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Video surveillance systems for use in security applications – Part 5: Data specifications and image quality performance for camera devices

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Systèmes de vidéosurveillance destinés à être utilisés dans les applications de sécurité – Partie 5: Spécifications des données et performances de la qualité d'image pour les dispositifs de caméra

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VIDEO SURVEILLANCE SYSTEMS FOR USE IN SECURITY APPLICATIONS –

Part 5: Data specifications and image quality performance for camera devices

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International Standard IEC 62676-5 has been prepared by IEC technical committee 79: Alarm and electronic security systems.

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

FDIS	Report on voting
79/607/FDIS	79/609/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62676 series, published under the general title *Video surveillance systems for use in security applications*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

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INTRODUCTION

IEC Technical Committee 79 in charge of alarm and electronic security systems together with many governmental organizations, test houses and equipment manufacturers has defined a common framework for video surveillance transmission in order to achieve interoperability between products.

The IEC 62676 series of standards on video surveillance systems is divided into five independent parts:

Part 1: System requirements

Part 2: Video transmission protocols

Part 3: Analog and digital video interfaces

Part 4: Application guidelines

Part 5: Data specifications and image quality performance for camera devices

Each part offers its own clauses for the scope, normative references, definitions and requirements.

The purpose of this part of IEC 62676 is to specify representation and measuring methods of performance values to be described in materials such as instruction manuals, brochures and specifications of video surveillance camera equipment, and provide convenience for users, installers, integrators and maintenance companies, etc.

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VIDEO SURVEILLANCE SYSTEMS FOR USE IN SECURITY APPLICATIONS –

Part 5: Data specifications and image quality performance for camera devices

1 Scope

This part of IEC 62676 defines recommendations and requirements for representation and measuring methods of performance values to be described in materials such as instruction manuals, brochures and specifications of video surveillance camera equipment.

This document consists of two parts. The first part is requirements for description of video surveillance camera specification items. The second part is requirements for measurement methods of video surveillance camera specification items.

A video surveillance camera's output can be analogue (e.g. composite video such as NTSC or PAL) or digital (e.g. compressed network output, uncompressed SDI (serial digital output), etc.).

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2 Normative references

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IEC 60825-1, *Safety of laser products – Part 1: Equipment classification and requirements*

IEC 61146-1, *Video cameras (PAL/SECAM/NTSC) – Methods of measurement – Part 1: Non-broadcast single-sensor cameras*

IEC 62471, *Photobiological safety of lamps and lamp systems*

IEC 62676-1-2:2013, *Video surveillance systems for use in security applications – Part 1-2: System requirements – Performance requirements for video transmission*

IEC 62676-3, *Video surveillance systems for use in security applications – Part 3: Analog and digital video interfaces*

ISO 14524, *Photography – Electronic still picture cameras – Methods for measuring opto-electronic conversion functions (OECFs)*

ITU-R Recommendation BT.601, *Studio encoding parameters of digital television for standard 4:3 and wide-screen 16:9 aspect ratios*

ITU-R Recommendation BT.709, *Parameter values for the HDTV standards for production and international programme exchange*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

3.1.1
4k
image size format with approximately 4 000 horizontal pixels defined as SMPTE 2036 (3 840 × 2 160 UHDTV)

3.1.2
aperture
opening of lens diaphragm through which light passes

3.1.3
bit rate
amount of digital signal in a second

3.1.4
C/CS mount
lens physical mounting standards (C mount and CS mount) typically used for video surveillance cameras

Note 1 to entry: C mount is an older standard defined as one inch (25,4 mm) in diameter with 32 threads per inch and the flange back distance where an image is projected on a sensor is 17,526 mm.

Note 2 to entry: CS mount is a newer standard which uses the same diameter and thread of C mount, but the flange back distance is 12,5 mm.

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3.1.5
colour temperature
measure of temperature of a heated surface which generates a radiant energy having the same spectral distribution generated from a blackbody of the same temperature

Note 1 to entry: Colour temperature is expressed in kelvins (K).

[SOURCE: IEC 60194:2015, 24.1355]

3.1.6
compression
process of reducing the size of data (image or video)

[SOURCE: IEC 62676-1-1:2013, 3.1.27, modified – In the definition, "data (image or video)" has replaced "a data (image) file".]

3.1.7
compression ratio
ratio of the uncompressed size of files, images or videos to the compressed size

Note 1 to entry: A high compression ratio means smaller image files and lower image quality and vice versa.

