

© Copyright SEK Svensk Elstandard. Reproduction in any form without permission is prohibited.

Audio- och videoutrustning – Mätning av elförbrukning – Del 2: Signaler och media

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

Som svensk standard gäller europastandarden EN IEC 62087-2:2023. Den svenska standarden innehåller den officiella engelska språkversionen av EN IEC 62087-2:2023.

Nationellt förord

Europastandarden EN IEC 62087-2:2023

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 62087-2, Second edition, 2023 - Audio, video, and related equipment - Determination of power consumption - Part 2: Signals and media**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 62087-2, utg 1:2016 med eventuella tillägg, ändringar och rättelser gäller ej fr o m 2026-03-24.

Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a mätning, säkerhet och provning och för utförande, skötsel och dokumentation av elprodukter och elanläggningar.

Genom att utforma sådana standarder blir säkerhetsfordringar tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

SEK är Sveriges röst i standardiseringsarbetet inom elområdet

SEK Svensk Elstandard svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

Stora delar av arbetet sker internationellt

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

Var med och påverka!

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

SEK Svensk Elstandard

Box 1284
164 29 Kista
Tel 08-444 14 00
www.elstandard.se

English Version

Audio, video, and related equipment - Determination of power
consumption - Part 2: Signals and media
(IEC 62087-2:2023)

Appareils audio, vidéo et matériel connexe - Détermination
de la consommation de puissance - Partie 2 : Signaux et
supports
(IEC 62087-2:2023)

Audio-, Video- und verwandte Geräte - Messverfahren für
die Leistungsaufnahme - Teil 2: Signale und Medien
(IEC 62087-2:2023)

This European Standard was approved by CENELEC on 2023-03-24. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.



European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 100/3771/CDV, future edition 2 of IEC 62087-2, prepared by Technical Area 12 "AV energy efficiency and smart grid applications" of IEC/TC 100 "Audio, video and multimedia systems and equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62087-2:2023.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2023-12-24
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2026-03-24

This document supersedes EN 62087-2:2016 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 62087-2:2023 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standard indicated:

IEC 60933-5 NOTE Approved as EN 60933-5

IEC 62087-3:2023 NOTE Approved as EN IEC 62087-3:2023 (not modified)

IEC 62087-4 NOTE Approved as EN 62087-4

IEC 62087-5 NOTE Approved as EN 62087-5

IEC 62087-6 NOTE Approved as EN 62087-6

IEC 62087-7 NOTE Approved as EN IEC 62087-7

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60107-1	1997	Methods of measurement on receivers for television broadcast transmissions - Part 1: General considerations - Measurements at radio and video frequencies	EN 60107-1	1997
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	EN 60315-3	-
IEC 60315-4	1997	Methods of measurement on radio receivers for various classes of emission - Part 4: Receivers for frequency-modulated sound broadcasting emissions	EN 60315-4	1998
IEC 60958-1	-	Digital audio interface - Part 1: General	EN IEC 60958-1	-
IEC 60958-3	-	Digital audio interface - Part 3: Consumer applications	EN IEC 60958-3	-
IEC 61938	-	Multimedia systems - Guide to the recommended characteristics of analogue interfaces to achieve interoperability (GMT)	EN IEC 61938	-
IEC 62087-1	-	Audio, video, and related equipment - Determination of power consumption - Part 1: General	EN 62087-1	-
IEC 62216	-	Digital terrestrial television receivers for the DVB-T system	EN 62216	-
Recommendation ITU-R BT.2100-2	-	Image parameter values for high dynamic range television for use in production and international programme exchange	-	-

INTERNATIONAL STANDARD

NORME INTERNATIONALE



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

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

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 33.160.10

ISBN 978-2-8322-6489-8

<p>Warning! Make sure that you obtained this publication from an authorized distributor.</p> <p>Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.</p>
--

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references	7
3 Terms, definitions, and abbreviated terms	8
3.1 Terms and definitions.....	8
3.2 Abbreviated terms.....	10
4 Signals	11
4.1 Audio-visual signals used for the determination of power consumption	11
4.1.1 Overview	11
4.1.2 Static video signals.....	11
4.1.3 Dynamic broadcast-content video signal.....	12
4.1.4 Internet-content video signal.....	13
4.1.5 Audio signal associated with video signals.....	13
4.2 Video signals used for the determination of the peak luminance ratio.....	14
4.2.1 General	14
4.2.2 Video signals	14
4.3 Audio signals used for determination of audio power consumption	15
4.3.1 Audio signals.....	15
4.3.2 Signal levels	15
5 Media	16
5.1 Online repository	16
5.2 Compatibility of test signals with previous packaged media.....	16
6 Signal provision.....	16
6.1 General.....	16
6.2 Signal provision equipment.....	17
6.2.1 USB stick media inserted in a USB port of the UUT	17
6.2.2 External audio-visual equipment.....	17
6.2.3 Service provider network equipment	18
6.2.4 Audio signal generator.....	18
6.3 Interfaces.....	18
6.3.1 USB.....	18
6.3.2 HDMI®	18
6.3.3 DisplayPort.....	18
6.3.4 Component analogue video	18
6.3.5 S-Video	19
6.3.6 Composite analogue video.....	19
6.3.7 Analogue terrestrial interface.....	19
6.3.8 Cable television interface	19
6.3.9 Digital terrestrial interface.....	19
6.3.10 Satellite interface.....	19
6.3.11 Network interfaces	19
6.3.12 Other interfaces	20
6.4 Accuracy of video signal levels	20
Annex A (normative) Video signals used for the determination of power consumption.....	21
A.1 Source of test media (video signals)	21

