
Avdio, video in pripadajoča oprema - Ugotavljanje porabe energije - 2. del: Signali in mediji

Audio, video, and related equipment - Determination of power consumption - Part 2: Signals and media

Audio-, Video- und verwandte Geräte - Messverfahren für die Leistungsaufnahme - Teil 2: Signale und Medien

Appareils audio, vidéo et matériel connexe - Détermination de la consommation de puissance - Partie 2: Signaux et supports

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33.160.01	Avdio, video in avdiovizualni sistemi na splošno	Audio, video and audiovisual systems in general

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Audio, video, and related equipment - Determination of power consumption - Part 2: Signals and media

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**Audio, video, and related equipment - Determination of power
consumption -
Part 2: Signals and media**

FOREWORD

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IEC 62087-2 has been prepared by technical area 19: Environmental and energy aspects for multimedia systems and equipment, of IEC technical committee 100: Audio, video and multimedia systems and equipment. It is an International Standard.

The first edition of IEC 62087-2, together with IEC 62087-1 and IEC 62087-3 to IEC 62087-6 canceled and replaced [IEC 62087:2011 \[1\]](#) in its entirety.

IEC 62087-2:2015 (first edition) separated signals and media that are to be used for determining power consumption and related characteristics into a dedicated part. The three original video signal sets (static, dynamic broadcast-content, and Internet-content) were not changed. Signals for the purpose of determining the peak luminance ratio that is sometimes associated with television set power consumption measurement programs had been added.

The second edition of IEC 62087-2 added HDR and UHD video test signals and dynamic box and outline test signals for TV power consumption testing. All test signals were made available

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from a specified IEC online repository for download, replacing the former physical media distribution.

This third edition of IEC 62087-2 cancels and replaces the second edition published in 2023. This edition constitutes a technical revision and includes the following significant technical changes with respect to the previous edition:

- SDR video signals have been updated.

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

Draft	Report on voting
100/xxxx/CDV	100/xxxx/RVC

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 62087 series, published under the general title *Audio, video, and related equipment - Determination of power consumption*, can be found on the IEC website.

This publication contains multiple test signals downloadable from a specified IEC online repository, available at <https://www.iec.ch/tc100/supportingdocuments>. These files form an integral part of this standard.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under 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
- amended.

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INTRODUCTION

This document identifies test signals to be used to determine power consumption and related characteristics specified in some other parts of the IEC 62087 series.

This third edition of IEC 62087-2 replaces the SDR broadcast video clips with new SDR broadcast video clips identical in content, scene cuts and length to the IEC HDR test clips with a few exceptions. It also incorporates numerous minor changes such as replacing "video signal" with "static pattern," where appropriate, replacing "unit under test" with "equipment under test" for consistency, etc.

All test signals are available for download from an IEC online repository.

IEC 62087 series currently consists of the following published parts:

- Part 1: General
- Part 2: Signals and media
- Part 3: Television sets
- Part 4: Video recording equipment
- Part 5: Set-top boxes
- Part 6: Audio equipment
- Part 7: Computer monitors
- Part 8: Small network equipment

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1 Scope

This part of IEC 62087 specifies the signals used to determine the power consumption and related characteristics of audio, video, and related equipment, such as television sets and computer monitors. In addition, this part specifies equipment, interfaces, and accuracy related to signal generation.

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 60107-1:1997, *Methods of measurement on receivers for television broadcast transmissions - Part 1: General conditions - Measurements at radio and video frequencies*

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

IEC 60315-1:1988, *Methods of measurement on radio receivers for various classes of emission. Part 1: General considerations and methods of measurement, including audio-frequency measurements*

IEC 60315-3, *Methods of measurement on radio receivers for various classes of emission - Part 3: Receivers for amplitude-modulated sound-broadcasting emissions*

IEC 60315-4:1997, *Methods of measurement on radio receivers for various classes of emission - Part 4: Receivers for frequency-modulated sound broadcasting emissions*

IEC 60958-1, *Digital audio interface - Part 1: General*

IEC 60958-3, *Digital audio interface - Part 3: Consumer applications*

IEC 61938, *Multimedia systems - Guide to the recommended characteristics of analogue interfaces to achieve interoperability (GMT)*

IEC 62087-1, *Audio, video, and related equipment - Determination of power consumption - Part 1: General*

IEC 62216, *Digital terrestrial television receivers for the DVB-T system*

Recommendation ITU-R BT.2100-2, *Image parameter values for high dynamic range television for use in production and international programme exchange*

3 Terms, definitions, and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62087-1 as well as in the following apply.

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

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

3.1.1 Video signal related terms and definitions

3.1.1.1

standard definition

SD

spatial video resolution ranging from 640×360 to $1\,280 \times 720$

3.1.1.2

high definition

HD

spatial video resolution ranging from $1\,280 \times 720$ to $1\,920 \times 1\,080$

3.1.1.3

ultra-high definition

UHD

Ultra HD

spatial video resolution above $1\,920 \times 1\,080$

3.1.1.4

average picture level

APL

average level of all the pixels of a single video signal frame or a group thereof in the linear luminance domain

Note 1 to entry: This note applies to the French language only.

