

ON TEST

DPA CORE+ and MicroLock

Simon Allen reviews the latest technology now found in DPA's miniature microphones . . .



ABOUT THE EXPERT SIMON ALLEN

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The latest round of developments from Danish microphone giant DPA are beginning to make me feel old. I've now been engineering long enough to remember using the original 4060 and 4061 microphones and have witnessed their now extensive line-up of miniature microphones ultimately define what we can do today. For example, I personally still own some of the original 4099 instrument microphones and I wrote a review of the CORE technology that was released in 2018 for this very publication (see *LSi June 2018*). Now in 2025, DPA has taken this technology another step further, releasing its all-new CORE+ technology.

This year we have also watched DPA update its well-known connectivity solution for miniature microphones. The MicroDot connection system can divide opinion, but ultimately has provided the brand with one of the most versatile solutions when connecting these microphones to all manner of transmitters and pre-amps.

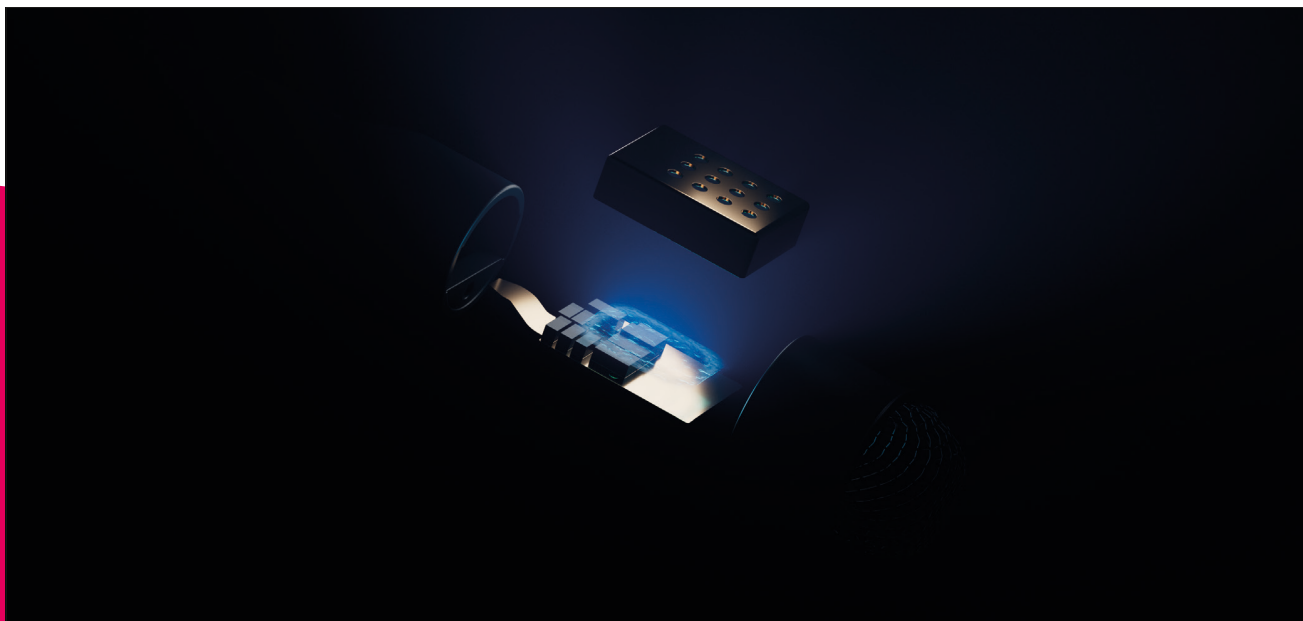
This has even left other manufacturers no choice but to attempt to replicate the formula. Now though, DPA has engineered some clever tweaks to bring us MicroLock. I was keen to find out how DPA is trying to stay ahead of the game . . .

INCREASED DYNAMIC RANGE

DPA has long been recognised for producing some of the most natural and cleanest sounding microphones. When the 4060 and 4061 were released in the 1990s, this brought the well-known reference sound to the world of miniature microphones. Since then, the capsules have largely remained unchanged, but the electronics inside the preamplifier of these condenser mics have undergone further wizardry.

Over recent times we have witnessed improvements in the technology throughout the signal chain, such as speaker systems that can deliver higher levels of SPL with less distortion, and digital wireless systems that are now able to transmit dynamic ranges higher than some microphones can deliver. This is why DPA developed CORE technology in 2018, which improved how the impedance converter (preamplifier) translates the tiny movements of the miniature diaphragm and electronically converts it into an electrical signal. This is done with the analogue signal to 'transform' the sound information without changing the characteristics of the microphone.

