market presence in 220+ countries worldwide

300+ employees

50,000+ ID scanning systems

80,000+ traffic systems

10,000+ satisfied partners
RECOGNITION SOFTWARE

SMART SURVEILLANCE

INTELLIGENT TRAFFIC SYSTEMS

IDENTITY DOCUMENT READERS & BIOMETRICS

RECOGNITION CAMERAS

OCR RESULTS:
• NUMBER PLATE: ARH 001
• NATIONALITY: EU-HUNGARY
• SPEED: 158 MPH / 254 KMH
• BLOCKLIST: -- NO --
• COLOR: BLUE METAL
• RECOGNITION TIME: 2018-06-12T15:19:21+03:00
OCR RESULTS:

- NUMBER PLATE: ARH 001
- VEHICLE TYPE: MERCEDES BENZ
- NATIONALITY: EU-HUNGARY
- SPEED: 158 MPH / 254 KMH
- BLACKLIST: --- NO ---
- COLOR: BLUE METAL
- OWNER: ZSOLT VANYI
- RECOGNITION TIME: 2018-01-12T15:19:21+00:00
TYPICAL APPLICATIONS

Traffic analytics? Access control? Logistics track-and-trace? The answer is ARH’s CARMEN® license plate recognition – possibly the best engine that effectively reads over 28,000 plates types all over the world. But Carmen can do more: ARH’s CARMEN® software family reads container codes, wagon codes, hazmat plates and more. The following examples include typical applications where ARH’s plate recognition engines offer unique benefits.

TRAFFIC MONITORING

- Airport and harbour logistics
- LAW ENFORCEMENT
- PARKING MANAGEMENT
- LOGISTICS TRACK-AND-TRACE
- Gas station security
- Container code recognition
- ACCESS CONTROL
- CONGESTION CHARGING
- USDOT code recognition
- Railway code recognition
- ADR (HAZMAT) CODE RECOGNITION
- TRAFFIC ENFORCEMENT
- TRAFFIC ANALYTICS
- campus security
- TOLL COLLECTION
- AVERAGE SPEED MEASUREMENT
- BORDER CONTROL
INTRODUCTION TO THE ANPR/LPR PROCESS

WHAT IS ANPR/LPR?
Automatic Number Plate Recognition/License Plate Recognition (ANPR/LPR) has been ARH’s core technology for over 27 years – software and hardware development and manufacturing.

ANPR/LPR is a traffic surveillance method based on optical character recognition (OCR). A specific OCR algorithm processes captured images or footage to recognize the plate characters. ANPR/LPR can be implemented in any traffic related application using either an existing CCTV/IP camera system or dedicated ANPR/LPR cameras, which ensure high recognition rates and true 24/7 operation.

The operation of any ANPR/LPR system can be divided into three main steps. It is important to highlight that CARMEN® ANPR/LPR technology provides a fully adaptable solution delivered either as an SDK (software development kit) that can be seamlessly integrated with any existing workflow – or as a standalone, ready to use application.

HOW DOES ANPR/LPR WORK IN PRACTICE?
The operation of any ANPR/LPR system can be divided into three main steps.

1. Detection & image capturing
At the front end of any ANPR/LPR system there is a camera that captures images of the plates. The camera plays an important role in the ANPR/LPR process, by making sure that the captured images are appropriate for ANPR.
This highly determines the overall performance of the system. The best results are achieved by using specialized cameras designed for ANPR/LPR.
ARH offers a wide range of dedicated ANPR/LPR cameras.

2. Image preselection and plate recognition
The main software aspect of an ANPR/LPR system is reading the plate text from the preselected set of captured images.
This automated recognition has several steps, including image normalization and enhancement, as well as detecting the vehicle in the image. The final step is taken by the OCR algorithm that recognizes the individual characters.
CARMEN® ANPR is the world leader in ANPR software, and it’s a result of over 26 years of continuous development. It facilitates country-independent recognition, in case of dense traffic reading of multiple plates from one image, color recognition, state or country identification, accomplishing all of this extremely fast with high accuracy.
3. Data record and end-user application
Besides the characters of the vehicle plate, CARMEN® also returns plenty of additional information, such as an image with the recognized plate(s) and the confidence level assigned to each character as well as the whole plate. Once all license plate data is saved to a database, the data record serves as input to the end-user’s business logic. Automated number plate recognition may be a key component of vehicle access control, traffic and toll enforcement and many other applications.
CARMEN® ANPR FREEFLOW

GLOBAL LICENSE PLATE RECOGNITION SOFTWARE FOR TRAFFIC SOLUTIONS

CARMEN® FREEFLOW is the unlimited version of the ANPR product line. Designed to read and process a large number of license plates in 24/7 traffic monitoring, security, highway tolling and congestion charging systems. It offers country-independent recognition as well as recognition of number plates featuring not only Latin characters but also characters from Arabic, Cyrillic, Chinese, Korean, Thai alphabets, and many more.

Other applications that can benefit from its fast and accurate automatic recognition capabilities include speed and journey time measurement, access control, parking management, bus lane enforcement, border control or gas station monitoring, etc. CARMEN® ANPR FreeFlow reads license plates from any image source extremely fast and with outstanding accuracy.

MAIN BENEFITS

- Increases security and safety of highways and access control areas
- Enhances fidelity by handling various plate sizes, syntaxes, and distorted plate images
- Allows smooth and problem-free 24/7 operation
- Saves time and energy with fast and reliable automated license plate reading
- Decreases data entry errors with improved accuracy and recognition rates
- Ensures easy installation through SDK and user-friendly API

KEY FEATURES

- Automatic recognition of license plates in free flowing traffic environments
- Fast, easy, and straightforward use
- Hardware independence: compatible with any image source (analog/digital/still images/MJPEG video streams)*
  - Country, state or province, and plate type recognition
  - Country-independent recognition including Latin, Arabic, Chinese, Korean, Thai, etc. characters
  - Optional License plate color recognition
  - Non-empty dangerous goods plate recognition included

* ARH's dedicated ANPR/LPR cameras are available for high quality image capturing and industry leading recognition rates.
In applications where the vast potential of CARMEN® FreeFlow is not necessary, one of the CARMEN® ANPR 5K/8K/11K versions may be the ideal choice. In fact, CARMEN® ANPR 5K/8K/11K may be the optimal cost-effective choice for roads with low traffic density or 3rd party smart cameras with not so powerful processors. CARMEN® 5K/8K/11K can also be recommended for vehicle access control systems.

**CARMEN® ANPR 5K, 8K and 11K: principle of operation**

In these versions, before actually starting to process an image, CARMEN® needs a credit. New credits are generated throughout the day (24 hrs). However, the number of available daily credits are limited – hence the name 5K, 8K and 11K. In these 3 cost-effective versions of CARMEN®, operation is dependent on 2 parameters: one is a time factor indicating the time lag between generation of new credits; the other is the maximum credit buffer size – these 2 factors determine the processable number of images in a given time period. Calculating with 3 images per vehicle, there are enough credits for a peak of 180-200-220 vehicles per hour. These CARMEN® versions are ideally used for vehicle access control in corporate headquarters, as well as on roads with low traffic density – where the cameras installed or the processing hardware have limited performance.

**MAIN BENEFITS**

- Offers the high recognition rates of CARMEN® FreeFlow with quad-core operation
- Saving time and energy in data entry by automating plate reading
- Centralising registration eliminates the need for access cards or codes to system users
- Increasing safety and security of access control areas
- Boosting reliability by handling various plate sizes, syntaxes, and distorted plate images
- Allowing smooth and problem-free 24/7 operation
- Cost effective versions of CARMEN® FreeFlow ANPR

**KEY FEATURES**

- Automatic recognition of analog/digital input plate images of vehicles in stop and go or reduced speed traffic situations
- Fast, easy, and straightforward use
- Country, state or province, and plate type recognition
- Country-independent recognition including Latin, Arabic, Chinese, Korean, Thai characters, and many more
- Optional license plate color recognition
Are you looking for a simple app to transform any video stream into ANPR results? Would you like to build your own system, without the need for ANPR integration? Motivated by these challenges and capitalizing on our 27 years of experience, we have created the forward-thinking Carmen® GO, the plug and play ANPR application. It only takes a few clicks to set up Carmen® GO upon first use. All you need to do is link your camera stream(s) to Carmen® GO and you will get ANPR results directly from the stream(s). By using Carmen® GO you can focus on what matters most to you: your customers and your core business.

