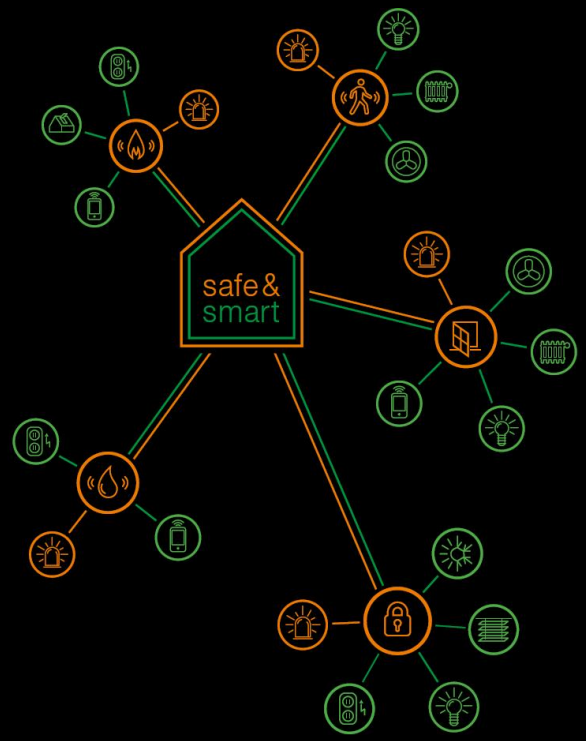


ABB Stotz-Kontakt GmbH

ABB safe&smart
Project planning of security systems

Power and productivity
for a better world™

Project planning of security systems
Content

- Introduction
- Preventing unauthorized access by perimeter surveillance
- Monitoring unauthorized access by indoor surveillance
- Protecting persons against technical hazards
- Setting of the alarm system
- Security and alarming modes
- Additional hints
- Disclaimer

Project planning of security systems
Introduction

First requirement for a failure-free and effective security system is a detailed project planning.

- Security systems are used
  - to prevent or monitor unauthorized access in buildings
  - to protect persons against
    - hold-up
    - technical hazards
- Security systems should alarm and/or call help in case of emergency
- False alarms have to be avoided!

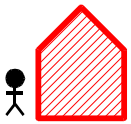
Project planning of security systems
Different security modes depending on user presence

Security mode		User presence
Unset		**User is at home**
Internally set		
Externally set		**User is absent**

Preventing unauthorized access by perimeter surveillance

Project planning of security systems
Security and alarming modes





Security mode / Surveillance method	Unset	Internally set	Externally set	Integration in building control
Perimeter surveillance		Internal alarm	External alarm	HVAC
Indoor movement detection			External alarm	Lighting
Technical detector	Internal alarm	Internal alarm	Technical alarm	Detector depending control setting
Hold-up signal	External alarm	External alarm		
Panic signal	Internal alarm	Internal alarm		
Protection against tampering for all system components	Internal alarm	Internal alarm	External alarm	
Lock monitoring*	As a precondition for setting			

*no alarm sensor!

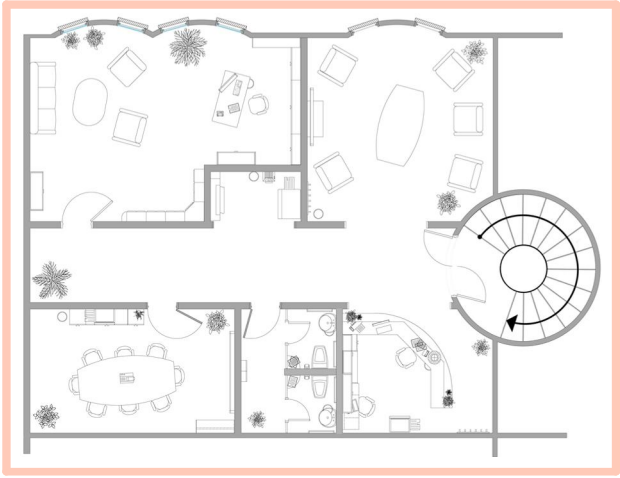
Project planning of security systems
Preventing unauthorized access by perimeter surveillance

Perimeter surveillance:

Surveillance of all doors, openings, windows and other entrys

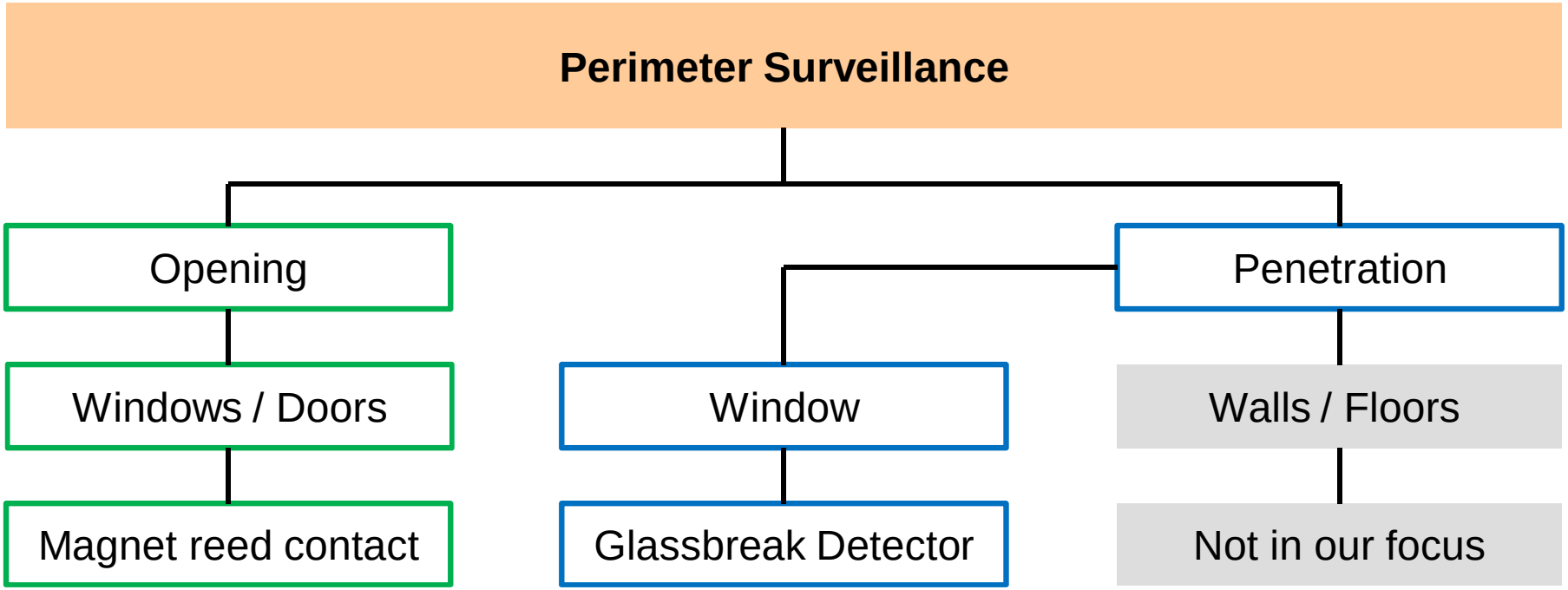
Possible surveillance functions:

- Opening
- Penetration / Glass break

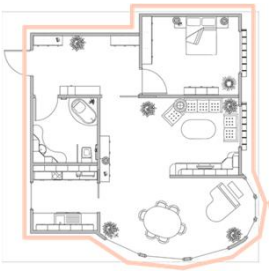


- Check the numbers and the material of the doors
- Check the numbers, material and type of the windows (how to open, size of the glass surface, ...)

