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ITeh STANDARD
Multimedia systems – Guide to the recommended characteristics of analogue interfaces to achieve interoperability

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Systèmes multimédias – Guide des caractéristiques recommandées des interfaces analogiques qui permettent d'obtenir l'interopérabilité

IEC 61938:2018

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**MULTIMEDIA SYSTEMS –
GUIDE TO THE RECOMMENDED CHARACTERISTICS
OF ANALOGUE INTERFACES TO ACHIEVE INTEROPERABILITY**

FOREWORD

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International Standard IEC 61938 has been prepared by IEC technical committee 100: Audio, video and multimedia systems and equipment.

This third edition cancels and replaces the second edition published in 2013. This edition constitutes a technical revision.

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

- a) electric tolerance is standardized;
- b) recommended value of output source impedance is adjusted;
- c) value of 6 Ω is additionally recommended to impedance-defined loudspeaker systems;
- d) values in each table are chosen with respect to the state of the art and representative of best practice in industry.

The text of this International Standard is based on the following documents:

CDV	Report on voting
100/2879/CDV	100/2996/RVC

Full information on the voting for the approval of this International Standard 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 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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
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INTRODUCTION

The first edition of IEC 61938 was derived from IEC 60268-15, IEC 60574-4 and IEC 60933-1 and also from related proposals which had been submitted up until the date of this revision. IEC 60268-15 was the first standard to address 'interoperability' – the ability of equipment from different manufacturers to be assembled into a system with full compatibility at every 'interface'. The aim of the previous revision was to make the intention of this document easily comprehensible by using widely used terminology in the title and text of the document. The purpose of this revision is to expand the measurement frequency range in step with the progress of recent equipment.

The features of the revision are the following:

- a) unification and arrangement of existing related standards, including effective proposals which have been submitted;
- b) extension of the measurement frequency range.

NOTE The standard numbers mentioned above correspond to the revised numbers, if applicable.

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MULTIMEDIA SYSTEMS – GUIDE TO THE RECOMMENDED CHARACTERISTICS OF ANALOGUE INTERFACES TO ACHIEVE INTEROPERABILITY

1 Scope

This document gives guidance on current practice for the characteristics of multimedia analogue interfaces to achieve interoperability between equipment from different manufacturers. It is not a performance standard.

Recommendations for interfaces for equipment used in vehicles, and for analogue video interfaces for broadcast and similar equipment, are not given.

