Technology SED

Design handbook

The purpose of this guide is to provide information for consultants, integrators and end customers to design sound detection systems with SED technology Sound Event Detector.

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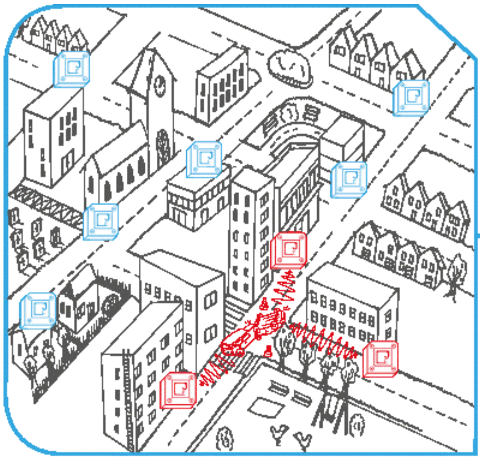


Content

Introduction

By reading this guide, you will gain the basic knowledge needed to meaningfully design and use Sound Event Detector, a sound recognition technology that leverages the strengths of artificial intelligence (AI).

Recognising sounds and classifying them into predetermined categories is the first step that happens in real time inside the detectors. If a recognised sound belongs to a category that is user-tagged for reporting, it immediately passes alerting information about the occurrence of the sound to the downstream system for further evaluation by a human agent. The speed and method of evaluating the situation and further follow-up actions depend on integrating SED technology into other systems.

The individual chapters of this design guide build on each other in a logical manner to guide you through the step-by-step design of a system using SED technology.

The manual should provide you with information and guide you through the design process so that important aspects that will enter the system and affect its operation and reliability are not overlooked.

Last but not least, it is important to understand the characteristics of the system and to have an overview of what can be expected from it.

It is advisable to keep clear notes, drawings or maps of the use and design process of the sound detection system, either on paper or better in electronic form. This is very likely to be a 'live' process, with a lot of data changing and adjusting as it goes along.

Links

- Downloads: Datasheet
- Email: Technical support JALUD Embedded
- AXIS Microphones (www.axis.com/products/microphones)
- AXIS Bridge (https://www.axis.com/products/audio-system-devices)
- METEL TWA microphones (www.metel.eu)
- Glass break tester Jablotron - Glass break tester (www.jablotron.eu)

Determining the purpose and objectives of sound detection

The purpose of using detection is typically to increase security in a given area of interest by quickly alerting to risky events such as human screams, gunshots, glass breakage, etc.

The goal is to protect human life, health, and property and to minimise damage.

SED technology for sound detection can and should be used in conjunction with CCTV surveillance. For this case, cameras with built-in microphones or equipped with external microphones are used. Licensed SED software shall be installed in the cameras. The SED technology is easily integrated into the VMS used for surveillance camera systems. By combining video and audio technologies, a higher level of surveillance and control is leveraged at an overall lower cost compared to using the two technologies separately.

Audio detection can also be used for other sounds of interest that are not necessarily related to personal safety, but can be related to any activity or action that produces a typical sound. Examples include the flight of a drone, the movement of vehicles, or the sound of a siren.

The specification of these events is detailed in the datasheet available for download in the References section. The datasheet is being updated, and the portfolio of detected sounds will be further expanded in the future.

The sound detection system using Sound Event Detector technology analyses the sounds within its range and alerts the appropriate evaluation point to the event that produced the sound.

As a reminder, the SED technology respects privacy (GDPR) as it only analyses the data immediately inside the detector and only sends information about what, when and where the analysis says happened for evaluation. It sends a one-second section of the audio sample to the operator, which cannot be used for subsequent identification or eavesdropping.

Determination of how information from the system is processed and evaluated

Detection systems generally only make sense if the information they gather gets to the right place at the right time.

Sound detection is controlled and evaluated by real-time software working directly in the camera or in a separate detector. The devices communicate with user applications via a central node. A server redirects communication messages between devices and users. The communication can be selected:

- SED Presentation desktop or mobile application.
- Third party software solution. Integration can be done into all software platforms that provide access via an open API.

Specific solutions for downstream integration steps into other software are beyond the scope of this guide and should be addressed with specialists who deal with operations centres, centralized security desks, VMS, etc.

General considerations for the design of an SED sound detection system

The volume level at which the SED begins to analyze and evaluate the event

For successful and reliable operation, the difference in signal strength between the classified sound event and the background noise (SNR) must be greater than 10 dB. In other words, if the device is installed in a noisy environment with high background noise, this can have a significant impact on the detection range.

Effect of environmental noise levels

In the following figure, various processes and activities are illustrated, including their typical sounds. It is important to note that the ambient noise level has a major impact on the detection capabilities of the specific sounds we wish to capture and analyse. When the ambient noise level is too high, the sounds of interest are simply "covered" by the noisy environment. For example, if an attack occurs in a busy train station and the victim whispers "HELP", unfortunately, even the best technology will not detect it. This can be compared to, for example, reduced visibility in fog that hides real objects from otherwise sharp eyesight.

Keep in mind, therefore, that it is possible to capture and analyse sounds that are more distinctive than the noises in the area of interest.

The figure shows typical sound pressure levels in dB measured at a distance of 1 m from the noise source.

A calibrated noise meter is used to measure ambient noise, preferably with data recording, e.g. on an SD card. Measurements with noise characteristic A with slow evaluation are suitable.

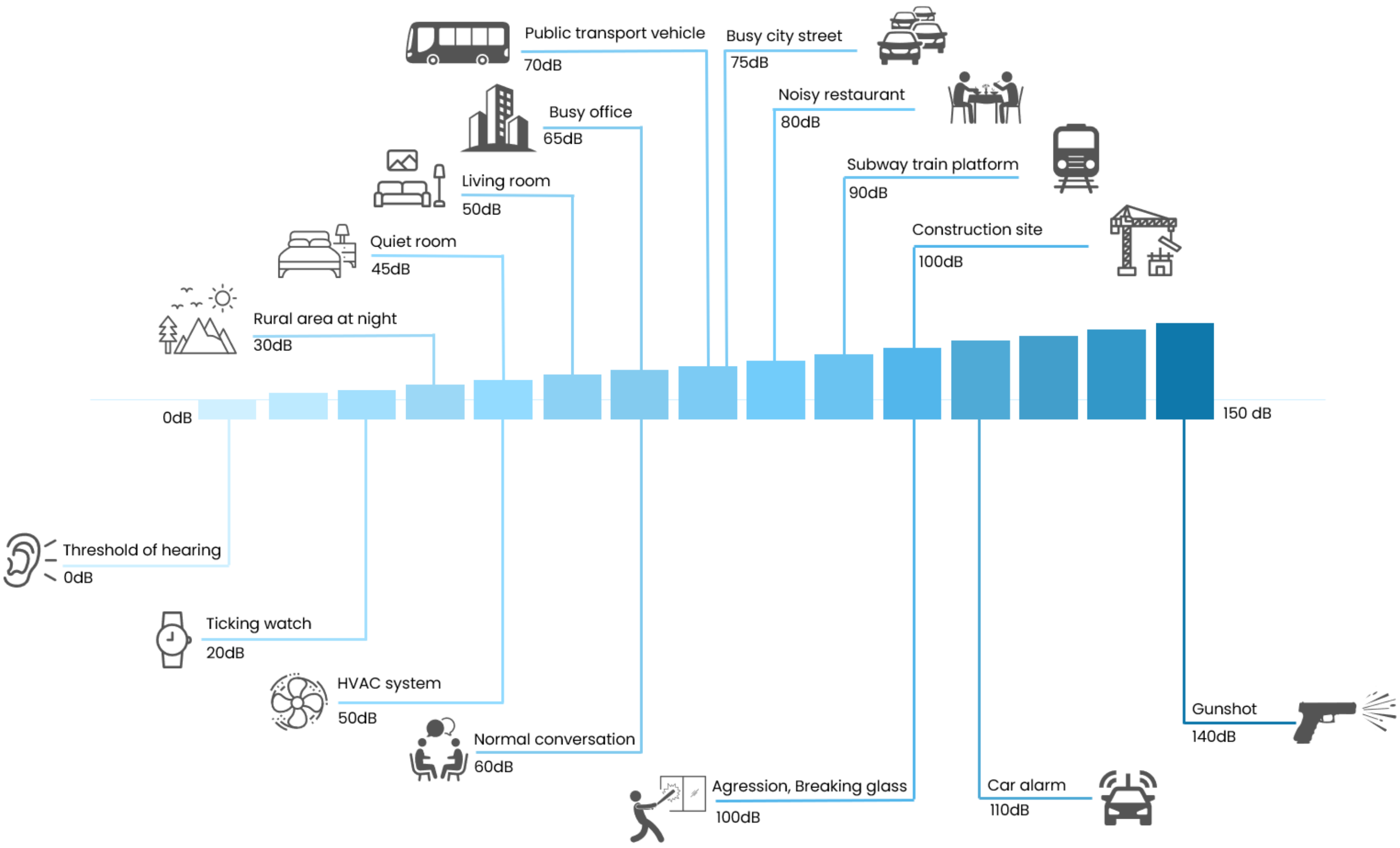


Figure 1. Typical ambient noise levels.

Detection coverage as a function of ambient noise

The detection range shown in the following figures is valid for ideally omnidirectional detectors and for placing the detectors in an open environment. It shows the size of the circle or sphere around the detector within which the detection is functional. The size of the circle/sphere is determined by the radius, which is the actual range of the sound detection. Sound propagation is affected by surrounding surfaces and objects, their shape, size, surface and other properties. Therefore, only the theoretical circles/spheres of the detection range for a certain background noise level are shown. It is intended to serve, for example, to evaluate the smallest mutual distance between detectors to cover the area of interest without so-called deaf spots.

