

# INTERNATIONAL STANDARD

**IEC**  
**61603-6**

First edition  
2001-10

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**Transmission of audio and/or video and  
related signals using infra-red radiation –**

**Part 6:  
Video and audio-visual signals**

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[IEC 61603-6:2001](https://standards.iteh.ai/catalog/standards/sist/6ba55ec5-aabc-4594-976e-75d0bbbce95d/iec-61603-6-2001)

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## Publication numbering

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

TRANSMISSION OF AUDIO AND/OR VIDEO AND RELATED SIGNALS  
USING INFRA-RED RADIATION –

## Part 6: Video and audio-visual signals

## 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 co-operation 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.
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International Standard IEC 61603-6 has been prepared by Technical area 3: Infrared systems, 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
100/295/FDIS	100/421/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 3.

The committee has decided that the contents of this publication will remain unchanged until 2003. At this date, the publication will be

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- withdrawn;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

# TRANSMISSION OF AUDIO AND/OR VIDEO AND RELATED SIGNALS USING INFRA-RED RADIATION –

## Part 6: Video and audio-visual signals

### 1 Scope

IEC 61603-1 specifies general requirements and methods of measurement for equipment using infrared radiation as a carrier of information.

This part of IEC 61603 specifies requirements and methods of measurement for analogue video transmission systems which are not covered by IEC 61603-1, nor by other standards. It allows systems which make different economic use of the available bandwidth to be described in order for conclusions regarding interference and compatibility to be drawn.

NOTE For details of audio transmission systems, see IEC 61603-2.

### 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61603. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 61603 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

[https://standards.iteh.ai/catalog/standards/sist/6ba55ec5-aabc-4594-976e-](https://standards.iteh.ai/catalog/standards/sist/6ba55ec5-aabc-4594-976e-75d0b1b7e95d/iec-61603-6-2001)

IEC 61603-1, *Transmission of audio and/or video and related signals using infra-red radiation – Part 1: General*

IEC 61603-2, *Transmission of audio and/or video and related signals using infra-red radiation – Part 2: Transmission systems for audio wide band and related signals*

IEC 61938, *Audio, video and audiovisual systems – Interconnections and matching values – Preferred matching values of analogue signals*

### 3 Definitions

For the purposes of this part of IEC 61603, the definitions given in Part 1 apply.

### 4 Abbreviations

IR	infrared (see IEC 61603-1)
IREDD	infrared emitting diode (see IEC 61603-1)
PD	photo diode
O/E	optical/electrical
Tx	transmitter/radiator
Rx	receiver
ND filter	neutral density filter

## 5 Explanation of terms

### 5.1 Combined transmitter and radiator

A combined transmitter and radiator (illustrated as element A-B in figure 1) does not have an electrical output.

### 5.2 Receiver

As well as the general characteristics given in IEC 61603-1, other characteristics may need to be specified if a receiver (illustrated as element B-C in figure 1) is combined with other functions, such as a television set.

### 5.3 Ancillary equipment

Ancillary equipment, such as power supplies or battery chargers, may be required for the operation of a system. The manufacturer shall specify all the necessary data for correct operation and maintenance.

### 5.4 Transmission of video signals

The transmission format of composite video signals and Y/C video signals are specified in this part of IEC 61603.

### 5.5 Safety aspects iTeh STANDARD PREVIEW

Safety aspects are considered in IEC 61603-1 (standards.iteh.ai)

## 6 System considerations IEC 61603-6:2001

<https://standards.iteh.ai/catalog/standards/sist/6ba55ec5-aabc-4594-976e-75d0bbbce95d/iec-61603-6-2001>

### 6.1 Area of application

This part of IEC 61603 describes a single-channel infrared video transmission system in one direction, mainly used for viewing a video programme from a VCR, video camera, or video disc player.

NOTE 1 In consumer applications, video signals may be available in composite video signals or in Y/C component video signals.

NOTE 2 A channel for video signals is defined in IEC 61603-1.

NOTE 3 Audio signal transmission systems are specified in IEC 61603-2.

NOTE 4 Transmission systems for high-speed data and remote control are under consideration.

### 6.2 Environmental conditions for operation

The environmental conditions for the equipment are mainly defined in relevant standards for individual units. Unless otherwise specified, the equipment shall at least be capable of operating within the following temperature and relative humidity ranges:

5 °C to 40 °C, and 25 % RH to 75 % RH

Systems and apparatus in accordance with this part of IEC 61603 are primarily used indoors, with the advantage of operating more than one interference-free system in adjacent rooms.

### 6.3 Partition of functions between elements of the systems

Due to the different applications for different room sizes, equipment is designed in various combinations of functional blocks. It is desirable to have only a few blocks of small size and low installation cost for home application.

## 7 General conditions for measurements

### 7.1 Test conditions

Temperature: 15 °C to 35 °C

Humidity: 45 % RH to 75 % RH

Brightness: 500 lx to 1 000 lx (on the surface of the receiver)

Normal (i.e. not operating at high frequency) fluorescent lamps shall be used.

