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Alarmanlagen – Einbruchmeldeanlagen Teil 7: Anwendungsregeln

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CENELEC

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Foreword

The text of this Technical Specification was prepared by the Technical Committee CENELEC TC 79, Alarm systems.

The text of the draft was submitted to the questionnaire and vote procedure and was approved by CENELEC as CLC/TS 50131-7 on 2003-06-04.

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Contents

Introduction

These application guidelines are intended to provide advice relating to the design, installation, operation and maintenance of Intruder Alarm Systems (IAS). The purpose of this document is to ensure, as far as is practical, that IAS provide the required performance with a minimum of unwanted alarms.

NOTE Clause 12 includes requirements relating to the operation of IAS.

These application guidelines are set out in the logical order in which an IAS would normally be designed and installed. Each procedure is set out separately in the guideline but it is accepted that, in practice, some of the procedures may be carried out simultaneously. Annex J describes in the form of a flowchart the main processes and documentation included in this application guideline.

Those responsible for the design, installation, operation and maintenance of IAS should be conversant with other European Specifications relating to IAS, particularly those relating to system performance, control and indicating equipment, detectors, warning devices, power supplies and alarm transmission systems.

These application guidelines are set out in seven main clauses; a brief explanation of each section is shown below:

- Clause 7 - System design

  This clause is intended to assist those responsible for designing IAS to design IAS suitable for the premises to be supervised in relation to the perceived risk(s). The design of the IAS will depend on many factors all of which will influence the design of the IAS to a greater or lesser degree. Consideration of these factors will result in a system design proposal for an IAS with the appropriate extent, security grade and environmental class.

- Clause 8 - Installation planning

  This clause is intended to help those responsible for installing the IAS by highlighting issues which should be considered prior to commencing the installation of the IAS.

- Clause 9 - System installation

  In this clause guidance is given with regard to issues arising during the installation of the IAS. This clause is intended to ensure the IAS is correctly installed as specified at the design stage.

- Clause 10 - Inspection, test, commissioning and acceptance

  In this clause guidance is given on issues arising after the IAS has been installed. The clause is intended to ensure the IAS has been installed as specified and also provides the level of performance intended at the design stage. Guidance is also provided with regard to the proper commissioning and handing over of the system to the user and to the documents, records and operating instructions which should be provided.

- Clause 11 - Documentation and records

  This clause describes the documentation which should be provided to the client on completion of the IAS. The documents are intended to provide a history of modifications to the IAS, based on the As Fitted document, prepared when the IAS installation was completed.

  The records are intended to chronicle any corrective action carried out following unwanted alarm conditions and details of any repairs or modifications to the IAS. The record should also include details of temporary disconnections.

- Clause 12 Operation

  This clause describes the responsibility of the client or user of the IAS to properly maintain the IAS and to ensure it is operated correctly.

- Clause 13 - Maintenance and repair

  This clause describes how the IAS should be maintained and repaired to ensure the IAS continues to provide the level of performance intended at the design stage.

1 Scope

These application guidelines include guidance on the design, planning, operation, installation, commissioning and maintenance of IAS installed in buildings. Requirements for IAS are specified in EN 50131-1.

These application guidelines are intended to assist those responsible for establishing the need for an IAS to ascertain the appropriate design of the IAS both in terms of the extent of the supervision required and in determining the grade of system performance necessary to provide the degree of supervision considered appropriate.

These application guidelines are also intended to assist those responsible for selecting equipment appropriate to both the level of performance required and the environmental conditions in which the equipment will be required to operate.

These application guidelines are relevant to all classes and grades of IAS of any size and complexity. This application guideline should be read in conjunction with EN 50131-1.

NOTE It has been assumed in the drafting of these application guidelines that the execution of its provisions will be entrusted to appropriately qualified and experienced persons. However the guidance is also appropriate to other persons who may be required to purchase or use an IAS.

2 Normative references

This Technical Specification 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 Technical Specification only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 50131-1:1997, *Alarm systems, Intrusion systems — Part 1: General requirements*

EN 50014:1997, *Electrical apparatus for Potentially explosive atmospheres General requirements*

3 Definitions and abbreviations

For the purpose of this Technical Specification the following definitions and abbreviations apply.

3.1 Definitions

3.1.1
active detector
detector capable of comparing input signals with pre-defined criteria (speed/frequency/amplitude/direction) prior to generating an alarm signal or message

3.1.2
alarm
warning of the presence of a hazard to life, property or the environment

3.1.3
alarm receiving centre
continuously manned centre to which information concerning the status of one or more alarm systems is reported

3.1.4
alarm company
organization which provides services for alarm systems

3.1.5
alarm condition
condition of an alarm system or part thereof, which results from the response of the system to the presence of a hazard

3.1.6
alarm system
electrical installation which responds to the manual or automatic detection of the presence of a hazard

3.1.7
alarm transmission system
equipment and network used to transfer information concerned with the state of one or more alarm systems to one or more alarm receiving centre

NOTE Transmission systems exclude local direct connections, i.e. interconnections between parts of an alarm system which do not require an interface to transform the alarm system information into a form suitable for transmission.

3.1.8
ancillary control equipment
equipment used for supplementary control purposes

3.1.9
as fitted document
document in which details of the IAS actually installed are recorded

3.1.10
control and indicating equipment
equipment for receiving, processing, controlling, indicating and initiating, the onward transmission of information

3.1.11
commissioning
putting an IAS into operational mode

3.1.12
client
individual or corporate body responsible for acquiring the IAS

3.1.13
detector
device designed to generate an intruder alarm signal or message in response to the sensing of an abnormal condition indicating the presence of a hazard

3.1.14
documentation
paperwork (or other media) prepared during the design, installation, commissioning and hand over of the IAS recording details of the IAS

3.1.15
entry/exit route
route by which authorized entry or exit to the supervised area may be achieved

3.1.16
equipment schedule
list of equipment to be installed or actually installed

3.1.17
fault condition
condition of an alarm system which prevents the IAS or parts thereof from functioning normally

3.1.18
final exit point
point at which the user enters or leaves the supervised premises

EXAMPLE: entrance door to supervised premises.

3.1.19
installation company
company responsible for installing the IAS

3.1.20
installation plan
document describing the methodology to be followed during the installation of the IAS

3.1.21
installer
individual or individuals responsible for carrying out the installation process

3.1.22
intruder alarm system
alarm system to detect and indicate the presence, entry or attempted entry of an intruder into supervised premises

3.1.23
interconnection
means by which messages and/or signals are transmitted between IAS components

3.1.24
isolation
status of a part of an alarm system in which an alarm condition cannot be notified, such status remaining until deliberately cancelled

3.1.25
non-active detector
detector which does not include any electronic components

EXAMPLE: a mechanical switch or contact.

3.1.26
non-specific wired interconnection
interconnection conveying information pertaining to two or more applications

3.1.27
normal condition
state of an IAS system where no conditions exist which would prevent the setting of the IAS

3.1.28
notification
passing of an alarm, tamper or fault condition to warning devices and/or alarm transmission systems

3.1.29
operational mode
state of an alarm when it is complete, commissioned and ready for use

3.1.30
power supply
that part of an alarm system which provides power for the IAS or any part thereof

3.1.31
response authority
designated authority with responsibility for attending the supervised premises following an alarm and taking the appropriate action

3.1.32
set
status of an IAS or part thereof in which an alarm condition can be notified

3.1.33
specific wired interconnection
interconnection conveying information pertaining to one application

3.1.34
specifier
individual or corporate body responsible for stipulating the requirements the IAS will be required to meet

3.1.35
subsystem
that part of an IAS located in a clearly defined part of the supervised premises capable of independent operation

3.1.36
supervised premises
that part of a building and/or area in which a hazard may be detected by an alarm system

3.1.37
system components
individual items of equipment which make an IAS when configured together

3.1.38
system record
history of alarm conditions, faults or modifications to the IAS

EXAMPLE: a Log Book.

