

INDUSTRY SOLUTIONS

Retailer, service station, bank, logistics/forwarding agent, school, hospital, airport, motorway/tunnel, car park, stadium, private property

APPLICATION BOOK – INDUSTRY SOLUTIONS AND REFERENCES

APP BOOK

www.eneo.tv



Contents

INDUSTRY SOLUTIONS, PROJECT REPORTS, TECHNOLOGY NOTES

Technology note: Symbols used	3
Retail	4
Shopping experience – Müller health and beauty retailer	6
Technology note: Privacy zone	7
Service station	8
Technology note: Protection class IP	10
Bank	12
Commerzbank – 2,400 cameras	14
Logistics/forwarding agent	16
Fresh produce centre – company premises	18
Technology note: H.264 compression	19
School	20
Nell Breuning School – Rödermark	22
Hospital	23
Airport	24
Film stars in winter sports – Ski resorts	26
Technology note: Day/night functionality	27
Motorway/tunnel	28
Technology note: Noise reduction with 3DNR	30
Security office – Mannheim	31
Car park	32
Event location – Baton Rouge	34
Technology note: Resolution	35
Stadium	36
Technology note: ONVIF and motion detection	38
Private property	39
Precision and accuracy sports – MSZU in Ulm	40

eneo

YOUR SPECIALIST FOR VIDEO SURVEILLANCE

For more than a decade, eneo has been an established brand for video surveillance and is exclusively available from professional installers and retailers. The product portfolio is distinguished by a wide variety, an excellent price-performance ratio and proven quality. We are both certified in accordance with EN ISO 9001 2008 and additionally assure our high product quality with thorough testing and incoming inspections.

Our comprehensive product range provides a suitable solution for nearly any requirement, regardless whether you are looking for a particularly efficient IP-based video surveillance system, want to automate your surveillance with analysis functions or require cameras with effective vandalism protection. However, we also offer complete industry solutions in collaboration with our certified specialised installers. We are presenting an extract from our comprehensive range of solutions in this Application Book.

What awaits you in detail? Using 3-D illustrations, we will present you sample solutions arranged by sectors which take specific characteristics of the respective location into account and have proven themselves in various applications. Furthermore, you will find a selection of current reference reports and technical explanations of important functions in the world of video surveillance.

Are the solutions presented here the last word? No, because requirements vary for each project, meaning there cannot be just *one* single solution for video surveillance (for example in retail or airports). Therefore, we have forgone representing recording options in detail, although we of course also offer them. Our certified eneo partners would be pleased to consult you on the subject of recording and to survey the conditions directly at your location.

Technology note

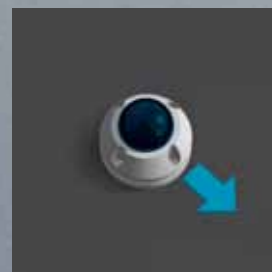
Symbols used in this Application Book



Classic boxed type camera used outdoors with a weather-proof housing.



Boxed type camera which is installed with an outdoor housing on a pan & tilt system, which means its position can be changed flexibly per remote control.



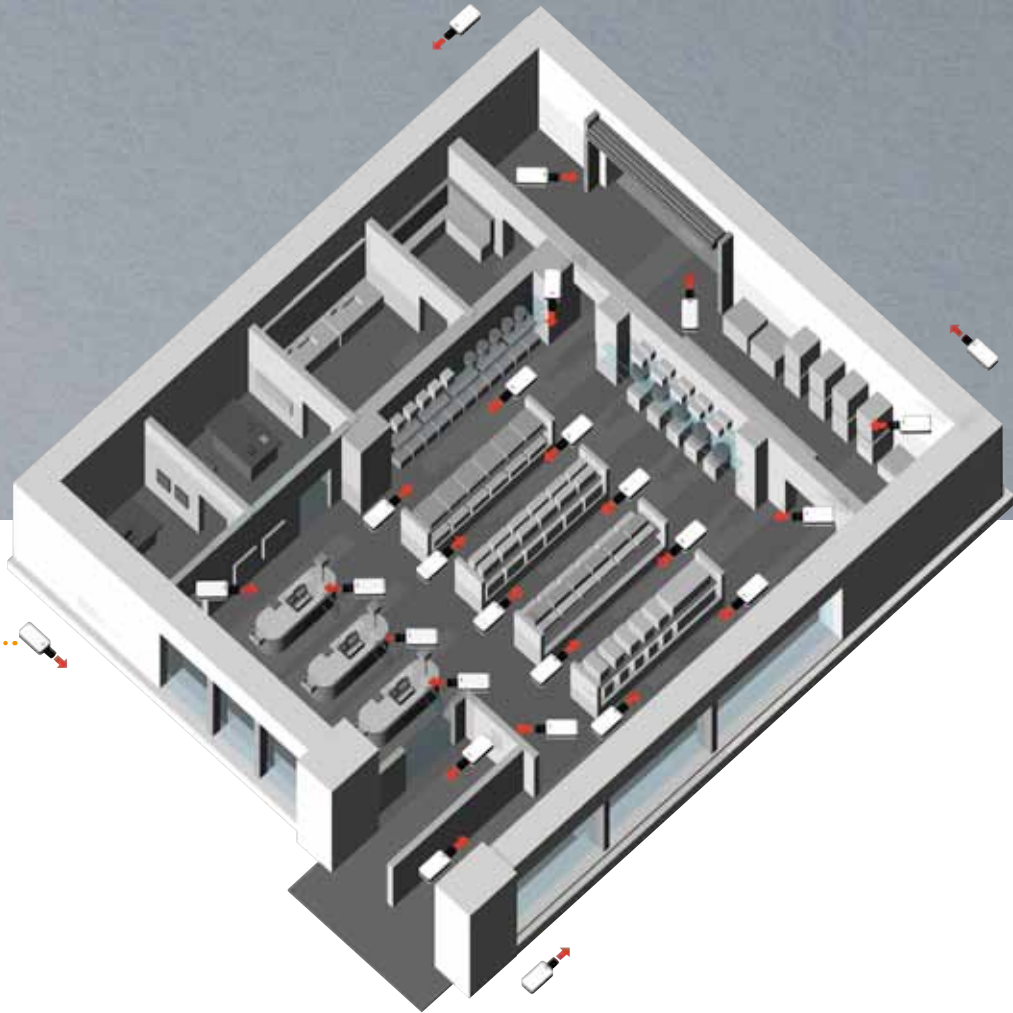
Fixed dome camera which is normally installed on the ceiling and is often protected against the effects of vandalism.



PTZ dome camera with moving camera module and zoom lens.

Retail

SOLUTIONS FOR THE RETAIL SECTOR Comprehensive surveillance for the prevention of robbery and burglary and the collection of evidence for criminal offences



OUTDOOR CAMERAS

Cameras used outdoors must have effective protection from the weather. The abbreviation IP ("International Protection") and a corresponding reference number is used to evaluate the degree of protection. We explain in detail exactly what this number means on page 10.

Statistically speaking, every German household steals goods worth 50 EUR annually. Honest customers have to contribute to the damages resulting from shoplifting with one percent of purchase prices. Even these figures are a very low estimate because of the high number of undetected cases. It is assumed that approximately 30 million cases of shoplifting remain undetected in Germany each and every year. The spectrum ranges from petty theft to drug-related crime, up to organised gang shoplifting, which does the greatest amount of damage in terms of value. Therefore, the key functions of a video surveillance system must include the prevention of robbery and burglary as well as theft and fraud. And, of course, the



INDOORS

In the store itself, comprehensive surveillance is ensured by distributing the cameras in such a way that blind spots are ruled out from the outset. Because there are no particular requirements regarding weather and vandalism protection for indoor use, classic boxed cameras are fully adequate. Of course, upon request fixed domes can also be installed, which are less conspicuous due to their compact dimensions. Varifocal lenses guarantee flexible installation. Cameras are also installed to check deliveries and the warehouse.

collection of evidence of criminal offences. Burglaries are prevented by the cameras installed outdoors with day/night functionality. These cameras are located in housings protected in compliance with IP66, meaning they are effectively protected from the weather. Alternatively, plug & play models in bullet housings are also available for this purpose. They have integrated IR illumination and are therefore particularly suitable for conditions with little available ambient light where installing external spotlights would be too expensive. Due to the relatively large distances which the cameras

have to cover, models with very high or megapixel resolution are used to capture incidents at the other end of the building in high definition. In order to keep the memory requirements low, video signals from the outdoor cameras are only recorded at night when motion is detected. In the warehouse, recording is only active in case of movement or an incident, such as when the warehouse door is opened. Indoors, recording is continuous during business hours to document criminal offences or cases of fraud and be able to submit corresponding evidence if necessary.



Shopping experience

PROJECT REPORT eneo complete systems are being used in over sixty Müller health and beauty retailers



The story of Müller health and beauty retailers resembles the Swabian version of the American dream. What began on 15 March 1953 as a barbershop in Unterfahlheim, Bavaria (near Ulm) is now one of the leading health and beauty retailers with locations in Germany, Austria, Switzerland, Hungary, Croatia, Slovenia and Spain. Along the way, company founder Erwin Müller upset the self-image of an entire sector with his revolutionary self-service health and beauty retail concept. In 1967, he went down in history as the "Rebel from Ulm" when he opened his locations on Mondays against the directive of the barbershop guild. Erwin Müller obviously wasn't particularly interested in the fact that he was suspended from the guild for this offence because in the following year he laid the foundations for the Müller stores which we know today when he opened the first barbershop which integrated the sale of health and beauty products. The success has proven Erwin Müller was correct. In the meantime,

nearly 24,000 employees work in over 600 locations all over Europe. And Müller continues to grow – an average of 50 new stores are opened each year with a product range which includes CDs, toys and stationery and really sets itself apart from the competition. It is a product range which facilitates a shopping experience in a pleasant atmosphere with prices which Müller invites you to check against competitors' prices in their slogan: "You should compare our prices."

Müller ensures that prices will remain just as low in the future by using eneo video surveillance which has now been installed in over sixty Müller stores. Inventory discrepancies are a growing problem in retail and can lead to rising prices if they are not prevented effectively. Thus protecting honest customers is essential. At Müller, the installation of the systems is always in accordance with strict data protection regulations which are fulfilled meticulously by the responsible installation company using a thorough checklist and

Technology note

Privacy zone

Privacy zone

For video security installations today, protecting privacy is just as important as protecting property. The privacy zone, or privacy masking function, has been developed for this purpose, and it makes certain areas in the cameras' field of view unrecognisable, for example the window of a house or the PIN pad on cash dispensers in order to conceal PIN entry from the security personnel. If these areas were not masked, the security personnel could spy on private individuals and breach their privacy, which could result in legal consequences for the responsible company.