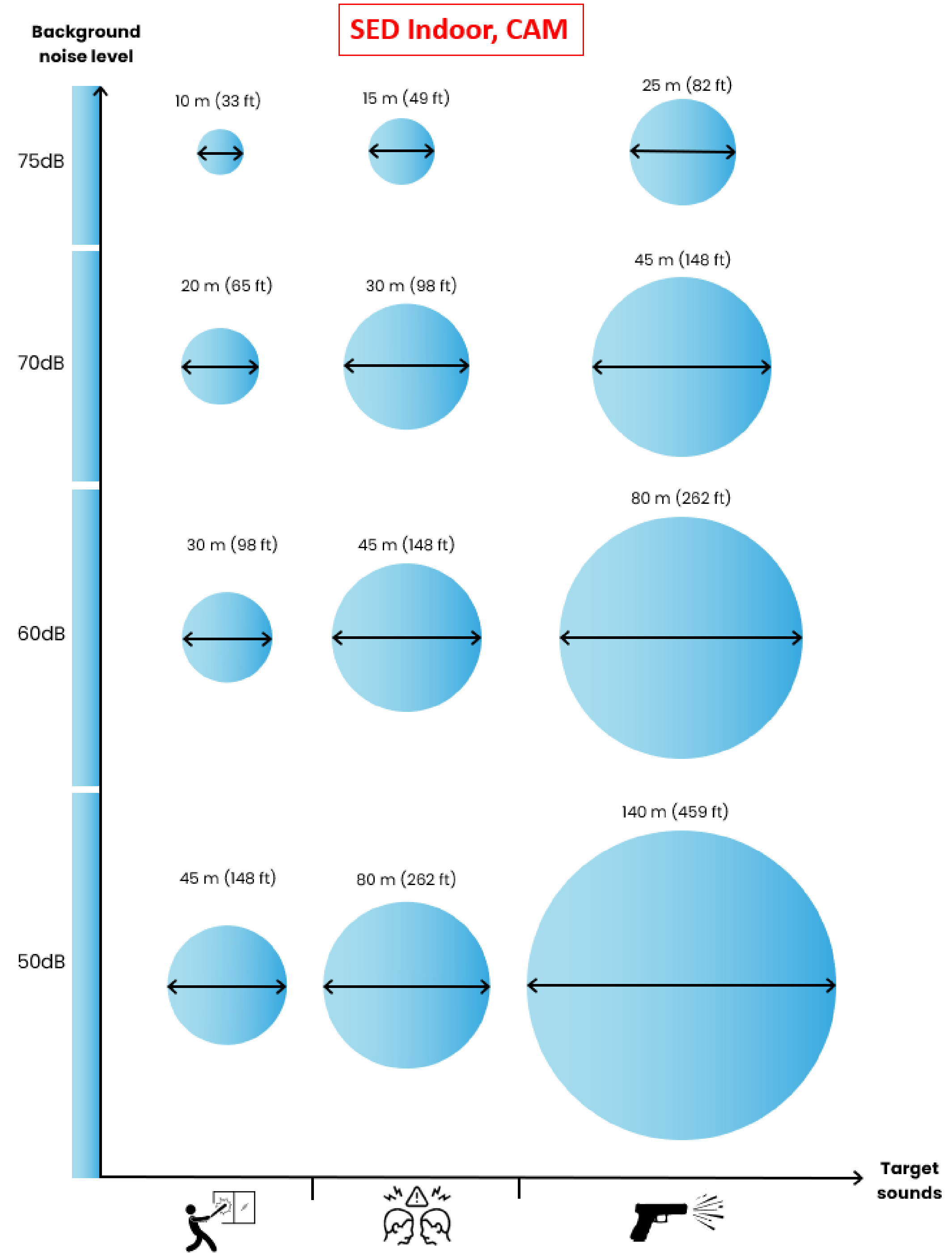


Figure 2. Theoretical ideal detection range versus background noise for SED indoor and camera. Glass shattering, aggression and shot.

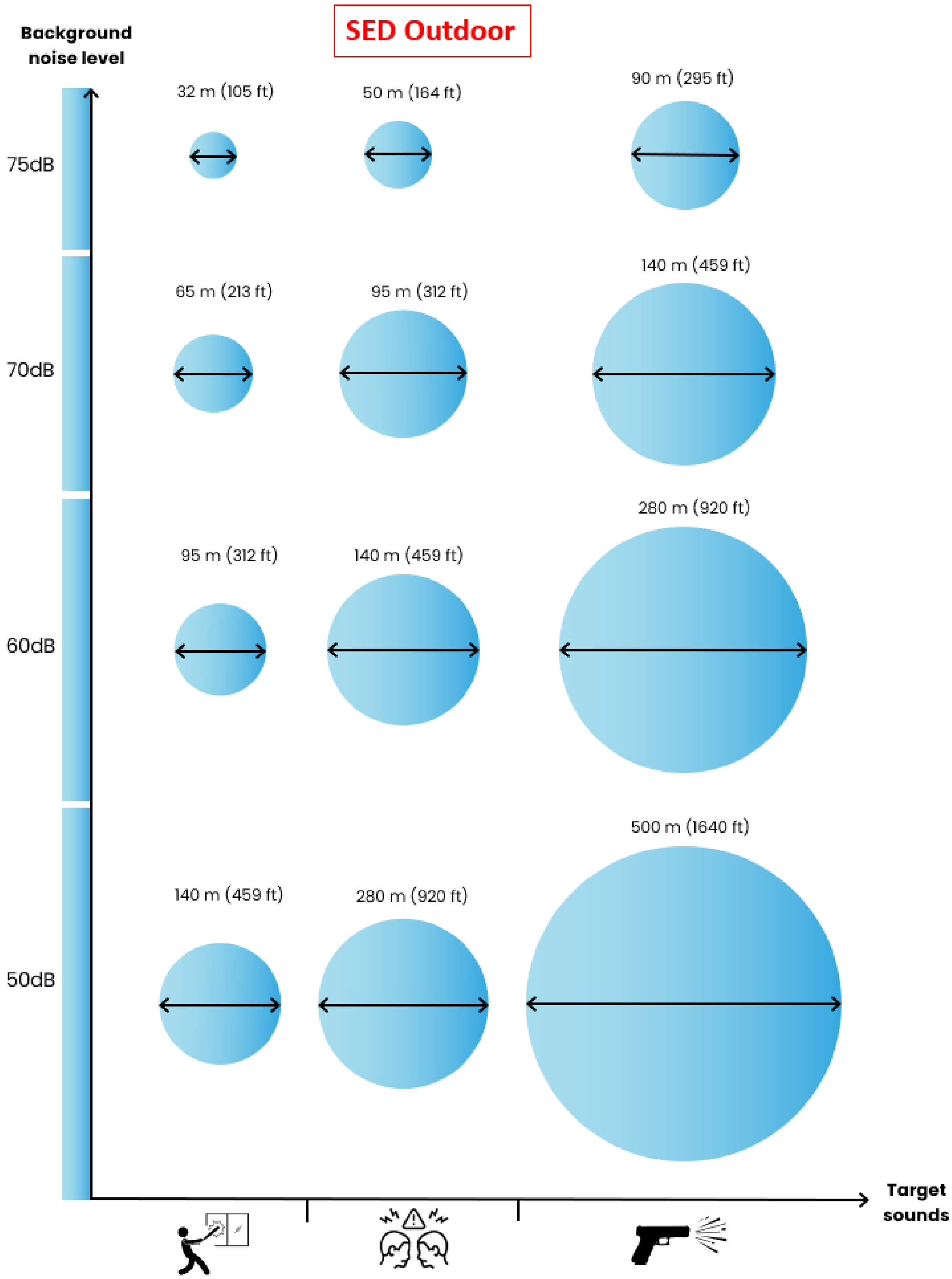


Figure 3. Theoretical ideal detection range versus background noise for the SED outdoor detector. Glass shattering, aggression and shot.

Effect of sounds dependent on the choice of detector location

The built-in microphone picks up all ambient sounds, which include sounds that occur in its immediate surroundings. The closer to the microphone the sound originates, the more important it is for the evaluation itself, and it can drown out important sounds further away.

It is therefore advisable to analyse each selected installation site individually for locally significant sounds. Each site is unique, and it is advisable to focus on and evaluate them not only at a single point in time but also over a longer time horizon.

- Possible disturbing elements include:
- Wind (location in passageway, passageway).
- Proximity to nesting birds.
- Columns with loose elements (ropes, cables, etc.).
- Structural elements of buildings where thermal expansion due to solar radiation may cause "peeling".
- Proximity to shopping trolley drop-off points at shopping centres.
- Proximity to traffic lights with audible signals for the blind.
- Location of frequent use of tram warning sign - bell.

The list of options is for illustrative purposes only and is intended to provide inspiration on where to focus.

Conditions for the operation of SED technology

SED technology can be operated:

- on third-party cameras by installing the SED software on the open platform of the camera manufacturer AXIS, Hikvision (must be equipped with internal or external microphones).
- by installing separate SED detectors.
- SED detectors must be located within the range of the power supply.
- Detectors should be sited according to their environment. Outdoor designs are water, wind and sun resistant. The indoor design is a design that is not distracting when placed indoors and does not draw attention to itself.
- Depending on the internet connectivity options, a wired (LAN required) or wireless (mobile signal required) design can be selected. Without internet connectivity, the SED detector is not functional.

- If a LAN with power (PoE) is available indoors, an indoor version with PoE power can be selected.
- For when power is only available for part of the day, an outdoor design with battery backup operation (typically for installations on utility poles) can be selected. See the section - Battery Backup Operation for details.
- If the internet is within reach but no electricity supply is available, a solar panel version can be selected. This design is highly individual, depending on the latitude of the installation, the geographical location and the specific solar conditions. Therefore, this design is not in the standard product offering and configuration for specific application is required with the manufacturer/integrator.

Operation with a backup battery

The SED variant with a backup battery is selected if the detector is required to operate continuously despite the intermittent mains power supply. A typical example is the installation of detectors on lighting poles. Mains voltage is supplied to these poles only for the night part of the day, when the evening switch-on and morning switch-off moments are centrally controlled. This central control is dependent on the user settings in the municipality or city.

The necessary time to charge a new battery from a discharged state to a full charge is approx. 7 hours. A fully charged battery will cover the operation of the device for up to 30 hours. As the battery ages, the capacity of the battery decreases, and this time is reduced.

The following graph shows the dependence of the battery charge level and operating time on the charging time. The red dashed line shows the necessary run time for the battery to operate the detector for 24 hours without interruption. It is in addition to the charging time up to the length of the day, i.e. 24 hours. Where the blue "operating time" intersects with the "necessary endurance time", the minimum charging time is approx. 4.5 hours. We stress that this applies to a new battery. The service organization should at least randomly check the detectors for continuity of operation (it makes sense to check each production batch) and replace the batteries if necessary.

