



SLOVENSKI STANDARD
SIST EN 61920:1999

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SIST ENV 50185-1:1999

SIST ENV 50185-2:1999

SIST ENV 50185-3:1999

Infrared transmission systems - Free air applications (IEC 61920:1998)

Infrared transmission systems - Free air applications

Infrarot-Übertragungssysteme - Nicht-leitungsgebundene Anwendungen
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Systèmes de transmission infrarouge - Applications en mode non guidé

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ICS:

31.260

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EUROPEAN STANDARD
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EUROPÄISCHE NORM

EN 61920

April 1998

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Supersedes ENV 50185-1:1995, ENV 50185-2:1996 and ENV 50185-3:1995

Descriptors: Sound transmission, electroacoustic equipment, video equipment, infrared radiation, definitions, classifications, parasitic signals, electromagnetic compatibility, characteristics, measurements, wavelengths, frequencies, marking

English version

**Infrared transmission systems
Free air applications
(IEC 61920:1998)**

Systèmes de transmission infrarouge
Applications en mode non guidé
(CEI 61920:1998)

Infrarot-Übertragungssysteme
Nicht-leitungsgebundene Anwendungen
(IEC 61920:1998)

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This European Standard was approved by CENELEC on 1998-04-01. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 100C/198/FDIS, future edition 1 of IEC 61920, prepared by SC 100C, Audio, video and multimedia subsystems and equipment, of IEC TC 100, Audio, video and multimedia systems and equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61920 on 1998-04-01.

This European Standard supersedes ENV 50185-1:1995, ENV 50185-2:1996 and ENV 50185-3:1995.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1999-01-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2001-01-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annex ZA is normative and annexes A, B, C and D are informative.

Annex ZA has been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 61920:1998 was approved by CENELEC as a European Standard without any modification.

Annex ZA (normative)

**Normative references to international publications
with their corresponding European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE: When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050(60) ¹⁾	1970	International Electrotechnical Vocabulary (IEV) Chapter 60: Radiocommunications	-	-
IEC 60050(845)	1987	International Electrotechnical Vocabulary (IEV) Chapter 845: Lighting	-	-
IEC 60747-5	1992	Semiconductor devices Discrete devices and integrated circuits Part 5: Optoelectronic devices	-	-
ISO/IEC 7498-1	1994	Information technology Open system interconnection Basic reference model	-	-

1) Partially replaced by IEC 60050(725).

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Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

INFRARED TRANSMISSION SYSTEMS – FREE AIR APPLICATIONS

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international cooperation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61920 has been prepared by subcommittee 100C: Audio, video and multimedia subsystems and equipment, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

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

FDIS	Report on voting
100C/198/FDIS	100C/219/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.

Annexes A, B, C and D are for information only.

INFRARED TRANSMISSION SYSTEMS – FREE AIR APPLICATIONS

1 Scope and object

This International Standard describes the classification of IR devices into groups and classes in order to identify and clarify problems caused by mutual interference. Mutual interference is caused by the increasing parallel application of different infrared (IR) systems.

Due to its physical characteristics, the possibility of local limitation is a special feature of IR radiation.

In this standard, the wavelength range from 700 nm to 1 600 nm is considered. All systems based on free air application which intentionally or unintentionally use IR radiation in this range, are included. Products which unintentionally emit IR radiation, such as illumination equipment are not deemed to be IR application systems. They are, however, integrated into this standard in order to enable facility planners to take into consideration and to foresee provisions against disturbance of IR application systems by such unintentionally emitted radiation.

The object of this standard is to prevent or at least to minimize mutual interference and to allow the coexistence of different IR products. It is intended to identify each IR product by its characteristics, according to the classification criteria.

It is not the object of this standard to describe the consequences of interference between IR systems or safety aspects of optical radiation.

All applications of fibre-optic technology are excluded.

In this context "free air" means freely radiated IR in indoor or outdoor applications.

If the IR systems are used for information transmission, this standard is only relevant in connection with the physical layer of the open systems interconnection (OSI) reference model (ISO 7498-1).