Project planning of security systems
Perimeter Surveillance - Summary



Project planning of security systems
Levels of perimeter surveillance according to EN 50131



	Grade 1	Grade 2	Grade 3	Grade 4
Level	**Low risk**	**Low to medium risk (private)**	**Medium to high risk (commercial)**	**High risk**
Perimeter doors	Opening	Opening	Opening and penetration	Opening and penetration
Windows		Opening	Opening and penetration	Opening and penetration
Other openings		Opening	Opening and penetration	Opening and penetration
Walls				Penetration
Ceilings and roofs				Penetration
Floors				Penetration
Rooms/halls	Trap	Trap	Trap	Trap

Project planning of security systems
Products for perimeter surveillance

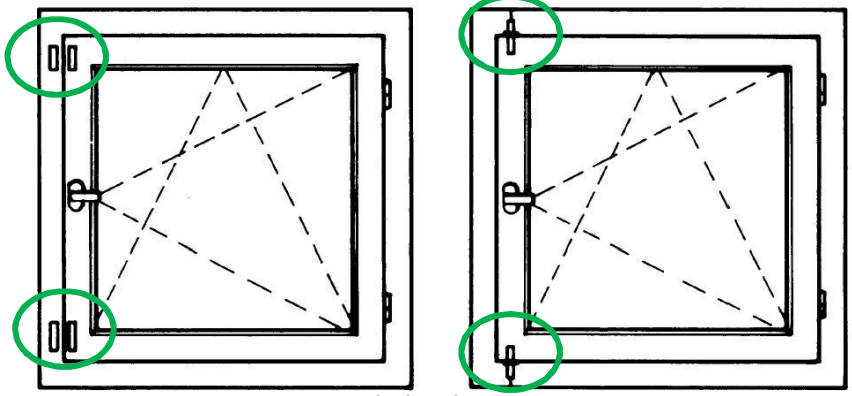
What is monitored	What is the monitored event	What is used for monitoring	Note
Doors and windows	Opening	Magnetic reed contacts	Drill hole or flush mounting in or on the window frames
	Glass break	Glass break sensors	Mounted on the glass surface

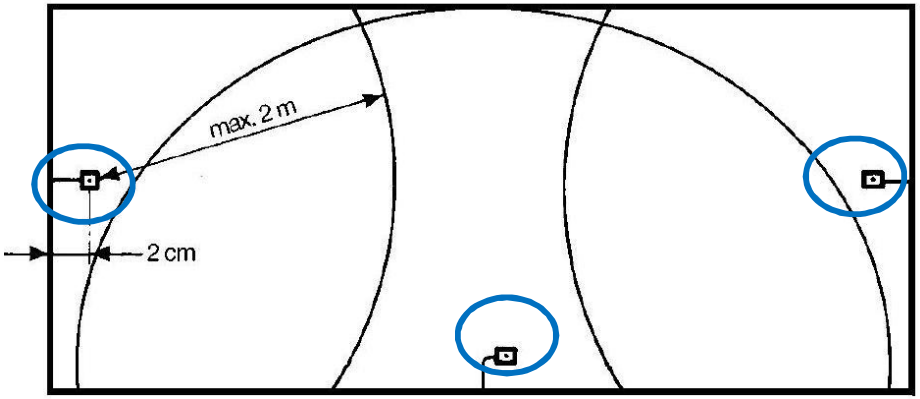
Magnetic reed contact

Symbol: ■

Glass break sensor

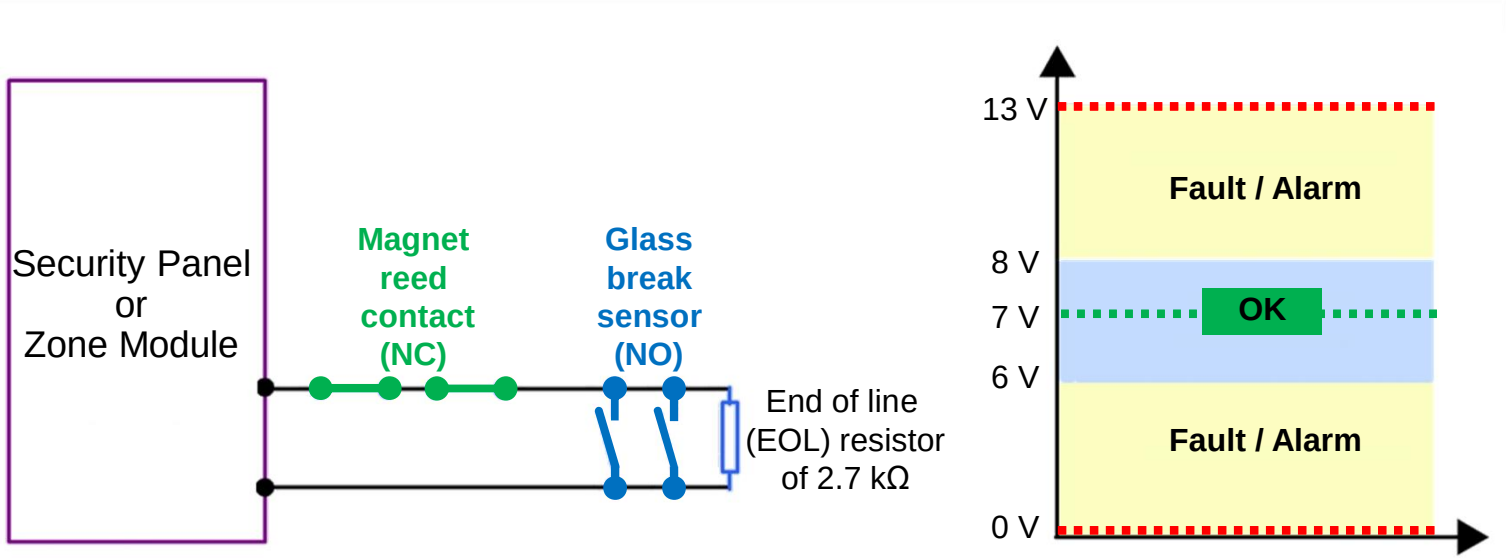
Symbol:



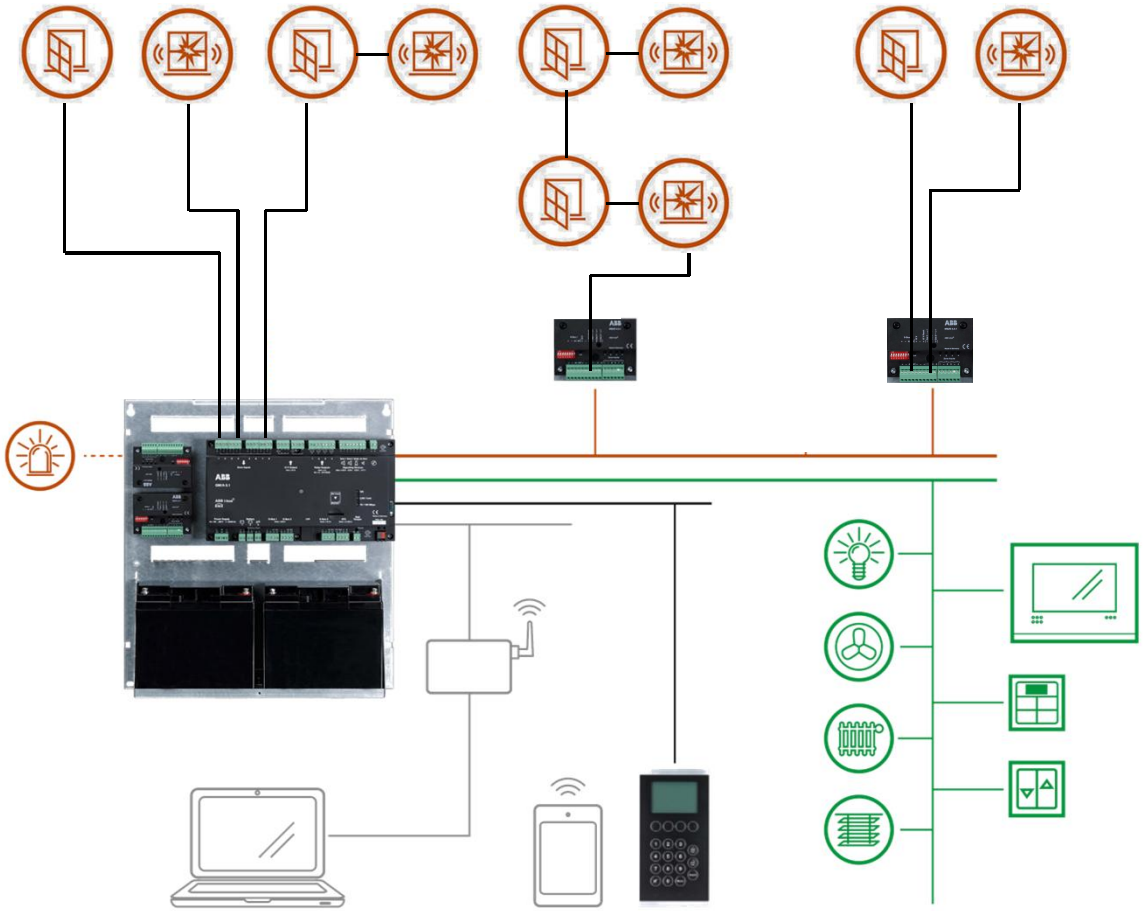


Project planning of security systems
Perimeter Surveillance - Installation

- Normally, a defined voltage is present at the input of the panel; an end of line resistor (2.7 kOhm) is used as a voltage divider
- A measurable change in this voltage occurs when there is a short-circuit or open-circuit on the line



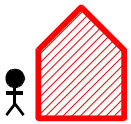
Project planning of security systems
Perimeter Surveillance – Installation example



Monitoring unauthorized access by indoor surveillance

Project planning of security systems
Security and alarming modes





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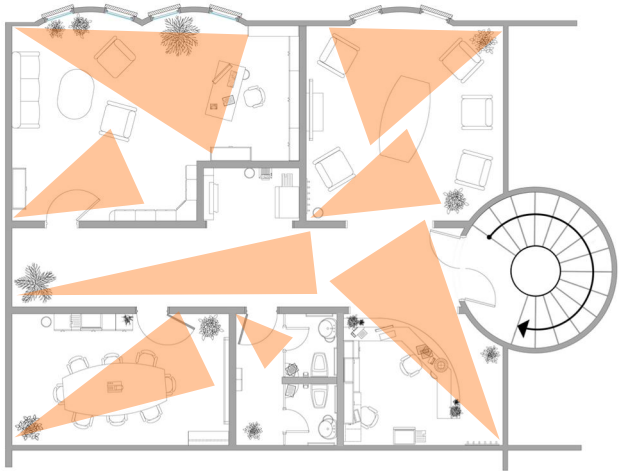
Project planning of security systems
Monitoring unauthorized access by indoor surveillance

Indoor surveillance

Detection of movements within enclosed rooms

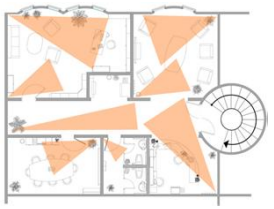
Possible surveillance functions:

