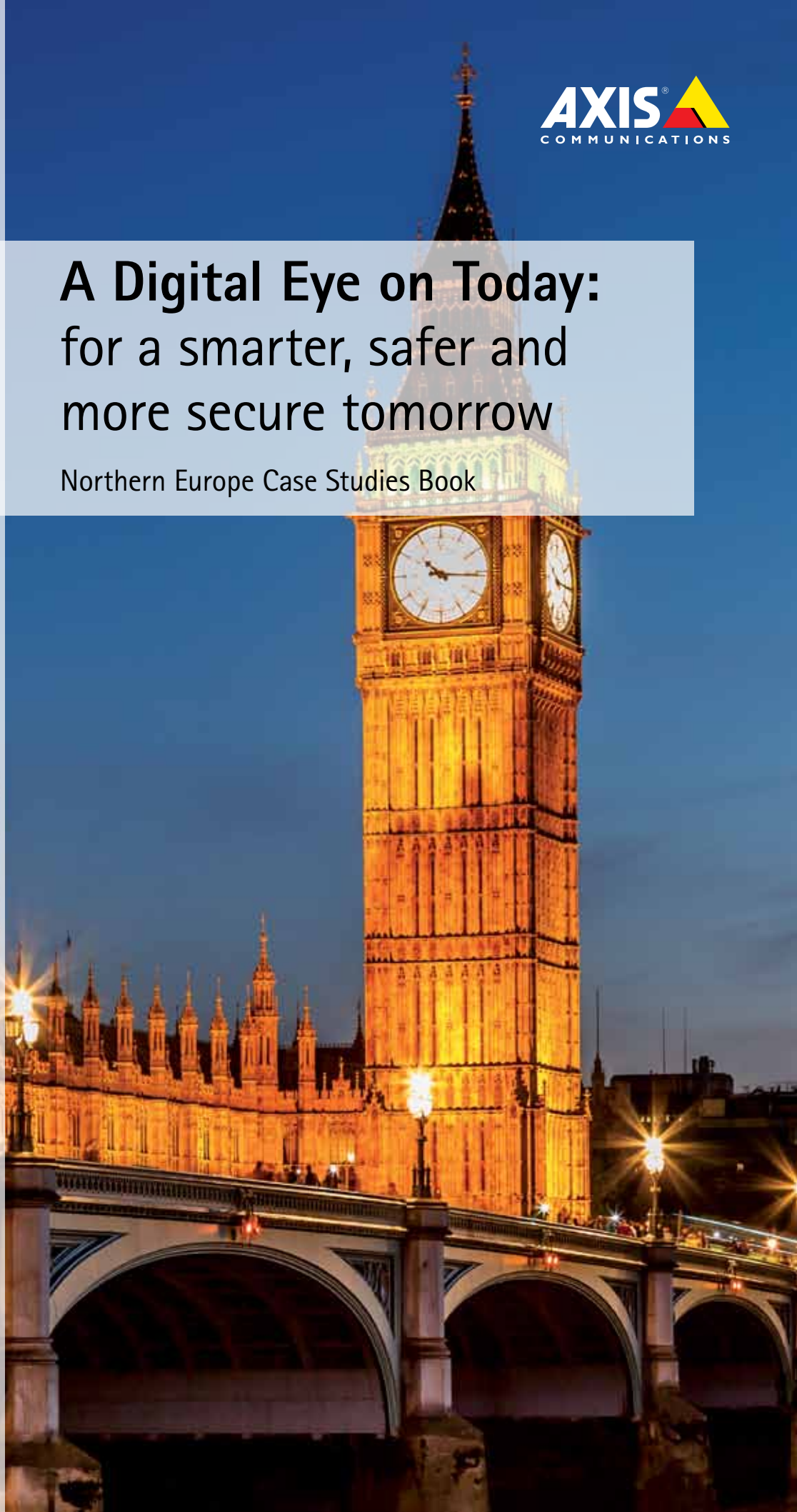


# A Digital Eye on Today: for a smarter, safer and more secure tomorrow

Northern Europe Case Studies Book





# **A Digital Eye on Today:** for a smarter, safer and more secure tomorrow

Northern Europe Case Studies Book





I joined Axis Communication UK in 1997 when we had a single network camera and the concept of IP-based, digital surveillance was still in its infancy. "Nursery Cam" and "Pet Cam" were two initial use cases that caught the imagination and remote monitoring over a phone line while painfully slow, was still a business driver for adoption.

Fast forward 16 years and Axis have the broadest range of IP video products on the market, an installation base that spans every industry segment and customers can now enjoy a far better remote monitoring experience from a mobile phone.

During those 16 years, I have been privileged to work for a company that has pioneered innovation in surveillance cameras, challenged conventional thinking on how we access video surveillance and the applications it's used for, while all along maintaining a steadfast commitment to education and raising market awareness of the benefits of IP video.

As a result, Axis now hold the position as market leader in surveillance cameras, which is quite some feat as we compete with manufacturers who sell both IP and analogue cameras.

Our network of passionate and proficient partners have installed Axis IP cameras and video encoders in every market segment imaginable across Northern Europe. Through the years I've had the pleasure to tour countless installations to see firsthand how IP video is helping to make our world a smarter, safer and more secure place.

Yet, unfortunately, when the security and surveillance industry is featured in the mainstream media, it's typically for all the wrong reasons. Rarely are security professionals praised for doing their jobs, nor do we often take the time to celebrate all the good that we've done together. That's exactly what this inaugural case study book is meant to do - Celebrate our successes.

In true coffee book fashion, this collection of success stories from across Northern Europe was brought together so it could be displayed proudly throughout our partners' offices and shared with their customers to showcase all that is possible with network video systems.



A big thank to you to all the true experts – our integrator, distribution, hardware and software partners – who made these stories a reality and for those end user customers who took the leap into IP video and have never looked back.

And here's to many more IP video success stories to come.

Best regards,

**Atul Rajput**  
Regional Director, Northern Europe  
Axis Communications

P.S. If you know of a story that should have been featured alongside this excellent and diverse collection, please reach out to our Northern Europe PR and Communication Specialist listed in the back and get your story told!

# City sur





# veillance



“ I've not heard any of the designers complain about the AXIS P3304 Network Cameras. On the contrary, several have actually praised the decision to make the conversion. ”

Security Manager Mike Coffman,  
National Gallery of Denmark



# National Gallery of Denmark – priceless art pieces protected by discreet Axis cameras.

Axis network cameras allow gallery visitors to focus on the artwork without being distracted by cameras and cables.



Organization:  
National Gallery of  
Denmark (SMK)

Location:  
Copenhagen, Denmark

Industry segment:  
City surveillance

Application:  
Safety and security,  
theft and damage  
prevention

Axis partners:  
G4S, Mirasys,  
EET Europarts

## Mission

The National Gallery of Denmark (SMK) in Copenhagen is the Danish government's main museum for visual arts. The gallery has approximately 115 employees and 60 students who occupy the building. Extremely valuable and priceless artworks are on public display in the galleries. While the art pieces must be protected from theft and damage, the employees and the thousands of people visiting the gallery daily must also be safe and secure in the building. In 2012 the entire CCTV system was extensively upgraded. An important consideration was that the cameras should be discreet and not distract attention from the paintings, and that they should also be easy to move, as the building is often reorganized internally.

## Solution

Approximately 60 analog cameras were replaced with AXIS P3304 Network Cameras, which mainly monitor the public areas of the gallery. The video management software, Mirasys NVR 5.1, was supplied by the Finnish company Mirasys. SMK still has a large number of analog cameras in the system, but the plan is to replace even more of these with IP cameras.

The remaining analog cameras are currently connected to AXIS Q7406 Video Encoders that convert the analog signal to IP and in that way even the older cameras are integrated into the system. This solution was developed jointly with Axis partner G4S in Denmark.

## Result

Everyone involved in the installation is satisfied with this new system. Gallery visitors – the most important group – do not even notice the cameras. Exhibition designers need not concern themselves with the cameras, as they are discreet and easy to locate. The security manager can simply install cameras after reconfiguration, while security guards appreciate the advantages provided by the system. They can design their own views with the cameras located in their area and also see the exact location of each camera in the building using floor plans. Since the entire system is based on an open platform, it can be simply upgraded in line with rapid technological development. There are also plans to exploit the opportunities of using intelligent applications, for example, to calculate the number of visitors and analyze how they move around the building.

"Our exhibition designers find the cameras fantastic. We're not used to hearing that."

Mike Coffman, Security Manager at the National Gallery of Denmark.

### A building in constant change

The exterior of SMK is the same from year to year, but the interior changes shape two to three times annually. Walls are moved, new walls are erected and old walls dismantled. In 2012, for example, the gallery showed a major Matisse exhibition.

IP cameras made the work simpler, cheaper and faster. "All you need to do is install the camera, program the IP address and run the cable. And then it takes a couple of minutes to adjust the camera angle and the lens," says Claus Bjerg at Axis partner G4S. Moreover, one cable per camera is sufficient, as the cameras are powered via the network cable. (This is important as SMK is a listed building in which running cabling, drilling and structural alterations are strictly limited).

For the exhibition designers, the cameras do the most important job – they are inconspicuous. Thanks to AXIS P3304's fixed dome design, the cameras blend discreetly into the environment, and visitors can devote all their attention to the artworks on display. Since the cameras provide high-definition images, they are also easier to locate. "I've not heard any of the designers complain about the AXIS P3304 cameras. On the contrary, several have actually praised the decision to make the conversion," says Security Manager Mike Coffman.

But although the cameras are barely visible, they do the job. The high-definition cameras provide the security guards with a good overview and enable them to plan their own rounds.

"G4S has been working in the building for a long time so they understand our needs. They were therefore able to present us with good proposals for both products and software," said Mike Coffman.

In the same way as SMK is constantly changing and being renewed, the needs and facilities for protecting visitors, staff and artworks will constantly change and be renewed. Products and services from Axis and its partners will enable this process without eating into unnecessary time and money.

### Intelligence is the future

So far the cameras are wholly used as safety and security cameras. This may change in the future according to Mike Coffman, who sees major opportunities. "Apart from using them to calculate how many people are in the building, it's possible to see how visitors move around and between the galleries. This is very useful information when planning exhibitions. It would also be good to be able to use intelligence in case of an evacuation, to know whether there are people left in the building and in that case, their location."

### Priceless art treasures and people

An art museum does what is considered inconceivable by most people. It allows public access to priceless objects. Over the years countless spectacular thefts from art museums have been committed, often when the galleries were full of visitors. Unfortunately, visitors also sometimes, intentionally or unintentionally, vandalize the artworks. It is therefore necessary to keep a close eye on the exhibitions the whole time. Leonardo da Vinci's Mona Lisa, without a doubt the world's most famous artwork, can be taken as an example. It was stolen in 1913 and missing for more than a year. Since being recovered, it has been damaged in two vandal attacks, and as recently as 2009, a Russian tourist threw a teacup at the painting, which escaped damage on that occasion.

However, the most important thing is nevertheless the people. Each year the gallery has around half a million visitors, many of them children. Security efforts are therefore largely focused on creating security for visitors, with the cameras having an important job to do.



## Axis products make Eslöv safer.

New technique saves money and increases safety.



Organization:  
Eslöv Municipality

Location:  
Eslöv, Sweden

Industry segment:  
City surveillance,  
Government

Application:  
Safety and security,  
crime prevention

Axis partner:  
ComTech Group

### Mission

The Municipality of Eslöv in Skåne has had problems with arson since 2008. To handle and rebuild burnt down buildings has to date cost the Municipality roughly 100 million kronor. The Municipality estimates that all together 4,500 square meters of property have been destroyed, among others, a school, a sports center and a kindergarten. An acute demand for action ensued within the municipality, aiming at preventing such destruction in the future. The Municipality had permission to monitor only 2 meters from the front of the properties, so conventional surveillance cameras were not an alternative.

### Solution

The need of the Municipality of Eslöv was to prevent such incidents happening and to make fast intervention possible. Identification was not a primary need; the objective was preventive detection. The Municipality therefore contacted Axis partner ComTech Group that chose AXIS Q1910-E Thermal Network Camera with a direct connection to an emergency service center. In this case, the camera works as a thermal sensor.

With the help of this overall solution, the Municipality may easily monitor places that are particularly at risk, without exposing the identity of the persons. There are a total of 23 cameras placed on seven buildings in the Municipality.

### Result

The investment is part of the closer surveillance that the Municipality of Eslöv has invested in to stop the arson. It is also possible that other vandalism can be prevented by the knowledge of the thermal sensors. The system is being installed as a measure of prevention and to hopefully detect problems at an early stage. If the investment produces the intended result, the Municipality of Eslöv will successively increase the surveillance using, among other things, thermal sensors.

"We have lost enough; many important buildings in Eslöv have been burned to the ground. Norrevångshallen, where the majority of the local sports clubs were housed, was a hard blow. Calculations have shown that 1,500 persons were affected by the incident, as quickly as the next day. The pressure to act increased after this incident. We hope that the monitoring efforts will help us to manage the problems and to create a more secure environment for our residents. We consider the project to be an investment for the future."

Lars Andersson, Property Manager, service and technology, in the Municipality of Eslöv.

### Thermal sensors as a preventive measure

The thermal sensors are switched on at all times, and there is readiness during evenings, holidays and nights. The technique is being used in real-time, which is why the Municipality of Eslöv has no need to store any recordings. The thermal sensors are connected to an emergency center that receives indications of when many people move or are present in a monitored location. In many locations the vegetation has been reduced in order to enhance visibility and to make monitoring of the area easier. Through a loudspeaker, mounted in connection to the Axis camera, the personnel at the emergency center can inform persons in question that they are being monitored. When necessary, the emergency center will send a guard to the location to speak to the persons that are present there.

The security guard company will act preventively. With the help of the system, potential problems are detected at an early stage, and fast action can be taken. It is also to the advantage of the guard, because the camera exposes what is going on first, and the guard can be prepared for what is happening. When the guard reaches the location, he or she is also closely monitored, which contributes to the security at work.

### Advanced technique for demanding environments

The Municipality of Eslöv uses 23 thermal sensors, distributed over 7 locations. AXIS Q1910-E is the first network-based thermal camera in the world and it can detect persons at a distance of up to 200 meters and vehicles at up to 550 meters. The model has both a sabotage alarm as well as a movement detection function. The camera works extremely well in demanding conditions, such as darkness, mist and smoke. The model is not affected by laser beams or bright light. AXIS Q1910-E is adapted to tough weather conditions, and for round-the-clock use. Due to these characteristics, the camera is well suited for all kinds of outdoor surveillance.

"The installation with network based thermal sensors saves time and money, as it is possible to simultaneously monitor several objects. The Municipality of Eslöv has a

large area to cover, which would be very costly with a conventional camera technique. It was not by chance that we chose the Axis thermal camera; it could offer the most cost-effective solution for our needs," Hans-Erik Jönsson, fire engineer in the Municipality of Eslöv, says.

The AXIS Q1910-E Thermal Network Camera supports ONVIF (Open Network Video Interface Forum), which makes it compatible with other network video products. The model also supports H.264 video compression. It allows for a smaller bandwidth, which in turn reduces the need for storage by 80%. However, the Municipality of Eslöv does not use this functionality as the monitoring is done in real-time.

### 'Ear to the ground'

In order to further increase security the Municipality of Eslöv has recently initiated a cooperation project called 'Ear to the ground'. The project is inspired by an effort that has previously been used in the Rosengård district in Malmö. The Municipality considers that the effort has worked well, even if the situation in Eslöv is, in many ways, different.

The aim of the project is to create long-term a more secure environment in Eslöv. The Municipality meets with, among others, the rescue service, the social service, security companies and the police, once a week to discuss the situation and to exchange experiences. After the meetings resources are allotted according to existing needs. So far the response from the participants in the project has been very positive. In addition to this project, the Municipality of Eslöv has a very good relationship with local industry with the aim to create security. The work has resulted in shorter reaction times in the handling of crises in the Municipality. Previously, measures could have been delayed for several weeks, and in some occasions even for months. Today, incidents are checked and processed within a week from when they happened.

"We already feel that the project has had an effect in the Municipality. The autumn vacation was the first in many years when there were no incidents caused by youth gangs in the Municipality," says Hans-Erik Jönsson, Fire Engineer in the Municipality of Eslöv.





## Surveillance cameras secure Danish housing cooperative. Tenants at Gersager Park installed 108 Axis network cameras to prevent trouble and disturbances.



Organization:  
Gersagerparken  
Cooperative Housing  
Society

Industry segment:  
City surveillance,  
Commercial

Location:  
Greve, Denmark

Application:  
Safety and security

Axis partners:  
ATEA, EET, Milestone

### Mission

The cooperative housing society\* Gersager Park in the Danish town of Greve has 1,100 apartments with some 2,500 tenants. At Gersager Park, they have never had any particular problems, but since security cameras were installed in a neighboring housing area that was having problems, the tenants at Gersager Park decided to also get video surveillance since they were worried that there might be a domino effect. They felt there was a risk that the troublemakers would move on to Gersager Park instead. The housing society contacted Axis partner ATEA, who previously had put in filters at Gersager Park. ATEA has now installed Axis network cameras with Milestone XProtect® software.

### Solution

The installation started in January of 2011 and consists of 108 Axis network cameras placed in strategic locations. The solution is flexible, and the tenants at Gersager Park chose to have cameras installed in half of the 80 entrances within the blocks of apartments.

The tenants themselves can move these cameras to other entrances, as needed. Additional units have been placed in common areas and along public footpaths and tunnels that lead into the housing area.

### Result

The majority of tenants are satisfied with the security that the surveillance cameras give, seeing them as security cameras rather than surveillance cameras.

At Gersager Park, there has been a positive dialog with the tenants before as well as during and after the installation of the surveillance cameras. The housing manager, John T. Olsen, has noted that both he himself and his colleagues receive more e-mails now than before the installation, since the tenants themselves have become more observant of keeping law and order and thus more often send reports of any irregularities they have witnessed.