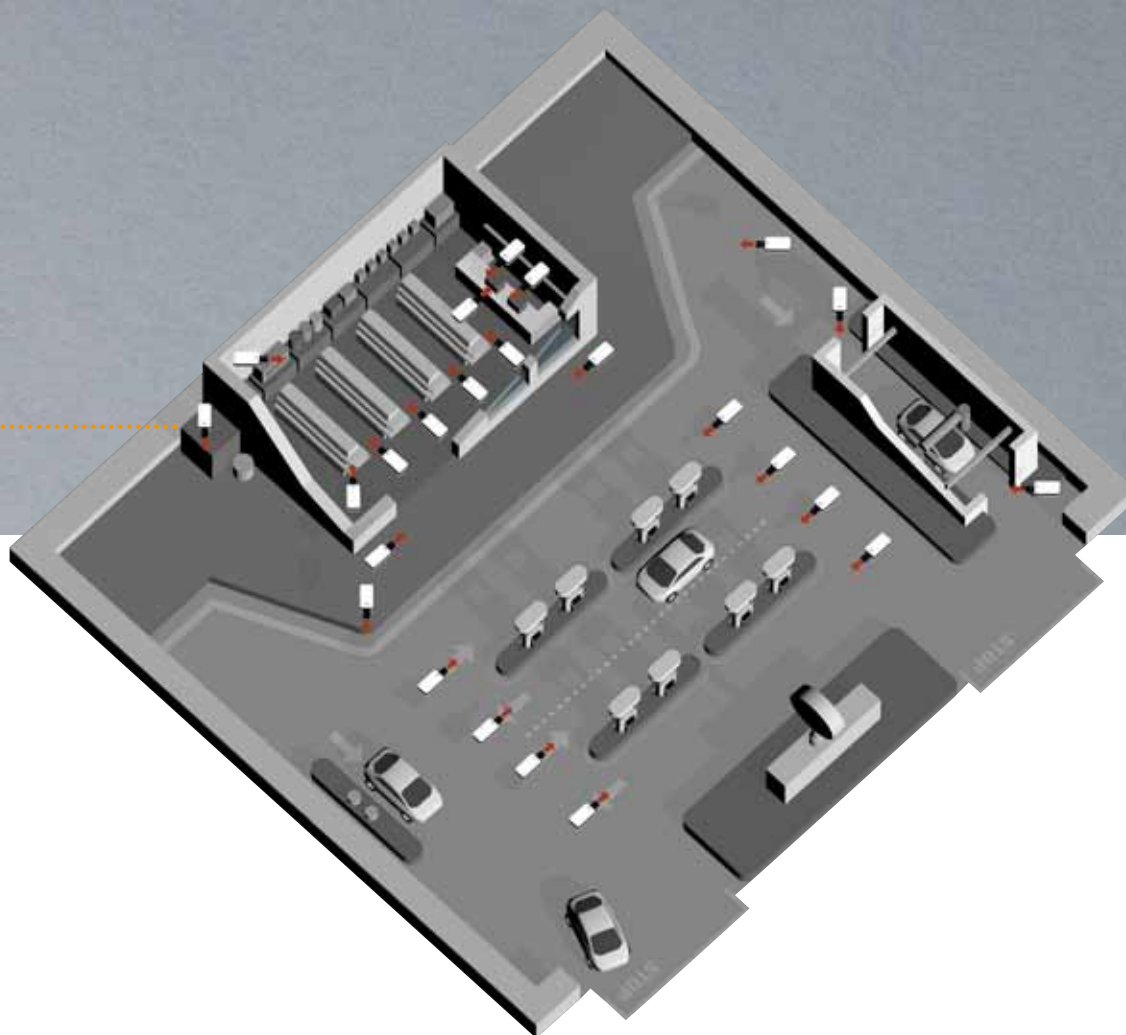
which require confirmation with a signature. Why did Müller choose eneo? "Based on the recommendation of our installation company, we carried out a three-week test in one location, and it was very successful," explains Mario Messner, Managing Director at the security agency Müller Sicherheitsdienst Ulm MSDU. "Due to the high image quality, a lower recording rate was sufficient compared to another recorder model which we had in operation at the same time with 25 pictures per second. Because we wanted to keep the memory requirements as low as possible, it didn't take us long to make a decision. We were also impressed by the price-performance ratio, which is significant when numerous cameras are being installed in each store." Mario Messner has never regretted this decision, quite the contrary. "We now have numerous cameras, domes and recorders from eneo in operation in over sixty stores. The number is in the hundreds. The failure rate is so minimal that they are negligible. The equipment is absolutely reliable."



The screen of the laptop has been concealed while other image areas have been represented unchanged.

Service station

SOLUTIONS FOR SERVICE STATIONS Particular attention is paid to recognising number plates at petrol pumps and shop surveillance



CAMERAS FOR DETECTION

High camera resolution is not always necessary. For example, if there should only be surveillance when motion is detected, such as in this area which is rarely frequented, inexpensive cameras can also be used without any problems, such as those with VGA resolution.

High petrol prices might tempt even the common consumer to refuel "for free" and either simply drive away or only pay for a newspaper at the counter and "forget" to pay for the petrol. However, petrol theft is not the only problem which faces service station operators. Many service stations now resemble little supermarkets, and thus the requirements placed on the surveillance of these shops must be similar to retail requirements.

Robberies are also not rare due to long business hours into the night, although robbery figures are declining. Service station owners expect an average of six percent inventory discrepancies, which can amount to approximately 50,000 EUR for a large service



PETROL PUMPS

Near petrol pumps, particular attention is paid to recognising number plates. Therefore, high-resolution cameras are required which can also display minor details in razor-sharp resolution so that e.g. digital zoom can be used to focus in on important image areas in the recordings. The surveillance of the carwash is used to collect evidence in case of wilful or accidental damage (e.g. when carelessly entering or leaving the carwash), the cameras directly in front of the building monitor the entrance and night counter, and the other outdoor cameras are for additional protection of the company premises.



station. This is an amount which can be dramatically reduced by implementing a professional video surveillance solution, meaning that installation is normally amortised after just over a year.

All outdoor cameras are located in housings protected in compliance with IP66 to brave the weather all year-round. There is also an option of reverting to cameras in bullet housings which can be installed particularly easily thanks to their plug & play concept while they also possess advanced features such as integrated

IR illumination. In the service station shop, boxed cameras and varifocal lenses are used which view both the shop shelves and particularly the checkout area from both sides.

It is possible to record the various video images in numerous ways according to individual wishes. In addition to permanent or time-controlled recording, the refuelling process itself can trigger recording if the system used is integrated in the Zelaris software solution via the OPC interface or in the video surveillance solution via the digital video recorder.



IP PROTECTION CLASS

Effectively protected from all weather – What does this mean in detail? Electrical equipment, which also includes cameras, is categorised by IP codes in terms of its suitability for various ambient conditions. The abbreviation IP stands for "International Protection". A two-digit number is added to the letters IP. This number indicates the extent of the housing's protection regarding touch and foreign objects (first digit) and moisture (second digit). This means that cameras which have more than IP68 are absolutely dust-proof and protected from permanent immersion in water.

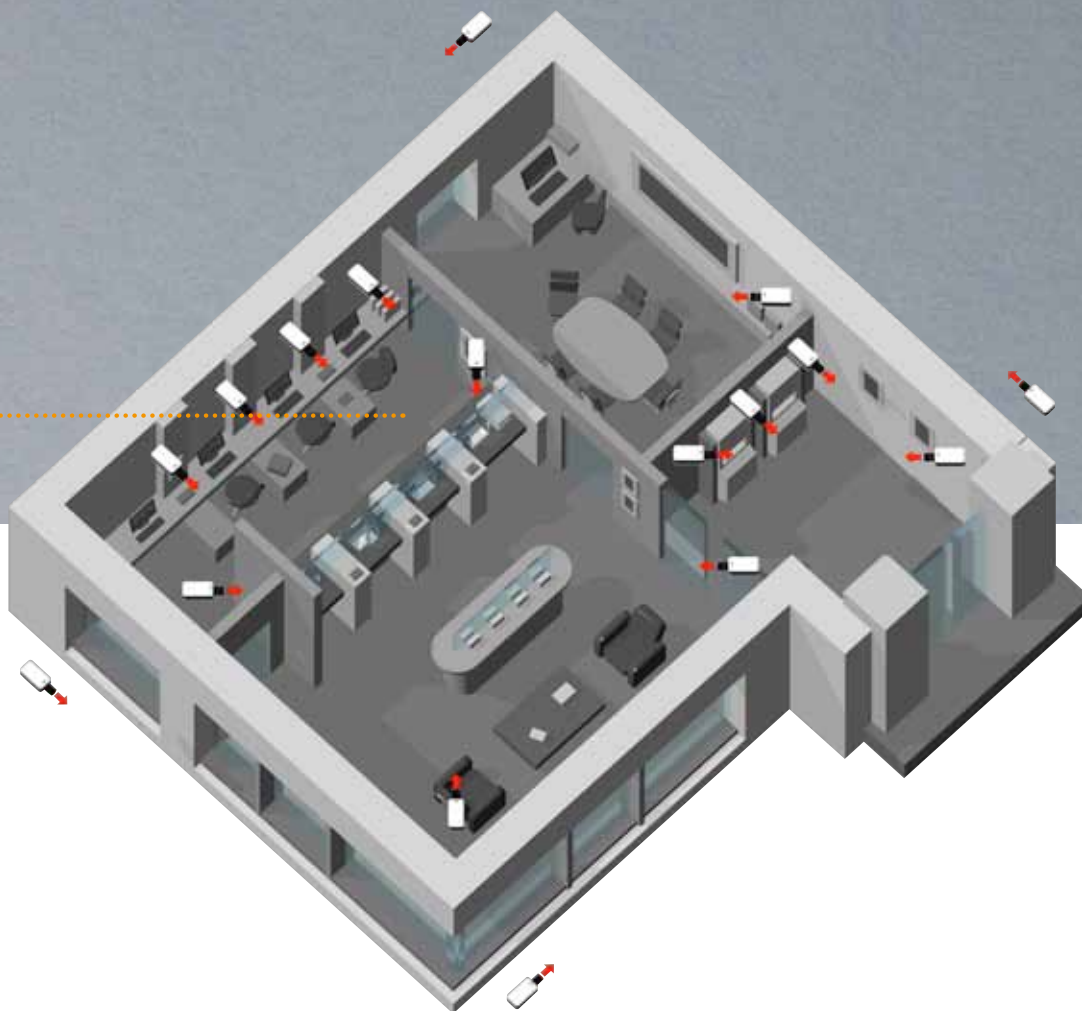
Technology note

IP PROTECTION CLASS

NUMBER	PROTECTION AGAINST BEING TOUCHED	PROTECTION AGAINST FOREIGN OBJECTS
0	No protection	No protection
1	Protection against large body parts (diameter 50 mm)	Large foreign objects (diameter more than 50 mm)
2	Hand protection (diameter 12 mm)	Mid-size foreign objects (diameter more than 12.5 mm, length up to 80 mm)
3	Tools and wires (diameter more than 2.5 mm)	Large foreign objects (diameter more than 2.5 mm)
4	Tools and wires (diameter more than 1 mm)	Granular foreign objects (diameter more than 1 mm)
5	Wire protection (such as IP 4) dust-protected	Accumulation of dust
6	Wire protection (such as IP 4) dust-proof	No dust entry
NUMBER	PROTECTION AGAINST WATER	
0	No protection	
1	Protection against vertically dripping water	
2	Protection against diagonally (up to 15°) dripping water	
3	Protection against spraywater falling up to 60° against the vertical axis	
4	Protection against all-round spraywater	
5	Protection against water jets (nozzle) from any angle	
6	Protection against strong water jets (flooding)	
7	Protection against temporary immersion	
8	Protection against permanent immersion	

Bank

SOLUTIONS FOR THE FINANCIAL SECTOR Video surveillance is clearly directed by the regulations of the professional association.



INDOORS

All checkout counters are monitored in the interior. For additional security, four more cameras keep an eye on the entire waiting area. Of course, the camera in the separate meeting room is not a must, and installing it can be foregone if a sense of familiarity should be instilled.

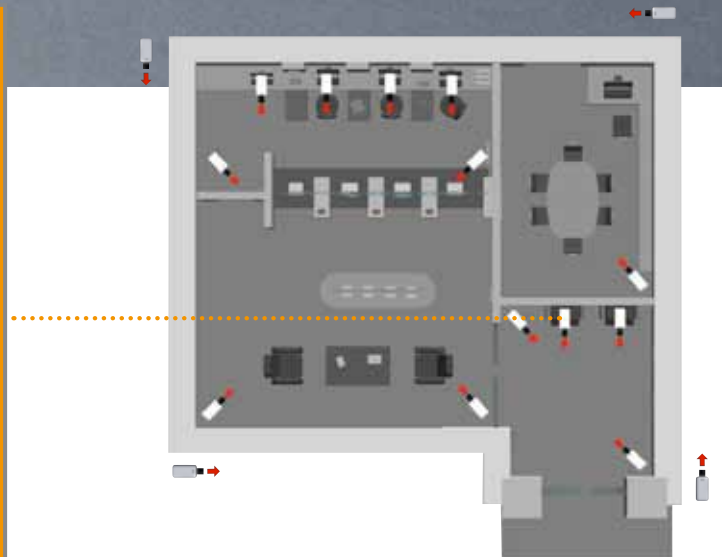
It is obvious that video surveillance in banks is subject to extremely high requirements. In addition to preventing robberies, vandalism and burglaries which normally occur at night or on the weekend when no personnel is on site, video surveillance can also hinder the manipulation of cash dispensers.