CARMEN® GO is a truly camera independent solution, letting you use any IP camera from any vendor. CARMEN® GO uses the same industry leader CARMEN® ANPR engine that is at the heart of top systems around the world but it goes to the next level by self-adjusting settings to achieve optimal results. This is how we can ensure that CARMEN® GO will return the best possible result based on the given stream.

### MAIN BENEFITS
- Camera independent: processes streams of any commonly available IP camera
- No need for ANPR expertise nor any ANPR integration skills
- Fully automatic operation adapts to incoming stream, self-adjusts to produce the best ANPR results
- Scalable solution that can handle up to 8 different streams adaptable to available processing power
- Automatic data storage options selectable by user: internal database, data file, FTP or data stream

### KEY FEATURES
- Stream processed automatically, no need for trigger or manual selection
- Available as standalone product
- Adaptable license options, available in 3 different performance packages, each up to 8 streams (24 different options in total)
- Built in advanced vehicle detection algorithm (VehDet)

### CARMEN® SERVER
Are you looking for a centralized, server based ANPR? Would you like to build your own, powerful backend? Your dedicated cloud or video management system? Think BIG! We have the solution: CARMEN® Server. This version enables your system to perform dozens, even hundreds, of number plate recognitions simultaneously.

- Available to serve 32 / 64 / 128 / 256 parallel ANPR processing tasks
- Enables you to build your own dedicated ANPR cloud server, capable of serving local, regional or nationwide systems
- Daily processed images can reach up to 200+ million*

* 256-core system, 100 ms average processing time
CARMEN® ACCR

The CARMEN® Automatic Container Code Recognition (CARMEN® ACCR) software has been specifically designed to extract and read the Container Codes of ISO containers – the primary identification number of intermodal (shipping) containers. The code identifies the owner and the type/category of the container, and it serves as a unique serial number. Reading the ISO 6346 (BIC code), ILU and MOCO container codes of shipping containers can automate and simplify road, railway, or harbor operations, help border control, manage inventories and run container surveillance systems.

CARMEN® ADR

The CARMEN® Automatic Dangerous Goods Recognition (CARMEN® ADR) software has been developed to recognise the Hazard Identification Numbers (Kemler codes) of vehicles carrying hazardous materials. The automatic reading of Hazard Identification Numbers (HIN) in a traffic monitoring or safety system increases safety on roads, bridges, in tunnels – wherever hazardous materials are transported. CARMEN® ADR identifies materials in transport through HIN codes that indicate primary and secondary hazards, which gives emergency responders the ability to quickly reference critical information about potential dangers.

CARMEN® DOT

The CARMEN® DOT software has been created to extract and read the DOT number of a CMV (Commercial Motor Vehicle). All commercial vehicles in the United States have to have a unique identification number obtained from their respective Dept. of Transportation: the USDOT (or DOT) number. CARMEN® DOT functions as a highly accurate tool for automatic identification and tracking, as well as supporting inventory control systems.

CARMEN® UIC

The CARMEN® Railway Code Recognition software (CARMEN® UIC) automatically extracts and reads the UIC numbers from railway wagons. Much like commercial motor vehicles and ISO containers, railroad cars carrying freight or passengers also have unique and internationally standardized identification numbers. Railway companies and logistics operations can significantly benefit from implementing CARMEN® UIC which reads railroad car codes from an image or video signal with the highest accuracy possible.
## COMPARISON CHART

### AVAILABLE VERSIONS

<table>
<thead>
<tr>
<th>Available versions</th>
<th>CARMEN® ANPR 5K / 8K / 11K</th>
<th>CARMEN® ANPR/ADR FREEFLOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUAD</td>
<td></td>
<td>SINGLE / DUAL / QUAD</td>
</tr>
</tbody>
</table>

### Supported operating systems

- Windows, LINUX

### Supported platforms

- x86_32 | x86_64 | ARMv7 or higher

### Suggested CPU cores

- 1–4
- 2 / 2 / 4

### NNC required, available NNC types

- USB (internal 4 pin or type A), PCIe card (X1), Mini PCIe

### Available tools

- SDK/API, license manager, engine manager (for Windows) ADI demo, AVI Demo *

### Supported programming languages

- Windows and Linux: C/C++, Java
- Windows only: C#, Visual Basic .NET

### Engine update availability

- One year from purchase included, optional subscription available on yearly basis

### Capacity (images/day)

- 5760 / 8640 / 11250
- unlimited**

### Processing threads

- 4 parallel threads
- 1 / 2 / 4 parallel threads

### Credit buffer

- 300 / 240 / 200
- unlimited

### Time for 4 new credits (sec)

- 60 / 40 / 30
- –

### INTERFACE

**Interface**

- **Input**: Image (1 still image or 1 frame from a video stream)

- **Output**: Through SDK functions: NUMBER PLATE RESULTS (multiple if applicable), COUNTRY/STATE, PLATE TYPE, TIP LIST, COLOR, CONFIDENCE LEVEL, POSITION, etc.

---

* For more TOOLS: check our SOLUTIONs or SMARTCAM product range

** Depends on CPU speed, settings, engine type
### SOFTWARE & SDK

<table>
<thead>
<tr>
<th>CARMEN® ANPR/ADR SERVER</th>
<th>CARMEN® GO ANPR</th>
<th>CARMEN® ACCR/DOT/UIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>32 / 64 / 128 / 256</td>
<td>SINGLE / DUAL / QUAD</td>
<td>SINGLE / DUAL / QUAD</td>
</tr>
<tr>
<td>Windows, LINUX</td>
<td>Windows</td>
<td>Windows, LINUX</td>
</tr>
<tr>
<td>x86_32</td>
<td>x86_64</td>
<td>server</td>
</tr>
<tr>
<td>32–256</td>
<td>2 / 2 / 4</td>
<td>2 / 2 / 4</td>
</tr>
<tr>
<td>NNC SERVER</td>
<td>USB (internal 4 pin or type A), PCIe card (X1), Mini PCIe</td>
<td>USB (internal 4 pin or type A), PCIe card (X1), Mini PCIe</td>
</tr>
<tr>
<td>SDK/API, license manager, engine manager(for Windows)</td>
<td>Carmen GO service application, web interface, license manager, SDK for the stream output</td>
<td>SDK/API, license manager, engine manager(for Windows)</td>
</tr>
<tr>
<td>one year from purchase included, optional subscription available on yearly basis</td>
<td>one year from purchase included, optional subscription available on yearly basis</td>
<td>one year from purchase included, optional subscription available on yearly basis</td>
</tr>
</tbody>
</table>

- **unlimited**
- **unlimited**
- **unlimited**

| Image (1 still image or 1 frame from a video) | Live video stream, 1–8 parallel – selectable at purchase | Set of images (multiple still images or frames from videos) |

- Through SDK functions: NUMBER PLATE RESULTS (multiple if applicable), COUNTRY/STATE, PLATE TYPE, TIP LIST, COLOR, CONFIDENCE LEVEL, POSITION, etc. |
- Direct output to INTERNAL DATABASE, FTP, CSV, DATA STREAM formats. Output data: NUMBER PLATE RESULTS, Plate country, images, stream ID, time stamp |
- Through SDK functions: OCR RESULTS TYPE, TIP LIST, CONFIDENCE LEVEL, POSITION |

Technical specifications are subject to change without prior notice. This document does not constitute an offer.

* For more TOOLS: check our SOLUTIONs or SMARTCAM product range

** Depends on CPU speed, settings, engine type
Parking? Toll collection? Enforcement? ARH’s new lineup of purpose-built license plate recognition cameras, as well as a new container camera, are optimized for the World’s No. 1 ANPR engine, Carmen® – functioning as the strong backbone of systems used in these application areas.

