sample rate converter from Cirrus, whose job is to bring the variety of formats processed by the music player to a uniform standard compatible with the DSP. The music player is comparatively gigantic, hiding under a shielding tin lid in the middle of the board.

Software

ESX has already introduced a new software version with its little sister model QL812SP. It is available as an app (Android and iOS) and desktop software (Windows) with an equivalent range of functions. As a sound processor, our QE812SP offers an identical feature set with eight input channels and 12 outputs. On the user interface, one feels at home right away; everything is logically arranged and largely self-explanatory. The settings are placed in four windows, so it doesn't get too crowded in each. Names can be assigned to the inputs and outputs, e.g., tweeter front left. These names are then found in other places, and the speakers are even placed correctly in the auto diagram at runtime. This applies to the predefined BMW and Mercedes setups with the corresponding under-seat and footwell woofers as well. In general, there are several niceties in addition to the standard functions. For example, the channels designated as subwoofers (no matter which) 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 startup setup that is always active after switching on. The marker „active/used/unused" also runs through the main window, e.g., with the EQ bands, of which there are 31 per output and can be either a shelf or a parametric EQ. Fine 3.5-mil-limeter steps or 0.01-millisecond steps are possible for the delay time. The crossovers can do Butterworth, Bessel, and Linkwitz up to 48 dB/octave, which is all anyone needs. The digital inputs or the Bluetooth can be prioritized in the software, which means it is automatically switched to S/PDIF or Bluetooth when music is played. If you don't want to do without car sounds, they can be added to the mixer, so digital and analog sources can be mixed. A new addition is the meter window, where we find level meters for all eight analog inputs and twelve outputs. This is


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

Here the output time alignment is set. The speakers are displayed nicely in the vehicle. Here, we see a Mercedes with footwell woofers as an example

In addition to the input EQ, there is a staging EQ with 31 bands per channel as well

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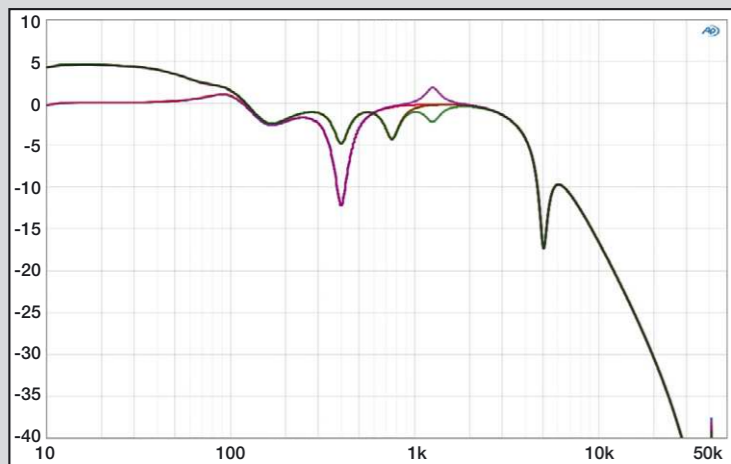
The EQs allow you to build shelf and parametric EQs and adjust them individually or together. The balance link EQ at 1.25 kHz simultaneously adjusts purple louder and green softer
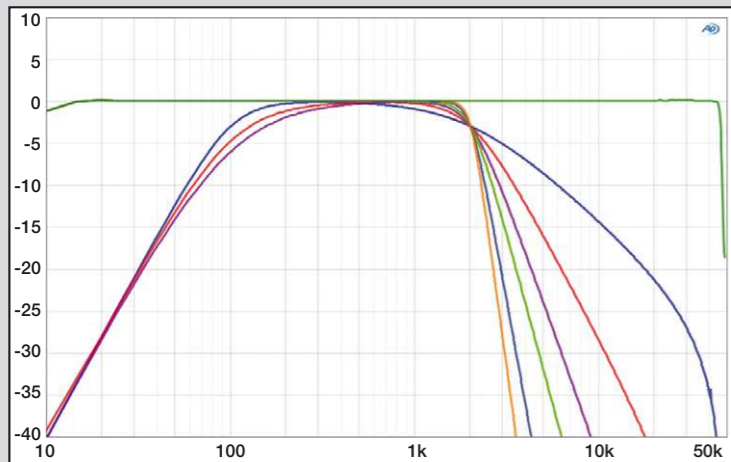
Hi-res frequency range up to 44kHz. 100-Hz high-pass with Butterworth, Bessel, Linkwitz. Low-pass at 2kHz with Butterworth, 6-48 dB/octave