3.1.39
tamper
deliberate interference with an IAS or part thereof

3.1.40
tamper alarm
alarm generated by tamper detection

3.1.41
tamper condition
condition of an alarm system in which tampering has been detected

3.1.42
tamper protection
methods or means used to protect an alarm system or part thereof against deliberate interference

3.1.43
technical survey
inspection of the premises to be supervised, carried out after the proposal has been accepted, to verify the selection, location and siting of system components and to consider the selection of components in relation to the environmental conditions to which the system components will be exposed

3.1.44
unset
status of an IAS or part thereof in which an alarm condition cannot be notified

3.1.45
user
person authorized to operate an alarm system

3.1.46
unknown alarm
alarm for which the cause cannot be positively identified

3.1.47
unwanted alarm
alarm conditions not generated by an intrusion or attempted intrusion into the supervised premises

3.1.48
warning device
device that gives an alarm or an alert

3.1.49
wire-free interconnection
interconnection conveying information between IAS components without physical media. The interconnection may convey information pertaining to two or more applications

3.1.50
zone
assessed area where abnormal conditions may be detected

3.2 Abbreviations

In this Application Guideline the following abbreviations are used:

ARC — Alarm Receiving Centre
ACE — Ancillary Control Equipment
ATE — Alarm Transmission Equipment
ATS — Alarm Transmission System
CIE — Control and Indicating Equipment
IAS — Intruder Alarm System(s)
PS — Power Supply
WD — Warning Device
PIR — Passive Infra-Red

4 Grade of IAS

The grade of the IAS will depend upon the performance required as determined during the risk assessment and location survey.

An IAS may include IAS components of differing grades when divided into clearly defined sub-systems. When the IAS is divided into sub-systems, each sub-system may be of a different grade. The grade of a sub-system shall be that of the lowest graded component within it.

Components shared by more than one sub-system should have a grade equal to that of the highest sub-system grade.

EXAMPLE: control and indicating equipment, alarm transmission system, warning devices and power supplies.

4.1 Grading structure

EN 50131-1 describes four grades of performance which should be considered when selecting equipment. These are as follows:

4.1.1 Grade 1: Low risk

Intruders are expected to have little knowledge of IAS and be restricted to a limited range of easily available tools.

4.1.2 Grade 2: Low to medium risk

Intruders are expected to have a limited knowledge of IAS and the use of a general range of tools and portable instruments.

EXAMPLE: a multi-meter.

4.1.3 Grade 3: Medium to high risk

Intruders are expected to be conversant with IAS and have a comprehensive range of tools and portable electronic equipment.

4.1.4 Grade 4: High risk

To be used when security takes precedence over all other factors. Intruders are expected to have the ability or resource to plan an intrusion in detail and have a full range of equipment, including means of substitution of vital components in the IAS.

5 Environmental classification

The environmental class of each system component should be determined by the environmental conditions in which the component is expected to operate.

EN 50131-1 defines four environmental classes as shown below:

I) indoor but restricted to residential/office environment;

EXAMPLE: living rooms and offices.

II) indoor in general;

EXAMPLE: sales floors, shops, restaurants, stairways, manufacturing and assembly areas and storage rooms.

III) outdoor but sheltered from direct rain and sunshine, or indoors with extreme environmental conditions;

EXAMPLE: garages lofts, barns and loading bays.

IV) outdoor in general

6 General

The IAS should be installed, operated (see Clause 12) and maintained in a manner consistent with the manufacturers recommendations for the equipment and the environmental conditions under which the IAS is expected to operate.

6.1 Other components

Components of other systems may be combined or integrated with the IAS providing the performance of the IAS components are not adversely influenced.

6.2 Safety

National or European requirements relating to safety may exist. Such requirements are not included in these application guidelines and reference should be made directly to the relevant National or European documents.

EXAMPLE: electrical safety.

6.3 Unwanted alarms

It is recommended that care should be taken by system designers, installation companies, alarm companies and users, to avoid unwanted alarms.

6.4 Responsibility

Responsibility for each individual stage in the process of supplying an IAS; design, installation, commissioning and hand-over should be clearly defined and agreed between the relevant parties.

6.5 Qualifications

Persons responsible for risk assessment and the design, installation, maintenance and repair of IAS should hold appropriate qualifications.

NOTE These qualifications required may vary from country to country.

6.6 Confidentiality

Information relating to the design, installation, operation and maintenance of the IAS should be treated as confidential.

6.7 Consultation

The design of a system should be determined in consultation with the client or specifier of the IAS (or his/her representative) and any other interested parties.

EXAMPLE: insurers or police.

When considered necessary, expert advice should be obtained.

The designer of the IAS should consider any requirements for third party approval of the whole IAS or a particular system component. Any such requirements should be identified at an early stage in the design of the IAS and the selection of system components.

6.8 Compatibility

Care should be taken during the selection of components to ensure all system components are compatible. Where any uncertainty arises the appropriate consultation should take place.

EXAMPLE: with the manufacturer/supplier, a test house or other third party.

7 System design

The objectives of the system design stage are to determine the extent of the IAS and select components of the appropriate grade and environmental classification and to prepare a system design proposal.

EXAMPLE: the number and type of detectors and their location.

7.1 Location survey — Risk

An assessment should be carried out at the premises to be supervised to determine the required grade of the IAS.

7.1.1 Contents

The contents at risk within the supervised premises should be considered when determining the design of the IAS. Annex A includes a list of examples of factors which should be considered. The list should not be regarded as definitive as other factors may be relevant in specific circumstances.

7.1.2 Building

Among other factors, the construction, location, type of occupancy and theft history of the supervised premises should be considered when designing an IAS. Annex B includes a list of examples of factors which should be considered, the list should not be regarded as definitive as others factors may be relevant in specific circumstances.

7.1.3 Minimum supervision levels

The level of supervision required will be influenced by the factors described in annexes A and B. Based on the assessment of these, the specifier should assess the method of intrusion which may be expected at different points throughout the premises and select the grade of the IAS and design the IAS accordingly. Examples of the methods of intrusion against which supervision is likely to be required is shown, by grade, in Annex E.

7.2 Location survey — Other influences

The existing and/or potential conditions at the premises to be supervised should be considered in the design of the IAS. Conditions which may influence the operation of the IAS fall into two categories:

- those conditions occurring within the supervised premises over which the user of the IAS may be reasonably expected to exercise control. Annex C includes a list of examples of factors which should be considered, the list should not be regarded as definitive as others factors may be relevant in specific circumstances;

- those conditions occurring outside the supervised premises over which the user cannot reasonably be expected to exercise control. Annex D includes a list of examples of factors which should be considered, the list should not be regarded as definitive as other factors may be relevant in specific circumstances.

NOTE The location survey is intended to identify, during the preparation of the system design proposal, factors which may influence the selection and siting of system components, particularly detectors. Additional factors may be identified during the technical survey (see 8.1.3) which may result in amendments to the system design proposal.

7.3 System design proposal

A system design proposal should be prepared for submission to the client or an agent appointed by the client. The proposal should include the information detailed in Annex F.

The system design proposal may be subject to alteration at other stages in the implementation of the system.

EXAMPLE: during the installation planning and installation implementation stages.

Any such changes should be agreed between the relevant parties and the documentation amended accordingly.

7.3.1 Selection of components

Only components meeting the appropriate security grade and environmental class should be selected. Due regard should be taken of the need to minimize the generation of unwanted alarms.

7.3.2 Siting of equipment

7.3.2.1 Siting of CIE

CIE should be sited within the supervised area. Where an IAS is divided into sub-systems of different grades the CIE should be within the area supervised by the sub-system with the highest grade. In grade 3 and 4 IAS setting any sub-system(s) should also set the sub-system supervising the area in which the CIE is located.

Examples of issues to be considered when siting CIE and ACE are shown in Clauses G.20 and G.21.

When unsetting is to be initiated outside the supervised area and completed inside the supervised area consideration should be given to siting the CIE or ACE adjacent to the final exit point of the supervised area, to limit the route from the point of entry to the CIE or ACE. Care should be taken to site the CIE or ACE so as to prevent observation of the operation of the CIE or ACE by unauthorized persons.

7.3.2.2 Siting of ATE

ATE should be sited within the supervised area. Where an IAS is divided into sub-systems of different grades the ATE should be within the area supervised by the sub-system with the highest grade. Examples of issues to be considered when siting ATE are shown in Clause G.23.

