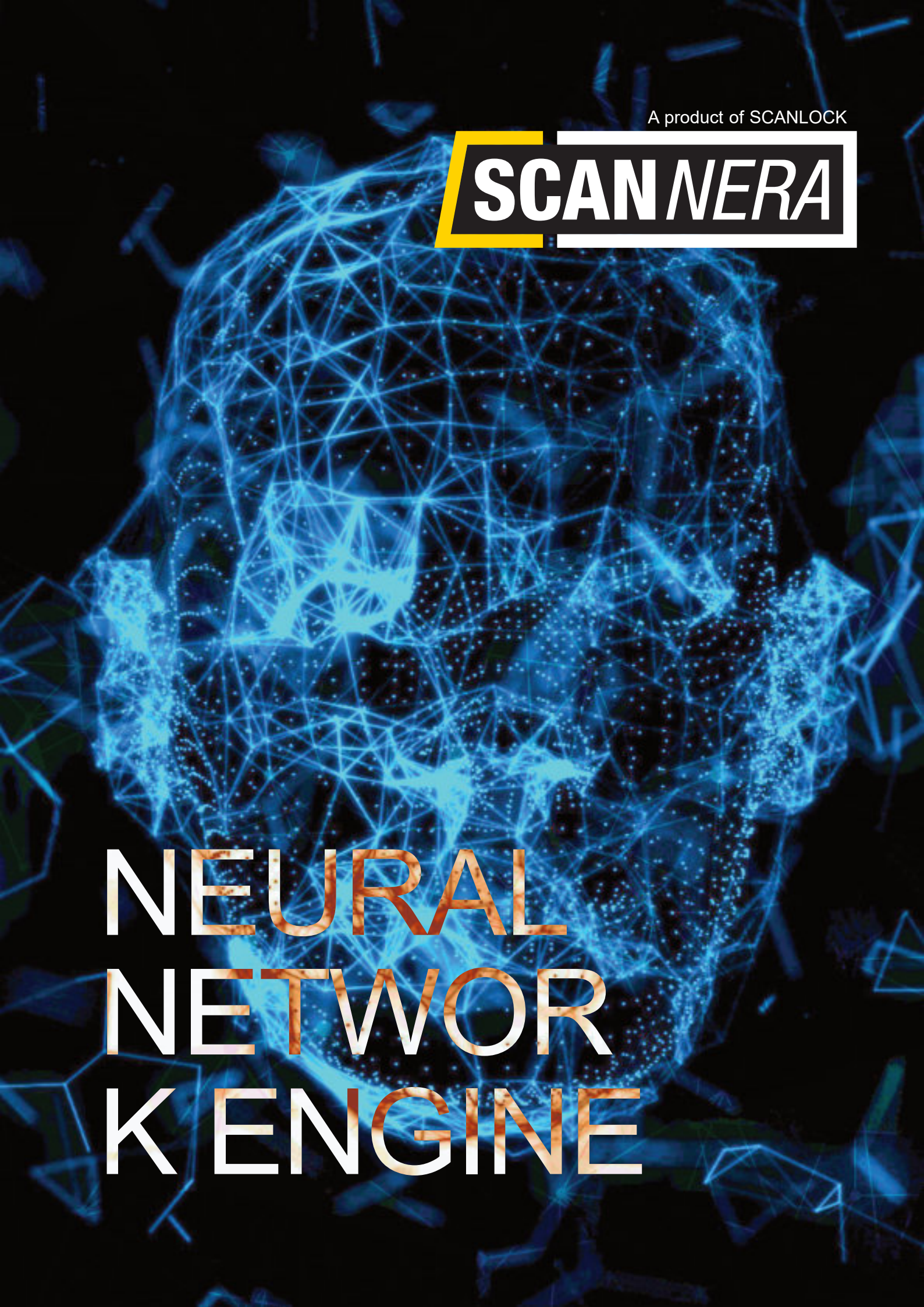

A product of SCANLOCK
SCANNERA
NEURAL
NETWORK
ENGINE

Each of us would like to live in a safe and modern world! Protected city, organised situation on the roads, minimum number of unsolved crimes. All that and much more can become a reality using Scannera video analysis.

