SLOVENSKI STANDARD
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Alarmni sistemi - Nadzorni sistemi CCTV za uporabo v aplikacijah varovanja - 7. del: Smernice za uporabo

Alarm systems - CCTV surveillance systems for use in security applications - Part 7: Application guidelines

Alarmanlagen - CCTV-Überwachungsanlagen für Sicherungsanwendungen - Teil 7: Anwendungsregeln

Systèmes d'alarme - Systèmes de surveillance CCTV à usage dans les applications de sécurité - Partie 7: Directive d'application

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Alarm systems - CCTV surveillance systems for use in security applications - Part 7: Application guidelines

Systèmes d'alarme - Systèmes de surveillance CCTV à usage dans les applications de sécurité - Partie 7: Lignes directrices

Alarmanlagen - CCTV-Überwachungsanlagen für Sicherungsanwendungen - Teil 7: Anwendungsregeln

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CENELEC

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

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Contents

Foreword

This document (EN 50132-7:2012) has been prepared by CLC/TC 79 "Alarm systems".

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2013-06-18
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2015-06-18

This document supersedes EN 50132-7:1996.

EN 50132-7:2012 includes the following significant technical changes with respect to EN 50132-7:1996:

In comparison to EN 50132-7:1996 major changes have been made to the document due to technical innovation in the field of video surveillance: the shift from analogue to digital, the general improvement of image quality, new CCTV standards and a new test target methodology. EN 50132-7:1996 needed a major review and additions.

Following subclauses of the old standard have been revised:

EN 50132-7:1996 Subclause & Title		EN 50132-7:2012 Subclauses
5.1	Purpose of the operational requirement	5.2
6.1.1	Automation of the following functions should be considered:	5.4.2
6.2	Alarm response	5.4.3
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The other chapters of EN 50132-7:1996 were completely rewritten.

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

1 Scope

This European Standard gives recommendations and requirements for the selection, planning, installation, commissioning, maintaining and testing of CCTV systems comprising of image capture device(s), interconnection(s) and image handling device(s), for use in security applications.

The objectives of this standard are to:

a) provide a framework to assist customers, installers and users in establishing their requirements,

b) assist specifiers and users in determining the appropriate equipment required for a given application,

c) provide means of evaluating objectively the performance of the CCTV system.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 50132-1:2010 *Alarm systems — CCTV surveillance systems for use in security applications — Part 1: System requirements*

EN 50132-5-1:2011 *Alarm systems — CCTV surveillance systems for use in security applications — Part 5-1: Video transmission — General video transmission performance requirements*

EN 50132-5-2:2011 *Alarm systems — CCTV surveillance systems for use in security applications — Part 5-2: IP Video Transmission Protocols*

EN 50132-5-3 *Alarm systems — CCTV surveillance systems for use in security applications — Part 5-3: Video transmission — Analogue and digital video transmission*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1
camera housing
enclosure to provide physical and/or environmental protection of the camera, lens and ancillary equipment

3.1.2
camera sensitivity
imaging device illumination necessary to produce a defined composite (colour) video signal amplitude with a CCTV system

3.1.3
CCTV surveillance installation
installation consisting of the hardware and software components of a CCTV system, fully installed and operational for monitoring a defined security zone

3.1.4
CCTV camera
unit containing an imaging device producing a video signal from an optical image

3.1.5
CCTV camera equipment
unit containing a CCTV camera plus appropriate lens and necessary ancillary equipment

3.1.6
CCTV control unit
equipment for controlling and monitoring the required operational functions of the CCTV system

3.1.7
CCTV technician
qualified person who is trained and competent in the installation, maintenance, servicing and fault-finding of CCTV systems

3.1.8
CCTV System
system consisting of camera equipment, monitoring and associated equipment for transmission and controlling purposes, which may be necessary for the surveillance of a protected area

3.1.9
corrective maintenance
emergency servicing of a system, or part thereof, carried out in response to the development of a fault