The solution at Gersager Park consists of AXIS Q1755 and AXIS M3204 Network Cameras that monitor public pathways and tunnels that lead into the housing area.

"We have chosen AXIS Q1755 for this task because the cameras have zoom, auto focus, and a day/night function, and since you can zoom from a PC to achieve the desired picture quality as well as picture segments. Furthermore, the cameras can see from a very long distance, which makes them perfect for this kind of task," says Business Manager Michael Okholm Nielsen from ATEA.

40 AXIS M3204 HDTV-quality Network Cameras have been installed in and around selected entrances. This camera is a vandal-resistant dome camera, which means that the camera lens is covered by a protective glass dome to prevent it being moved or removed.

The last camera model that was chosen at Gersager Park was AXIS P3344-VE, 61 in all. According to Michael Okholm Nielsen this camera has been chosen for strategic locations because it can see alongside the buildings, has HDTV quality and a suitable focal distance that can be set to the desired picture segment.

"The camera has a sun visor on the glass dome that protects the lens from sunlight and poor recordings. This camera is of course also vandal-resistant," adds Michael Okholm Nielsen.

The most important thing for Gersager Park is that the system is flexible, and with that in mind they have chosen to take advantage of ATEA's DLM concept – Device Lifecycle Management. The DLM process is adapted and optimized according to the practical task and the individual customer. A monthly fee is paid to ATEA for service and insurance for all the cameras. Equipment that has been destroyed is replaced with new equipment, so that Gersager Park always has the most up to date equipment from Axis.

**Information is important**

One of the most important aspects regarding video surveillance is to make sure that people are not monitored unnecessarily. Axis partner ATEA, who set up the solution for video surveillance at Gersager Park, takes this matter very seriously:

"We are responsible for telling those who have access to the surveillance recordings what they are allowed to do – legally as well as adhering to the ethical rules – in that unnecessary surveillance is not allowed," says Michael Okholm Nielsen.

"We spent 3 days at Gersager Park holding meetings where we informed the tenants about what was happening and how they could ask questions regarding the video surveillance. This contributed to creating a positive attitude to it and to the security that is so important in connection with video surveillance," emphasizes Michael Okholm Nielsen.





### Good evidence

Gersager Park has a large and enclosed area for rubbish, but there has been a problem with companies who have driven by and dropped off their waste at night. According to the housing manager at Gersager Park, John T. Olsen, this is no longer a problem: "With our surveillance cameras from Axis, we can now look at the recordings of who has stopped by. And since the camera images are so clear, we can see their faces as well as the company logos on their vehicles."

Since long before the cameras were installed, the tenants at Gersager Park have been very consistent in their way of handling disturbances. Among other things, they charge a fine of 250 DKK on top of the rent, for individuals who throw their rubbish in and around the entrances. Before the cameras were installed, you had to sort through the rubbish manually in order to find anything with a name and address on it, but now you can just use the camera recordings.

"People also became shrewder, sorting out anything with a name and address on it. That made it quite hard to find the culprits. But with the sharpness and zoom function of the Axis cameras, we now have solid proof when we need to find those who cause problems," says the housing manager at Gersager Park.

"With our surveillance cameras from Axis we can now find and look at recordings of individuals who have created problems or disturbances. And since the camera images are so clear, we can see the faces of trouble-makers and the company logos on the vehicles that drop off garbage in our garbage area."

### A necessary part of security in everyday life

It has only been about 10–15 years since people started associating video surveillance with "Big Brother is watching you." Today this attitude has changed: "We have supplied video surveillance to several housing areas in Denmark, among them Tingbjerg and Vollsmose. For them it has primarily been a question of stopping disturbances, while the surveillance at Gersager Park is about prevention and creating security. In fact, it is the element of security that has made people accept video surveillance as a necessary part of their daily life," says Michael Okholm Nielsen from ATEA.

At Gersager Park, there is no doubt that Axis' surveillance cameras have come to stay. "We are very happy with this solution. And as time goes on, we find new places where we need to have cameras installed in order to give the tenants security in their daily life," concludes housing manager John T. Olsen from Gersager Park.



# Critical infras



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“ Axis offered a reliable and high quality solution to carry out the system upgrade. We also had great user experience of Axis. ”

Kari Nykänen, Ph.D. in charge  
of information security at Oulun Energia.



## Oulun Energia chose Axis network cameras for a more efficient surveillance solution.

A reliable solution with remote monitoring possibilities and intelligent video functions were the key requirements when Oulun Energia decided to upgrade their surveillance system.



Organization:  
Oulun Energia group

Location:  
Oulu, Finland

Industry segment:  
Energy, critical  
infrastructure

Application:  
Safety and security,  
remote monitoring,  
process monitoring

Axis partners:  
Stanley Security Oy,  
Anixter

### Mission

Oulun Energia is Northern Finland's leading energy group. Oulun Energia is a company that sells and distributes electricity, heat and steam as well as other related services. The company spans the entire value chain of the energy sector: including the production of raw material, generation, distribution and sales of electricity and heat.

### Solution

In the end of the old surveillance system's life cycle, Oulun Energia made a decision to use IP-based video surveillance system in order to achieve more efficient surveillance. In the end, Axis network cameras were chosen. "Axis offered a reliable and high quality solution to carry out the system upgrade. We also had great user experience of Axis," says Kari Nykänen, Ph.D. in charge of information security at Oulun Energia.

### Result

The video surveillance system at Oulun Energia is used in monitoring the energy production. In the heating plants and electricity network the video surveillance system is used mainly for surveillance of production and of the premises. Cameras are also used to help remotely operate parts of their facilities. "For us, the main benefit of the remote surveillance system is that it allows us to work remotely with the visual aid of the cameras. You can monitor the processes at the distant plants much more efficiently," says Kari Nykänen.

“Very few companies can offer the quality of camera we need in our critical industry, but Axis cameras can, and do, deliver.”

Kari Nykänen, Ph.D. in charge of information security at Oulun Energia.

The work of replacing the old analog systems started in 2007 with a newer IP-based camera solution, although it presented its own unique set of challenges. Issues arose because of the strong electrical fields present at their facilities which are emitted from structures like their network transformers.

There are upwards of 100 Axis network cameras installed today at 15-20 remote sites, with more planned for the future. All these cameras are constantly recording and the company now has footage of each every ongoing process. Oulun Energia also benefits from a feature in their cameras that transmits a signal if it is out of operation, and there are plans to implement further intelligent video features into the system to help them get even more useful data.

Oulun Energia also uses their cameras to investigate incidents of graffiti and vandalism. The normal procedure following an incident is to produce video clips of the event, report the offense and process the matter further. However, the camera system can also keep them safe, as a vandal may not necessarily realize the danger they are in if, for example, they get too close to an electric field transformer. It is vital that Oulun Energia are aware of anyone who may be trespassing on their sites, which is why they also get peace of mind in knowing that their cameras work well as a deterrent, as they have clearly visible signage warning of the cameras' presence.

The cameras help the company when there has been a crisis situation on the production line too, by helping Oulun Energia investigate the cause. They can also help with planning: for instance if a building is too close to an electrical plant, it could cause problems in that location. With Axis cameras present it gives the team a clearer picture of the situation which, in short, means they can prevent incidents from happening.

The cameras are contributing to a safer work environment and help to prevent damage and costly production stops. “We have not once been in a situation where there has been no video material of an event; the recording capacity is good and it clearly meets our demands,” says Kari Nykänen.

Oulun Energia asked its employees whether they minded that their workstations may be monitored by cameras, but the feedback they received suggested no one found it to be a nuisance; in fact staff reacted positively.

The company is now planning new power and heating plants where it is expected that additional camera surveillance systems will be implemented.



# Axis cameras resolve surveillance and assist with health and safety management at Donarbon.

Network cameras identify unsuitable refuse taken to Cambridgeshire waste management plant.



Organization:  
Donarbon

Location:  
Cambridgeshire, UK

Industry segment:  
Utilities

Application:  
Waste management,  
health and safety,  
remote monitoring and  
security

Axis partner:  
3IT

## Mission

At Cambridgeshire's largest waste management park, Donarbon was keen to upgrade its existing surveillance system to help improve health and safety across the site. It also wanted to be able to record all vehicles entering and leaving the park and monitor deposits so that any persistent offenders dumping unsuitable refuse could be identified. At the heart of Cambridgeshire County Council's waste PFI (Public Finance Initiative) contract with Donarbon is the Mechanical and Biological Treatment (MBT) plant. A surveillance system to help the MBT control room view what's happening on the plant was essential to assist with health and safety management and also to monitor waste arrivals for anything unusual.

## Solution

Donarbon's IT contractor, 3IT, recommended an IP-based surveillance solution from Axis Communications. A range of Axis network cameras were deployed throughout the site that deliver excellent image quality under all lighting conditions over the IP network.

To view and record the footage taken from the cameras, 3IT advised Donarbon to use AXIS Camera Station, a software solution for simultaneous viewing and recording of high-quality, H.264, MPEG-4 and Motion JPEG video, with no recording limitations.

## Result

Donarbon now has an extremely effective surveillance solution which not only monitors vehicles entering and leaving the site, but also contributes significantly to health and safety improvements. An unexpected benefit the surveillance system delivers is helping the MBT plant's engineers to remotely monitor the equipment and quickly identify any major faults. 3IT also set up the MBT technology providers in Austria with remote access to the surveillance system to assist the on-site technicians with fault diagnosis.



"The Axis network cameras save us a great deal of money when it comes to insurance claims. We will have evidence of what has happened in the case of an incident and can prove liability."

Huw Gaskill, MBT Manager, Donarbon.

### Axis cameras assist with health and safety management at Donarbon

Donarbon, part of the Dickerson Group, is based on a 200 hectare site at Waterbeach, Cambridgeshire. It has a major waste PFI contract with Cambridgeshire County Council to treat the county's waste and ensure the council meets recycling targets. As part of the PFI contract, Donarbon has a MBT plant, the first of its kind in this country. It uses the latest technology to sort waste and helps reduce the amount sent to landfill as up to 80% can be recycled.

### Unwanted items

Donarbon waste management park accepts a range of waste brought in by various vehicles and means. Staff often find objects in the waste that could damage the expensive machinery so it is vital to survey the tipping area to identify these items so that they can be removed. Damage to the site by garbage trucks and dumpsters was also a problem, and Donarbon was keen to monitor this to identify repeat offenders.

Donarbon already had analog cameras in place, but was looking to step up its surveillance. It approached 3IT, its IT provider, to suggest a solution. "We recommended Donarbon upgrade to an IP-based solution as it would provide the image quality needed for improved surveillance and allow for images to be shared remotely over the network – which is very useful in the event of an incident. As a partner of Axis Communications, we didn't hesitate to base the new system on its technology," said Kevin Auden, director, 3IT Ltd.

3IT placed Axis cameras in strategic locations in the plant: AXIS 225FD Fixed Dome Network Cameras were positioned in the reception, AXIS 221 Network Cameras were installed in the entrance bays and AXIS 232D+ Network Dome Cameras were installed in the preparation hall. To view and record footage, Donarbon uses AXIS Camera Station, a software solution for the simultaneous viewing and recording of high-quality video. 3IT recommended that footage be stored on NAS (Network Attached Storage) boxes located throughout the site.

### Unexpected benefits

The MBT plant is designed to run with only a few people and this is now possible thanks to the cameras. The production coordinator is responsible for identifying the location of staff across the site and he can now view this from a PC in the control room. 3IT also installed a 42" wall mounted monitor so control room operatives can look at all the cameras at once and another monitor is in the reception to allow visitors to view the working plant.

The MBT machinery sorts around 50 tons of waste per hour and any blockages could cause it to come to a halt. 3IT have now set up the IP-based system so that the engineers responsible for support and maintenance of the machinery can log on remotely and identify any faults over the Internet. The engineers then advise staff on site, which speeds up the repair process and reduces costs as call outs are fewer.

Commenting on the benefits of the new surveillance system, Huw Gaskill, MBT manager, said: "The cameras' PTZ functionality means we can rotate the cameras 360 degrees and zoom into a bolt head. This greatly assists with quickly locating blockages. Whenever a vehicle enters or leaves the site, we now have video evidence and if any damage is caused we are able to identify the vehicle responsible. This saves us a great deal of money when it comes to insurance claims as we can prove liability."

"The cameras also help us identify any hazardous goods discarded onsite. For example, recently a garbage truck deposited some smoldering waste and we could zoom in and detect the problem immediately."

James Challis, Group IT Manager said "We are even using recorded footage to educate visiting school parties on recycling and waste management. This enables us to show them how the MBT plant works without them having to go near the machinery. Now, thanks to the IP-based system, we have an extremely effective surveillance solution which contributes significantly to health and safety management and keeping our machinery operational at all times."



# Video encoders and decoders from Axis facilitate the transition to digital surveillance systems.

Ruukki is modernizing the surveillance system at Raahe, its Finnish plant.



Organization:  
RUUKKI

Location:  
Raahe, (Oulu), Finland

Industry segment:  
Industrial/Manufacturing

Application:  
Safety and security,  
process control

Axis partners:  
Noatek, Mirasys,  
EET Nordics

## Mission

Finnish company Ruukki Metals, a part of Ruukki Group, produces, processes and supplies metal-based solutions to the construction and engineering industries. Ruukki Group has 11,700 employees and operates in 27 countries. The company's headquarters are in Helsinki, and the net sales amount to approximately EUR 2,400 million. The production processes and the planned area are monitored from several control rooms by cameras. The older analog surveillance systems had reached their maximum capacity and needed to be modernized. There was also the need for better picture quality and the possibility of intelligent features in the cameras.

## Solution

The analog systems had been upgraded to their absolute limit; but replacing all of the cameras at the same time was not an alternative. Both due to cost reasons and because surveillance must be kept operating around the clock, seven days a week. The solution Ruukki Metals chose was to install video encoders and decoders during the transition phase to be able to modernize the systems

and to achieve the benefits an IP-based solution provides; a scalable system, cost efficient with possibilities to add intelligent functions. The solution can be compared to a virtual video matrix that has a simple user interface and the advantage offered by an IP system of being able to grow indefinitely. The video encoder converts the camera's analog signals to digital. The video decoder makes it possible for the monitor or the TV screen to display the images.

## Result

In 2010, Axis partner Noatek began with the installation of Axis video encoders and decoders. The project is expected to last for ten years and eventually, all analog cameras will be replaced by network cameras and the entire surveillance system will be IP-based. Calculations show that Ruukki will save 50% of the cost by replacing the analog matrix systems in favor of video encoders instead of installing additional analog matrix systems to cover its needs.



"Axis Communications' solution with video encoders and decoders, allows us to modernize our camera system at the same time as round-the-clock surveillance is maintained. We also find it positive to be able to replace our analog cameras over a period of time. It is too large an investment to replace the cameras before the end of their working life."

Juha Korpela, Technical Expert at Ruukki.

### Why cameras in production?

Ruukki's largest steel mill in Finland is located outside Oulu, south of Raahe. The mill primarily produces and refines hard steel for the automotive industry. Iron ore is taken from several different mines, including Kiruna, and each year 800 ships, 55,000 trucks and 30,000 rail wagons arrive and depart to and from Ruukki with loads which contain iron ore and processed steel.

At Ruukki's plant in Raahe, surveillance used to be carried out by people who were often working in exposed and dangerous situations. Crane operators controlled their cranes from a crane basket. Today the crane is controlled from a control room with a camera filming what is happening from the basket, which makes the workplace a lot safer. The cameras are used to keep an eye on what is going on in the production line, for example, to see if a transportation line is empty or full. The cameras are also used to monitor Ruukki's facility. The department working with video is responsible for all areas within the plant and consists of about ten people involved in the maintenance and planning of surveillance systems.

### A major project

Planning of the new surveillance system began in 2009 and installation started in 2010. The installation of the video encoders and the new IP cameras will continue over the next few years. As of today, one of the 40 control rooms is equipped with the new system. Over 100 Axis video encoders are installed to transform the analog camera streams to IP. The models used are AXIS 241S (single channel) and the rack-mounted AXIS Q7406 Blade (six channel). A simple custom user interface has been developed to monitor live video which completely replaces the old matrix technology. Instead of each monitor being connected to a PC, Axis video decoders are used.

### Benefits of decoders

Video decoders are also used to display video on large screens in the control room. They were chosen because they are easy to control from the proprietary software and so that the number of PCs with software in the system can be minimized.

This improves the stability and in addition, they continue to display the video even if the software in the PC system is updated. Overall, this provides a very stable and simple platform. For continuous recoding, Mirasys' video management software can be used. "Being able to update the software without interrupting the video display is of the utmost importance to us. Using decoders makes this possible," says Juha Korpela.

### Cost-effective system provides high image quality

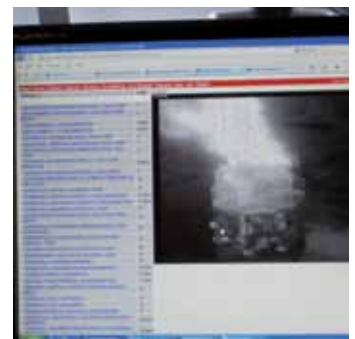
Calculations show that Ruukki will save 50% of the cost by using video encoders instead of installing additional analog matrix systems to cover its needs. Most of the work can also be done indoors, which saves time and money as the climate in Oulu is very severe. Another advantage is the improved video quality which the new IP cameras and the stored images from the old analog cameras offer. "The video encoders provide a new lease of life to the analog cameras. The future really is IP," says Antti Nousiainen from Noatek.

### Testing the use of thermal network cameras

Cameras can be used in many areas in this type of industry. Among other things, Axis thermal network cameras have been tested and are now being used to further enhance the safety of the plant. Thermal cameras monitor the dangerous gas which is emitted when steel is melted to make iron. The gas cannot be seen with the naked eye and it must be burned as soon as it comes up into the chimney. The cameras monitor the process.