7.3.2.3 Siting of detectors

Detectors should be sited in compliance with the manufacturer’s recommendations and to provide the range and coverage determined during the risk assessment stage of the IAS design. Examples of issues to be considered when siting detectors are shown in Annex G.

7.3.2.4 Siting of Warning Devices

WD should be located in positions which are not readily accessible (so as to minimize risk of intentional or unintentional damage) consistent with reasonable access for servicing and so as to give effective notification of alarms.

WD should be so mounted as to minimize the possibility of removal without generating an alarm condition.

Interconnections to externally mounted WD, which are accessible from outside the supervised area, should be provided with tamper protection.

EXAMPLE: enclosed in metal conduit.

7.3.3 Interconnections

Interconnections appropriate to the system performance required and the environmental conditions should be selected.

Where wired interconnections are used consideration should be given to the relevant electrical installation specifications and to equipment manufacturers recommendations.

7.3.3.1 Specific wired interconnections

When specific wired interconnections are selected these should be run inside the supervised premises. When it is impractical for interconnections to be routed inside the supervised area they should be provided with tamper protection.
EXAMPLE: enclosed in metal conduit.

The size and material of cables used for wired interconnections and its insulation should be such that the voltage delivered to any systems component is not less than the minimum specified operating voltage, when measured in the maximum current condition, with the minimum power supply voltage.

All cables used for interconnections should be adequately supported and its installation should conform to good working practices.

When cables may be subjected to accidental damage; they should be mechanically protected.
EXAMPLE: below 2 metres above floor level.

Cables should be run in positions where there is the least risk of physical damage. If risk of physical damage exists the cable should be protected by ducting, trunking or conduit. When these are made of conductive material due regard should be paid to their proper earthing and correct grounding.

Electrical interference may cause unwanted alarms. This should generally be overcome by filtering the mains input to the IAS, separating interconnecting cables from high voltage cables and by screening.

Interconnection wiring should not be run in the same conduit or trunking as cables carrying high voltage.
EXAMPLE: mains supplies, or cables carrying high frequency signals unless they are physically separated and/or suitably screened so as to prevent cross interference.

All joints in interconnection wiring should be mechanically and electrically secure.

To facilitate rapid tracing of faults in interconnecting wiring all cables should be identifiable at their ends. Sufficient test points, contained in junction boxes, should be provided for efficient fault identification.
EXAMPLE: colour coded insulation; labelled.

Care should be taken with regard to the size and type of cable selected, its routing and fixing. Examples of issues to be considered when specifying specific wired interconnections are included in G.1.1.

7.3.3.2 Non-specific wired interconnections

When non-specific wired interconnections are selected, in addition to the requirements included in 7.3.3.1 above, consideration should be given to the effect other systems sharing the interconnections may have on the performance of the IAS. This issue may be particularly relevant should the other system(s) develop a fault. Examples of issues to be considered when specifying non-specific wired interconnections are included in G.1.2.

7.3.3.3 Wireless interconnections

When wireless interconnections are selected careful consideration should be given to the influence of intentional or unintentional transmissions using the same frequency and/or means of signal modulation as those of the IAS. Such transmissions may result in the IAS generating tamper or fault conditions or prevent the interconnections functioning correctly. Examples of issues to be considered when specifying wireless interconnections are included in G.1.3.

7.3.4 Setting and unsetting

Care should be taken when selecting the means of setting and unsetting. Whenever possible completion of setting and unsetting should require a deliberate action by the user.

Audible or visual indication should be perceivable to indicate when the setting or unsetting procedure is in progress and/or has been completed.

7.3.4.1 Setting

Setting may be either initiated within the supervised premises and completed outside the supervised premises or the entire setting procedure may be completed outside the supervised premises, using appropriate ACE. The IAS should not set until the IAS is in a normal condition. The IAS may allow certain limited conditions preventing setting to be overridden.

NOTE Subclause 8.3.3.1 of EN 50131-1 includes requirements relating to overriding certain conditions and 8.3.6 & 8.3.7 of EN 50131-1 permit the isolation and inhibiting of function respectively.

When setting is initiated within the supervised premises and is to be completed outside the supervised premises, a maximum time should be permitted to complete the setting procedure. When the maximum setting period is exceeded an indication should be provided.

When setting is initiated within the supervised premises and completed outside the supervised premises an indication should be perceivable when the setting procedure is initiated and when setting is completed. This indication should be time limited.

When setting of the IAS is to be performed entirely outside the supervised premises an indication should be perceivable when the IAS is set. This indication should be time limited.

7.3.4.2 Unsetting

Unsetting may be either initiated outside the supervised premises and completed within the supervised premises or may be performed entirely outside the supervised premises using appropriate ACE.

Consideration should be given to preventing physical access to the supervised premises, via the final exit point, until either the entry procedure has been initiated or the IAS has been unset.

When unsetting is initiated outside the supervised premises and completed inside the supervised premises an indication should be provided when the unsetting procedure is initiated and when unsetting is completed.

When unsetting of the IAS is to be performed entirely outside the supervised premises an indication should be provided when the IAS is unset. This indication should be time limited.

A maximum time period should be permitted to complete the unsetting procedure. When the maximum unsetting period is exceeded an alarm condition should be notified.

7.3.5 Entry and exit routes

When setting or unsetting of the IAS is to be carried out in two stages, the route between these two points should be carefully considered and be as short as possible.

EXAMPLE: setting initiated at the CIE or ACE and completed at the final exit point.

Indication provided during the setting and unsetting procedures, when setting or unsetting is achieved in two stages, should be perceivable throughout the entry and/or exit route and immediately outside the final exit point.

The CIE should be configured such that signals or messages from detectors on the exit/entry route, activated during the setting or unsetting procedure, are not processed as intruder signals or messages. Detectors located on the exit/entry route should be monitored and the IAS should not set until the IAS is in the normal condition.

7.3.5.1 Exit routes

When a detector not on the exit route is activated during the setting procedure an indication should be provided and completion of the setting procedure prevented.

7.3.5.2 Entry routes

When a detector not on the entry route is activated during the unsetting procedure an alarm condition should be notified.

7.3.6 Indication

Mandatory requirements for indications are included in EN 50131-1. These require all mandatory indications to be available together at one location. Indications may be repeated, in whole or in part, at other locations.

Individual indication should be provided to indicate the alarm status of each active detector.

EXAMPLE 1: movement, vibration, acoustic or infra-red beam detectors.

Not more than ten non-active detectors may share a common means of indication.

EXAMPLE 2: magnetic or mechanical contacts.

7.3.7 Grouping of detectors

Individual detectors maybe grouped together for control or other purposes.

EXAMPLE: to provide part setting/unsetting facilities, isolation of several detectors using a single command or operation, or to simplify the identification of the origin of an alarm condition.

7.3.8 Notification

Minimum requirements for notification are included in EN 50131-1, depending on the grade of the IAS notification may be by WD or ATS or a combination of both.

7.3.8.1 Warning devices

When notification is by two WD consideration should be given to installing the two WD at positions remote from each other.

Where the possibility exists of confusing the sound of the IAS WD with WD of other alarm systems, consideration should be given to enabling the sound of the IAS WD to be differentiated from the sounds of WD's of other alarm systems.

When a WD is used to supplement an ATS, operation of the WD may be delayed for a period not exceeding ten minutes or suppressed completely, providing the ARC has confirmed receipt of the alarm signal from the ATS.

NOTE National regulations may require a delay in the operation of the WD. The duration the WD is permitted to operate may be similarly subject to National regulation.

7.3.8.2 ATS

Many communication formats exist for the transmission of messages between ATE and receiving equipment at an ARC. Care should be taken to ensure the ARC can accept signals from the ATE to be installed.

7.3.9 Power

Care should be taken to ensure power supplies used in IAS are adequate for the load under both normal and alarm conditions.

When power is normally derived from a mains supply with an alternative power source as backup, care should be taken to ensure the capacity of the alternative power source is capable of powering the IAS, including WD, for the required standby period.