The installation of an "optical room surveillance system" in financial institutions which accept and dispense bank notes is clearly directed by the regulations of the professional association. These regulations determine both, the use of video surveillance and the minimum requirements the technology in use must



CASH DISPENSERS

In this solution, particular attention was paid to the foyer with the cash dispensers. In the past few years, manipulations have continuously increased, especially in this area. Moreover, professional association regulations recommend using surveillance in the foyers because bank robbers could possibly mask or unmask themselves in this area and then be identified. The cash dispensers are monitored from both sides in order to immediately expose people who are illegally tampering with the dispensers, as well as to give customers a sense of security.



meet. These requirements cannot be described in detail here as they range from the camera angle to the resolution, up to the recording duration. All the cameras used must be certified according to the stipulated regulations.

The outdoor area is secured by high-resolution cameras whose fields of vision cover all the sides of the building and which are protected from the weather with suitable housings. When using plug & play cameras in bullet housings, sabotage is effectively prevented from the outset because the hidden cable

guide makes it significantly more difficult or even impossible to manipulate the equipment (e.g. by severing the cable).

Due to the sensitive field of application, we recommend using high-resolution cameras, if possible from a megapixel range which also displays details in razor-sharp resolution. Zelaris software is ideal for managing the video signals because it is DGUV certified and already being used by the Commerzbank for the central surveillance of the entire network of branches in Frankfurt am Main.

Commerzbank

PROJECT REPORT Frankfurt Commerzbank-Tower: Video management software makes failure and sabotage monitoring possible – 2,400 cameras are connected



The bold architecture of the Commerzbank Tower fascinates many visitors to Frankfurt, and behind the mirrored façade, a complex software solution provides the necessary security in the branch network. This software was realised for the Commerzbank headquarters by the Frankfurt systems house Heer GmbH aided by eneo Zelaris software. The system application includes alarm activation to the central control station, manufacturer-independent recording of alarm images, time-controlled functional testing and sabotage monitoring using reference image comparison. The software package required for this purpose consists of eneo Zelaris video management software, the PVis management system and PVis advanced risk management.

Thanks to Zelaris, surveillance systems which were already connected could continue to be used regardless of their manufacturer and without expensive new investment. Due to the processing of analogue and network-based video systems, the system offers a high level of investment security and allows the integration of future video surveillance at any time. As an expandable client/server-based solution, it is also suitable for use in large surveillance

systems. The following requirements had to be fulfilled for the Commerzbank headquarters: failure and sabotage monitoring of the installed surveillance cameras in the 800 Commerzbank branches as well as connecting to and saving current images in case of a robbery.

External cameras are connected in the 800 branches all over Germany directly via networks or via the image memory used in the respective branch. Failure and sabotage monitoring is via time-controlled reference image comparison in the central control station of the Commerzbank Tower. For this, an image is called up from each external camera cyclically or according to a defined schedule. This image is then compared to the reference image previously saved and evaluated using adjustable parameters.

In the entire tower, more than 120 cameras are used, in addition to 70 cameras and 15 pan & tilt systems in the nearby cash sorting office (Mainzer Straße) where there are foreign currency transactions in the amount of 300 to 500 million EUR daily. According to Gerhard Reinhardt, responsible for central security and branch organisation,



"We use the layout-based Zelaris software to compare the camera images because they are not recorded. During the project, 800 branches will then be connected to the system with at least three cameras each so that over 2,400 cameras will be connected in the end.

The alarm systems in the branches can be connected to the central control station via the OPC server. An automatic layout representation with a marked triggered camera as well as simultaneous image connection to the control station make it possible to verifiably assess the alarm situation. Additionally, all displayed images as well as the control images of the sabotage monitoring are saved in the central control station.

"At the Commerzbank, we have established our own network for this purpose and the initial 18 branches have been successfully connected. While we use PVis for the transfer, Zelaris is used for video management and the layout-based identification of the cameras. In this way, automatic image comparison can be executed regularly. Otherwise we would need several months to check all the cameras. The system is an ideal solution for us be-

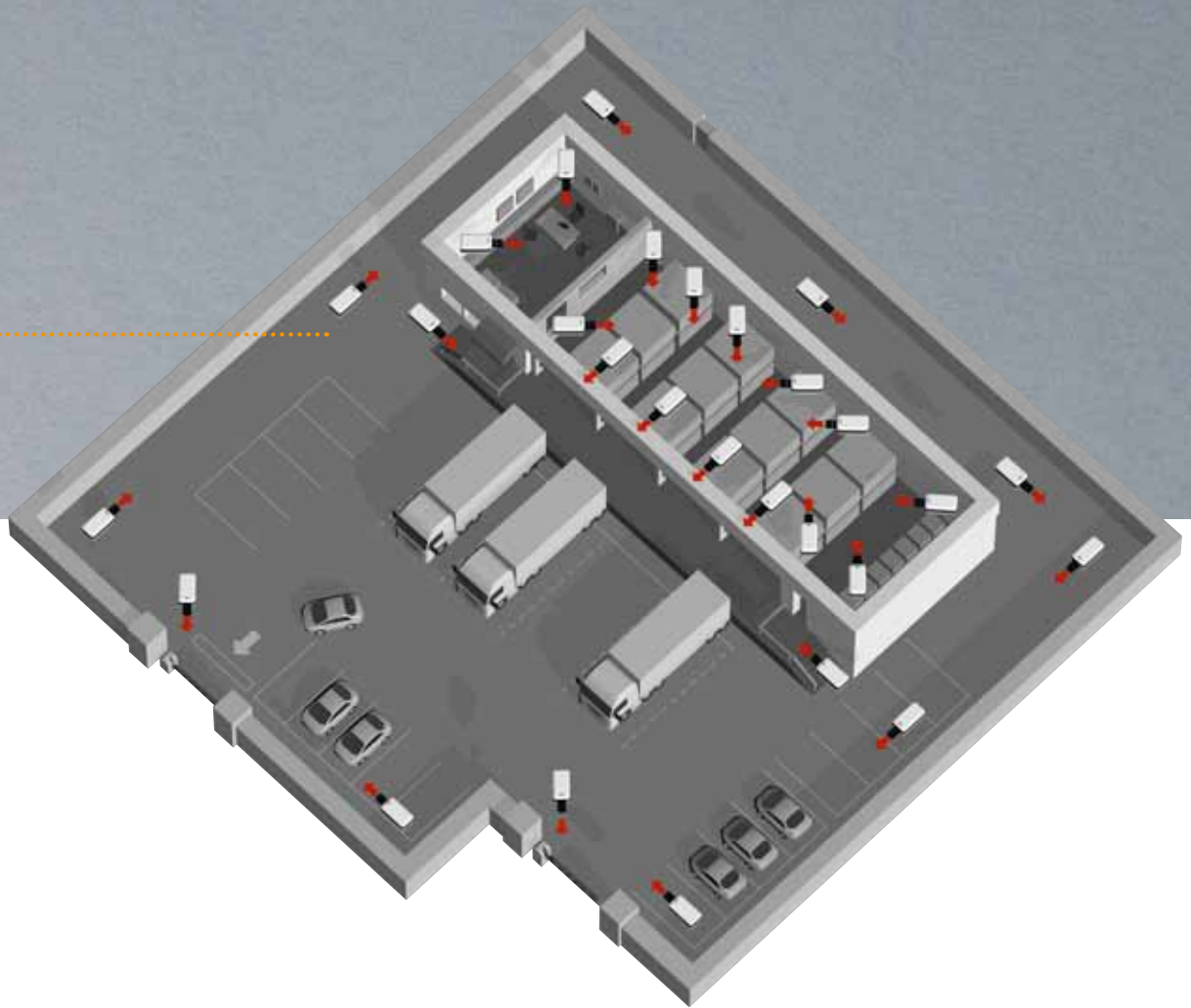
cause it can be upgraded gradually and regardless of the manufacturer. This means that it practically grows along with us," according to Reinhardt.

In addition, action texts and forms can be defined for each message, which should be processed depending on the alarm situation. All alarms can be called up again in the history with the corresponding images. Monthly sabotage testing in accordance with accident prevention regulations is automatic – thus it is now possible to reduce the number of false alarms forwarded to local police departments, which are subject to a charge. Because they are saved in the central control centre, all results can be reconstructed at any time.

Configurations of the sabotage monitoring can be defined easily using the image contents. Edges and stationary image elements are also defined and can then be checked with a test. Thus sabotage monitoring is switched on and runs completely automatically. Testing is controlled according to a schedule or cyclically in the background and reports any sabotage such as blurring, image failure, the camera being covered or turned.

Logistics/forwarding agent

SOLUTIONS FOR TRANSPORT COMPANIES The challenge of logistics companies lies in the size of the company premises



DOMES CAMERAS

As an alternative to the cameras described here, PTZ domes can also be used. The slightly higher price is normally offset by the zoom functionality and moving camera module, which thus provides even higher flexibility in video surveillance.

Wherever valuable goods are stored and transported, thieves are not far away, particularly when it is a forwarding agent's car park which appears to be poorly guarded. But the threat can be even more serious, for example if you operate in the international movement of goods and transport air freight to the United States. In this case, even a forwarding agent located in Germany can become the target of international terrorism. But more trivial reasons also speak for the use of professional video technology, such as insurance premiums which are significantly lower with the accordant security as they would be without. Moreover, accusations regarding transport damage can easily be invalidated because with the video images, it can be proven simply whether a



EXTERNAL SPOTLIGHTS

Due to the size of the property to be monitored, supplementing the outdoor cameras with external spotlights is recommended. White light spotlights are a direct deterrent which immerse the environment in bright light. However, they can only be used if they don't bother neighbouring residents. Alternatively, it is possible to use discreet IR spotlights whose light is nearly invisible. As a rule, the spotlights switch on automatically using a sensor-controlled twilight switch when the amount of light diminishes.



shipment already arrived damaged or if the damage occurred during transshipment. The requirements which are imposed on logistics companies and forwarding agents are increasing and becoming even more complex in light of ever higher delivery quantities. Requests for delivery dates which are "just in time" are referred to as an example.

As a rule, neuralgic points are the surveillance of external security boundaries and their access areas as well as the transshipment warehouses. An especially high resolution is important, particularly for the surveillance of the

access area so that number plates can also be identified without any problems. The indoor cameras should also be protected by housings. Plug & play cameras in bullet housings can be used well because they can also monitor poorly lit transshipment warehouses reliably due to their integrated IR illumination and the switchable IR cut filter. In order to monitor large company premises without employing additional staff, value should be attached to automatic analysis functions and intelligent alarm management which only inform the security personnel in case of an actual alarm.

Fresh produce centre

PROJECT REPORT eneo dome cameras safeguard the company premises of the Frankfurt fresh produce centre



In the Frankfurt fresh produce centre, approximately 130 retailers take care of an annual transshipment of 440,000 tonnes, which feed up to 5 million consumers in the Rhine-Main region. Heer GmbH relies on eneo's technology for the surveillance of the spacious company premises. When the Frankfurt Großmarkthalle was reconstructed to become the new home of the European Central Bank, the Frankfurt fresh produce centre was built as a new location. A wholesale market was constructed on 133,000 square metres, offering space for wholesalers, importers and forwarding agents while fulfilling the latest requirements for technology and logistics. Just like the former Großmarkthalle, it primarily appeals to resellers and bulk consumers. Over 130 food wholesalers and importers provide an average of 3,000 customers (wholesalers, restaurants, commercial kitchens, hotels, food retailers) with fruit, vegetables, international fine food specialities, organic products, poultry, fish, meat and dairy products.

For the security of the huge area surrounding the two 300 metre long building complexes, the operating company FRIBEG relies on video surveillance and chose eneo's technology. From now on, the domes and cameras installed by Heer GmbH which feature a high light sensitivity and a 5–50 mm lens will observe all areas

of the spacious company premises, including the access area, receiving area and the surrounding car park.

The high-resolution domes are mounted to the light poles and ensure complete documentation, regardless of whether it is the entry or exit, whether 1 or 1,000 employees are parked on the company car park, whether customers want to access the company premises secured by a barrier or forwarding agents want to deliver goods to the loading ramp. Exits from the premises were programmed to keep a regular eye on sensitive areas. If necessary, number plates can be zoomed on precisely to identify vehicles. For outdoor use, the domes are also located in a 4.9" dome housings with integrated heating and fan.