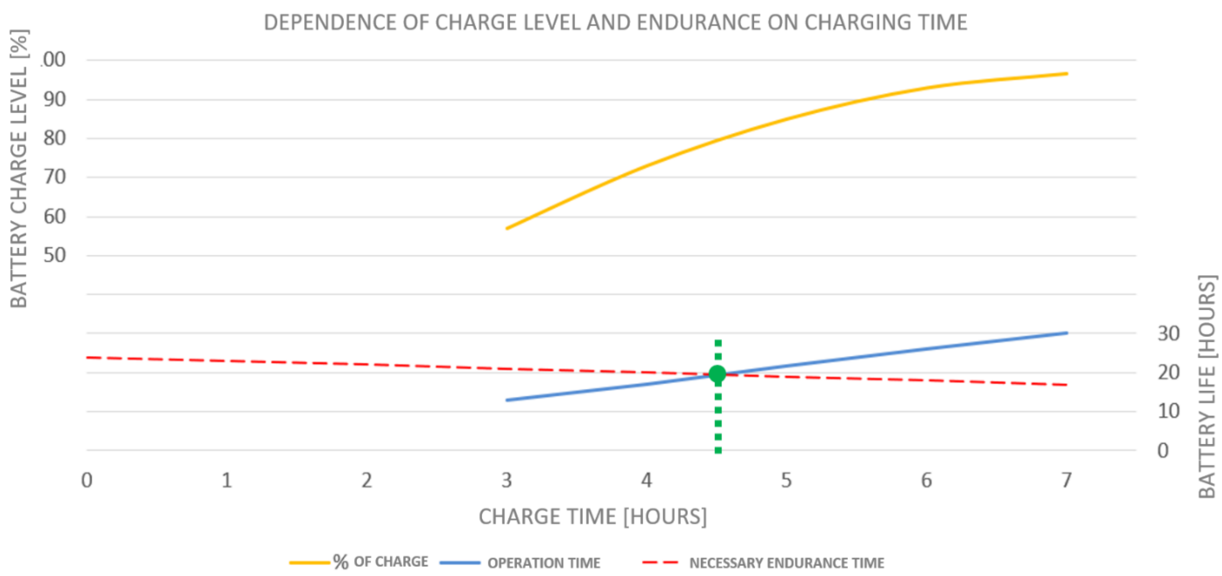


Figure 4: Graph of the dependence of the battery charge level and the SED runtime on the charging time.

In general, a first approximation can be made to the length of the "nautical" night, which should roughly correspond to the need for public lighting. The length of the nautical night is therefore roughly the time available to charge the battery for "uninterrupted" operation. The length of the nautical night as a function of latitude and season is given in the table below and the trend is shown in the graph.

		Length of night, "Nautical night" - darkness [hr]											
	DATE	1.1.	01.02.	1.3.	1.4.	01.05.	01.06.	01.07.	01.08.	01.09.	01.10.	01.11.	01.12.
latitude	65°	17:20	15:10	12:14	8:43	4:28			1:12	7:26	11:01	14:18	16:50
	60°	16:04	14:26	12:09	9:18	6:17	3:00	2:05	5:10	8:20	11:08	13:46	15:42
	55°	15:13	13:55	12:03	9:42	7:20	5:14	4:50	6:33	8:56	11:13	13:23	14:56
	50°	14:34	13:31	11:58	10:00	8:04	6:29	6:13	7:28	9:22	11:15	13:04	14:21
	40°	13:35	12:53	11:49	10:26	9:08	8:08	7:58	8:43	10:00	11:18	12:34	13:26
	30°	12:52	12:24	11:40	10:43	9:49	9:09	9:02	9:33	10:25	11:19	12:11	12:47
	20°	12:15	11:58	11:30	10:55	10:22	9:55	9:52	10:11	10:44	11:19	11:51	12:12
	10°	11:41	11:33	11:22	11:05	10:48	10:35	10:32	10:42	10:59	11:15	11:31	11:40
	0°	11:10	11:10	11:10	11:10	11:10	11:10	11:10	11:10	11:10	11:10	11:10	11:10

Figure 5. Length of the "nautical" night.

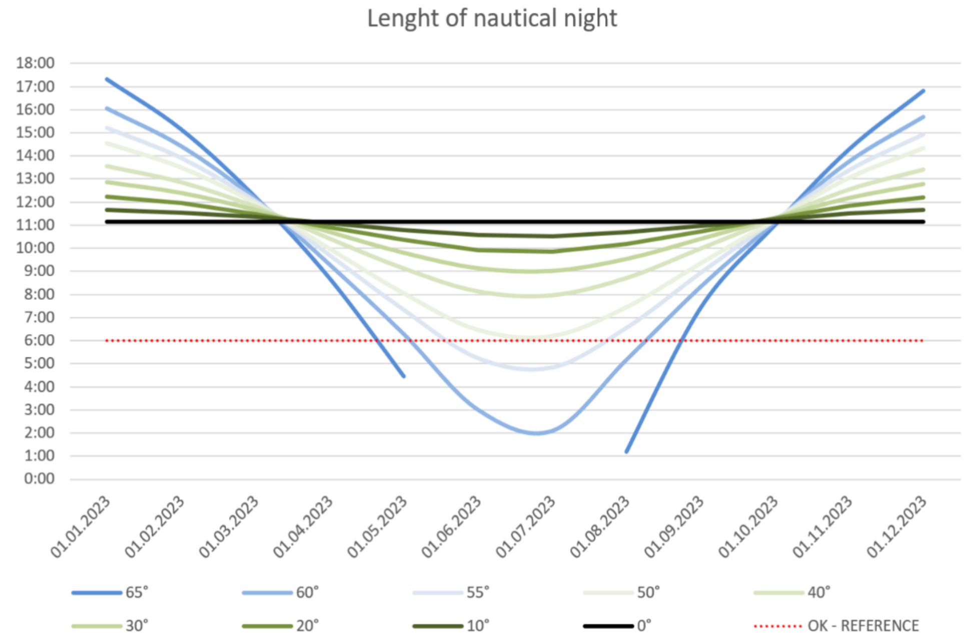


Figure 6: Length of the "nautical" night graph.

Example: evaluation for the Czech Republic. The Czech Republic lies between the 48.5° and 51° parallel, so the length of the nautical night should not fall too far below 6 hours even in the summer months. Thus, the standard length of switching on public lighting in this country should be sufficient to recharge the batteries. Local reductions in the duration of night-time lighting, which are often set in less exposed locations to save energy, should also be taken into account.

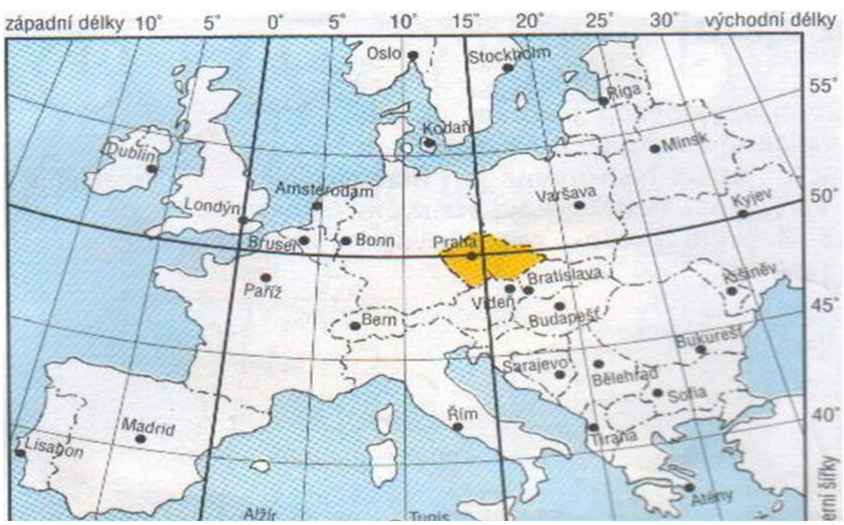


Figure 7. Example of the position of the Czech Republic in relation to the geographical parallels.

Spatial properties of SED detection

The spatial and directional characteristics of the sound sensing range vary according to the technology used. All figures in this chapter are depicted without overall scale, as the range distances are always dependent on ambient noise and this effect is not taken into account here.

SED technology on the camera system

For cameras with both internal and external microphones and installed SED technology, the characteristics of the microphones used and, if applicable, their location are decisive. This is highly dependent on the specific design of the installation and cannot simply be described in concrete terms. It is necessary to follow the manufacturers' specifications for the microphones used and to take into account their placement and position at the camera.

SED detector

For indoor and outdoor SED designs and the spatial and directional characteristics of the detectors have an impact on the deployment when full coverage of the surveillance area of interest is required.

Internal design

The reflection of sound waves off walls has a large effect on the detection range in indoor areas, significantly increasing the detection range in all directions. Conversely, narrow passages and similar spaces, where sound waves split and return, influence reducing the detection range. The directional characteristic in the figure is informative because it is measured in the free space in front of the wall on which the detector is placed.

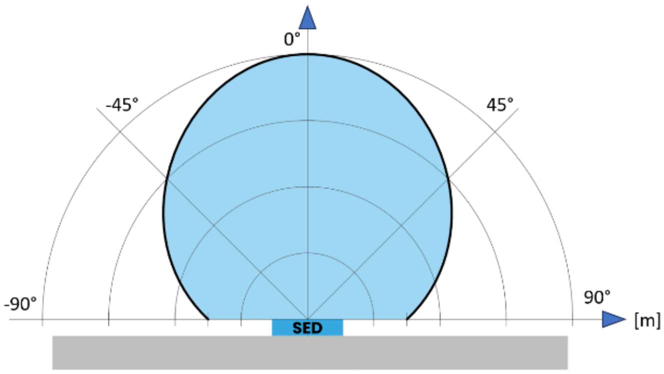


Figure 8: Directional characteristic of the detection range for the indoor variant of the SED on the wall.

Outdoor design

The outdoor version of the SED is equipped with a directional sound wave collector that roughly doubles the distance in front of the detector to which it can receive sounds of sufficient intensity to cover the desired area.