### Models for the future

The project at Ruukki's plant in Oulu is in full swing and tests have begun with several different IP cameras. The climate and the extreme circumstances that prevail at the plant in Oulu place high demands on product quality. The AXIS Q60 Network Camera Series is used for area surveillance and thermal cameras are used to detect fires and gas. In the future it will also be possible to install so-called "low light" cameras in the ovens.



**RUUKKI**

**noatek**

**MIRASYS**

**EET**  
NORRIS

## Ulstein shipyard chooses Axis cameras to monitor and provide surveillance.



Organization:  
Ulstein Verft

Location:  
Ålesund, Norway

Industry segment:  
Industrial/Manufacturing

Application:  
Safety and security,  
anti-theft surveillance,  
fire prevention

Axis partners:  
Niscayah, Anixter,  
Detec

### Mission

Ulstein Group is a Norwegian family-owned company in the shipbuilding industry and has about 800 employees. The company was founded in 1917 and is located outside Ålesund in Norway. It has offices and factories in China and sales offices worldwide. Ulstein manufactures large, technologically complex ships for the oil and exploration industries. Innovation, technology and design are important cornerstones for Ulstein and ship designs are also sold to other shipyards.

Ulstein Verft has invested a great deal in technology expertise. "Anyone can build hulls, but the big boats of today have a lot of technical equipment on board. Therefore, a modern shipyard needs to invest in product development and research. We want to be at the cutting edge in everything we do. And this also applies to our surveillance of the shipyard," says Don Johansson, Safety Responsible at Ulstein Verft.

### Solution

The shipyard on an island outside Ålesund is currently monitored by 11 AXIS 232+ and AXIS 233D Network Cameras. The shipyard previously had no camera surveillance system and when it decided to install one it chose Axis Communications and Axis partner Niscayah as supplier and installer.

The choice of IP-based cameras means there is no need to lay cables and installation is more flexible. The IP system makes it easier to expand the system with more cameras and also to implement intelligent video for future requirements. The IP camera system is supported by software from Detec, one of Axis's ADP partners in Norway. Ulstein Verft uses software models Detec TL and Detec L. Detec's software is very flexible and can be upgraded with the number of camera licenses and clients that are needed in the future.

"We want to deliver the best possible quality in everything and this also applies to surveillance cameras. Axis allows you to do more with the cameras than just set an IP address. The interface is easy to work with."

Trond Inge Larsgård, Niscayah Norway.

The shipyard's entry gate is currently staffed by guards who monitor the gates and the hall in which the ships are built. Remote access is used to monitor a small shipyard located approximately 1.5 hours away. "This is an important cost saving that also gives us greater control", says Don Johansson.

### Result

Five ships are to be delivered from the shipyard in 2012. The production time is at least six months and involves major investments and the purchase of expensive material. "We have had incidents in which expensive material was stolen from the area. This means big problems as the manufacture of the vessels is delayed," says Don Johansson. The camera surveillance increases security and makes it possible to be able to investigate incidents afterwards and provide image-based evidence. The image material is recorded and viewed using software from Detec. The images are saved for 7 days in pursuance of Norwegian legislation.

### A complicated working process can be made safer using cameras

Designing and building large, technologically complex ships is a challenge. Situations that both delay and jeopardize the process easily occur. The IP camera system helps monitor the process so that nothing unforeseen occurs and the image material can subsequently help investigate and analyze the course of events. For example, a small fire occurred during welding work. A welding spark hit a pallet with highly flammable material that began to burn. The fire was put out by an attentive employee and did not cause any damage. However, as a camera captured the incident it was possible to discuss safety measures with the subcontractor responsible for the welding work.

Don Johansson has not had any negative reactions to the cameras. When the decision to install camera surveillance was made, the trade union representatives were informed of the plans and the response was only positive. The only question from the trade union representatives was whether the installation should not be expanded with more cameras. "We are now looking at extending the system and intelligent video functions are also an enticing prospect," says Don Johansson.



ULSTEIN®



ANIXER



DETEC



# Axis is the world leader in IP video and surveillance cameras

## And your #1 choice for quality and reliability in all conditions.

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- > The world leader in network video, driving the shift from analog to digital
- > Sweden-based company, with over 16 years of experience in IP video and nearly three decades of network know-how
- > Installations worldwide in sectors ranging from retail and transportation to education and city surveillance
- > Dedicated partner network offering unrivaled expertise
- > Solutions delivering enduring results, even in the most extreme conditions and remote locations
- > Open standards only, for easy integration and scalability

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# Educa



# ation



“ Analogue-based CCTV has no future because it is not able to absorb some of the more recent technology developments such as wireless, Power over Ethernet, progressive scan, mega-pixel or compression enhancements including H.264. It's standing still whilst the IP equivalent is benefiting from a great many innovations all the time. I simply could not countenance going to the board of governors of the college to recommend putting in a CCTV system, which would be no less expensive, but would be obsolete within 10 years. ”

Domingo Rodriguez-Baez, Assistant Estates Manager, Knowsley Community College

# Axis enables Knowsley College to look into an IP-Surveillance future.

UK campuses gain 100% surveillance coverage with future-proof solution.



Organization:  
Knowsley College

Location:  
Liverpool, United Kingdom

Industry segment:  
Education

Application:  
Campus security

Axis partner:  
MCW Group

## Mission

Knowsley Community College has 3,500 full-time students, aged between 14 and 19 years old. The majority of these students are located at the Kirkby and Roby campuses which are located seven miles apart, north-east of Liverpool. During 2006 the college's principal tasked his assistant estates manager, Domingo Rodriguez-Baez, with specifying and developing a new, more comprehensive surveillance system for both campuses. The request followed a number of petty criminal incidents in parking lots which went undetected due to the inadequate analog-based CCTV system in place at the time.

## Solution

Knowsley College achieved 100% coverage with this new surveillance solution. Axis partner MCW Group installed 172 Axis network cameras at Kirkby and a further 152 at Roby, ensuring that every entrance, corridor, stairwell, back alley, server room, boiler room and switch room was integrated into a comprehensive IP-Surveillance system.

All cameras are Power over Ethernet (PoE), achieving total savings of £26,000 at the installation stage in comparison with a quotation from a local specialist for an equivalent number of wired analog CCTV cameras.

MCW Group recommended a video storage and management solution based on Axis network cameras, HP Proliant servers and Milestone XProtect video management software. By deploying the latest version of Milestone XProtect Enterprise the college has the option to integrate both Automatic Number Plate Recognition (ANPR) and facial recognition functionality at a later date, both of which it is considering for vetting visitors and policing assigned parking spaces. In addition, the college's security manager now has the option of viewing images on his mobile device while patrolling elsewhere in the campus or off-site.



"I wanted to recommend a future-proof solution. It needs to grow with our needs and enable us to make continual improvements and extensions. I knew a pure IP system offered these options whereas it became increasingly clear that analog-based CCTV has no future because it cannot absorb new technology developments such as wireless, Power over Ethernet, progressive scan, megapixel or compression enhancements including H.264."

Domingo Rodriguez-Baez, Assistant Estates Manager, Knowsley Community College.

## Result

Knowsley College now has a pure IP-Surveillance system which provides 100% coverage of both campuses and offers a platform flexible enough to take advantage of new technology developments such as the H.264 compression standard, megapixel cameras and intelligent analytics capabilities including ANPR and facial recognition. Return on the £500,000 total investment will be achieved in less than six years, as this IP-based solution can be maintained by the college's own IT department – if the existing analog-based CCTV system had been extended, maintenance would have needed to be outsourced at a cost of £72,000 per year.

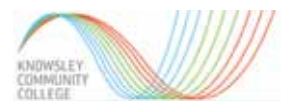
## Knowsley Community College – award-winning vocational skills center

The college, which opened in 1984, operates across two large campuses to the northeast of Liverpool. It also has three high street 'learning shops' and delivers courses via more than 200 community outreach centers. The Kirkby campus has an award-winning vocational skills center and offers courses such as brick laying, joinery and hair & beauty; as well as business studies, business administration and secretarial training. The college employs 700 staff including 400 teachers and has been awarded Grade One (Outstanding) in Leadership & Management by UK schools inspectorate Ofsted.

## Pure IP-Surveillance provides total coverage and future-proof investment

During the 1980s a standalone CCTV system had been installed in both campuses of the college. From the early 2000s, there had been an increasing number of petty criminal incidents such as damaged car hubcaps and side-view mirrors in the campus' parking lot. It was frustrating to know that, despite investment in CCTV cameras, there was no guarantee that the college's security team would be able to find the culprits or even confirm what happened following an incident.

When these acts of vandalism occurred worried parents would often enquire whether the college had traced the offenders on camera. Subsequent investigations often proved unsuccessful because relevant CCTV footage could not be located and the college's principal, Sir George Sweeny, parents and staff alike were expressing their frustration with the situation. Sir George subsequently tasked Domingo to find a more comprehensive and reliable surveillance system in keeping with the college's vision of providing a secure site for education. After weighing up the options of extending the existing CCTV system, moving to a CCTV-IP hybrid system, or building a pure IP-Surveillance system, Domingo chose to specify a pure IP-Surveillance system. The new system offers both assurance of return on investment and the flexibility to extend the functionality and scale of the system in the future.



# Axis cameras protect staff and students at the Lady Eleanor Holles School.

Future-proof next generation CCTV system improves school security and on-site safety of staff and pupils.



Organization:  
The Lady Eleanor Holles  
School

Location:  
UK

Industry segment:  
Education

Application:  
Safety and security

Axis partners:  
Kent CCTV & Data  
Limited, Milestone

## Mission

The Lady Eleanor Holles School in the UK needed to replace its existing analog CCTV with a more effective IP surveillance solution. The school wanted a cost-effective, user-friendly solution that was easy to install and could provide exceptional image quality to facilitate the identification of trespassers and thieves and improve the on-site safety of staff and pupils. They also wanted something that could be added to their large expanding computer network, utilizing virtualization for the recording server.

## Solution

The school chose an IP-based surveillance system containing 42 HDTV Axis network cameras. These cameras provided exceptional image quality and were powered by Power over Ethernet (PoE) to reduce installation costs. Kent CCTV & Data Limited was selected to install the system and used Milestone XProtect® Enterprise, an open platform IP video management software for multi-site and server deployments.

## Result

The school now has a cost effective, easy-to-use IP surveillance system that provides exceptional image quality. This highly scalable solution was quick and easy to install. The cameras are delivering excellent footage which can be readily accessed and shared across the network. Already, footage from the new system has been used by the police to identify and prosecute a trespasser who had broken into a neighboring school.

## Axis cameras protect staff and students at the Lady Eleanor Holles School

The Lady Eleanor Holles School is one of the oldest girls' schools in the country, with a student body of approximately 860 girls aged 7 to 18. The school stands on a 24 acre site, its buildings surrounded by gardens and playing fields. This spacious environment has enabled the school to build numerous extensions over the years to enhance its facilities and the curriculum.

"We are absolutely delighted with our next generation CCTV solution which is already delivering a host of benefits. The image quality is far superior than that of our previous analog system and staff feel confident that if needed, footage could be used to identify trespassers or other criminals. As well as being straightforward to use, it took very little time to install our system and it is highly scalable meaning that further cameras can be easily added to it in the future."

Umesh Chapaneri, Acting Head of Technical Support Services, Lady Eleanor Holles School.

Having had its small, outdated analog CCTV system for more than 15 years, the school was keen to replace it with a much larger, more effective, fully-IP surveillance solution. And, as the school was undergoing an extension to its main building, it was a good time to review its existing infrastructure. The school's previous surveillance system was made up of 16 cameras, a few of which were unreliable. The footage provided was also not as detailed as the school wanted. The school needed an IP surveillance solution that was efficient, robust and able to deliver exceptional image quality that was fit for purpose.

### **An easy-to-use high-definition solution**

The Lady Eleanor Holles School understood the many benefits of IP surveillance having seen a network video-based solution at a neighboring school, and was convinced that a next generation CCTV system would best fit its needs. The Lady Eleanor Holles School put the project out to competitive tender, and Axis partner, Kent CCTV & Data Limited, was awarded the contract for its innovative approach to the supply, installation and maintenance of the solution.

Miles Davies, technical director at Kent CCTV & Data Ltd, said: "As today's schools contain a lot of expensive equipment it is crucial that they have a robust, reliable surveillance system. Additionally, the Lady Eleanor Holles School wanted a solution that was easy to install and use, so that a range of staff could access and share the footage as and when they needed to do so."

Axis Communications was chosen to supply the network cameras and 5 different models were deployed in and around the school site.

AXIS P3346-VE Network Cameras were installed to cover external entrances, exits, driveways and walkways. These day and night fixed dome network cameras offer superb video performance. Able to support digital pan/tilt/zoom and multi-view streaming, these cameras also feature P-Iris, a revolutionary precise iris control system that provides optimal image quality in all lighting conditions. The second external camera was AXIS P1346-E Network Camera, two of which were installed on the building site

to view the building construction in time lapse. This is a fixed day and night camera, providing superb HDTV video quality in a robust design. Added to this, AXIS P1347-E Network Cameras were installed to monitor the school's car park. These cameras are ideal for use in any application that requires coverage of a large area or extremely high image detail as they have 5 megapixel performance, P-iris control for optimal image clarity and H.264 compression.

In the school's buildings, AXIS P3346 and AXIS P3304 Network Cameras cover the entrance and fire exits. Like the AXIS P3346, AXIS P3304 offers superior image quality including progressive scan and wide dynamic range, providing crisp and clear images of both illuminated and low-light areas. In addition, the AXIS P3304 provides HDTV 720p/1 megapixel resolution at full frame rate. The cameras are viewed and controlled using Milestone XProtect Enterprise, giving excellent situational awareness for quick response and accurate investigation.

### **Putting staff in the picture**

Umesh Chapaneri, acting head of technical support services at the Lady Eleanor Holles School, said: "The safety and security of our staff and pupils is of paramount importance so we were very keen to make the investment in a new surveillance system. The level of detail that our new IP surveillance system delivers is in a different league from the grainy, unusable images offered by our previous system. In fact, footage from the new cameras has already been used by the police to identify a trespasser who had broken into a neighbouring school and then came onto our land." Chapaneri continued, "It is also now possible to share images across the network so that any footage can be viewed remotely over the Internet. This is already saving staff considerable time which was previously spent trawling through hours of footage. As well as being very quick to install, one of the main benefits of our new system is how straightforward it is to use. Staff have been able to access and share images with little or no training, for example our receptionist uses the cameras to monitor the school gates and our administrator is regularly accessing the footage to check operations."



  
Kent CCTV & Data Limited



## Axis protects University of Aberdeen now and in the future.

University of Aberdeen builds a future-proof IP-Surveillance system using Axis network cameras and video encoders.



Organization:  
University of Aberdeen

Location:  
Aberdeen, Scotland

Market segment:  
Education

Application:  
Campus safety and security

Axis partner:  
Arthur McKay

### Mission

After the University of Aberdeen conducted a strategic review of security, the university decided to rationalize four stand-alone analog CCTV systems and establish a central control room for the entire university. The four systems varied in age and the university wanted a single system which would feature new cameras as well as including existing analog cameras. The system would have to offer the flexibility to cope with future expansion, and to eliminate stand-alone proprietary systems that risked obsolescence.

### Solution

William Stevenson, Assistant Estates Director for Support Services at the University of Aberdeen led the project for the university. He appointed surveillance system integrators Arthur McKay, who had extensive experience in network video projects. Arthur McKay installed 20 AXIS 233D Network Cameras, with 10 AXIS 241Q Video Encoders deployed to convert 35 existing analog-based CCTV cameras. A new Virtual Local Area Network

(VLAN) carried video data from a total of 55 cameras deployed in the new system. Images were stored on a RAID 5 SCSI device with 12 Terabytes (TB) of data capacity, with Milestone XProtect® Enterprise network video recording software Version 6.0e with Milestone XProtect® Smart Client used for management and viewing of images.

### Result

Image quality has improved dramatically, ensuring that images submitted to the local police can be used as evidence. Thirty-five of the existing analog cameras that were still serviceable have been integrated into the new surveillance system to keep costs down. Morale amongst the security team has improved as the new technology helps make their job easier. The system can be scaled further to accommodate growth across the university's campus.



"We have been very impressed with the image quality offered by the new Axis system. The previous system delivered images which rarely identified individuals caught on camera in a way in which they could be positively identified."

William Stevenson, Assistant Estates Director for Support Services, University of Aberdeen.

## Managing a growing university

Founded in 1495, the University of Aberdeen is the UK's fifth oldest university. Today it boasts some 13,900 students, and is currently going through rapid expansion with three new buildings due to be opened in the next few years, after successfully raising over £80 million and with a new campaign to raise a further £150 million by 2010. It is also partway through the largest WiFi deployment in Scotland and the second largest in the UK, with some 1,000 Trapeze WiFi access points installed.

Security and surveillance is the responsibility of the Estates Section's Support Services department, employing a total of 150 people out of the 240 total Estates Section staff. Support Services provides all cleaning, portering and security services to the university. A total of 30 personnel today provide surveillance monitoring and physical patrolling throughout the campus around the clock.

## Surveillance challenges

William Stevenson, Assistant Estates Director for Support Services at the University of Aberdeen was in charge of the strategic review carried out in 2005 looking at the surveillance requirements for the university. Some immediate issues needed to be addressed; the control room had been outgrown as over time more equipment and staff had come on board. Four separate stand-alone CCTV systems were in operation, with proprietary cameras and components requiring spares and maintenance from different manufacturers. A new system would have to be easily scalable to accommodate the future expansion plans for the university and be implemented with minimal disruption.

Stevenson had seen the success of IP-Surveillance deployments elsewhere in the education sector. The solution would need to capitalize on some 35 existing analog CCTV cameras as well as introducing new cameras.

Stevenson reduced the list of possible integrator companies down to two, and chose respected Scottish building services and facilities management company Arthur McKay. His chosen integrator already had extensive experience in working with IP-Surveillance and had worked previously with both Axis and video management specialists Milestone Systems.