The commercial solution of **SCANNERA** will enable you to monitor customers and visitors and analyse traffic at your shopping, office, or entertainment centres. This will also enable you to control workload of employees, avoid queues and crowds. React to age and gender composition of visitors in real-time. Understand behaviour of your customers.

We have numerous solutions for improvement of staff and travellers security at crowded places – from airports, seaports, railway stations, motorways, subways

Suitable combination of existing visual analysis with possibility of integration into VMS system or BI system enables us to offer data for statistical analysis, warn against undesirable situations or to find a lost child at a shopping mall.

It is possible to use following analyses with our system

Object classification inside defined zone or at trespass of line

Analytical method involves very precise classification of the object using algorithm based on neural networks. It is possible to determine position of the object and to classify it within a category: animal, luggage, pedestrian, cyclist, car, van, or lorry. The following analytical tools are implemented based on this analytical algorithm:

Detection of crowd

The main aim of this tool is detection of crowds of people. This tool can hence detect e.g., protests, brawls, etc. Module counts what number of objects of pedestrian type is present within the user defined zone. Should the number go over the set threshold, the snapshot is captured, and notification sent to authorised personnel.

Detection of object within the zone

The goal of this tool is the detection of the occurrence of an object within the zone. Several objects can be selected: animal, luggage, pedestrian, cyclist, car. The user further defines the detection zone and minimum continuous detection time for triggering an alarm. In case of object occurrence according to the defined rules, a snapshot is saved, and a notification sent.

Practical uses include:

- Perimeter protection – detection of a person within restricted area.
- Loitering and graffiti – prolonged occurrence of the person within the zone where it is unusual.
- Detection of vehicle stop prohibition violation - longer stay of the vehicle in the defined prohibited zone.
- Traffic jam detection and prediction.

Traffic statistics

The role of the tool is the detection of a vehicle crossing a defined line and its classification (cyclist, motorcycle, car, van, truck). In the case of this tool, the action does not trigger an alarm, but is recorded in an internal statistic. Subsequently, graphs and tables can be exported over a certain time horizon, which describe in detail the load of a given road for individual days, hours, load map bound to day of the week, etc., including the classification and sorting of vehicle types.

There is an API for connecting any BI system to data analysis.

Age and gender detection

The subject of this analysis is gender detection and age estimation by category. It can be used for statistical purposes e.g., in shopping malls and the system generates data for forensic search according to age and gender in combination with the re-identification of persons below.

Reidentification of persons

The analytical tool consists in classifying the colour and type of clothing, hair length and other symptoms for re-identification of the person. This tool runs on all cameras in real time. The tool collects bulk data that are written into the database. The database can then be forensically searched for photos of people according to specified parameters (for example, gender + colour and type of top of clothing). After finding a person of interest all similar persons can be searched for across the camera system.

Recognition of registration number, model and colour of the vehicle

This analytical tool recognizes the model, the colour of the vehicle and the text of its registration plate. Possible uses are:

- Automated entry systems
- Automated toll gates
- Collection of large-scale data for the needs of forensic search of the criminal police.

Face recognition

This analytics tool allows you to recognize a face and identify a person based on an existing photo database of faces. The output is the ID of the identified person, or a flag the un-match. Possible uses are:

- Streamlining the activities of special forces (airports, secret service).
- Automated customer identification, for example in gambling facilities.