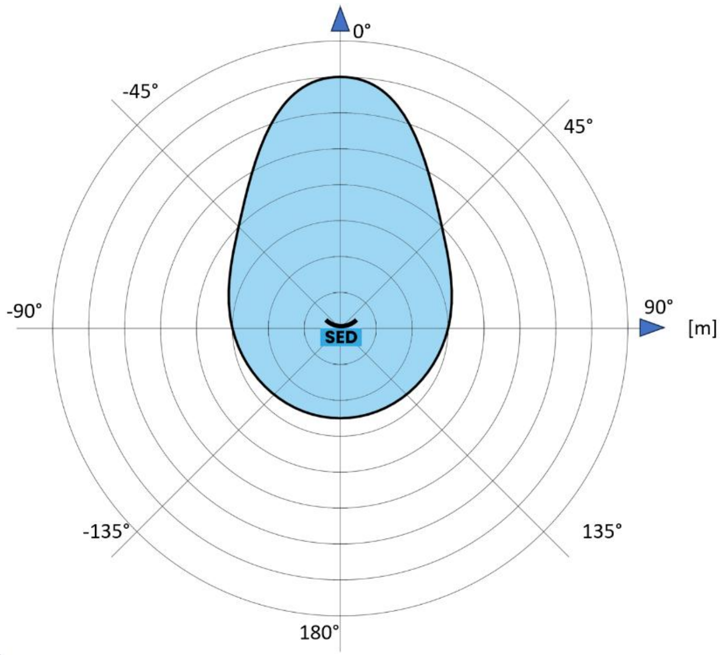


Figure 9. Directional characteristic of the detection range in free space for the outdoor variant of the SED.

The SED indoor is fitted with a design cover for interior placement, which itself reduces the range in the lateral direction. However, the range in an indoor environment is affected by sound reflections from the walls and this generally increases the range significantly in this environment.

The outdoor SED is equipped with a sound collector (amplifier) to increase the range in the outdoor environment.

The following figure compares the detection ranges for:

- theoretical, ideally omnidirectional microphone. That's the dashed circle in the picture on the left and right.
- SED internal - picture on the left.
- SED outdoor - picture on the right.

We stress that these characteristics are valid for the free environment.

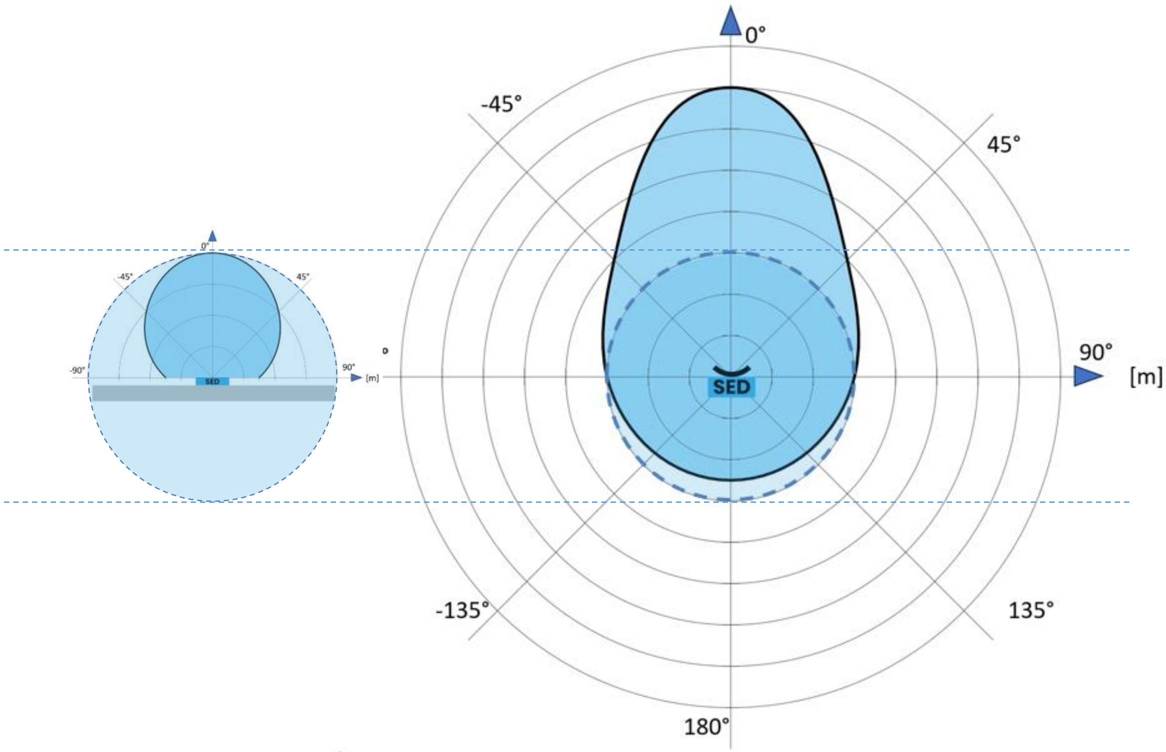


Figure 10. Theoretical comparison of detection ranges in free environment (without dimension).

Determining the area in which sound detection is to be performed

The choice of the extent of the outdoor areas or, on the contrary, the indoor areas in the buildings is up to the project sponsor. To further develop the design of the sound detection system application, it is necessary to determine the areas to be covered by the detection. These areas may or may not be contiguous.

It is also possible to use sound detection without problems in a single location that is important to the user and use the free-to-use SED Presentation application for monitoring. Such a solution is the lowest cost.

Conversely, detection can be used to cover even large areas or buildings. The number of detectors is not limited, and the system can handle large numbers of detectors without problems.

The determination of the area to be monitored is related to the content of the other chapters of this manual and the size of the monitoring area may often be reassessed or adjusted according to their evaluation.

Analysis of the status of surveillance technologies already in use in the area (if any) and their applicability to sound detection

If there are already surveillance cameras installed in your area of interest and there is an interest in using them for audio detection, then it is necessary to find out whether they are cameras with open software architecture. The specification of the manufacturers whose cameras are applicable for the software installation is given in the datasheet. The suitability of a particular camera model should be verified in the manufacturer's documentation.

Document the number of usable cameras, the presence of internal microphones, the location and options for retrofitting external microphones if not already installed.

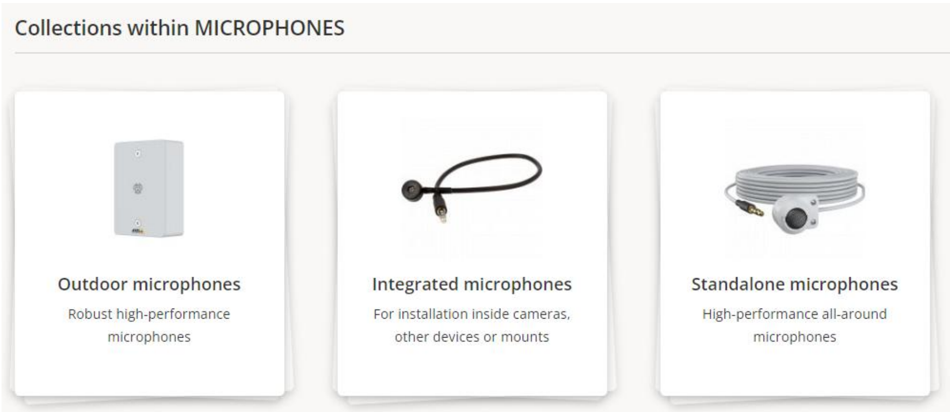
External microphone types, features and conditions of use can always be found up-to-date on the manufacturer's website.

Do the same if you want to design a system combined with the use of newly installed cameras and separate SED detectors. Here you should choose the appropriate types of cameras either according to your own knowledge of their properties or better after consulting the manufacturer or a representative of the manufacturer.

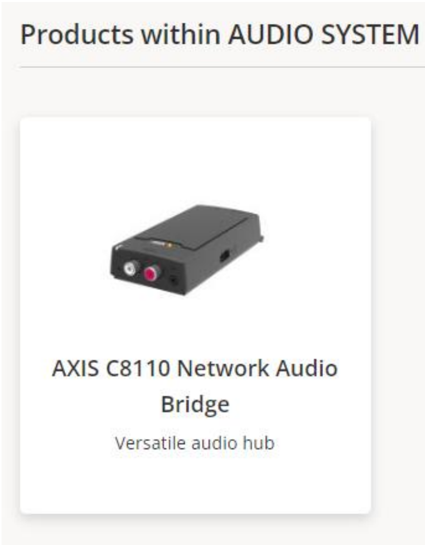
Audio accessories for AXIS cameras:

Due to the possibility of outdated third party content, we provide links to the manufacturer's website and a preview of the site for illustration. Here you will always find the most up-to-date information about the products you are looking for (see the introduction for a summary of the links).

Microphones



Bridge



Audio accessories METEL:
JALUD Embedded supplies the following tested microphones for outdoor use.

METEL TWA microphone

If the prerequisites for the use of already installed cameras in the proposed system are fulfilled, an analysis of the coverage of the area of interest is carried out according to the following chapters.

If there are sufficient cameras already in use and the area is covered, then there is no need to consider additional detector installations.

If the cameras already in use do not cover the whole area of interest, then a new area is defined, reduced by the areas covered by the cameras.

Analysis of ambient noise levels in the area

Carry out noise level mapping. If your area is large, divide it into sub-areas with little acoustic impact. Assign each area an approximate ambient noise level according to the diagram in the chapter: General considerations for designing a sound detection system with SED technology can be found in Chapter: Influence of Ambient Noise Level.

If you are unsure of the accuracy or sufficiency of the estimate, take measurements on site. It is also advisable to find out the time specifics of the site and to focus on the peculiarities that can be expected at the site during the measurement. Use a calibrated noise meter with a slow response setting. Individual measurements should result in an average noise level over a relatively short period of time. If measurements are taken at different times of the day/week, take the maximum value as the relevant value. Exclude this maximum value if it is the result of an exceptional event that is not normally repeated. If it is significant and circumstances permit, it is advisable to use a data logger to analyse and record the data.

The resulting ambient noise can then be used to find the theoretical detection coverage for a particular type of event. Interpolate between these values for noise values.

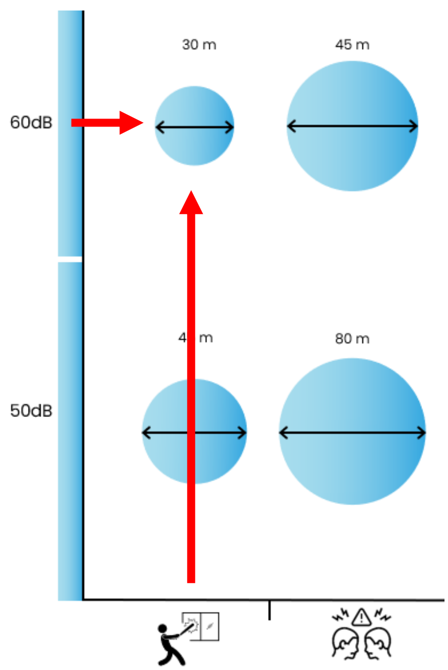


Figure 11: Example of reading the detection range from the graph for an ambient noise level of 60 dB and violent glass breakage – a circle of 30 m, i.e. a distance from the detector of 15 m.