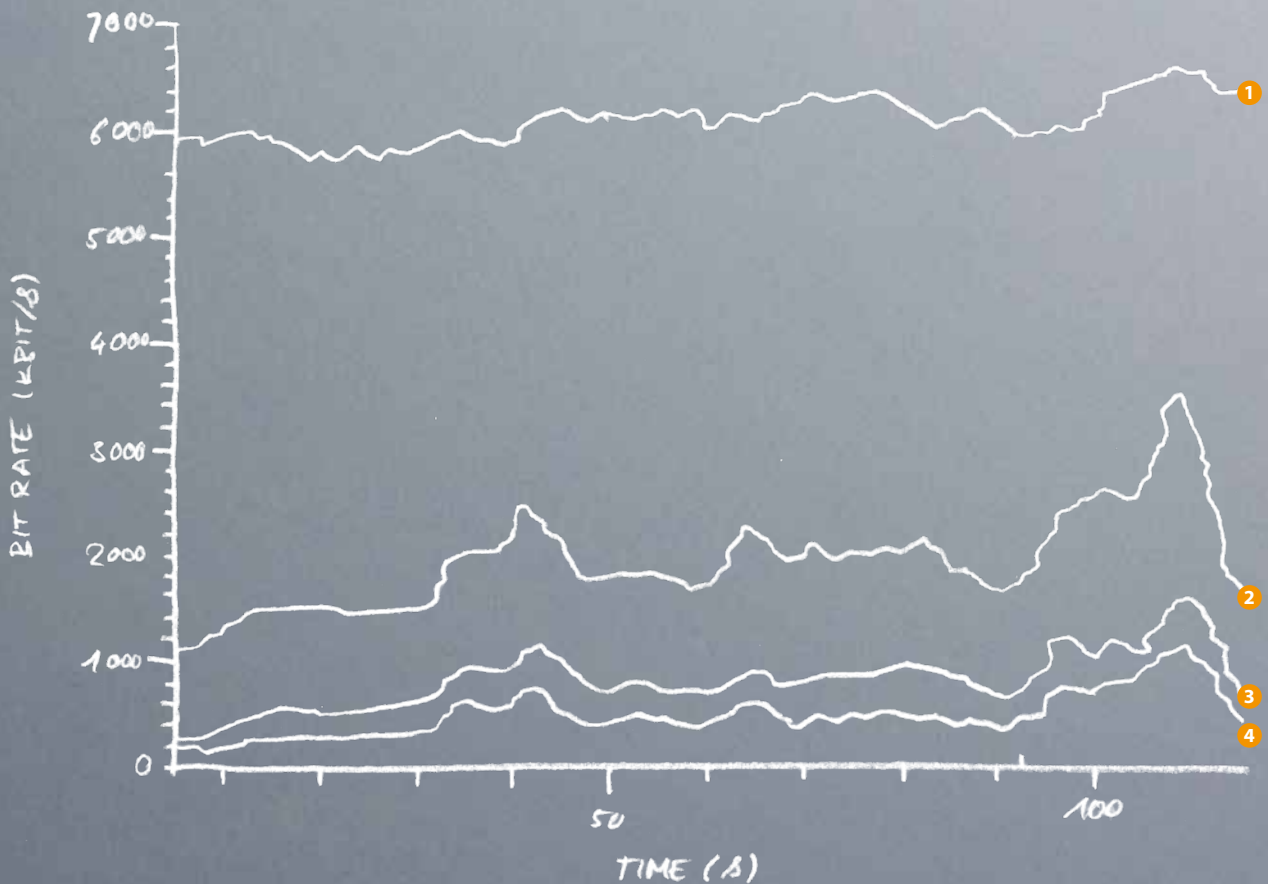
When starting up the system, the security agency was surprised when the zoom features of the domes made the inspection date recognisable on a truck located 400 metres away. This is why the Frankfurt fresh produce centre authorised representative Guido Jahnke has drawn a positive conclusion: "On one hand, video surveillance allows us to monitor and analyse individual situations on the premises. On the other hand, in case of an alarm, the identification and conclusive documentation of the results is possible."

H.264 compression

When buying network products for video surveillance, it is essential for the technology to feature the H.264 compression method. With H.264 the costs for memory and bandwidth usage are reduced by at least 50 percent for the same amount of video data with the same image quality compared to other compression methods.

Technology note

Compression method



1 Motion JPG

2 MPEG-4 Part 2

No motion compensation

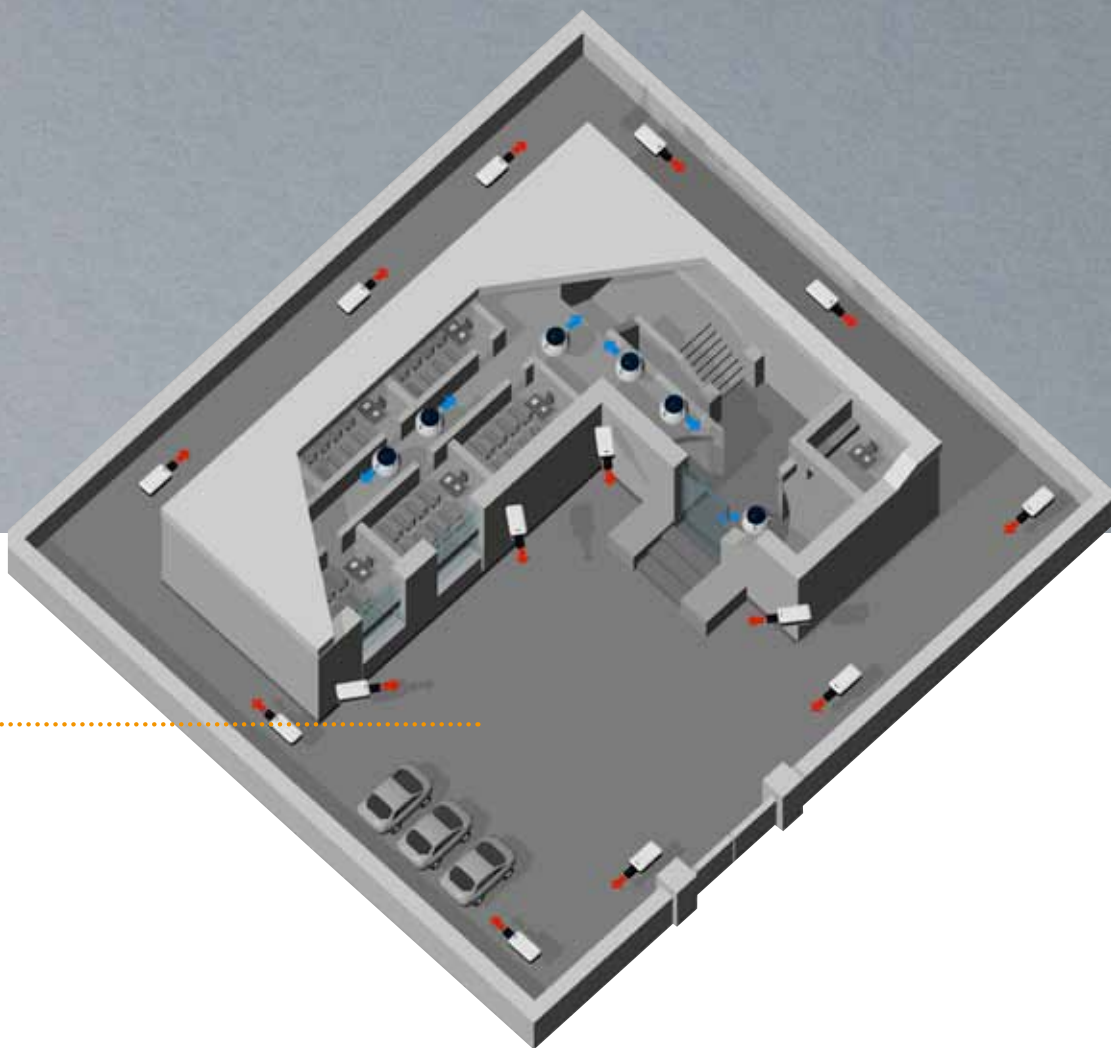
3 MPEG-4 Part 2

With motion compensation

4 H.264

School

SOLUTIONS FOR SCHOOLS Video surveillance technology in schools must either be installed out of reach or with vandalism protection



OUTDOORS

Individual decisions must be taken regarding which outdoor points should be categorised as neuralgic. For example, if bicycle theft is common, the corresponding storage space should be monitored. Other points include the teacher car park, entrances and schoolyards.

Video surveillance in schools is a much discussed topic and cannot be realised easily because numerous data protection issues must be observed. However, if one considers only the damage caused by school vandalism, it becomes obvious how important this topic is. For example, the Darmstadt-Dieburg administrative district spends 120,000 EUR per year just on replacing school windows which were wilfully destroyed. But the theft of computers, monitors and projectors as well as violence among students are common in many schools.

Numerous examples where vandalism and theft no longer occurred following installation indicate that video surveillance is



VANDALISM PROTECTION

Because the cameras inside the school (depending on the ceiling height) might be easily accessible, dome cameras are used here which are well-protected against the effects of vandalism and even resist heavy blows without damage. Depending on requirements, there is a choice between high-resolution models or versions with PAL resolution. There is a concentration of the surveillance of the hallways and foyers so that teaching and learning in the classrooms remains relaxed without there being a sense of being observed.



very effective in preventing criminal offences. High-resolution cameras in the classic box type design which are protected from wind and weather are used outdoors. There is also an option of reverting to our cameras in bullet housing. The cameras are mounted high on the building, offering a very good overview without being directly accessible.

However, if you are still worried that the cameras become the target of vandalism, there is also an option of reverting to the weather-protected versions of our dome cameras which are available either as a fixed dome or PTZ dome, if higher flexibility is desired.

If there is a lot of commotion in the schoolyard and hallways (e.g. right before school begins or during breaks), recording is continuous. While classes are in session, there is considerably less going on, so that a recording mode can be selected which doesn't begin until motion is detected.

Because there is usually little or no traffic in the schoolyard and hallways after school lets out, you can generally switch to motion-controlled surveillance to reduce memory requirements. Of course the changeover is not manual, but rather automatic according to defined schedules.