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of the IEC and ISO maintain registers of currently valid International Standards.

IEC 60050(60):1970, *International Electrotechnical Vocabulary (IEV): Radiocommunications*¹⁾

¹⁾ Partially replaced by IEC 60050(725).

IEC 60050(845):1987, *International Electrotechnical Vocabulary (IEV) – Chapter 845: Lighting*

IEC 60747-5:1992, *Semiconductor devices – Discrete devices and integrated circuits – Part 5: Optoelectronic devices*

ISO 7498-1:1994, *Information technology – Open system interconnection – Basic reference model*

3 Definitions

For the purpose of this International Standard the following definitions apply:

3.1

bandwidth of a receiver, amplifier or network

the extent of a continuous range of electrical frequencies or optical wavelengths over which the response does not differ from its nominal value by more than a specified amount
[IEV 60-12-025 extended]

3.2

fluorescent lamp

a discharge lamp of the low pressure mercury type in which most of the light is emitted by one or several layers of phosphor excited by the ultraviolet radiation from the discharge
[IEV 845-07-26]

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3.3

harmonic

integral multiple of a basic frequency [SIST EN 61920:1999](#)

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3.4

interference

disturbance experienced in the reception of a wanted signal, caused by an unwanted signal or noise

3.5

infrared radiation

optical radiation for which the wavelengths are longer than those for visible radiation
[IEV 845-01-04]

NOTE – For infrared radiation, the range between 780 nm and 1 mm is commonly subdivided into:

IR-A 780 nm to 1 400 nm

IR-B 1,4 μm to 3 μm

IR-C 3 μm to 1 mm

3.6

infrared system

system which uses IR radiation in free air application consisting of IR emitters and IR receivers

3.7

modulation frequency

electrical signal frequency which modulates the IR radiation

3.8

peak intensity

maximum intensity I_p (mW/sr) of the optical radiation in the direction of maximum emission around the rated wavelength λ_p

3.9**radiant intensity**

quotient of the radiant flux $d\Phi_e$ leaving the source and propagated in the element of solid angle $d\Omega$ containing the given direction, by the element of solid angle [IEV 845-01-30]

3.10**radiation characteristic**

defined by two angles α_1 and α_2 for describing the focusing of IR emission. References are the points of half optical radiant intensity. α_1 is the angle of maximum divergence, α_2 is the angle perpendicular to the plane expanded by α_1 , where $\alpha_1 \geq \alpha_2$.

3.11**steradian**

SI unit of solid angle: solid angle that, having its vertex at the centre of a sphere, cuts off an area of the surface of the sphere equal to that of a square with sides of length equal to the radius of the sphere [IEV 845-01-20] (ISO 31/1-2.1,1978)

3.12**subharmonic**

integral divisor of a basic frequency

3.13**wavelength**

distance in the direction of propagation of a periodic wave between two successive points at which the phase is the same [IEV 845-01-14]

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4 Symbols

B_f	bandwidth of the modulated radiant intensity (kHz)
B_λ	bandwidth of the optical radiant intensity (nm)
f	modulation frequency (kHz)
f_p	frequency at the modulated peak intensity I_{pf} (kHz)
f_l	lower band limiting frequency (kHz)
f_u	upper band limiting frequency (kHz)
I_o	time averaged total optical radiant intensity (mW/sr)
I_p	total optical peak intensity (mW/sr)
$I_{p\lambda}$	spectral optical peak intensity (mW/(sr nm))
$I_{e\lambda}$	spectral optical radiant intensity (mW/(sr nm))
I_{ef}	spectral modulated radiant intensity (mW/(sr Hz))
I_{pf}	spectral modulated peak intensity (mW/(sr Hz))
sr	steradian
λ	wavelength (nm)
λ_p	wavelength at the optical peak intensity $I_{p\lambda}$ (nm)
λ_l	lower band limiting wavelength (nm)
λ_u	upper band limiting wavelength (nm)