These improvements are all in aid of extending the microphone's dynamic range, and therefore

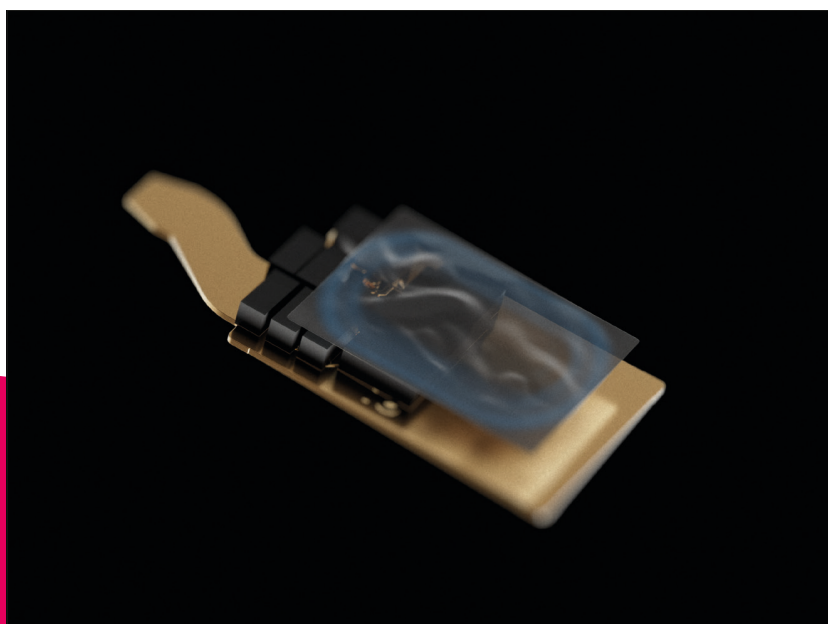
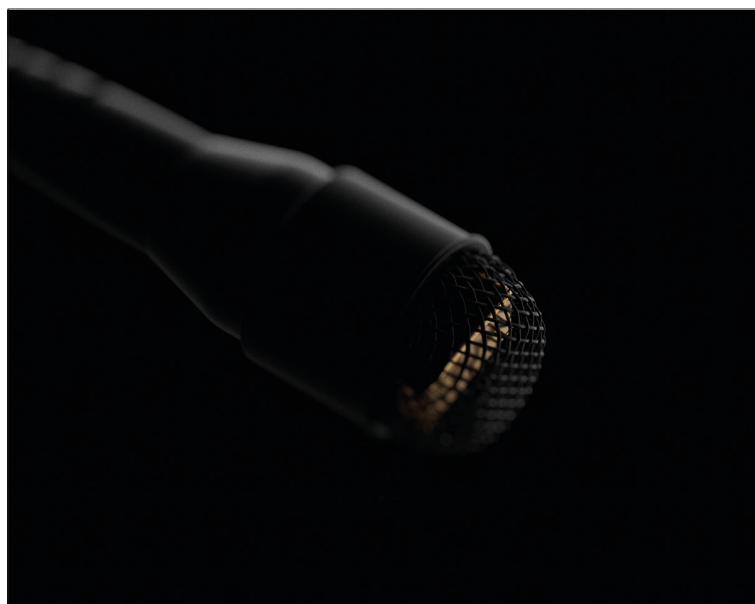


"As you get closer to the limits of the microphone it sounds as clean as it does in the lower range . . ."

its 'workable' range, as well as being less susceptible to overloading. Extending the difference between the noise floor (the mic's self-noise) to the max SPL obviously increases the microphone's dynamic range. Lowering the mic's self-noise is therefore one aspect, as well as raising the level at which Total Harmonic Distortion (THD) of 1% occurs. It is widely regarded that 1% THD is the level at which most people will be able to hear a negative change in audio quality. This is exactly what the CORE technology achieved, which in other words minimised distortion by raising the upper range that the microphone can handle.

CORE+ technology incorporates the CORE technology, but extends the linearity of the microphone at the SPL range close to the point of 1% THD. Interestingly, this means that the max SPL hasn't changed, but as you get closer to the limits of the microphone it sounds as clean as it does in the lower range.