## Simple and effective

Arthur McKay installed 20 new AXIS 233D Network Cameras and integrated 35 existing analog cameras into the IP-Surveillance system through the use of AXIS 241Q (Quad) Video Encoders. All data is carried on a VLAN, with the university's extensive network supplying 100 megabits per second (Mbps) of bandwidth to all cameras via one gigabit (GB) link at the server end.

The university moved to a new, larger security office in January 2007 as the focal point for an upgrade of its surveillance system; all images are now viewed on two Samsung 42-inch LCD screens capable of displaying 16 cameras on each screen comfortably. Images are collected in MPEG-4 format, reducing bandwidth and storage requirements by at least 50% compared with JPEG. Images are then stored on a RAID 5 SCSI device which is capable of holding up to 12 TB of data, with the 55 cameras currently using nine TB of storage space to collect two weeks worth of images.

Arthur McKay was able to make the new cameras live alongside the original CCTV cameras that were operating via Axis video encoders in a matter of days. The system can now be expanded as the campus grows, with plans for 16 new network cameras to be deployed campus-wide in the next three years. It can also exploit its extensive investment in network and cabling infrastructure going forward.



"We now have absolute certainty that those who are captured will be identifiable which is very reassuring, particularly if we need to show the images to the local police if a crime has been committed," says William Stevenson, Assistant Estates Director for Support Services, University of Aberdeen.





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# Hotels venue





# s and es





“ We have worked with the NEC to deliver an integrated solution to improve the effectiveness of its security and traffic teams. We carried out a rigorous testing process of potential solutions to ensure an enhanced customer experience alongside increased safety measures. We chose to install over 200 Axis cameras within the fully integrated solution. ”

Paul Austin, director at Vindex Systems

# Axis cameras provide discreet secure environment for staff and guests at luxury hotel.

State-of-the-art surveillance system guarantee staff and client safety.



Organization:  
La Suite West

Location:  
UK

Industry segment:  
Hotel/Restaurant/  
Tourism

Application:  
Safety and security

Axis partners:  
Trident Systems UK Ltd,  
Anixter

## Mission

The recently remodelled La Suite West, formerly The Hyde Park Hotel in London, is the minimalist and latest creation of award-winning British designer, Anouska Hempel. The design of the hotel meant that discreet surveillance was essential and therefore the hotel wanted to upgrade its security system to reflect this. As well as being discreet, the solution needed to produce high-quality images and offer the ability to monitor video streams both on and off-site. The surveillance system, therefore, needed to be state-of-the-art in order to guarantee staff and client safety, not compromise security, and continue to provide the highest quality service.

## Solution

La Suite West, one of a small chain of luxury boutique hotels, has worked with Axis partner, Trident Systems UK, for a number of years to specify and manage the hotel chain's telecoms, networks, security and CCTV. After extensive research, it specified IP surveillance cameras and chose the AXIS M3014, AXIS M3011 and AXIS P3346-VE Network Cameras as they met the high

specification required by the hotel, whilst also keeping within budgetary constraints and providing discreet, quality surveillance with additional monitoring functions.

## Result

The Axis surveillance system has exceeded La Suite West's needs. The hotel understands security is paramount and now has a reliable, high-quality, advanced surveillance system that can be accessed and monitored 24x7, both on and off-site. It provides the hotel with the control it needs and gives it the added flexibility to easily grow the system to meet future security requirements. This state-of-the-art system, installed by Trident and the products provided by Axis' distribution partner Anixter, easily meets all requirements of the pristine, boutique hotel. It allows staff to deliver best practice and provide a safe and secure hotel environment to all hotel guests. An unexpected additional benefit of the system is that it has assisted staff training, and allowed the hotel to further improve customer service.

"I didn't realise just how much I had in one system. There are many features and layers and the footage can be analysed in many different ways to your advantage. I am extremely impressed with the innovative system, not only for security, but also to monitor time management and to use as a training tool to enable perfect service and housekeeping."

Mr Meir Abutbul, director of La Suite West Hotel.

### A discreet secure environment

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The Axis installation system has been flexibly designed to provide numerous benefits to the hotel including, remote access and viewing in real-time, excellent picture quality, outstanding night surveillance, the ability to e-mail images and remote monitoring access via smartphones. The discreet but effectively installed cameras are utilised to monitor staff movements and ensure quality control. It has allowed hotel management to have greater control and monitor all of the hotel's operations. It has also been a valuable tool for the food and beverage department as it has been able to use the footage to monitor the kitchen and restaurant floors.

Mr Meir Abutbul, director of La Suite West, expressed his satisfaction with the Axis cameras that have been installed both internally and externally in the hotel's public areas: "I didn't realise just how much I had in one system. There are many features and layers and the footage can be analysed in many different ways to your advantage. I am extremely impressed with the innovative system, not only for security, but also to monitor time management and to use as a training tool to enable perfect service and housekeeping."

Trident Systems UK Ltd is a recommended installer for Axis products. It has an excellent industry reputation for its quality of workmanship, attention to detail and ability to work with management to discretely install systems while maintaining maximum surveillance coverage. Mr Abutbul continued: "Trident Systems UK has gone above and beyond its remit to satisfy our requirements and this has given us peace of mind knowing that we have ongoing technical support as part of the service."

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# Axis network cameras enable the NEC to deliver security and traffic management in real-time.

Innovative solution helps deliver the NEC's aim to become 'venue of choice'.



Organization:  
The NEC

Location:  
Birmingham, UK

Industry segment:  
Stadiums/Venues

Application:  
Safety and security

Axis partners:  
Vindex Systems,  
Genetec

## Mission

The NEC is located on a 610-acre site, eight miles from Birmingham city centre offering more than 186,000 square metres of covered exhibition space spanning 33 conference suites and 20 interconnecting halls, in addition to over 160 acres of hard standing ground and 75 acres of woodland. The venue welcomes approximately 2.1 million visitors each year to over 140 diverse trade and consumer events - including long-standing shows like BBC Gardeners' World, BBC Good Food Show and Spring Fair alongside specialist exhibitions such as Clothes Show Live and Festival of Quilts - plus over 400 live events and conferences. The NEC has stated that it wants to be the 'venue of choice' for the UK's leading events.

## Solution

Axis partner Vindex Systems led a proof of concept trial which included camera shoot-outs using various manufacturers' cameras side by side onsite at the venue to see in a live situation which would be best for the challenge. The result being that Vindex selected Axis HD IP PTZ and fixed cameras to be installed.

## Result

Thanks to Axis network cameras' ease of set up, high-quality images and their ability to integrate with the Genetec Video Management Software platform, the NEC now has real-time high-quality information and the necessary communication tools to deliver 'intelligence-lead safety, security and traffic management'.



"Our customers' experience and safety is paramount. The fact that we are using a state-of-the-art, future proof security and traffic management solution enables us to be confident that they will keep on returning to our venue."

Gary Masters, the NEC group security and traffic operations manager.

### Better utilising security and traffic teams to reduce incidents

The NEC is located on a 610-acre site, eight miles from Birmingham city centre offering more than 186,000 square metres of covered exhibition space spanning 33 conference suites and 20 interconnecting halls; in addition to over 160 acres of hard standing ground and 75 acres of woodland. The venue welcomes approximately 2.1 million visitors each year to over 140 diverse trade and consumer events - including long-standing shows like BBC Gardeners' World, BBC Good Food Show and Spring Fair alongside specialist exhibitions such as Clothes Show Live and Festival of Quilts - plus over 400 live events and conferences.

The NEC has stated that it wants to be the 'venue of choice' for the UK's leading events.

Paul Austin, director at Vindex Systems, an Axis gold partner, said: "We have worked with the NEC to deliver an integrated solution to improve the effectiveness of its security and traffic teams. We carried out a rigorous testing process of potential solutions to ensure an enhanced customer experience alongside increased safety measures. We chose to install over 200 Axis cameras within the fully integrated solution."

The project was part of the NEC's wider objective to become the 'venue of choice'. Security solutions are key to achieving this; if customers and exhibitors are confident of the security measures in place at the venue they will select it to host their events. Vindex Systems acted as the principal contractor and provided all civil and electrical works. There was a team of 20 working on site.

Paul continued: "The project was challenging as the site was continuing to operate during the installation. There were over 2 million visitors during the duration of the project so we had to ensure the work was well coordinated with the minimum of disruption. We also had to create a multi-point wireless network to ensure the infrastructure had the ability to support the new cameras and management software across the whole 650-acre estate."

The Axis cameras selected by Vindex Systems were subjected to a camera 'shoot-out', alongside other manufacturer's cameras on site to prove their effectiveness and quality in a live environment. The Axis cameras proved to be the best quality and most effective solution.

Vindex selected to deploy 168 Axis cameras made up of 130 fully functional AXIS P5534 indoor 720P HDTV pan/tilt/zoom cameras, five AXIS P3344 720P HDTV indoor fixed dome cameras, eight AXIS Q1755 720P HDTV cameras with integrated ten optical zoom lens. They also provided NEC with 25 AXIS M1054 HDTV cameras, made available to exhibitors to hire during exhibitions to provide them with real-time streaming of the event.

40 AXIS P3367-V fixed dome cameras were deployed to cover the exhibition centre's main entrances in order to meet the challenging light conditions due to the amount of glass used in the lobby. Axis solutions were also deployed to enable seamless integration with the chosen Genetec VMS Platform, which is vital in centrally managing the security and traffic operations for the site from a newly created 'Venue Operations Centre'. The integrated solution provides all operators with intelligent, high quality, intuitive information in order for them to make informed decisions based on the time of day and activity on site.

Gary Masters, the NEC group security and traffic operations manager concluded: "The centrally managed and integrated solution provided by Vindex Systems has already proven to be an effective tool. The high quality images that the Axis cameras provide are vital in our efforts to reduce incidents of crime and ultimately helped to improve the effectiveness of our security and traffic management team.

"Our customers' experience and safety is paramount. The fact that we are using a state-of-the-art, future proof security and traffic management solution enables us to be confident that they will keep on returning to our venue."



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birmingham

SYSTEMS  
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Genetec

# Experience smarter video surveillance



# Reta







“ Axis is a company who sets their standards very high, from the outstanding quality of their products right through to exemplary service and support levels. The fact that we have installed thousands of Axis cameras at a leading UK retailer without a single failure, speaks volumes for the confidence we have in partnering with Axis for the long term. ”

Ben Merchant, operations manager at  
KMH Group

# Axis network cameras enable Douglas Court Shopping Centre to cut slip and fall claims.

Additional benefits include cutting theft, improving customer service and protecting their investment in surveillance infrastructure.



Organization:  
Douglas Court Shopping  
Centre and Shipton Group

Location:  
Cork, Ireland

Industry segment:  
Retail

Application:  
Loss prevention,  
safety and security  
and optimized operations

Axis partners:  
RPC Consultants  
and Milestone

## Mission

The Shipton Group, which owns and manages Douglas Court Shopping Centre in Cork, Ireland, required a surveillance solution to cut crime, gather video evidence to dramatically cut slip and fall injury claims, reinforce tenants' health and safety obligations and even improve customer experience to deploy support staff more effectively to tasks and locations around Douglas Court.

## Solution

The Shipton Group worked with Irish IT consultancy RPC Consultants, a leading Axis partner in the region, to deliver a network video system covering the corridors and emergency exits serving the center's retail outlets, inside public areas and the center's car park. A total of 76 Axis network cameras were deployed across the 13.5 acre site. AXIS 232D+ and AXIS 225FD Network Cameras were deployed externally. The AXIS 232D+ were found to perform well in adverse conditions including positioning on top of 100 foot high poles.

All external cameras were linked to the network via wireless routers. A mixture of AXIS 212 PTZ and AXIS 232D+ Network Cameras were also deployed internally, with all internal static cameras utilizing Power over Ethernet, thereby significantly reducing internal wiring costs.

## Result

Shipton Group has almost eliminated slip and fall claims at Douglas Court whilst policing the center's service corridors which also act as emergency exits in case of fire. The new system has also deterred shoplifters - with theft reducing significantly. Local police relations have also improved now that they know they can use images provided by Douglas Court in a court of law because they guarantee identification of those involved. This was not the case with the previous analog-based CCTV system.

"The near elimination of slip and fall claims and clear drop in shoplifting losses at Douglas Court, together with more effective policing of fire escape corridors, all makes for a safer and ultimately more profitable retail center. We are therefore very pleased with the new surveillance system which has definitely delivered rapid return on investment for the group"

Mr Ted Nolan, Health, Safety and Security Manager at the Shipton Group.

### **Using IP-Surveillance as a comprehensive management tool**

The Shipton Group was looking for a modern surveillance system which would allow Douglas Court Shopping Centre to tackle a number of issues beyond what their ageing CCTV security system had been delivering. The group's IT consultant RPC was tasked with developing a highly scalable and future-proofed solution to help reduce or eliminate a wide range of business issues including exposure to slip and fall claims; blocking of service corridors which also served as fire exits and needed to be kept clear; as well as positively identifying vandals and shoplifters for prosecution purposes.

### **Axis delivers higher image quality and the flexibility of an open solution**

After piloting both network and analog-based surveillance solutions, network video emerged as the way forward. After testing, Axis network cameras proved the best for image quality, openness, flexibility and easy integration with network video management system Milestone. For example, RPC considered using analog cameras to cover the car parks but found that they would be tied into very expensive proprietary wireless-to-analog devices or face even more expensive and disruptive cabling works through the car parks.

Selecting Axis network cameras meant that RPC could select best-of-breed wireless access point and bridge solutions. Inside the center RPC was able to deliver power easily to selected Axis network cameras through best of breed Power over Ethernet switches, creating additional cost savings.

### **Extensive video management possibilities**

All Axis network cameras were networked with the Milestone XProtect Enterprise 5.6F video management system. The Milestone system provides easy management, storage, viewing and copying of video evidence in case of an event. Images are stored for a total of 150 days at two frames per second, primarily to catch out

slip and fall claimants who are entitled, by law, to file a claim long after an alleged event. Axis also offers an open Application Programming Interface for all its products, VAPIX®, which allows future integration of the center's current stand-alone systems such as people counting and Automatic Number Plate Recognition systems. 76 Axis PTZ and dome network cameras in total were selected and installed across the car parks and through the service corridors and public areas of the shopping center.

### **Solving specific management issues**

Douglas Court's new system helps center management. If overnight security staff capture evidence of blocked service corridors, relevant images are sent by email to the center's manager so tenants can be informed the following morning if they have blocked corridors.

Shipton's senior management at headquarters five miles away can now remotely monitor the center's cameras and use the information to help deploy extra staff in areas where they can best help the customers in busy periods. The group's health and safety management team can analyze whether the center's cleaning crew clears spillages quickly enough to avoid the risk of injury and any resulting slip and fall claims. Security officers can use almost total coverage of the center to track suspect individuals from the central monitoring station rather than physically tailing them in and out of shops. In short, Axis network cameras have helped to deliver a state-of-the-art network video system which delivers multiple management benefits to Douglas Court whilst simultaneously future-proofing the group's investment.



## Axis' network cameras enable Bonhams' auctions to be viewed live over the Internet.

Quru 'LiveBid' incorporating Axis network cameras allows registered users to see auction lots in real time from anywhere in the world.



Organization:  
Bonhams

Location:  
UK, worldwide

Industry segment:  
Retail

Application:  
Remote viewing,  
broadcasting

Axis partners:  
Azlan, Quru

### Mission

Bonhams is a privately owned British auction house and one of the world's oldest and largest auctioneers of fine art and antiques. It had been working with Quru, to develop a bespoke Enterprise Resource Planning (ERP) application allowing it to handle the entire auction process.

Building on this, a 'LiveBid' application was launched last year that allowed real-time bids to be made from anywhere in the world via the Internet. However, even though the system was successful, it was audio-only and it was clear that Bonhams was keen to add video so that bidders could not only hear the auctioneer but actually see them. It would bring a whole new dimension to the auction experience and give Bonhams a clear competitive edge.

### Solution

Following a proof of concept trial over a six-month period, the application was re-launched with live footage captured and streamed using AXIS P5534 Network Cameras.

### Result

Thanks to Axis network cameras incorporating Quru's 'LiveBid' application, interested parties can not only hear the auction online and bid on lots from anywhere in the world, but also see the auctioneer, enhancing the whole auction experience for those not able to attend the auction rooms. It has resulted in a system that is being rolled-out to other Bonhams' auction houses across the globe.



"Video has made improvements to our business that we could not have conceived before the trial. Historically, surveillance cameras and CCTV were something that we saw purely as a security measure and not a tool we could use to really improve the way we run our business."

Matthew Girling, CEO Europe, Bonhams.

## Viewed live over the Internet

Bonhams is a privately owned British auction house and one of the world's oldest and largest auctioneers of fine art and antiques. The Bonhams name is recognised worldwide throughout all sectors of the fine art, antiques and the collectors market, with several of its departments established as world leaders within their specialist category.

Quru, a leading opening standards, services and solutions provider, has been a partner of Bonhams for the last few years, working as its outsourced global IT department, responsible for its helpdesk, servers desktops and support. During this time, it has developed a totally bespoke ERP application to manage the entire auction process; from the lot being brought in for valuation, to the auction, to the item being taken away by the new owner. Bonhams wanted to add an interactive application that would allow people to bid for lots in real-time, from anywhere in the world. Robin Porter, Business Development Manager, Quru said: "We have worked with Bonhams to streamline its IT and the bespoke application has revolutionised the way it can manage its business. Taking this a step further, we developed an interactive application that would allow registered users to bid live on auction lots from anywhere in the world."

Launched as an audio-only application, LiveBid allowed registered users to access auctions and place bids in real-time. As good as this application was, Bonhams wanted to go one step further and introduce video so that people could see the auctioneer as well as hear the dialogue and bid in real-time. Robin continued: "We developed the video application and started the pilot at Bonhams' New Bond Street HQ. The trial coincided with a renovation of the building so the solution could be installed during this time. The building now has three additional sales rooms."