TYPICAL APPLICATIONS

TOLL COLLECTION
- Public parking lots
- Parking revenue systems
- Company employee parking
- Shopping mall parking
- Residential areas
- Visitor parking

TRAFFIC SECURITY MONITORING
- Company employee parking
- Public parking lots

SPEED ENFORCEMENT
- Shopping mall parking
- ADR (HAZMAT) CODE RECOGNITION

LAW ENFORCEMENT
- Company employee parking

BARRIER/GATE CONTROL
- VEHICLE ACCESS CONTROL

ADR (HAZMAT) CODE RECOGNITION
- BORDER CONTROL

ANPR IMAGING
- TOLL COLLECTION

BORDER CONTROL
- AVERAGE SPEED MEASUREMENT

CONTAINER/RAILWAY CODE RECOGNITION

TRAFFIC ENFORCEMENT

ARH
LITTLE KNOWN FACTS ABOUT ANPR CAMERAS

THE MEGAPIXEL MYTH
A common misunderstanding about recognition cameras: higher megapixel means better recognition accuracy. However, this is not true. A superior ANPR software like our neural network based CARMEN® needs a character to be only 16 pixels high (20 pixels in case of non-Latin characters). This means that a 1 or 3-megapixel resolution camera is more than enough to cover one lane of the road for license plate recognition. Higher resolution than that, like 5-7 megapixel cameras, are not only unnecessary for ARH’s ANPR engine CARMEN®, but will actually increase processing time without any benefits.

ILLUMINATION
All of ARH’s purpose-built ANPR cameras have integrated illumination – this is not the case for all manufacturers. ARH’s range of LED illuminators include white or 2 different wavelengths of infrared light sources – preset to focus the maximum amount of light to the perfect distance for the actual camera. Integrated lights are synchronized with the camera for perfect time flashing, with extra low energy consumption while maintaining high performance and high power output. Frame Parity Flashing – an innovative solution that improves illumination for ANPR purposes of both reflective and non-reflective license plates at the same location with the same camera. If necessary, a maximum of 7 additional fully compatible external flashes can be connected to ARH recognition cameras from our own product line: the FreewayCAM IR-LIGHT series.

VEHICLE DETECTION (VEHDET)
A common problem in license plate recognition is selecting the right images. If there is no trigger mechanism, the recognition engine needs extreme processing power to keep up with the continuous flow of images or the live video stream. If there is a trigger-based mechanism, the recognition engine can start processing the license plate right away. Benefits: lower hardware requirements and lower overall consumption; improved performance and faster processing. Our unique solution is called Vehicle Detection. This image-based vehicle detection does the frame preselection for the ANPR engine. It is capable of detecting the shape of a vehicle – note that it is not the license plate it detects but the vehicle itself. VehDet will trigger an event – even if there is no license plate on the detected object. The result: no lost event, even without a license plate on the vehicle.

PROCESSING POWER
The industry average is a dual-core processor – other manufacturers call them smart ANPR/LPR cameras. Our cameras, by default, have a dual-core CPU and an FPGA integrated circuit dedicated to image processing itself – plus there is an extra quad-core 1.0 (ARM) or 1.9 GHz (ATOM) CPU dedicated to ANPR processing. This processing power is truly unique on the market. Running our CARMEN® engine parallel on 4 cores, processing 4 plates simultaneously aboard the camera, produces extremely fast ANPR processing. It blows competition away.
ParkIT Camera
SECOND GENERATION

IP CAMERA FOR ACCESS CONTROL
DESIGNED FOR VEHICLE PLATE RECOGNITION

CAMERA FOR AUTOMATED ANPR-BASED ACCESS MANAGEMENT

ParkIT is a purpose made digital ANPR/LPR camera, optimized for drive-through or parking applications. As a fully featured, lightweight camera, ParkIT is comprised of a resistant, single sealed waterproof enclosure with IP65 (ingress protection) rating and the camera hardware. The camera includes synchronized infrared (IR) LED illumination unit providing clear and sharp images during day and night. Its technical features include pan, tilt, wall mounted brackets with hidden cabling, auto day & night switching and barrier control functions.

Access control (entry & exit) to restricted car park or vehicle storage areas, maximum stay car park management, pay-on-exit, pay-on-foot car park management and security control or monitoring application areas can all benefit from the progressive capabilities of the ParkIT camera. If you are looking for a complete parking system or a drive-through service, ARH has a turnkey solution, ParkIT System.

MAIN BENEFITS

- Compact, cost-efficient recognition camera with great capabilities
- Capturing clear day and night images for accurate vehicle licence plate recognition
- Built-in motion detection for triggering image capturing
- Offering a user-friendly solution
- Easy integration with auto set-up wizard and simple configuration

KEY FEATURES

- Accessibility via web browsers, with embedded web server
- Automated adaptive settings, tracking environmental changes
- Auto day & night switch, IR night illumination
- Still images and video stream outputs
- Remote control and access of camera settings
- Complex I/O capabilities: control barrier and receive trigger signal
ALL PURPOSE ANPR/LPR CAMERA
DESIGNED FOR VEHICLE PLATE RECOGNITION AT ANY SPEED

FreewayCAM
SECOND GENERATION

ANPR/LPR CAMERA DEVELOPED FOR HIGH SPEED TRAFFIC APPLICATIONS

FreewayCAM is a field-proven, widely used versatile digital IP camera designed specifically for ANPR/ LPR (Automatic Number Plate Recognition) in low or high-speed traffic environments. The camera consistently captures high quality images in a variety of environments and light conditions. The camera’s unique optical module with auto-adjustable shutter time and real-time motion detection-based self-triggering function also ensure appropriate image capturing at virtually any speed – even up to 255 km/h (158 mph).

The camera can be enhanced with a variety of add-on components for specific functions or circumstances. It enables the connection of additional synchronized FreewayCAM IR-LIGHT at sites where extra brightness is necessary.

Adding the external ARH RAD-AR can deliver more precise triggering than software-based motion sensing, which is a less resource-intensive solution at high speed roads and traffic congestion.

MAIN BENEFITS

• Capturing ANPR optimized images day or night, even vehicles at high speeds
• Increased recognition accuracy rates by purpose-built hardware
• Saving time by simplifying setup and providing unlimited remote access to control settings
• Decreasing network loads with adjustable image compression
• Easy installation, plug & play, auto-setup wizard for easy configuration

KEY FEATURES

• Auto day & night switch; adaptive settings to constantly changing light conditions
• Automatic time synchronization (NTP)
• Adjustable image compression for maximum ANPR/LPR performance
• Still images (JPEG) and compressed live video streams (MJPEG)
• Optimized for CARMEN® ANPR engine
RECOGNITION CAMERAS & SENSORS

FreewayCAM
THIRD GENERATION

MODULAR ANPR/LPR CAMERA
MAKE THE MOST OUT OF EVERY ANPR SYSTEM

UNIQUE IMAGE-BASED VEHICLE DETECTION MEANS NO LOST EVENTS

The new FreewayCAM is a fixed modular IP camera purpose-built for ANPR. It is a robust, sturdy workhorse camera which performs reliably in any weather or light conditions. It provides images ideal for ANPR even in high-speed traffic at zero visible light. The IP67 certified, vandal-proof, metal body houses a powerful computer running ARH’s one-of-a-kind – purely image-based – Vehicle Detection algorithm. This feature preselects every image that contains a license plate within a few milliseconds. As a result, passing vehicles are registered as individual events including image, license plate, time, location and speed data without the need to process every single frame. What is even better, there are no lost events even when the license plate is damaged or missing.

The third generation FreewayCAM is available either as a single-lens HDx model or a dual-lens FullHD model. The second lens is called Advanced Vision. The main sensor delivers ARH’s usual high-standard ANPR output. The Advanced Vision second ANPR sensor makes sure that you get a clear ANPR image even when the sun glares or casts a shadow on the plate. This powerful DUAL lens format represents the leading-edge of the plate recognition industry today and tomorrow.

MAIN BENEFITS

• Glare- and shadow-free ANPR output even under extreme light conditions
• ANPR optimized images of fast-moving vehicles up to 255 km/h (158.5 mph)
• No lost events – even when license plate is damaged or missing
• On-board Vehicle Detection (VehDet) – preselects the ANPR relevant images for you
• Design and manufacturing in one hand – 26 years of experience

KEY FEATURES

• Dual ANPR lens available with Advanced Vision
• The most challenging lighting conditions are also covered
• Saving bandwidth with the on-board video analytics
• Vehicle Detection on-board – an accurate way to initiate an event
• Secure access from anywhere through HTTPS interface

We stand behind our products’ quality with confidence. We are proud to offer you a uniquely long, 3-year manufacturer’s warranty for this product.
SmartCAM

THIRD GENERATION

ANPR/LPR CAMERA WITH UNRIVALLED PROCESSING POWER
AND EVEN FASTER ON-BOARD RECOGNITION

EXTRA OVERVIEW LENS TO SEE THE BIG PICTURE

The new SmartCAM is a modular ANPR camera with a built-in smart illuminator and a powerful industrial-grade computer with 2+4 cores to effortlessly handle even the most complex license plates. The device uses the industry’s finest engine, CARMEN®️, which is ARH’s guarantee for the best number plate recognition results available. Due to the modular design, ARH is able to offer a wide range of SmartCAMs.