NOTE The alternative power source should be capable of powering WD in both alarm and non-alarm conditions. When WD are in an alarm condition the alternative power source should be capable of powering WD for the maximum duration they are required to operate.

7.3.10 Response to IAS

The planned response (intervention) following the activation of the IAS should be clearly defined.

8 Installation planning

8.1 General

Prior to commencing the installation of system components the following issues should be considered.

8.1.1 Manufacturer's recommendations

All system components should be installed in accordance with the manufacturer's recommendations. If installation of a component in accordance with the manufacturer's recommendations is not possible advice should be sought from the manufacturer or supplier.

8.1.2 Environmental considerations

System components should be suitable for the environmental conditions in which they are to operate.

8.1.3 Technical survey

To ensure the performance of the IAS is consistent with the requirements as detailed in the System Design Proposal a technical survey of the premises to be supervised should be carried out.

The objective of the Technical Survey is to ensure, as far as is possible, that the IAS provides the performance specified in the System Design Proposal. Examples of issues, which should be considered during a Technical Survey, are included in Annex G.

NOTE Depending on the size and complexity of the planned IAS the Technical Survey may be carried out at the same time as the Location Survey or may be carried out by the installer prior to commencing installation of the IAS or may be carried out independently.

8.1.3.1 Operation of IAS

The Technical Survey should consider the operation of the system, particularly setting and unsetting procedures, to ensure operation of the IAS is as simple as possible.

8.1.3.2 Selection of components

The Technical Survey should verify the selection of components specified in the System Design Proposal and should also confirm the proposed siting of the components is consistent with the optimum performance and manufacturers recommendations.

The siting of components to be operated by a user should be checked to ensure ease of operation.

8.1.3.3 Interconnections

Interconnection requirements should also be considered and the means specified in the System Design Proposal verified.

8.1.3.4 Amendment to System Design Proposal

The Pre-installation Survey may identify issues which may require the modification of the System Design Proposal. Any such changes should be agreed with the client and be recorded.

8.1.4 Installation Plan and Equipment Schedule

Subject to the size and complexity of the planned IAS consideration should be given to preparing an Installation Plan. The Installation Plan should be based on the System Design Proposal and consider the issues identified in the Pre-installation Survey.

The Installation Plan should specify where each system component is to be located and how it should be sited.

EXAMPLE 1: height from floor level

Details of the interconnections required and, if wired, cable types and routing should also be specified.

The system configuration should be finalised and agreed.

EXAMPLE 2: setting/unsetting procedures, circuit programming, WD delay and duration periods (if any).

The Installation Plan should include an Equipment Schedule detailing all equipment to be installed including cable (if any).

9 System installation

9.1 Competence

The installation should be carried out by installers with the necessary training and experience. Installers should have the appropriate tools and test equipment necessary to install the IAS correctly.

9.2 Installation process

The system should be installed and configured in accordance with the System Design Proposal. Any deviations should be agreed, in writing, with the client.

10 Inspection, functional testing and commissioning

10.1 Inspection

An inspection of the system should be carried out on completion of the installation of the IAS to confirm the IAS has been installed in accordance with the System Design Proposal and the Installation Plan (if prepared). Any deviations should be recorded for inclusion in the As Fitted document.

10.2 Functional testing

The performance of each detector should be tested and compared with the requirements included in the System Design Proposal and the Installation Plan (if prepared). Particular care should be taken with movement and vibration detectors which may require adjustment of range or coverage. Other types of detector may also require final adjustment prior to commissioning.

The configuration of site-specific data should be checked to confirm the indication and notification provided is as required in the Installation Plan.

Finally a complete operational test should be carried out, including activation of any WD and ATE. Where ATE is installed a check should be made with the ARC or other receiving centre to ensure the test signals were successfully received.

10.3 Commissioning

On completion of the tests the IAS should be placed into operational mode.

10.4 Handover

Hand over of the IAS to the user should be carried out by a person with the appropriate training and experience.

A full demonstration of the IAS should be provided including the operation of detectors and how these should be tested.

An explanation of the functions of the CIE, ACE and ATS should also be provided. Communication procedures with the ARC (if any) should be explained.

Clear and concise operating instructions should be provided, these should include both how the CIE is operated and the specific setting and unsetting procedures for the IAS. These instructions should be provided to all users responsible for operating the IAS.

Depending upon the complexity of the IAS users should be offered training in the operation of the IAS. The level of training given should be commensurate with the complexity of the IAS.

The training should emphasize how unwanted alarms can be avoided, EXAMPLE: the proper closing of doors, windows and the switching off of equipment which might adversely influence detectors.

10.5 Test period

Following the handing over of the IAS it is recommended that the IAS is tested for a period to be agreed with the client. During this period the IAS should be operated normally.

To minimise the risk of unwanted alarms being generated during the test period the means of notification should be inhibited.

Alternatively when an ATS has been installed, only the operation of any WD may be inhibited, the ATS remaining operational. The ARC should be instructed to inform only the Installation Company, Alarm Company or client in the event of an alarm condition being generated.

Any alarm conditions occurring during the test period should be investigated by the Installation Company, Alarm Company or client and corrective action taken. Following completion of the agreed period without unwanted activations the IAS should be fully commissioned.

10.6 Acceptance

Following the successful completion of the test period, where applicable the ARC should be informed that the IAS is fully operational. The responding authority, if any, should also be informed and where necessary provided with any keys or access codes.

The client should be requested to sign an Acceptance Certificate stating the IAS has been installed in accordance with the As Fitted Document and operates accordingly and that sufficient instruction and training has been provided to ensure the proper operation of the IAS.

10.7 As fitted document

A document should be prepared, based upon the System Design Proposal, amended to reflect any changes to the IAS design found to be necessary during the installation process. The As Fitted document should be an accurate record of the installed IAS including all information relating to the equipment installed and its location. If warranted by the size and complexity of the IAS the As Fitted document should also include details of the types of cables used and their routing.

The As Fitted document should be made available to maintenance and service personnel.

10.8 Certificate of conformance

The Installation Company should provide the client with a Certificate of Conformance stating the IAS has been installed in compliance with the As Fitted document.

When the IAS, or any components of the IAS, are claimed to comply with any legislation, regulation(s), National or European Specifications, any such claims should be included in the Certificate of Conformance

11 Documentation and records

11.1 Documentation

The following documentation should be provided to the client. The client or user should be requested to make this documentation available should the IAS require modification, repair or maintenance and should also ensure the documentation is kept up to date. Where applicable the documentation should be prepared in accordance with EN 61082.

As Fitted document

System Operating instructions

Operating instructions should be provided in sufficient detail to minimise the possibility of mis-operation. Consideration should be given to dividing the instructions into two sections:

actions required to set and unset the system and carry out a limited range of control functions e.g. setting, unsetting, resetting, isolating or testing;

detailed instruction covering all the other functions of the IAS.

Instructions – Maintenance and repair

Instructions and other documentation necessary to maintain and repair the IAS.

Installation company.

The name, address and telephone number of the individual or installation company.

Maintenance and repair.

The name, address and telephone number of the company or individual responsible for maintaining and/or repairing the IAS, including details of how these organisations or individuals may be contacted at all times.

Monitoring

The name, address and telephone number of the ARC or other Monitoring Centre responsible for initiating a response to the IAS.

Verification

Details of any procedures relating to the verification of alarm conditions.

Intervention

The name, address and telephone number of the organisation responsible for attending the supervised premises following the generation of an alarm condition.

Acceptance certificate.

Certificate of Conformance.

11.2 Records

A means should be provided to record any information necessary to ensure the IAS operates as intended. The record should include details of the time and date of any alarm conditions, which detector was responsible for generating the alarm condition and in the case of an unwanted alarm condition, details of any remedial action initiated to prevent the occurrence of further unwanted alarm conditions. The record should also include details of any modifications or additions to the IAS.

The IAS records may be recorded in any medium or at a location remote from the supervised premises providing they are easily accessible to persons maintaining the IAS. An example of the items to be recorded and the format of a log book, which could be located at the supervised premises, are shown in Annex H.