The initial proof of concept was trialled for six months before it was rolled out, and uses AXIS P5534 Network Cameras specified and provided after close collaboration between Axis and Axis partner, Azlan, a leading value-

added distributor of networking, communications, mid-range enterprise server, storage and software solutions in Europe. Matthew Girling, CEO Europe, Bonhams said: "We want to make the auction process accessible to those parties that cannot make it. Auctions shouldn't be exclusive to those that can attend, and telephone bids require an intermediary – the bidder relies on whoever is on the end of the phone to represent them."

"We were really impressed with the audio version of Live-Bid and feedback from clients was extremely complimentary. When the suggestion of adding a live video feed was put forward it made perfect sense. The proof of concept was a success, and the additional dimension that video brings to the auction process is extremely valuable and helps set us apart from our competition. Video has made improvements to our business that we could not have conceived before the trial. Historically, surveillance cameras and CCTV were something that we saw purely as a security measure and not a tool we could use to really improve the way we run our business."

AXIS P5534 PTZ Dome Network Camera offers HDTV-quality video and 18x zoom for indoor surveillance applications. With an IP51-rated protection against dust it is ideal for use in demanding environments including warehouses and shops, so was the perfect model for Bonhams' auction rooms. Day/night functionality also ensures high image quality in low light conditions. All cameras provided the benefits of remote access via the internet and excellent HDTV-quality images, both of which are much more complicated to achieve with legacy analogue CCTV systems. In addition, Quru specified three AXIS P1347-E outdoor cameras. These have been installed to take time-lapse footage of the renovations to Bonhams' headquarters. This unique footage shows each stage of the works over the 18 months it took to complete them. AXIS P1347-E Network Camera is a top-of-the-line, 5-megapixel outdoor-ready network camera with HDTV 1080p performance, precise iris control for optimal image clarity and H.264 compression. Its use was perfect for Bonhams as it is particularly suited for outdoor surveillance use and any application that requires coverage of a large area or extremely high image detail.



Bonhams



## Virtual eyes improve customer experience at Douglas Village.

IP-Surveillance system enables Irish shopping center to improve the quality of its services to shoppers and tenants.



Organization:  
Douglas Village  
Shopping Centre

Location: Cork, Ireland

Industry segment:  
Retail

Application:  
Security and surveil-  
lance, merchandising  
and operations

Axis partners:  
Masterclass Security,  
RPC Consultants,  
Milestone Systems

### Mission

The complete renovation of one of Cork's largest shopping centers gave Douglas Village the perfect opportunity to reconsider its surveillance requirement. It wanted a system that could assist with the day-to-day management of the busy shopping center and to ensure health and safety levels were maintained at all times. The management team's ultimate priority was to provide a safe and secure environment for its tenants and customers and a new surveillance system would certainly enable this.

### Solution

Douglas Village's owners, Shipton Group, consulted with Axis' partners Masterclass Security and RPC Consultants to design and install a new IP-based surveillance system which in addition to being used for security purposes could be used to help with the daily management of the shopping center. Masterclass Security turned to Axis Communications to provide 180 cameras both internally and externally which include AXIS 233D, AXIS 216FD and AXIS 216MFD Network Cameras.

Milestone XProtect Enterprise 5.6F video management system is used to manage, store, record and view footage from the cameras.

### Result

One of the IP-based surveillance system's first purposes was to oversee the building work during the center's refurbishment. The cameras were used to ensure that the building contractors complied with health and safety regulations and to manage the flow of vehicles in and out of the site. With the refurbishment complete, the system now supports the day-to-day running of the site e.g. managing traffic flow as visitors arrive and keeps watch on the emergency exits to ensure they are kept clear at all times.

"Axis' network cameras were the best we could find and completely met our needs in terms of images quality, openness and flexibility. They are also incredibly easy to deploy in any location and integrate with Milestone XProtect Enterprise."

Richard Cronin, director, RPC Consultants.

## Virtual eyes improve customer experience at Douglas Village

Douglas Village Shopping Centre is situated in the heart of Douglas, in Cork, Ireland. Following extensive renovation it has grown in size from 90,000 to 230,000 square feet. It is now Cork's largest shopping destination and boasts 113 shops, 2,000 car spaces, a multi-screen cinema complex and a large variety of pubs and restaurants.

The center's refurbishment offered its owners the ideal opportunity to review their surveillance requirements. The management company wanted a system that could tackle a number of issues beyond what its existing CCTV security system was capable of, with its main priority being to provide a safe and secure environment for tenants and customers.

### Management tool

Douglas Village's owners, Shipton Group consulted with Axis' partners Masterclass Security and RPC Consultants to design and install a new IP-based surveillance system which could be used to help with the day-to-day management of the shopping center as well as to provide security and surveillance. The system's equipment was sourced from Anixter distribution.

Masterclass Security turned to trusted partner Axis Communications to provide the cameras covering the corridors, emergency exits, public areas and car park. Milestone XProtect Enterprise 5.6F video management system is used to manage, store, record and view footage from the cameras. The new IP-based surveillance system was deployed in stages and during the center's refurbishment phase was used to help ensure that the building contractors complied with health and safety regulations and to manage the flow of vehicles in and out of the site. As work on the refurbishment came to a close, roll-out of the IP-based surveillance system was completed with a total of 180 Axis cameras rolled out across the site. AXIS 216FD Network Cameras were deployed internally and externally and AXIS 216MFD, AXIS 233D PTZ and AXIS 216FD Network Cameras were installed specifically to monitor the car parking areas.

Richard Cronin, director, RPC Consultants said, "Axis network cameras were the best we could find and completely met our needs in terms of image quality, openness and flexibility. They are also incredibly easy to deploy in any location and integrate with Milestone XProtect Enterprise."

### Virtual eyes

The IP-based surveillance system now performs a number of functions such as helping to manage traffic flow as visitors arrive at Douglas Village and assist with day-to-day operations, e.g. keeping an eye on the loading bays and ensuring that emergency exits are kept clear and public areas are clean and tidy.

The openness of the Axis cameras combined with Milestone's open platform architecture has allowed Douglas Village to take advantage of a range of other solutions which enable better management of the center. For example, it has installed an AVD People Counting analytics solution on the AXIS 209FD Network Cameras at the center's entrances which give accurate footfall analysis, a key metric used by the retail industry. The system is also connected to the center's access control and intercoms and the car park's sophisticated, color-coded parking system. All elements of the surveillance system feed into the command center, located adjacent to the car park monitors and give the center's management team a complete overview and total control.

"It's like having virtual eyes! It's about time management and getting the most out of your staff," said Bartosz Mieszala, center manager, Douglas Village. "If we didn't have CCTV, we would have to spend most of the day walking around the site and still wouldn't see everything."

"We want our customers to come in and have an enjoyable shopping experience. That means getting in with no issues, finding a car parking space, picking up a shopping trolley and enjoying their visit in a safe, friendly and clean environment," concludes Mieszala.



## Traditional shopping mall installs modern surveillance.

Swedish shopping center, Frölunda Torg, invests in safety and security by installing Axis network cameras.



Organization:  
Diligentia/Frölunda Torg

Location:  
Gothenburg, Sweden

Industry segment:  
Retail

Application:  
Loss prevention, safety  
and security

Axis partners:  
Insupport, EET Nordics,  
Milestone Systems

### Mission

Frölunda Torg is a shopping center located in the city district with over a hundred shops, restaurants and cafés all under one roof. The shopping center, which is managed by Diligentia, has struggled with problems such as vandalism, gangs and theft. Addici Security was hired to manage operations and provide security guards on foot patrol. The company was also responsible for purchasing a new surveillance system as previously all surveillance was being handled by just a few analog cameras, which could not handle their needs.

### Solution

In connection with the renovation of Frölunda Torg, a surveillance system consisting of about 50 Axis network cameras were installed. In the purchase of the system, it was important not only to obtain an open platform, but also good enough image quality to make it possible to identify individuals via the camera images captured. Axis partner Insupport was commissioned to install the network cameras together with "Milestone XProtect® Corporate software" from Axis ADP partner Milestone Systems.

### Result

The new surveillance system has been deployed to monitor entrances, large public areas and delivery areas. All images are stored and recorded locally. The high-quality images captured make it possible to identify exactly what has happened in any incident which occurs, allowing the staff to circulate images and identify suspects. After an incident, images from the cameras can also be examined by the police and used as evidence. For the future, Diligentia is considering an addition to their new surveillance package of around 200 of the shops located in the shopping center. If the new installation proves effective, the additional cameras will be connected to the existing central surveillance system.



"Just like most shopping centers, Frölunda Torg had to take action against shoplifting, intoxicated individuals and rowdy gangs of youths. Therefore, we chose to invest in a solid surveillance system. The property's manager, Diligentia, chose to invest in security guards on patrol in combination with surveillance cameras."

Johan Sjökvist, Business Developer Security at Addici Security.

### Frölunda Torg – a well-established shopping center undergoing change

Frölunda Torg was opened on September 8, 1966 and was the biggest shopping center in Europe at that time. It cost SEK 80 million to build and took seven years to complete. In January 2007, Diligentia, one of the biggest property companies in Sweden, took over responsibility for managing the shopping center. In connection with the takeover, a major renovation began in October 2009 with the first stage providing 20 new shops and a new food marketplace. The second stage will be completed in 2011 and Frölunda Torg will then contain a total of 200 shops, in addition to the service companies and healthcare center already in place.

### Better, more secure surveillance despite fewer staff

During the first stage of the conversion, a surveillance system was installed, half of which consisted of pan/tilt/zoom cameras. The Axis models used in the system are AXIS P5532 PTZ Dome, AXIS P5534 PTZ Dome, AXIS M3204, AXIS P3344, and a number AXIS 209MFD Network Cameras. The cameras automatically record video in the event of motion and sound. In the surveillance center, a guard has access to images from all cameras and can communicate with the guards on foot patrol, who rapidly intervene if required. This makes the solution both cost-efficient and secure.

The surveillance system and the images from the cameras also provide evidence when recalling a sequence of events, and are a good supplement to the security guards. A camera in the designated room where suspected shoplifters are taken has also enhanced the security for both the staff and any suspects who have been apprehended.

"We have higher quality surveillance today despite having fewer staff. Without the surveillance cameras, we would have needed at least two more guards on foot patrol. The camera surveillance and the quality of the images make this possible. The investment in surveillance will be repaid in both the short and long term," says Johan Sjökvist.

Diligentia is also planning to extend surveillance with Axis thermal cameras for perimeter protection, among other things. These will contribute to incidents being discovered sooner. The company also hopes to prevent vandalism to the buildings.

### Facts

The following models from Axis were used for the surveillance of Frölunda Torg:

- > AXIS P5532 PTZ Dome works equally well day and night, even in poor light conditions.
- > AXIS P5534 PTZ Dome has HDTV quality and very high resolution.
- > AXIS M3204 is cost-efficient, small, vandal-proof, has HDTV and is adapted to a retail environment.
- > AXIS P3344 has HDTV quality and works well outdoors.
- > AXIS 209MFD is a compact camera model that is easy to install.



## Increased safety and security with Axis network cameras.

Axis network cameras contribute to better monitoring in Kjell & Company's stores.



Organization:  
Kjell & Company

Location:  
Sweden

Industry segment:  
Retail

Application:  
Store surveillance

Axis partner:  
Alco Security

### Mission

Kjell & Company is Sweden's fourth fastest growing brand name in the Swedish retail sector. Its number of stores during the 2004 to 2009 period has increased from 9 to 46. Kjell & Company's stores have over 7,000 items in stock, and well-functioning surveillance is certainly needed in order to ensure safety and security for the personnel. Kjell & Company was looking for a cost-effective system with great flexibility and the best possible image quality.

### Solution

Kjell & Company evaluated a number of video surveillance systems and came to the conclusion that network cameras from Axis Communications met the company's requirements best. The AXIS P3301 Network Camera was chosen. A Kjell & Company store has, on average, 7-8 cameras for surveillance of the check-out area, entrances and exits, as well as the store grounds and the store room.

The IP-based cameras from Axis were connected to Kjell & Company's existing network and IT system, a solution which has many advantages including easy installation, scalability, and the ability to move the cameras around easily.

### Result

Axis' surveillance cameras improve security when handling cash and this in turn increases the safety for those who work in the stores. The use of digital technology makes for considerably better image quality, and when incidents occur, they can be resolved more easily than with analog systems. Kjell & Company now deploys this state-of-the-art IP surveillance system in all its new stores opened each year, and gradually replaces older systems in existing stores.

“Since Axis network cameras are high quality and compatible with all IT systems, we can rely on a future-proof solution.”

Martin Knutson, IT Director at Kjell & Company.

### Cost-effective system

Kjell & Company already had existing software for managing network cameras. However, surveillance cameras with better image quality than the old cameras could deliver were needed. Kjell & Company had a clear-cut list of requirements. The surveillance cameras should deliver good image quality, be easy to install and move, and be able to be angled according to need. The AXIS P3301 Network Camera was chosen. Kjell & Company also wanted to be able to update all of the cameras across Sweden centrally via the main office. “With Axis network cameras we can install a camera and save the basic settings in order to then apply these settings to all cameras in all of our stores at the same time. Being able to update all of the cameras in one go saves us an enormous amount of time and gives us a cost-effective system,” explains Erik Ljungdahl, IT Technician at Kjell & Company.

Another important advantage of Axis network cameras is the ability to be able to angle them. Kjell & Company’s stores have differing layouts, and the challenge lies in being able to install a camera in the proper way and at the same time get a good overall view of the store premises. “Kjell & Company chose AXIS P3301, a robust camera with compact design and high image quality, which we have designed for demanding indoor installations. The AXIS P3301 also has Axis’ latest processor, which means that Kjell & Company is now saving bandwidth and storage with the H.264 compression standard. The camera is also prepared for use with modern applications for intelligent video analysis,” says Magnus Zederfeldt, Axis Sales Manager for Scandinavia and the Baltics.

### Flexible future

Kjell & Company, which is one of Sweden’s fastest growing chain stores, currently has 46 stores in 26 cities and their goal is to maintain their high store opening rate in Sweden, but also in the long run establish themselves abroad. When a new Kjell & Company store is built, Axis network cameras are installed and easily connected to the existing system. With the help of Power over Ethernet (PoE), the cameras are installed quickly, and the need for separate power supplies and heavy space-consuming hardware is eliminated.

The solution can quickly be adapted according to varying needs. “Our strategy is to continually install Axis network cameras, because in the future we want to be able to switch over to any different kind of software. Since Axis network cameras maintain high quality and are compatible with all IT systems, we can rely on a future-proof solution,” says Martin Knutson, IT Director at Kjell & Company.

### Increased benefit with Axis cameras

According to an analysis conducted in the fall of 2009 by the HUI (Swedish Retail Institute) at the request of Axis, nine out of ten store owners are positive toward camera surveillance. Nine out of ten companies have chosen to install surveillance cameras in order to prevent and investigate thefts and shopliftings more easily.

With improved image quality, Kjell & Company has gained a greater ability to identify people at entrances and exits, as well as see details in connection with money handling at check-out. The recorded material can be accessed from Kjell & Company’s central network. Store managers are authorized to access the recordings from their store, regional managers can see the recordings from stores in their region and authorized IT personnel have access to recorded material from all Kjell & Company stores. The recorded material is saved for the amount of time that is legally permitted, and the police can request and be given access to the recordings when an incident occurred.

However, Kjell & Company does not solely use the Axis network cameras for store security. The network cameras are also a future investment from a profitability perspective. The cameras’ ability to count visitors gives Kjell & Company an effective tool for compiling statistics and analyzing customer flows, best sellers, hot zones, and more. “By using the cameras in this way, we can actively work on improving the layout of the stores, and present our selection of products in the best way. This means that the surveillance system fulfills another important function – it helps us boost sales,” concludes Martin Knutson.



## Komplett manages shrinkage and multi-national deliveries centrally with Axis network cameras.



Organization:  
Komplett

Location:  
Sandefjord, Norway

Industry segment:  
Retail

Application:  
Loss prevention, safety  
and security

Axis partners:  
Milestone Systems,  
Vakt Service Teknikk,  
ComScan

### Mission

Listed on the Oslo Stock Exchange, Komplett is a major e-commerce company with 9 web shops in Scandinavia, selling PCs and computer components, consumer electronics, and home and leisure products. Komplett has Pick-up-Points located in Sandefjord, Oslo, Lørenskog, Trondheim, Fredrikstad, Stavanger, Stockholm, Gothenburg, Malmö and Copenhagen. At the end of 2010, Komplett reported a total of 620,000 active customers.

Due to the high value of the IT products involved, parcel tracking is crucial to Komplett's operational excellence. Several incidents at the Pick-up-Points are reported every month. A reliable video surveillance and monitoring system is therefore an important business tool to document the deliveries to, and pickups by, customers, and also to ensure safety for employees.

### Solution

Video monitoring has been part of Komplett's logistics setup since 2000. In 2008 they completely reviewed the security system and decided to move from analog to digital video surveillance. 90 network cameras were installed with Milestone XProtect® Enterprise for 120 device licenses. For more effective bandwidth usage, in 2010 AXIS P1346 network cameras with H.264 compression were added to improve performance from the remote sites. They plan to roll out more of these Axis models to gain greater efficiency of data transfer from the geographically spread pickup locations.

### Result

Komplett's existing IT network infrastructure was already in place making it easy to move the security solution to network video and Milestone IP video management software – a flexible, scalable, open platform solution that lets Komplett continue to grow with new innovations over time. They can now manage video data coming from all their Scandinavian sites centrally at their headquarters.



"I'm not able to get the same sharp and clear image quality with the old cameras as I get with Axis network cameras, whatever settings I'm trying to adjust. I'm very pleased with the results I get from the AXIS P1346 Network Camera."

Tor Kiste, Security and Property Manager for Komplett Group.

### High image quality helps solve incidents

The reason for the move from analog to digital video surveillance was to improve video quality and to store video more effectively, using new technology to make better use of system bandwidth. The data is distributed from all locations using Cisco network infrastructure with IP video products and Milestone XProtect software.