At one end of the range you can find the cost-efficient, single lens HDx camera, a special 1080p 4:3 ratio sensor, combining high resolution with vertically increased field of view, which offers supreme ANPR imaging at a very competitive price. With the on-board Vehicle Detection, it keeps tracking of every vehicle even when the license plate is damaged or missing. In the middle of the range is our dual Overview camera. Its primary lens and sensor focus on the license plate, while the second Overview lens makes sure that you won’t have to take your ‘eyes’ off of the surroundings. At the other end of the range you can find our FHD DUAL PLUS Advanced Vision camera, which is one of our most powerful smart camera yet.

MAIN BENEFITS

• Standalone traffic solution
• Our most powerful smart camera yet
  • All events are directly exported to a database
• Cost-efficient single sensor or wide application dual sensor variations
• Modular design and hardware add-ons to satisfy all needs
• Trouble-free remote access via the in-built secured web-server

KEY FEATURES

• 2+4 cores of processing power
• Recognizing reflective and non-reflective vehicle plates at the same time
  • Overview or Advanced Vision second lens with its dedicated sensor
• On-board video analytics such as Vehicle Detection

We stand behind our products’ quality with confidence. We are proud to offer you a uniquely long, 3-year manufacturer’s warranty for this product.
The new SpeedCAM is a top-of-the-range camera with integrated speed radar and on-board ANPR. Its built-in radar, also functioning as a high-precision trigger, provides certified speed measuring up to 255 km/h (158.5 mph). As a deterring effect, SpeedCAM controls traffic 24/7, which means increasing road safety without the presence of law enforcement on site.

The revolutionary DUAL ANPR sensors deliver an all-time high recognition rate with full image details, thanks to the symbiosis of the main LPR lens with the glare free/shadow free imaging of the camera’s secondary Advanced Vision lens. This third generation of SpeedCAM is built with an even more powerful chipset which lets the camera to recognize even the complex license plates faster than ever.

Since all events are exported to a database, no advanced programming skills are required for integration. Therefore, the new SpeedCAM is not just a building block in the system; it is a standalone Traffic Solution on its own right.

**MAIN BENEFITS**

- A Traffic Solution by itself; no need for extra hardware
- All events are exported to a database
- Integrated radar for speed measurement or triggering
- Glare-free / Shadow-free images – ANPR results even under challenging light conditions
- Built-in 4G / LTE modem and GPS
- Robust metal body – built to last

**KEY FEATURES**

- All-time high recognition rates achieved by the cooperation of the DUAL ANPR sensors
- Multi-core imaging and ANPR
- Certified speed measuring or triggering up to 255 km/h (158.5 mph)
- Powerful on-board ANPR solution with Vehicle Detection
- Capable of reflective and non-reflective license plate recognition at the same time

**We stand behind our products’ quality with confidence. We are proud to offer you a uniquely long, 3-year manufacturer’s warranty for this product.**
Finally a truly dedicated camera for container code recognition

The new ContainerCAM is an IP camera for tracking and identifying shipping containers on ships, trains or semi-trailer trucks. Shipping containers must resist harsh conditions; thus, a camera is required which can reliably function in these circumstances as well. ContainerCAM can indeed withstand wear and tear. The camera can easily read close-range BIC and ILU container codes as well as UIC railway code even when the reporting mark (ownership code) is damaged or the printed surface is uneven. ContainerCAM is a dual-sensor / dual-lens camera. The main super-wide-angle camera module is for container code recognition. The second Overview camera module offers a detailed image of the surroundings. The dual lenses and the integrated wide-angle white illumination LEDs are optimized for close-up ACCR or railway code recognition. They make sure that the OCR software will always get the best possible input.

ContainerCAM has been designed as the premier imaging tool for ARH’s CARMEN® ACCR. (See CARMEN® ACCR description in this catalog.)

Main benefits

- Specifically developed for Carmen® ACCR
- Extra wide-angle lenses – ideal for close-range imaging
- Remote access through the secure webserver
- Up to 7 extra plug-and-play illuminators

Key features

- Reads BIC and ILU container codes as well as UIC railway code
- Built-in white LED illumination
- Motion detection analytics to maximize efficiency
- Dual lens setup with a second Overview lens

We stand behind our products’ quality with confidence. We are proud to offer you a uniquely long, 3-year manufacturer’s warranty for this product.
EnforceCAM

Typically used to monitor busy intersections and heavy traffic, EnforceCAM can join forces with one or multiple dedicated ANPR cameras and various sensors – with the single purpose of increasing traffic safety. EnforceCAM is designed to function as an overview camera in traffic monitoring systems. Intelligent motion tracking technology and a range of built-in event detectors can spot the violation of specific traffic rules, such as solid line crossing, moving in a wrong direction, red light crossing and improper lane use in an intersection or at railroad crossings. In short, EnforceCAM is single gantry (single pole) traffic monitoring camera applying non-intrusive detection technology: a range of switch-on/switch-off detectors (scalable and flexible) functioning as full on-board tracking intelligence to identify traffic events. EnforceCAM is the overview camera of choice to use with a complete traffic site controller (TrafficSpot®) and a back-office system (GDS). It has extendable, enormous storing capacity via accessible SD XC memory slot, enough up to several months or even years. EnforceCAM’s event-based recording enhances system efficiency: each event record contains the pre-event video, helping to provide eligible evidence for court proceedings.

MAIN BENEFITS

- Automatic Incident Detection (AID) – object tracking, detecting wrong way and congestions
- Enforcement functions: red light violation, prohibited turns, bus lane use, etc.
- IP-based remote access to control settings through web browsers
- Solid IP67 housing protecting a vandal proof, massive 24/7 camera

KEY FEATURES

- Low-power but bright LED light
- Video analytics based intelligent functions
- Customized/integrated traffic analytics available according to customer needs
- Automatic Time Synchronization (NTP)

We stand behind our products’ quality with confidence. We are proud to offer you a uniquely long, 3-year manufacturer’s warranty for this product.
Automatic Number Plate Recognition technologies are on the move. Today’s markets demand hardware and software solutions that can automatically read license plates while the camera itself is in motion. Up until now, with no reliable way to trigger, the processing power needed for these applications ranged from immense to non-existent.

With its revolutionary software based image preselection algorithm, compact size, discreet design and the world’s most sophisticated ANPR engine, the MicroCam M202 and M402 camera family provides an all-in-one solution to the greatest challenge in ANPR yet: capturing and reading license plates while both the camera and the vehicle are in motion. Reading license plates from moving vehicles for toll collection purposes, various police applications and parking enforcement is now possible with ARH’s ONVIF compliant devices.

**MAIN BENEFITS**
- Small form factor enables patrol car rooftop-, roadside-, barrier- and gate-mounting
- Reads license plates while operating from a moving vehicle
- Quick and easy installation with single cable connection, PoE+, power
- Preselection algorithm to detect license plates
- Ideal for toll collection, police applications, neighbourhood watch and parking enforcement

**KEY FEATURES**
- On the move license plate recognition
- Intelligent IP camera with image preselection for ANPR engine (M202/M402)
- Onboard ANPR software (M402)
- IR illumination and automatic brightness control optimized for ANPR/LPR
- IP 67 rated weatherproof housing
- ONVIF compliant device
ARH S1
SECOND GENERATION

PORTABLE SPEED AND TRAFFIC ENFORCEMENT CAMERA
WITH ANPR/LPR AND COMMUNICATION

REDEFINES STANDARDS IN LAW ENFORCEMENT CAMERAS

A speed camera measures speed. ARH S1 does a lot more than that – quick setup, compact design, long-range detecting and ANPR, tamper-free system architecture and fully automatic operation make it ideal as a speed and traffic enforcement device. Each passing vehicle is an event with its own data package containing vehicle speed, license plate data, time and place stamp and recorded video/images. The camera detects speeding and also identifies traffic violations like illegal lane use. Autonomous operation is possible from a patrol car or tripod, and as a practical feature, the camera can be accessed remotely. S1’s wide range of day and night vision is guaranteed by built-in IR lights and ARH’s very own state-of-the-art CARMEN® automatic number plate recognition (ANPR) engine.

