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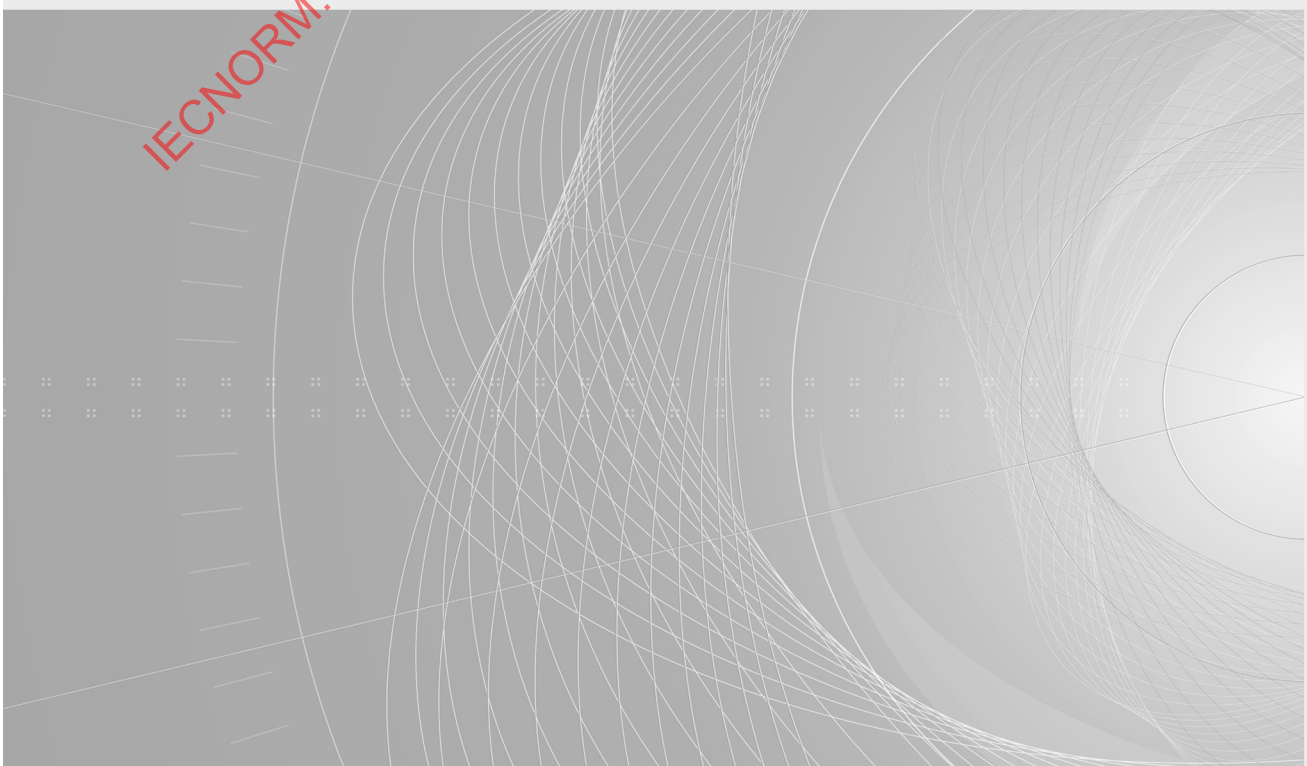
TECHNICAL SPECIFICATION

Alarm systems – Intrusion and hold-up systems – Part 7: Application guidelines



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Alarm systems – Intrusion and hold-up systems – Part 7: Application guidelines

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ALARM SYSTEMS – INTRUSION AND HOLD-UP SYSTEMS –

Part 7: Application guidelines

FOREWORD

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- the required support cannot be obtained for the publication of an International Standard, despite repeated efforts, or
- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC 62642-7, which is a technical specification, has been prepared by IEC technical committee 79: Alarm and electronic security systems.

This standard is based on EN/TS 50131-7 (2010).

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
79/315/DTS	79/332/RVC

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

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

A list of all parts of the IEC 62642 series can be found, under the general title: *Alarm systems – Intrusion and hold-up systems*, on the IEC website.

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

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

This part 7 of the IEC 62642 series of standards gives requirements for intrusion and hold-up alarm systems. The other parts of this series of standards are as follows:

Part 1 System requirements
Part 2-2 Intrusion detectors – Passive infrared detectors
Part 2-3 Intrusion detectors – Microwave detectors
Part 2-4 Intrusion detectors – Combined passive infrared / microwave detectors
Part 2-5 Intrusion detectors – Combined passive infrared / ultrasonic detectors
Part 2-6 Intrusion detectors – Opening contacts (magnetic)
Part 2-71 Intrusion detectors – Glass break detectors – Acoustic
Part 2-72 Intrusion detectors – Glass break detectors – Passive
Part 2-73 Intrusion detectors – Glass break detectors – Active
Part 3 Control and indicating equipment
Part 4 Warning devices
Part 5-3 Interconnections – Requirements for equipment using radio frequency techniques
Part 6 Power supplies
Part 7 Application guidelines
Part 8 Security fog devices/systems

In order to insure the consistency of the whole IEC 62642 series, the terminology is defined at one place that is the master document IEC 62642-1 that gives general requirements concerning the intrusion system. Exception is made for specific terms to installation and where repetition is deemed essential for the clarity of this document.