Komplett's main warehouse in Sandefjord, Norway, is over 21,000m<sup>2</sup> in size. During 2010 the Group's web shops handled a total of over a million orders which accounted for over 4 million products: a product is picked every 8 seconds on average, and an order is dispatched every 24 seconds round the clock, every day, all year long. Theft, mistakes or accidents during the delivery process, even some threats towards staff, are issues to be managed.

The AXIS P13 Network Camera Series is comprised of indoor and outdoor-ready fixed cameras that deliver high image quality with H.264 compression, ideal for high-performance surveillance in any environment. The models have a remote back-focus function that enables the focus to be fine-tuned from a computer, which makes implementation and adjustment easier for the integrator of the system.

"The outdoor-ready cameras are good: we appreciate the ease of installation and the remote zoom and focus functionality. I have been able to work in -40 degree Celsius weather and fine-tune the cameras with just my T-shirt on – inside a nice, warm office!" remarks Ole Håkon Norby, Account Manager at the system integrator Vakt Service Teknisk Vestfold.

Komplett is currently adding Axis HDTV network cameras and an Axis thermal camera is installed on the central truck loading dock with a view into the containers outside. Motion detection in the cameras checks if anyone tries to tamper with the containers. Tor Kiste, Security and Property Manager for Komplett, receives SMS alerts from the Milestone software, even at night or during weekends. He can easily check the video in the XProtect Smart Client from home, to confirm if there is a false alarm or a real incident before calling the security service company – this saves a lot of time and money.

"This gives us peace of mind – we can see what's happening during night shifts and on weekends – especially in December which was one of our busiest months," says Mr. Kiste.

### Future possibilities for video-enabling operations

Komplett also monitors the ultra-speedy, multi-level assembly line robots picking the goods at the main warehouse using AXIS P3344 cameras. There can be substantial operational savings when the surveillance system is expanded to monitor critical parts of the packaging process.

Komplett will add more network cameras over time, installing them at gates in addition to more on the production lines, and upgrading to use new functionality that comes out on the market. Axis HDTV network cameras are being further tested for location roll-outs: these will save even more bandwidth costs and give better image quality. An upgrade to Milestone XProtect Corporate is being considered for new administrative features, and a 'plug-and-play' integration framework for adding video analytics or access control interoperability.



The video surveillance system has proved its worth on several occasions. Among other incidents one occurred at a pickup point where thieves took a taxi to the local train station, and with the clear video images, Komplett was able to send the license number directly to the police – who tracked it down to meet the culprits when their train reached the next destination!

 **KOMPLETT**

  
**VAKT SERVICE**  
TEKNIKK

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# Transpo





# ortation





“ Axis worked closely with us throughout the trial period and recommended a range of cameras suitable for our varying needs. We chose Axis cameras as they provide excellent image quality and a breadth of coverage that analogue cameras are just unable to achieve... Axis cameras are also extremely easy to install which in a station is a real plus point as cameras can be relocated very quickly and easily if the need arises. These cameras are also a greener option as they use less power than our previous analogue CCTV system and are simpler to maintain. ”

Raul Marquez, senior project engineer,  
Network Rail

## Malmö Central Station – a modern and secure station via the use of Axis surveillance cameras.

With the renovation of Malmö Central Station, 110 surveillance cameras were installed, with the objective of improving passenger security.



Organization:  
Malmö Central Station  
(Jernhusen)

Location:  
Malmö, Sweden

Industry segment:  
Transportation

Application:  
Safety and security

Axis partners:  
El-kompaniet Svenska,  
Niscayah, Anixter,  
Milestone

### Mission

Malmö Central Station, which is owned and managed by Jernhusen, is Sweden's third largest station. Each year, approximately 17 million people visit the station, and each day 350 trains arrive and depart. In December 2010, the new city tunnel in Malmö was opened, incorporating a 17-km-long connection, of which 6 km is underground. At the same time, the central station's main building was rebuilt and new sections were added. The glass-covered concourse was opened and the central hall was transformed into an attractive marketplace. A large number of surveillance cameras were installed in connection with the renovation work. The cameras were installed to increase the safety and security of passengers and visitors to the station.

### Solution

A total of 110 network cameras monitor all activities in the central hall, the glass concourse, some parts of the station's hall and the car parks at Malmö Central Station. Models used include AXIS P5534-E and AXIS P3344-VE Network Cameras. The cameras are monitored from a security center in the station and the images are also sent to Malmö city surveillance center.

The software that manages the display and the recording of the images comes from Axis partner Milestone, called Milestone XProtect® Corporate video management software.

### Result

Jernhusen does not tolerate a lack of security or damage. Passengers and visitors should be able to enjoy their visit to Jernhusen's stations and feel safe, regardless of what time of the day. Jernhusen has a concept called "safe station", which is all about increasing safety through a variety of measures, ranging from better lighting to station assistants. "Safe station" also means increasing the use of camera surveillance. In addition to increasing passenger and visitor safety, the installation of security cameras also provides security for the security guards, who often must intervene to defuse a situation or remove people from the station. Sometimes the security guards must use physical force, and the cameras provide legal protection for both the guard and the person involved if a report of excessive use of force is submitted. The cameras have thus become an important addition to the patrolling security guard force.

"If you have decided to invest in a camera surveillance system, it is better to choose a really good system that is future ready, as you will profit from this in the long term."

Martin Andersen, Quality Manager at Jernhusen.

### Security, design and installation

Jernhusen has stated that its ambition is to provide people with a safe and secure environment and to provide exactly the service they require. The reconstruction of Malmö Central Station has been an important project for Jernhusen, as its intention has been to preserve and renovate the old time-honored station. Design was an important consideration, and in October 2011, Malmö Central Station received an international award for the best project in railway architecture and industrial design, a Brunel Award, one of the finest distinctions awarded in the railway industry.

Axis partners Niscayah Ltd and El-kompaniet AB have carried out all of the installation work at Malmö Central Station, and they have recently signed a long-term contract with Jernhusen covering the existing operational and maintenance responsibilities for electronic, telecommunications, data and CCTV. In total, there are 110 network cameras, AXIS P5534-E and AXIS P3344-VE models, in use in the surveillance system. The cameras were a good match and fitted in very well with the design requirements. Sandor Haizer, supervisor at El-kompaniet, describes the installation as simple: "It saves both time and money when you can adjust the focus and zoom on the cameras from your computer and you do not have to climb up and down ladders."

### Surveillance and identification

One of the requirements Jernhusen had when choosing the camera models for its surveillance system was the ability to identify people, and for that reason Jernhusen invested in quality cameras with HDTV resolution. The police, and even Customs and Excise, often contact Jernhusen to access images when incidents have occurred or there is a suspicion that a crime has taken place. The police contact the security center several times a week with image requests. One example of an incident that took place in February 2012 happened when a shop in Copenhagen was robbed. The robbers left behind a train ticket which was time stamped at Malmö Central Station. With the help of precision camera images from the security center and eyewitness reports, the police were able to identify and apprehend the perpetrators.

Image quality is extremely important, and the security team at Malmö Central Station rely on the surveillance system. "Many camera systems are poor; however, with the new cameras, you can easily identify people and objects," says Jonas at Bevakningstjänst (the Surveillance service), who is one of the people in charge of surveillance at Jernhusen.

Jernhusen is interested in installing more cameras in the future, There is also an interest in intelligent video applications. Counting people and also studying the flow of movement can easily be achieved using network camera applications. There is also interest in a portable system, where video footage can be viewed on iPads or smartphones.



## Safer ship travel with Axis network cameras.

Fire on board resulted in a new level of safety on Hurtigruten's vessels.



Organization:  
Hurtigruten ASA\*

Location: Norway

Industry segment:  
Transportation

Application:  
Safety and security

Axis partners:  
Milestone, NCMC AS,  
Com-Scan A/S

\*Hurtigruten ASA is a merger of the shipping companies Ofotens og Vesteraalens Dampskibsselskab and Troms Fylkes Dampskibsselskap ASA

### Mission

Hurtigruten is a traditional ferry service for the transportation of goods and passengers between Bergen and Kirkenes in Norway. More than 230,000 passengers sail on one of Hurtigruten's vessels every year. On September 15, 2011 a disaster occurred. On one of Hurtigruten's vessels, MS Nordlys, an explosive fire broke out in the engine room and the passengers and crew were safely evacuated from the vessel. In connection with the renovation of MS Nordlys, it was decided to replace parts of the communication system and infrastructure. Some systems were obsolete and new technology was installed. The consultancy firm NCMC AS was engaged to ensure that the solutions installed were identical to the standard that the company had chosen and that NCMC AS was developing.

### Solution

The old infrastructure on board the MS Nordlys was based on an analog matrix that was completely destroyed in the fire. When the new telephone cables were laid, a modern new IP network was also installed.

This allowed the old analog cameras on board to be replaced with the latest in IP camera technology: Axis network cameras. 23 Axis cameras were installed, along with Milestone XProtect® Professional video management software. The surveillance system was thus integrated with the rest of the infrastructure and MS Nordlys got a state-of-the-art surveillance system that enhances the safety and security of the passengers and crew, as well as improved communication on board the vessel.

### Result

Several essential functions on board the vessel use and benefit from the surveillance system. Reception, the shop, unloading /loading, landing, the car deck, bridge and engine room all represent tasks for the crew, who gain enhanced safety as a result of the cameras. The cameras in the engine room help the engineers on board make sure everything is in order and provide additional safety for the crew in the engine room as their colleagues can warn them in time when incidents occur. The camera up on the mast also provides additional safety and allows the head of the engine room to see the color of the smoke.



"When we develop new solutions for a customer, we never consider only the price. The solution is what is important."

Idar Flø, CEO of i Norwegian Centre of Maritime Communication AS.

### Innovative new high-quality technology

Hurtigruten has served the coastal population since 1866 and was appreciated from the start not only as a transport route but also as a tourist attraction. The route currently employs 11 vessels that call at 34 ports every day, 365 days a year. More than 230,000 passengers sail on one of Hurtigruten's vessels every year.

On September 15, 2011 a disaster occurred. On one of Hurtigruten's vessels, MS Nordlys, an explosive fire broke out in the engine room and the passengers and crew were safely evacuated from the vessel. The fire caused great damage to the vessel, which remained in a shipyard for repairs for five months. Nordlys was only able to re-enter service on March 20, 2012. In connection with the renovation, it was decided to replace parts of the communication system and infrastructure. Some systems were obsolete and new technology was installed.

The consultancy firm NCMC AS was engaged to ensure that the solutions installed were identical to the standard that the company had chosen and that NCMC AS was developing. NCMC AS is a consultancy firm for maritime IT system solutions and evaluates new technologies to find the very best solutions for all individual needs on board a vessel. The objective is to install innovative new technology of the highest quality with the best functionality.

Milestone XProtect® video management software is based on open standards and supports over 1,500 different models of network camera via LAN, WAN or the internet. "The total surveillance solution was very good as Axis has products that fit into many different environments. Milestone's software is flexible, reliable and easy to use. My objective is always to find the state of the art and the Axis/Milestone combination provided this," says Idar Flø, CEO of NCMC AS.

The Nordlys has a dedicated VLAN for CCTV, which is also standardized, making it easy to extend the system to other ships. Installing IP networks on board vessels can be a challenge as the ship moves all the time.

On MS Nordlys this was solved by using 3 different network technologies that complement and back each other up, guaranteeing contact with the control rooms in ports. "By using a common IT-based standard for the infrastructure, this can also be implemented on other ships. It is then easier for the control rooms on shore to communicate with the ships in service," says Flø. The camera models used are AXIS P3343, AXIS P3344, AXIS P1343 and AXIS P1344, and AXIS M3204 in the shop on board the vessel. PTZ model AXIS P5534-E is used on the car deck. The cameras are housed in stainless steel to cope with the extreme external stresses, both from wind and weather but also from moisture and heat down in the engine room. Several essential functions on board the vessel use and benefit from the surveillance system. Reception, the shop, unloading/loading, landing, the car deck, bridge and engine room all represent tasks for the crew, who gain enhanced safety as a result of the cameras.

The cameras in the engine room help the engineers on board make sure everything is in order and provide additional safety for the crew in the engine room as their colleagues can warn them in time when incidents occur. The camera up on the mast also provides additional safety, allowing the color of the smoke to be seen.

"The image quality from the Axis cameras is very high. We have also benefited greatly from Milestone's solution. It provides overview and control and is easy and intuitive to use, as well as providing enhanced safety for the passengers," says Ole Johan Andreassen, Captain of MS Nordlys. Hurtigruten may need to add more cameras in the future. The company is also looking at introducing intelligent video. 'People counting' is an example of intelligence that can be of great benefit in emergency situations, for example an evacuation of the vessel.

### Unique requirements for shipping industry

During the work on installing the new surveillance system on MS Nordlys, NCMC worked with Axis's/Milestone's distributor Com-Scan A/S. Com-Scan A/S is one of the most experienced suppliers to the shipping industry and knows the specific requirements well.



"We have worked within this segment for a long time and have great experience of installations of safety solutions for the shipping industry. The conditions on board a vessel are special and experience is required to find optimum solutions and be able to install them," says Thor Heggedal of Com-Scan A/S.



## Axis network cameras help improve operations at Freightliner's Manchester terminal.

A new surveillance system at Freightliner's Manchester terminal enables users to quickly search and access vital footage and enhance security operations.



Organization:  
Freightliner Ltd.

Location:  
UK

Industry segment:  
Transportation

Application:  
Terminal security, health  
and safety, operations

Axis partner:  
NW Systems Group

### Mission

As the leading intermodal rail freight operator in the UK, Freightliner wanted to enhance surveillance at its Manchester terminal following the successful installation of network video cameras at some of its other terminals in the UK by Axis partner NW Systems Group. The Manchester terminal wanted to take advantage of an IP-Surveillance system to assist with operations around the site and to monitor the arrival of containers at the terminal by road and rail. This improvement in surveillance would also help significantly improve security and health and safety around the site.

### Solution

Following successful deployment of IP-Surveillance systems at many of its other sites in the UK, the organization turned to IP solutions specialists NW Systems Group to provide cameras for its Manchester terminal. NW Systems Group deployed a range of Axis network video cameras, all specifically chosen to deliver excellent image quality even for night time surveillance.

Freightliner uses AXIS Camera Station, IP-Surveillance software that allows for video monitoring and recording for up to 50 cameras, to search and view essential footage.

### Result

The Manchester terminal is now able to take full advantage of IP-Surveillance to assist with on-site operations. The terminal's managers have a prime view of the terminal and can quickly respond to emergencies and distribute resources around the terminal as required. It also found that the number of claims against it for damaged containers has gone down as the site's managers can now quickly access high quality images delivered by the Axis cameras over the network which prove liability.

"Running the system in-house, coupled with the quality and durability of the cameras and software, means that our maintenance costs have been significantly reduced. All in all, we are very impressed with the quality of the Axis surveillance system."

Andy Murphy, deputy general manager, Freightliner terminals.

## Improving operations at Freightliner's Manchester terminal

Freightliner Ltd is UK's leading intermodal rail freight operator moving up to 3,000 containers per day. It is part of Freightliner Group which employs 1,800 staff and has 170 locomotives and more than 3,000 wagons. The organization has 13 terminals throughout the UK and surveillance is extremely important for operational monitoring purposes.

Previously, each terminal relied upon standalone analog CCTV, but following the successful upgrade to network video at some of its other sites, the Manchester terminal wanted to take advantage of the same technology. The Manchester terminal was keen to upgrade to network video because locating footage on VHS tapes was a laborious process and the image quality provided by the analog CCTV system was frequently poor and unusable.

Andy Murphy, deputy general manager, terminals said: "In the past, searching for a specific piece of footage was extremely time-consuming. We needed a solution that would allow us to speed up this process and share footage electronically with others quickly and easily."

### An overview of operations

NW Systems Group, an Axis partner, had already successfully upgraded the surveillance systems across many of the Freightliner sites at a rate of two terminals per year. When Freightliner decided to upgrade at its Manchester terminal, NW Systems Group recommended Axis network cameras so that it could monitor footage remotely, share it across the Internet with other sites and obtain enhanced image quality.

Thirteen AXIS 211 and AXIS P1343 Network Cameras have been installed in strategic locations to record registration plates and container IDs as vehicles arrive and leave the terminal. They are also used for security purposes at the terminal gates.

AXIS 233D and AXIS 232D+ Network Dome Cameras provide the terminal's managers with an overview of operations across the site and the AXIS P3343-VE Network

Camera records images of the drivers. AXIS Camera Station is used to view footage simultaneously and allows the end user to quickly locate and distribute footage.

### Superior image quality

The Manchester terminal now has a fully operational surveillance system that delivers a host of benefits. The terminal's authorized staff members can now view live or recorded video from any terminal, over the Wide Area Network or remotely over the Internet.

Footage of containers as they arrive and depart is now available at the Manchester terminal. If a complaint is received that a container has been damaged, they can find and check the footage much more quickly than on the older system to establish if it is a genuine claim or if it was already damaged on arrival. This reduces the rail freight operator's insurance claims as they have footage proving liability.

From an operational perspective, the cameras also allow the terminal staff to react to any emergencies around the site. Andy Murphy explains: "All of our cameras have motion detection which allows our operators to monitor in real time when a situation arises. We can then take the appropriate action to deal with the issue. The cameras have helped us to streamline our operations. For example, we can now monitor traffic queues at the gates and it also helps us plan the allocation of equipment around the site, as the cameras can monitor what is needed in a specific location.

The quality of the footage has also greatly improved: "The image quality is excellent and the night time images have also surprised us. Running the system in-house coupled with the quality and durability of the cameras and software, means that our maintenance costs have been significantly reduced. All in all, we are very impressed with the quality of the Axis surveillance system and the installation carried out by NW Systems Group," concludes Andy Murphy.



*Freightliner*

  
NW Systems Group

# Axis' network cameras help safeguard motorists traveling through the Tyne Tunnel.

New tunnels monitored by IP-based surveillance help improve notorious traffic blind spot.



Courtesy of TT2. All rights reserved.