I put the 4061 CORE+ to the test rather aptly with some opera singers I was working with. I also requested a previous generation 4061 CORE for comparison reasons, using both with Sennheiser EW-DX wireless systems, which deliver an impressive 134dB of dynamic range. Having used 4061s many times before, I was in fact surprised at the amount of distortion I could now detect in the 4061 CORE compared to the CORE+ model. It can only be described as a case of truly appreciating something, only once it's been taken away. I found myself automatically checking the transmitters and receivers to see

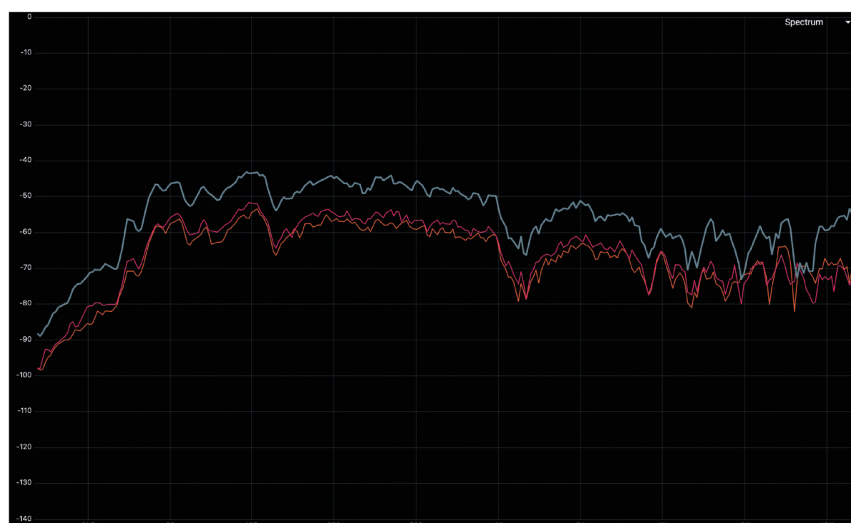


if there was another issue, before realising it was in fact the microphones themselves. Perhaps subjectively, I also ended up using less processing with the CORE+ model as the audio quality seemed more natural in general.

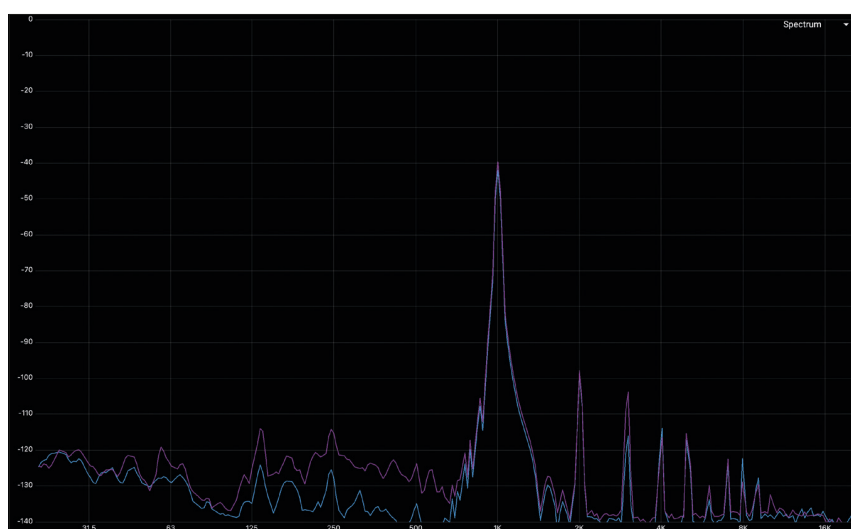
To be slightly more scientific (but not within laboratory conditions), I carried out a couple of bench-style tests back at mine. To do this, I used hard-wired XLR connections to remove the wireless systems from the signal path.



1 Figure 1



2 Figure 2



3 Figure 3

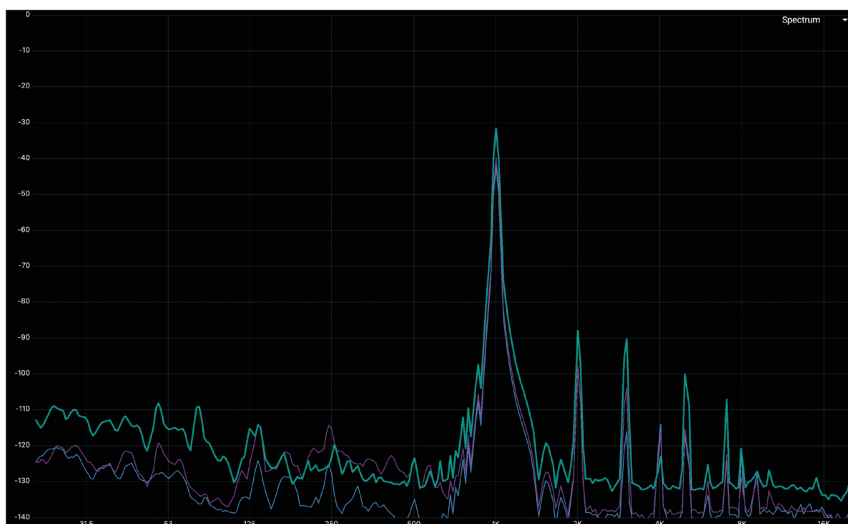
Figure 1 shows an averaged frequency response of the microphones as they captured pink noise generated by one of my calibrated studio monitors. The red plot represents the 4061 CORE and the orange plot represents the 4061 CORE+. Figure 2 shows the same again, but with the addition of the 4060 CORE+ shown in grey. There isn't much to be learnt by these results other than the reassurance that the tonal curve of the older CORE version and the latest CORE+ version are very close. The 4060 CORE+ also follows the same trace, but with a higher level of sensitivity.