A number of requirements are contained in this standard for which a formal test procedure can only be written by defining (and hence restricting) the technology by which the requirement is achieved. Accordingly, it has been recognised that such functions can be tested only by agreement between installers and test house, according to documented information relating to how the required functionality has been achieved.

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

These application guidelines are set out in the logical order in which an I&HAS 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 K describes in the form of a flowchart the main processes and documentation included in this application guideline.

Those responsible for the design, installation planning, system installation, commissioning, operation and maintenance of I&HAS should be conversant with other International Standards relating to I&HAS, 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.

a) Clause 7 – System design

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

b) Clause 8 – Installation planning

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

c) Clause 9 – System installation

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

d) Clause 10 – Inspection, functional testing and commissioning

In this clause, guidance is given on issues arising after I&HAS has been installed. The clause is intended to ensure I&HAS 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.

e) Clause 11 – Documentation and records

This clause describes the documentation which should be provided to the client on completion of I&HAS. The documents are intended to provide a history of modifications to I&HAS, based on the as-fitted document, prepared when I&HAS 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 I&HAS. The record should also include details of temporary fault conditions.

f) Clause 12 – Operation of I&HAS

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

g) Clause 13 – Maintenance and repair of I&HAS

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

ALARM SYSTEMS –
INTRUSION AND HOLD-UP SYSTEMS –

Part 7: Application guidelines

1 Scope

This Technical Specification provides guidance on the design, planning, operation, installation, commissioning and maintenance of intrusion and hold-up alarm system (I&HAS) installed in buildings. Requirements for I&HAS are specified in IEC 62642-1:2010.

The recommendations of this Technical Specification (TS) also apply to intruder alarm system (IAS) and hold-up alarm system (HAS) when these systems are installed independently.

When an I&HAS does not include functions relating to the detection of intruders, the requirements relating to intrusion detection do not apply.

When an I&HAS does not include functions relating to hold-up, the requirements relating to hold-up do not apply.

NOTE 1 Unless otherwise stated, the abbreviation I&HAS is also intended to mean IAS and HAS.

These application guidelines are intended to assist those responsible for establishing an I&HAS to ascertain the appropriate design of I&HAS 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 I&HAS of any size and complexity. These application guidelines should be read in conjunction with IEC 62462-1:2010.

NOTE 2 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 I&HAS.

2 Normative references

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

IEC 62642-1:2010, *Alarm systems – Intrusion and hold-up systems – Part 1: System requirements*

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

3.1.2
alarm receiving centre
continuously manned centre to which information concerning the status of one or more I&HAS is reported

3.1.3
alarm company
organization which provides services for I&HAS

3.1.4
alarm condition
condition of an I&HAS, or part thereof, which results from the response of the system to the presence of a hazard

3.1.5
alarm system
electrical installation which responds to the manual or automatic detection of the presence of a hazard

3.1.6
alarm transmission system
equipment and network used to transfer information concerned with the state of one or more I&HAS to one or more alarm receiving centre

NOTE Alarm transmission systems exclude local direct connections, i.e. interconnections between parts of an I&HAS which do not require an interface to transform I&HAS information into a form suitable for transmission.

3.1.7
ancillary control equipment
equipment used for supplementary control purposes

3.1.8
as-fitted document
document in which details of I&HAS as actually installed are recorded

3.1.9
control and indicating equipment
equipment for receiving, processing, controlling, indicating and initiating, the onward transmission of information

3.1.10
commissioning
putting an I&HAS into operational mode

3.1.11
client
individual or corporate body responsible for acquiring the I&HAS

3.1.12
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

3.1.13
documentation
paperwork (or other media) prepared during the design, installation, commissioning and handover of I&HAS recording details of the I&HAS

3.1.14
entry/exit route
route by which authorized entry or exit to the supervised area or part thereof may be achieved

3.1.15
equipment schedule
list of equipment to be installed or actually installed

3.1.16
fault condition
condition of an alarm system which prevents an I&HAS or parts thereof from functioning normally

3.1.17
entry/exit point
point at which the user enters or leaves the supervised premises

EXAMPLE Entrance door to supervised premises

3.1.18
hold-up alarm system
alarm system providing the means for a user to deliberately generate a hold-up alarm condition

3.1.19
hold-up device
device which when triggered causes a hold-up alarm signal or message to be generated

3.1.20
hold-up alarm condition
condition of an alarm system, or part thereof, which results from the response of an I&HAS to the triggering of a hold-up device

3.1.21
inhibit
status of a part of an I&HAS in which an alarm condition cannot be notified, such status remaining until I&HAS or part thereof is unset

3.1.22
installation company
company responsible for installing the I&HAS

3.1.23
installation plan
document describing the methodology to be followed during the installation of the I&HAS

3.1.24
installer
individual or individuals responsible for carrying out the installation process

