



Amplify your surveillance offering with IP audio.



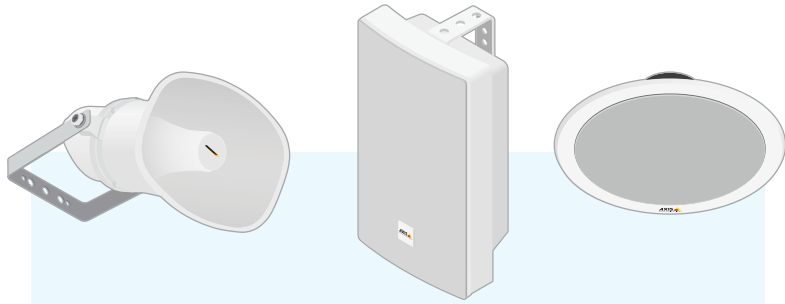


Table of contents

- ▲ **Benefits of network audio**
- ▲ **Amplify your security**
- ▲ **Amplify your business**
- ▲ **Retail**
- ▲ **Education**
- ▲ **Critical infrastructure**
- ▲ **World of audio possibilities**



In the late 80s, network video transformed security cameras and the way businesses protected their operations. Today, network audio offers the same opportunity, taking businesses to the forefront of modern surveillance solutions; not only do organizations protect their business operations but they also elevate the customer experience. Network audio provides an array of features, capabilities and business opportunities not found with traditional analogue speakers. Read more about how a modern surveillance solution might be beneficial to your business.

More about network audio and the benefits

Network audio is transferred to a network speaker using an ethernet cable providing both data and power. The audio signal is digital all the way, from source to the speaker. Like a computer, the network audio device has its own IP address. It is connected directly to a network and can be placed wherever there is a network connection.

Network audio is an invaluable tool that elevates a security system to the next level of protection and can help deter incidents before they happen. Some of the ways this is possible are through pre-recorded messages triggered by an IO device, video or audio analytics on a camera, audio and/or live messages to the monitored scene. Deterring incidents and theft through audio solutions not only helps to create a safer environment, it can also extend significant savings, such as better asset protection, human resource optimization, safety perception, and more.



What are the benefits of an intelligent network audio system?



Installation

The installation is simple because these all-in-one solutions are pre-configured to operate and sound great right out of the box. No extra hardware is needed, nor do they require any audio expertise to operate. Additionally, an all-in-one unit means less space, and less cabling, making the installation very efficient.

High quality audio

Intelligent network audio systems are designed to deliver high-quality background music and clear speech announcements. As a networked system, the speakers allow for remote health monitoring to make sure they remain functional and play music or announcements as intended.

Programmability

A manager can pre-program audio schedules centrally as well as adjusting the time and volume of music and voice announcements.

Versatile operating options

The speakers can be addressed and controlled individually or in groups called zones. Through a smart interface, for example, a retailer can send a command to a single speaker or a unified command to multiple units simultaneously. By creating zones to address groups of speakers, a retailer can direct different background music to specific departments, deliver live or pre-recorded announcements to page employees or promote products, and control or change the volume for each unit individually based on an event or time of the day.

Multiple audio sources

When it comes to sourcing music, retailers can draw from the speakers' preinstalled audio player application. They can create and schedule their own playlists from audio streaming services, or they can play local playlists in MP3 format. The files can reside on a server (multi-site or multi-zone) or on the edge in an SD card installed on a leader speaker (single zone).

