

REDLINE VERSION



**Guideline for synchronization of audio and video –
Part 1-1: Measurement methods for synchronization of audio and video
equipment and systems – General**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 33.160.01

ISBN 978-2-8322-6218-4

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	5
1 Scope.....	7
2 Normative references	7
3 Terms, definitions and abbreviated terms	7
3.1 Terms and definitions.....	7
3.2 Abbreviated terms.....	7
4 Measuring conditions.....	8
4.1 General conditions.....	8
4.1.1 Power supplies	8
4.1.2 Environmental conditions.....	8
4.2 Specific conditions	8
4.3 General settings.....	8
4.4 Specific settings.....	9
5 Measurement methods	9
5.1 General block diagram	9
5.2 Test signal source and test signal	9
5.2.1 General	9
5.2.2 Signal generator	10
5.2.3 Test disc.....	10
5.3 EUT	10
5.3.1 Equipment	10
5.3.2 Compound equipment.....	12
5.4 Measuring instruments.....	12
5.4.1 General	12
5.4.2 Measurement of signal.....	13
5.4.3 Measurement of reproduced signal	13
5.4.4 Specific requirement	13
Annex A (informative) Assessment of the result of measurement	14
Annex B (informative) General measurement and test method of audio latency	15
B.1 Measurement.....	15
B.2 Test signal	15
B.3 Test method.....	15
Bibliography.....	16
Figure 1 – General block diagram for measurement	9
Figure 2 – Audio and video device	10
Figure 3 – Source device	11
Figure 4 – Display device.....	11
Figure 5 – Recorder device.....	12
Figure 6 – Compound equipment	12
Figure 7 – Measurement of reproduced signal	13
Figure B.1 – block diagram of test.....	15

Table B.1 – Frequency range of test signal 15

INTERNATIONAL ELECTROTECHNICAL COMMISSION

GUIDELINE FOR SYNCHRONIZATION OF AUDIO AND VIDEO –

Part 1-1: Measurement methods for synchronization of audio and video equipment and systems – General

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

DISCLAIMER

This Redline version is not an official Standard and is intended to provide the user with an indication of what changes have been made to the previous version. Only the IEC International Standard provided in this package is to be considered the official Standard.

This Redline version provides you with a quick and easy way to compare all the changes between this standard and its previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

The main task of IEC technical committees is to prepare International Standards. In exceptional circumstances, a technical committee may propose the publication of a technical specification when

- the required support cannot be obtained for the publication of an International Standard, despite repeated efforts, or
- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 62312-1, which is a technical specification, has been prepared by technical area 11: Quality for audio, video and multimedia systems, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

This second edition cancels and replaces the first edition published in 2008. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) new Annex B informs of general measurement and test method of audio latency;
- b) comments from SMPTE (including small technical issues).

The text of this Technical Specifications is based on the following documents:

Enquiry draft	Report on voting
100/3048/DTS	100/3105/RVDTS

Full information on the voting for the approval of this technical specification can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The list of all the parts of IEC 62312, published under the general title *Guideline for synchronization of audio and video*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The “colour inside” logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this publication using a colour printer.

INTRODUCTION

Audio and video equipment processes or reproduces the input signals of audio and video, then outputs these signals in various forms. Audio and video equipment needs time to process or reproduce the input signal. This time depends on the signal format, the architecture of the equipment and the design of the equipment. Hence, audio and video equipment may have different output delays for audio and video signals, and this causes unsynchronised audio and video outputs.

This Technical Specification is the general part of the measurement method for that time difference between audio and video outputs. The other parts of IEC ~~TS~~ 62312-1 describe specific measurement methods for specific audio and video equipment.

GUIDELINE FOR SYNCHRONIZATION OF AUDIO AND VIDEO –

Part 1-1: Measurement methods for synchronization of audio and video equipment and systems – General

1 Scope

The IEC 62312 series gives guidelines for methods of ~~synchronization of~~ synchronizing audio and video.