Organization:  
TT2

Location:  
United Kingdom

Industry segment:  
Transportation

Application:  
Tunnel/toll booth surveillance

Axis partner:  
2020 Vision Technology

## Mission

The New Tyne Crossing has been constructed under the River Tyne in the North East to serve all traffic traveling south and north-bound. The tunnel's operators, TT2, see surveillance as an integral part of its safety and security strategy and required an innovative system that could act as its 'eyes' to monitor the safe transport of commuters through the tunnels' approach roads and toll plazas.

## Solution

Systems integrator 2020 Vision Technology was tasked with providing an innovative approach to surveillance that could provide real-time visual intelligence and post-incident analysis. 2020 Vision recommended an IP-based surveillance system be deployed consisting of 102 fixed AXIS P1343 Network Cameras for the tunnels with additional cameras to monitor the approach roads and toll booths.

## Result

AXIS P1343 Network Camera is a fixed day and night camera and delivers excellent image quality and H.264 performance. It also has a progressive scan sensor which allows for sharp images of moving vehicles in challenging light conditions to be captured. The footage is displayed onto a video wall and individual operator work stations. It is seamlessly integrated at data level to 'talk' to the video automated incident detection system linked to the SCADA systems. Now, if there is a crash, breakdown or fire, the system immediately alerts the tunnel staff who can then initiate the appropriate course of action.



"The Axis cameras provide total coverage of the tunnels and surrounding areas and without this comprehensive footage, we would need many more staff to function safely and collect tolls."

Ron Henderson, operations manager, TT2 Ltd.

### Axis' network cameras help safeguard motorists traveling through Tyne Tunnel

The New Tyne Crossing has been constructed under the River Tyne in the North East which features two tunnels to serve south and north-bound traffic. Both tunnels form a major commuter route between North and South Tyneside and are used by approximately 45,000 motorists on a daily basis. Previously considered one of the UK's worst traffic black spots, the safety of those using the tunnels is still of prime importance so it was essential the new tunnel feature surveillance as an integral part of its safety and security strategy.

The surveillance system needed to be able to act as 'eyes' to see through the tunnels and monitor the approach roads and toll booths. Following an evaluation of a variety of systems, local systems integrator 2020 Vision Technology was asked to design and install a new surveillance system.

### A challenging environment

The New Tyne Crossing presented an interesting challenge to 2020 Vision as the tunnels are confined spaces with restricted light conditions. In order to provide TT2 with the ability to 'see everywhere,' 2020 Vision needed to come up with an innovative approach so that it could provide real-time visual intelligence and post-incident analysis. Peter Houlis, managing director, 2020 Vision Technology said: "The safety of anyone passing through the tunnels is imperative. When specifying cameras, the ability to share and access video images is essential in those situations where immediate and urgent action is required."

2020 Vision Technology recommended an IP-based surveillance system be deployed and demonstrated how the progressive scan sensor on an Axis network camera can produce clear, sharp images of moving vehicles.

### The 'eyes' of the tunnel

2020 Vision Technology deployed the new system which consists of 102 fixed AXIS P1343 Network Cameras in the tunnel and additional cameras monitoring the approach roads and toll booths.

AXIS P1343 Network Camera is a fixed day and night camera and delivers excellent image quality and H.264 performance. It also has a progressive scan sensor which allows for sharp images of moving vehicles in challenging light conditions to be captured. The cameras sit on the tunnel's common network infrastructure using Power over Ethernet (PoE) and 2020 Vision hosts the digital recording system which feeds images taken from the Axis cameras to the tunnel's traffic incident system.

Digital footage is recorded around-the-clock on to a network video recorder (NVR) and is then displayed onto a video wall and individual operator work stations. This footage is then seamlessly integrated at data level to 'talk' to the fire safety systems, video analytic traffic management supervisory control and data acquisition (SCADA) systems. The system then alerts the tunnel's staff when an incident such as a crash or breakdown occurs so that the appropriate course of action can be taken.

Ron Henderson, operations manager of TT2 Ltd said: "The IP-based surveillance solution provided by 2020 Vision Technology plays a key role in the safe operation of our site, the remote operations of our toll plazas and to enhance the security of our precincts and out stations. The Axis cameras provide total coverage of the tunnels and surrounding areas and without this comprehensive footage, we would need many more staff to function safely and collect tolls."

The tunnel's operators now have 'eyes' everywhere and have access to real-time visual intelligence and post-incident analysis from which informed decisions can be made. The system helps the tunnel's operators with safe and efficient traffic management and protects against fraud at the toll booths. The new surveillance system has also meant that there are just three interactive operator workstations in the tunnel's control room and has enabled fewer operators to provide a more sustainable, efficient and safer journey through this busy commuter route.



## Safer travel with network cameras from Axis Communications.

Axis network cameras make the trip safer and save time for SL's travelers and drivers.



Organization:  
SL – Storstockholms  
Lokaltrafik AB

Location:  
Stockholm, Sweden

Industry segment:  
Transportation

Application:  
Safety and security, and  
prevention of vandalism

### Mission

Storstockholm's Lokaltrafik AB (SL) transports 700,000 passengers daily, by bus and train, within the Stockholm area. To create a safer environment and a stress-free journey for both travelers and personnel, it is necessary to have complete surveillance of buses, trains, stations, waiting rooms, pathways and train depots. In 2005, SL began the Security Project (Trygghetsprojektet) with the intention of creating a safer travel and work environment, minimizing interruptions in traffic, and lowering the high costs of graffiti and vandalism control, and sanitation. Surveillance cameras are a significant part of the Security Project and, in 2007, installations were begun, using Axis network cameras in buses, on subway trains, and in waiting rooms and train depots.

### Solution

SL knew the strict requirements for the installation. The cameras in the driver's workplace and in the passenger areas must withstand both sabotage and unfavorable environments. Because there was no special camera for the transportation market, Axis was given the assignment, together with SL, to design a whole new camera that would fulfill the specific demands.

The result was AXIS 209FD-R, a small compact camera that can withstand a large amount of abuse. Approximately 10,000 network cameras have been installed in 2,200 buses. There have been about 4,500 fixed cameras, both AXIS 225FD with vandalism protection, as well as AXIS 212 PTZ with fisheye optics, installed in subway and commuter stations, in waiting rooms, pathways, train depots and train coaches. All cameras at the stations are connected to SL's Security Central, where all events are registered and responded to. With almost 14,500 network cameras, this installation is the largest in Sweden.

### Result

The Security Project contributes to a safer environment for both personnel and travelers. The surveillance system has a preventative effect because the number of crimes decreases with camera surveillance. Through the 24-hour Security Central, SL can decrease the interruptions in traffic. The system also helps the police to secure evidence against any wrongdoers, as digital image technology offers a clear identification of objects and people. In the long run, SL can lower costs for graffiti control, sanitation and other maintenance costs, in addition to improving SL's traffic planning and the security of the traffic.



### **Intelligent and robust innovations**

In the new surveillance system, Axis contributes to the development of network cameras for surveillance, identification and guarding of non-authorized entry to train tracks. The digital images are stored in a mobile video and alarm surveillance system (Mobile Digital Video Storage System) that has been integrated into SL's existing traffic and safety system.

SL had strict requirements for the network cameras. The cameras that were being installed in the buses, at the drivers' seats and in the passenger areas needed to be very durable against possible sabotage, and also withstand moisture, dust and vibrations. At the same time, the cameras could not be too hard or sharp, risking injury to passengers during an accident. Axis and SL sat down and designed a whole new type of intelligent camera that could withstand abuse.

"We had to try to identify every stress that a camera can be subjected to in a public environment. AXIS 209FD-R is designed to handle the most unfavorable conditions and has built-in intelligence, meaning that the camera itself sends an alarm if something is wrong with it. For example, if there is a person standing in the way of the camera, the alarm will activate. If the camera has been sprayed with paint, the event is registered," says Kent Fransson, Product Manager at Axis Communications.

Because the AXIS 209FD-R continuously records images, and because the surveillance system is integrated with SL's traffic system, the camera's images can be marked with bus stop information and GPS synchronized time.

### **High image quality and flexibility with Axis network cameras**

To make the security even better, SL has chosen to install about 4,500 cameras in the surrounding areas. About 3,500 fixed cameras, specifically AXIS 225FD with an aluminum cover, have been installed in escalators, on station platforms and along tracks. The aluminum cover protects against vandalism, and the camera has such a high image quality that it can fulfill two functions: monitoring the status of the train platform, and monitoring the tracks. By the turnstile booth, and at certain corners in the stations, SL has chosen to install about 900 fixed cameras, namely the AXIS 212 PTZ with fisheye optics, that can identify people.

Because all cameras are connected to the already existing IT network, SL did not have to install new cables for electricity and video. New installations in the future will be easier, and it is also cost-effective to use the same cables for both power supply and network video, using Power over Ethernet. Flexibility is also better because cameras can be installed virtually anywhere.

Axis' market-leading position for network cameras, the flexibility of the system, and Axis' ability to meet SL's clear requirements for a durable camera for surveillance of drivers' seat and passenger areas, were all important reasons for choosing Axis as a cooperating partner.

"We had the privilege to be involved very early in the Security Project, and because of this, we have been able to develop specific cameras and features as needed. It is a big advantage that we, as a product supplier, can take part in the project's development phase. We can be an active part in problem-solving with quick turnaround. It is also incredibly enjoyable and instructive for us to work in such a close relationship with the end user."

Magnus Zederfeldt, Area Sales Manager Nordics and Baltics, Axis Communications.

"The surveillance system and the Security Project have been positive changes for us. It has given us more return than we had predicted. Among other things, we find that graffiti has decreased. We can also plan traffic better through the ability to act quickly and, if needed, put extra trains into service if the load gets too high, and also in connection with construction and other things. The surveillance system gives us the ability to encourage drivers to be extra careful if there are a lot of people on the platform," says Stefan Danielsson, Project Manager for SL's Security Project.

Because of the high image quality, the police can make good use of the image material as evidence. The police can, if needed, request recorded material, and the police image analysis group is working daily to solve crimes with the help of the cameras in the Security Project. Each year, there are between 500-600 images requested from SL, and the police say that, in cases where there is recorded material, they find that almost all of the images are so good that they can be used by the current investigator. Among other things, the police image analysis group has, since their beginning in 2007, solved several robberies, and they have also been able to catch a serial rapist in Söderort, in Stockholm, with the help of a camera on a night bus.

### Good surveillance creates a safe journey

About 3,000 security-related events occur every month within SL's traffic area. With the help of the new surveillance system, the operator can go to the right camera to see what event tripped the alarm. An operator with special authority assesses the situation and can request appropriate resources, such as a security guard or the police.

"Because of the high resolution of the network cameras, it is significantly easier to identify people and events. This makes it easy to act quickly. But we are, of course, protecting personal privacy. All image material is handled with confidentiality and, in the event of a possible crime, all images are handed over to the police. We do not carry out any investigation ourselves, and our staff has no ability to review recorded material," says Bengt Carlsson, SL's Security Manager.

The new surveillance system with Axis network cameras creates a safer environment for both personnel and travelers. Another aspect is that SL can lower the costs of traffic interruptions, graffiti and vandalism control, and sanitation.





# Customer segments



## RETAIL

Interest in network video is increasing rapidly in the retail segment. By using remote monitoring, the manager can see the store or storage areas without traveling to the actual store, which is beneficial from a carbon footprint perspective. Intelligent applications in Axis' network cameras are contributing to systems that are improving security in stores.



## TRANSPORT

The need to counter vandalism, theft and threats is increasing in public transport systems throughout the world. Network camera installations contribute to a safer environment on trains, buses, traffic routes and in airports.



## BANKS

Axis' solutions provide security for customers and employees in banks and exchange offices. Very small network cameras with HDTV quality, which are adapted for surveillance in automatic teller machines and other concealed areas, enable identification in the event of a crime and create a safer working environment.



## CITY SURVEILLANCE

The global urbanization trend is creating a greater need for safe and secure urban environments for millions of people. Today, Axis' network solutions are found in more than 500 cities. These solutions contain products that withstand vandalism and tough weather conditions.



## INDUSTRY

Digital solutions are used to monitor assets and streamline processes in factories, warehouses and on building sites. Strict demands are imposed so that systems can cope with tough external conditions, large surveillance areas and poor lighting conditions. By using network cameras in some installations, customers can see how the recently purchased product was produced and ensure that no illegal measures were involved.



## EDUCATION

A safe and secure school environment should be something natural. Axis' network solutions enable simple installations and scalable surveillance systems in schools, universities and other educational organizations. The surveillance cameras contribute to reduced vandalism, less theft and the creation of a safer environment for teachers and students.



## HEALTHCARE

Axis' network cameras improve security for personnel and patients. The possibility of remote monitoring of patients by surveillance cameras streamlines day-to-day processes and reduces travel, which has a positive impact on the carbon footprint.



## CRITICAL INFRASTRUCTURE

Digital video surveillance is a cost-effective way to boost the level of security for operators of critical infrastructure. The buildings or solar plants can be observed by remote monitoring and travel needs decrease. Axis' network cameras are also used on highways; by using video, traffic can be redirected when traffic jams occur.

# IP video glossary

## **Autofocus**

A system by which the camera lens automatically focuses on a selected part of the subject.

## **Angle**

The field of view, relative to a standard lens in a 35mm still camera, expressed in degrees. For practical purposes, this is the area that a lens can cover, where the angle of view is determined by the focal length of the lens. A wide-angle lens has a short focal length and covers a wider angle of view than standard or telephoto lenses, which have longer focal lengths.

## **ARTPEC (Axis Real Time Picture Encoder)**

A chip designed by Axis for image compression. ARTPEC supports a range of CCD and CMOS sensors, built-in functionality for sharpening, backlight compensation, noise reduction and white balance, support for multiple compression standards and multi-streaming.

## **Aspect ratio**

A ratio of width to height in images. HDTV-standard video uses an aspect ratio of 16:9, whereas older television screens and computer monitors use 4:3.

## **Auto-iris (or DC-Iris)**

This special type of iris is electrically controlled by the camera to automatically regulate the amount of light allowed to enter.

## **Bit rate**

The bit rate (in kbit/s or Mbit/s) is often referred to as speed, but actually defines the number of bits/time unit for data and not distance/time unit.

## **Broadband**

In network engineering terms, this describes transmission methods where two or more signals share the same carrier. In more popular terminology, broadband is taken to mean high-speed data transmission.

## **CCD (Charged Coupled Device)**

This light-sensitive image device used in many digital cameras is a large integrated circuit that contains hundreds of thousands of photo-sites (pixels) that convert light energy into electronic signals. Its size is measured diagonally and can be 1/4", 1/3", 1/2" or 2/3".

## **CIF (Common Intermediate Format)**

CIF refers to the analog video resolutions 352x288 pixels (PAL) and 352x240 pixels (NTSC).

## **Client/server**

Client/server describes the relationship between two computer programs in which one program, the client, makes a service request from another program, the server, which fulfills the request. Typically, multiple client programs share the services of a common server program. A web browser is a client program that requests services (the sending of web pages or files) from a web server.

## **CMOS (Complementary Metal Oxide Semiconductor)**

A CMOS is a widely used type of semiconductor that uses both negative and positive circuits. Since only one of the circuit types is on at any given time, CMOS chips require less power than chips using just one type of transistor. CMOS image sensors also allow processing circuits to be included on the same chip, an advantage not possible with CCD sensors, which are traditionally more expensive to produce.

## **Coaxial cable**

Coaxial cable is the standard means of transmitting analog video in a CCTV system. Coaxial is also used by cable companies to distribute television in residential buildings.

## **Contrast**

Defines the degree of difference between the lightest and darkest parts of an image or video stream.

## **Corridor Format**

Refers to an aspect ratio unique to Axis cameras that enables the viewer to see a "portrait" type view, as opposed to the "landscape" view of traditional video. Corridor format is enabled by either installing an Axis camera sideways or by rotating the unique 3-axis lens found in certain cameras, and then the image is rotated back 90° so the operator can view a 9:16 image as opposed to a traditional 16:9 one. Corridor Format is ideal for viewing hallways, stores aisles, tunnels, stairwells and roads.

# IP video glossary (continued)

## DHCP (Dynamic Host Configuration Protocol)

DHCP is a protocol that lets network administrators automate and centrally manage the assignment of Internet Protocol (IP) addresses to network devices in a network. DHCP uses the concept of a "lease" or amount of time that a given IP address will be valid for a computer. The lease time can vary, depending on how long a user is likely to require the network connection at a particular location. DHCP also supports static addresses for e.g. computers running web servers, which need a permanent IP address.

## DNS (Domain Name System)

DNS is used to locate and translate Internet domain names into IP (Internet Protocol) addresses. A domain name is a meaningful and easy-to-remember name for an Internet address. For example the domain name www.example.com is much easier to remember than 192.0.34.166. The translation tables for domain names are contained in Domain name servers.

## Edge Storage

Storage at the edge is an expression that refers to data storage and backup typically used in portable and mobile computing. In surveillance, however, edge storage refers to recording video directly to SD-card inside the camera or Network Attached Storage (NAS) device. The camera and NAS are said to be at the "edge" of the network, while the server, PC, and NVR are considered the "core."

## Ethernet

Ethernet is the most widely installed local area network technology. An Ethernet LAN typically uses special grades of twisted pair wires. The most commonly installed Ethernet systems are 10BASE-T and 100BASE-T10, which provide transmission speeds up to 10 Mbps and 100 Mbps respectively.

## Firewall

A firewall works as a barrier between networks, e.g. between a Local Area Network and the Internet. The firewall ensures that only authorized users are allowed to access the one network from the other. A firewall can be software running on a computer, or it can be a standalone hardware device.

## Fixed Network Camera

A fixed network camera, sometimes referred to as a box or cube camera, is a certain form factor where the camera resembles a brick or rectangle and has a stationary field-of-view. Fixed cameras are typically used in overt surveillance applications. Some fixed cameras have digital PTZ functionality, but the camera itself does not move. See also PTZ. Examples of fixed network cameras include the AXIS M10 Series, AXIS M11 Series, AXIS P13 Series and AXIS Q16 Series.