Scalability and flexibility

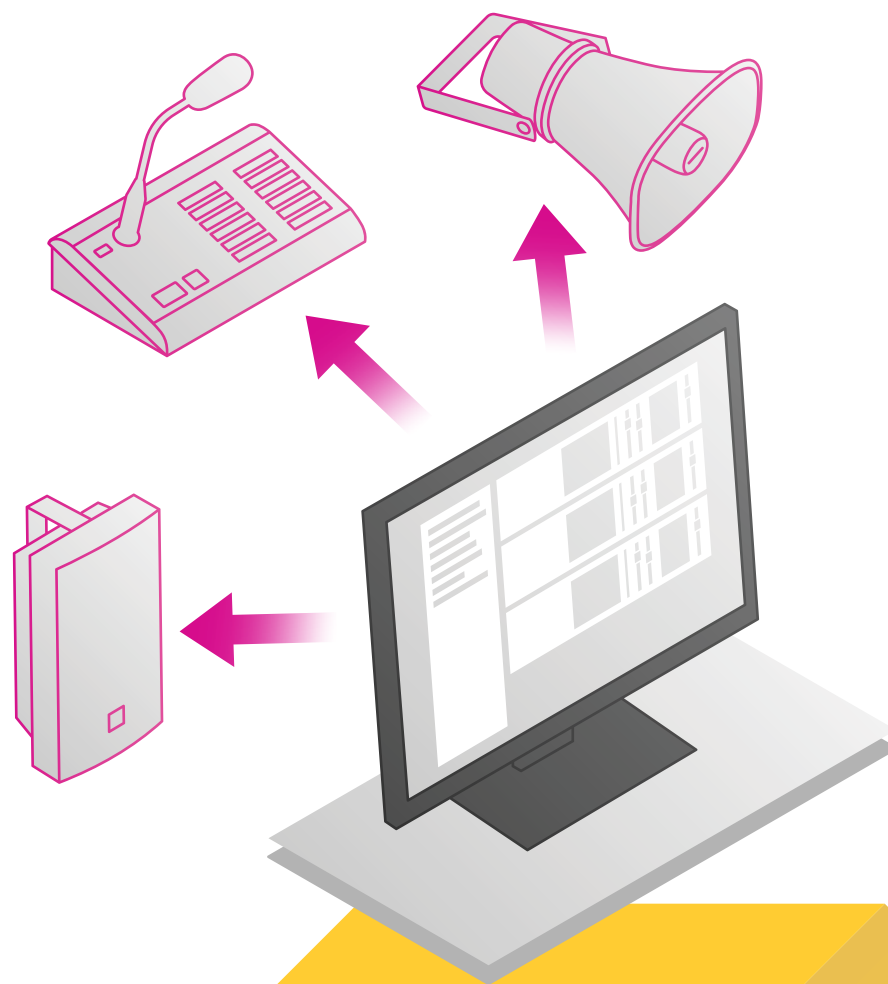
Simple installation and management mean that the systems can, without difficulty, adapt and change depending on your business needs. For example, if retailers change the size of their store, open additional outlets or relocate, it is easy to add or remove devices and add, change or remove devices from audio zones to meet the store's existing demands, future proofing the technology.

Amplify your security with IP audio

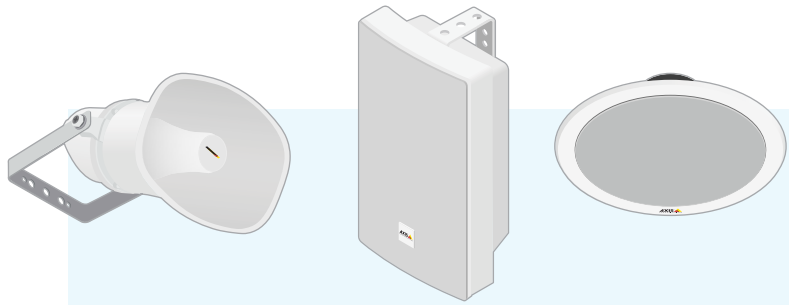
A network audio system is the perfect complement to an existing video-based security installation to ensure a safe environment for employees or customers. Network audio products can be a vital part of a security solution by helping to provide critical information during hazardous situations or sending warning messages to deter loiterers.