3.1.25
intruder alarm system
alarm system to detect and indicate the presence, entry or attempted entry of an intruder into supervised premises

3.1.26
interconnection
means by which messages and/or signals are transmitted between I&HAS components

3.1.27
isolation
status of a part of an alarm system in which an alarm condition cannot be notified, such status remaining until deliberately cancelled

3.1.28
non-specific wired interconnection
interconnection conveying information pertaining to two or more applications

3.1.29
normal condition
state of an I&HAS system where no conditions exist which would prevent the setting of the I&HAS

3.1.30
notification
passing of an alarm, tamper or fault condition to warning devices and/or alarm transmission systems

3.1.31
operational mode
state of an alarm system when it is complete, commissioned and ready for use

3.1.32
part set
status of an I&HAS in which an intruder alarm condition can be notified but part of I&HAS is unset

3.1.33
power supply
that part of an alarm system which provides power for I&HAS or any part thereof

3.1.34
response authority
designated authority with responsibility for attending the supervised premises following an alarm and taking the appropriate action

3.1.35
set
status of an I&HAS or part thereof in which an alarm condition can be notified

3.1.36
specific wired interconnection
interconnection conveying information pertaining to one application

3.1.37
specifier
individual or corporate body responsible for stipulating the requirements I&HAS will be required to meet

3.1.38
subsystem
that part of an I&HAS located in a clearly defined part of the supervised premises capable of independent operation

3.1.39
supervised premises
part of a building and/or area in which an intrusion, attempted intrusion, or the triggering of a hold-up device may be detected by an I&HAS

3.1.40
supervised premises transceiver
equipment at the supervised premises, including the interface to the alarm system and the interface to the alarm transmission network

3.1.41
system components
individual items of equipment which constitute an I&HAS when configured together

3.1.42
system record
history of maintenance, faults, repair or modifications to the IAS

EXAMPLE A log book.

3.1.43
tamper
deliberate interference with an I&HAS or part thereof

3.1.44
tamper alarm
alarm generated by tamper detection

3.1.45
tamper condition
condition of an I&HAS in which tampering has been detected

3.1.46
tamper protection
methods or means used to protect an I&HAS or part thereof against deliberate interference

3.1.47
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

3.1.48
unset
status of an I&HAS or part thereof in which an alarm condition cannot be notified

3.1.49
user
person authorized to operate an I&HAS

3.1.50
unknown alarm
alarm for which the cause cannot be positively identified

3.1.51
unwanted alarm
alarm conditions not generated by an intrusion or attempted intrusion into the supervised premises

3.1.52
warning device
device that gives an audible alarm in response to a notification

NOTE A warning device may also provide alert indications providing such indications are easily distinguishable from an alarm.

3.1.53
wire-free interconnection
interconnection conveying information between I&HAS components without physical media

3.1.54
zone
assessed area of a supervised premises where an intrusion, attempted intrusion, or the triggering of a hold-up device may be detected by an I&HAS

3.2 Abbreviations

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

ACE	ancillary control equipment
APS	alternative power source
ARC	alarm receiving centre
ATS	alarm transmission system
CIE	control and indicating equipment
HAS	hold-up alarm system(s)
I&HAS	intrusion and hold-up alarm system(s)
IAS	intruder alarm system(s)
PIR	passive infra-red
PS	power supply
SPT	supervised premises transceiver
WD	warning device

4 Security grade of I&HAS

The security grade of I&HAS will depend upon the performance required as determined during the risk assessment and location survey.

An I&HAS may include I&HAS components of differing grades when divided into clearly defined sub-systems. When I&HAS 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, e.g. control and indicating equipment, alarm transmission system, warning devices and power supplies.

IEC 62642-1:2010 describes four security grades which should be considered when selecting equipment. These are as follows.

NOTE In all grades the term “intruder” is intended to embrace other types of threat (e.g. robbery or the threat of physical violence, which might influence the design of an I&HAS).

Grade 1 – Low risk

An intruder or robber is expected to have little knowledge of I&HAS and be restricted to a limited range of easily available tools.

Grade 2 – Low to medium risk

An intruder or robber is expected to have a limited knowledge of I&HAS and the use of a general range of tools and portable instruments (e.g. a multi-meter).

Grade 3 – Medium to high risk

An intruder or robber is expected to be conversant with I&HAS and have a comprehensive range of tools and portable electronic equipment.

Grade 4 – High risk

This grade is to be used when security takes precedence over all other factors. An intruder or robber is expected to have the ability or resource to plan an intrusion or robbery in detail and have a full range of equipment, including means of substitution of components in an I&HAS.

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.

NOTE 1 Classes I, II, III and IV are progressively more severe and therefore Class IV components may, for example, be used in Class III I&HAS.

NOTE 2 Annex A includes special national conditions for specified countries.

IEC 62642-1:2010 defines four environmental classes as shown below.

5.1 Environmental Class I – Indoor

Environmental influences normally experienced indoors when the temperature is well maintained (e.g. in a residential or commercial property).

NOTE Temperatures may be expected to vary between +5 °C and +40 °C.

