



SLOVENSKI STANDARD

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Alarmni sistemi - Nadzorni sistemi CCTV za uporabo v aplikacijah varovanja - 5. del: Video prenos

Alarm systems - CCTV surveillance systems for use in security applications - Part 5:
Video transmission

Alarmanlagen - CCTV Überwachungsanlagen für Sicherungsanwendungen - Teil 5:
Videoübertragung

Systèmes d'alarme - Systèmes de surveillance CCTV à usage dans les applications de
sécurité - Partie 5: Transmission video

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EUROPEAN STANDARD

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**Alarm systems -
CCTV surveillance systems for use in security applications
Part 5: Video transmission**

Systèmes d'alarme -
Systèmes de surveillance CCTV à usage
dans les applications de sécurité
Partie 5: Transmission video

Alarmanlagen -
CCTV Überwachungsanlagen für
Sicherungsanwendungen
Teil 5: Videoübertragung

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This European Standard was approved by CENELEC on 1999-10-01. 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

This European Standard was prepared by the Technical Committee CENELEC TC 79, Alarm systems.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50132-5 on 1999-10-01.

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) 2002-02-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2002-10-01

Annexes designated "normative" are part of the body of the standard. In this standard, annexes A and B are normative.

EN 50132 will consist of the following parts, under the general title "Alarm systems – CCTV surveillance systems for use in security applications":

- Part 1 System requirements ;
- Part 2-1 Black and white cameras ;
- Part 2-2 Colour cameras ;
- Part 2-3 Lenses ;
- Part 2-4 Ancillary equipment ;
- Part 3 Local and main control unit ;
- Part 4-1 Black and white monitors ;
- Part 4-2 Colour monitors ;
- Part 4-3 Recording equipment ;
- Part 4-4 Hard copy equipment ;
- Part 4-5 Video motion detection equipment ;
- Part 5 Video transmission ;
- Part 6 (free) ;
- Part 7 Application guidelines.

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Introduction

The purpose of the transmission system in a closed circuit television (CCTV) installation is to provide reliable transmission of video signals between the various CCTV equipment in security, safety and monitoring applications.

The complexity of a video transmission system varies in accordance with the requirements of the installation.

Examples of the different types of video transmission systems covered by this standard are as follows:

- a) Using cable transmission media :
 - Coaxial cable,
 - Twisted pair cable,
 - Fibre optic cable.
- b) Using wireless transmission methods :
 - Microwave,
 - Infra red,
 - Radio transmission.

NOTE Multiple video signals may be combined in one physical transmission path using multiplexing techniques.

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1 Scope

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This standard specifies the minimum requirements for the specification and testing of the performance of a video transmission channel involving transmitter, receiver or intermediate devices associated with the selected transmission media, for use in CCTV surveillance systems.

Video transmission equipment may be combined with additional functions, e.g. for audio or data transmission. These functions are not included in this standard.

This standard covers the transmission of colour and black and white video signals in accordance with CCIR Report 624-4, 625 lines, 50 fields per second.

This standard is not applicable for transmission systems which use in the whole system or in parts thereof compressed video signals in any way.

NOTE Compression techniques use methods to match the information content of signals to the best channel capacity. The various test signals of this standard applied on different methods to compress video signals can supply results which meet the requirements of this standard. However, it should not be concluded from such results that those parts of transmission systems using methods to compress video signals are able to transmit a real video signal with a high information content in the correct way.

Methods to compress video signals can use techniques reducing video signals without any loss of information (so called "redundant reduction") or with some loss of information (so called "irrelevance reduction").

2 Normative references

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.

CCIR report 624-4	1990	Characteristics of television systems
CCIR recommendation 567-3 use	1990	Transmission performance of television circuits designed for use in international connections
EN 50081-1	1992	Electromagnetic compatibility – Generic emission standard – Part 1: Residential, commercial and light industry
EN 50130-4 + A1	1995 1998	Alarm systems - Part 4: Electromagnetic compatibility - Product family standard: Immunity for components of fire, intruder and social alarm systems
EN 50130-5	1998	Alarm systems - Part 5: Environmental test methods
EN 60065	1998	Audio, video and similar electronic apparatus - Safety requirements (IEC 60065:1998, mod.)
EN 60068-1	1994	Environmental testing - Part 1: General and guidance (IEC 60068-1:1988 + corr. Oct.1988 + A1:1992)
EN 60950	2000	Safety of information technology equipment (IEC 60950:1999 + corr. 2000, mod.)