Examples

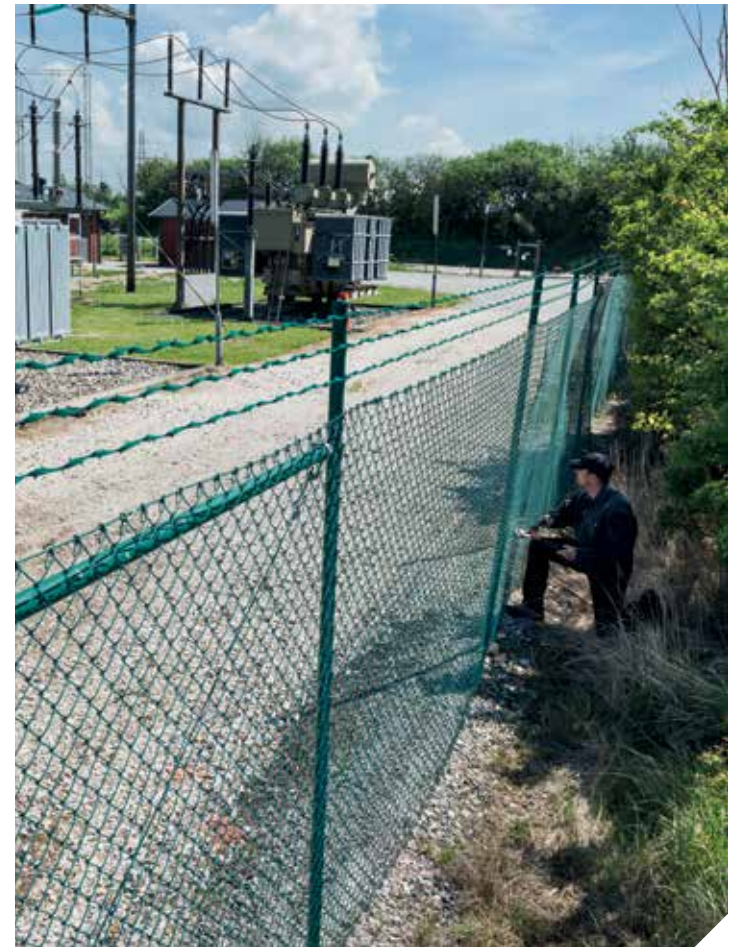
- 1.** A large retail corporation in the US wanted to deter muggers in their parking lots and increase perceived safety for their customers. The solution that they found was a pod with cameras triggered by new cars arriving playing an audio clip through our AXIS C3003-E Network Horn Speaker "Welcome to [store name], we look forward to seeing you in the store". Through this solution, the retailer has seen a reduction in parking lot crime. Potential criminals understand they are being watched and customers have a sense of ease knowing they are safe in the parking lots.
- 2.** In the context of perimeter protection, if someone is caught acting suspiciously near sensitive or protected areas of a facility, security operators can use the audio system to announce that the area is being monitored and that authorities are on the way.
- 3.** To deter shouldering and protect banking customers using ATMs, a network camera can trigger an audio clip in the speaker, warning the offender to keep their distance while sending a notification to the bank's security control room. This type of warning can be enough to prevent the need for additional security measures because the offender will come to realize they are being watched.



IP audio can also be utilized as an active security sensor with analytics to detect screams, glass breaking or gunshots, adding a new dimension to a physical security system.



- ▲ **Reduce stolen or damaged property incidents**
- ▲ **Protect assets more effectively**
- ▲ **Optimize human resources**
- ▲ **Create a safer environment for staff and customers**
- ▲ **Proactively deter incidents before they happen**
- ▲ **Deter unwanted activity**