5.2 Environmental Class II – Indoor – General

Environmental influences normally experienced indoors when the temperature is not well maintained (e.g. in corridors, halls or staircases and where condensation can occur on windows and in unheated storage areas or warehouses where heating is intermittent).

NOTE Temperatures may be expected to vary between –10 °C and +40 °C.

5.3 Environmental Class III – Outdoor – Sheltered or indoor extreme conditions

Environmental influences normally experienced out of doors when I&HAS components are not fully exposed to the weather or indoors where environmental conditions are extreme.

NOTE Temperatures may be expected to vary between –25 °C and +50 °C.

5.4 Environmental Class IV – Outdoor – General

Environmental influences normally experienced out of doors when I&HAS components are fully exposed to the weather.

NOTE Temperatures may be expected to vary between –25 °C and +60 °C.

6 General

I&HAS 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 I&HAS is expected to operate.

6.1 Other components

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

6.2 Electrical safety

National or regional 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 regional standards.

6.3 Unwanted alarms

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

6.4 Responsibility

Responsibility for each individual stage in the process of supplying an I&HAS, 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 planning, system installation, maintenance and repair of I&HAS should hold appropriate qualifications.

NOTE These qualifications required may vary from country to country.

6.6 Competence

Persons responsible for risk assessment and the design, installation planning, system installation, maintenance and repair of I&HAS should have the necessary training and experience.

6.7 Tools

Persons responsible for installation planning, system installation, commissioning, maintenance, repair and inspection of I&HAS should have the appropriate tools and test equipment.

6.8 Confidentiality

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

6.9 Consultation

The design of a system should be determined in consultation with the client or specifier of I&HAS (or their representative) and any other interested parties, e.g. insurers or police.

When considered necessary, expert advice should be obtained.

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

6.10 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, e.g. with the manufacturer, supplier, a test house or another third party.

7 System design

The objectives of the system design stage are to determine the extent of I&HAS and select components of the appropriate functionality/performance criteria, grade and environmental classification and to prepare a system design proposal, e.g. number and type of detectors and their location.

7.1 Location survey – Risk

An assessment of the premises to be supervised should be carried out to determine the required grade of the I&HAS.

7.1.1 Contents

The contents at risk within the supervised premises should be considered when determining the design of the I&HAS. Annex B 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 and robbery history of the supervised premises should be considered when designing an I&HAS. 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.

7.1.3 Minimum supervision levels for IAS

The level of supervision required will be influenced by the factors described in Annexes B and C. 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 methods of intrusion to be considered are shown, by grade, in Annex F.

7.1.4 Minimum supervision levels for HAS

Hold-up devices should only be installed when the need for such devices has been established by a risk assessment, i.e. not installed as “addition” to an IAS.

Consideration should be given to selecting the type of notification appropriate to the risk.

Consideration should be given to the consequences of activation of a WD following the triggering of a hold-up device.

The level of supervision required will be influenced by the factors described in Annexes B and C.

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 I&HAS. Conditions which may influence the operation of I&HAS fall into two categories:

- those conditions occurring within the supervised premises over which the user of I&HAS may be reasonably 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;
- those conditions occurring outside the supervised premises over which the user cannot reasonably be expected to exercise control. Annex E 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 8.4) 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 G.

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

Where standards for a system component do not exist, it is permitted to use components not having a grade or class. In such circumstances, the grade of the system will be the grade of the lowest graded component.

7.3.2 Siting of equipment

7.3.2.1 Siting of CIE and ACE

CIE should be sited within the supervised area. Where an I&HAS 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 I&HAS setting any sub-system(s) should also set the sub-system supervising the area in which the CIE is located. Depending of the type of setting/unsetting the ACE – or parts of the ACE – may be located outside of the supervised area.

Examples of issues to be considered when siting CIE and ACE are shown in Clauses H.21 and H.22.

When unsetting is to be started 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 SPT

SPT should be sited within the supervised area. Where an I&HAS is divided into sub-systems of different grades, the SPT should be within the area supervised by the sub-system with the highest grade. Examples of issues to be considered when siting SPT are shown in Clause H.24.

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 I&HAS design. Examples of issues to be considered when siting detectors are shown in Annex H.

7.3.2.4 Siting of hold-up devices

Hold-up devices should be sited in compliance with the manufacturer's recommendations and to provide a high chance to trigger these in a case of hold-up or threat. Examples of issues to be considered when siting hold-up devices are shown in Clause H.20.

7.3.2.5 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 minimise 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 suitable tamper protection, e.g. enclosed in metal conduit.

Operation of a warning device may be suppressed in the event of the operation of a hold-up device.

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 suitable tamper protection, e.g. 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 system 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.

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 mechanically protected, e.g. 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 higher rated voltage and by screening.

Interconnection wiring should not be run in the same conduit or trunking as cables carrying high voltage, e.g. 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, e.g. 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 H.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 I&HAS. 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 H.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 I&HAS. Such transmissions may result in I&HAS generating tamper or fault conditions or prevent the interconnections functioning correctly. Examples of issues to be considered when specifying wireless interconnections are included in H.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 started 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. I&HAS should not set until I&HAS is in a normal condition. I&HAS may allow certain limited conditions preventing setting to be overridden.