Firearm detection

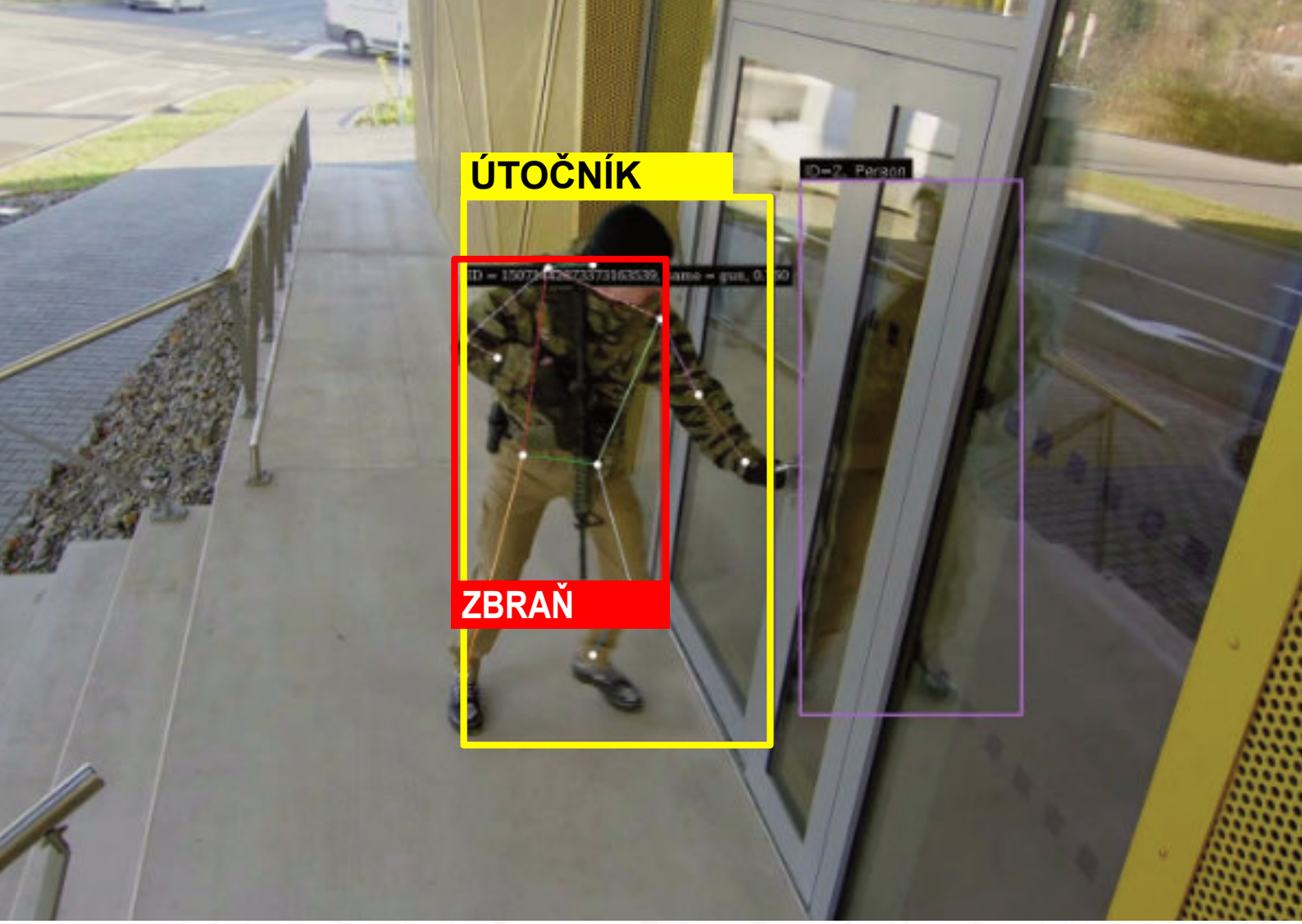
This analytical tool allows detection of a firearm in the image and triggering an alarm. Possible uses are especially in the protection of soft targets, such as:

- Hospital protection
- School protection
- Protection of municipal offices.

Tracking a person's skeleton

The analytical method focuses on recognizing a person's torso, head and limbs and then evaluating their mutual position. Based on this detection, unusual body positions can be evaluated, and an alarm condition can be triggered. These are, for example:

- “Hands up” at petrol stations, banks…
- Fall of a person - can be used to detect a fight or a brawl (school environment), or to protect clients (retirement homes).



User learning

The system allows user marking of valid and invalid results. Thanks to this input it can learn further and thus refine the quality of analysis.