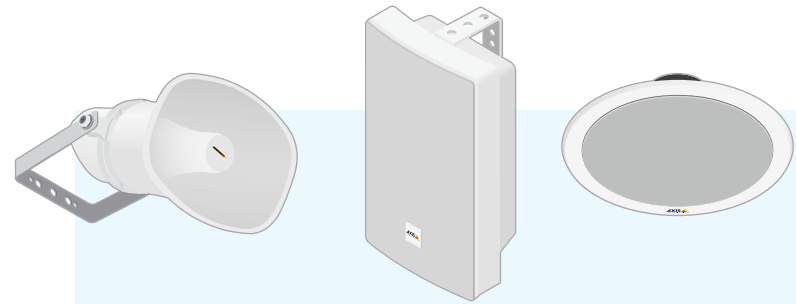


Amplify your business with IP audio

Network audio is not only a perfect addition to an existing physical security system, Axis has redefined the concept of network-based audio to include announcement and background music capabilities.

Our audio technology can support retail stores, restaurants/hotels and city buildings, among others, in their need for background music. With pre-set volume and the ability to select music, our audio solutions allow for central and remote control, meaning better management of background music. Music can be combined with scheduled and live announcements, further helping to enhance the customer's in-store experience. Research has shown that productivity, mood and behavior are positively influenced by music, something that can be actively leveraged in retail, schools and manufacturing environments.

For example, a school in Korea had an analogue system with low-quality sound and limited functionality. Investing in a new analogue system revealed high costs and limited functionality. The solution that they decided upon included Axis speakers and a specially developed software from a local partner that addressed the school's cost and functionality requirements. The school installed a total of 130 Axis speakers and 20 Axis audio bridges. Following the installation, school management was very happy with the easy management, flexible zoning and the cost for installing the new system. The cost for the new install was lower than updating the analogue system.



With network audio, you can:

- ▲ **Add smart live scheduled announcements**
- ▲ **Schedule background music**
- ▲ **Make public address and paging announcements**
- ▲ **Ensure the same customer experience across multiple locations**
- ▲ **Increase customer satisfaction**
- ▲ **Reach your target audience at the right time and in the right place**
- ▲ **Optimize staff productivity**
- ▲ **Influence purchasing behavior**
- ▲ **Keep customers engaged**

Network audio in retail



Working in retail has never been so challenging. From attracting customers into the store, optimizing store layout, preventing shoplifting, reducing checkout lines and handling peak shopping periods, there are several considerations that are top of mind for retailers. Competition is strong, margins are under pressure, and costs of internal/external losses continue to rise. However, there are smart technologies designed to support retailers and give the consumer a greater, faster and safer shopping experience.

Often, while various retail departments have the same goal of increasing store profitability, they also have very different methods of achieving this – often working in silos. Merchandisers, for example, look to boost customer experience and increase sales, with loss prevention departments looking to secure products against theft. These different motivations can lead to less than optimal solutions such as bulky security measures or poor product placement. A holistic approach to loss prevention taking into account both day-to-day security and the customer experience, can be a key driver for success. From assessing real-time inventory through RFID technology to detailed shopper behavior analytics, these once disparate functions have an opportunity to combine, maximizing merchandising effectiveness whilst mitigating the effects of shrinkage.

An audio network solution can help optimize your business. Network audio, in addition to your surveillance system, can help deter vandalism and crime, limit losses and improve the customer experience.



Use cases

Background music

Background music is not a new phenomenon, but by having a network audio solution that is connected to the internet, the choice of background music is vastly improved. It also means that different tracks or announcements can be rolled out across different zones in a location.

By selecting music that is in keeping with the target audience's taste, consumers are less likely to listen to their own music on headphones while shopping. This means that retailers can target customers with announcements highlighting new products or offers, further increasing sales.

Scheduled and live announcements

Businesses can make live or scheduled announcements during the day in different zones at the right time and right place for an efficient communication. For example, retailers can broadcast a limited sale offer for a specific item or department during a typically quiet period of the day to help boost sales for a specific item or within a specific department.



Improve customer experience

For a retail operation of any kind, one of the most important considerations is enhancing and optimizing the customer experience. From the moment a potential customer steps into a store, to the point where they exit, smart retailers know that every detail counts in making customers happy and encouraging them to do business in a particular location. What they see, feel, smell and sense is critical – and a big part of the experience is what they hear.

