

## AES standard for acoustics – Digital interface for microphones

Published by

**Audio Engineering Society, Inc.**

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### Abstract

This standard describes an extension of the existing digital audio interface AES3 to provide a digital interface for microphones.

An AES standard implies a consensus of those directly and materially affected by its scope and provisions and is intended as a guide to aid the manufacturer, the consumer, and the general public. The existence of an AES standard does not in any respect preclude anyone, whether or not he or she has approved the document, from manufacturing, marketing, purchasing, or using products, processes, or procedures not in agreement with the standard. Prior to approval, all parties were provided opportunities to comment or object to any provision. Attention is drawn to the possibility that some of the elements of this AES standard or information document may be the subject of patent rights. AES shall not be held responsible for identifying any or all such patents. Approval does not assume any liability to any patent owner, nor does it assume any obligation whatever to parties adopting the standards document. This document is subject to periodic review and users are cautioned to obtain the latest edition. Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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2016-02-08 printing

## Contents

<b>0 Introduction</b> .....	<b>4</b>
0.1 Patents.....	4
0.2 Conventions used in this standard.....	4
0.3 Reserved bits.....	5
0.4 Precautions regarding equipment damage.....	5
<b>1 Scope</b> .....	<b>5</b>
<b>2 Normative references</b> .....	<b>5</b>
<b>3 Definitions and abbreviations</b> .....	<b>5</b>
3.1 Definitions.....	5
3.2 Abbreviations.....	6
<b>4 Configuration</b> .....	<b>7</b>
4.1 AES3 compliance.....	7
4.2 Equipment compatibility.....	7
4.3 Sampling Frequencies.....	7
<b>5 Power requirements</b> .....	<b>7</b>
5.1 Receiver.....	7
5.2 Transmitter.....	7
<b>6 Remote control system</b> .....	<b>7</b>
<b>7 Synchronization</b> .....	<b>8</b>
7.1 Mode 1 operation.....	8
7.2 Mode 2 operation.....	8
<b>8 Microphone identification and status information</b> .....	<b>8</b>
<b>Annex A (normative) Remote control instructions</b> .....	<b>9</b>
A.1 Simple instruction.....	9
A.2 Extended instruction.....	12
A.3 Hardware example, simple instruction mode.....	21
A.4 Hardware example, extended instruction mode.....	22
A.5 Hardware example, data recovery.....	23
<b>Annex B (normative) Structure of remote control pulses</b> .....	<b>24</b>
<b>Annex C (normative) Synchronization of digital microphones, Mode 2</b> .....	<b>25</b>
C.1 Description of mode 2.....	25
C.2 Specification of PLL circuit.....	25
C.3 Functional diagram and hardware example.....	27
<b>Annex D (normative) Microphone identification and status information</b> .....	<b>29</b>
D.1 Description.....	29
D.2 Specifications.....	29
D.3 Page definition and user bit allocations.....	29

## Foreword

[This foreword is not a part of *AES standard for acoustics — Digital interface for microphones*, AES42-2001.]

This standard has been produced under project AES-X42, Digital Interfacing of Microphones, following the rules of the AES Standards Committee by the SC-04-04 Working Group on Microphone Measurement and Characterization, of the SC-04 Subcommittee on Acoustics.

At the 102nd AES Convention in Munich, Germany, in 1997, Task Group SC-04-04-D, headed by S. Harris, discussed the concept of a digital microphone interface. Two fundamental possibilities of data transmission based on AES3 were considered, an asynchronous mode (mode 1 operation) and a synchronous mode (mode 2 operation). In 1998 a writing body within the task group was set up, headed by K. Konrath to draft a proposal for mode 1. The writing body included J. Binder, D. Flackus, M. Goodman, A. Haupt, H. Jahne, O. Kern, Konrath, J. Kühnast, C. Langen, M. Lienert, W. Niehoff, S. Peus, and H. Wollherr. During three meetings in 1999 the body drafted the proposed standard and presented it during the 106th AES Convention in Munich.

In 1999 and 2000, mode 2 was designed and tested, and has been incorporated into the standard.

D. Josephson, chair  
J. Green, vice-chair  
SC-04-04

### Foreword to second edition, 2006

After the initial release of AES42, some refinements to the normative part of the standard continued to be discussed, principally on the topic of allocating bits in the command stream for control and reporting of gain and limiter/compressor settings. Accordingly, the principal changes in this document define additional operating features in the command structure so that processing internal to the microphone may be controlled from a mixing console, for example.