The Records should be supplied in a manner suitable for the long term preservation of the records. When the records are stored at the supervised premises the client should be requested to make the records accessible to those responsible for maintaining the IAS and also to ensure the records are securely stored when not in use. The client should also be made aware of the need to ensure the records are kept up to date.

12 Operation of IAS

The client and/or user of the IAS and those responsible for the maintenance and service of the IAS should be made aware of their responsibility to

i) ensure that only individuals trained to operate the system are allowed to operate it and that the IAS is operated in accordance with operational instructions and training,

ii) ensure the premises are used and maintained in a manner such as not to cause unwanted alarms,

iii) regularly test the IAS to ensure the performance of the IAS is maintained at the required level,

iv) report any defects in the IAS promptly to the responsible alarm company,

v) report any changes to the construction or to the use of the premises which might adversely influence the performance of the IAS,

vi) maintain the documents and records.

13 Maintenance and repair of the IAS

13.1 General

It is the client's responsibility to arrange for the IAS to be properly maintained (inspected and serviced) and repaired as necessary. An arrangement should be made between the client and a competent organisation for the maintenance and repair of the IAS. The arrangement should specify the method of liaison necessary to provide access to the supervised premises. The name and telephone number of the maintenance and repair organisation and the Alarm Company should be prominently displayed at the location of the CIE or ACE. Examples of issues, which should be considered when maintaining IAS, are included in Annex I.

13.2 Inspection and servicing

13.2.1 Maintenance routine

To ensure the continued correct functioning of the IAS, the IAS should be periodically maintained (inspected and serviced). A maintenance schedule should be agreed immediately upon the completion of the installation.

Any batteries should be replaced at intervals not exceeding the battery manufacturer's recommendations. Care should be taken that all equipment is properly reinstated after testing.

All intervention during maintenance or repair, including testing, should be recorded in the Log Book.

13.2.2 Prevention of unwanted alarms during routine testing

It is important to ensure when maintaining an IAS that maintenance operations do not result in the generation of an unwanted alarm.

If a link to an ARC or other remote manned centre is to be used during the test, then it is essential to notify the ARC or other remote centre before undertaking the test.

When the transmission of signals to an ARC or other remote manned centre is prevented during testing, a visual indication of this state should be given, either automatically or manually, at the control and indicating equipment.

The occupants of the premises should be notified of any test of the IAS which may result in the operation of the WD.

13.3 Repair

In the event of any indication of a malfunction or damage to any part of the IAS the user should immediately inform the organisation or individual responsible for the maintenance and repair of the IAS so that any necessary remedial action may be taken. The time within which repair of the IAS will commence, following a request to the organisation or individual responsible for carrying out the repairs, should be agreed.

13.4 Spares

When an IAS is large or complex it is recommended that a supply of spares are held at the supervised premises.

Annex A
(informative)

System design — Location survey — Contents

When considering the design of an IAS the design of the system should be consistent with the risk of an attack on the supervised premises. The level of risk will depend, among other issues, on the type of contents. Examples of issues which should be considered are included below.

A.1 Type

Ease of disposal.

Attraction to burglar.

A.2 Value

Maximum probable value of a single loss.

Consequential costs of loss.

Sentimental value.

A.3 Bulk or size

Ease of removal and transport.

Ease of disposal/sale.

Ease of access to the supervised premises.

A.4 Theft history

Methods of attack used in previous thefts.

A.5 Danger

To the environment.

Of misuse of the contents.

A.6 Damage

Vandalism of contents.

Risk of arson to content.

Annex B
(informative)

Systems design — Location survey — Building

When considering the element of risk in the design of an IAS the structure of the premises to be supervised will be a major determining factor. Issues which should be considered are included below.

B.1 Construction

Construction of walls, roof, floor and basement (if any).

B.2 Openings

Construction of windows, doors, roof lights, ventilation ducts or any other openings in the shell of the building which could facilitate unauthorised entry.

B.3 Occupancy

i) whether the supervised premises are unoccupied for extended periods;

ii) the presence of security guards;

iii) whether the public has access to the supervised premises.

B.4 Keyholding

Availability of key-holders to respond to the IAS.

B.5 Locality

i) whether the supervised premises are located in a high crime risk area;

ii) the presence of adjacent building or structures which might aid an attacker;

iii) the speed and quality of response to the IAS;

iv) the proximity or otherwise of adjacent occupied premises.

B.6 Existing security,

i) the quality and extent of any existing mechanical security devices;

ii) the quality and extent of any existing IAS.

B.7 Theft history

i) the number of previous thefts at the supervised premises;

ii) the methods of attack used during any previous thefts.

B.8 Local legislation or regulation

i) safety requirements which might influence the design of the IAS;

ii) fire regulations which might influence the design of the IAS;

iii) building construction which might influence the design of the IAS.

B.9 Security environment

i) whether the building is located in an urban area;

ii) whether the building is located in a rural area.

Annex C
(informative)

Location survey — Influences affecting the IAS originating within the supervised premises

There are many factors occurring within the supervised premises which may influence the performance of an IAS. These factors should be considered when selecting the type of equipment, particularly detectors, the siting of that equipment and its adjustment. Factors within the supervised premises may, in general terms, be considered within the control of the user of the premises and where such conditions might adversely influence the operation of a particular item of equipment or the whole IAS efforts should be made to eliminate such conditions. Examples of conditions which might adversely influence the operation of an IAS are included below.

C.1 Water pipes

Where microwave detectors are employed consideration should be given to the effect of moving water in plastic pipes.

C.2 Heating, ventilating and air conditioning systems

Where heating, ventilation and/or air-conditioning systems are installed consideration should be given to the influence such systems would have on the detectors which could be affected by air turbulence.

EXAMPLE: ultrasonic detectors.

C.3 Suspended signs or other objects:

Consideration should be given to the effect of moving signs, or any other object, within the field of view of a movement detector.

EXAMPLE: curtains or plants.

C.4 Lifts

Consideration should be given to the effects of vibration caused by lifts, or any other machinery, on detection devices.

C.5 Lighting

Consideration should be given to the effect of lighting fittings, particularly fluorescent fittings which may interfere with microwave detectors, compact high intensity discharge fittings which may generate a high level of Electro Magnetic Interference and spotlights, which if directed onto the lens or mirror of a Passive Infra-red detector, may cause a false activation. The effect of car headlights should also be considered when locating Passive Infra-Red detectors.

C.6 Electromagnetic interference

All electrical equipment is capable, either deliberately or inadvertently, of generating electromagnetic interference which might influence the operation of IAS equipment. This interference may be conducted into the equipment via power supply or signal wiring, alternatively this wiring may act as an antenna for radiated interference. In addition to conducted and radiated interference consideration should be given to the effects of electrostatic discharges when handling electronic components.

Examples of commonly available equipment which might cause the above interference are as follows:

i) electrical welding sets;

ii) equipment using gas discharge devices;

iii) electrical generators or motors;

iv) motor driven household appliances.

C.7 Extraneous noise

Where detectors employing ultrasonic techniques are used consideration should be given to the influences of equipment capable of generating energy in the same energy spectrum as the detector.

EXAMPLE: telephone bells, air lines (particularly if leaking) and compressors.

C.8 Animals or pets

Where movement detectors are employed consideration should be given to the influence of animals or pets. Other types of detectors may also be affected.

C.9 Draughts

Air movements may influence the performance of movement detectors and consideration should be given to draughts when siting detectors. Ultrasonic and passive infra-red detectors are most susceptible to draughts, Ultrasonic detectors which rely on air as the medium which carries the ultrasonic energy used in the detection process, (Doppler shift) will be affected by air movement. Passive Infra-Red detectors may be affected by draughts if the draughts create a rapid temperature change close to the detector’s sensor, the rapid temperature change close to the sensor may create a thermal shock generating a spurious activation. Draughts may be created by ill-fitting doors or windows. Movement detectors may also be indirectly influenced by loose objects moving in draughts; EXAMPLE: suspended signs, curtains or plants.

C.10 Stock arrangement

When considering the siting of movement detectors consideration should be given to the possibility of stock being re-arranged to block the field of view of the detector. Consideration should also be given to the possibility of stock being dislodged and causing a spurious activation.