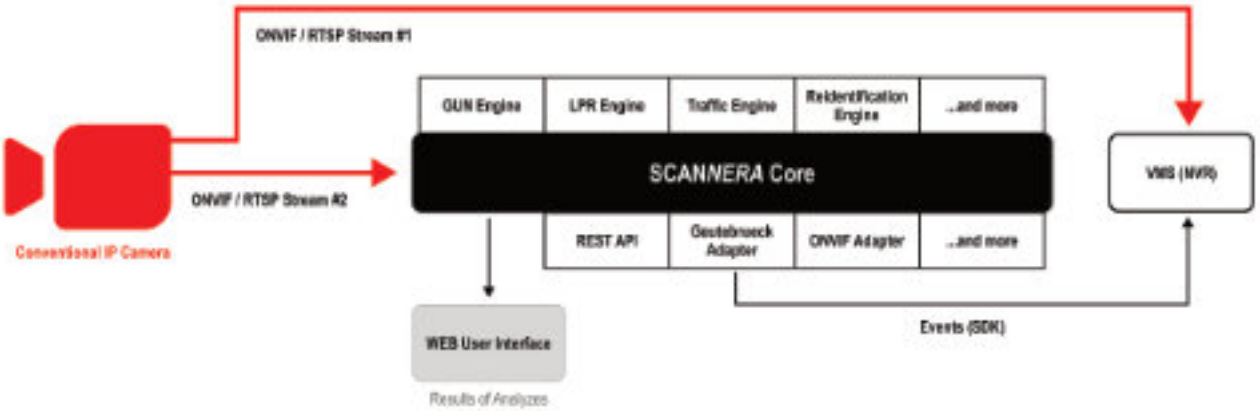
Camera system topology SCAN*NERA* solution

Any CCTV IP camera sends an ONVIF or RTSP stream to the SCANNERA system where this stream applies the desired type of video analysis. The required computing power of the server hardware is defined by calculation based on the number of analyses required and the number of cameras. As a rule, HD or Full HD stream with H.264 compression is considered. The required network infrastructure depends on how it is used. Simply put, the data stream must be sent from the camera to the SCANNERA system and subsequently the same data stream to the VMS (Example 2), or the data stream from the camera is doubled and one stream is sent to the existing VMS and the other to the SCANNERA analysis solution (Example 3). The most common topologies and uses are presented in the following examples:

Example 1)

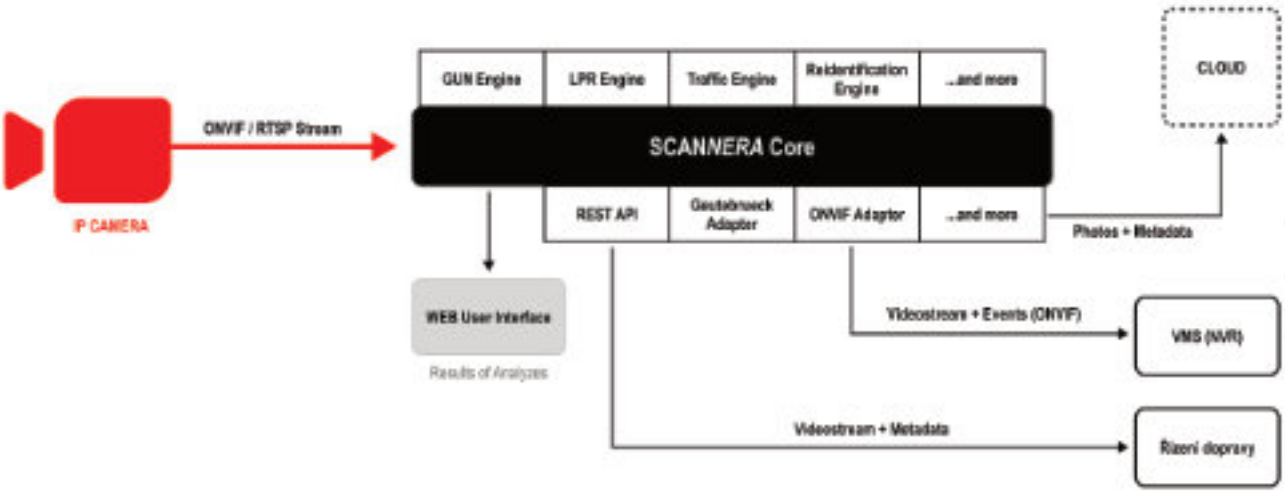
The camera sends the stream to the existing VMS, or recording device, and at the same time to the SCANNERA system. The primary output of the analyses are events or alarms sent directly to the VMS through communication interface. For these purposes, the ONVIF protocol, REST API can be used, or it can be created to order direct integration into your existing system. An example of a possible integration is the connection to the system Geutebrück using the manufacturer's SDK. A necessary condition of this variant is that the camera must have the possibility of sending at least two streams.