## Fixed Dome Network Camera

A fixed dome network camera also has a stationary view like the fixed camera, but comes in a domed form factor. Fixed dome cameras are typically used in more discreet applications where the customer requires the camera to better blend in with the environment. Examples of fixed dome network cameras include the AXIS M30 Series, AXIS M32 Series and AXIS P33 Series.

## Fixed iris

In indoor environments where light levels may be constant, a fixed iris lens can be used. With fixed iris lenses, the iris opening cannot be adjusted and is fixed at a certain f-number. The camera can compensate for changes in the level of light by adjusting the exposure time or using gain.

## Focal length

Measured in millimeters, the focal length of a camera lens determines the width of the horizontal field of view, which in turn is measured in degrees.

## Frame rate

The frame rate used to describe the frequency at which a video stream is updated is measured in frames per second (fps). A higher frame rate is advantageous when there is movement in the video stream, as it maintains image quality throughout.

## Full-duplex

Transmission of data in two directions simultaneously. In an audio system this would describe e.g. a telephone system. Half-duplex also provides bi-directional communication, but only in one direction at a time, as in a walkie-talkie system. See also Simplex.

## **H.264**

Also known as MPEG-4 Part 10. This is the new generation compression standard for digital video. H.264 offers higher video resolution than Motion JPEG or MPEG-4 at the same bit rate and bandwidth, or the same quality video at a lower bit rate.

## **HDTV (High-definition television)**

HDTV is a standard defined by the Society of Motion Picture and Television Engineers and provides up to five times higher resolution than standard analog TV. HDTV has better color fidelity and a 16:9 format. The two most important HDTV standards today are SMPTE 296M and SMPTE 274M.

## **Hosted Video**

Hosted video, also referred to as VSaaS (Video Surveillance as a Service) or cloud video, is a video surveillance application provided as a service using the Internet. The IP cameras and/or encoders are connected to the network and then stream video via the Internet to a hosting provider, also known as a cloud provider. Video is stored in a secure offsite facility, and a service provider is responsible for maintenance and system upgrades. A NAS device can be added for a hosted video solution for redundant and high-resolution recording.

## **IEEE 802.11**

A family of standards for wireless LANs. The 802.11 standard supports 1 or 2 Mbit/s transmission on the 2.4 GHz band. IEEE 802.11b supports data rates up to 11 Mbit/s on the 2.4 GHz band, while 802.11g allows up to 54 Mbit/s on the 2.4 GHz band.

## **Image compression**

Image compression minimizes the file size (in bytes) of an image. Two of the most common compressed image formats are H.264 (MPEG-4 Part 10) and Motion JPEG.

## **Interlacing**

Interlaced video is video captured at 50 pictures (known as fields) per second, of which every 2 consecutive fields (at half height) are then combined into 1 frame. Interlacing was developed many years ago for the analog TV world and is still used widely today. It provides good results when viewing motion in standard TV pictures, although there is always some degree of distortion in the image. See also Progressive Scan.

## **IP (Internet Protocol)**

The Internet Protocol is a method transmitting data over a network. Data to be sent is divided into individual and completely independent "packets." The Internet Protocol ensures that the data packets all arrive at the intended address.

## **IP address**

An IP address is simply an address on an IP network used by a computer/device connected to that network. IP addresses, which are unique to the device to avoid conflicts, allow all the connected computers/devices to find each other and to pass data back and forth.

## **IP camera**

The terms IP camera and network camera are synonymous: a camera and computer combined in one unit. It operates as stand-alone unit and only requires a connection to the network. IP cameras produce a digital image and are known for superior image quality, functionality, scalability and total cost of ownership benefits when compared to analog CCTV.

## **Infrared (IR)**

Infrared radiation is radiation at a longer wavelength than visible light, which means it cannot be seen by the naked eye. As color cameras can "see" infrared radiation as well as visible light, these cameras are equipped with an IR-cut filter, to prevent distortion of the colors the human eye can see. To use the camera in very dark locations or at night, this filter can be removed, to allow infrared radiation to hit the image sensor and thus produce images. An infrared lamp can be used for improved illumination for night surveillance, whilst not producing any extra visible light.

## **Inputs/Outputs (I/O's)**

The digital I/Os on, for example, a network camera can be used to connect any device that can toggle between an open and a closed circuit, like a door switch, alarm, sensor, etc.

## **JPEG (Joint Photographic Experts Group)**

Together with the GIF file format, JPEG is an image file type commonly used on the web. A JPEG image is a bitmap, and usually has the file extension '.jpg' or '.jpeg.' When creating a JPEG image, it is possible to configure the level of compression to use. As the lowest compression (i.e. the highest quality) results in the largest file, there is a trade-off between image quality and file size.



# IP video glossary (continued)

## **kbit/s (kilobits per second)**

A measure of the bit rate, i.e. the rate at which bits are passing a given point. See also Bit rate.

## **LAN (Local Area Network)**

A LAN is a group of computers and associated devices that typically share common resources within a limited geographical area.

## **Light sensitivity**

The smallest amount of light needed for the camera to produce an image of useable quality. Light sensitivity, or minimum illumination, is presented in lux (lx), which is a measure of luminance.

## **Lux**

A standard unit of illumination measurement.

## **MAC address (Media Access Control address)**

A MAC address is a unique identifier associated with a piece of networking equipment, or more specifically, its interface with the network. For example, the network card in a computer has its own MAC address.

## **Manual iris**

This is the opposite of an auto-iris, i.e. the camera iris must be adjusted manually to regulate the amount of light allowed to reach the image sensor.

## **Mbit/s (Megabits per second)**

A measure of the bit rate, i.e. the rate at which bits are passing a given point. Commonly used to give the "speed" of a network. A LAN might run at 10 or 100 Mbit/s. See also Bit rate.

## **Motion JPEG**

Motion JPEG is a simple compression/decompression technique for network video. Latency is low and image quality is guaranteed, regardless of movement or complexity of the image. Image quality is controlled by adjusting the compression level, which in turn provides control over the file size, and thereby the bit rate.

## **Megapixel**

A megapixel is one million pixels. It is commonly used to describe the resolution of digital cameras. For example, a 5 megapixel camera is capable of capturing roughly 5,000,000 pixels. While megapixel will describe the number of pixels in the image, it does not denote other factors of image quality, such as frame rate, color fidelity and aspect ratio. See also Pixel.

## **MPEG (Moving Picture Experts Group)**

The Moving Picture Experts Group develops standards for digital video and audio compression. It operates under the auspices of the International Organization for Standardization (ISO). The MPEG standards are an evolving series, each designed for a different purpose.

## **MPEG-4**

MPEG-4 is a group of audio and video coding standards and related technology. The primary uses for the MPEG-4 standard are web (streaming media) and CD distribution, conversational (videophone) and some broadcast television.

## **Multicast**

Bandwidth-conserving technology that reduces bandwidth usage by simultaneously delivering a single stream of information to multiple network recipients.

## **Multi-stream**

Multi-stream is enabled when an IP camera is programmed to stream different video data and/or fields of view from the same scene. For instance, with multi-streaming, one video stream can be set to record constantly at a low frame rate and resolution, while a second simultaneous stream can be sent with higher frame rate and resolution upon motion in the scene. Multi-streaming can also be used to isolated individual areas of the main scene and send different fields-of-view from a single camera.

## **ONVIF (Open Network Video Interface Forum)**

ONVIF is an open industry forum for the development of a global standard for the interface of network video products.

### **P-Iris**

P-Iris is an automatic, precise iris control developed by Axis Communications of Sweden and Kowa Company of Japan. It involves a P-Iris lens and specialized software that optimize image quality.

### **Pan/Tilt/Zoom (PTZ)**

A PTZ camera can provide Pan (left to right), Tilt (up and down) and Zoom (in and out) functionality for the operator. This is typically controlled by a mouse, PTZ joystick or with presets in the camera.

### **Pixel (Picture Element)**

A pixel is one of the many tiny dots that make up a digital image. The color and intensity of each pixel represents a tiny area of the complete image.

### **PoE (Power over Ethernet)**

Power over Ethernet provides power to a network device via the same cable as used for the network connection, which streams data and, in some cases, controls pan/tilt/zoom functionality. This is very useful for IP surveillance and remote monitoring applications in places where it may be too impractical or expensive to power the device from a power outlet.

### **Privacy masking**

3D privacy masking is supported in most Axis PTZ dome cameras. It enables selected areas of a scene to be blocked or masked from viewing and recording. It allows masking to be maintained even as the camera's field of view changes through panning, tilting and zooming as the masking moves with the camera's coordinate system.

### **Progressive scan**

Progressive scan, as opposed to interlaced video, scans the entire picture, line by line every sixteenth of a second. In other words, captured images are not split into separate fields as in interlaced scanning. In a surveillance application, this can be critical when viewing detail within a moving image, such as a person running.

### **Protocol**

A special set of rules governing how two entities will communicate. Protocols are found at many levels of communication, and there are hardware protocols and software protocols.

### **Proxy server**

In an enterprise that uses the Internet, a proxy server acts as an intermediary between a workstation user and the Internet. This provides security, administrative control and a caching service. Any proxy server associated with a gateway server, or part of a gateway server, effectively separates the enterprise network from the outside network and the local firewall. It is the firewall server that protects the enterprise network from outside intrusion.

### **Quality of Service (QoS)**

QoS provides the means to guarantee a certain level of a specified resource to selected traffic on a network. Quality can be defined as a maintained level of bandwidth, low latency, no packet losses, etc.

### **Resolution**

Image resolution is a measure of how much detail a digital image can hold: the greater the resolution, the greater the level of detail. Resolution can be specified as the number of pixel-columns (width) by the number of pixel-rows (height), e.g. 320x240. In IP video, resolution is typically referred to in terms of SVGA, megapixel and HDTV. In analog systems it is also common to use other format designations, such as CIF, QCIF, 4CIF, etc.

### **Router**

A device that determines the next network point to which a packet should be forwarded on its way to its final destination. A router creates and/or maintains a special routing table that stores information on how best to reach certain destinations. A router is sometimes included as part of a network switch. See also Switch.

### **Server**

In general, a server is a computer program that provides services to other computer programs. A computer running a server program is also frequently referred to as a server. In practice, the server may contain any number of server and client programs. A web server is the computer program that supplies the requested HTML pages or files to the client (browser).

# IP video glossary (continued)

## Simplex

In simplex operation, a network cable or communications channel can only send information in one direction. See also Full-duplex.

## SSL/TLS (Secure Socket Layer/Transport Layer Security)

These two protocols (SSL is succeeded by TLS) are cryptographic protocols that provide secure communication on a network. SSL is commonly used over HTTP to form HTTPS, as used e.g. on the Internet for electronic financial transactions. SSL uses public key certificates to verify the identity of the server.

## Switch

A switch is a network device that connects network segments together, and which selects a path for sending a unit of data to its next destination. In general, a switch is a simpler and faster mechanism than a router, which requires knowledge about the network and how to determine the route. Some switches include the router function. See also Router.

## TVL (TV Lines)

A method of defining resolutions in analog video, which maxes out at 540 TVLs.

## VAPIX®

VAPIX® is Axis' own open application programming interface (API) for cost-efficient, flexible, scalable and future-proof integration with other systems. Read more: Network Video Developer Pages

## Varifocal lens

A varifocal lens provides a wide range of focal lengths, as opposed to a lens with a fixed focal length, which only provides one.

## Video encoder

A video encoder, or video server, makes it possible to move toward a network video system without having to discard existing analog equipment. It is ideal for integration with existing analog CCTV (closed circuit television) system. A video encoder brings new functionality to analog equipment and eliminates the need for dedicated equipment such as coaxial cabling, monitors and DVRs – the latter becoming unnecessary as video recording can be done using standard PC servers.

## VPN (Virtual Private Network)

This creates a secure "tunnel" between the points within the VPN. Only devices with the correct "key" will be able to work within the VPN. The VPN network can be within a company LAN (Local Area Network), but different sites can also be connected over the Internet in a secure way. One common use for VPN is for connecting a remote computer to the corporate network, via e.g. a direct phone line or via the Internet. Read more: Network security

## WAN (Wide-Area-Network)

Similar to a LAN, but on a larger geographical scale.

## Wide Dynamic Range (WDR)

The wide dynamic range (WDR) function of a camera is intended to provide clear images even under back light circumstances where intensity of illumination in a scene can vary, namely when there are both very bright and very dark areas simultaneously in the field of view of the camera. WDR enables the capture and display of both bright and dark areas in the same frame, in a way that there are details in both areas so that bright areas are not saturated and dark areas are not too dark.

## WLAN (Wireless LAN)

A wireless LAN is a wireless local area network that uses radio waves as its carrier: where the network connections for end-users are wireless. The main network structure usually uses cables.

## Zoom lens

A zoom lens can be moved (zoomed) to enlarge the view of an object to show more detail.

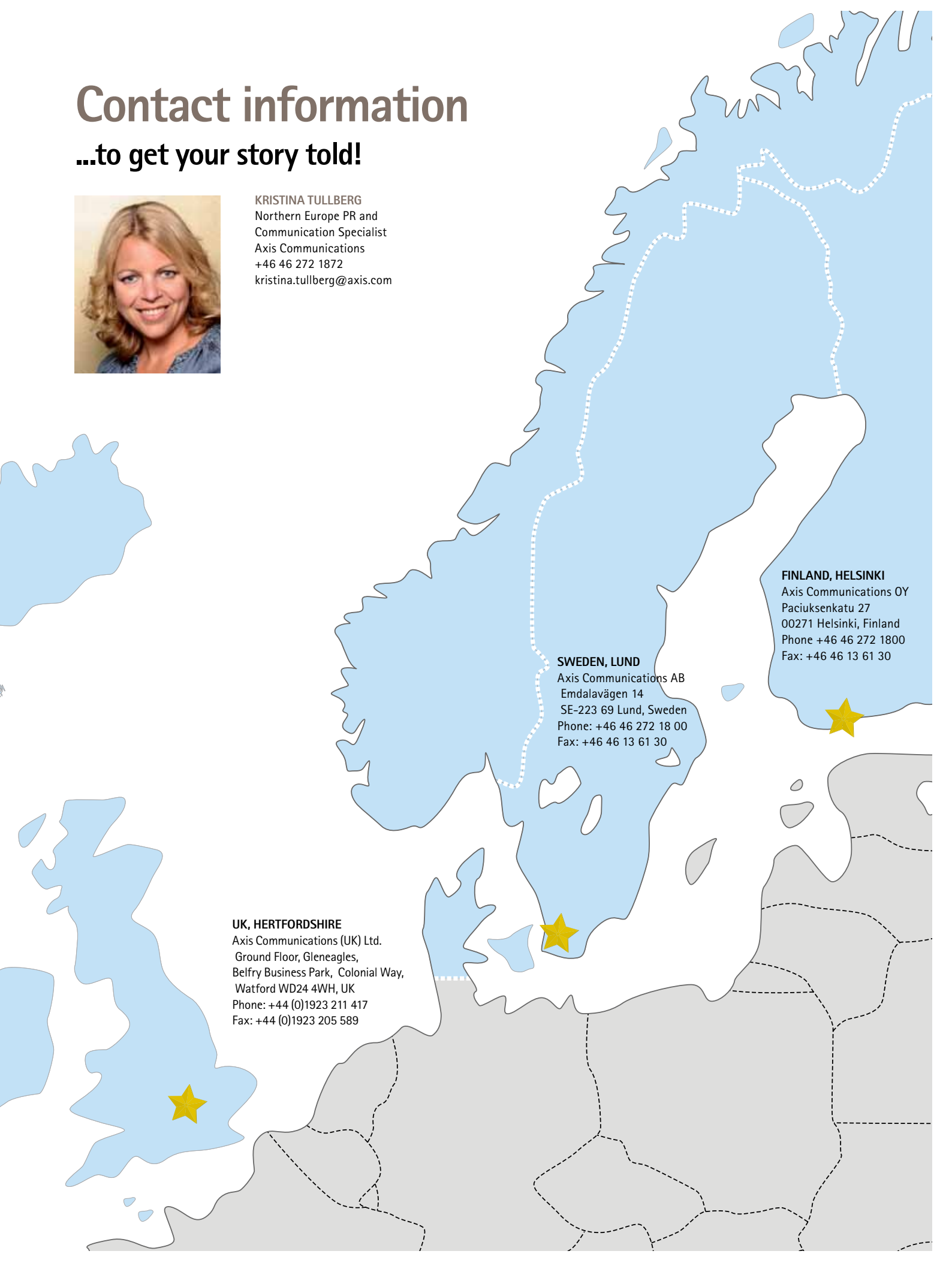


# Contact information

...to get your story told!



**KRISTINA TULLBERG**  
Northern Europe PR and  
Communication Specialist  
Axis Communications  
+46 46 272 1872  
kristina.tullberg@axis.com



**UK, HERTFORDSHIRE**  
Axis Communications (UK) Ltd.  
Ground Floor, Gleneagles,  
Belfry Business Park, Colonial Way,  
Watford WD24 4WH, UK  
Phone: +44 (0)1923 211 417  
Fax: +44 (0)1923 205 589

**SWEDEN, LUND**  
Axis Communications AB  
Emdalavägen 14  
SE-223 69 Lund, Sweden  
Phone: +46 46 272 18 00  
Fax: +46 46 13 61 30

**FINLAND, HELSINKI**  
Axis Communications OY  
Paciuksenkatu 27  
00271 Helsinki, Finland  
Phone +46 46 272 1800  
Fax: +46 46 13 61 30



Get the Axis picture. Stay one step ahead.



### **About Axis Communications**

As the market leader in network video, Axis is leading the way to a smarter, safer, more secure world — driving the shift from analog to digital video surveillance. Offering network video solutions for professional installations, Axis' products and solutions are based on an innovative, open technology platform.

Axis has more than 1,400 dedicated employees in 40 locations around the world and cooperates with partners covering 179 countries. Founded in 1984, Axis is a Sweden-based IT company listed on NASDAQ OMX Stockholm under the ticker AXIS. For more information about Axis, please visit our website [www.axis.com](http://www.axis.com).