Nell Breuning School

PROJECT REPORT Nell Breuning School in Rödermark makes bicycle theft impossible

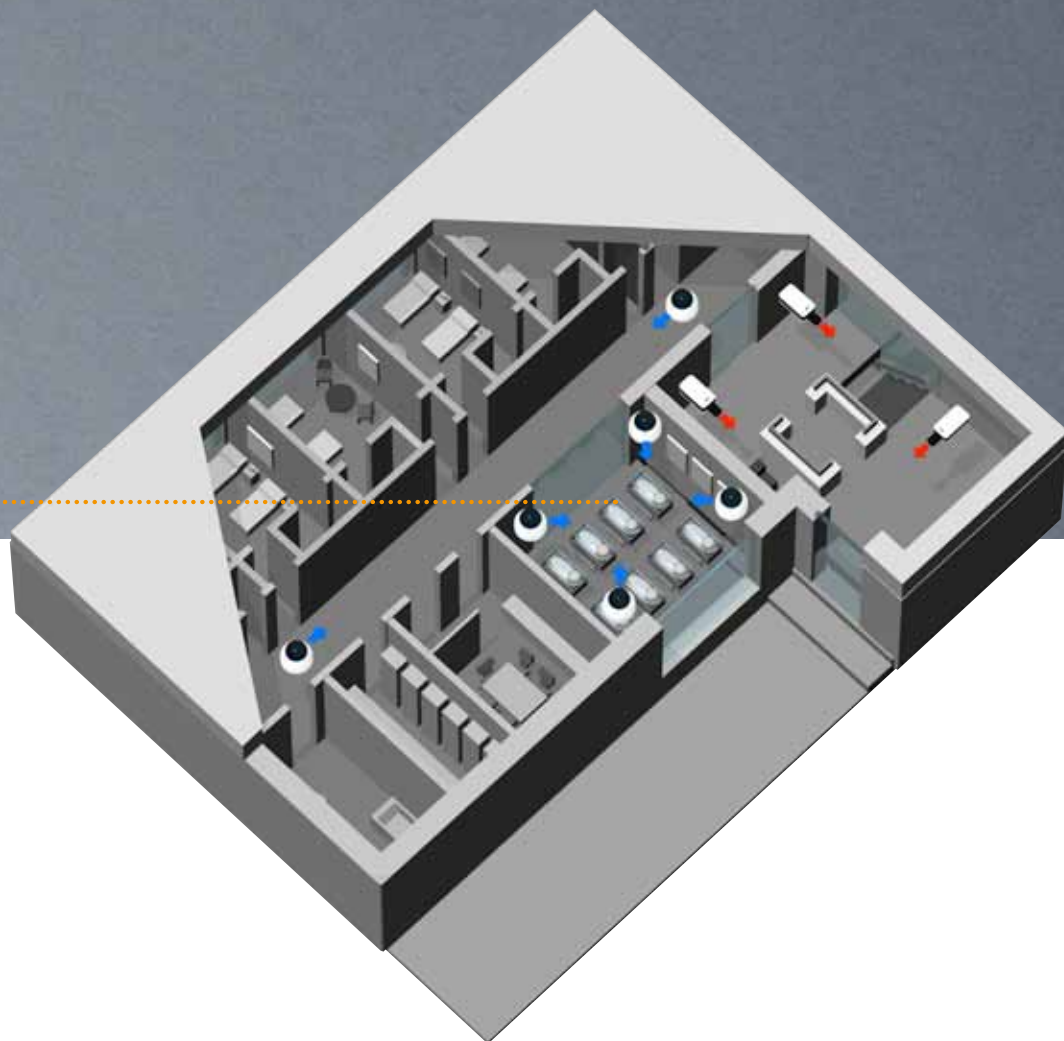


Students who store their bicycles on the grounds of Nell Breuning School in Rödermark need not fear that they will have to walk home after school. The use of video surveillance has proven to be an effective tool against the frequent vandalism and theft offences. One of the objectives was lowering the number of thefts and damages; another was that school administration and parents' council attached great importance to the preventative nature of the campaign. There has been an increase in bicycle theft and vandalism in the past few years, which resulted in a rise in complaints from students and parents. The school administration, parents' council, student representatives, and booster club quickly agreed to handle the problem aggressively and decided on video surveillance of a preventative nature. Following the agreement of all school committees, there was an equally quick discussion with the data protection representative of the Offenbach district. Shortly thereafter Securiton GmbH installed the eneo components: five day/night cameras are mounted at a high level – two at the central entrances and exits of the school premises and three more at the two large bicycle areas and the

car park at the main entrance of the school. They ensure 24-hour recording when motion is detected. These recordings can then be called up for up to two weeks. Since the cameras were installed, a significant improvement has been noted, according to school director Jochen Zeller. The situation is much less tense and several perpetrators have already been held responsible based on the recorded data. At the same time, the development of a criminal hotspot was halted with the significant decrease in bicycle theft and damage. The project is considered a positive example for the compatibility of maintaining data protection regulations and public security as well as for the smooth, result-oriented cooperation among school administration, parents' council, and student representatives. Thanks to the good cooperation among school administration, parents' council and student representatives as well as the booster club, there were almost no protests against this innovation which would hardly have been conceivable a few years ago for data protection reasons alone. According to the statement of Rödermark's mayor Roland Kern, the district, which has data sovereignty, also does not see any issues.

Hospital

SOLUTIONS FOR HOSPITALS There are numerous necessities for video surveillance for hospitals. The example featured here shows the maternity ward



DISCREET SURVEILLANCE

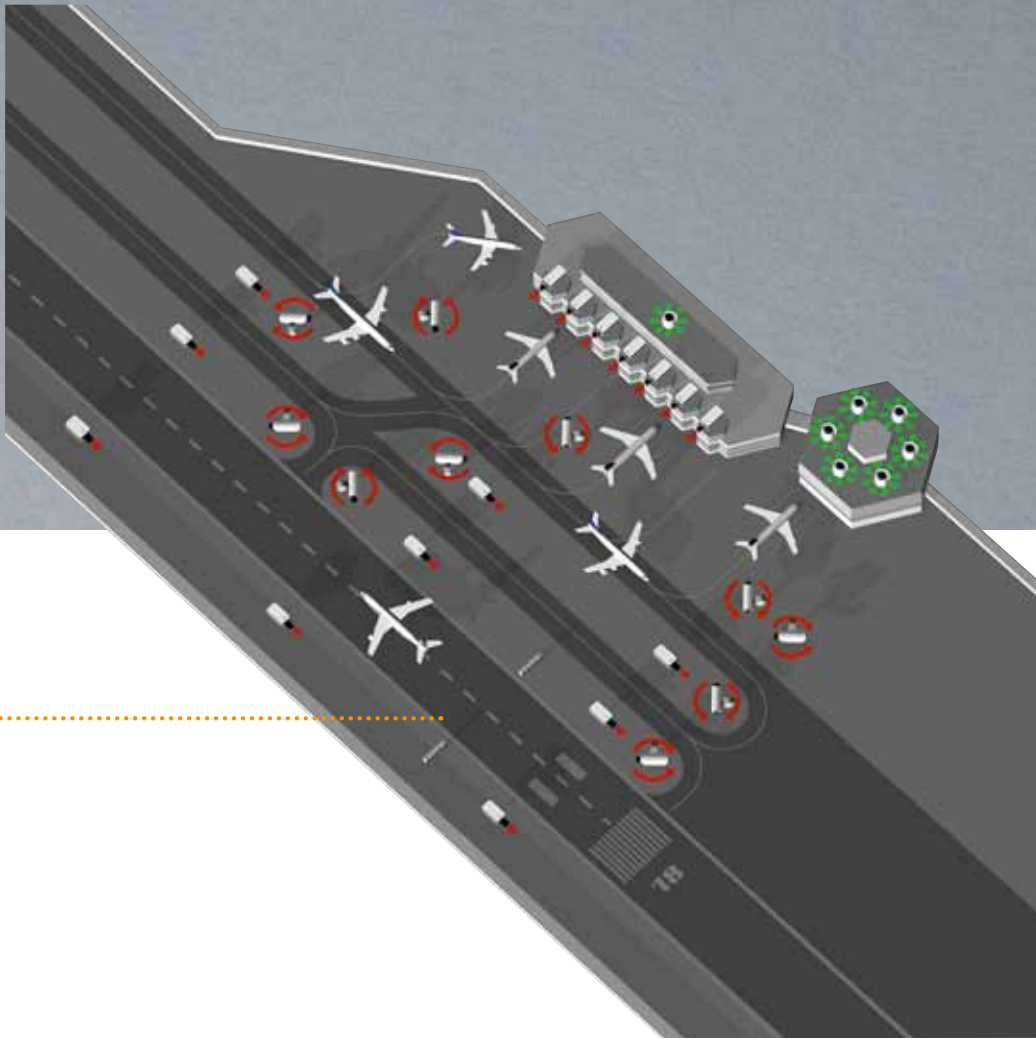
The sample solution featured here shows the maternity ward where both the hallway and the nursery are monitored with fixed domes. The fixed domes are day/night models which – if required – also have integrated IR illumination so that clear pictures are also produced in the dark. There is also an option of reverting to versions with audio support.

Video surveillance in hospitals is the subject of controversial debate, much like installing corresponding technology in schools. The fact of the matter is that hospitals want to convey a sense of security and safety and that video technology can play a role in doing so. This particularly applies to maternity wards.

The goal of the application is conveying security without conspicuously displaying the technology used. Fixed domes are ideal for this purpose because they can be installed nearly invisibly on the ceiling thanks to their partly very flat design. Because no one stays in the stairwell for a significant length of time, the use of boxed type cameras can be reverted to there. Moreover, this signals: Warning – this area of the hospital is under video surveillance.

Airport

SOLUTIONS FOR AIRPORTS An airport is like a small city which requires numerous different solutions for video surveillance. We will describe the runway as an example



IP SOLUTION WITH ZELARIS

Due to the size and complexity of video surveillance systems at airports, we recommend using an IP-based solution with the central video management software Zelaris, which can provide a significant contribution to scene analysis via additional modules and only direct the attention of air traffic control to truly critical events.

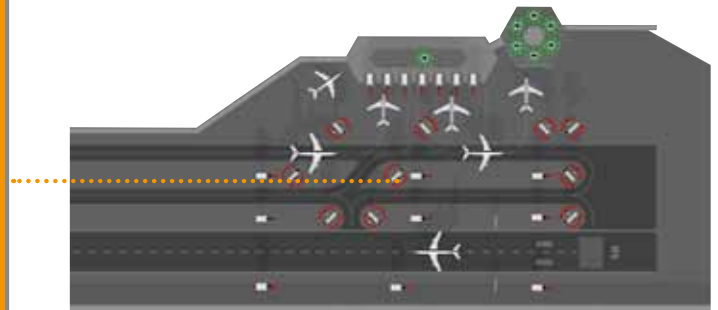
An airport is too complex to be able to fully describe a possible surveillance solution here. This is because the size and infrastructure resemble a small city including stores and restaurants, but of course also with areas only found in airports which require individual solutions due to their high level of sensitivity, such as baggage transport, air traffic control, terminals, passenger handling, etc.

The solution represented here is limited to the runways. However, Zelaris also provides products and solutions for other areas of an airport. Runways are especially critical points because disruptions to the process disturb the precisely scheduled flight plan and could result in high follow-up costs for airport operators. Therefore air traffic control



PAN & TILT SYSTEMS

The eneo VPT pan & tilt system, which is used on the runway here, has a successful tradition. More than 50,000 VPT systems have been in use worldwide, and they do their jobs reliably even during adverse weather conditions. There is an option of operating the pan & tilt head with the existing housing types or as a complete system with integrated housing – of course this is also the case with IP cameras. The horizontal panning speed is 100° per second. In the tilt range, the speed is 50° per second.



must always know exactly what is happening in these areas.

PTZ domes are installed on the docks, and thanks to their moving camera module, they can follow arriving and departing aeroplanes. High-resolution cameras on pan & tilt heads are used on the runways. Thanks to the heads' high-speed technology, they can also follow very fast objects. These cameras, which are located in housings protected in compliance with IP66, are equipped with motorized zoom lenses which zoom in on unauthorised movements (people, for example)

in order to give security personnel the opportunity to identify the problem in detail.

The rest of the cameras which are not installed on pan & tilt heads are overview cameras that keep an eye on the entire runways and docks. They offer a high resolution and are equipped with varifocal lenses as well as telephoto lenses, if required, and provide functions such as switchable IR cut filters and wide dynamic range. If air traffic control detects an incident with their help, the occurrence can be scrutinised with the cameras on pan & tilt heads.

Film starts in winter sports

PROJECT REPORT Continuous alpine operation of eneo VPT systems



A special kind of holiday video is made possible by the skiMovie systems from Skidata, skiline.cc and skiMovie. Skiers and snowboarders can now have their runs on ten slopes in Austria filmed upon request. Of course, the film clip can be downloaded afterwards or sent to friends as a link. Are you interested? Then simply visit a ski resort with skiMovie, register with skiMovie, go through the turnstile at the starting gate and ski off. Not only the exact time is measured for the run. Instead, the above-mentioned video is also made starring the winter sports enthusiast. Subsequently skiers can log into their personal skiline.cc accounts, enter their ski pass numbers and view all of their skiMovies including their run times. Each skier can then decide individually whether the video should be analysed to improve technique or just serve as a souvenir of a memorable holiday.

Professionals can reach speeds up to 150 km/h while downhill skiing, which is often referred to as the supreme discipline in alpine sports. Very few users of skiMovie systems would probably ever be that fast,

although speeds of over 100 km/h aren't a rarity there either, depending on the skier's willingness to take risks. This poses a serious challenge for the technology used because if the tracking is too slow, the cameras used only capture tracks in the snow and miss the skier. At the same time, the technology has to be effectively protected from the weather and sub-freezing temperatures to ensure maintenance-free operation. During the skiing season, outages can result in high follow-up costs if the system has to be temporarily removed from operation for maintenance.