3.1.10
corrective maintenance report
document that details the requirement for normal or emergency corrective maintenance and indicates the corrective action taken, as required by this Standard or other applicable technical standard

3.1.11
customer
person or organisation utilising the design, installation and services of an approved company (including the customers agent)

3.1.12
detect
with a 1,7 m person occupying at least 10 % (PAL) of the available screen height, picture quality should be sufficient after an alert to enable an observer after an alert to search the display screens to determine with good certainty whether or not a person is present

3.1.13
electronic iris
automatic electronic shutter which varies the camera sensitivity in relation to the varying light conditions in order to maintain the video output signal within defined limits

3.1.14
electronic shutter
arrangement in the camera changing its sensitivity by electronically controlling its exposure time

3.1.15
event recording
event controlled recording or storing of image signals for a pre-determined time

3.1.16
external synchronisation
method of feeding reference timing signals to all connected devices to ensure that their video output signals are synchronous

3.1.17
focal length (f)
property of a lens, expressed in mm, giving the angle of view for a given sensor size

3.1.18
geo data
digital information assigning a certain spatial location to the earth's surface

3.1.19
identify
with a 1,7 m person occupying at least 100 % (PAL) of the screen height, picture quality and detail should be sufficient to enable identitification of an individual beyond reasonable doubt

3.1.20
inspect
with a 1,7 m person occupying at least 400 % (PAL) of the screen height, picture quality and detail should be sufficient for judicial investigations

3.1.21
imaging device
device that converts an optical image into an electrical signal

3.1.22
imaging device illumination
level of illumination (luminance) at the photosensitive surface of the imaging device

3.1.23
iris
variable aperture mechanism which regulates the amount of light passing through the lens onto the imaging device of the CCTV camera

3.1.24
kell factor
subjective number of lines of resolution that can be visually perceived in a video display system, expressed as a percentage of the total number of lines of resolution

3.1.25
lens
optical device for projecting an image of a desired scene onto the photo sensitive surface of the imaging device

3.1.26
monitor
with a 1,7 m person occupying at least 5 % (PAL) of the screen height, the level of detail should be sufficient to observe the number, direction and speed of movement of people across a wide area, providing their presence is known to him; i.e. they do not have to be searched for

3.1.27
image presentation device
device for converting video signals into pictures on a display screen

3.1.28
observe
with a 1,7 m person occupying between 25 % and 30 % (PAL) of the screen height, the level of detail should be sufficient to see characteristic details of an individual, such as distinctive clothing and allowing a view of activity surrounding an incident

3.1.29
pan and tilt unit
motorised unit permitting the vertical and horizontal positioning of the camera equipment

3.1.30
PAL (resolution)
standard-definition video mode referring in digital applications to 576 lines or 720×576 pixel

3.1.31
pan, tilt, zoom
function of a camera permitting the vertical, horizontal positioning of the camera together with the angle of view

3.1.32
picture storage
storing of video images

3.1.33
preventive maintenance
routine servicing of a system, carried out on a scheduled basis

3.1.34
preventative maintenance report
document which records the preventive maintenance carried out in accordance with this code of practice or other applicable technical standard

Note 1 to entry: The report may be an electronic document.

3.1.35
recognise
with a 1,7 m person occupying at least 50 % (PAL) of screen height viewers can say with a high degree of certainty whether or not an individual shown is the same as someone they have seen before

3.1.36
risk assessment
systematic process to determine the impact of the consequences of hazards and threats relative to their probability. The result of the analysis provides the basis for risk evaluation within a risk management process

3.1.37
risk management
culture, processes and structures that are directed towards the effective management of potential opportunities and adverse effects

3.1.38
risk management process
systematic application of management policies, procedures and practices to the tasks of establishing the context, identifying, analysing, evaluating, treating, monitoring and communicating risk

3.1.39
scene illumination
level of illumination (luminance) on the area to be kept under surveillance

3.1.40
site plan
pictorial representation of the protected area showing the location and intended views of the CCTV cameras

3.1.41
system design proposal
specification of the system design including location factors, site plan, field of view, detector range and coverage and control room design

3.1.42
time lapse recording
periodical recording of video signals at pre-defined intervals

3.1.43
zoom lens
lens with adjustable focal length and therefore an adjustable angle of view

3.2 Abbreviations

For the purposes of this document, the following abbreviations apply.