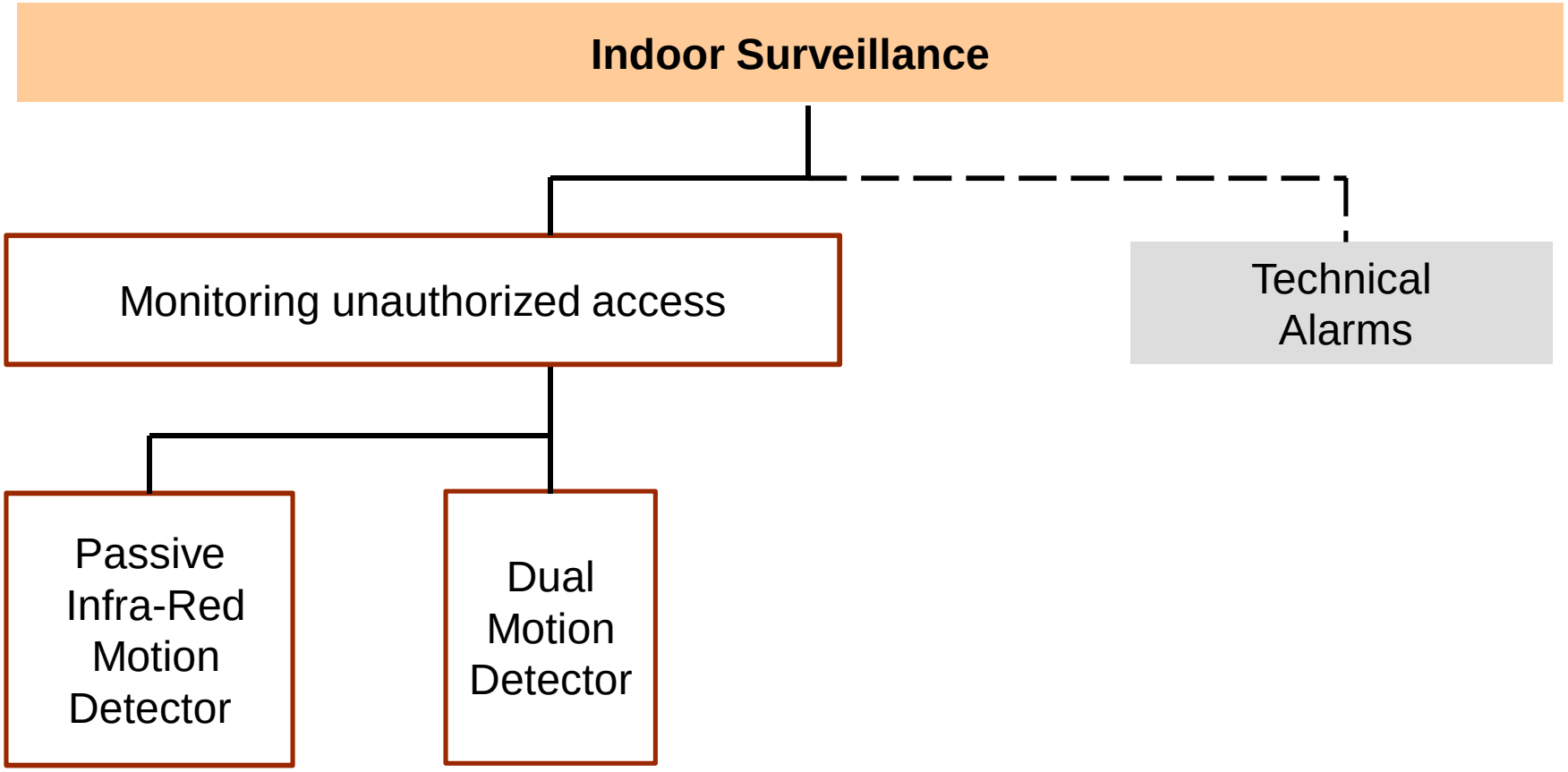
- Detection of movements



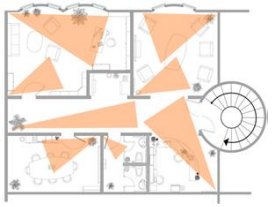
- Check the numbers of rooms or areas you want to observe

Project planning of security systems
Indoor surveillance - Summary





Project planning of security systems
Levels of perimeter surveillance according to EN 50131



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Walls				Penetration
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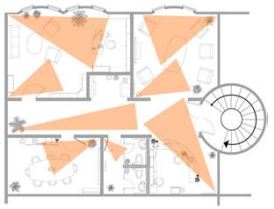
Floors				Penetration
Rooms/halls	Trap	Trap	Trap	Trap

Project planning of security systems
Indoor surveillance

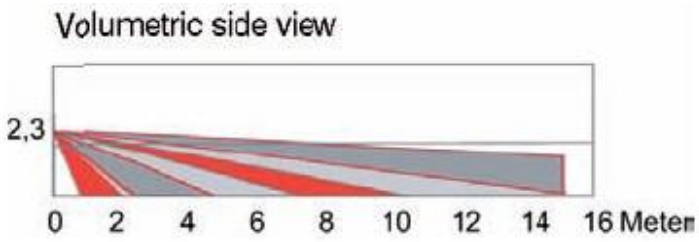


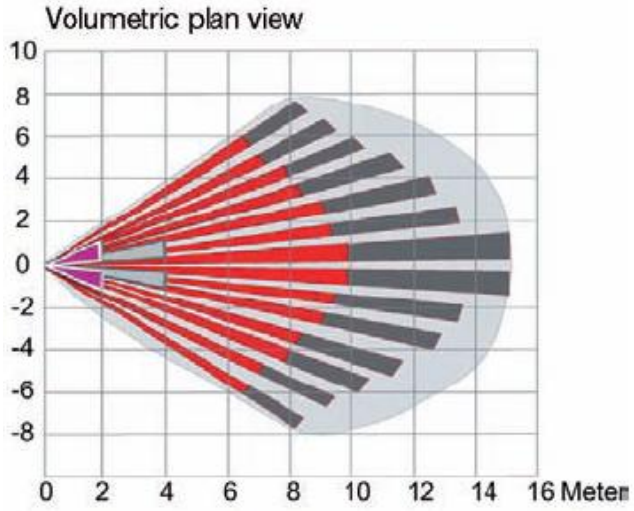
What is monitored	What is the monitored event	What is used for monitoring	Note
Rooms and halls	Detection of motion	Motion detectors	▪ Observe sources of interference! Heating and air-conditioning (temperature differences) ▪ Mounting in room corners ▪ Do not mount in the direction of windows

Symbol:

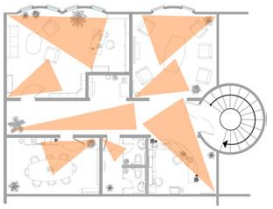
infrared det.

dual det.

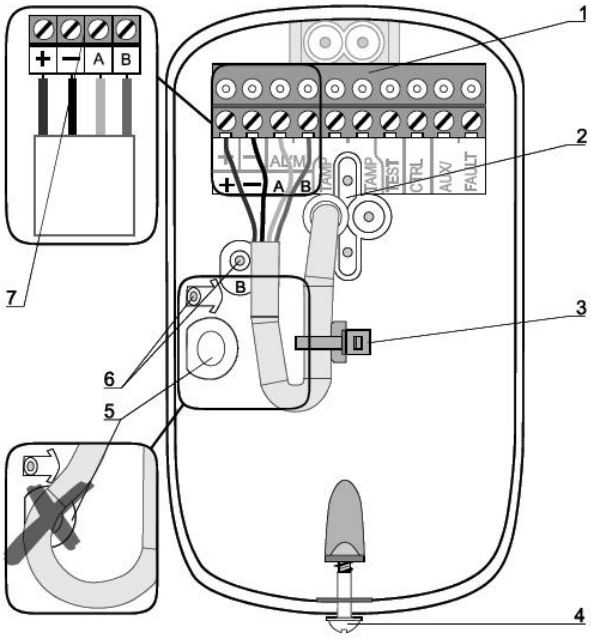




Project planning of security systems
Indoor surveillance - Installation

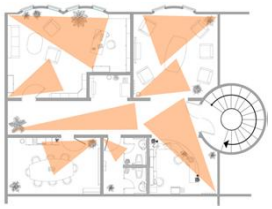


- For conventional wiring to zone inputs or direct connection to the Security-Bus (S-Bus 1) of the intrusion alarm panel
- The detector features an alarm memory, a remote controlled walking test and an “under voltage” monitoring

