

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

Systemes multimédia – Guide des caractéristiques recommandées des interfaces analogiques permettant d'obtenir l'interopérabilité

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

Systèmes multimédia – Guide des caractéristiques recommandées des interfaces analogiques permettant d'obtenir l'interopérabilité

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**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 second edition cancels and replaces the first edition published in 1996 and constitutes a technical revision.

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

- the main title was changed to: Multimedia systems – Guide to the recommended characteristics of analogue interfaces to achieve interoperability;
- the scope was adapted to the title;
- a new introduction has been added. The necessity of the above revisions is mentioned in this introduction;
- the values in each table were chosen with respect to the state of the art and representative of best practice in industry;

- plug-in power systems and soundcard power systems are added;
- a new subclause 12.3 has been created: Interoperability of portable audio headphones / earphones and portable audio equipment;
- a new Annex A describing pairing and screening of conductors is added;
- a new Annex B describing phantom power variants for specialized applications is also added.

The text of this standard is based on the following documents:

FDIS	Report on voting
100/2130/FDIS	100/2155/RVD

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

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

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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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'. However, the purpose, terminology and implications of IEC 61938 are now widely misunderstood because the words 'matching' and 'preferred' used in IEC 61938, are frequently misinterpreted, resulting in IEC 61938 being regarded as a performance standard, which was never its intention. The aim of this revision is to make the intention of this standard easily comprehensible by using widely used terminology in the title and text of the standard.

The features of the revision are the following.

- a) Unification and arrangement of existing related standards, including effective proposals which have been submitted.
- b) The concept of "general purpose input/output".

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 International Standard 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.

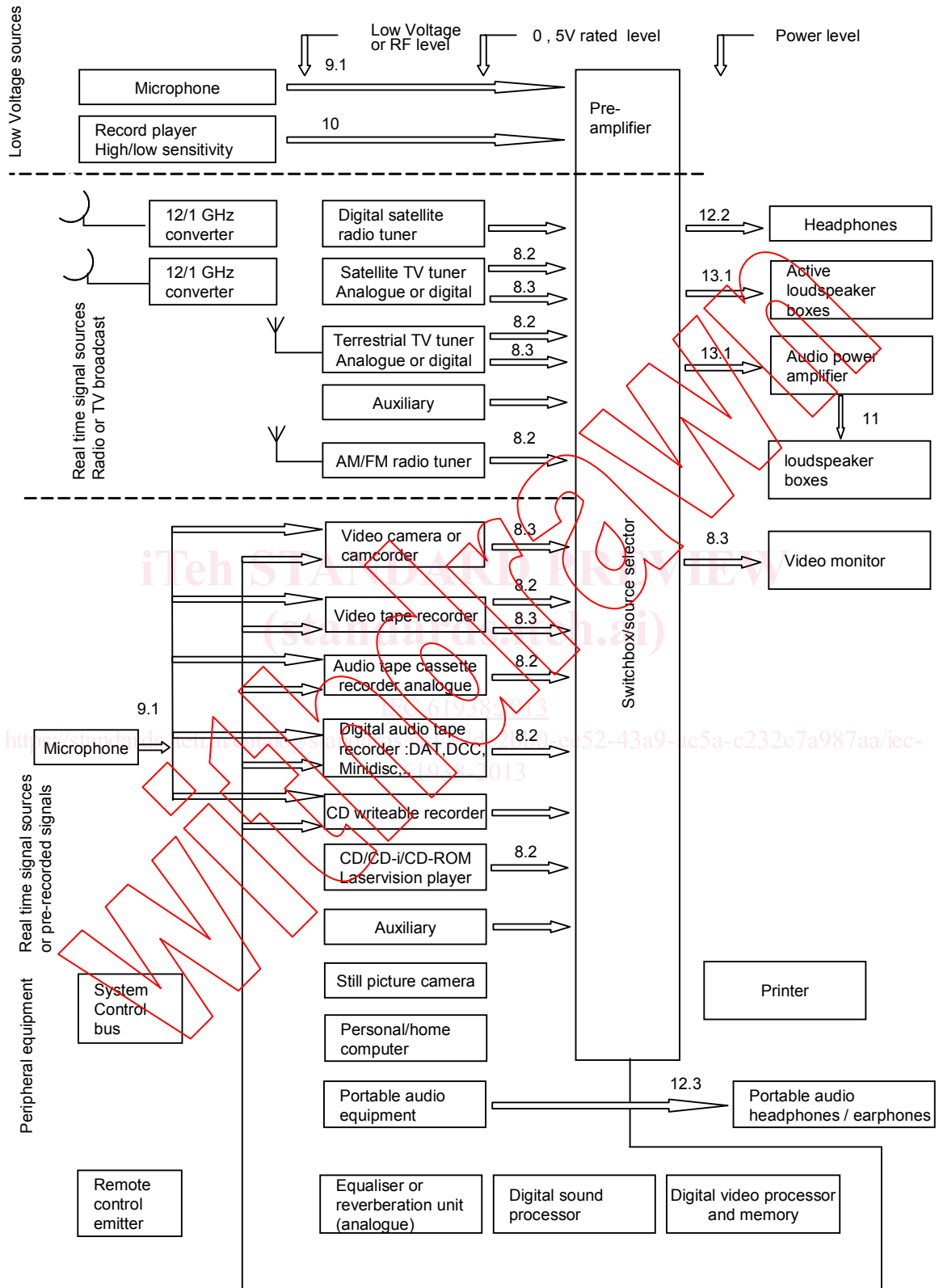
Figure 1 shows in a diagram the possible interfaces of the audio and video sources and destinations.

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IEC 1298/13

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

Figure 1 – Audio and video sources and destinations

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60038:2009, *IEC standard voltages*

IEC 60094-2:1994, *Magnetic tape recording and reproducing systems – Part 2: Calibration tapes*

IEC 60107-6:1989, *Recommended methods of measurement on receivers for television broadcast transmissions – Part 6: Measurements under conditions different from broadcast signal standards*

IEC 60130-9:2011, *Connectors for frequencies below 3 MHz – Part 9: Circular connectors for radio and associated sound equipment*

IEC 60268-1:1985, *Sound system equipment – Part 1: General*
Amendment 1:1988
Amendment 2:1988

IEC 60268-3:2000, *Sound system equipment – Part 3: Amplifiers*

IEC 60268-5:2003, *Sound system equipment – Part 5: Loudspeakers*
Amendment 1:2007

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*
Amendment 1:1989
Amendment 2:1991

IEC 60268-12:1987, *Sound system equipment – Part 12: Application of connectors for broadcast and similar use*
Amendment 1:1991
Amendment 2:1994

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 (all parts), *Digital audio interface*

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.

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

3.6**composite video, blanking and synchronization signal****CVBS signal**

combined signal consisting of

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

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 60050:1997, 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 60050:1997, 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. which, 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.

4 General conditions

All voltages are r.m.s. voltages, unless otherwise indicated.

Impedances of audio circuits are valid in the frequency range of 20 Hz to 20 kHz, 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 (a.c.) power supply voltages and frequencies**

For a.c. 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.

5.2 Direct current (d.c.) power supply voltages

DC power supply voltages and the permissible tolerances are given in Table 1. The equipment should operate over the range of voltages given, but may not necessarily meet all of its specifications at the given limits.