

# TECHNICAL SPECIFICATION



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

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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## 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**

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- 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

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- reconfirmed,
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## 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.

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## 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*

#### 3 Terms, definitions and abbreviated terms

~~For the purposes of this document, the following terms and definitions apply. Also the terms and definitions given in IEC 62312-2 apply.~~

##### 3.1

##### **EUT**

~~equipment under test~~

##### 3.1 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

##### 3.2 Abbreviated terms

EUT equipment under test

## 4 Measuring conditions

### 4.1 General conditions

#### 4.1.1 Power supplies

##### 4.1.1.1 Voltage

The supplied AC power voltage shall be the fixed value of the region where the equipment under test is used. The supplied DC power voltage shall be the fixed value specified by the manufacturer. The tolerance shall be within  $\pm 1$  % in both cases. If this tolerance does not affect the results of measurement, the tolerance can be within  $\pm 5$  %.

##### 4.1.1.2 Frequency

The frequency of the AC power supply shall be 50 Hz or 60 Hz and the fluctuation shall be within  $\pm 2$  %.

##### 4.1.1.3 Waveform distortion

###### 4.1.1.3.1 AC power supply

The waveform of the AC power supply shall be a sine wave in which the harmonic content is 2 % or less.

###### 4.1.1.3.2 DC power supply

The ripple voltage shall be 0,1 % or less.

### 4.1.2 Environmental conditions

#### 4.1.2.1 Environmental air condition

The environmental conditions for measurements shall be:

Ambient temperature:  $20^{+15}_{-5}$  °C

Relative humidity: 60 %  $\pm$  15%

Air pressure: 96 kPa  $\pm$  10 kPa

#### 4.1.2.2 Warm up

The equipment under test shall be powered on 5 min before starting the test. It may be zero if the warm up does not affect the results of the measurement.

#### 4.1.2.3 Initialization

The equipment under test shall be initialized before starting the test.

### 4.2 Specific conditions

If specific conditions are required for the measurement of the equipment, those conditions shall be specified.

NOTE ~~The other subparts of IEC 62312-1 specify~~ IEC TS 62312-2 specifies the measurement method for the specific equipment; the special conditions ~~may be~~ are specified in that part.

### 4.3 General settings

General settings for equipment shall be set to the default setting, which is specified by the manufacturer, normally the centre position. If there ~~will be~~ is no special indication ~~and~~ about

the functions that affect the results of measurement of synchronization, all ~~of the~~ controllers shall be switched off.

#### 4.4 Specific settings

~~If specific equipment has its own specific settings, it shall be set to have the results of measurement regarding the specific settings. The other subparts of IEC 62312-1 specify specific settings for specific equipment.~~

If a piece of equipment has its own specific settings, it shall be set to have the results of measurements related to those specific settings.

### 5 Measurement methods

#### 5.1 General block diagram

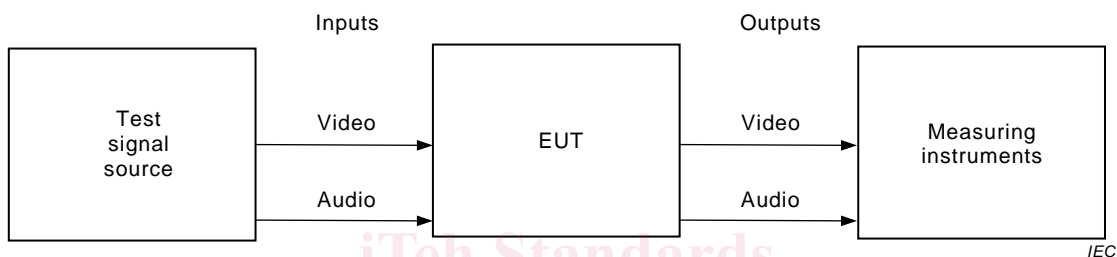


Figure 1 – General block diagram for measurement

The test signal source provides the reference audio and video signal. There is either no time difference between them or the difference is specified. These audio and video test signals are applied to the EUT in the appropriate method for each EUT. The EUT reproduces or processes these test signals and outputs the audio and video signals. The measuring instruments measure the output from the EUT and measure the time difference between audio and video outputs from the EUT.

The test signal source outputs the signal in a format that should be suitable for the EUT to process.

In the case that the EUT, such as an audio amplifier, reproduces no video signal, general measurement and the test method of audio latency is available as described in Annex B.

#### 5.2 Test signal source and test signal

##### 5.2.1 General

The test signal source provides audio and video test signals as a reference signal for measuring. The content, format and media of the test signal are different depending on the EUT.

The basic format of the test signal content consists of synchronized audio and video signals that are used as a reference for synchronization and are processed or reproduced by the EUT. The EUT outputs the resulting signal to the measuring instruments. The output signal should be detectable and be able to be measured by the measuring instruments. To conform to this requirement, the test signal content should be made suitable for the measuring instruments.

The form of the test signal is an electrical signal or a signal recorded on media. The format and media of the test signal should be appropriate for the EUT. This would normally be the default format and media appropriate to the functionality of the EUT.