INFORMATION FOR MANUFACTURERS

WHY AND HOW TO IMPLEMENT AN EASY AES42 INPUT BASED ON AN AES3 INPUT WITH SRC

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Contents

TL;DR

- It is very easy to upgrade an AES3 input with SRC to an AES42 input: only the 10V phantom power (max. 2.5W) needs to be implemented.
- This opens up a new customer group—users of digital SCHOEPS microphones.
- Microphone control is handled locally by the SCHOEPS app, which uses acoustic signals (”dweedle tone”), eliminating the need for complex AES42 remote control implementation.
- Optionally, the proposed “AES42-Mode-3” offers an easy and straightforward solution for synchronizing the microphone.

THE “WHY”

AES42 (=the only existing pro-audio input standard for digital microphones) has a poor reputation so far.

Implementing AES42 has often been considered too complicated and expensive for sound consoles or interface products. However, with the advent of microphones that can be acoustically controlled (like the CMD 42), remote control functionality is no longer required. Contrary to some beliefs, it is not essential for the interface to store and recall the microphone’s settings. Digital gain is applied in the interface, not in the microphone, so microphone settings are mostly static and only need to be set only once at the start of a production or application or even in their lifetime. There is no longer any analogue gain in the digital microphone that would need to be adjusted dynamically.

Synchronization is also unnecessary, as modern SRCs are now present in interfaces and accepted by customers. This makes it very easy for interface manufacturers to offer compatibility with digital microphones as a simple additional feature.

Users of digital SCHOEPS microphones already represent a significant market factor in film sound. There are numerous AES42-compatible devices (see: https://schoeps.de/fileadmin/user_upload/user_upload/AES_42_interfaces_for_Schoeps_CMD_42_and_SuperCMIT.pdf) in this segment.

In other applications, demand has so far been low due to the lack of interfaces, but this will soon change: by 2026, new interfaces for studio, live, music recording, and broadcast will be available with AES42 support.

MICROPHONES ON THE MARKET

Currently, there are two digital microphones from SCHOEPS, both operating according to the AES42 standard:

- Since 2025: CMD 42 (https://schoeps.de/en/products/colette/microphone-amplifiers/cmd-42.html), a digital Colette module for MK capsules. Application depends on interface availability; the Colette series is versatile, as is the CMD 42

- Since 2010: SuperCMIT (https://schoeps.de/en/products/shotgun-microphones/cmit-series/supercmit.html), a digital shotgun microphone with enhanced directivity, mainly used in film sound.

Digital microphones from other manufacturers (e.g., Neumann, Sennheiser) are still in use by some customers, but production has long since ceased.

LEGACY AES42 IMPLEMENTATION VARIANTS

AES42 provides these features over and above AES3:

- Mode-1, only DPP (Digital Phantom Power)
- Mode-2, Remote Control + Synchronization

MODE-1, ONLY DPP

We recommend manufacturers implement only Mode-1. As explained above, there is no justification for more complex implementations.

In the simplest case, only Mode-1 (DPP) is needed. It allows the microphone to operate “free running,” which requires a sampling rate converter on the interface input side.

Upgrading an existing AES3 input with SRC to provide power to a microphone is straightforward. Providing power requires a switchable voltage source (10V/250mA) applied to the centre tap on the signal transformer of the AES3 interface. The XLR ground pin 1 is the return path for the supply current. This is similar to phantom powering an analogue microphone, but the parameters are adapted for digital microphones.

Note:

- The voltage at the source is nominally 10V, but microphones typically accept a range, so cable losses are tolerated.
- Remote control temporarily raises the voltage to 12V, so microphones tolerate this as well.
- Older microphones have linear regulators, resulting in nearly constant current regardless of voltage. The CMD 42 uses switchmode regulators, keeping power nearly constant; lowering voltage increases current consumption.
- The microphone may briefly draw more than 250mA at startup, so current limiting/overcurrent protection is advisable but should not trip too easily.
- The signal transformer should support this current; when using EMC chokes, beware of core saturation.

MODE-2

AES42 Mode-2 uses remote control and synchronization features. A distributed PLL is implemented, with one component located in the microphone and another in the interface, communicating through remote control commands. (Further details omitted here).

There is no interface available that supports Mode-2, and customers using digital microphones are not requesting it.

YOUR CUSTOMERS INSIST ON SYNCHRONIZATION? OUR PROPOSAL: “MODE-3” – EASY SYNCHRONIZATION WITHOUT REMOTE CONTROL

In legacy AES42, implementing synchronization (Mode-2) also requires remote control, so both features are linked. SCHOEPS proposes a new “Mode-3,” allowing synchronization without remote control. Future microphones will support this mode, but the CMD 42 does not (yet).

“Mode-3” modulates a low-level word clock onto the phantom power, allowing the microphone to synchronize to the system clock on the console without needing remote control. Console manufacturers can support Mode-3 synchronization in addition to DPP with little extra expense.

Microphones with acoustic configuration (like CMD 42) can be fully controlled without console support, so manufacturers may omit remote control to save costs.
If remote control is implemented, consider its interaction with acoustic remote control. Which method has priority? The microphone will execute the last command received, regardless of source. If the console periodically sends its settings, it will override acoustic commands. Disabling automatic command repetition is important to allow acoustic commands to persist.