The eneo type VPT-651 pan & tilt systems are the core of the system. In addition to an endless pan range and hidden cable guide, they realise a speed of up to 100° per second, thus making high-speed tracking possible. There are demanding requirements on the tracking; the dynamic range stretches from very "aggressive" to very slow, which requires constant exchange of data with the central server regarding the current and target positioning of both the pan and tilt axes. Data is exchanged every 25 milliseconds. In doing so, a media converter transfers the RS-485

Technology note

Day/night functionality

Day/night

Even if it's so dark that you can hardly see your hand in front of your face, models with day/night functionality still provide clear and high-contrast images. The cameras are equipped with a switchable IR cut filter which automatically pivots in when the ambient light decreases, darkening the image.



When the sun rises in the morning or when the light intensity is sufficient, the cut filter removes the infrared light and renders the recording in colour just as the human eye is accustomed to.

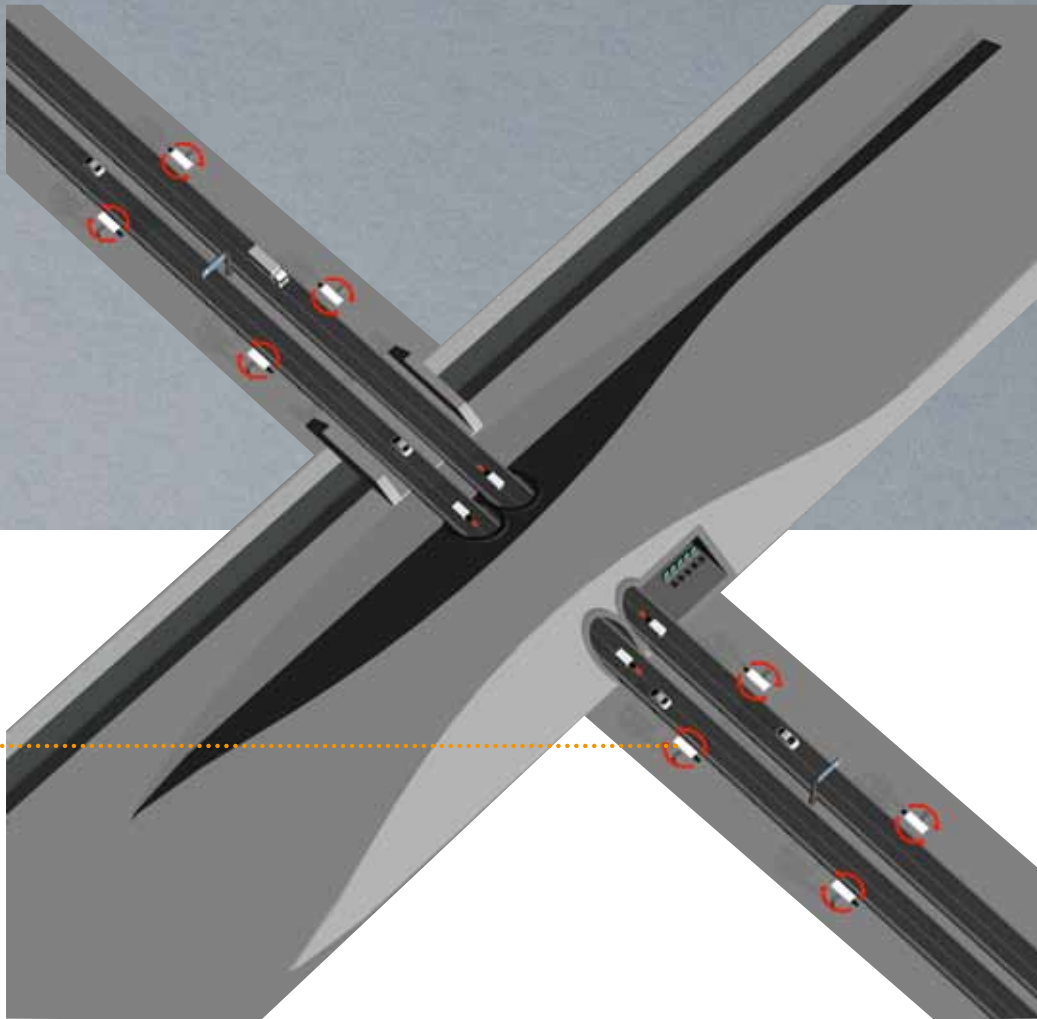


control signals of the VPT-651 to IP signals which are transferred to the central server independently of the camera video stream to ensure performance which is as high as possible. Automatic tracking is realised via a PC-based management system which was developed specifically for the skiMovie systems. An average of one or two systems is used per skiMovie system. Franz Holzer, who is responsible for the skiMovie systems at Skidata is impressed with the system, "After a great day on the slopes, skiMovie is a reminder of your skiing experience. skiMovie is more than just a private film, it is a completely new and creative form of marketing. It is a nice souvenir for skiers and snowboarders and provides the resort with new customers and sponsors."

skiMovie systems are not just a benefit for the winter sports enthusiast. They also offer the ski resort operators numerous advantages. The video clips make the ski resort more known because the clips often travel around the world on YouTube after the athletes upload them to the video site. Moreover, lifts can be used to capacity more concertedly, for example by installing the skiMovie system on a less popular slope.

Motorway/tunnel

SOLUTIONS FOR MOTORWAYS AND TUNNELS Accidents in tunnels can be disastrous. Therefore, they score worse in the ADAC test if they are not under continuous video surveillance



INSTALLATION HEIGHT

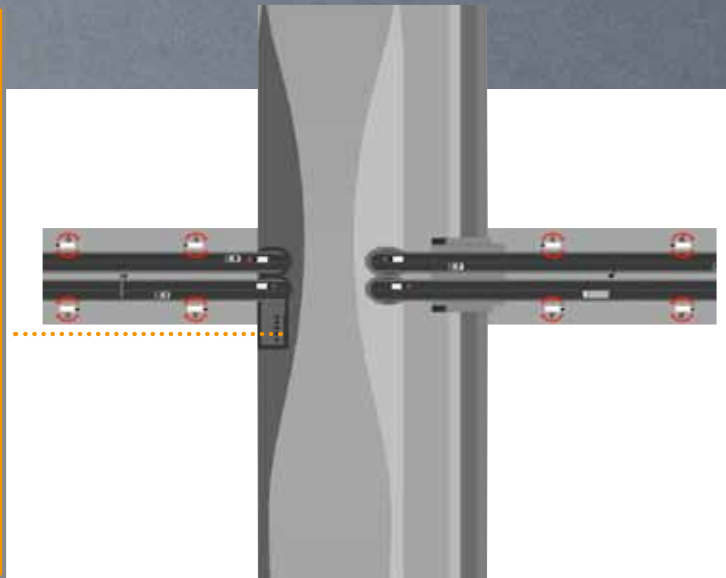
The cameras must be installed at a height of approx. five metres so that the clarity does not suffer, even with a high percentage of trucks. Because there is a primary focus on the pure detection of incidents for tunnel surveillance, spacing of approximately 150 metres between the cameras is considered absolutely sufficient.

Although the probability of having an automobile accident in a tunnel is relatively low, accidents are a constant safety hazard because every accident has much more serious consequences in a tunnel than outdoors due to the narrow space and limited emergency walkways. This is why ADAC regularly tests tunnels in all of Europe. In Germany alone, there are approximately 300 tunnels with a total length of around 240 kilometres. One important testing criterion is whether each tunnel is under continuous video surveillance or not. This is due to the fact that only full tunnel surveillance guarantees that all safety precautions are immediately employed in case of an accident and that security personnel takes the correct decisions appropriate for the situation.



CONTROL CENTRE

Day and night, tunnels must be monitored via a control centre which can intervene immediately in case of an accident. It is not significant whether this control centre is located right at the tunnel as described here or at a remote location. What is important is that measures can be initiated immediately in case of an accident. Because of the option of also integrating other (building) management systems via the OPC interface, the Zelaris software solution in the control version is also particularly suitable here because it was developed especially for large control centres.



Bright streaks in images which originate from overexposed image areas which could be caused by automobile headlights are referred to as blooming and the smear effect. When selecting a camera, attention must be paid to the fact that there are corresponding functions which effectively prevent and minimise these negative effects. In addition, the cameras should be models with day/night functionality in order to provide usable recordings even in low lighting. It is also important that the cameras have outdoor housings with hidden cable guides so that road salt and spraywater splashed up

by the vehicles cannot affect the camera module and cable. A decision should be taken on site regarding whether the cameras should be mounted on pan & tilt heads as illustrated here. For example, one deciding factor is whether the camera should only keep an eye on one lane or several simultaneously, which would require more adjustment flexibility. In general, moving cameras should be installed in motorway junction areas. It is best if the cameras are additionally equipped with motorised zoom lenses in order to zoom in on events which are further away without quality loss.

Noise reduction with 3D DNR

Technology note

Noise reduction
with 3D DNR

DNR stands for Digital Noise Reduction, which reduces so-called image noise. In order to understand this function, it is necessary to consider the basic process of how a camera captures an image. If light falls onto the camera chip, the photodiodes convert it into electric current. The brighter the light is, the more current flows. Thus, nothing should actually happen to the photographic sensor in absolute darkness. However, the electrons are also set into motion by heat, which especially increases due to long operating times and the basic voltage which is necessary to operate the sensor. There is always ground noise – regardless of whether in broad daylight or late at night. However, the light intensity influencing the photodiodes is so high when it is bright that the electrons which are set into motion by heat or basic voltage are significantly outnumbered. Thus the basic noise is not noticeable. Night photographs are a different story because the number of electrons inadvertently set into motion is no longer significantly outnumbered by the number triggered by incident light. The signal and noise are mixed, and the image has considerable interference. So-called multidimensional digital noise reduction 3D DNR was developed specifically for recordings at night or locations with low lighting. It reduces both image noise and errors in colour blending. For this purpose, the 3D DNR function compares an image with the next one and removes the smallest pixels which are not contained in the original image.



Test image without 3D DNR Image noise can be clearly recognised.



Test image with 3D DNR Thanks to this function, image noise is reduced significantly. The colours and contrasts are pictured clearly.

Security office

PROJECT REPORT The VdS-approved ML-Sicherheitszentrale security office which operates throughout Germany relies on Zelaris