### 7.2 Location

A sufficiently large room should be used for the test, so that the reflection of infrared radiation from the walls, floor and ceiling is negligible.

NOTE The location illustrated in figure 2 may be used if a correction due to reflection is made.

An absorbing optical filter (neutral density or ND filter) is applied to the transmitter or the receiver. The following precautions are essential:

- a) take into account the correlation between the absorption of the filter and the transmitting distance;
- b) when measuring directivity, adjust the filter to the direction of the transmitter;
- c) maintain the brightness at the receiver within the 500 lx to 1 000 lx range.

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## 8 Characteristics to be specified and their methods of measurement

IEC 61603-6:2001

### 8.1 Transmitting distance and directivity

#### 8.1.1 Transmitting distance

Calculate the transmitting distance (as illustrated in figure 3) using the following equation:

$$d_0 = \sqrt{\frac{I}{E}}$$

where

$d_0$  is the transmitting distance (in m);

$I$  is the specified radiant intensity (in mW/sr), and

$E$  is the irradiance value (in mW/m<sup>2</sup>).

The transmitting distance  $d$  (in m) at the angle of maximum divergence at half the optical radiant intensity (such as  $H_1$ ,  $H_2$ ,  $V_1$ , and  $V_2$  illustrated in figure 4) may be calculated as follows:

$$d = \sqrt{\frac{I}{2E}} = d_0 \times \frac{1}{\sqrt{2}}$$

#### 8.1.2 Characteristic of the transmitter to be specified

The radiant intensity  $I$  (in mW/sr) in the optical axis (see figure 5).

Measurement methods shall be in accordance with IEC 61603-1.



### 8.1.3 Characteristics of the receiver to be specified

The minimum required irradiance  $E$  (in  $\text{mW/m}^2$ ) for an unweighted signal-to-noise (S/N) ratio of 40 dB under the following conditions (see figure 6):

Directivity:	optical axis ( $0^\circ$ )
Signal:	50 % white
Frequency deviation:	2 MHz (sync tip: 11,5 MHz, peak white: 13,5 MHz)
Bandwidth:	NTSC: 100 kHz to 4,2 MHz
	PAL: 100 kHz to 5,0 MHz

### 8.1.4 Maximum transmitting distance

Calculate the maximum transmitting distance from the specified radiant intensity  $I$  (see 8.1.2) and the irradiance value  $E$  (see 8.1.3), using the equation specified in 8.1.1.

NOTE In another method, the maximum transmitting distance for an unweighted S/N ratio of 40 dB under the conditions of 8.1.3 can be measured by aligning the optical axes of the transmitter and receiver, without measurement of the radiant intensity of the transmitter and the irradiance at the receiver.

### 8.1.5 Directivity

#### 8.1.5.1 Directivity characteristics of the transmitter to be specified

Use an optical power meter to measure radiant intensity on the optical axis "AB" (as illustrated in figure 7). Measure the radiant intensity at the vertical and horizontal angles  $\theta_{H1}$  and  $\theta_{V1}$  in accordance with 8.1.2. Then find the directivity of the transmitter by measuring the radiant intensity  $I$  (in  $\text{mW/sr}$ ) at various angles  $\theta_{H1}$  and  $\theta_{V1}$  at the transmitter (see figure 8).

Calculate the directivity characteristics of the transmitting distance from the above directivity characteristics and the irradiance  $E$  of receiver (8.1.3) using the equation specified in 8.1.1.

#### 8.1.5.2 Directivity characteristics of the receiver to be specified

Use a transmitter giving a higher S/N ratio and the receiver to be measured on the optical axis ( $0$  degree) as below.

Measure the minimum required irradiance  $E$  (in  $\text{mW/m}^2$ ) for an unweighted S/N ratio of 40 dB under the conditions specified in 8.1.3, by changing the distance between the reference transmitter and the receiver. Find the minimum required irradiance  $E$  ( $\text{mW/m}^2$ ) in the direction "AB" by measuring the irradiance at vertical and horizontal angles  $\theta_{H2}$  and  $\theta_{V2}$  at the receiver (see figure 9). Find the following characteristics of the receiver directivity by measuring the minimum required irradiance  $E$  at various angles  $\theta_{H2}$  and  $\theta_{V2}$  (see figure 10).

Calculate the directivity characteristic of the transmitting distance from the above directivity characteristics and the radiant intensity  $I$  (in  $\text{mW/sr}$ ) of the transmitter (8.1.2) using the equation specified in 8.1.1.

If a transmitter and receiver are specified, the directivity characteristic of the transmitting distance can be calculated by an equivalent method.

## 8.2 Spurious emission

The measuring method is as follows:

- Sub-carrier without video signals;
- Measuring band range: 0 MHz to 100 MHz;
- Measuring system: as specified in figure 11.