[SOURCE: IEC 62676-1-1:2013, 3.1.28, modified – In the definition, "files, images or videos" has replaced "files or images".]

3.1.8
contrast
<related to image> difference in visual luminance properties that makes an object (or its representation in an image) distinguishable from other objects and the background

Note 1 to entry: In visual perception of the real world, contrast is determined by the difference in the colour and brightness of the object and other objects within the same field of view.

[SOURCE: IEC 62676-1-1:2013, 3.1.33]

3.1.9
dome camera
camera mounted inside a dome, usually protecting it from outside influences

3.1.10
dynamic range
quotient of the signal from the maximum measurable indication of a quantity by the signal from the minimum measurable value of that quantity

[SOURCE: IEC 62232:2011, 3.15]

3.1.11
electronic shutter
arrangement in the camera changing its sensitivity by electronically controlling the exposure time of the image sensor

[SOURCE: IEC 62676-4:2014, 3.1.14]

3.1.12
encoding streams
series of consecutive encoded images or video from the same image source which are transmitted from one system component to another

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[SOURCE: IEC 62676-1-1:2013, 3.1.77, modified – In the definition, "encoding streams" has replaced "image streams", "encoded images or video" has replaced "images".]

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3.1.13
exposure control
electronic control of the time needed to expose image sensor pixels to light

Note 1 to entry: For "live" video stream the default exposure is typically 1/25 s or 1/30 s.

3.1.14
exposure time
length of time for which image sensor pixels are exposed to light

3.1.15
flare
light falling on an image, in an imaging system, which does not emanate from the subject point

Note 1 to entry: Flare is also sometimes referred to as veiling glare.

Note 2 to entry: See also image flare (3.1.30).

3.1.16
frame
<related to image format> full frame of video as acquired in progressive mode or as combination of two interlaced fields together

[SOURCE: IEC 62676-2-1:2013, 3.1.20, modified – The specific context "<related to image format>" is added.]

3.1.17
frame rate
number of frames per second

3.1.18
F-number
iris opening of a lens defined as a ratio between the focal length of the lens and its iris opening

Note 1 to entry: It is typically a number larger then 1 (e.g. F1.4, F2, F2.8) and indicates the amount of light coming through the lens where a lens with lower F-number transmits more light than a lens with higher numbers.

3.1.19
gain
camera function to amplify the electronic signal

3.1.20
gamma correction
correction of the linear response of a camera to compensate for the monitor screen non-linear response

Note 1 to entry: It is measured with the exponential value of the curve describing the non-linearity. A typical monochrome monitor's gamma is 2,2, and a camera needs to be set to the inverse value of 2,2 (which is 0,45) for the overall system to respond linearly (i.e. unity).

3.1.21
global shutter
image read-out method of the image sensor where the exposure timing of all visible lines is the same

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Note 1 to entry: Global shutter is a term associated with the CMOS image sensors where the image read-out is usually sequential, i.e. line by line, which produces the so-called "rolling shutter" effect. If the read-out is non-sequential, i.e. all visible lines are read out at the same time, it is called "global shutter".

(standards.iteh.ai)

3.1.22
group of pictures
GOP

IEC 62676-5:2018
https://standards.iteh.ai/catalog/standards/sist/ccfabce5-662a-40f9-86d9-3e75fe584795/iec-62676-5-2018

set of video images in an encoded video stream consisting of reference images (I-frames), predicted images (P-frames) and bi-directional images (B-frames)

3.1.23
H.264
ISO/IEC 14496-10, MPEG-4 Part 10 standard, also named Advanced Video Coding (AVC), supporting video compression (coding) from low bit-rate network streaming applications to HD video applications with near-lossless coding for network-friendly video representation

[SOURCE: IEC 62676-1-2:2013, 3.1.33, modified – In the definition, "ISO/IEC 14496-10, " is added.]

3.1.24
H.265
ISO/IEC 23008-2, MPEG-H Part 2 standard, also named High Efficiency Video Coding (HEVC), that provides about double the data compression ratio of H.264 at the same image quality

3.1.25
high definition
HD
image size format expressing sizes higher than standard definition (SD) television with aspect ratio of 16:9 defined as SMPTE ST 296 (1 280 × 720) and SMPTE ST 274 (1 920 × 1 080)

Note 1 to entry: Number of pixels in the image above HD, such as 4k, is defined in SMPTE ST 2036-1.