Music player app on iPhone with cover display

The display remote control allows source and setup selection as well as the control of the music player

helpful to be aware of what signal is present where. The correct level can be read and adjusted for all channels with level controls. In the I/O section, there is routing and a 31-band input EQ per channel with full functionality.
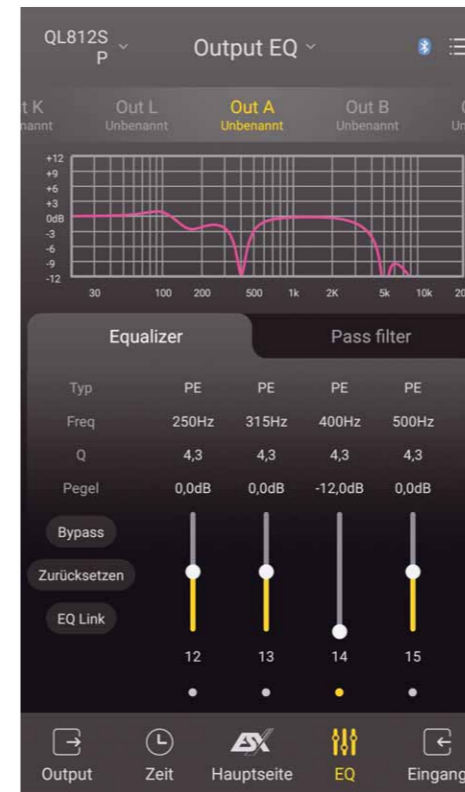
Additional staging level

When the expert mode switch is pressed, the programming changes fundamentally. The number of analog inputs is reduced from eight to four, but an entirely new channel layer emerges. There are then four staging channels, which are located between the input channels and the outputs. This way, a multi-way front system can be assigned to a staging channel, which receives its dedicated 31-band EQ in the staging area. So the individual loudspeakers are separated and delay-corrected in the output section, and the output EQ is adjusted to the needs of the loudspeaker. That remains untouched from then on; the sound design happens via input EQ and staging EQ for, e.g., total front left. For simplified adjustment, channels can also be linked so that SPL and EQs can be changed either absolutely or relatively for the group. The staging EQ also has the balance link as a unique feature. It works like a balance control and takes away from one side what it adds to the other side when linked right-left. Of course, for each EQ band, which then also allows the stage imaging of the system to be fine-tuned.

Like the output EQ displayed here, input EQ and staging EQ can also be adjusted in the mobile app
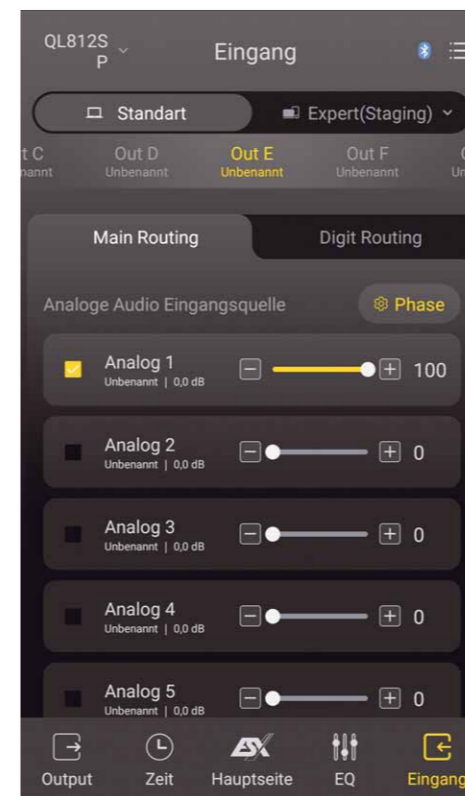
Depending on Standard or Expert mode, inputs can be conveniently routed to outputs or staging channels

Conclusion

With its built-in music player, the QE812SP is the most comprehensive offering on the market. In addition to first-class hardware and various digital and analog inputs, including Bluetooth streaming, the music player, with its dedicated control, allows the playback of any digital music in HiRes quality directly out of the DSP. This makes it a self-sufficient HiFi control center that no longer needs auxiliary players or control devices.

Elmar Michels

ESX QL812SP

Price	**1500 Euro**
Contact	Audio Design, Germany
Internet	www.audiodesign.de

Specifications

Dimensions   279 x 155 x 46 mm

Inputs
- 8-channel high-level with autosense
- 8-channel RCA, 2 x gain control
- Sensitivity 6 V (RCA), 45 V (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, remote control)

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

DSP-channels
- 8 Inputs, 12 Outputs (+ 4 Staging)

DSP software
(PC V2/Android V1.0.0 in test)

Equalizer
Inputs
- param./Shelf, 31 bands per channel, 8-channel (Standard)
- param./Shelf, 31 bands per channel, 4-channel + digital (Expert)

Staging (only Expert):
- param., 31 bands per Channel, 4-Channel

Outputs
- parametric, 31 band per channel, +12 – -12 dB
- 20 – 20k Hz, 1 Hz steps, Q 0.3 – 15
- optional 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

Features
- 8 presets
- Inputs and outputs arbitrarily routable
- Start-stop capability up to 7.2 V
- EPS (Error Protection System) for diagnostic function
- Signal dependent switching to Bluetooth or S/PDIF
- Coupling of channels (gain and EQ) absolute and relative possible
- Ground switch against hum interference
- Setup change via mode pin
- Input sensitivity adjustable via jumper
- Bluetooth (audio streaming and app control of all functions)
- WIFI (hi-res audio streaming, music player app)
- Music player display on head unit
- Internal memory for test tones

Optional accessories
- Remote controller RC-DQ (volume, bass level, sources, setups)

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„All-in-one solution comprising a high-end DSP and a HiRes music player."