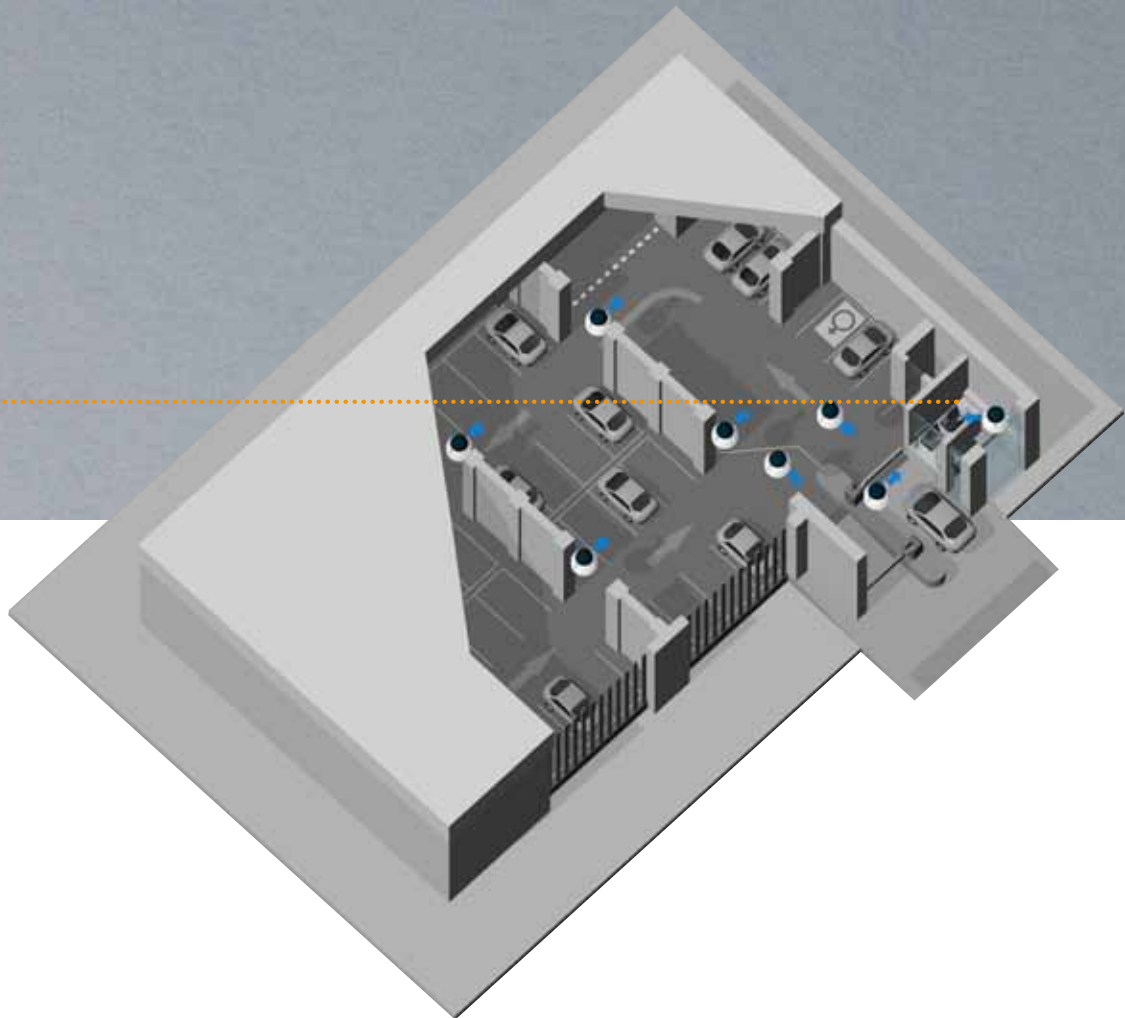
It is called "caught in the act" and not "observed in the act a few days later". This expression makes it obvious: direct intervention is critical in case of burglary. In contrast, assessing the recorded video later is of little use, even with high-resolution IP megapixel images unless you want to count the dust particles on the culprit's ski mask. However, because of the costs, it is often impossible to ensure round-the-clock surveillance. This is a dilemma for which the security agency ML-Sicherheitszentrale GmbH (www.ml-sicherheitszentrale.de) has developed an impressive solution. The Zelaris video management software is at the core of the concept.

ML-Sicherheitszentrale offers its services as a VdS-approved emergency and service control centre throughout Germany. By collaborating with local partners at the location of the customer's camera, a solution is offered which can be summarised as follows: event-controlled images from IP cameras can be received

and evaluated around the clock from the Mannheim control centre. Local security agents are only alerted for intervention if needed. Via Zelaris, the IP cameras and locations of the individual customers are merged under one interface. Why did they opt for Zelaris? "One reason is that in Zelaris, very many IP camera protocols are directly integrated. Another is that the integrated ONVIF interface will ensure a high level of flexibility in the future," says Ralf Schreckenbach from the security technology firm Alarm- und Sicherheitstechnik Lohrer GmbH, which was partially responsible for the design as the responsible specialised installer. "Additionally with Zelaris there are only one-time costs for upgrades and updates. Therefore, as far as the cost-benefit aspect goes, Zelaris was the ideal solution." ML-Sicherheitszentrale is staffed 24 hours a day, 365 days a week. Its emergency call and control centre services are suitable for numerous applications where round-the-clock surveillance is desired but there is no possibility for the customer to realise it himself.

Car park

SOLUTIONS FOR CAR PARKS Due to low ceiling heights and complicated lighting conditions, car parks place special requirements on video surveillance



PAY STATIONS

From the customer's point of view, pay stations should definitely be monitored because thieves could quickly snatch and steal wallets which were held out to make payment.

Car parks place particular requirements on video surveillance technology: low ceilings and poor lighting conditions which vary widely from the very dark to the very bright. Car parks are usually not inviting places, but vandalism and theft must be prevented. In addition, parking damage must be resolved after the fact.

A system for video surveillance can give effective support here while at the same time conveying a sense of security to the customers. This is especially pertinent to women because they often consider themselves subject to assaults in car parks. Because the ceilings are very low and can be easily reached without aids, the cameras used need to be efficiently protected from



WIDE DYNAMIC RANGE

In car parks the wide dynamic range function is crucial at entrances and exits. Wide dynamic range considerably increases the dynamic range of the camera so that details are clearly recognisable both in the dark and light ranges. For this, the entire image is exposed and evaluated for a longer period. Finally, the camera automatically selects the ideally exposed range from the various exposure times. The overall image is then assembled from these individual images. People and objects in shadows no longer disappear into the darkness without the bright ranges becoming unrecognisable.



vandalism. Primarily fixed domes are suitable for car parks because when they are equipped with wide-angle lenses, they can view both the lanes and the parking spaces.

To keep the number of domes installed low, we recommend a resolution which is as high as possible. This is also useful for subsequently making number plates recognisable in case of parking damages. Parking for women is monitored more to ensure additional security there. Particular attention is paid to entrances, exits and pay stations. The

domes installed at entrances and exits must provide conclusive images despite incident light while also display number plates clearly.

Therefore, functions like displaying compensation, highlight compensation and particularly wide dynamic range are of great importance here.

Depending on the business hours, time-controlled recording is possible.

Because vandalism and theft can also occur after business hours, there should be recording at night at least if motion is detected.

Event location

PROJECT REPORT Fast beats and images: Event location "Baton Rouge" with eneo complete system



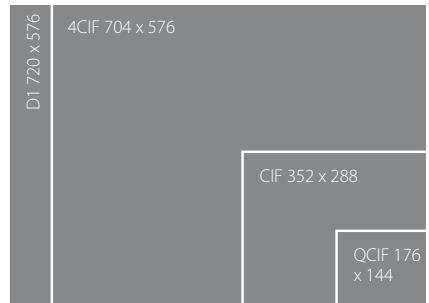
On certain days, the Mannheim event location "Baton Rouge" lures up to 1,000 visitors inside with its several areas on various levels. In addition to carefully planned events and marketing activities, a sophisticated security concept ensures the comfort of the guests. The eneo video surveillance system installed by TBM Meyer GmbH in Mannheim plays a decisive role in doing so. To guarantee all the guests dance carefree and prevent disputes and wilfully triggered fire alarms, the operators decided to use video surveillance. The surveillance allows unambiguous face recognition of each guest in the foyer in addition to the creation of a complete storyboard. According to specifications, the system should also be able to document the conduct of visitors and security agents even for large numbers of people in order to clearly identify perpetrators in case of improper use of the safety devices. This is a challenge because there are difficult lighting conditions on the dance floor, not least due to the complex light show and stroboscope effects. In addition, several areas including the emergency exits are monitored. Detailed rendering for face recognition should be realised in those areas despite limited lighting.

The total of 16 installed day/night cameras, including two PTZ domes, four domes with Pixim technology and seven mini domes plus three cameras with infrared cut filters pass this test with flying colours. In addition to the overview and detailed view, they display all the processes which have to be monitored because they are important for security and have a preventative effect at the same time. For example, two cameras in the till area document all processes and make cash exchanges recognisable. Three additional cameras support the security service in the foyer, and three more were installed at the emergency exit doors with push-button alarms. The individual bars, cloakrooms and dance floors are other focal points. By the way, all camera housings were painted with special lacquer to match the colour style of Baton Rouge. "The rapid realisation of the project – there were less than six weeks between planning, execution and finally initial operation – is owed to the positive collaboration of all project partners and the eneo components which are ideally coordinated to one another. This is where the quality of a sophisticated, powerful and user-friendly digital video surveillance is evident," said TBM Managing Director Norbert Meyer in explaining the concept of the system.



Technology note

Resolution



Analogue image recording For D1 resolution, there is a maximum of 720 x 576 pixels.

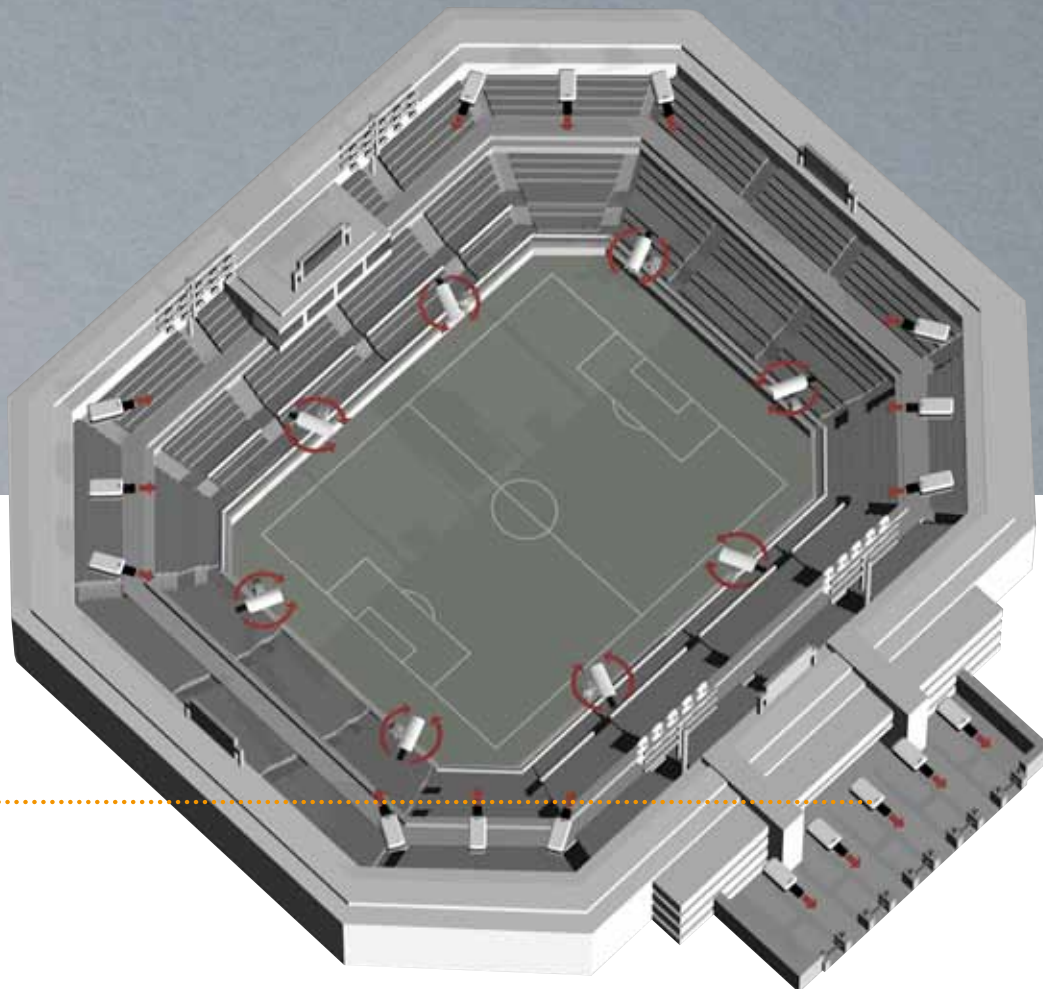
1920 x 1080

1280 x 720

Digital image recording Megapixel resolution offers the significantly larger video image and thus higher detailed precision.

Stadium

SOLUTIONS FOR STADIUMS Violence in stadiums is not only continuously increasing in the 1st and 2nd divisions of the Bundesliga. Video surveillance can provide effective assistance in enforcing stadium bans



FULL-HD IP CAMERAS

In order to identify people clearly and consistently enforce stadium bans which were already declared, it is necessary to have resolution which is as high as possible. For this reason, when using IP cameras, we recommend reverting to Full HD cameras with 1920 x 1080 pixels.