This part of IEC 62312-1 describes general measurement methods for the synchronization of audio and video equipment.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC TS 62312-2:2018, *Guideline for synchronization of audio and video – Part 2: Methods for synchronization of audio and video systems*

TECHNICAL SPECIFICATION

**Guideline for synchronization of audio and video –
Part 1-1: Measurement methods for synchronization of audio and video
equipment and systems – General**



CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references	7
3 Terms, definitions and abbreviated terms	7
3.1 Terms and definitions.....	7
3.2 Abbreviated terms.....	7
4 Measuring conditions.....	7
4.1 General conditions.....	7
4.1.1 Power supplies	7
4.1.2 Environmental conditions.....	8
4.2 Specific conditions	8
4.3 General settings.....	8
4.4 Specific settings.....	8
5 Measurement methods	9
5.1 General block diagram	9
5.2 Test signal source and test signal	9
5.2.1 General	9
5.2.2 Signal generator	9
5.2.3 Test disc.....	9
5.3 EUT	10
5.3.1 Equipment	10
5.3.2 Compound equipment.....	11
5.4 Measuring instruments.....	12
5.4.1 General	12
5.4.2 Measurement of signal.....	12
5.4.3 Measurement of reproduced signal	12
5.4.4 Specific requirement	13
Annex A (informative) Assessment of the result of measurement	14
Annex B (informative) General measurement and test method of audio latency	15
B.1 Measurement.....	15
B.2 Test signal	15
B.3 Test method.....	15
Bibliography.....	16
Figure 1 – General block diagram for measurement.....	9
Figure 2 – Audio and video device	10
Figure 3 – Source device	11
Figure 4 – Display device.....	11
Figure 5 – Recorder device.....	11
Figure 6 – Compound equipment	12
Figure 7 – Measurement of reproduced signal	13
Figure B.1 – block diagram of test.....	15

Table B.1 – Frequency range of test signal 15

INTERNATIONAL ELECTROTECHNICAL COMMISSION

GUIDELINE FOR SYNCHRONIZATION OF AUDIO AND VIDEO –

Part 1-1: Measurement methods for synchronization of audio and video equipment and systems – General

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

The main task of IEC technical committees is to prepare International Standards. In exceptional circumstances, a technical committee may propose the publication of a technical specification when

- the required support cannot be obtained for the publication of an International Standard, despite repeated efforts, or
- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 62312-1, which is a technical specification, has been prepared by technical area 11: Quality for audio, video and multimedia systems, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

This second edition cancels and replaces the first edition published in 2008. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) new Annex B informs of general measurement and test method of audio latency;
- b) comments from SMPTE (including small technical issues).

The text of this Technical Specifications is based on the following documents:

Enquiry draft	Report on voting
100/3048/DTS	100/3105/RVDTS

Full information on the voting for the approval of this technical specification can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The list of all the parts of IEC 62312, published under the general title *Guideline for synchronization of audio and video*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

Audio and video equipment processes or reproduces the input signals of audio and video, then outputs these signals in various forms. Audio and video equipment needs time to process or reproduce the input signal. This time depends on the signal format, the architecture of the equipment and the design of the equipment. Hence, audio and video equipment may have different output delays for audio and video signals, and this causes unsynchronised audio and video outputs.

This Technical Specification is the general part of the measurement method for that time difference between audio and video outputs. The other parts of IEC 62312-1 describe specific measurement methods for specific audio and video equipment.

GUIDELINE FOR SYNCHRONIZATION OF AUDIO AND VIDEO –

Part 1-1: Measurement methods for synchronization of audio and video equipment and systems – General

1 Scope

The IEC 62312 series gives guidelines for methods of synchronizing audio and video.

This part of IEC 62312-1 describes general measurement methods for the synchronization of audio and video equipment.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC TS 62312-2:2018, *Guideline for synchronization of audio and video – Part 2: Methods for synchronization of audio and video systems*