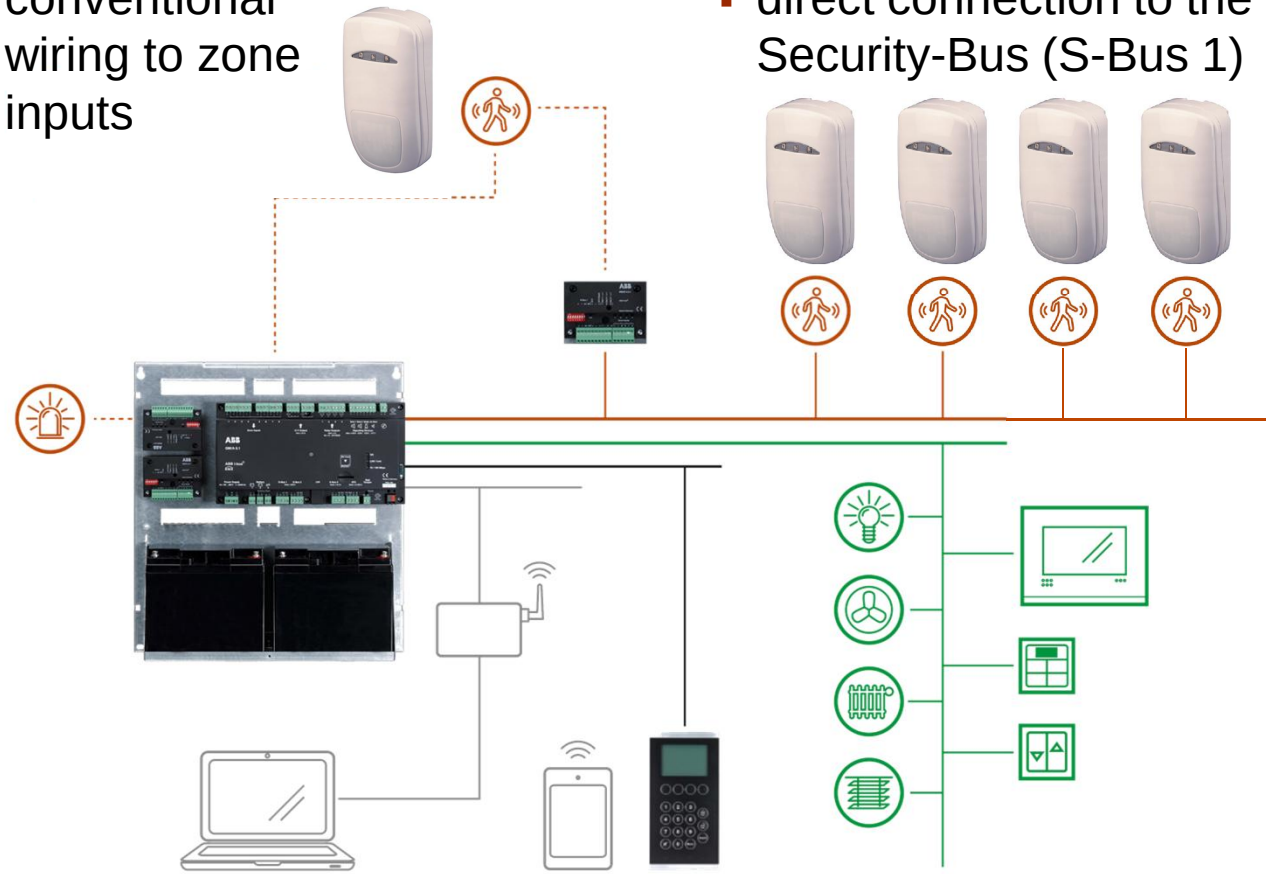


1 = terminal block
2 = cable entry point
3 = cable attachment point for cable tie
4 = cover screw (loosen only – do not remove)
5 = observe cable entry
6 = position of mounting screws for wall – or corner mounting.
(Use is mandatory in conjunction with the off the wall tamper cup detection)
7= Connection to the Security-Bus (S-Bus 1)

Project planning of security systems
Perimeter Surveillance – Installation example



- conventional wiring to zone inputs
- direct connection to the Security-Bus (S-Bus 1)



Project planning of security systems
Possible sources for false alarms

Be aware of some possible sources for false alarms when selecting the mounting position of Movement Detectors:

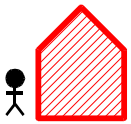
- Water pipes
- Heating, ventilation and air conditioning
- Suspended signs
- Light tubes
- Electromagnetic emissions
- Pets, animals, insects
- Air turbulences
- Mobile devices, cargo goods
- Building structure, vibrations,
- Environmental conditions (Temperature, humidity)

The false alarms can result from fast temperature changes or changed environmental conditions.

Protecting persons against technical hazards

Project planning of security systems
Security and alarming modes





Surveillance method \ Security mode	Unset	Internally set	Externally set	Integration in building control
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Lock monitoring*	As a precondition for setting			

*no alarm sensor!

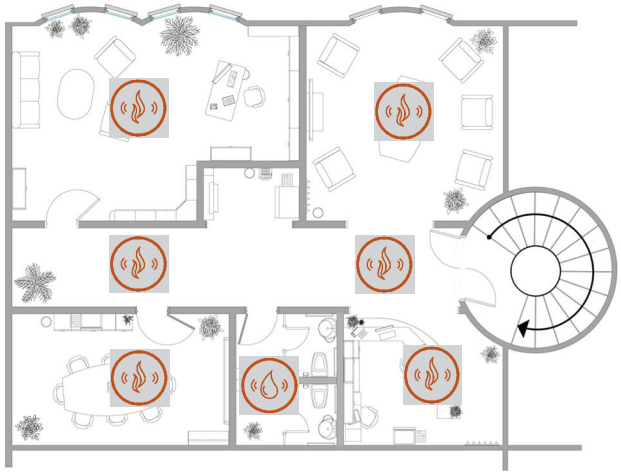
Project planning of security systems
Protecting people against technical hazards