S1 is years ahead of its competitors. With 2 cameras, integrated LED illumination and an intuitive touchscreen in a robust stylish housing, S1 is fast, reliable and performs valid speed measurement from 600 m (1968 ft) away. S1 has an internal and an external battery and can be safely transported in its rugged outdoor carrying case. Ready for service – wherever you need it.

MAIN BENEFITS

• Improved traffic safety thanks to the deterring effect of monitoring
• Data package is evidence for traffic authorities
• Recorded data stored in a hidden partition
• Long range speed detection up to 600 meters
• Video based traffic enforcement
• Fully automatic operation
• Exceptional ANPR range with highly accurate ANPR results
• Fast and easy deployment: installed on location under 3 mins
• Anti-fraud / anti-corruption / no tamper design

KEY FEATURES

• Compact all-in-one design: camera, illuminator, GPS and laser integrated into a sturdy housing
• Laser beam measurement – impossible for drivers to detect if their speed is being monitored
• Works on a tripod or from inside patrol vehicle
• Time and location data (GPS coordinates)
• Laser, WI-FI, 4G, GPS
• Detects violations: bus lane or emergency lane use, ignoring a no-entry sign
The FreewayCAM IR-LIGHT series are extra illumination components available for ARH’s 2nd and 3rd generation cameras. These extra light sources can be used to achieve brighter overview images or increase the recognition accuracy for non-reflective license plates. The white LED version is available for container code recognition or color license plates.

It is possible to connect multiple synchronized units (up to seven) to one ARH camera.

### MAIN BENEFITS
- Synchronized flash with compatible ARH cameras
- Better ANPR accuracy in low visibility conditions
- Enables high quality images in low light environments
- Can be installed in a distance from the camera to avoid excessive reflections
- All-weather operation
- Low power consumption
- All settings available from the camera interface

### KEY FEATURES
- 25 pcs high quality IR LED (third generation), 18 pcs high quality IR LED (second generation)
- 3 different flash intensity modes
- The LED intensity may be set separately for multiple connected units (up to seven)
- Effective range for ANPR: 3 to 20 meters (10-66 feet) on non-reflective license plates and can reach up to 100 meters (328 feet) in case of reflective license plates
- Adjustable LED illumination time up to 950 μs
- IR 850nm wavelength
- IP67 rating

We stand behind our products’ quality with confidence. We are proud to offer you a uniquely long, 3-year manufacturer’s warranty for this product.
RECOGNITION CAMERAS & SENSORS

FreewayCAM RAD-AR
THIRD GENERATION

IMPROVES CAMERA RECOGNITION RATES

The separately available RAD-AR extension is a great way to boost the recognition rates and reduce the workload of your ANPR system. How? Without a trigger (a signal which initiates an ANPR event) the system must run the license plate recognition process on every single frame. This requires huge processing power. To resolve this problem, when RAD-AR senses a passing vehicle, it sends a trigger signal to the camera which marks the frames where the recognition process must run. Moreover, RAD-AR is the most efficient, hardware-based trigger accessory available for third generation cameras. As a result, the system will run faster and more efficiently than a system without a trigger.

The RAD-AR is delivered as a kit, containing the RAD-AR bracket so nothing else than common tools are required to mount it.

MAIN BENEFITS

• Improves camera recognition rates
• Reduces processing workload
• Non-intrusive installation
• Available for third generation ARH cameras

KEY FEATURES

• Most efficient single-unit image preselection by hardware
• Fully compatible with third generation ARH cameras
• Delivered as a kit – bracket and cable included
• Easily mounted with common tools
## COMPARISON CHART

<table>
<thead>
<tr>
<th>Model</th>
<th>ParkIT Camera</th>
<th>FreewayCAM</th>
<th>SmartCAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Code</td>
<td>ParkITCAM-01-1150, ParkITCAM-01-7250</td>
<td>FreewayCAM-02-1150, FreewayCAM-03-4354</td>
<td>SmartCAM-03-6450, SmartCAM-03-6652</td>
</tr>
<tr>
<td>Generation</td>
<td>second, second</td>
<td>third</td>
<td>third</td>
</tr>
<tr>
<td>Function of the second sensor</td>
<td>–, –</td>
<td>Advanced Vision</td>
<td>Overview, Advanced Vision</td>
</tr>
<tr>
<td>Resolution (primary + secondary sensor)</td>
<td>752 × 480, 2048 × 1536</td>
<td>752 × 480, 1440 × 1080</td>
<td>1440 × 1080, 2048 × 1536 + 1280 × 960</td>
</tr>
<tr>
<td>Typical frame rate (primary + secondary)</td>
<td>60, 30</td>
<td>60, 30 + 54</td>
<td>60, 60 + 30, 30 + 54</td>
</tr>
<tr>
<td>Optical zoom (primary camera)</td>
<td>11×</td>
<td>3.3×</td>
<td>11×, 3.3×</td>
</tr>
<tr>
<td>Image Buffer / Event Storage (approx.)</td>
<td>500 / –, 150 / –</td>
<td>500 / –, 1K / –</td>
<td>1K / 60K, 800 / 60K, 500 / 30K</td>
</tr>
<tr>
<td>Built-in LED illumination wavelength</td>
<td>850 nm, 850 nm / white</td>
<td>760 nm**, 850 nm</td>
<td>850 nm, 760 nm** / 850 nm</td>
</tr>
<tr>
<td>Optimal OCR range at ambient light</td>
<td>4 m – 20 m (13 feet – 65 feet), 4 m – 20 m (13 feet – 65 feet), 10 m – 20 m (33 feet – 65 feet)</td>
<td>4 m – 20 m (13 feet – 65 feet), 4 m – 20 m (13 feet – 65 feet), 10 m – 20 m (33 feet – 65 feet)</td>
<td>1.0 m – 4 m (3.3 feet – 13 feet), 1.0 m – 4 m (3.3 feet – 13 feet), 8 m – 15 m (26.2 feet – 49.2 feet), 8 m – 15 m (26.2 feet – 49.2 feet)</td>
</tr>
<tr>
<td>Built-in Vehicle Detection</td>
<td>–, –</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Built-in RADAR / LASER</td>
<td>–</td>
<td>optional RADAR</td>
<td>optional RADAR</td>
</tr>
<tr>
<td>Onboard ANPR</td>
<td>–</td>
<td>ANPR</td>
<td>ANPR+</td>
</tr>
<tr>
<td>On-board computer (independent CPU cores)</td>
<td>400 MHz, 500 MHz, 400 MHz</td>
<td>ARM 2×766 MHz, ARM 2×766 MHz + 4×1 GHz</td>
<td>ARM 2×766 MHz + Intel Atom 4×1.9 GHz</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>-20 °C – 70 °C (-4 °F – 158 °F), -45 °C – 70 °C (-49 °F – 158 °F)</td>
<td>-40 °C – 70 °C (-40 °F – 158 °F), -40 °C – 70 °C (-40 °F – 158 °F)</td>
<td>-40 °C – 70 °C (-40 °F – 158 °F)</td>
</tr>
<tr>
<td>IP Rating</td>
<td>IP65, IP67</td>
<td>IP67</td>
<td>IP67</td>
</tr>
<tr>
<td>Full remote access</td>
<td>YES, YES</td>
<td>YES (HTTPs), YES (HTTPs)</td>
<td>YES (HTTPs)</td>
</tr>
<tr>
<td>4G &amp; GPS</td>
<td>NO, NO</td>
<td>NO</td>
<td>optional</td>
</tr>
<tr>
<td>Optional accessories</td>
<td>Junction box for ParkIT camera, FreewayCAM RAD-AR Trigger, FreewayCAM IR-LIGHT 2, FreewayCAM junction box</td>
<td>IO cables, FreewayCAM RAD-AR Trigger, FreewayCAM IR-LIGHT 3, FreewayCAM junction box</td>
<td>IO cables, FreewayCAM RAD-AR Trigger, FreewayCAM IR-LIGHT 3, FreewayCAM junction box</td>
</tr>
</tbody>
</table>
### Recognition Cameras & Sensors