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this standard the following definitions apply:

3.1.1

physical transmission path

combination of the transmission medium and necessary amplifiers and other equipment to form a transmission path with one or more transmission channels

3.1.2

transmission channel

combination of the transmission medium and necessary amplifiers and other equipment to form a connection between video equipment in a CCTV system.

3.1.3

transmission system

combination of equipment and media that provide the transmission of video signals between the various CCTV equipment.

3.2 Abbreviations

3.2.1 APL: Average picture level

3.2.2 CCIR: Comité Consultatif International des Radiocommunications (International Radio Consultative Committee).

3.2.3 CCTV: Closed Circuit Television

3.2.4 PAL: Phase Alternate Line

4 Requirements

4.1 General

The properties of the transmission system shall be provided in a specification sheet covering the items in this clause.

The specifications stated by the manufacturer shall be those determined under the standard operating conditions, indicating the type and requirements for the transmission media and such additional information that enable the system designer to achieve the requirements of this standard.

The common requirements of a video transmission system are given in 4.2 to 4.7. The additional requirements for the transmission of PAL colour video signals are given in 4.8 to 4.11.

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The minimum requirements and specification items are given in 4.2 to 4.15.

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4.2 Video input and output standards.iteh.ai/catalog/standards/sist/8322903d-4d0a-48f1-a03e-99c1d9b61c79/sist-en-50132-5-2001

4.2.1 Source and load impedance

The source and load impedance of a transmission system shall be 75Ω on the unbalanced coaxial input and output. The impedance tolerance is specified in 4.2.2.

4.2.2 Return loss

The return loss in the inputs and outputs shall be ≥ 20 dB from 0,1 MHz to 5 MHz.

4.2.3 Input and output signal levels

The nominal input and output signal levels shall be $1 V_{pp}$ in accordance with CCIR rep. 624-4 for 625 lines, 50 fields per second and, in case of colour, PAL colour coding. The transmission equipment shall be capable of operating within specification for a video component in the composite input and output signals of up to $1,0 V_{pp}$. The signal level of the synchronization components in the composite video signal shall be $(0,3 \pm 0,05) V_{pp}$. For colour signals, the amplitude of the burst component in the composite video signal shall be $(0,3 \pm 0,05) V_{pp}$.

4.2.4 Input signal frequency

The equipment shall be capable of operating at an input signal with a horizontal frequency (f_h) of $15\,625 \text{ Hz} \pm 1 \%$ and a vertical frequency of $^2/_{625} \times f_h$ and a subcarrier frequency of $4,43 \text{ MHz} \pm 50 \text{ ppm}$.

4.2.5 Input and Output DC voltage

The equipment shall be capable of operating correctly when presented with a video input signal having a DC component of (0 ± 2) V.

The DC voltage in the terminated output signal shall not exceed (0 ± 2) V.

4.3 Insertion gain

The insertion gain of the transmission system shall be (0 ± 1) dB on the nominal $1 V_{pp}$ input signal.

4.4 Bandwidth and frequency response

4.4.1 General

The bandwidth and frequency response requirements of the video transmission system are determined by the linear distortion requirements given in 4.4.2 to 4.4.5.

4.4.2 Line time waveform distortion

The waveform distortion on a line time square wave signal shall be ≤ 5 %.

4.4.3 Field time waveform distortion

The waveform distortion on a 50 Hz square wave shall be ≤ 5 %.

4.4.4 Damped low frequency distortion

The peak overshoot of the video signal measured at blanking level shall not exceed 0,25 V.

The peak overshoot shall settle to $\leq 0,02$ V within 5 s.

During the test the video and synchronization signals shall not be clipped or compressed by more than 20 % of their original value.