C.11 Structure of the supervised premises

Consideration should be given to the structure of the supervised premises. Particular consideration should be given to the construction of the roof, walls, floors and basements. When the structure uses lightweight materials particular consideration should be given to the mounting of movement detectors which may be affected by vibration. The condition and fit of doors and windows and the effect of rapid temperature changes should also be considered when selecting and siting detectors.

C.12 Special considerations

When the supervised premises are used to store or process flammable or explosive materials special consideration must be given to the suitability of equipment used in such conditions and it is recommended that specialised advice is obtained. Similarly, if a corrosive or dusty (dust may provide the fuel for an explosion in the same manner as flammable vapour) atmosphere is expected to be present, suitable equipment must be considered which is designed to operate in the prevailing or expected conditions.

EXAMPLE 1: equipment meeting the requirements of EN 50014.

Where detectors are mounted on the structure of the supervised premises to detect attack on the fabric, consideration should be given to the material used in the fabric, the use of which may not be immediately evident. When the material used in the structure changes, detectors may require a change in configuration.

EXAMPLE 2: adjustment of sensitivity, or a different type of detector may be required.

Where detectors are mounted on glazing consideration should be given to the type of glass.

EXAMPLE 3: plate, toughened or laminated, and the type and siting of detectors selected accordingly.

When siting detectors consideration should also be given to how easily the glass can be removed from its frame. Condensation can also cause problems when detectors are mounted directly onto a glazed surface as a very high temperature gradient can occur between the inside and the outside surfaces of the glass leading to the generation of condensation.

Annex D
(informative)

Location survey — Influences affecting the IAS originating outside the supervised premises

There are many factors occurring outside the supervised premises (excluding environmental conditions) which may influence the performance of an IAS. These factors should be considered when selecting the type of equipment, particularly detectors, and the siting of that equipment. Factors outside the supervised premises are, in general terms, considered to be outside the control of the user of the premises and where such conditions might adversely influence the operation of a particular item of equipment, or the whole IAS, efforts should be made to eliminate the effect of such conditions by the careful selection and siting of equipment. Examples of conditions which might adversely influence the operation of an IAS are included below.

D.1 Long term factors

Long term factors may be considered as those which are not expected to change over a considerable period i.e. over several years. These factors may include road, rail, including underground transport systems and air traffic, car parks both above and underground should also be considered. In certain countries the probability of minor earth-quakes or tremors may be a factor worth considering as may be the probability of subsidence.

D.2 Short term factors

Short term factors should also be considered, particularly the effects of building construction adjacent to the supervised premises.

D.3 Weather conditions

The prevailing and potential weather conditions which may affect the supervised premises should be considered, particularly when the premises are located in an exposed position, or on a coastal site exposed to high winds and driving rain. In certain locations the site may also be more than normally exposed to lightning strikes. In these circumstances particular care should be taken in selecting equipment with the appropriate environmental performance characteristics.

D.4 Radio frequency, interference

Where supervised premises are located close to public service radio or television transmitter masts, civil or military radar antennas, mobile telephone system base stations, emergency services transmitter masts or ham radio antennas, special consideration should be given to the EMC immunity performance of equipment to be installed. If IAS using wire-free interconnections are to be installed careful consideration should be given to the effect of other, probably more powerful transmitters, in the vicinity of the IAS.

D.5 Adjacent premises

When there are premises immediately adjacent to the premises to be supervised consideration should be given as to the activities, processes and equipment being carried out or operating in the adjacent premises. Particular care should be taken if heavy equipment is operated which might cause vibration or equipment which might generate high levels of Electro-Magnetic interference.

EXAMPLE: welding equipment.

D.6 Environmental conditions

Equipment suitable for the existing or potential environmental conditions should be used.

EXAMPLE: temperature range (maximum/minimum) or humidity.

D.7 Other conditions

Where public access is possible to the exterior structure of the supervised premises consideration should be given to activities which may be expected to occur.

EXAMPLE: children at play.

Similarly when the supervised premises is part of a larger structure, consideration should be given to activities which can be expected to occur within the adjoining parts of the building.

Annex E
(informative)

Levels of supervision

The following table is included to provide guidance to the client or specifier with regard to the type of intrusion which may be expected at various points of the supervised premises. The application guidance should be based on the risk assessed during the Location Survey and by assessing probable methods of intrusion likely to be used by intruders with differing levels of skill.

The guidance included in the table should not be regarded as a comprehensive list of all possible methods of intrusion which might be encountered, as conditions will vary from one premises to the next. Consideration may need to be given to providing supervision against methods of intrusion not included in the table. Similarly, there may be circumstances when the specifier feels that certain methods of intrusion are not applicable to all or part of the supervised premises, even though these may be included for the grade of IAS considered necessary.

The table does not attempt to set out how specifiers should design all IAS within a given grade and should be read as such. In many cases the specifier will be able to achieve the desired level of supervision for a given premises by using IAS components of different grades providing supervision against differing intrusion methods.

Table E.1 — Levels of supervision

To be considered	Grade 1	Grade 2	Grade 3	Grade 4
Perimeter doors	O	O	OP	OP
Windows		O	OP	OP
Other openings		O	OP	OP
Walls				P
Ceilings and Roofs				P
Floors				P
Room	T	T	T	T
Object (high risk)			S	S
Key: O = Opening P = Penetration T = Trap. S = Object requiring special consideration.				

Annex F
(normative)

Information to be included in the System Design Proposal

A System Design Proposal should be prepared for the attention of the client or specifier (or his/her agent) of the IAS. The proposal should include all the information necessary to enable the client or specifier to ensure the IAS is appropriate for the application. The information provided should include the following.

F.1 Client details

The name, address, and the trading name, if different from the name of the client, and any other information necessary to clearly identify the client.

F.2 Supervised premises details

The name and address of supervised premises.

Description of supervised premises.

EXAMPLE 1: type of construction, single or multi-storey.

What the premises are used for.

EXAMPLE 2: shop, factory, home.

F.3 Security grade

The grade of the proposed IAS.

The grade of any sub-systems.

F.4 Environment class

The environmental class of each system component.

F.5 Schedule of equipment

A schedule of the type and location (in words or diagrammatic form) of all equipment and a statement relating to the expected coverage of movement detectors should be provided.

F.6 System configuration

Details of the system configuration.

EXAMPLE: programming of site specific data.

F.7 Notification

Details of the proposed notification equipment, the type and location of WD and ATE and the name of the ARC or other remote centre to which signals will be transmitted.

F.8 Legislation

Details of any claims of compliance of system components or the IAS to any Local or National legislation.

EXAMPLE: noise abatement laws.

F.9 Standards

Details of any claims of compliance of system components or the IAS to any National or European Standard.

F.10 Other regulations

Details of any claims of compliance of system components or the IAS to any other regulations.

EXAMPLE: guidelines or codes of practice published by insurance companies or inspectorate bodies.

F.11 Certification

Details of any claims for certification of the components.

Details of any claims for certification of the IAS.

F.12 Intervention

Planned response to alarm activations and or faults.

EXAMPLE: police, Key-holder, intervention service, service company.

F.13 Maintenance

Recommendations for the scheduled maintenance of the IAS or particular system components including details of the frequency of any maintenance visits and a list of the work to be carried out during each visit. When serviced the IAS should be inspected and tested and adjusted to ensure correct operation. Examples of issues which should be considered when maintaining an IAS are given in Annex I.

F.14 Repair

Details of the proposed repair service to be provided including contact names and daytime and twenty four hour telephone numbers.

Annex G
(informative)

Technical survey

A Technical Survey should be carried out to confirm that the requirements included in the System Design Proposal can be achieved and also to determine the precise location of each system component and interconnection cable routes (were wired interconnections are employed). The Technical Survey should also identify any factors which might affect the reliable operation of the IAS. Examples of such factors are included below.

G.1 Interconnections

Interconnections may be achieved by using specific wiring, non-specific wiring or wireless techniques.