In case the setting is started within the supervised premises and completed outside the supervised premises, such completion should be performed e.g. by locking the entry/exit point door, and signal of such locking is transmitted to CIE (e.g. mechanical switch operated by the latch of the lock).

NOTE 8.3.6 of IEC 62642-1:2010 includes requirements relating to overriding certain conditions and 8.3.10 and 8.3.11 of IEC 62642-1:2010 permit the inhibiting and isolation of function respectively.

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

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

7.3.4.2 Unsetting

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

Consideration should be given to preventing physical access to the supervised premises, via the entry/exit point, until either the entry procedure has been started or I&HAS has been unset.

When unsetting is started outside the supervised premises and completed inside the supervised premises, an indication should be provided when the unsetting procedure is started and when unsetting is completed. When unsetting of I&HAS is to be performed entirely outside the supervised premises, an indication should be provided when I&HAS 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.

NOTE 8.3.8.2 of IEC 62642-1:2010 specifies a maximum period of 45 s permitted to complete the unsetting procedure.

7.3.5 Entry and exit routes

When setting or unsetting of I&HAS 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 started at the CIE or ACE and completed at the entry/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/exit route and immediately outside the entry/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 I&HAS should not set until I&HAS is in the normal condition.

7.3.5.1 Exit routes

When a detector that is 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 that is 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 IEC 62642-1:2010. 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 detector including processing capability, e.g. movement, vibration, acoustic or infra-red beam detectors.

Not more than ten detectors not including a processing capability may share a common means of indication, e.g. magnetic or mechanical contacts.

7.3.7 Grouping of detectors

Individual detectors may be identified individually or 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 IEC 62642-1:2010. Depending on the grade of I&HAS 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.

Consideration should be given to enabling the sound of I&HAS 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 10 min 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 SPT and an ARC. Care should be taken to ensure the ARC can accept signals from the SPT to be installed and process all signals correctly.

7.3.9 Power supplies

Care should be taken to ensure power supplies used in I&HAS are adequate for the load under both normal and alarm conditions including when the APS is being recharged.

When power is normally derived from a mains supply with an alternative power source (APS) as backup, care should be taken to ensure the capacity of the alternative power source is capable of powering the I&HAS, for the required standby period as specified in IEC 62642-1:2010.

The electrical load of I&HAS should be measured with the system in the normal, i.e. non-alarm, condition and the information recorded in the as fitted document.

The maximum electrical load should also be measured when I&HAS is in an alarm condition, i.e. when WD(s) are operating and SPT(s) transmitting and the information recorded in the as fitted document.

The APS should be capable of powering I&HAS for the period specified in Table 23 of IEC 62642-1:2010 in both normal and alarm condition.

Where the APS is a battery, allowance should be made for loss of capacity during the lifetime of the battery and when the current drawn exceeds the manufacturer's "20-hour" discharge rate.

7.3.10 Response to I&HAS

The planned response (intervention) following the activation of I&HAS should be clearly agreed and documented between the parties.

8 Installation planning

8.1 General

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

8.2 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.

8.3 Environmental considerations

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

8.4 Technical survey

To ensure the performance of I&HAS 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 I&HAS provides the performance specified in the system design proposal. Examples of issues, which should be considered during a technical survey, are included in Annex H.

NOTE Depending on the size and complexity of the planned I&HAS 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 I&HAS or may be carried out independently.

8.4.1 Operation of I&HAS

The technical survey should consider the operation of the system, particularly setting and unsetting procedures, to ensure operation of I&HAS is as simple as possible.

8.4.2 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.

8.4.3 Interconnections

Interconnection requirements should be considered and the means specified in the system design proposal verified.

8.4.4 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.

8.5 Installation plan and equipment schedule

Subject to the size and complexity of the planned I&HAS consideration should be given to preparing an installation plan. The installation plan should be based on the system design proposal and consider any issues identified in the technical 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 (if any) and duration periods.

The installation plan should include an equipment schedule detailing all equipment to be installed including cable (if any).

9 System installation

The system should be installed and configured in accordance with the system design proposal. Any deviations from the system design proposal 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 I&HAS to confirm I&HAS has been installed in accordance with the system design proposal and the installation plan (if prepared). Any deviations from the system design proposal 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 detectors may also require final adjustment prior to commissioning.

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

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

10.3 Commissioning

On completion of the tests I&HAS should be placed into operational mode.

10.4 Handover

Handover of I&HAS to the user should be carried out by a person with the appropriate training and experience.

A full demonstration of I&HAS should be provided including the operation of detectors, the use of hold-up devices 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 I&HAS. These instructions should be provided to all users responsible for operating the I&HAS.

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

The training should emphasize how unwanted alarms can be avoided, e.g. 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 I&HAS it is recommended that I&HAS is tested for a period to be agreed with the client. During this period I&HAS 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 I&HAS should be fully commissioned.

10.6 Acceptance

Following the successful completion of the test period, where applicable the ARC should be informed that I&HAS 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 I&HAS 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 I&HAS.