ASB Anti Social Behaviour

CCIR	Comité Consultatif International des Radiocommunication (International Radio Consultative Committee)
CCTV	Closed Circuit Television
DVR	Digital Video Recorder
EMC	Electro-magnetic Compatibility
CRT	Cathode Ray Tube
FAT	Factory Acceptance Testing
FPS	Frames per Second
Gbps	Gigabit per second
NVR	Network Video Recorder
LCD	Liquid Crystal Display
IP	Internet Protocol
IPD	Image Presentation Device
Mbps	Megabit per second
OR	Operational Requirements
PTZ	Pan Tilt Zoom
VRN	Vehicle Registration Number
UAT	User Acceptance Testing
UPS	Uninterruptible Power Supply
UTC	Coordinated Universal Time
UV	Ultra Violet
VCA	Video Content Analysis
VMS	Video Management System
VMD	Video Motion Detector
WORM	Write Once Read Many

4 General considerations

4.1 General considerations

A CCTV system is the combination of image capture devices, lighting, interconnections, image handling devices, etc. selected and installed to meet the customer's security surveillance requirements.

The recommended procedure for implementing a CCTV system is as follows:

4.2 Risk assessment

4.2.1 General

Prior to CCTV system design, and to help understand its purpose, a threat assessment and risk analysis should be performed. The threats and hazards to the premises should be identified and assessed for their likelihood and impact. These represent the risk to the premises or organization.

A risk assessment should be carried out and the CCTV system should be designed to mitigate the assessed risks. CCTV designs should be made in accordance with this standard.

NOTE ISO 31000:2009 describes the principles for the carrying out of a risk assessment.

There is no single model design for a CCTV system. The design should be based on the individual location and premises, the threats and content in these locations, and the anticipated threats or damage.

Examples of issues to be considered are included below:

a) cost of loss;

   1) what is the value e.g. financial, intellectual etc of the contents at the location?

   2) what is the effect of disruption to activities at the location?

b) location;

   1) what is the quality and extent of any existing physical security?

   2) is the location situated in a high crime risk area?

   3) are there adverse environmental conditions?

c) occupancy;

   1) is the location unoccupied for extended periods?

   2) are there security guards?

   3) do the public have access to the location?

d) theft, robbery and threat history;

   1) is there a history of thefts, robberies or threats at the location?

   2) and if so, what was the method of attack for any previous threat?

Results from this assessment are used to help to inform decisions about what type of CCTV system to specify and install.

4.2.2 Selection of security grades

The results of the risk assessment (see 4.2.1) should be used to determine the requirements of the CCTV system and its components. Where appropriate a security grade should be assigned to the components, sub-systems and functions of the CCTV system. The identified security grade requirements should be specified in the OR and agreed by the customer and system designer.

Depending on the level of risk, the security grade needs to be defined for the following CCTV system functions:

1) Common interconnections
2) Storage

3) Archiving and backup
4) Alarm related information
5) System logs
6) Backup and restore of system data
7) Repetitive failure notification
8) Image handling device PSU monitoring
9) Image buffer holding time
10) Essential function device failure notification time
11) Monitoring of interconnections
12) Tamper detection
13) Authorisation code requirements
14) Time synchronisation
15) Data authentication
16) Export/copy authentication
17) Data labelling
18) Data (manipulation) protection

Individual functions of the CCTV system may be specified at a different security grade: for example a system specified generally at grade 1 with a grade 4 storage including a fail-safe image storage.