Smart zoning

In many organizations, it can be more efficient to use zones when delivering audio messages. Zones allow users to target announcements to specific audiences in the relevant areas of a site, without repeating the message across the entire network of speakers. This can be achieved by using connected audio alongside IP-enabled cameras and a video management system, to view where the message needs to go and broadcast it to those within the defined perimeter.

Use cases

Better security with audio

Surveillance cameras have long been used in security. However, using remote audio alongside remote video monitoring allows users to speak to those caught on camera. In the example of perimeter protection, a security officer may spot someone loitering with a potential cutting tool to break in through a fence. The guard could then use the audio system to speak directly to the potential intruder, informing them that they are being filmed and police are on the way. Knowing they are being filmed is a very big deterrent for criminals and they are likely to abandon their illicit activity before they commit a crime.

Integrating network audio without overheads

Compared to analogue systems, network audio systems have a much lower total cost of ownership and more flexibility. Retailers no longer need to sustain and manage separate systems for announcements and background music, something that can be very expensive and time-consuming.



Detect and deter

Prevent opportunities for vandal and break-ins while protecting your staff and customers by identifying suspicious behavior and taking action in real time. An automated response system works to deter organized crime cells and increase personal interaction with loiterers within each individual store. For example, a "dwell time" trigger that sends a pre-recorded message to the area and notifies staff has contributed toward a reduction in organized crime as well as an 85% reduction in shrinkage for one US retailer. Additionally, the retailer has seen increased sales and improved customer experience.

Changing music to evoke emotions

Volume and tempo play a significant role in in-store marketing. Loud volume makes people move faster while quieter music makes them stay longer. Low tempo music makes people spend more money, while up-tempo music is a mood booster. As a business owner, you can use this to trigger different behavioral responses throughout the day.

A fast-food restaurant might want to increase the customer flow during lunch hours by playing up-tempo music at higher volume. But during the afternoon the same restaurant ought to play mid-to-low-tempo music at a lower volume to make customers stay longer and spend more money.

Let's take a look at how network audio could be used in retail

Let's assume this is our shop with a parking lot, a sales floor and a small back office. There is an analogue audio system, but it doesn't cover the full area – inside and out. The existing system is connected to an Axis audio bridge and two Axis network speakers installed outside facing the parking lot are used to cover the full area. The shop has a subscription with an online music streaming service. Connecting any device, whether it's a streaming box, a PC or a phone or tablet to the input of the audio bridge will play this music on all speakers or selected zones. The music will be synchronized by the audio bridge to guarantee a seamless audio experience, even when mixing analogue and network audio systems

Make your store smart and make the difference for your retail business!



10:00 a.m.	Schedule announcements	The store opens and a scheduled message "Good morning customers and welcome" sounds.
10:02 a.m.	Scheduled music playing	Create the right atmosphere with background music. Research shows that the longer customers stay in your store, the more likely it is that they'll buy more. They enter your store to buy a pair of jeans, but if they linger, they may also pick up a t-shirt and a pair of socks. Music plays a central role in encouraging customers to stay.
10:30 a.m.	Live announcement for sales offer	Announcements or audio clips have higher priority than background music which means the background music will be muted or lowered (check if stopped or muted) during this time: "Take advantage of today's special offer, get two hair products for the price of one in aisle three"
2:00 p.m.	Schedule announcements	The store is full, and you need more staff. You have a camera running AXIS Queue Monitor to trigger the message automatically when queues for checking out are too long. The system triggers an audio clip to request more staff when there is a queue at the checkout: "Lisa to the cashier" or "Help to checkout counter".
5:00 p.m.	Parking lot announcements	An automated audio response system designed to welcome customers to the store upon parking. "Welcome to [store name]". The system aims to deter muggers in the store's parking lot while contributing toward increased customer safety.
6:00 p.m.	Detect & deter	There is a person lingering in an aisle, he is an intruder and he is planning a theft. The Queue Monitor analytic "Dwell Time Trigger" in the camera initiates an audio clip in a ceiling speaker and sending a notification to staff to attend to the visitor.
7:45 p.m.	Schedule announcement	The store is close soon, so a trigger sounds: "We will be closing soon. Please make your way to a cashier."