Analysis of local noise sources

If anomalies are known to be recurring or likely to recur at the site, it is advisable to minimise their influence by more appropriate detector placement. If it is not possible to find a more suitable location for the detector and the site needs to be monitored, it is advisable to consult JALUD Embedded technical support (see link in the first chapter). This will prevent unwanted system reactions to non-standard, specific sounds that could potentially overwhelm the evaluation centre with more unwanted alerts.

A possible solution to filter out or disable unwanted alerts is to use a higher version of the detector software where certain categories of specific sounds can be turned off or on. For the specification of the software version and specific sounds, see the datasheet linked in the first chapter.

For more extensive anomalies or precise special requirements for certain types or categories of sounds to be detected and subsequently reported or not reported, it is possible to contact the SED Technology manufacturer directly to request a custom solution. After a positive opinion from technical support (see link in the first chapter), it is possible to agree to extend the business case with a customized software adaptation.

A suitable addition is also to find out available information about future developments in the area of interest and their impact on the functionality of the proposed system.

Analysis of infrastructure, power supply options, LAN availability, mobile signal availability

Several factors influence the optimal placement of detectors:

- knowledge of the area to be covered by monitoring. This area is reduced by the area that the SED technologies installed in existing cameras, if used, are able to cover.
- power supply options, or the presence of mains voltage in close proximity to the intended location and the ease of implementation of how to bring this voltage to the sensor.
- Depending on the location of the detectors, either an outdoor or indoor option is chosen.
- Consideration or minimisation of the influence of local sound sources.
- Preference for LAN connection over mobile signal connection (in principle, higher connection stability, resistance to interference).
- For the indoor version, preference for the possibility of using the power supply of the detectors via LAN - PoE.
- If a mobile signal connection is required, evaluate the quality and stability of the signal at the location.

Determining the location of indoor/outdoor detectors

For the placement of individual detectors, the coverage of a particular detector for a given installation site, i.e. for a given expected ambient noise level, must be determined according to the following figure. The result is a size-defined directional characteristic of the detection ranges considering the ambient noise. Specific length measurements of one example are added to the figure.

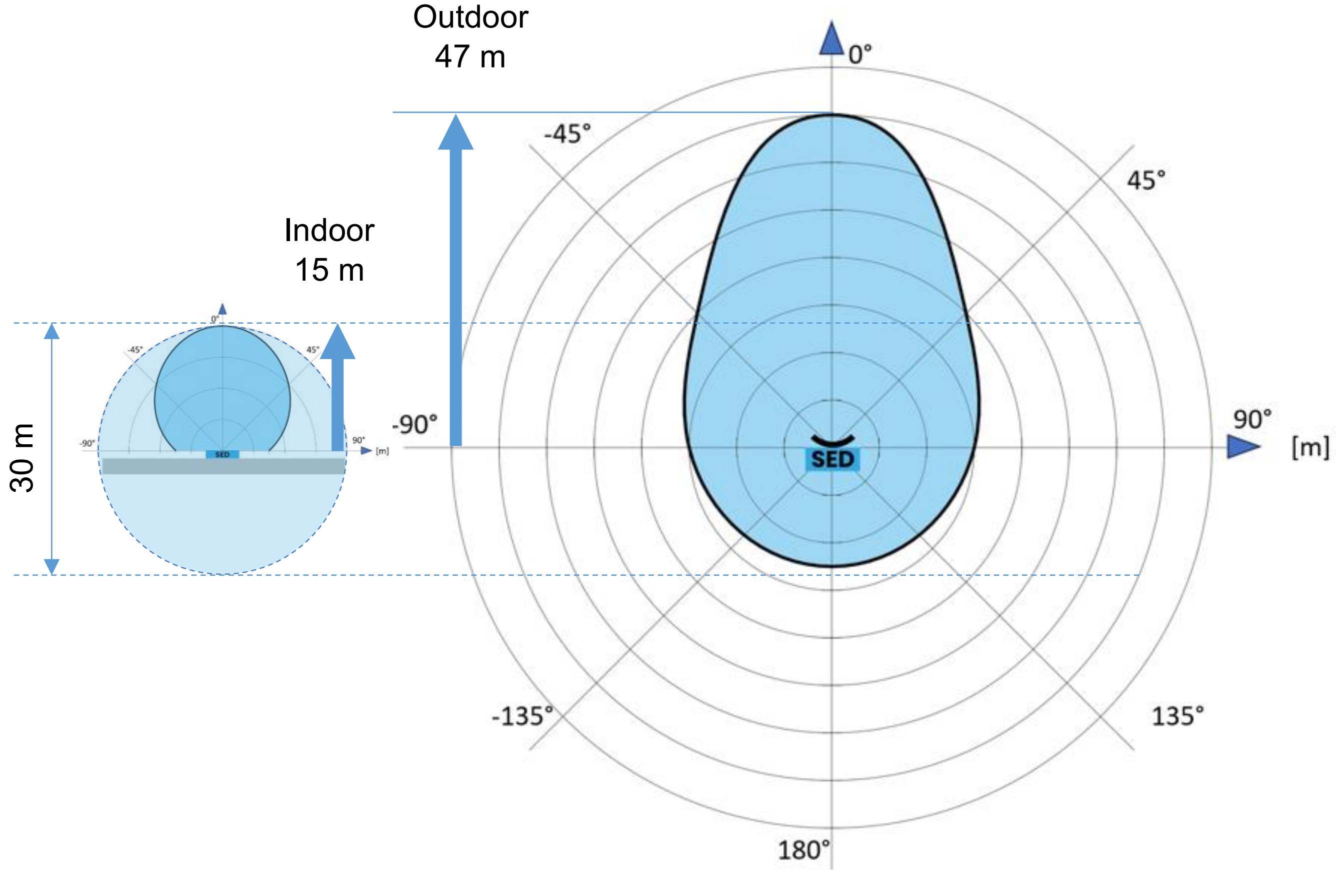


Figure 12. Example for ambient noise and type of sound event - 60 dB / glass breakage. The range of the indoor detector is 15 meters and corresponds to the radius of the theoretical circle. The range of the external detector is 47 metres in a straight line.

In case of probable local noise sources, it is advisable to choose a layout with smaller detector spacing. However, exact numbers cannot be determined due to the randomness of the phenomena and is a matter of empirical assessment.

If the local noise incidence values need to be determined before the detectors are deployed, then a test measurement using a noise meter is appropriate.

Indoor environment

Another prerequisite for the correct operation of the indoor detector is its height positioning. In rooms with higher ceilings, it is advisable to mount the detectors on the wall. In the case of ceiling heights of around 3 m, the detectors can be mounted on the ceiling without any problems.

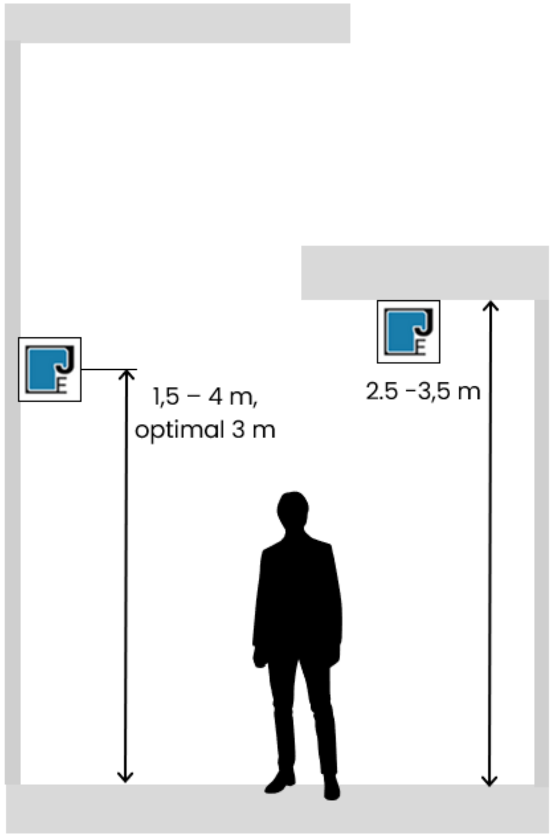


Figure 13. Height placement of detectors.

Hall

Detection is required throughout the entire hall area.

The contours of the directional characteristics of the detectors used shall be inserted in the floor plan of the interior space, of a size corresponding to the given noise level of the interior space, to cover all the predefined spaces as well as possible. The scale of the space and the scale of the detector coverage for a given ambient noise shall correspond. For safe detection, it is advisable to choose an overlapping layout.

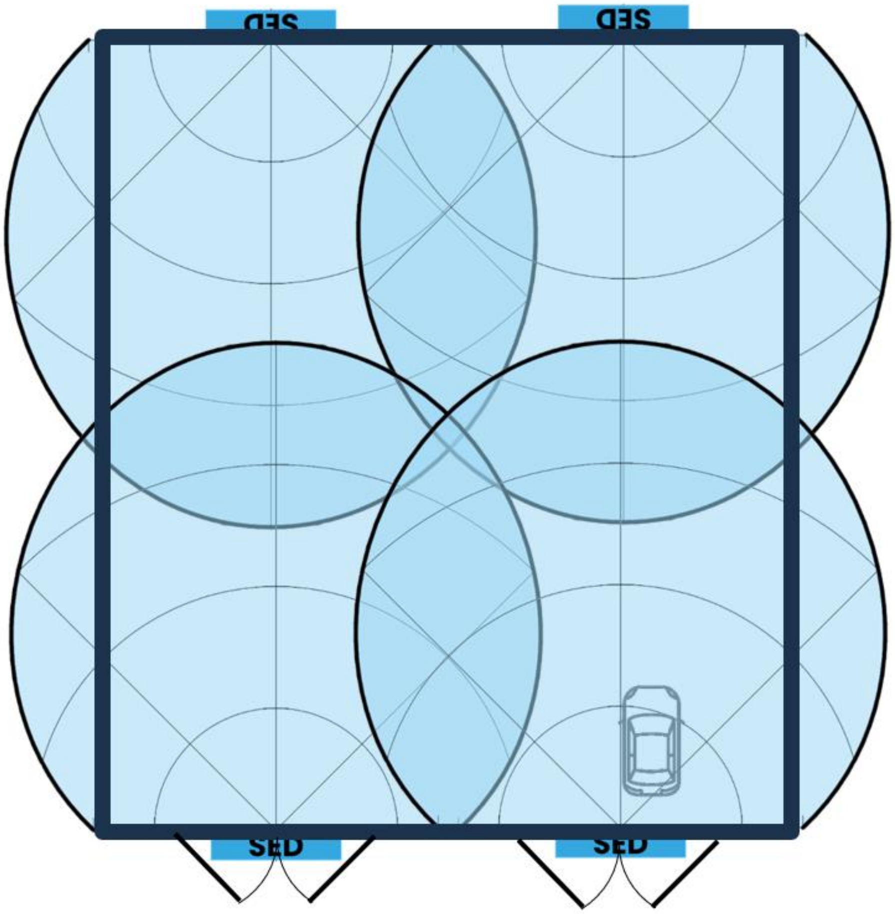


Figure 14: Arrangement of detectors in a hall-type building with overlay.