Any additional functions which are required above the security level may be defined individually in the OR.

4.3 Develop operational requirements

The Operational Requirements (OR) document shall be produced. This is a formal written statement of need, justifications and purpose of the proposed CCTV system. The installer should assess and determine whether production of the OR is to be completed before or after the site survey. See 5.2 Purpose of the Operational Requirements for more details.

4.4 Site survey

Once a location has been chosen for a CCTV system installation a site survey should be undertaken. This is to familiarise the system designer with the specifics of the intended site, such as access constraints, siting of key components (cameras, controls, power supplies etc) and environmental factors (see Clause 6 Equipment Selection and Performance for more details).

This should be completed by visiting the location to assess its suitability, and to note any issues for the system design phase.

If the location where the CCTV system is to be installed has not yet been constructed then the site survey may be carried out after a preliminary design has been created.

4.5 System design including site plan

Once the site survey and OR is completed the CCTV system can be designed and a System Design Proposal and Specification needs to be prepared. The design shall take into account the various requirement and location factors identified in the previous stages. At this stage a site plan should be drawn up, including locations for the various key components e.g. cameras (including field of view), detectors (including range and coverage), control rooms, power supplies, interconnections, etc.

(See Clause 6 ´Equipment Selection and Performance´ for more details.)

4.6 Develop test plan

Having designed the CCTV system, a test plan shall be produced to allow any installed system to be suitably proven. This test plan should include all critical aspects of the CCTV system, such as image quality, system interconnectivity, coverage, camera view etc. The purpose is to ensure that the system can be measured against its OR, and proved to be fit for its intended purpose. See Clause 13 Define Testing Plan for more information and 6.11.2 for tamper protection testing.

4.7 Installation, commission and hand over

The Risk assessment, OR and system design (including a site plan) should all be used to help facilitate the CCTV system installation.

Having completed the installation, commissioning tests as specified in the test plan should be completed according to the OR.

Once this has been successfully completed the system can be formally handed from the installer to the owner. See Clause 15 for more details.

4.8 Documenting the system

Documentation should be completed supporting the design, installing and commissioning phases of the CCTV system. These should be collated and held by the owner as the system references. The risk assessment, OR, testing plan, site survey, system design and site plan (see Clauses 14 and 16) should be included, along with the following documents:

- testing results, as built plans/drawings, data interface descriptions;
- training, manuals, support documentation, etc.;
- maintenance plan including routine inspection cleaning, etc (see Clause 17 for more details).

5 Operational requirements specifications

5.1 General

The purpose of the CCTV installation shall be summarized in a document called 'Operational Requirements'. Further information can be found in the bibliography.

5.2 Purpose of the Operational Requirements

The Operational Requirements states clearly what the customer expects the functions of the system to do. If there is an agreement between system designer and customer, the Operational Requirements could be defined within the System Design Proposal and Specification. If so, this should be clearly stated within the document. The development / design process encourages clear thinking about who will use the CCTV system, where and when it will be used and in particular the purpose of the CCTV system. It is produced by CCTV owners, operators and anyone who intends to use information from the CCTV system. The later stages of development of the OR shall involve those with the necessary skills to convert statements into a technical specification and test procedures.

At appropriate stages checks shall be made to ensure that the proposed implementation will meet the Operational Requirements. Without an Operational Requirement and a matching test procedure there is no practical methodology to assess whether the system can meet its required purpose.

5.3 Content of the Operational Requirements

The Operational Requirements shall consist of the following parts:

5.3.1 Basic objective / functionalities

- Intended purpose(s) of the system (e.g. site monitoring, detection and/or monitoring and/or recording of attacks against individual and property, thefts, robberies or damage).
- Risk assessment, which informs the selection of the required security grade of the system according to EN 50132-1.

5.3.2 Definition of surveillance limitations

- Limitations imposed by legislation, city rules or similar orders.
- Limitations such as privacy areas required by the customer or by the proximity of neighbours.