Network audio in education

As a school administrator, you rely daily on public address systems to communicate efficiently with students, staff, and visitors. From signaling class changes and making general announcements, to more serious risk-based communication such as an impending threat or weather emergency.

Network audio from Axis complements your video surveillance system with high quality audio for two-way communication with visitors, students and staff. Whilst the Axis speakers enable an operator to address intruders and deter unwanted activity through the use of remote monitoring, it can also play prerecorded audio files in response to an alarm event.

Sometimes, an audible warning is all you need to prevent vandalism, break-ins or mischievous behaviour. When combined with high quality video analytics or other physical sensors to detect loitering, presence or motion, network audio provides a proactive layer of security by frightening away intruders before they commit a crime. Plus, with the possibility to play pre-recorded messages or sounds, school facility managers can eliminate continual monitoring, better allocate resources, and keep staff or security personnel out of harm's way.

Typically, schools have different floors, corridors and sometimes buildings. If a school has problems with tardiness, a member of staff could look at various locations and see where pupils are loitering rather than attending class. Through the smart zone system, the teacher could speak to the pupils and let them know they should hurry along to class, without having to make an announcement to the whole school. Smart zoning can also be very useful in an emergency, where escape may not be possible through one exit. The response can be automated and tell people heading towards the unusable exit to go to an alternative safe exit to evacuate.

The use of audio throughout schools – from public address to a support for learning – can help in every aspect of education, from the school gate to the classroom.

Traditional audio systems in schools have been dispersed. One system is implemented for public address and another for visual or media use within an educational institution. To ensure optimum efficiency in schools, there now exist combined systems, which incorporate network offerings along with new opportunities that can be considered. However, the evolution of network audio technology in recent years has augmented and enhanced this traditional function and optimized operation throughout the entire school campus.



Benefits of network audio in education

Ultimate flexibility in public address

The need to broadcast messages to students and teachers throughout the school is still a key function and the principle use of audio in education. Through scheduled announcements signifying the start and finish of the school day, breaks or calling students to assembly, public address plays a central role in the structure of the day and the smooth operations of the school.

Smart zoning brings added functionality to public address, allowing administrators to target announcements to specific areas of the school, for instance a specific scheduled announcement in a specific zone, such as the library, will close in 15 minutes. With network audio it is easy to change both the zones and the content anytime, as needed. Administrators themselves are less tied to the front office than previously through the ability to make audio announcements via a suitably enabled phone or mobile device.

If an emergency occurs, no matter whether it requires an evacuation or lock-down, pre-recorded announcements can give clear, calming instructions that will prevent confusion and panic, and ensure that teachers and students alike take the most appropriate action to remain safe and secure.

Network audio as a learning tool

While the benefits of network audio in public address described previously are fundamental to the daily workings of a school, its use within the classroom is where additional value can be delivered in improved learning.

Network audio also allows more interactive content to be implemented, increasing the scope of resources that can be used to teach children. By adding audio capabilities to public announcement systems in schools, teachers can use devices such as laptops, tablets or smartphones to amplify class lectures and broadcast streamed media through the classroom's speakers. Audio can also be used to play music in media centers, hallways, and cafeterias.

Audio system, part of security system

If the school has a video surveillance system, audio can be used as a deterrent. In case of emergencies such as a fire or lock-down, there are often strict requirements requiring specialized hardware. Axis audio solutions can assist in improving their reach. Speakers have in-built microphones so not only can they be used for two-way communication, but it is even possible to use them as active security sensors when running audio analytics detecting loud noises such as glass breaking, aggression detection or gun shots.