In indoor spaces, sound is usually reflected off the walls, thus effectively extending the detection range. This extension is usually of a significant magnitude and the coverage of the detectors without overlap is sufficient. It depends on the acoustic properties of the walls and ceilings of the hall, the attenuating elements inside the hall, i.e. the internal equipment, and it is not possible to quantify by how much in general. Here it is only possible to recommend at least an indicative test of the range in a given building. Experience has shown that the range extension due to sound reflection is very significant. However, the possible noise attenuation is also significant.

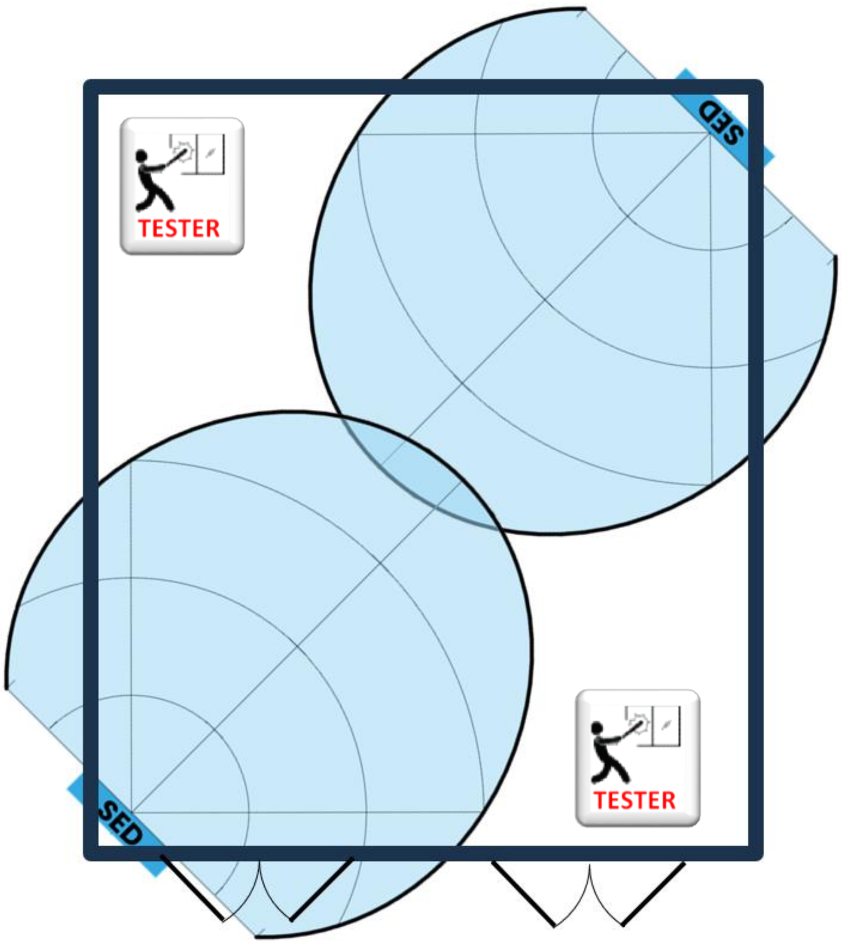


Figure 15: Arrangement of detectors in a hall-type building without overlapping, i.e. taking into account the positive effect of sound reflections. The locations where it is advisable to check the detection with, for example, a Glass break tester are marked.

Corridor

Detection required in corridors only (marked in colour).

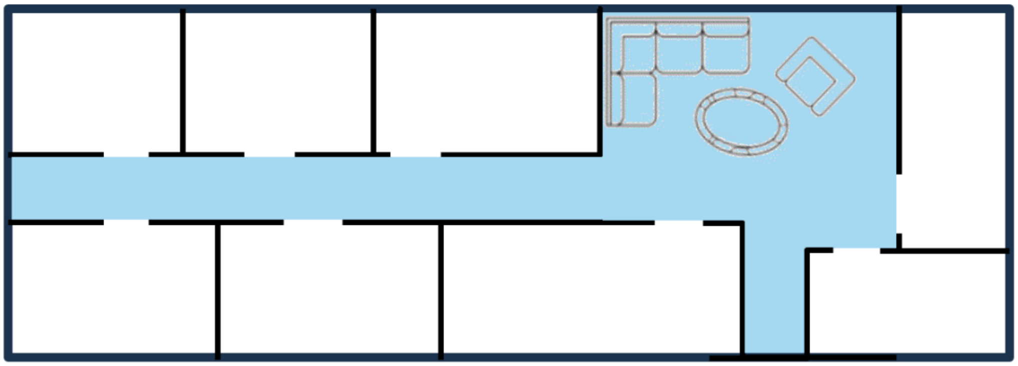


Figure 16. Interior floor plan with corridors.

The contours of the directional characteristics of the detectors to be used shall be inserted into the floor plan of the interior space, of a size corresponding to the ambient noise, so as to cover all the predefined spaces as well as possible. The scale of the space and the scale of the detector coverage for a given ambient noise shall correspond. For safe detection, an overlapping layout should be chosen.

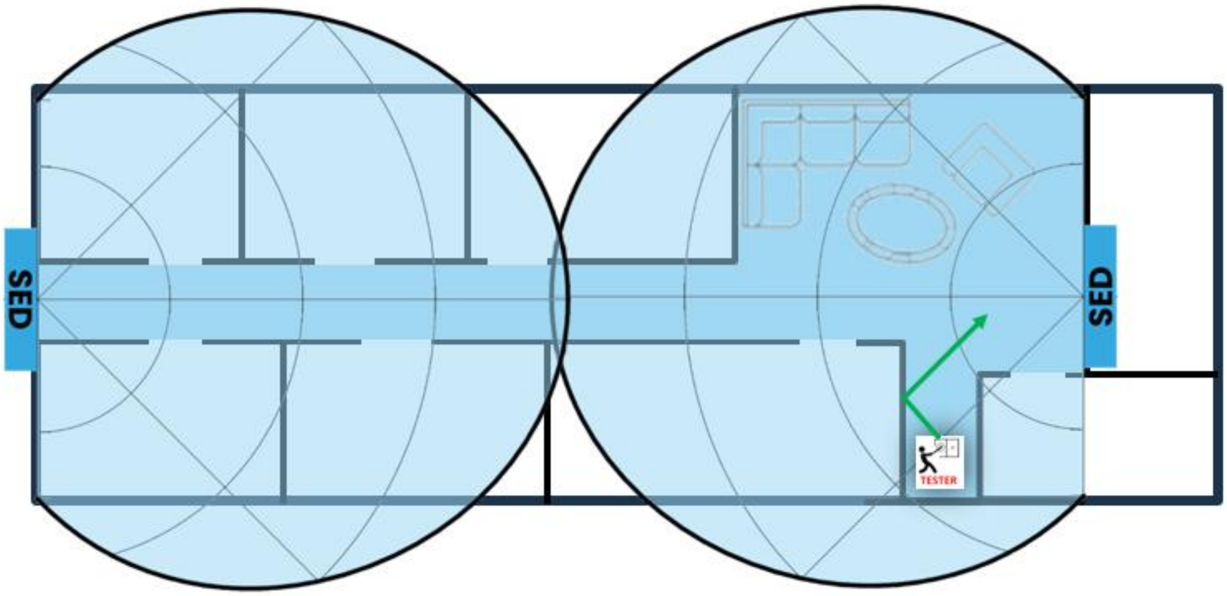


Figure 17: Detector placement in a corridor type building with overlay. Nearby corridors indirectly visible are easily covered by sound reflection.

This interior space is distinguished by longer, narrow corridors that act as a sound resonator. The condition is that the walls do not absorb and muffle sound by their surface or lining. In this case, on the contrary, they act as a sound absorber. Standard corridors conduct sound over a greater distance. The design can take this into account and not cover the entire length of the corridors with the detection range. For this case, it is advisable to carry out a range check with a Glass break tester.

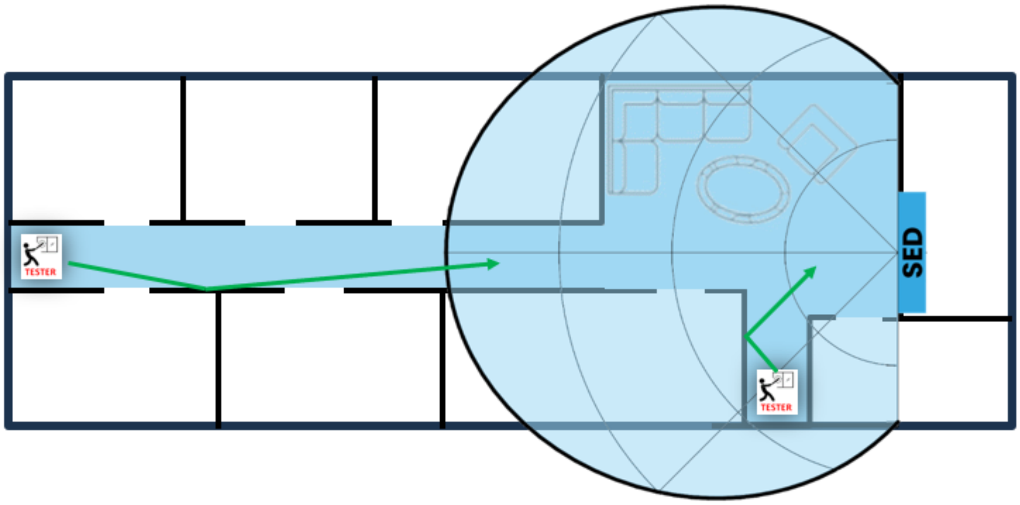


Figure 18. Arrangement of detectors in a corridor type building without overlap.