Figures 3 and 4 are more revealing. Figure 3 shows the frequency response of the 4061 CORE in purple and the 4061 CORE+ in blue, as they trace the response of the same monitor producing a 1kHz sine wave at a calibrated 100dB peak SPL. Figure 4 shows the same, with the addition of the 4060 CORE+ shown in green. These plots clearly show a difference in both the harmonics between the CORE and CORE+ technology as well as a much lower noise floor below the 1kHz signal. Even the 4060 CORE+ with its higher level of sensitivity has a lower self noise in the vocal range than the 4061 CORE. Just for clarity, we can't deduce any findings from the number of harmonics above the 1kHz test signal as these are most likely being produced by the source speaker as they are within the mics themselves. We should only compare any differences.

MICROLOCK

While CORE+ effectively brings the performance of these miniature microphones into their third generation, MicroLock is the first update DPA has made to its connectivity solution. This is testament to the MicroDot connector, which has provided us with a huge array of connection options. There's now a connector for virtually any mainstream wireless transmitter or analogue connection that's out there today. Admittedly they can be expensive and they're not without some occasional flaws, but on the whole the MicroDot solution has been a success story that's stood the test of time. Other brands now try to imitate this solution, which has to be the sincerest form of flattery.

MicroLock is a very simple yet clever improvement over the original MicroDot. Based on the same system, the MicroLock now employs a spring-loaded mechanism to lock into place. This provides a more secure connection with a clicking noise as you tighten it in place, providing the reassurance that you've made a stable connection. This connection and the water-resistant materials it's made from have also been designed to ensure a consistent connection even over time. While it's hard



↑ Figure 4

→ The MicroLock

"The new MicroLock connection has been built to handle repetitive use and the wear and tear of the professional environment..."

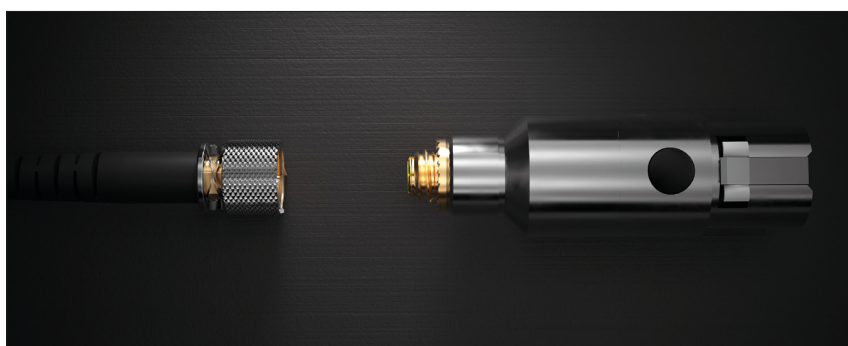


to test durability during a short review such as this, DPA claims that the new MicroLock connection has been built to handle repetitive use and the wear and tear of the professional environment.

Thankfully, MicroLock and MicroDot are completely backwards (or forwards, depending on how you are looking at the connection) compatible and interchangeable. As well as the spring-loaded mechanism or ratchet-style casing, the new MicroLock connection can be identified with a 'DPA green' insert, in the same way MicroDot has always been coloured with a red insert. Obviously, the locking connection can only be achieved if both the male and female parts are MicroLock or DPA green in colour. I think MicroLock is a great step forward that solves some of the problems experienced in the field, while retaining the compact and discreet connection that so many are already heavily invested in.

CONCLUSION

Well done DPA, it looks like you've done it again! Now we all want to replace our existing CORE microphones with CORE+ versions. This will be the second time in my career I've had this realisation - if only they offered a trade-in programme.



In all seriousness though, the new CORE+ technology is a very welcome improvement that will not only keep the DPA range of miniature microphones in line with today's expectations, but probably ahead of the competition too. While CORE+ is currently only available in the 4060, 4061, 4071, 4661, 4066, 4266 and 4466 microphones, expect to see it being rolled out to the 4088, 4188, 4288, 4488, 4166, 4062 and hopefully the 4099 at some point too.

As for the new MicroLock connector, this is one of those really simple yet effective product developments that in a few years' time we will wonder how we ever worked without it. ☒

▶ www.dpamicrophones.com