Indoor surveillance

Detection of technical hazards within enclosed rooms

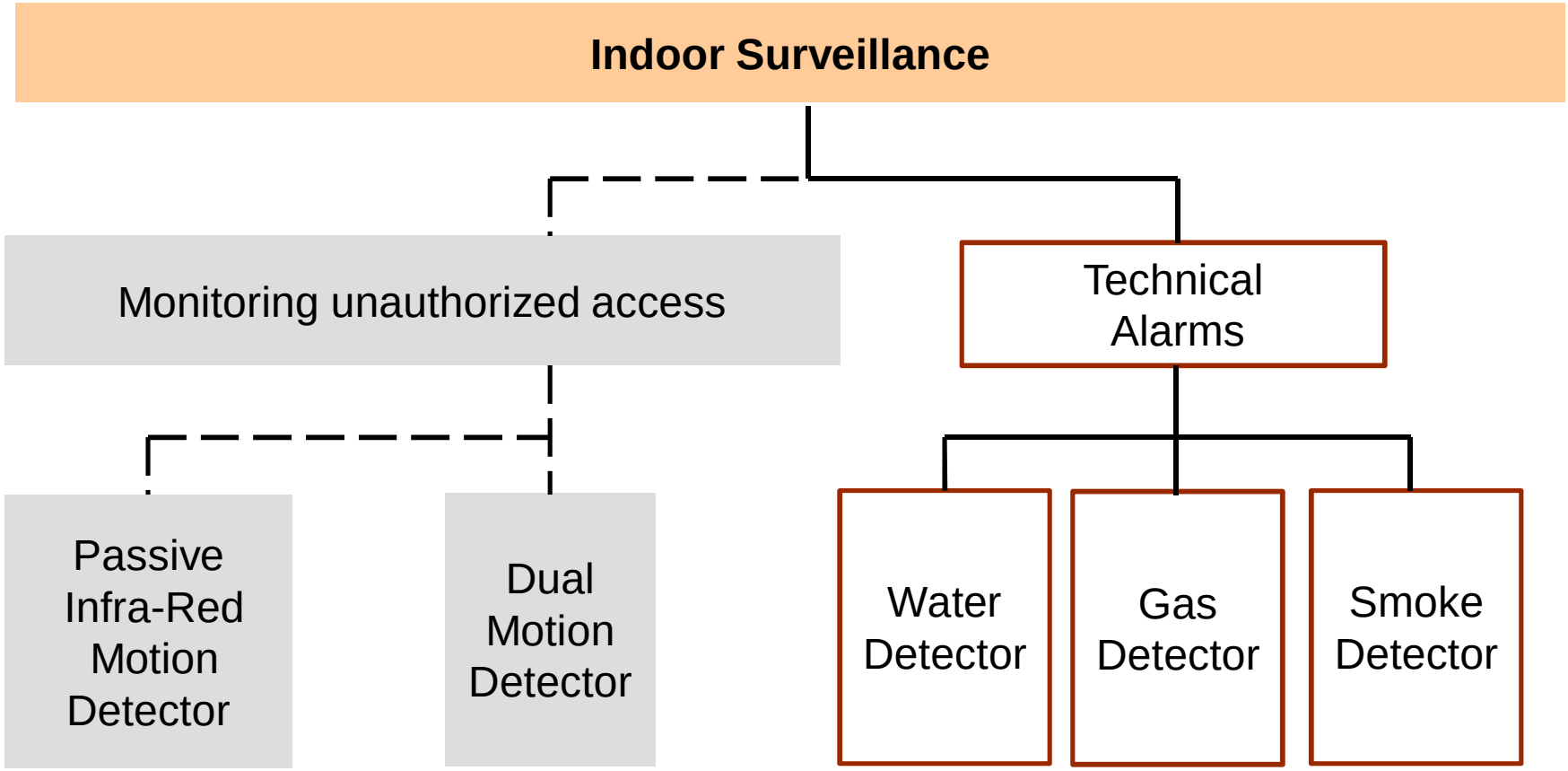
Possible surveillance functions:

- Detection of fire/smoke
- Detection of water
- Detection of gas



- Check the numbers of rooms or areas you want to observe
- An internal alarm will sound when these detectors are activated
- Detection of technical hazards is always active

Project planning of security systems
Indoor surveillance - Summary



Project planning of security systems
Monitoring of technical hazards

What is monitored	What is used for monitoring	Note
Water leak	Water detector	
Gas Leak	Gas detector	Observe installation location! (light and heavy gasses)
Occurance of smoke	Optical smoke detector	Not in kitchen/bathroom/sauna
Occurance of heat	Thermal maximum detector	For heat detection only

smoke and heat det.

Symbol:

optical

thermal

water det.

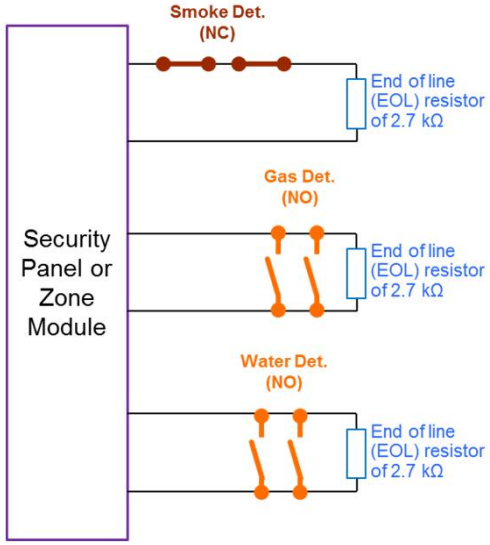
Symbol:

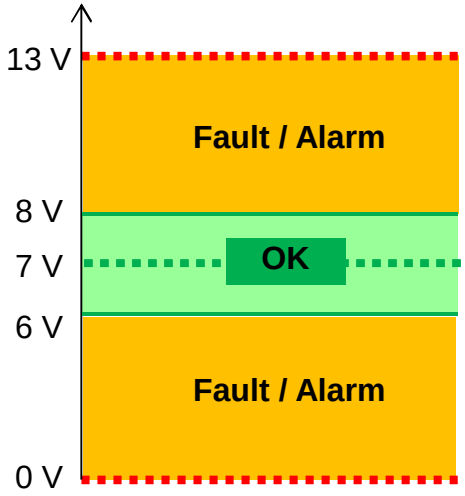
gas det.