Individual rooms, offices

For each individual room of normal size, it is sufficient to mount one detector on the wall so that it faces the centre of the room. Alternatively, it can be mounted on the ceiling near the centre of the room.

With regard to the supply of mains voltage and, if necessary, the LAN connection, ceiling mounting is suitable for rooms with coffered ceilings where cables can be routed in the space between. Otherwise, in a normal room it is more appropriate to choose a wall location.

Space with the effect of a narrowed passage

A narrowed passage or partial division of spaces divides spaces not only visually but also acoustically. Sound waves are largely reflected back at this interface and dampen the passage of sound. This effect must be taken into account when designing the placement of detectors. An example is shown for a corridor with a separating door. Such a solution is often used, for example, in hospitals for departmental separations. Although these doors are practically always open, this has a significant damping effect on the sound transmission. It is not possible in this case to count on an increase in the range of detection of sound reflections as in the case without these separating doors. A fuller coverage of the detectors must be chosen.

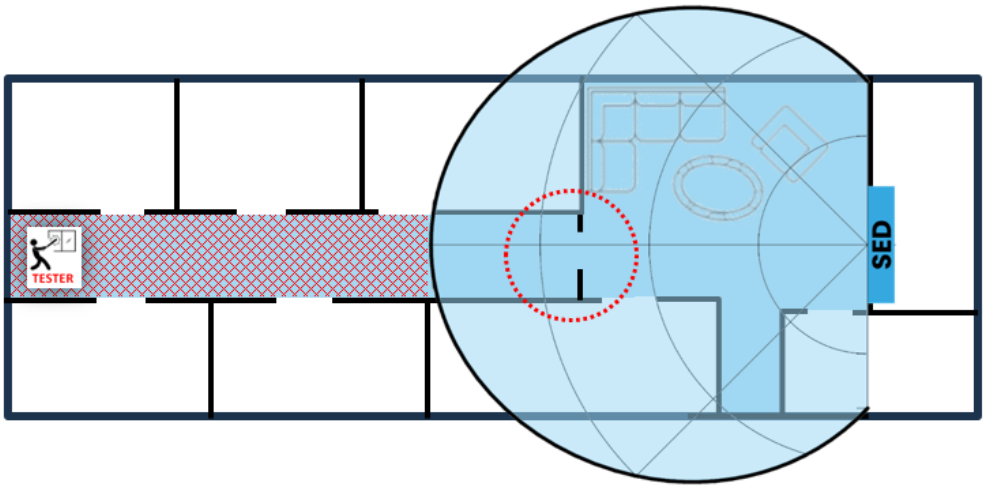


Figure 19: Example of insufficient coverage due to a narrowed passageway. Here, the coverage should be selected as shown in Figure 17.

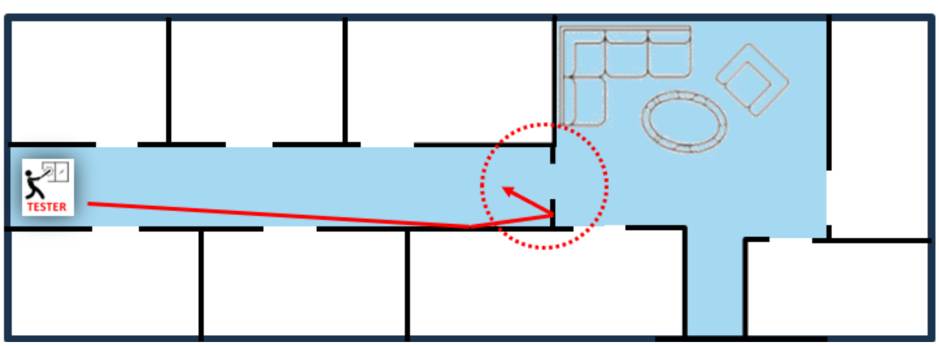


Figure 20. Narrowed passage. Reflection of sound waves.

Outdoor environment

The space between the buildings

Schematic map of the area in scale.

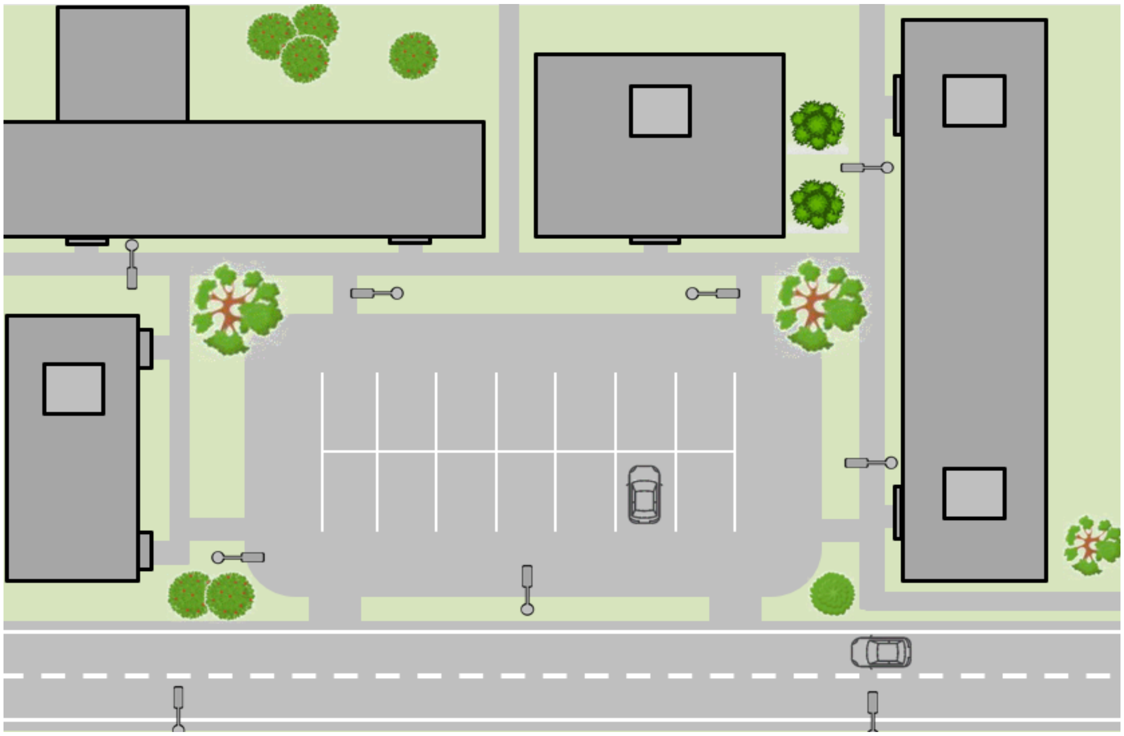


Figure 21. Scale plan of the space between the buildings.

The space between the buildings is specific due to the significant effect of sound reflections back from the walls. This sound effect extends the originally oval directional characteristic of outdoor detectors to all other directions. For this case we can, from empirical experience, calculate for the coverage of the space an approximately circular area of detector range. The radius of the circle corresponds to the longest range of the oval characteristic for a given ambient noise level.

The following figure schematically illuminates the principle of increasing the coverage range by reflecting sound from building walls.

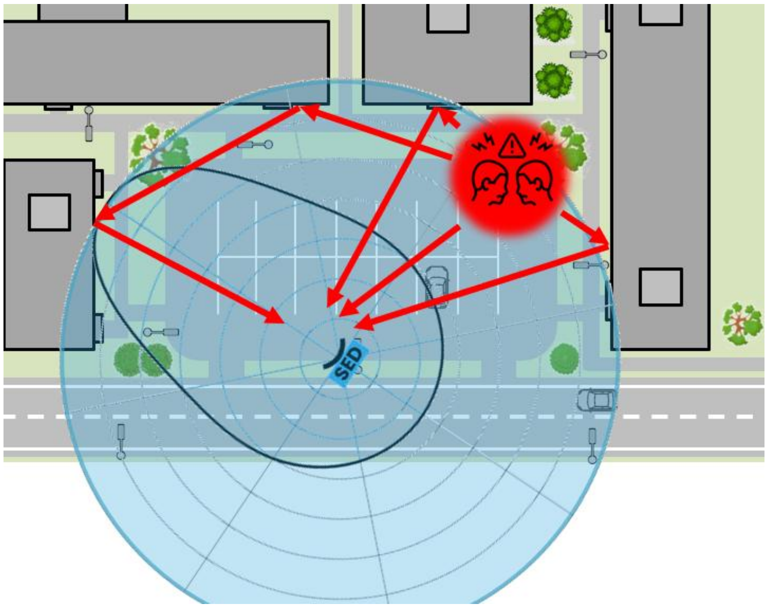


Figure 22. Reflection of sound from the walls of buildings.

Map showing the required coverage area and possible power supply points.

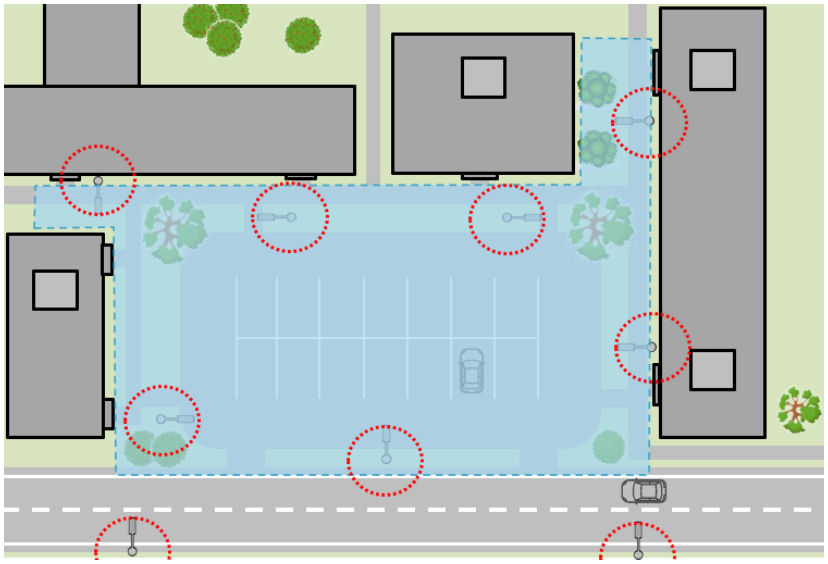


Figure 23: Definition of the monitored area with selected locations suitable for power supply - lighting poles.