A typical example is the installation in an existing camera system with the addition of a real-time analysis, evaluation, and processing on the part of VMS.



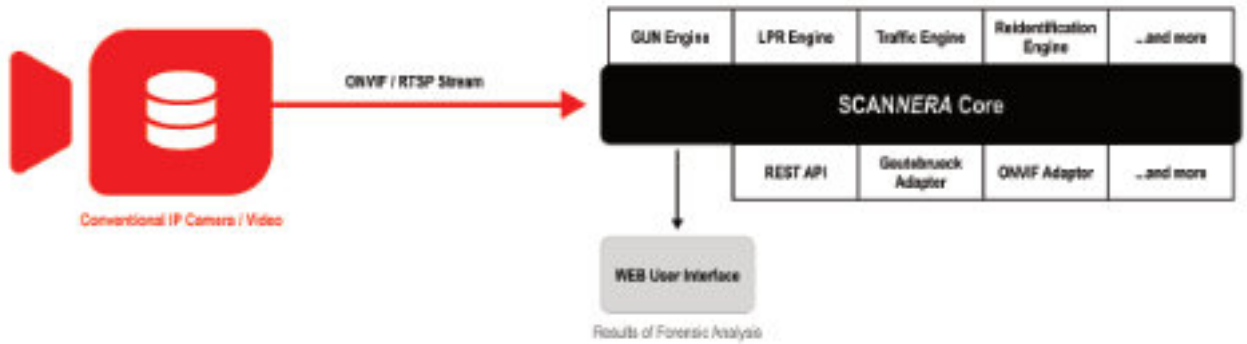
Example 2)

The camera sends only one stream directly to the SCANNERA system. This solution takes advantage of its own redistribution of streams and thus only one stream from the camera can be sent over the network. This stream can be sent to more analysis modules and can also send multiple streams enriched with metadata from the analyses out for different purposes of further processing.
This multi-stream distribution is provided by the SCANNERA server's own proxy gateway.
A typical example of use may be real-time analysis, where the image from a common camera is supplemented by metadata and then sent to VMS as an intelligent ONVIF camera. VMS processes these events or metadata based on the ONVIF standard and triggers an alarm directly in the VMS operator console. Thanks to proxy gateway, you can also send the required metadata (with or without image) to a third system that has metadata processing. An example of further processing outside of VMS can be traffic analysis for the purpose of statistical reporting of the date or transmission of car license plates.



Example 3)

The camera sends the stream directly to the SCANNERA solution, where the selected analysis is applied to this stream. The evaluation takes place on the web user interface, which is part of the SCANNERA system. This example is typically used in forensic analysis, where the user defines the parameters of the analysis and subsequently, the results are presented on a web user interface. Under the IP camera you can in this case, also present a video recording exported from VMS.



System requirements

Most analytics modules require GPU acceleration on an NVIDIA RTX or TESLA series graphics card. The minimum configuration for a small camera system is a computer with a quad-core Intel Core i7, 32 series CPU GB RAM and NVIDIA RTX3060 graphics card.

An example is the usual deployment on a medium-sized city camera system (25 cameras, 30 concurrent analyses, performance reserve 5 analyses for emergency measures and forensic analysis from video): A server with 128 GB of RAM, a 16-core CPU and a pair is recommended for this application NVIDIA RTX3090 graphics cards, or one specialized card for neural acceleration NVIDIA TESLA A40 network.

The system is well scalable, it is possible to use any number of servers, according to the required number of analysed streams. It is also possible to assign individual analysis to a specific server. For example, performance-intensive analysis can be assigned to one powerful server and the other servers can be purchased in a lower configuration.

SCANLOCK International, s.r.o. has been operating on the European market for more than 25 years. It thus offers a stable background of a proven company and many years of experience in the field.

We are a specialized wholesaler of security and operating technologies that puts emphasis on a comprehensive project solution from pre-project preparation, through delivery to support during implementation. Subsequent technical support and specialised services are a matter of course.

SCANLOCK CZ, spol. s r.o.
Březinova 1608/42
616 00 Brno
Czech Republic

Phone +420 515 917 917
E-mail info@scanlock.cz
www scannera.ai