10.7 As-fitted document

Documentation should be prepared, based upon the system design proposal, amended to reflect any changes to I&HAS design found to be necessary during the installation process. The as-fitted document should be an accurate record of the installed I&HAS including all information relating to the equipment installed and its location. If warranted by the size and complexity of I&HAS 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 I&HAS has been installed in compliance with the as-fitted document.

When the I&HAS, or any components of the I&HAS, are claimed to comply with any legislation, regulation(s), or national or regional 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 I&HAS require modification, repair or maintenance. The client or user should also ensure the documentation is kept up to date. Where applicable the documentation should be prepared in accordance with IEC 61082-1:

- as-fitted document;
- system operating instructions;
- operating instructions should be provided in sufficient detail to minimise the possibility of misoperation. 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, inhibiting or testing;
  - detailed instruction covering all the other functions of the I&HAS;
- 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 I&HAS, 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 I&HAS;
- 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 system record should be provided to record any information necessary to ensure I&HAS 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 I&HAS.

The system records may be recorded in any medium or at a location remote from the supervised premises providing it is easily accessible to persons maintaining the I&HAS. An example of the items to be recorded and the format of a system record (log book), which could be located at the supervised premises, are shown in Annex I.

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 I&HAS 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 I&HAS

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

a) ensure that only individuals trained to operate the system are allowed to operate it and that I&HAS is operated in accordance with operational instructions and training,

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

c) report any defects in I&HAS promptly to the responsible alarm company,

d) report any changes to the construction or to the use of the premises which might adversely influence the performance of the I&HAS,

e) maintain the relevant documents and records.

13 Maintenance and repair of I&HAS

13.1 General

It is the client's responsibility to arrange for I&HAS 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 I&HAS. 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 J.

13.2 Inspection and servicing

13.2.1 Maintenance routine

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

The user of I&HAS should be informed of those parts of the system that will be inoperable during maintenance.

Any batteries should be replaced at intervals not exceeding the battery and equipment manufacturers 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 system record, e.g. log book.

13.2.2 Prevention of unwanted alarms during routine testing

It is important to ensure when maintaining an I&HAS that maintenance operations do not result in the generation of an unwanted alarm. Special care should be taken when testing hold-up devices because of the high risk of false alarms.

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 I&HAS 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 I&HAS the user should immediately inform the organisation or individual responsible for the maintenance and repair of I&HAS so that any necessary remedial action may be taken. The time within which repair of I&HAS will commence, following a request to the organisation or individual responsible for carrying out the repairs, should be agreed.

Annex A
(informative)

Special national conditions

Special national condition: National characteristic or practice that cannot be changed even over a long period, e.g. climatic conditions, electrical earthing conditions.

NOTE If it affects harmonization, it forms part of the Technical Specification.

For the countries in which the relevant special national conditions apply, these provisions are normative, for other countries they are informative.

Subclause	Special national condition
5.4	**Denmark, Finland, Norway, Sweden.** I&HAS components shall operate correctly when exposed to environmental influences normally experienced out of doors when I&HAS components are fully exposed to the weather. Temperatures may be expected to vary between –40 °C and +60 °C with average relative humidity of approximately 75 % non-condensing. For 30 days per year relative humidity can be expected to vary between 85 % and 95 % non-condensing.

Annex B
(informative)

System design – Location survey – Contents

When considering the design of an I&HAS 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.

B.1 Type

Ease of disposal.

Attraction to burglar.

Danger of robbery.

B.2 Value

Maximum probable value of a single loss.

Consequential costs of loss.

Sentimental value.

B.3 Bulk or size

Ease of removal and transport.

Ease of disposal/sale.

Ease of access to the supervised premises.

B.4 Theft and robbery history

Methods of attack used in previous thefts and robberies.

B.5 Danger

To the environment.

Of misuse of the contents.

To persons.

B.6 Damage

Vandalism of contents.

Risk of arson to content.

Annex C
(informative)

Systems design – Location survey – Building

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

C.1 Construction

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

C.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.

C.3 Occupancy

a) Whether the supervised premises are unoccupied for extended periods;
b) the presence of security guards;
c) whether the public has access to the supervised premises.

C.4 Keyholding

Availability of key-holders to respond to the I&HAS.

C.5 Locality

a) Whether the supervised premises are located in a high crime risk area;
b) the presence of adjacent building or structures which might aid an attacker;
c) the speed and quality of response to the I&HAS;
d) the proximity or otherwise of adjacent occupied premises.

C.6 Existing security

a) The quality and extent of any existing physical security devices;
b) the quality and extent of any existing I&HAS.

C.7 Theft, robbery and threat history

a) The number of previous thefts, robberies and threats at the supervised premises;
b) the methods of attack, robbery or threat used during any previous thefts.

C.8 Local legislation or regulation

a) Safety requirements which might influence the design of the I&HAS;
b) fire regulations which might influence the design of the I&HAS;
c) building construction which might influence the design of the I&HAS.

C.9 Security environment

a) Whether the building is located in an urban area;
b) whether the building is located in a rural area.