Map with detectors located at possible power supply locations. The shape characteristic of the range of the detectors shall be sized to match the ambient noise. The locations shall be chosen empirically according to previous findings for the area of interest so that all important locations are reliably covered and the whole defined area is covered as well as possible.

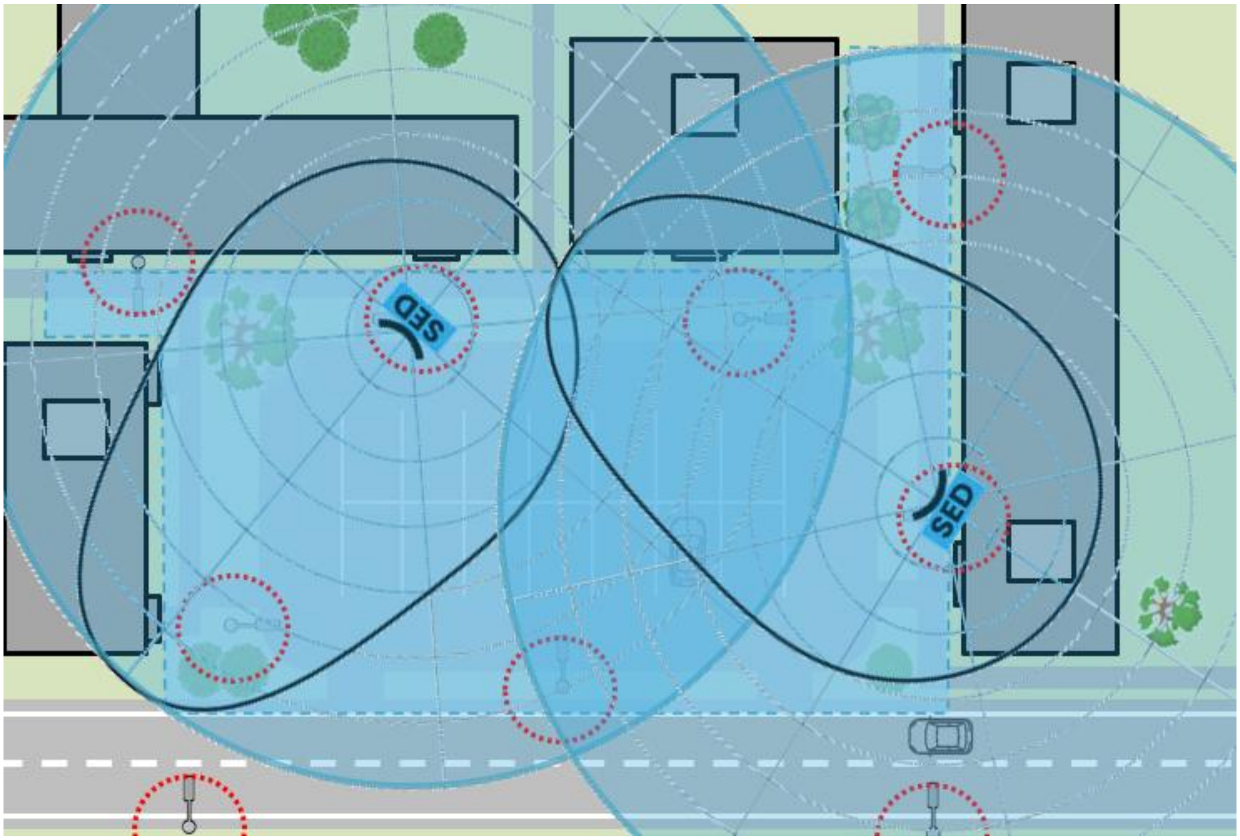


Figure 24: SED placement scheme for coverage of the built-up area, taking into account the effect of sound reflection from walls.

Park

A schematic map of the park in scale.

Figure 25. Scale plan of the park.

Map showing the required coverage area and possible power supply points.

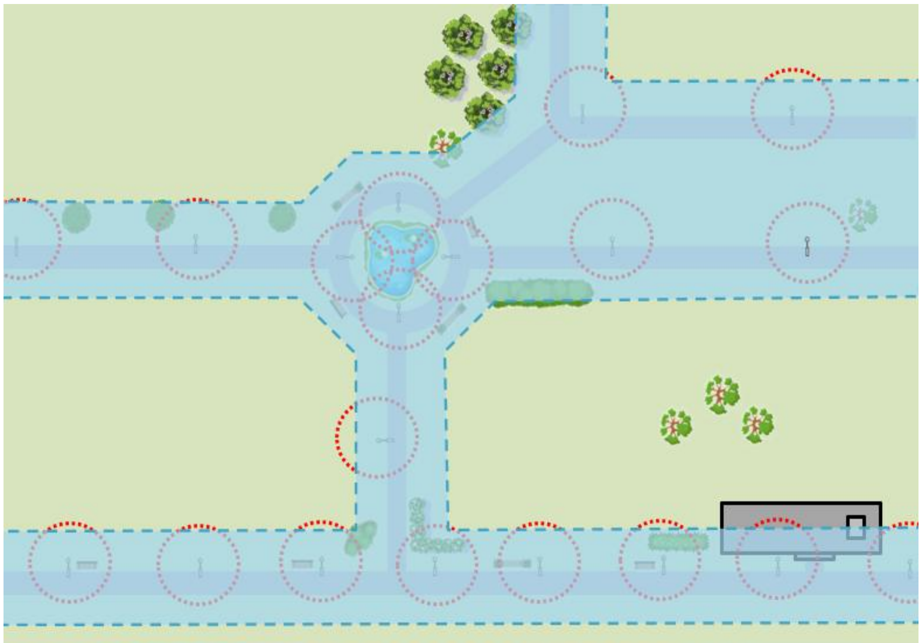


Figure 26: Definition of the monitored area with selected locations suitable for power supply - here lighting poles.

Map with detectors located at possible power supply locations. The shape characteristic of the range of the detectors shall be sized to match the ambient noise. The location shall be chosen empirically according to previous findings for the area of interest so that all important locations are reliably covered and the whole defined area is covered as well as possible.

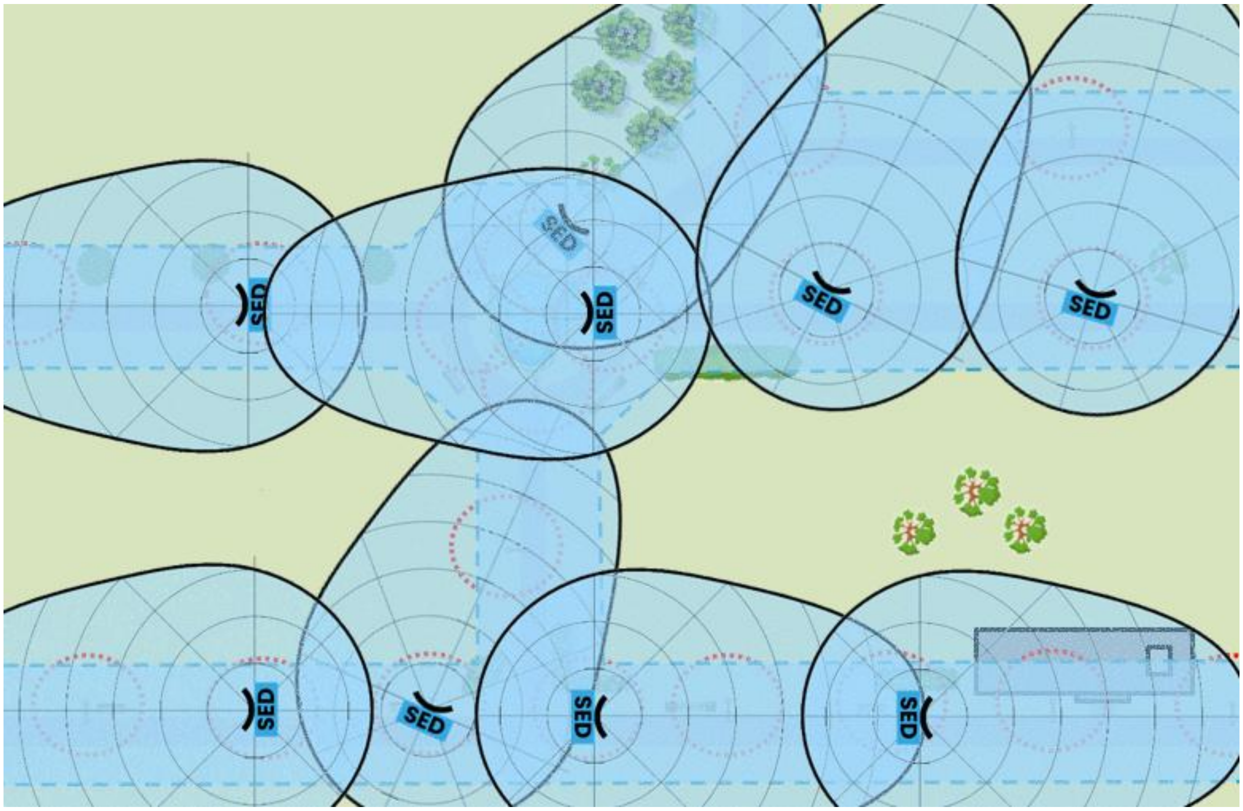


Figure 27: SED deployment scheme to cover the area of interest.

The result is a listing of SED detector locations including the direction of their rotation in space. It also includes a specification of the detector type according to the availability of uninterrupted power and LAN for each specified location. This results in a choice of detectors with or without battery backup and with LAN cable or cellular signal connectivity.

Evaluation

In hindsight, we will review the previous steps and evaluate the proposal from all available perspectives and viewpoints. In case of doubt about the solution of a local task, it is possible to contact technical support and consult the suitability of your chosen solution.

In the final stage of the detailed and elaborate design, it is advisable to make control measurements of the ambient noise at the locations of future detector deployment and to verify local noise sources.

For verification of local conditions in larger projects, it is advisable to purchase a detector or detectors suitable for mobile testing purposes, i.e. a version with battery backup and mobile connection (SED OGB). In this way, the detector can be operated in a mobile, portable mode with functional control via the SED Presentation mobile app. Using the Glass break tester (Link in the introduction. To detect this tester, it is necessary to make the SW settings so that this category of sound is "visible" to the user) it is then possible to better verify the local conditions and check the actual function of the detectors.

This should be followed by a review of the detector locations if necessary.

Finally, we wish you every success with the design and use of sound detection systems.

If you are unsure, please contact our technical support.

Thank you.