Let's take a look at a normal school day

Here we have a school, there are classrooms, a gymnasium, a school yard, hallways and the principal's office.

This school has already realized the advantages with IP audio. They have installed speakers in hallways and classrooms plus a horn speaker in the school yard. The gymnasium already has an analogue audio system which is also used for parties, so an audio bridge has been used. There is a microphone in the principal's office for announcements.



8:15 a.m.		School starts and it is indicated by a bell sound played on selected speakers. This happens automatically. The sound clip is heard on any of the speakers found throughout the school grounds.
9:21 a.m.	Live announcements to speaker zone	The principal's office needs to urgently get hold of Jake whose parents just called. They know he's in class but not exactly in which room, so they make a live announcement to all classrooms through their 2N SIP Microphone. One button here is configured to connect to all classrooms for events like this.
11:33 a.m.	Button triggers prerecorded emergency message	Lockdown exercise. A button on the microphone triggers a prerecorded emergency message containing lockdown procedures. This pre-recorded audio clip is stored on the microphone and a button is configured to broadcast it on all available speakers.
1:45 p.m.	Scheduled announcement in a specific zone	"The library will close in 15 minutes".
2:00 p.m.	Scheduled bell sounds and live announcements	The principal message for all the students is automatically played "Have a nice weekend, see you on Monday", and the bell sounds.
6:00 p.m.	Detect & deter	An after-school dance in the school's gym is held. The existing analogue sound system in the gym might well drown out the sound of emergency messages or klaxon siren. Now, however, the sound system is connected to the main IP system with an Axis audio bridge and the announcement trigger will always mute music so there is no risk of them being missed.

Audio is a cost-effective tool for the efficient operation and management of the school and student improvement and safety.

Whether in the classroom, the corridors, the canteen or playground, network audio has a key role to play in the safety, happiness and education of our children.

Network audio in critical infrastructure



It is crucial to protect the perimeters of critical infrastructure sites. Intruders constitute the biggest threat to the safety of critical infrastructure facilities. Detecting and identifying unauthorized individuals on sites with extensive perimeters, wide areas, remote locations and extreme weather conditions add to the complexity of the challenge.

It is also important to monitor the entire area of a site. Individuals who have legitimate intentions but wander into prohibited areas place themselves and others at risk. Monitoring entrances and exits and safeguarding potentially hazardous areas is also a crucial aspect to consider. Smart analytics can trigger warnings and alert your staff, saving time and money spent on routine patrols and attending to false alarms. Warnings can also set off a pre-recorded announcement to deter intruders.



Adding network audio to your security solution allows you to:

Respond immediately and intervene remotely with prerecorded or live messaging

Network audio solutions allow security operators, in a monitored installation, to activate a prerecorded message or speak live to employees or offenders. In unmonitored installations, video analytics can allow for prerecorded messages to be delivered. By integrating camera, software and network audio, you can detect people moving in the wrong direction and notify immediately via an audio message or an alarm via the speaker.

Convert reactive video surveillance into proactive video surveillance

Within the context of perimeter protection, the addition of network cameras and audio, intruders can be detected and deterred via an immediate notification – either live or by a predefined trigger. The use of these triggered announcements keeps the premises safe and secure at all times.

Cameras with audio analytics add proactivity to your surveillance system. For example, if there is an explosion, response times by authorities can be faster, thanks in part to the surveillance system's ability to detect sounds.



Adding network audio to your security solution allows you to:

Detect and deter crime

As a deterrent to potential crime, vandalism and anti-social behavior, live and pre-recorded audio announcements are more effective and efficient than standard sirens. Live call outs are highly effective in monitored surveillance systems, where operators can give detailed instruction based on the specific situation, or issue warnings.

When video surveillance operators identify an individual committing or looking likely to commit a crime, the ability to issue a warning to that specific individual is highly effective. For example, a warning such as "To the person in the baseball cap, and the spray paint, be aware that you are on camera and that graffiti is vandalism and is illegal..." is likely to stop the perpetrator in their tracks.