Annex D
(informative)

Location survey – Influences affecting I&HAS originating within the supervised premises

There are many factors occurring within the supervised premises which may influence the performance of an I&HAS. 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 I&HAS, efforts should be made to eliminate such conditions. Examples of conditions which might adversely influence the operation of an I&HAS are included below.

D.1 Water pipes

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

D.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.

D.3 Suspended signs or other objects

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

EXAMPLE Curtains or plants.

D.4 Lifts

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

D.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 electromagnetic 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.

D.6 Electromagnetic interference

All electrical equipment is capable, either deliberately or inadvertently, of generating electromagnetic interference which might influence the operation of I&HAS 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:

a) electrical welding sets;

b) equipment using gas discharge devices;

c) electrical generators or motors;

d) motor driven household appliances.

D.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.

D.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.

D.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.

D.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.

D.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.

D.12 Special considerations

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, e.g. 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 and construction of glass, e.g.: float glass, toughened or laminated glass and whether or not there is double glazing. The type and siting of detectors should be 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.

D.13 HAS risk of false alarm

Special consideration should be given to siting the hold-up devices to minimize unwanted alarms, e.g. by children.

Annex E
(informative)

Location survey – Influences affecting I&HAS originating outside the supervised premises

There are many factors occurring outside the supervised premises (excluding environmental conditions) which may influence the performance of an I&HAS. 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 I&HAS are included below.

E.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.

E.2 Short term factors

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

E.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.

E.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 I&HAS 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 I&HAS.

E.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, e.g. welding equipment.

E.6 Environmental conditions

Equipment suitable for the existing or potential environmental conditions should be used, e.g. temperature range (maximum/minimum) or humidity.

E.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, e.g. children at play.

Similarly when the supervised premises are 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 F
(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 I&HAS considered necessary.

If there exists a risk of threat to persons, the IAS should be extended to include hold-up devices.

The levels of supervision shown in Table F.1 are included as examples to be considered. In many cases the designer will need to consider examples from different grades to achieve the desired level of supervision for a given premises.

Table F.1 – Levels of supervision

To be considered	Grade 1	Grade 2	Grade 3	Grade 4
Perimeter doors	O	O	O+P	O+P
Windows		O	O+P	O+P
Other openings		O	O+P	O+P
Walls				P
Ceilings and roofs				P
Floors				P
Room	T	T	T	T
Object (high risk)			S	S

Key

O = Opening

P = Penetration (i.e. supervision of structures to detect intrusion or an attempted intrusion)

S = Object requiring special consideration

T = Trap (i.e. supervision of selected areas where there is a high probability of detection)

Annex G
(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 I&HAS. The proposal should include all the information necessary to enable the client or specifier to ensure I&HAS is appropriate for the application. The information provided should include the following.

G.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.

G.2 Supervised premises details

The name and address of supervised premises.

Description of supervised premises, e.g. type of construction, single or multi-storey.

What the premises are used for, e.g. shop, factory, home.

G.3 Security grade

The grade of the proposed I&HAS.

The grade of any sub-systems.

G.4 Environment class

The environmental class of each system component.

G.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.

G.6 System configuration

Details of the main system functions, including setting/unsetting and part set (functional specification).

G.7 Notification

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

G.8 Legislation

Details of any claims of compliance of system components or I&HAS to any local or national legislation, e.g. noise abatement laws.

G.9 Standards

Details of any claims of compliance of system components or I&HAS to any national or regional standard.

G.10 Other regulations

Compliance of system components or I&HAS to any other regulations, e.g. issued by insurance companies or inspectorates.

G.11 Certification

Details of any claims for certification of the components.

Details of any claims for certification of the I&HAS.

G.12 Intervention

Planned response to alarm activations and or faults, e.g. police, key-holder, intervention service, service company.

G.13 Maintenance

Recommendations for the scheduled maintenance of I&HAS 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 I&HAS should be inspected and tested and adjusted to ensure correct operation. Examples of issues which should be considered when maintaining an I&HAS are given in Annex I.

G.14 Repair

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

Annex H
(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 (where wired interconnections are employed). The technical survey should also identify any factors which might affect the reliable operation of the I&HAS. Examples of such factors are included below.

H.1 Interconnections

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

H.1.1 Specific wired interconnections

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

a) size and type of cable;

b) need to conceal the cable;

c) effects of voltage drop;

d) isolation of I&HAS cables from other cables carrying high voltages;

EXAMPLE 1 Mains supplies or those carrying high frequency signals.

e) ensuring cables are mechanically secure;

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

g) the need to provide protection against mechanical damage;

EXAMPLE 2 If less than two metres above floor level.

h) conformance with local wiring regulations;

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

j) need to provide tamper security to junction boxes (subject to the grade of IAS);

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

l) use of flexible cable loops where necessary;

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

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

H.1.2 Non-specific wired interconnections

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

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

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

c) effect of any modification made to other systems sharing the common wiring on the operation of the I&HAS.

H.1.3 Wireless interconnections

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

a) siting of antennas to ensure reliable communication with other system components;
b) possibility of other RF equipment interfering with I&HAS interconnection equipment;
c) proximity of large metal objects to the equipment antenna.