<table>
<thead>
<tr>
<th>SpeedCAM</th>
<th>MicroCAM M202</th>
<th>MicroCAM M402</th>
<th>ARH S1</th>
</tr>
</thead>
<tbody>
<tr>
<td>FHD Dual Plus</td>
<td>MicroCAM-02-4390 (IR850)</td>
<td>MicroCAM-02-4330 (IR850)</td>
<td>ARHCAMS1-01-3573</td>
</tr>
<tr>
<td></td>
<td>MicroCAM-03-6350 (IR850)</td>
<td>MicroCAM-03-4362 (IR850)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SpeedCAM-03-4562</td>
<td>MicroCAM-02-4450 (IR850)</td>
<td></td>
</tr>
</tbody>
</table>

**Function of the sensor – Advanced Vision – Overview**

**Resolution (primary + secondary sensor):**
- 752 × 480
- 2048 × 1536
- 752 × 480
- 1440 × 1080
- 2048 × 1536
- 1280 × 960
- 1440 × 1080
- 1440 × 1080
- 1920 × 1080

**Typical frame rate (primary + secondary):**
- 60
- 30
- 60
- 60
- 30
- 54
- 60
- 60
- 30
- 30
- 54
- 30
- 30
- 25

**Optical zoom (primary camera):**
- 11×
- 11×
- 3.3×
- 3.3×
- 30×

**Image Buffer / Event Storage (approx.):**
- 500 / –
- 150 / –
- 500 / –
- 1K / –
- 1K / 60K
- 800 / 40K
- 500 / 30K
- 800 / 60K
- 500 / 30K
- 800 / –
- 800 / 60K
- 1K / 15K

**Bulit-in LED illumination wavelength:**
- 850 nm
- 850 nm
- 850 nm / white
- 760 nm** / 850 nm
- 850 nm
- 850 nm
- 850 nm
- 850 nm
- 850 nm
- 850 nm
- 850 nm
- 850 nm
- 760 nm / 850 nm

**Optimal OCR range at ambient light:**
- 4 m – 20 m (13 feet – 65 feet)
- 10 m – 20 m (33 feet – 65 feet)
- 4 m – 20 m (13 feet – 65 feet)
- 10 m – 20 m (33 feet – 65 feet)
- 1.0 m – 4 m (3.3 feet – 13 feet)
- 8 m – 15 m (26.2 feet – 49.2 feet)
- 1.0 m – 4 m (3.3 feet – 13 feet)
- 8 m – 15 m (26.2 feet – 49.2 feet)
- 20 m – 150 m (65 feet – 500 feet)

**Built-in Vehicle Detection:**
- YES
- YES
- YES
- YES
- YES
- YES

**Built-in RADAR / LASER:**
- optional
- RADAR
- optional
- RADAR
- RADAR
- optional

**Onboard ANPR:**
- ANPR
- ANPR
- ANPR
- ANPR
- ANPR

**On-board computer (independent CPU cores):**
- ARM 2×766 MHz
- ARM 2×766 MHz
- ARM 2×766 MHz
- ARM 2×766 MHz
- ARM 2×766 MHz
- ARM 2×766 MHz
- ARM 2×766 MHz
- ARM 2×766 MHz
- Intel Atom 4×1.9 GHz

**Operating temperature range:**
- -20 °C – 70 °C (-4 °F – 158 °F)
- -45 ° – 70 °C* (-49 °F – 158 °F)*
- -40 °C – 70 °C* (-40 °F – 158 °F)*
- -40 °C – 70 °C* (-40 °F – 158 °F)*
- -40 °C – 70 °C* (-40 °F – 158 °F)*
- -40 °C – 70 °C* (-40 °F – 158 °F)*
- -40 °C – 50 °C (-4 °F – 122 °F)

**IP Rating:**
- IP65
- IP67
- IP67
- IP54

**Full remote access:**
- YES
- YES
- YES (HTTPs)
- YES
- YES (HTTPs)
- YES (HTTPs or WiFi)

**4G & GPS:**
- NO
- NO
- NO
- YES
- YES

**Optional accessories:**
- Junction box for ParkIT camera
- FreewayCAM RAD-AR Trigger,
- FreewayCAM IR-LIGHT 2,
- FreewayCAM junction box
- IO cables, FreewayCAM IR-LIGHT 3,
- FreewayCAM junction box
- Tripod mounting console, 5/10 m spare data cable

**Notes:**
- Technical specifications are subject to change without prior notice. This document does not constitute an offer.
- *internal temperature / ambient 40 – 55 °C (104 – 130 °F)
- **available as an OEM product
<table>
<thead>
<tr>
<th>KOD 768</th>
<th>KOD 768</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VEHICLE FRONT NUMBER PLATE</strong></td>
<td><strong>VEHICLE REAR NUMBER PLATE</strong></td>
</tr>
<tr>
<td>EU KOD 768</td>
<td>EU KOD 768</td>
</tr>
<tr>
<td><strong>DATA OBTAINED FROM THE INSTALLED OBU OF A VEHICLE</strong></td>
<td><strong>VEHICLE LICENCE PLATE NUMBER, VEHICLE AXLES, VEHICLE CLASS, VEHICLE WEIGHT LIMITS, EQUIPMENT OBU IDENTIFIER</strong></td>
</tr>
<tr>
<td><strong>LENGTH</strong></td>
<td><strong>WIDTH</strong></td>
</tr>
<tr>
<td>2,350 CM</td>
<td>355 CM</td>
</tr>
<tr>
<td><strong>NUMBER OF AXLES</strong></td>
<td><strong>SHAPE</strong></td>
</tr>
<tr>
<td>5</td>
<td>(J2, J3, J4)</td>
</tr>
<tr>
<td><strong>CERTIFIED SPEED DATA</strong></td>
<td></td>
</tr>
<tr>
<td>82 KM/H</td>
<td></td>
</tr>
</tbody>
</table>
Where do you need traffic data? License plates, vehicle speed, dimensions, number of axles, weight, journey time and more? ARH’s multi-sensor traffic data collection point is designed to monitor a wide range of vehicle attributes. The massive amount of traffic data is expertly handled by ARH’s combined data server and backend software – connected to one or multiple endpoints. The following examples include typical application areas where ARH’s Intelligent Traffic System solutions offer unique benefits.

**TYPICAL APPLICATIONS**

**WEIGH-IN-MOTION**
- Bus lane enforcement
- Level crossing monitoring
- Red light enforcement
- Waiting time detection (ELI)
- 100% Video based detection

**TRAFFIC ENFORCEMENT**
- Traffic enforcement
- Journey time monitoring

**TRAFFIC SECURITY MONITORING**
- Law enforcement

**LAW ENFORCEMENT**
- Parked vehicle enforcement

**TOLL COLLECTION**
- Toll collection

**AUTOMATED BORDER CONTROL**

**PARKING MANAGEMENT**
- Parking management

**VEHICLE CATEGORISATION**

**SMART CITY**
- Average speed measurement
- Stolen vehicle recovery
SMART CITY / SAFE CITY SOLUTIONS

OUR VISION OF SUSTAINABLE, SECURE AND AGILE METROPOLITAN MOBILITY

A key area in every smart city concept is efficient traffic management. If done right, it can have a great positive impact on urban growth, safety and environment. ARH’s non-intrusive intelligent traffic monitoring devices with on-board video analytics can build up an entire smart city system. You will get real-time, accurate information on the level of service, the ability to predict traffic trends, identify potential threats or know immediately when an incident has occurred.

BENEFITS OF ARH’S INTEGRATED SMART CITY SOLUTION

1. **Vehicle identification, traffic count and prediction of trends**
   ARH offers both fixed and portable sensors that detect and count each and every vehicle, read their license plate, identify their nationality, speed and category.

2. **Proactive traffic management**
   ARH provides the data to make smart decisions, show real-time traffic data as a heat map, predict congestion and warn of potential traffic incidents.

3. **On-street parking enforcement**
   Parking enforcement on busy city roads requires tremendous effort when done manually. ARH’s solution collects evidence and provides an automated way of reading plates on the move.