Symbol:

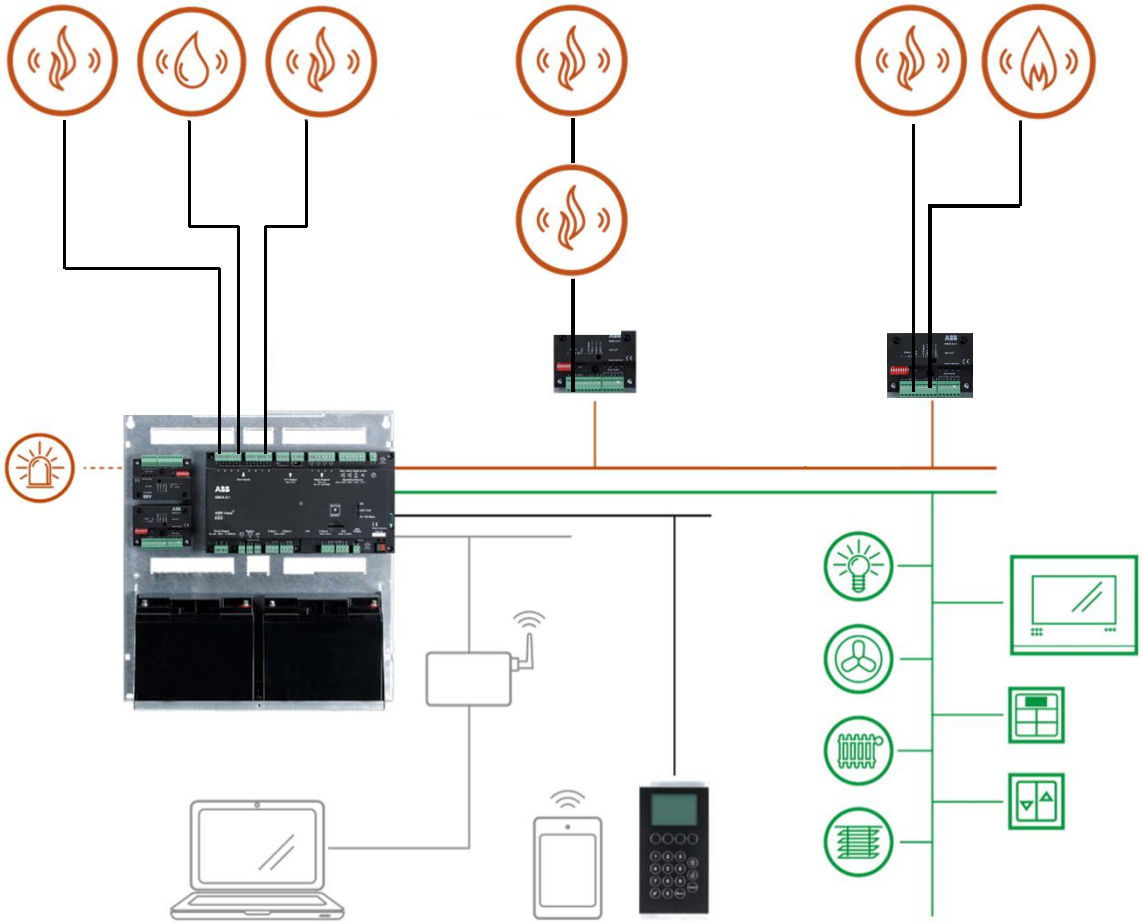
Project planning of security systems
Monitoring of technical hazards - Installation

- Normally, a defined voltage is present at the input of the panel; an end of line resistor (2.7 kOhm) is used as a voltage divider
- A measurable change in this voltage occurs when there is a short-circuit or open-circuit on the line
- Please use different zones for each kind of technical alarm





Project planning of security systems
Monitoring of technical hazards
Installation example



Setting of the alarm system

Project planning of security systems
Security and alarming modes

Security mode	User presence	Setting devices
Unset	User is at home	
Internally set		
Externally set	User is absent	
- Direct		
- Delayed		

Note: Lock monitoring of windows and doors is a useful precondition for setting.
A lock monitoring contact can prevent the setting process, but does not cause an alarm!

Project planning of security systems
Lock monitoring – As a precondition for setting

- Are windows and doors closed and locked?

What is monitored	What is the monitored event	What is used for monitoring	Note
Doors	Locking of the door	Lock bolt switching contact	Installation in the door strike plate
Windows	Closing of the window	Non-contact operation of the reed contact by separate permanent magnet	Installation in the window surround

Lock bolt switching contact

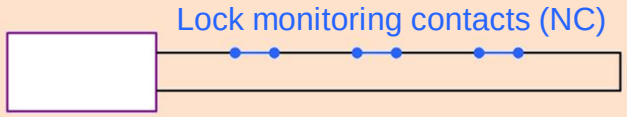
Symbol: 

Window Lock Monitoring Contact

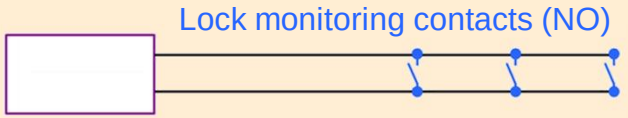
Electromechanical bolt lock

Project planning of security systems
Lock Monitoring - Installation

- Lock monitoring contacts are connected to the Security Panel or to a Zone Module via a non-monitored line
- There are two variants, which can be used:



- Closed circuit types are closed in the normal state
- Setting process is possible, if all contacts are closed
- Setting process is prevented, if at least one contact is open