The draft was prepared by Task Group SC-04-04-D, which was led by C. Langen.

### Foreword to third edition, 2010

After the second edition of AES42, the main addition to this standard is the AES42 system-command set to enable storage and recall of user settings in the microphone itself.

Additionally a new feature has been introduced: Since the upload times were not acceptable for a firmware update using the AES42 interface the bit rate can be changed. This higher bit rate, called Fast-DPP mode, can be used to transmit DPP commands or firmware update data. It is introduced as an option.

Furthermore an optional periodic transmission control feature is introduced to allow manufacturer specific command sets for remote control of microphone features.

The draft was prepared by Task Group SC-04-04-D, led by C. Langen.

### Note on normative language

In AES standards documents, sentences containing the word “shall” are requirements for compliance with the document. Sentences containing the verb “should” are strong suggestions (recommendations). Sentences giving permission use the verb “may”. Sentences expressing a possibility use the verb “can”.

# AES standard for acoustics – Digital interface for microphones

## 0 Introduction

### 0.1 Patents

The Audio Engineering Society draws attention to the fact that it is claimed that compliance with this AES standard may involve the use of the US patent 5 051 799 dated 1991-09-24. It may also involve the use of the European Application EP 0766494A1 dated 1995-09-29. This application includes a priority for a US application: 05886656. It may also involve the use of the German patent DE 19606261 dated from 1996-02-06. This application includes a priority for the European Application EP 0794686 and the US patent 6028946.

The AES holds no position concerning the evidence, validity, and scope of these patent rights.

The holder of the US patent right has assured the AES that it is willing to negotiate licenses under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is archived with the AES.

The holder of the German patent right has assured the AES that it is willing to negotiate licenses under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is archived with the AES.

Information on the European application may be obtained from SGS-Thompson. Information on the US patent 5 051 799 may be obtained from Digital Technology Licensing LLC, C/O General Patent Corporation International, 75 Montebello Road, Suffern, NY 10901 – 3740 USA. Information on the German patent may be obtained from Stage Tec Entwicklungsgesellschaft für professionelle Audiotechnik mbH, Tabbertstrasse 10, 12459 Berlin, Germany.

Attention is drawn to the possibility that some of the elements of this AES standard may be the subject of patent rights other than those identified herein. The AES shall not be held responsible for identifying any or all such patent rights.

### 0.2 Conventions used in this standard

#### 0.2.1 Decimal points

According to International Electrotechnical Commission (IEC) directives, the comma is used in all text to indicate the decimal point. However, in the specified coding, including the examples shown, the full stop is used, as in IEC programming language standards.

#### 0.2.2 Data representation

In this standard, all coding and data representations are printed in an equally spaced font.

### **0.2.3 Non-printing characters**

Non-printing characters are delimited by angle brackets, as in <CR> for carriage return.

### **0.3 Reserved bits**

Unless otherwise indicated, bit assignments shown as reserved are reserved for future standardization by the AES, only by means of amendment or revision of this document.

### **0.4 Precautions regarding equipment damage**

The AES holds no position on the issue of possible damage to equipment by users of this document, but draws attention to 4.1, 4.2, and 4.3. Use of this document is voluntary and the AES has no authority to review, certify, or mandate compliance with its provisions, either by its members or by the general public.

## **1 Scope**

This standard describes an extension of the existing digital audio interface AES3 to provide a digital interface for microphones.

## **2 Normative references**

The following standards contain provisions which, through reference in this text, constitute provisions of this document. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this document are encouraged to investigate the possibility of applying the most recent editions of the indicated standards.

AES3-2003 *AES Recommended Practice for Digital Audio Engineering — Serial transmission format for two-channel linearly represented digital audio data.*

IEC 61938 (1996-12) *Audio, video and audiovisual systems — Interconnections and matching values — Preferred matching values of analogue signals.* Geneva CH: International Electrotechnical Commission.

ISO/IEC 646:1991, *Information technology — ISO 7-bit coded character set for information interchange.* Geneva CH: International Electrotechnical Commission.

IEC 60268-8 (1973), *Sound System Equipment Part 8: Automatic Gain Control Devices.* Geneva CH: International Electrotechnical Commission.

## **3 Definitions and abbreviations**

### **3.1 Definitions**

#### **3.1.1 Interface**

Digital interface compliant with this standard

#### **3.1.2 Digital phantom power DPP**

DC supply power provided over this interface

#### **3.1.3 Mode 1**

Synchronization mode using no external clock