4. **Vehicle fingerprinting**
   Tampering with a license plate is a common offence that was once hard to detect. ARH’s system successfully addresses this problem by creating a fingerprint based on the physical characteristics of a vehicle and assigning license plate data to it. If the same LP appears on a different type of vehicle, the system will immediately spot the non-matching plate.

5. **Safe roads thanks to average speed measurement**
   Local drivers tend to remember where to push the brake when they reach fixed speed radars. However, average speed measurement cannot be deluded as it calculates the vehicle’s speed from journey time and distance between checkpoints.

On the following pages you will find further information on ARH’s intelligent traffic solutions that provide prosperity, safety and a more liveable urban environment.
PARKIT SYSTEM® APPLICATION WITH ANPR CAMERAS AND GRAPHICAL INTERFACE FOR PARKING AND ACCESS CONTROL

AUTOMATED, EXPANDABLE VEHICLE ACCESS CONTROL SYSTEM FOR ANY SIZE OF INSTALLATION

ParkIT System® is a complete end user system specifically developed for vehicle access control that is highly flexible and customizable for use from a small residential to an industrial, commercial or government installation of any size. The system can even be installed at multiple sites at once. The system components are designed and built together to achieve simple and easy integration into any access control environment without the need for programming or other specialized skills. ParkIT System® is easy to set up, simple to operate, and it permits separate user access and administration levels for straightforward operation and data management.

Components of the system are comprised of one or more ParkIT camera(s), the industry-leading CARMEN® ANPR/LPR engine, ParkIT® Application software and customizable graphical management and user interface (GMI/GUI) for all levels. The entire secure system is accessible through thin client or other (even mobile) IP-based connections.

NEW! As of September 2018, ParkIT System® is available as a software module prepared to cooperate with 3rd party cameras.

MAIN BENEFITS

- Fast automated or predetermined vehicle access – with a powerful reporting module
- Simple ANPR/LPR-based access permission without key, card or code
- Easy installation, straightforward IP connection
- Uncomplicated graphical management and user interface

KEY FEATURES

- Unlimited expandability from 1 to even 1000 access points
- Customizable roles at 3 levels (user, admin, developer)
- License plate-based security and surveillance functions
- Black- and whitelist management, statistical functions
- Multi-language GMI / GUI
- Available with pre-installed server option as well
TrafficSpot® is a variable sensing and monitoring system installed on a single, fixed detection point (i.e.: traffic gantry or pole) for accurate surveillance and data gathering. The standard list of components includes: radar, laser, overview camera, ANPR camera and industry-leading CARMEN® ANPR/LPR software.

The additional integrated processing unit intelligently computes all measured and detected data; marks each vehicle-related event with a timestamp, location and lane identification; bundles the gathered data in an encrypted package and sends it to a pre-designated central location. In addition to toll collection and traffic monitoring, the added modules and detection systems enable TrafficSpot® to perform traffic light and lane enforcements or weigh-in-motion functions as well.

**MAIN BENEFITS**

- All the necessary traffic information gathered and processed in a single location
- Ideal for toll collection; speed, lane and traffic light enforcement; weigh-in-motion
- Quick ROI
- Simple maintenance
- Scalability; cost effective installation and deployment

**KEY FEATURES**

- 100% TÜV certified vehicle detection via multiple detectors including radar trigger, virtual loop and laser trigger
- Purpose-built to gather valuable traffic data by way of a multi-sensor traffic monitoring gantry
- Secure data retention; continued functioning offline for at least five days
- IP-based communication
- Efficient data compression and upload
- Each necessary data set bundled in a single “event” package for ARH GLOBESSEY® Data Server (GDS)
- Modular scalability for individual needs – you pay only for what you need
- Monitoring and management of each components through ARH GLOBESSEY® Data Server
- Comprehensive data gathering regarding each passing vehicle (front/rear/overview/side images, ANPR results, vehicle dimensions, category, axle numbers, weight, speed, possible traffic violations, location/date/time information)
GLOBESSEY® DATA SERVER (GDS)

ROBUST AND FAST ITS DATA STORAGE MIDDLEWARE

Globessey® Data Server (GDS), is a combined data server and middleware, gathers information from different endpoints to make them available for various end user applications. The operators of GDS can manage the processes through a dedicated graphical interface, which is supplied along with the system, running in a web browser.

MAIN BENEFITS

• Optimized traffic speed, easier toll collection, safer roads
• Support of other traffic-related agencies (parking, law enforcement, border control, tariff, tax and statistics)
• User and developer friendly; fast ROI
• Useful outside traffic-related applications where complex image- and text-based data is mass processed (international borders, shipping ports, logistics, airports, etc.)
• Needs only a thin client at end user side

KEY FEATURES

• SUPPORTS ANY NUMBER OF ENDPOINTS
• Standard, customizable independent data packages from endpoints
• Central server connected via secure SSL
• Fast IP traffic in- and outflow with xml or binary communication

• HIGH AVAILABILITY: SUPER FAST AND SECURE DATA STORING
• Data redundancy through high-availability replication and clustered storage
• Highly efficient image storage
• Dynamic hardware scalability without maximum limits

• BUSINESS DOMAIN EXPERTISE
• Multiple business applications made possible by a single central backend, effectively and reliably
• Each data record is searchable, with custom-tailored access
• Wide selection of premade modules available (e.g.: stolen vehicle search)

• BUSINESS LOGIC WITH ITS OWN DATABASE
• Highly effective remote operation, reflects detailed conditions in real-time
• User-friendly display; maps and statistics
• Search; fast and flexible with preset automation, export functions
• Customizable GUI and search functions
### COMPARISON CHART

<table>
<thead>
<tr>
<th><strong>TRAFFICSPOT® LIGHT</strong></th>
<th><strong>TRAFFICSPOT® LIGHT</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(WITH SMARTCAM OR SPEEDCAM)</strong></td>
<td><strong>(WITH 2D SCANNER)</strong></td>
</tr>
<tr>
<td><strong>TRAFFICSPOT® PRO</strong></td>
<td><strong>(WITH 3D SCANNER)</strong></td>
</tr>
<tr>
<td><strong>Non-intrusive</strong></td>
<td>•</td>
</tr>
<tr>
<td><strong>Mounting options</strong></td>
<td>single gantry or pole</td>
</tr>
<tr>
<td><strong>Traffic situation</strong></td>
<td>free-flow</td>
</tr>
<tr>
<td><strong>Multi-lane management</strong></td>
<td>•</td>
</tr>
<tr>
<td><strong>Detection rate</strong></td>
<td>over 80 %</td>
</tr>
<tr>
<td><strong>Front and rear ANPR</strong></td>
<td>•</td>
</tr>
<tr>
<td><strong>ANPR accuracy</strong></td>
<td>up to 98.5 %</td>
</tr>
<tr>
<td><strong>Overview imaging</strong></td>
<td>optional</td>
</tr>
<tr>
<td><strong>Side-view imaging</strong></td>
<td>•</td>
</tr>
<tr>
<td><strong>Speed measurement</strong></td>
<td>optional (radar based)</td>
</tr>
<tr>
<td><strong>Traffic enforcement</strong></td>
<td>•</td>
</tr>
<tr>
<td>(red-light-, emergency/bus lane-, forbidden zone-, white line crossing-, wrong way/turn detectors)</td>
<td></td>
</tr>
<tr>
<td><strong>Vehicle categorization</strong></td>
<td>optional (5 categories)</td>
</tr>
<tr>
<td><strong>Vehicle categorization accuracy</strong></td>
<td>approx. 80 %</td>
</tr>
<tr>
<td><strong>Vehicle dimension measurement</strong></td>
<td>•</td>
</tr>
<tr>
<td><strong>Dimension measurement accuracy</strong></td>
<td>•</td>
</tr>
<tr>
<td><strong>Axle counting</strong></td>
<td>•</td>
</tr>
<tr>
<td><strong>WIM – Weigh-In-Motion</strong></td>
<td>•</td>
</tr>
<tr>
<td>(integrated into road pavement)</td>
<td>•</td>
</tr>
<tr>
<td><strong>WIM accuracy</strong></td>
<td>•</td>
</tr>
<tr>
<td><strong>DSRC</strong></td>
<td>•</td>
</tr>
<tr>
<td><strong>Onsite processing</strong></td>
<td>•</td>
</tr>
<tr>
<td><strong>Encrypted data storing at the site</strong></td>
<td>•</td>
</tr>
<tr>
<td><strong>Encrypted data forwarding</strong></td>
<td>•</td>
</tr>
<tr>
<td><strong>3rd party support</strong></td>
<td>•</td>
</tr>
<tr>
<td><strong>GDS compatibility</strong></td>
<td>•</td>
</tr>
<tr>
<td><strong>Device health monitoring</strong></td>
<td>•</td>
</tr>
<tr>
<td><strong>24/7 operation</strong></td>
<td>•</td>
</tr>
</tbody>
</table>

