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AES-10id-2020



AES information document for digital audio engineering - Engineering guidelines for the multichannel audio digital interface, AES10 (MADI)

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Abstract

This document provides guidance for areas of application of the MADI standard (AES10) that might be unclear. It is not intended to replace AES10, but to supplement it in those areas that are not suitable for definition in a standards document.

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Foreword

[These forewords are not part of *AES information document for digital audio engineering — Engineering guidelines for the multichannel audio digital interface (MADI) AES10, AES-10id.*]

Foreword from the first edition, 1995

Since its introduction in 1991, AES10 has become the accepted standard for the transmission of more than two channels of linearly represented digital audio data in a professional audio environment. From time to time, requests have been made to the AESSC SC-02 Subcommittee on Digital Audio for additional help in implementing the MADI interface and particularly for completion of subclause 6.2 on fiber-optic transmission, which has remained under consideration. The working group decided to place the requested guideline in an AES information document, together with a recommendation for the use of fiber-optic transmission. The working group hopes that experience gathered during use of this recommendation will help in the final drafting of subclause 6.2.

A writing group of AESSC SC-02-02 Working Group on Digital Input/Output Interfacing under the leadership of Paul Lidbetter prepared these guidelines.

Robert A. Finger
Chair, SC-02-02 Working Group on Digital Input/Output Interfacing, 1 June 1994

Foreword to the second edition, 2004

The second edition was prepared by a writing group led by R. Caine. It incorporates comments from K. Kondakor, C. Travis and J. Honor.

J. Grant
Chair, SC-02-02 Working Group on Digital Input/Output Interfacing, 2004-10-18

Corrigendum 2011-04-26

Clause 9.4 has been updated editorially to reflect experience of newer integrated circuits.

Foreword to fourth edition, 2020

This revision includes minor changes to remove insensitive terms.

J. Grant.
Chair, SC-02-02 Working Group on Digital Input/Output Interfacing, 2020-11-27

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”.

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1 Introduction and Scope

1.1 Introduction

The MADI standard, AES10-1991, is a proven, long-standing interface based on the FDDI standard ISO 9314 that has been in use since the 1980s.

The original purpose of MADI was for the interconnection of sound consoles to multi-track tape recorders and the standard has not been found wanting in any respect for that purpose. It was, however, adopted immediately by a large broadcaster as a means to route many programmes round large installations and hence formed an interface to routing switchers. This gave rise to slightly different requirements, so that the revision of MADI known as AES10-2003 includes the option of dropping the ‘varispeed’ capability in exchange for 64 rather than 56 audio channels. MADI also exploits the FDDI provision for signalling in the carrier ‘sync symbol’ characters. The original standard has been used many times in large routing installations, so that probably more MADI interfaces exist for routing than for console-to-tape interconnection. The 2003 revision was also driven by the need to accommodate 96 kHz sampling (and other double-rate sampling frequencies).

1.2 Scope

This document deals with a number of details not laid down in the AES10 standard, or unnecessarily restricted by the standard, concerning synchronisation, packing, and so on which have given rise to delivery problems. The first edition of this document, AES-10id-1995, has many explanatory notes but was mostly written before there was very much experience of using MADI operationally.

This revision of AES-10id is divided into sections dealing with: input from AES3 bitstreams, output to AES3 bitstreams and including additional concerns for other digital audio interfaces, synchronisation of AES3 to MADI decoders, synchronisation of MADI to AES3 decoders, and some general problems uncovered by experience.

This document should be read in conjunction with the current revision of the standard, AES10-2003, described in text as “the standard”.