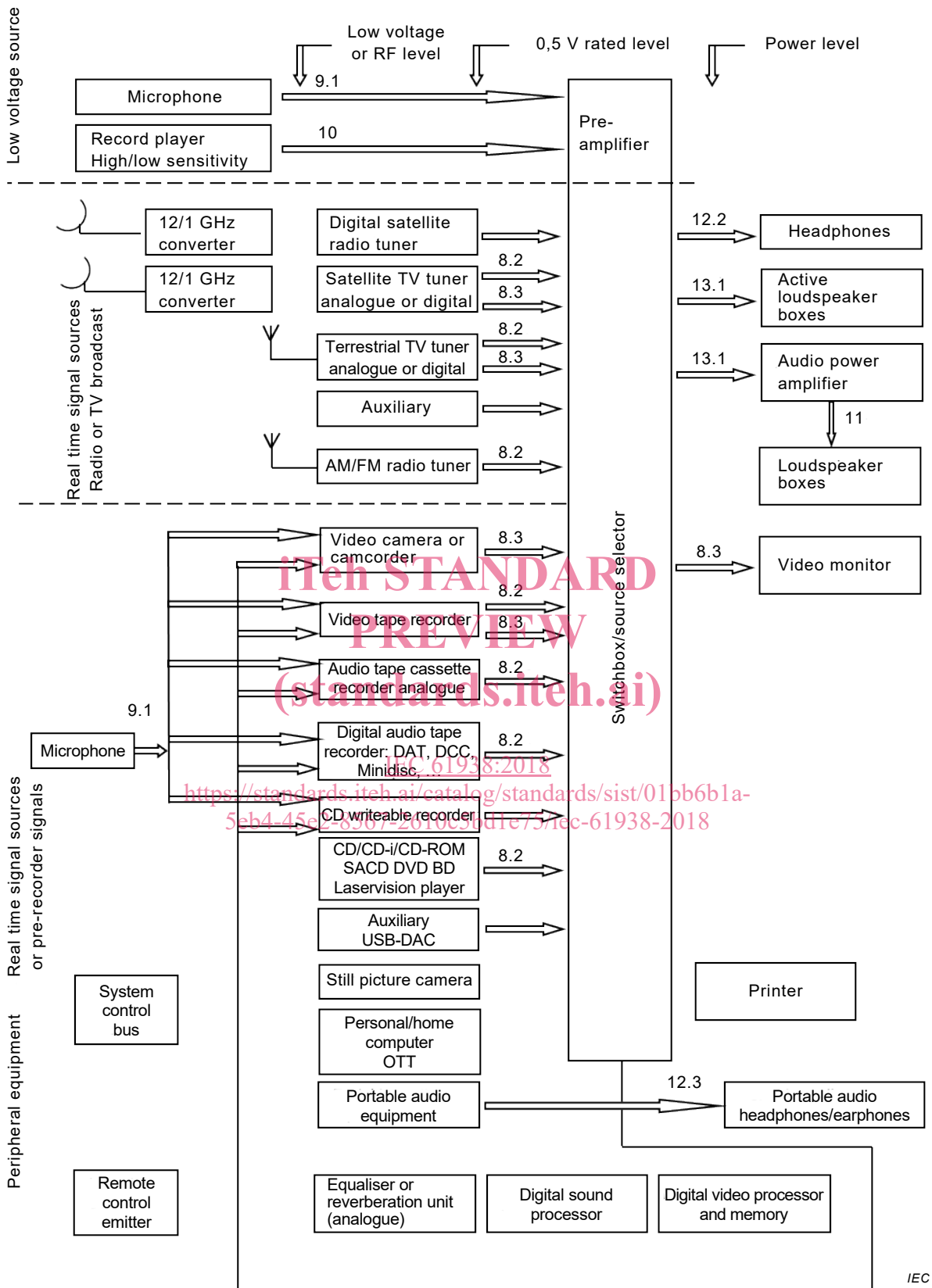
Refer to IEC 60958 for the interconnection of digital signals.

Figure 1 shows in a diagram the possible interfaces of the audio and video sources and destinations.

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NOTE The numbers indicated above the arrows refer to the appropriate clause or subclauses of this document.

Figure 1 – Audio and video sources and destinations

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 60038, *IEC standard voltages*

IEC 60094-2, *Magnetic tape recording and reproducing systems – Part 2: Calibration tapes*

IEC 60268-1, *Sound system equipment – Part 1: General*

IEC 60268-3, *Sound system equipment – Part 3: Amplifiers*

IEC 60268-5, *Sound system equipment – Part 5: Loudspeakers*

IEC 60268-7:2010, *Sound system equipment – Part 7: Headphones and earphones*

IEC 60268-11:1987, *Sound system equipment – Part 11: Application of connectors for the interconnection of sound system components*

IEC 60268-11:1987/AMD1:1989, *Sound system equipment – Part 11: Application of connectors for the interconnection of sound system components*

IEC 60268-11:1987/AMD2:1991, *Sound system equipment – Part 11: Application of connectors for the interconnection of sound system components*

IEC 60268-12, *Sound system equipment – Part 12: Application of connectors for broadcast and similar use*

IEC 60603-11:1992, *Connectors for frequencies below 3 MHz for use with printed boards – Part 11: Detail specification for concentric connectors (dimensions for free connectors and fixed connectors)*

IEC 60958:2016, *Digital audio interface – ALL PARTS*

ITU-R BT.1700:2005, *Characteristics of composite video signals for conventional analogue television systems*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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>

3.1

luminance signal

electrical signal representing the luminance of the television picture elements

[SOURCE: IEC 60050-723:1997, 723-05-56, modified – Note has been deleted.]

3.2

chrominance signal

electrical signal that is associated with the luminance signal to convey colour information; in practice this signal is made up of two components

[SOURCE: IEC 60050-723:1997, 723-05-57]

3.3

Y" signal

VBS signal

combined signal consisting of

- a luminance signal;
- blanking and synchronizing signals.

Note 1 to entry: The Y" signal is the composite video signal (CVBS signal) without the C" signal.