G.1.1 Specific wired interconnections

When specific interconnection wiring is used the factors below should be considered:

i) size and type of cable;

ii) need to conceal the cable;

iii) effects of voltage drop;

iv) isolation of IAS cables from other cables carrying high voltages. EXAMPLE: mains supplies or those carrying high frequency signals;

v) ensuring cables are mechanically secure;

vi) wherever possible install in inaccessible position to restrict tampering;

vii) the need to provide protection against mechanical damage. EXAMPLE: if less than two metres above floor level;

viii) conformance with local wiring regulations;

ix) use of adequate jointing methods e.g. junction boxes (soldering or crimping only to be used when use of a junction box is impractical);

x) need to provide tamper security to junction boxes (subject to the grade of IAS).

xi) need to employ special cabling as recommended by the equipment manufacturer;

xii) use of flexible cable loops where necessary;

xiii) need to keep cable runs inside the supervised premises whenever possible;

xiv) the need, when it is necessary to run cables outside the supervised premises/area, to provide cables with the appropriate level of tamper protection.

G.1.2 Non-specific wired interconnections

When non-specific wired interconnections are employed in addition to the factors in G.1.1 above the following factors should be considered:

i) effect of other signals using the common wiring on the operation of the IAS;

ii) effect of a fault occurring in other systems sharing the common wiring on the operation of the IAS;

iii) effect of any modification made to other systems sharing the common wiring on the operation of the IAS.

G.1.3 Wireless interconnections

When wireless interconnections are employed the factors below should be considered:

i) siting of antennas to ensure reliable communication with other system components;

ii) possibility of other RF equipment interfering with the IAS interconnection equipment;

iii) proximity of large metal objects to the equipment antenna.

G.2 General considerations for any detectors

Notwithstanding the type of detector there are issues which should be considered during the technical premises survey. Examples of such issues are included below:

i) moving objects within the range of a detector;

ii) that animals will not be within range of the detector when the IAS is set;

iii) correct selection of equipment for the environment;

iv) installation in accordance with manufacturers specification;

v) selection of detectors with adequate coverage requirements for the individual identification of electronic detectors in the event of activation;

vi) provision of test facilities to check the operation of detectors;

vii) positioning to discourage removal/disabling or tampering.

G.3 General consideration movement detectors

When movement detectors are proposed consideration should be given to issues which might influence the operation of any type of movement detector. Examples of such influences are included below:

i) requirements to detect masking of detector(s);

ii) requirements to detect significant reductions of range;

iii) need to be fixed to solid surface in a position where the field of view is unlikely to be obstructed;

iv) when installed in areas open to the public consideration should be given to ensuring the range/coverage of a detector does not extend beyond the boundary of the area to be supervised;

v) depending on the security grade that walk test indication only operates during test procedures.

G.4 Ultrasonic movement detectors

Movement detectors employing ultrasonic techniques are susceptible to particular types of influences examples of which are included below:

i) sources of extraneous (ultrasonic) noise. EXAMPLE: telephone bells, compressors, refrigerators etc;

ii) excessive draughts, or any other air movements. EXAMPLE: heating or ventilation equipment;

iii) changes in relative humidity;

iv) interaction with other ultrasonic detectors;

v) mounting height of detectors which can influence detection capability.

G.5 Microwave detectors

Movement detectors employing microwave techniques are susceptible to particular types of influences, examples of which are included below:

i) assurance that detection coverage is confined to supervised premises;

ii) EXAMPLE: no penetration of building fabric by microwave energy;

iii) liquid moving in plastic pipes;

iv) interaction with other detectors;

v) interference from fluorescent lamps;

vi) distortion of coverage pattern by metal or other reflective surfaces;

vii) movement or vibration of

   a) metal objects within the boundary of coverage of the detector. EXAMPLE: metal pipes,

   b) large metal objects outside the boundary of coverage.

G.6 Passive infra-red movement detectors

Movement detectors employing Passive Infra-red techniques are susceptible to particular types of influences, examples of which are included below:

i) objects in the field of view which can experience rapid changes of temperature, EXAMPLE: heaters, radiators;

ii) draughts across the face of a detector;

iii) direct sunlight on detectors;

iv) hot or cold air turbulence;

v) Under-floor heating;

vi) direct light on the face of a detector. EXAMPLE: car headlights, flashlights;

vii) siting of multiple element sensors only where the reference area for both elements are subject to similar temperature changes. EXAMPLE: from carpets and furniture;

viii) ingress of insects into the detector. EXAMPLE: use detectors with adequate sealing.

G.7 Multi technology devices

Multiple technology detectors may include two or more detector technologies.

EXAMPLE: Passive infra-red and Microwave.

As each is susceptible to different influences consideration should be given to any which might affect the performance of the overall detector. Examples of other issues to be considered are included below:

i) all factors relevant to each individual technology;

ii) independent test facilities for each technology;

iii) consideration of the detection pattern of both or all technologies to ensure a common detection pattern is achieved.

G.8 Vibration and seismic detector

Examples of issues which should considered when proposing vibration or seismic detectors are included below.

i) ambient vibration level;

ii) secure attachment of the detector to a smooth, solid surface;

iii) changes to the fabric, or cracks in the fabric of the structure, which might alter the detection characteristics;

iv) use of differing building materials with different vibration characteristics;

v) selection of detectors with characteristics suitable for the characteristics of the building fabric;

vi) effect of temperature changes, EXAMPLE: the expansion or contraction of building materials generating vibrations in the structure;

vii) avoidance of the ingress of water or damp into the detector or condensation on glass;

viii) testability of the detector.

G.9 Break-glass detectors (active and passive)

The performance of Break-glass detectors can be significantly affected by the type of glass being protected and the adhesive used. Examples of these and other factors which should be considered when proposing this type of detector are included below:

i) installation only on glass i.e. not on polycarbonate sheeting;

ii) reduction of performance if fitted on laminated glass or glass fitted with plastic film;

iii) installation should not be on cracked glass or glass not securely fitted to frame;

iv) adequate attachment to glazing, special care should be taken when fitting to patterned glass;

v) use of correct adhesive in accordance with manufacturers recommendations;

vi) possibility of removing glass from frame without activating the detector.

G.10 Acoustic glass-break detectors

The following issues should be considered:

i) observation of the manufacturer's requirements if used for supervising:

   a) glazing with plastic film;
   b) laminated glass;
   c) wired glass.

ii) air space between the detector and glass to be supervised, EXAMPLE: acoustically damping (soft) coverings will tend to decrease range/sensitivity;

iii) minimisation of unwanted alarms due to noises with similar characteristics to breaking glass, EXAMPLE: jangling objects (keys) or bells;

iv) the effect on performance of floor and wall coverings, EXAMPLE: acoustically reflective (hard) coverings will tend to increase range/sensitivity.

G.11 Infra-red beam interruption devices

The following issues should be considered:

i) protection against mechanical damage if necessary;

ii) only use mirrors which are supplied with the detector;

iii) avoidance of multi-path reflection not part of detector pattern;

iv) prevention of vehicle lights or sunlight falling on receivers;

v) the effect of heaters in path of the beam;

vi) avoidance of the beam passing through glass or other attenuating material.

G.12 Continuous wiring

The following issues should be considered.

i) configuration of wiring to detect the anticipated method of attack, EXAMPLE: a hand-hole or total access;

ii) secure attachment and design to prevent removal of the detection wire without activation. EXAMPLE: the use of anchor loops;

iii) installation only on a suitable surface which cannot damage the wiring;

iv) siting of detection wiring only within the supervised premises;

v) consideration of environmental conditions, EXAMPLE do not install in damp areas or on damp surfaces;

vi) protection against accidental damage. EXAMPLE: shield wires against physical damage;

vii) configuration to detect a break or short circuit;

viii) continuously monitoring for early detection of faults;

ix) attachment to surfaces in a manner which will avoid stretching.

G.13 Acoustic detectors

The following issues should be considered:

i) avoidance of acoustically noisy environments;

ii) preference of use in an acoustically hard environment;

iii) use in small areas i.e. where better performance may be expected;

iv) consideration of the effects of intermittent noises. EXAMPLE: telephone bells.