Aggression detection

Many security incidents are preceded or initiated by some kind of noise. By leveraging audio and video analytics, movement and aggressive sounds can be detected. Sounds can be the first sign of an escalating situation and can be used when monitoring for safety and security.

For businesses with a greater exposure to incidents that involve aggressive behavior, gunshots or breaking glass, cameras with sound detection capabilities and network audio add great value to a security system. They can automatically alert for potential incidents and play pre-recorded audio clip triggered by motion detection. For example, in public transit systems, where staff and passengers can be exposed to an intoxicated person and disorderly behavior, early aggression detection reduces the risk of violence by enabling intervention at the verbal stage, before any escalation to physical aggression.

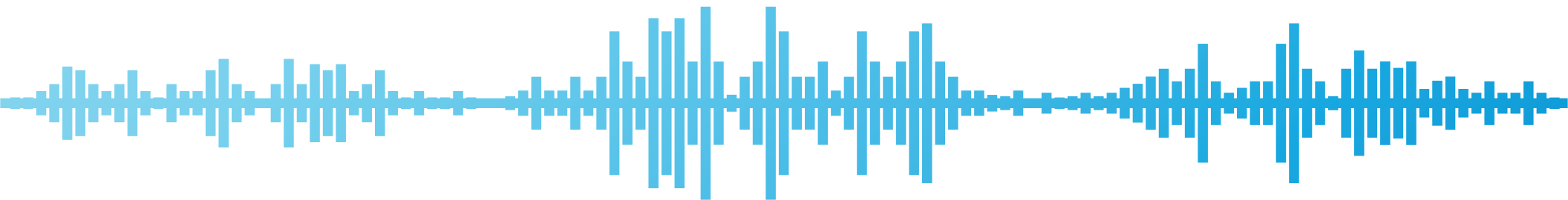
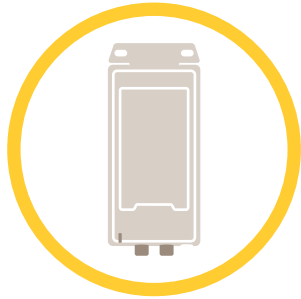
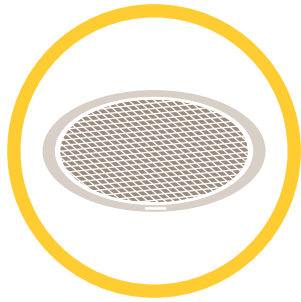


A world of audio possibilities

Adding audio to an existing video surveillance solution is a straightforward and cost-effective enhancement, but one which brings benefits that far outweigh the additional investment. The ability to deter numerous types of crime, react faster and more effectively to incidents, increase sales and customer satisfaction, and provide direct instruction, guidance and advice creates more value from a solution than video alone. An all-in-one speaker system combines all elements into a single unit that is easy to integrate with any video management system and even easier to install.

You can use network audio to:

- ▲ Improve security on your premises with event-triggered announcements and direct callouts.
- ▲ Make live or scheduled announcements in different zones, at the right time and right place.
- ▲ Create ambiance with easy and flexible scheduling of great-sounding background music.



For any questions or additional information around our audio products and solutions, please **call us at 1 800 444 2947, option 1**. If you would like to schedule an on-site demo to see the possibilities with Axis solutions, please contact us via **email at cainsidesales@axis.com**



About Axis Communications

Axis enables a smarter and safer world by creating network solutions that provide insights for improving security and new ways of doing business. As the industry leader in network video, Axis offers products and services for video surveillance and analytics, access control, and audio systems. Axis has more than 3,000 dedicated employees in over 50 countries and collaborates with partners worldwide to deliver customer solutions. Axis was founded in 1984 and has its headquarters in Lund, Sweden.

For more information about Axis, please visit our website www.axis.com