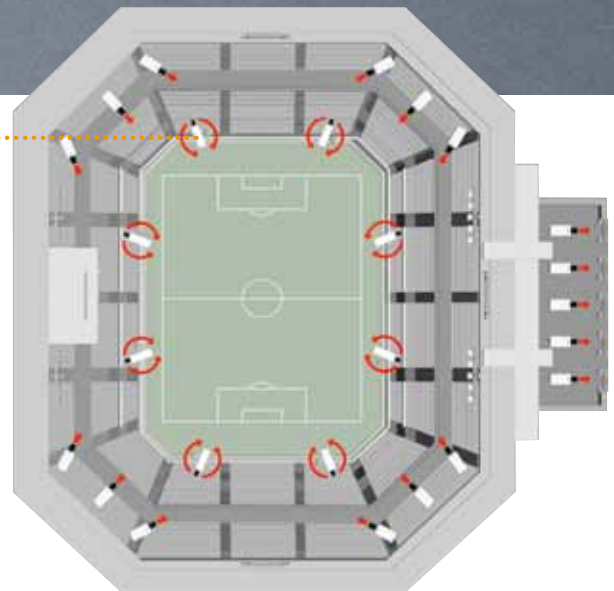
Merely in terms of the 1st and 2nd divisions of the football Bundesliga, there are 12,000 problematic fans. 3,500 stadium bans have now been declared. Hundreds of people are injured each season. And the violence continues to increase, and not just in the 1st and 2nd divisions.

So-called "Ultras" do not come for the athletic event, but rather as "violence tourists". They let out their aggression both against the other team's fans and their very own team if the game isn't going as they had hoped. Unfortunately, this development was observed last season. Stadium operators are wise to at least keep the violence outside of their stadiums. A professional system of video surveillance which helps to



PAN & TILT SYSTEMS

The current eneo pan & tilt systems are a logical further development of the successful VPT-42. In combination with the proven and rugged stepping motor, powerful spur gears achieve panning speeds of up to 100° per second. Improved control of the stepping motors by 1/16 step ensures excellent smoothness even at lower speeds and guarantees high drive dynamics. A fast 32 bit ARM processor manages all the PTZ functions and at the same time offers storage space for several RS-485/422 control protocols. As an option, PTZ domes can also be used at these positions.



clearly identify people is crucial for this purpose because it aids in enforcing stadium bans more consistently. Due to the large area to be monitored and the need to identify people as clearly as possible, cameras with very high resolution should be used throughout the entire stadium. For one thing, security personnel must cover large areas quickly. Secondly, suspicious activities have to be reviewed fast.

Classic box type cameras are mounted in weather-protected housing at the entrances and above the

stands. Equipped with wide-angle lenses, they cover the entire stadium and ensure an overview. Additionally, in this way individuals who were banned from the stadium can be hindered from entering the building and stands directly in the entrance area.

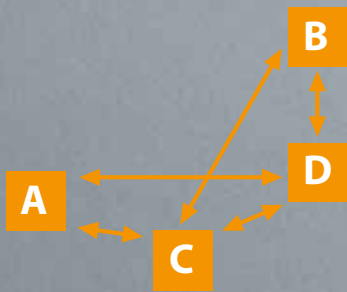
However, the cameras at the core of the installation are installed in housings protected in compliance with IP66 on pan & tilt heads and can both change the camera's line of vision and display details in telephoto in high definition thanks to their high-performance motorised zoom lens.

Technology note

ONVIF-compatible and motion detection

ONVIF-compatible

The IP cameras and IP domes from eneo support the ONVIF standard which guarantees that products exchange information independently of the respective manufacturer. Thus they can be used together in a comprehensive system. Because of this, the eneo cameras can also be used flexibly in the systems of third-party suppliers.

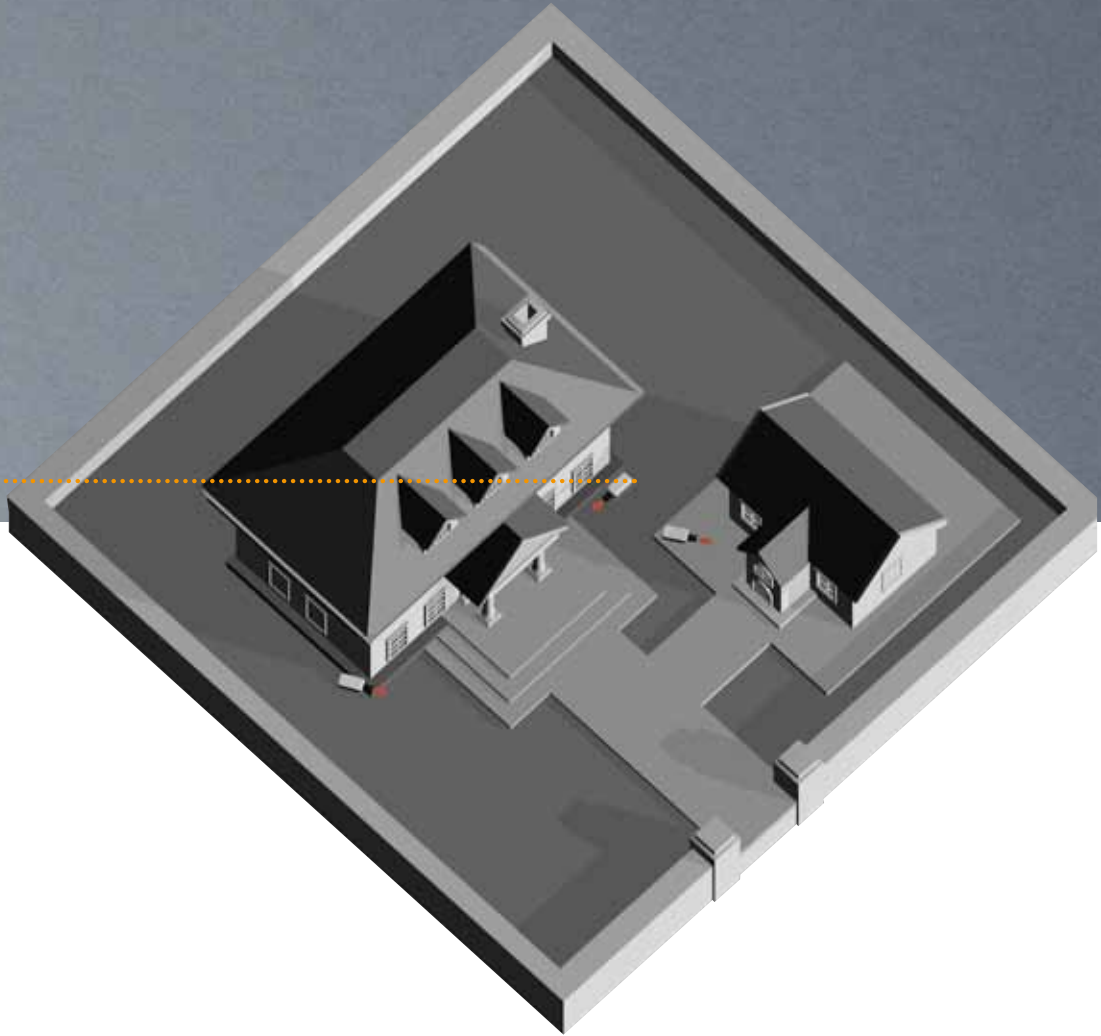


Motion detection

The integrated motion detection in most eneo cameras features decisive advantages. The most important advantage is the direct processing of the video motion detection in the camera itself, which decreases the workload for all the recording devices in the system. Furthermore, event-controlled surveillance is made possible, and the security personnel is relieved because they are immediately notified if the video motion detection triggers an alarm. The motion detection can be set separately for each video stream. Motion is only detected in the displayed window while other areas are ignored. Additionally, the focus can be quickly shifted to suspicious movements using the digital zoom.

Private property

SOLUTIONS FOR PRIVATE INDIVIDUALS Supplementing existing security precautions with video surveillance can also make sense in the private sector.



MINIMAL SOLUTION

The installation described here should be considered a cost-effective minimal solution in which the entrances doors are monitored with bullet cameras with integrated IR illumination and switchable IR cut filter.

Statistically speaking, there is a burglary every two minutes. The total damage is more than 400 million EUR annually in private properties alone. The damage is approximately 1,000 EUR per burglary, although the psychological consequences are usually more serious than the material damage because the sense of security within your own home plummets.

Burglary protection effectively prevents such unwelcome experiences because few burglars are true professionals, which means they are deterred by security precautions which are clearly visible. In addition to installing mechanical solutions and alarm systems, video surveillance systems are also ideal for larger properties.

Precision and accuracy sports

PROJECT REPORT A visit to Ulm: eneo complete system provides additional security in the Müller Schießzentrum Ulm (MSZU) shooting centre.



As I arrive at the entrance to the Müller Schießzentrum Ulm (MSZU) shooting centre on a drizzly day in early March, I have no idea what to expect. I am only familiar with pistols and guns from action films and a Swiss army knife is the only weapon I have ever held in my hands. But I am not here to shoot. An eneo complete system was installed in MSZU with 43 dome cameras and five digital video recorders, and I would like to see it. Mario Messner, Managing Director of the security agency Müller Sicherheitsdienste Ulm (MSDU), is awaiting me out front. He is responsible for both, the security concept of the shooting centre and the more than 600 Müller health and beauty retailers. I ask him why he decided on eneo as we enter the shop of the shooting centre. "eneo complete systems have been doing an outstanding job in health and beauty retailers for years. They are absolutely reliable products. It went without saying that the shooting centre would also use eneo," explains Mario Messner. The shop offers 1,200 square metres with a full range of products for hunters and sports shooters. The salesrooms have a sophisticated design with a large landscape diorama in the middle. They constitute a particularly sensitive area because in addition to clothing for men and

women, over 500 long and short firearms are offered, along with approximately 900 different kinds of ammunition, all of which are of course securely stored behind special glass. "Professional video surveillance was still very important to us, even though the law doesn't require it," says Mario Messner. "The surveillance has a preventative effect and provides additional security when no one is in the salesroom, for example at night."

At the end of the shop, Mario Messner opens a glass door and we go down into the underground range facility of the MSZU. I use the word "facility" deliberately because anyone who wasn't impressed by the size of the shop will now surely understand why the MSZU is Europe's largest shooting centre. At the beginning of the 300-metre shooting range, I initially fall for an optical illusion. The first 100 metres are freely accessible and the floor is in a warm brown tone. In contrast, the rear part of the range is green and the backstop at the end is black, which gives the impression that the range ends after 100 metres. "No, no, the range doesn't really end until all the way in the back at the black rectangle" says Mario Messner. As in the salesrooms, fixed domes are also installed here. "The entire facility was designed and built according to



the latest security standards," explains Mario Messner. "However, we wanted to safeguard ourselves even more. Therefore, we also rely on continuous video documentation here. This also applies to the shooting ranges which are 25 and 100 metres long." MSZU doesn't just set new standards in terms of size and security. Both the air conditioning with high-power ventilation which extracts the lead dust and the environmental concept with professional disposal of the shell casings are unique.

The shooting gallery with its 100-metre shooting range is unparalleled because the 3D hunting simulation with its animated animals is the only one of its kind worldwide. Shooters go on very realistic driven hunts and can subsequently analyse their hits precisely in the 3D model of the targeted animals. Seven parallel shooting ranges and even a high stand offer ideal training conditions, particularly for hunters. In addition to hunters, the 25-metre shooting gallery is also intended for police officers and security agents who can practise all standard disciplines there, including night simulations. eneo fixed domes also provide additional security here. Finally Mario Messner leads me out past the shop, café and car parks to the largest MSZU building, the indoor

clay pigeon shooting range. On 3,000 square metres with a ceiling height of 22 meters, 26 traps make it possible to practice various shooting disciplines year round, including the Olympic disciplines skeet, trap and double trap in addition to rabbit, battue and normal pigeon. Trap shooting has been an Olympic sport since 1900 and challenges shooters in a special way because they don't know which one of their three traps will release in which direction. Two Fastrax Speed Domes are installed between the shooters at a height of more than 18 metres. Mario Messner explains why this product was selected: "High resolution was particularly important to us here, but of course in a hall this big, a high zoom factor is a factor which cannot be neglected."

On the way back to the car park, Mario Messner adds: "For recording, we rely on five video recorders installed at the respective camera locations. However, they can also be controlled and administered centrally via the network."

The light rain has stopped in the meantime and a few rays of sunshine have even emerged. Before we say goodbye, I ask him if he would decide on eneo again in the future. "Anytime," comes Mario Messner's reply.

Your partner for eneo products:

www.eneo.tv