H.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:

a) correct selection of equipment for the environment;
b) installation in accordance with manufacturers specification;
c) selection of detectors with adequate coverage requirements for the individual identification of electronic detectors in the event of activation;
d) provision of test facilities to check the operation of detectors;
e) positioning to discourage removal/disabling or tampering.

H.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:

a) moving objects within the range of a motion detector;
b) that animals will not be within range of the motion detector when I&HAS is set;
c) requirements to detect masking of detector(s);
d) requirements to detect significant reductions of range;
e) need to be fixed to solid surface in a position where the field of view is unlikely to be obstructed;
f) 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;
g) that walk test indication only operates during maintenance or test procedures.

H.4 Ultrasonic movement detectors

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

a) sources of extraneous (ultrasonic) noise, e.g. telephone bells, compressors, refrigerators etc;
b) excessive draughts, or any other air movements, e.g. heating or ventilation equipment;
c) changes in relative humidity;
d) interaction with other ultrasonic detectors;
e) mounting height of detectors which can influence detection capability.

H.5 Microwave detectors

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

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

EXAMPLE No penetration of building fabric by microwave energy.

b) liquid moving in plastic pipes;
c) interaction with other detectors;
d) interference from fluorescent lamps;
e) distortion of coverage pattern by metal or other reflective surfaces;
f) movement or vibration of
   1) metal objects within the boundary of coverage of the detector, e.g. metal pipes,
   2) large metal objects outside the boundary of coverage.

H.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:

a) objects in the field of view which can experience rapid changes of temperature;

EXAMPLE 1 Heaters, radiators.

b) draughts across the face of a detector;
c) direct sunlight on detectors;
d) hot or cold air turbulence;
e) under-floor heating;
f) direct light on the face of a detector;

EXAMPLE 2 Car headlights, flashlights.

g) siting of multiple element sensors only where the reference area for both elements are subject to similar temperature changes;

EXAMPLE 3 From carpets and furniture.

h) ingress of insects into the detector;

EXAMPLE 4 Use detectors with adequate sealing.

H.7 Multi technology devices

Multiple technology detectors may include two or more detector technologies, e.g. 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:

a) all factors relevant to each individual technology;
b) independent test facilities for each technology;
c) consideration of the detection pattern of both or all technologies to ensure a common detection pattern is achieved.

H.8 Vibration and seismic detector

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

a) ambient vibration level;

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

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

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

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

f) effect of temperature changes;

EXAMPLE The expansion or contraction of building materials generating vibrations in the structure.

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

h) testability of the detector.

H.9 Break-glass detectors

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:

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

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

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

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

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

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

H.10 Acoustic glass-break detectors

The following issues should be considered:

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

1) glazing with plastic film,

2) laminated glass,

3) wired glass;

b) air space between the detector and glass to be supervised;

EXAMPLE 1 Acoustically damping (soft) coverings will tend to decrease range/sensitivity.

c) minimisation of unwanted alarms due to noises with similar characteristics to breaking glass;

EXAMPLE 2 Jangling objects (keys) or bells.

d) the effect on performance of floor and wall coverings.

EXAMPLE 3 Acoustically reflective (hard) coverings will tend to increase range/sensitivity.

H.11 Infra-red beam interruption devices

The following issues should be considered:

a) protection against mechanical damage if necessary;
b) only use mirrors which are supplied with the detector;
c) avoidance of multi-path reflection not part of detector pattern;
d) prevention of vehicle lights or sunlight falling on receivers;
e) the effect of heaters in path of the beam;
f) avoidance of the beam passing through glass or other attenuating material.

H.12 Continuous wiring

The following issues should be considered:

a) configuration of wiring to detect the anticipated method of attack;
   EXAMPLE 1 A hand-hole or total access.
b) secure attachment and design to prevent removal of the detection wire without activation;
   EXAMPLE 2 The use of anchor loops.
c) installation only on a suitable surface which cannot damage the wiring;
d) siting of detection wiring only within the supervised premises;
e) consideration of environmental conditions;
   EXAMPLE 3 Do not install in damp areas or on damp surfaces.
f) protection against accidental damage;
   EXAMPLE 4 Shield wires against physical damage.
g) configuration to detect a break or short circuit;
h) continuously monitoring for early detection of faults;
i) attachment to surfaces in a manner which will avoid stretching.

H.13 Acoustic detectors

The following issues should be considered:

a) avoidance of acoustically noisy environments;
b) preference of use in an acoustically hard environment;
c) use in small areas i.e. where better performance may be expected;
d) consideration of the effects of intermittent noises.
   EXAMPLE Telephone bells.

H.14 Conductive foil – General considerations

The following issues should be considered:

a) configuration of foil to detect the anticipated method of attack;
   EXAMPLE 1 Total access or hand access.
b) installation of foil only within the supervised premises;
c) continuously monitoring for early detection of faults;
d) avoidance of repair, i.e. if damaged, foil should be replaced;
e) consideration of methods of protecting foil against accidental damage;
   EXAMPLE 2 By window cleaners or children when proposed for shops.
f) consideration of the suitability of the material to which the foil is to be attached and the method of fixing;
g) assurance of detection of anticipated method of attack.