3.4

colour signal

C" signal

chrominance signal with burst signal included, modulated on a subcarrier

3.5

composite video signal

CVS signal

combined signal consisting of

- a luminance signal;
- a colour signal.

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3.6

composite video, blanking and synchronization signal

CVBS signal

combined signal consisting of

- a luminance signal;
- a colour signal;
- blanking and synchronizing signals.

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3.7

blanking signal

signal used to control the suppression of the signal conveying picture information during certain parts of the scanning period, for example, during fly-back

[SOURCE: IEC 60050-723:1997, 723-05-37, modified – Example has been deleted.]

3.8

synchronizing signal

signal used to determine the timing for the scanning processes in transmission and reception

[SOURCE: IEC 60050-723:1997, 723-05-36]

3.9

interface

shared boundary between two pieces of equipment, defined by functional characteristics, common physical interconnection characteristics, signal characteristics and other characteristics, as appropriate

[SOURCE: ISO/IEC 2382-9:1995, definition 09.01.06, modified – Definition has been adapted.]

3.10

minimum output voltage

voltage measured across the rated load impedance of a piece of equipment, and related to a minimum input signal limited by signal-to-noise ratio

3.11

maximum output voltage

voltage measured across the rated load impedance of a piece of equipment and related to a maximum input signal limited by non-linearity

3.12

rated source impedance

internal impedance, stated by the manufacturer, of the source supplying the signal to the piece of equipment

Note 1 to entry: Unless otherwise specified, the rated source impedance is assumed to be a constant pure resistance.

Note 2 to entry: The manufacturer may also give the range of source impedances which he considers tolerable in practice.

Note 3 to entry: Multiple values, or a range of values, may be specified, providing the corresponding rated (distortion-limited) output voltages and/or powers are also stated.

3.13

input impedance

internal impedance measured between the input terminal and its corresponding return of the piece of equipment

3.14

rated source e.m.f.

e.m.f. specified by the manufacturer which, when connected to the input terminals in series with the rated source impedance, gives rated distortion-limited output voltage across the rated load impedance at an appropriate setting of the controls

3.15

minimum source e.m.f. for rated output voltage

e.m.f. that, when connected to the input terminals in series with the rated source impedance, gives rated output voltage across the rated load impedance with the volume control(s), if any, set for maximum gain and the tone control(s), if any, set as specified for rated conditions

3.16

rated load impedance

impedance, specified by the manufacturer, to which the output terminals are to be connected for measuring purposes

Note 1 to entry Unless otherwise specified by the manufacturer, the rated load impedance shall be assumed to be a constant pure resistance.

Note 2 to entry Multiple values, or a range of values, may be specified, provided the corresponding rated (distortion-limited) output voltages and/or powers are also stated.

3.17

output source impedance

internal impedance measured between the output terminal and its corresponding return under specified conditions

3.18**rated output voltage**

voltage specified by the manufacturer, measured across the rated load-impedance of a piece of equipment

3.19**overload source e.m.f.**

maximum source e.m.f. for which a piece of equipment, connected as for rated conditions and with an appropriate setting of the volume control, can deliver an output voltage 10 dB below the rated distortion limited output voltage without exceeding the rated total harmonic distortion

3.20**externally powered microphone**

microphone containing internal active circuitry that obtains its operating power from an external device to which it is connected

3.21**powered input**

point on a device at which an externally powered microphone may be connected

Note 1 to entry This is a terminal which serves as an input for signals from a microphone and also as an output for power to the microphone.

3.22**P12**

designation of a specific phantom power supply system

3.23**P24**

designation of a specific phantom power supply system

3.24**P48**

designation of a specific phantom power supply system

4 General conditions

All voltages are RMS voltages, unless otherwise indicated.

Impedances of audio circuits are valid in the frequency range of 20 Hz to 20 kHz, unless otherwise indicated.

Electrical tolerance is $\pm 5\%$, unless otherwise indicated.

Tables containing tolerances indicate that the equipment should operate over the entire range of possible values, but may not meet all of its specifications at the given limits.

5 Power supply**5.1 Alternating current (AC) power supply voltages and frequencies**

For AC power supply voltages and frequencies, refer to IEC 60038.

For special applications, for example ships and aircraft, other voltages and/or frequencies and the permissible tolerances are subject to agreement between manufacturers and users.

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