4.4.5 Short time waveform distortion

The 2T Pulse to bar ($K_{P/B}$) ratio shall be ≤ 5 %.

The 2T K factor (K_{2T}) shall be ≤ 5 %.

4.5 Signal to noise ratio

The signal to noise ratio of the transmission channel, which includes the accumulated noise in cascaded amplifiers and cable loss correction, shall be ≥ 46 dB.

4.6 Interference

Interference from e.g. data channels, other video channels, audio channels, shall not cause visible disturbance to the picture.

4.7 Luminance non-linearity

The luminance non-linearity shall be ≤ 10 %.

4.8 Chrominance to luminance gain inequality

The gain error shall be ≤ 20 %.

4.9 Chrominance to luminance delay inequality

The delay error shall be ≤ 100 ns.

4.10 Differential gain

The differential gain error shall be ≤ 10 %.

4.11 Differential phase

The differential phase error shall be $\leq 10^\circ$.

4.12 Environmental conditions

The apparatus shall withstand the environmental influences of the specified service environment.

The service environment is defined by selection of one of the following four classes:

Class I: Indoor but restricted to residential/office environment

Class II: Indoor in general

Class III: Outdoor but sheltered from direct rain and direct sunshine, or indoor with extreme environmental conditions

Class IV: Outdoor in general.

As a minimum, the equipment shall withstand exposure to the environmental influences of the tests given in clause 7 for the specified service environment.

4.13 Electro-magnetic radiation

The electro-magnetic radiation of the transmission equipment shall conform to the relevant standards of the application, as a minimum it shall conform to EN 50081-1.

4.14 Immunity to electro-magnetic interference

The immunity to electro-magnetic interference of the video transmission equipment shall conform to EN 50130-4.

4.15 Electrical safety

The electrical safety of the video transmission equipment shall conform to the relevant standards of the application, as a minimum it shall conform to EN 60065 or EN 60950.

5 Test conditions

5.1 Introduction

The test requirements described in this clause have been devised to measure the performance of CCTV transmission systems in a manner corresponding to their normal operation. The tests cover the most important transmission properties and enable comparisons between measurements taken at different laboratories.

To guarantee sufficient accuracy and reproducibility in the measurements, the test shall be conducted in certain specified conditions.

5.2 Test equipment

Test equipment shall be calibrated to tolerances in relation with the required accuracy of the respective measurements.

5.2.1 The test equipment normally required are :

- a) A video wave form monitor or oscilloscope, preferably with facilities for triggering of the sweep from field or line pulses of the CVS signal.
- b) Monochrome or colour video monitor.
- c) Video noise meter, capable of CCIR weighted noise measurements in accordance with CCIR rec. 567-3.
- d) Video signal generator providing appropriate test signals.
- e) A video vectorscope.

NOTE Video analysis equipment combining some of the above mentioned functions may be used.

5.2.2 Test signals

List of signals (also refer to CCIR Rec 567-3, annex 1, part C).

Signal A: half frame white and black bar signal (see Figure A.1).

Signal B: pulse and bar signal (see Figure A.2).

Signal C: frequency burst (see Figure A.3).

Signal D1 and D2: grey scale signal (see Figures A.4 and A.5).

Signal F: 20T pulse (see Figure A.6).

5.2.3 Equipment set-up

The transmission equipment shall be connected and adjusted in accordance with the manufacturer's recommendations, for the recommended cables and up to their maximum specified length. Unless otherwise specified in the tests, the system shall operate at nominal input and output levels and terminated in a standard load impedance of $75 \Omega \pm 5 \%$.

5.3 Laboratory conditions

Unless otherwise specified, the atmospheric conditions in the laboratory shall be the standard atmospheric conditions for measurements and tests, specified in EN 60068-1, 5.3.1, as follows:

Temperature : 15 °C to 35 °C

Relative humidity : 25 % to 75 %

Air pressure : 86 kPa to 106 kPa

6 Performance tests

6.1 Input and output signal levels

6.1.1 Principle

To verify the minimum and maximum signal amplitude at the transmission equipment input and output terminals.