- : not included  
• : included
<table>
<thead>
<tr>
<th>Feature</th>
<th>TRAFFICSPOT® (WITH 2D SCANNER)</th>
<th>TRAFFICSPOT® PRO (WITH 3D SCANNER)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-intrusive</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Mounting options</td>
<td>single gantry</td>
<td>free-flow and stop-n-go</td>
</tr>
<tr>
<td>Traffic situation</td>
<td>free-flow</td>
<td>free-flow and stop-n-go</td>
</tr>
<tr>
<td>Multi-lane management</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Detection rate</td>
<td>over 95%</td>
<td>100%, TÜV certified</td>
</tr>
<tr>
<td>Front and rear ANPR</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>ANPR accuracy</td>
<td>up to 98.5%</td>
<td></td>
</tr>
<tr>
<td>Overview imaging</td>
<td>optional</td>
<td></td>
</tr>
<tr>
<td>Side-view imaging</td>
<td>optional</td>
<td></td>
</tr>
<tr>
<td>Speed measurement</td>
<td>optional (radar based)</td>
<td>optional (radar based)</td>
</tr>
<tr>
<td>Traffic enforcement (red-light-, emergency/bus lane-, forbidden zone-, white line crossing-, wrong way/turn detectors)</td>
<td>optional</td>
<td>optional (radar based)</td>
</tr>
<tr>
<td>Vehicle categorization</td>
<td>8+1 categories</td>
<td>28+1 categories</td>
</tr>
<tr>
<td>Vehicle categorization accuracy</td>
<td>approx. 96%</td>
<td>approx. 98%</td>
</tr>
<tr>
<td>Vehicle dimension measurement</td>
<td>width and height</td>
<td>width, height and length</td>
</tr>
<tr>
<td>Dimension measurement accuracy</td>
<td>approx. 10 cm</td>
<td>approx. 10 cm</td>
</tr>
<tr>
<td>Axle counting</td>
<td>optional (indirect or direct)</td>
<td></td>
</tr>
<tr>
<td>WIM – Weigh-In-Motion (integrated into road pavement)</td>
<td>optional</td>
<td></td>
</tr>
<tr>
<td>WIM accuracy</td>
<td>15 to 5 %</td>
<td></td>
</tr>
<tr>
<td>DSRC</td>
<td>optional</td>
<td></td>
</tr>
<tr>
<td>Onsite processing</td>
<td>•</td>
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ABOUT ARH

100,000+ LPR SYSTEMS

License Plate Recognition (LPR) – also known as Automatic Number Plate Recognition (ANPR) – is ARH’s flagship technology. The 2 key components of LPR systems are the LPR software, purpose-made to read vehicle license plates, and dedicated LPR cameras.

ARH’s flagship software product is the Carmen® ANPR engine trained in-house to reliably read all license plates in the world. Carmen’s cutting edge is its alphabet-independent operation of unrivalled speed and accuracy. Carmen® ANPR reads license plates from many image sources: still images as well as live or recorded video streams. It offers country-independent and alphabet-independent recognition of not only Latin characters, but also Arabic, Cyrillic, Chinese, Korean, Thai and many more alphabets.

We at ARH develop, manufacture and offer a broad range of purpose-built LPR cameras. For LPR-optimized imaging, purpose-built cameras yield far better results than general-purpose cameras. This is why ARH developed a line of dedicated plate recognition cameras – for fixed, portable and mobile use – designed with the entire process of LPR in mind: triggering, image capturing, image preselection and, optionally, onboard plate recognition.

License Plate Recognition is used excessively all over the world for plate-based toll collection, automated border control, traffic monitoring, traffic and speed enforcement, parking management, vehicle access control and many other application areas.

With hardware and software development in one hand, in-depth industrial expertise accumulated in the course of 28 years of in-house product development, we have:

- The potential to develop electronic, mechanical and optical systems and software;
- Our own manufacturing base to produce electronic and mechanical equipment as well as complete systems;
- Service potential – from installation through operation.

In other words, ARH can offer unrivalled benefits in License Plate Recognition.

60,000+ ID READER SYSTEMS

We design and deliver purpose-made ID scanners and passport readers that can read ALL identity documents in the world. ARH passport readers extract both printed and electronic data from official travel documents and national IDs including ID cards and driver’s licenses. A technologically more challenging task is detecting fake, forged or tampered ID documents – a process called verification or authentication. ARH’s passport readers perform identity document authentication within seconds by checking a range of document-specific security features in various wavelengths of light. Authentication includes analyzing data integrity, too: cross-checking the captured printed and electronic information in compliance with the latest and most advanced e-passport standards.

ID document reading is widely used all over the world for 24/7 Automated Border Control (ABC), e-gates, airline check-in systems, know-your-customer schemes in banking, hotel guest registration, physical access control systems and age verification in bars, casinos and the gaming industry.

With hardware and software development in one hand, field-tested innovative technology, in-depth industrial expertise accumulated in the course of 28 years of product development, we have:

- A team of over 200 engineers;
- Our own manufacturing base to produce electronic and mechanical equipment;
- The potential to develop electronic, mechanical and optical systems and dedicated OCR software.

In other words, ARH can offer unrivalled benefits in ID reader systems.
12,000+ SATISFIED PARTNERS

Many of ARH’s clients are system integrators creating LPR systems and ID reader systems – both of which are based on Optical Character Recognition (OCR). Read about these technologies here.

Beside OCR-based technologies, we have multiple other product lines. A key area in every Smart City concept is efficient traffic management. Intelligent Transportation Systems (ITS) can have a great positive impact on urban growth, safety and environment. ARH’s non-intrusive intelligent traffic monitoring devices with on-board video analytics deliver real-time, accurate information with the aim to streamline traffic and maximize urban infrastructure potentials.

Video analytics plays a great role in traffic enforcement by automatically recognizing traffic offences and assisting the work of traffic authorities with photo and video evidence records.

Smart CCTV detecting user-defined events is used for monitoring urban areas, sport stadiums, shopping malls, fleets of public transportation as well as logistics and manufacturing sites – not only as a means of proactive security management, but also as a new and untapped marketing tool. Intelligent video surveillance will never completely replace human workforce – but it can always ideally support personnel in their daily work with smart technology.

As a privately-owned company with headquarters in Budapest, Hungary, ARH has direct market presence in 140 countries and a network of 50 country-level sales representatives. We have:

- Multiple market-leading ARH products
- A team of over 200 engineers
- Product development potential – turning ideas into prototypes and serial production

Beside LPR systems and ID reading systems, our technology is used in ITS, plate-based vehicle access control, traffic enforcement based on video analytics and intelligent Video Management System or Smart CCTV systems.

In other words, ARH can offer unrivalled benefits – as proven by over 12,000 satisfied partners worldwide.
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CERTIFICATIONS

We are committed to delivering quality products and services that exceed customer requirements and expectations at all times, in an environment that supports and promotes continuous improvement.
Three ISO certificates recognize that ARH’s operation conforms to the highest international standards.

- **ISO 9001:2015**
  Quality management – manufacturing, sales, marketing and customer support.

- **ISO 14001:2015**
  Environmental management – ARH is committed to be a green company.

- **ISO 27001:2013**
  Information security management – protection of confidentiality, integrity and availability of sensitive data at ARH.

SOCIAL MEDIA

- [linkedin.com/company/adaptive-recognition](https://linkedin.com/company/adaptive-recognition)
- [youtube.com/arhungary](https://youtube.com/arhungary)
- [twitter.com/aracorpusa](https://twitter.com/aracorpusa)

MICROSITES

- [https://carmen.hu/](https://carmen.hu/)
- [https://carmen-go.com/](https://carmen-go.com/)
- [http://prmc.eu/](http://prmc.eu/)

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