G.14 Conductive foil - General considerations

The following issues should be considered:

i) configuration of foil to detect the anticipated method of attack, EXAMPLE: total access or hand access;

ii) installation of foil only within the supervised premises;

iii) continuously monitoring for early detection of faults;

iv) avoidance of repair, i.e. if damaged, foil should be replaced;

v) consideration of methods of protecting foil against accidental damage, EXAMPLE: by window cleaners or children when proposed for shops;

vi) consideration of the suitability of the material to which the foil is to be attached and the method of fixing;

vii) assurance of detection of anticipated method of attack.

G.15 Conductive foil on glass

The following issues should be considered:

i) possibility of removing glass from the frame without creating an alarm condition;

ii) use on glass which will break cleanly. EXAMPLE: do not use on laminated glazing or polycarbonate sheeting etc;

iii) attachment to glass in accordance with manufacture's recommendations;

iv) avoidance of fitting on damaged or defective glazing. EXAMPLE: on cracked glass;

v) positioning of take-off points to avoid the effects of condensation;

vi) use of properly designed interconnections to bridge between window frame and glazing or between panes of glass.

G.16 Protective switches

The following issues should be considered:

i) positioning to detect the opening of doors or windows or the removal of objects;

ii) installation within supervised premises;

iii) consideration of the size of the opening for access or the removal of objects and positioning of switches accordingly. EXAMPLE: entry of person or entry of hand;

iv) positioning of switches in a manner which will prevent the switch operating due to the normal movement of the object to which the switch is to be attached (or the movement of the object to which the magnet is attached when magnetically operated switches are used).EXAMPLE: rattling doors or windows;

v) consideration of factors which might affect reliability or security:

   a) use of magnetically operated switches on ferrous metal structures. EXAMPLE: use non-ferrous brackets;

   b) installation in a position where the switch cannot be easily overcome. EXAMPLE: by use of thin metal strip to hold back an actuating lever;

   c) installation in a position where the switch cannot be deliberately activated. EXAMPLE: under a display item;

   d) assurance that a switch is firmly fixed;

vi) consideration of environmental conditions and selection of a switch suitable for the conditions in which it must operate. EXAMPLE: waterproof switches on roller shutters.

G.17 Capacitance detectors

The follows, issues should be considered:

i) installation in a stable environment EXAMPLE: where capacitance between the ground plane and the supervised object is not subject to rapid changes;

ii) consideration of the effect of adjacent metal objects;

iii) assurance that detection coverage is confined to the supervised object.

G.18 Pressure mats

The following issues should be considered:

i) avoidance of installation in high traffic areas.

ii) concealment of pressure mats.

iii) consideration of whether to use open or closed circuit monitoring.

iv) consideration of how replacement mats can be installed. EXAMPLE: when under fitted carpets.

v) avoidance of hazardous environmental conditions. EXAMPLE: humidity resulting in moisture forming.

vi) means of interconnection. EXAMPLE: the type of wiring used should be discreet and robust.

G.19 Taut wire

The following issues should be considered:

i) changes of temperature and humidity;

ii) installation within the supervised premises;

iii) configuration to detect anticipated method of attack.

G.20 Control and indicating equipment and power supplies

The following issues should be considered:

i) avoidance of installation in areas to which the public have access;

ii) installation within the supervised premises with easy access for maintenance;

iii) avoidance of mounting on a perimeter wall if not of substantial construction;

iv) provision of adequate indications for fault or alarm identification purposes;

v) design of entry and exit procedures to minimise unwanted alarm activations;

vi) assurance that event log capacity is consistent with the size and complexity of the IAS;

NOTE EN 50131-1 includes requirements for event recording;

vii) provision of adequate test facilities for users and those responsible for maintaining the IAS:

viii) selective walk test mode for large IAS with many detectors distributed throughout a large building;

ix) the ability to confirm which detectors have operated correctly during and following a detector test;

x) connection of the power supply to the mains network within the supervised premises;

xi) provision of a power supply solely for the use of the IAS;

xii) routing of the power supply to IAS via:

xiii) connection to the mains supply via a fused spur point (recommended for grade 3 and 4 IAS);

xiv) Connection to the mains supply via an un-switched socket dedicated to the CIE (recommended only for grade 1 and 2 IAS);

xv) provision of adequate ventilation for the power supply.

G.21 Ancillary control equipment

The following issues should be considered:

i) location consistent with ease of operation;

ii) siting to prevent observation of the operation of the keypad (if provided) by unauthorised persons unless shielded or scrambled;

iii) consideration of environmental conditions if mounted externally.

G.22 Actions to prevent inadvertent operation

The following issues should be considered:

i) inclusion of a pre-alarm warning if the IAS is activated during the entry procedure;

ii) responsibility of a single body (company or individual) for the operation of IAS installed in a multi-occupancy building;

iii) when part setting of the IAS is provided consideration of the inclusion of a pre-alarm warning if the system is activated during setting or unsetting;

iv) restriction of access to functions of the CIE which could influence the operation of the IAS to properly trained and competent personnel;

v) prevention of inadvertent access to the supervised premises when the system is set;

vi) EXAMPLE: mechanical securing of all doors to the supervised premises when the IAS is set;

vii) consideration of access via the designated entry door in the design of the entry and exit procedures.

G.23 Alarm transmission systems

The following issues should be considered:

i) concealment of alarm transmission path wiring as far as is practical;

ii) consideration of factors which might prevent the transmission of an alarm signal EXAMPLE: company switch boards (PABX);

iii) monitoring of the availability of the local alarm transmission path. EXAMPLE: monitoring the dial tone;

iv) measures to prevent incoming calls blocking the transmission of messages when the ATS equipment is connected to PSTN lines. A separate line is recommended;

v) means to prevent the inadvertent disconnection of plug-in transmission lines. EXAMPLE: a telephone socket with a locking facility;

vi) inclusion of lightning protection devices where transmission cables are run on poles adjacent to the supervised premises;

vii) installation of ATE within the supervised premises in a discreet location.

G.24 External warning devices

The following issues should be considered:

i) siting in a prominent position;

ii) accessibility to authorised personnel without compromising audibility or visibility to the general public;

iii) siting to minimise risk of accidental or intentional damage;

iv) siting to provide reasonable access for servicing (with due regard to i. to iii. above);

v) concealment of any external wiring or provision of the appropriate level of tamper protection;

vi) when two WD are provided and simultaneous attack is anticipated interconnection of the two WD and siting as far apart as possible;

vii) secure mounting to the building structure.

G.25 Internal warning device

The following issues should be considered:

i) proximity to CIE or ACE (in IAS grades 3 and 4). EXAMPLE: the WD should not be sited immediately adjacent to CIE or ACE;

ii) siting inside the supervised premises in an inaccessible position compromising audibility or visibility.

G.26 External box for retaining keys

The following issues should be considered:

i) supervision against opening and removal;

ii) concealment of external wiring or provision of the appropriate level of tamper protection.

Annex H
(informative)

Log book

Example of a log book which could be used to record events. EXAMPLE: alarm conditions (whether genuine or unwanted), faults, tests, temporary disconnections and repair visits. A brief note of any work: carried out or outstanding should be made.

Reference data:
Name and address ……

……

Responsible person: ……date……

……date……

……date……

IAS installed by: ……date……

IAS maintained by: ……date……

……

Monitored by: ……

……

Telephone number: ……should be contacted if service required.

Event data:

Date	Time	Event	Action required	Date completed	Initials

Expendable components: Replacement due:

…….. ……..

…….. ……..

Annex I
(informative)

Maintenance

I.1 Maintenance – Equipment

Equipment should be maintained in accordance with manufacturers recommendations.

I.2 Maintenance – IAS

Maintenance (inspections and test) should include the following:

i) tamper detection;

ii) setting and unsetting;

iii) entry and exit procedures;

iv) power supplies and circuits;

v) operation of detectors;

vi) operation of warning devices;

vii) operation of ATE.

Care should be taken to ensure the equipment is properly reinstated after testing.

Annex J
(informative)

Flow chart

The flow chart below describes the main processes included in the application guideline. Whilst the processes are shown individually in the flow chart, in practice some of the processes may carried out at the same time. The documentation arising out of each process is also shown.