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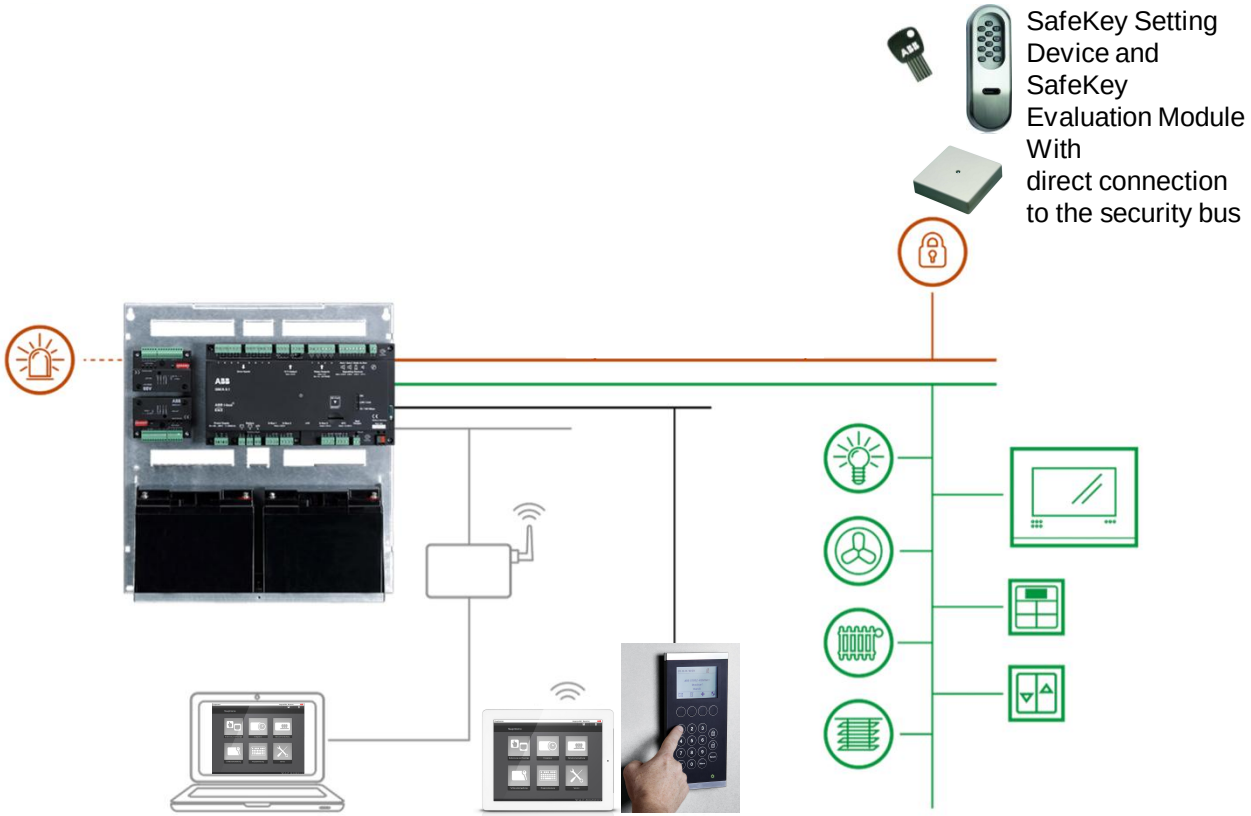
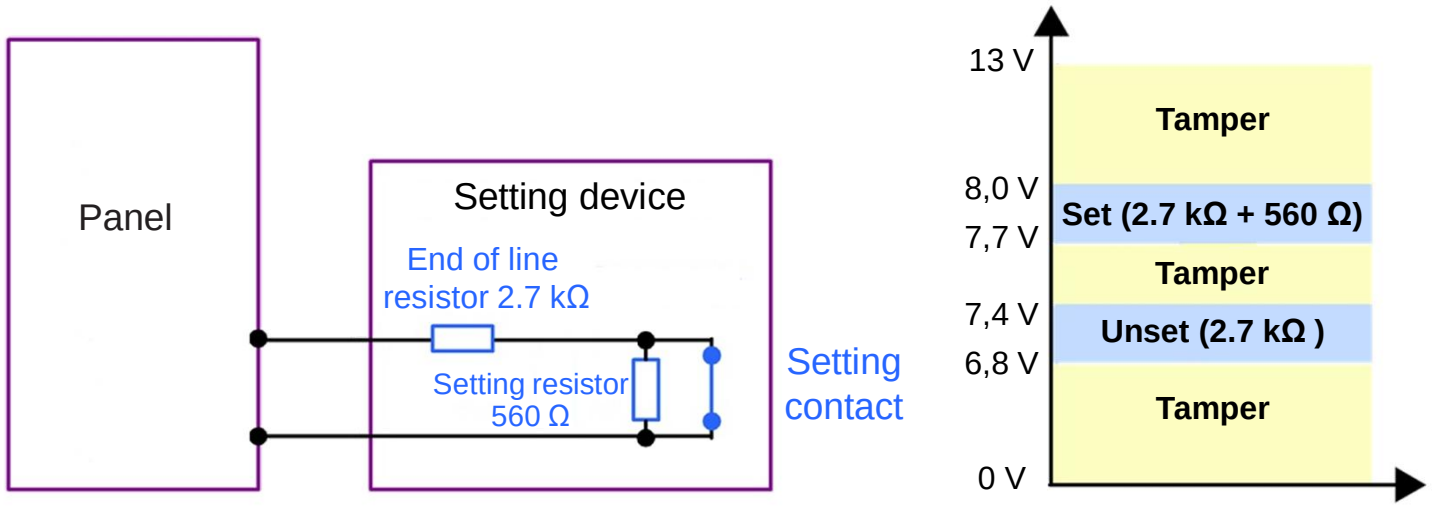
Project planning of security systems
Setting of the Alarm System - Installation



Project planning of security systems
Setting devices – Installation of conventional devices

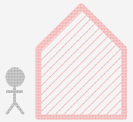
Additional information

- The setting line is used, on the one hand, to set an area of the security system and, on the other, to detect manipulation (tampering) of the setting unit
- Three states (set, unset and tamper) can be created through the parallel switching of a 560 Ohm resistor with the setting contact



Security and alarming modes

Project planning of security systems
Security and alarming modes



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Project planning of security systems
Security and alarming modes

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Project planning of security systems
Security and alarming modes

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Project planning of security systems
Alarming devices

Type of alarming	What is used for alarming	Note
Internal alarming with occupancy	Internal siren, keypad	
External alarming with absence	External siren with/without strobe light	Height at least 3 m from the ground
Remote alarming (silent alarm)	Dialling device with voice output	

Symbol: 

internal siren

Symbol:  acustic

 optical

external siren

Additional hints

Project planning of security systems
Additional hints for the planning process

- Observe exactly the objects conditions and consider especially the constructional weaknesses (windows, doors,…)
- Control any unauthorized access options to the object (balconies, trees, garage roofs)
- Define the different detector zones (peripheral and interior protection zones, technical zones, panic attack, tamper zone, etc.)
- Define the wires run (please note: power lines, air ducts, cavity walls, etc.), length and numbers of conductors

Project planning of security systems
Additional hints for the installation

- All components mounted within the supervised area
- Tamper contacts of outdoor devices required (Siren, SafeKey) (for EN 50131 Grade 2)
- Tamper contacts of all devices (for EN 50131 Grade 3 and 4)
- Resetting a tamper alarm only for system integrator (Access Level 3)
- Max. 10 contacts per detector circuit
- Installation of cables within supervised area
- Overvoltage protection
- Panel and dialler within the area of a detector

Project planning of security systems
Additional hints for the conversation with the customer

- Clarify the risks of intrusion with your customer and his insurance company
- Clarify with the customer if after the installation of the security system the constructional, furniture or technical conditions (cabinets, partitions, heaters, air-conditioning, curtains, etc.) may change regularly
- Ask the customer about his wishes and/or behaviors regarding security and alarming modes (delayed setting, panic detector, local alarming, silent alarming, location of the components)
- Consider areas, which should not be monitored at customers option. Make a note of this options.

Project planning of security systems
Additional hints: Handover to the customer

- A full demonstration of the alarm system should be provided including the operation of detectors, the use of hold-up devices and how these should be tested
- Clear and concise operating instructions should be provided
- It is recommended that alarm system is tested for a period to be agreed with the client. During this period the system should be operated normally but without alarm-devices
- Maintenance/inspection/repair
- The customer should sign an acceptance certificate stating the system has been installed in accordance with the document and operates accordingly
- System record/logbook

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