5.3.3 Definition of the site(s) under surveillance

- Buildings, internal, external or separate areas, etc. which are covered by the CCTV system.

5.3.4 Definition of activity to be captured

- The intended targets of the system in each part of the site (e.g. unauthorized persons within an area bounded by a perimeter fence; vehicles entering the access driveway, etc.).
- The expected speed of the intended target.
- The intended observation category of the targets from the perspective of the operator (e.g. detection, recognition or identification of a person).
- Whether external detection is required.

5.3.5 System / picture performance

- The key performance characteristics of the system and its displayed images (e.g. timescale for operator to view persons and track their movements throughout the scene).
- The degree of image detail required for the purpose which is to be observed in each of the live, recorded and exported views (i.e. it may be desirable or appropriate for a different resolution to be used in the live view than in the recorded view).
- Definition of any image analysis functionality, together with expected accuracy and whether this is to be achieved by the operator or automatically by the system.

5.3.6 Period of operation.

- Definition of operating hours for the system (e.g. daily between 21.00 and 08.00 and all day on Sundays and public holidays).

5.3.7 Conditions at the location

- Definition of environmental conditions, which will apply and/or vary during the monitoring period and are significant in terms of system design. (e.g. illumination of the site, potential obstacles in camera view, maximum and minimum temperatures).

5.3.8 Resilience

- Definition of the ability of the system to continue operating despite the existence of adverse circumstances (e.g. ability to continue operating during sudden or unexpected loss of power for a significant or defined length of time, absence of single interconnection paths, whether all or parts of the system have the same requirement).

5.3.9 Monitoring and image storage

- Definition of where, and by whom, the system shall be monitored and operated.
- Definition of what is to be recorded (e.g. all images for 10 min before and after an event; all camera views at all times).
- Definition of retention period for recordings and circumstances in which this will change (e.g. all recorded images to be kept for and erased after 28 days except where they relate to a criminal event).
- Definition of additional (remote) sites where the images shall be available.
- Definition of procedures to be followed when extracting, storing and handling images and data from the system.

5.3.10 Export of images

- Definition of how images will be exported for short sequences (e.g. a 10 min clip to be exported to WORM media; individual image snapshots exported to USB/IP storage device).
- Definition of how images will be exported for long sequences (e.g. network download for full system archive).

- Definition of required compatibility of exported media (e.g. sequences should be re-playable without the need for any software/codec/hardware that is not considered part of a standard desktop operating system).

5.3.11 Routine actions

- Definition of actions that are required as a matter of normal routine (e.g. the monitoring service shall carry out routine video patrols at 2 h intervals throughout the monitoring period).

5.3.12 Operational Response

- Definition of the person responsible for the response (e.g. key holder, guarding service and/or police).
- Definition of the type of response needed for each potential event (e.g. when a trespasser is observed the local law enforcement agency is contacted).
- Definition of target times for each response (e.g. Security personnel to attend scene within 3 min of event detection).

5.3.13 Operator workload

- Definition of the number of display screens an operator is expected to monitor.
- Definition of the number of alarm events the operator is expected to manage.
- Definition of the number of live cameras the operator is expected to manage.

5.3.14 Training

- Definition of required training for each role involved in the management and operation of the system.

5.3.15 Expansions

- Definition of any planned future extensions of the system, indicating any compatibility requirements.
- Definition of method used to connect with other systems.

5.3.16 List of any other special factors not covered by the above

NOTE If the operational requirement cannot be met with current technology or resources it will be noted in the system design document.

5.4 System operational criteria

5.4.1 General

The system operational criteria involve determination of:

- the operational procedures;
- the alarm response;
- the system response times.

5.4.2 Automation

The CCTV system shall be designed to enable the operator to analyse the content of the displayed images and take all necessary actions as defined by the O.R.

Automatic processing can assist operators allowing them to concentrate on essential tasks.