Note 2 to entry: APL is a measure of the linear signal that might be available inside of some display equipment and delivered to the display device. The properties and their differences of the external and internal video signals are shown in Figure 1.

Note 3 to entry: There are other standards that use the terms "pre-gamma" and "post-gamma" to describe APL' and APL, respectively.

3.1.1.5

average picture level based on non-linear input signal

APL'

average level of all pixels of a single video signal frame or a group thereof in the non-linear luminance domain

EXAMPLE Display equipment such as television sets or computer monitor receive input signals that encode luminance or brightness in a non-linear way. Examples for such non-linear encoding are PQ (absolute luminance) or HLG (3.1.1.8)(brightness) EOTFs (ITU-R BT.2100-2).

Note 1 to entry: APL' (3.1.1.5) is defined as a percentage of the range between reference black and reference white level.

Note 2 to entry: This is not a measure of the linear signal that might be available inside of some display equipment and delivered to the display device. The properties and their differences of the external and internal video signals are shown in Figure 1.

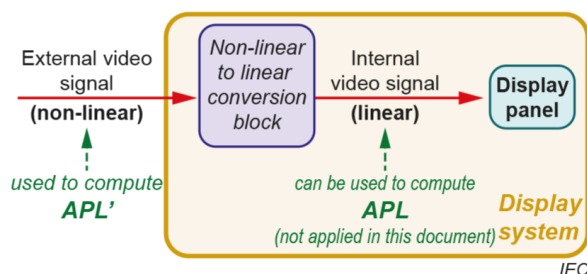


Figure 1 – Occurrence of linear and non-linear signal encodings in context of a typical display processing pipeline for computing APL and APL'

Note 3 to entry: There are other standards that use the terms 'pre-gamma' and 'post-gamma' to describe APL' and APL, respectively.

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3.1.1.6**standard dynamic range video**

SDR video

capability of components in a video pipeline to capture, process, transport or display luminance levels and tone gradations that can be characterized by the dynamic range, colour rendering and tone gradation capabilities essentially compatible with cathode ray tube (CRT) displays

EXAMPLE BT.709/BT.1886 and IEC 62966-2-1 (sRGB)

Note 1 to entry: This note applies to the French language only.

3.1.1.7**high dynamic range video**

HDR video

capability of components in a video pipeline to capture, process, transport or display luminance levels and tone gradations that exceed capabilities of conventional SDR imaging pipeline components

EXAMPLE An HDR video signal typically uses a greater bit depth, luminance and colour volume than standard dynamic range (SDR) video. It also typically utilizes different tone curves such as perceptual quantizer (PQ) or hybrid log gamma (HLG (3.1.1.8)) as specified in ITU-R BT.2100 instead of gamma, as used with SDR. When the HDR video signal is rendered on an HDR display, it is possible to see greater luminance ranges and wider colour gamut

Note 1 to entry: HDR video can provide an enhanced viewer experience and can more accurately reproduce scenes that include, within the same image, deep dark areas, and bright highlights, such as emissive light sources and reflections.

Note 2 to entry: This note applies to the French language only.

3.1.1.8**hybrid log-gamma**

HLG

one set of transfer functions offering a degree of backwards compatibility by more closely matching the previously established electronic display transfer curves

Note 1 to entry: Sets of transfer functions related to HDR signals are specified in Rec. ITU-R BT.2100

Note 2 to entry: HLG (3.1.1.8) is used both as a description of a dedicated transfer function and as a video format name.

3.1.2 Interface related terms and definitions**3.1.2.1****component analogue video**

baseband analogue video interface that carries a standard or high-definition colour video signal over three signal lines

Note 1 to entry: See CTA-770.3-E S-2022.

3.1.2.2**composite analogue video**

baseband analogue video interface that carries a standard-definition colour video signal over a single signal line

Note 1 to entry: See SMPTE ST 170M:2004 for the 59,94 Hz version and ITU-R BT.470-5 for the 50 Hz version.

3.1.2.3**S-video**

baseband analogue video interface that carries a standard definition colour video signal using two signal lines

Note 1 to entry: See IEC 60933-5.

3.1.2.4**digital visual interface**

DVI