A.2	Test media (video signals) available for download from the IEC 62087-2 online repository	21
Annex B (informative) Description of video signals used for the determination of power consumption		28
B.1	General.....	28
B.2	Static video signals	28
B.3	Dynamic broadcast-content video signals (SDR)	28
B.4	Internet-content video signals	29
B.5	Dynamic broadcast-content data (SDR)	30
B.6	Internet-content data.....	32
B.7	Dynamic broadcast-content video signals (HDR).....	33
Annex C (informative) Description of video signals used for the determination of the peak luminance ratio.....		34
C.1	General.....	34
C.2	Three-bar video signal	34
C.3	Dynamic box and outline video signal	34
Bibliography.....		35
Figure 1 – Occurrence of linear and non-linear signal encodings in context of a typical display processing pipeline for computing APL and APL'.....		9
Figure 2 – Dynamic box and outline video signal (L20PeakLumMotion).....		14
Figure B.1 – SDR Dynamic broadcast-content video signal APL'.....		29
Figure B.2 – Internet-content video signal APL'.....		30
Table 1 – Static video signals overview.....		12
Table 2 – Dynamic broadcast-content video signals overview		13
Table 3 – Dynamic box and outline video signal naming		14
Table A.1 – 50p (50Hz) SDR SD video signals used for the determination of power consumption		22
Table A.2 – 50p (50Hz) SDR HD and UHD video signals used for the determination of power consumption		23
Table A.3 – 50p (50Hz) HDR HD and UHD video signals used for the determination of power consumption		24
Table A.4 – 59,94p (60Hz) SDR SD video signals used for the determination of power consumption		25
Table A.5 – 59,94p (60Hz) SDR HD and UHD video signals used for the determination of power consumption		26
Table A.6 – 59,94p (60Hz) HDR HD and UHD video signals used for the determination of power consumption		27
Table B.1 – SDR Dynamic broadcast-content data		30
Table B.2 – Internet-content data.....		33

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**AUDIO, VIDEO, AND RELATED EQUIPMENT –
DETERMINATION OF POWER CONSUMPTION –****Part 2: Signals and media**

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.

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.

This second edition cancels and replaces the first edition published in 2015. This edition constitutes a technical revision.

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

- a) HDR and UHD video test signals have been added;
- b) dynamic box and outline test signals have been added, replacing the static box and outline test signals;
- c) all test signals are provided as media files for download from a specified IEC online repository, which replaces previous DVD and Blu-ray media.

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

Draft	Report on voting
100/3771/CDV	100/3848/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.

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.

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.

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.

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

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.

IEC 62087:2008¹ (second edition) added methods for measuring On (average) mode power consumption of television sets, based on three video signal sets. These include static signals, dynamic broadcast content signals, and Internet content signals.

IEC 62087:2011² (third edition) revised methods for measuring power consumption of set-top boxes. The signals and media were not changed in this third edition.

IEC 62087-2:2015³ (first edition) separates 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) are not changed. This edition adds signals for the purpose of determining the peak luminance ratio that is sometimes associated with television set power consumption measurement programs.

This second edition of IEC 62087-2 adds HDR and UHD video test signals and dynamic box and outline test signals for TV power consumption testing. All test signals are available from a specified IEC online repository for download, replacing the former physical media distribution.

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

¹ IEC 62087:2008, *Methods of measurement for the power consumption of audio, video and related equipment*

² IEC 62087:2011, *Methods of measurement for the power consumption of audio, video and related equipment*

³ IEC 62087-2:2015, *Audio, video, and related equipment – Determination of power consumption, Part 2: Signals and media*

AUDIO, VIDEO, AND RELATED EQUIPMENT – DETERMINATION OF POWER CONSUMPTION –

Part 2: Signals and media

1 Scope

This part of IEC 62087 specifies the signals used to determine the power consumption of audio, video, and related equipment, such as television sets and computer monitors. It also specifies signals for determining the peak luminance ratio that is sometimes associated with television set power consumption measurement programs. 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*