market presence in 220+ countries worldwide

12,000+ satisfied partners

350+ employees

60,000+ ID scanning systems

100,000+ traffic systems
RECOGNITION SOFTWARE

SMART SURVEILLANCE

IDENTITY DOCUMENT READERS & BIOMETRICS

INTELLIGENT TRANSPORTATION SYSTEMS

RECOGNITION CAMERAS

OCR RESULTS:
- NUMBER PLATE: ARH 001
- NATIONALITY: EU-HUNGARY
- SPEED: 158 MPH / 254 KMH
- BLACKLIST: --- NO ---
- COLOR: BLUE METAL
- RECOGNITION TIME: 2019-01-12T15:19:21+03:00
RECOGNITION SOFTWARE
CARMEN® GO
CARMEN® ANPR
CARMEN® ADR
CARMEN® ACCR
CARMEN® DOT
CARMEN® UIC

RECOGNITION CAMERAS
PARKIT CAMERA
FREEWAYCAM
SMARTCAM
SPEEDCAM
CONTAINERCAM
ENFORCECAM
MICROCAM
S1
FREEWAYCAM IR-LIGHT
FREEWAYCAM RAD-AR

INTELLIGENT TRANSPORTATION SYSTEMS
PARKIT SYSTEM®
TRAFFICSPOT
GLOBESSEY® DATA SERVER (GDS)
SMART SURVEILLANCE
VIDEO SURVEILLANCE SYSTEM
INTELLIO IVS4
INTELLIO INITIO
INTELLIO VISUS
INTELLIO SOLUTIONS

IDENTITY DOCUMENT READERS & BIOMETRICS
COMBO SCAN
COMBO SCAN KIOSK
COMBO SMART
COMBO SMART KIOSK
COMBO SMART N
PRMC
SCANNER SOFTWARE
AFS 510

ABOUT ARH
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: 2019-01-12T15:19:21+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 types all over the within milliseconds, under extreme weather conditions, at speeds of up to 300 km/h (185 mph).
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 character 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

ADR (HAZMAT) CODE RECOGNITION

TRAFFIC ENFORCEMENT

TRAFFIC ANALYTICS

campus security

TOLL COLLECTION

AVERAGE SPEED MEASUREMENT

BORDER CONTROL

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 types all over the within milliseconds, under extreme weather conditions, at speeds of up to 300 km/h (185 mph).
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 character recognition engines offer unique benefits.
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 28 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 utilizing 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 and identifying the plate type 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 28 years of continuous research and 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 country and state information, (28000+ types differentiated globally), location of plate on the image, character size, the confidence level assigned to each character as well as the whole plate and an image with the recognized plate(s). 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.
GLOBAL LICENSE PLATE RECOGNITION SOFTWARE FOR TRAFFIC SOLUTIONS

CARMEN® FREEFLOW is the unlimited version of the ANPR product line. It is 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 accuracy 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 as a complementary or fallback solution. CARMEN® 5K/8K/11K is also 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 low density 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

<table>
<thead>
<tr>
<th>NUMBER PLATE</th>
<th>PARKING TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNX - 058</td>
<td>18h 47min</td>
</tr>
<tr>
<td>WTS - 402</td>
<td>08h 23min</td>
</tr>
<tr>
<td>GRW - 051</td>
<td>11h 11min</td>
</tr>
<tr>
<td>XFR - 453</td>
<td>01h 27min</td>
</tr>
<tr>
<td>LWE - 245</td>
<td>05h 07min</td>
</tr>
<tr>
<td>KOP - 983</td>
<td>03h 34min</td>
</tr>
<tr>
<td>KOP - 983</td>
<td>03h 34min</td>
</tr>
<tr>
<td>KOP - 983</td>
<td>03h 34min</td>
</tr>
<tr>
<td>KOP - 983</td>
<td>03h 34min</td>
</tr>
</tbody>
</table>
CARMEN® GO

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 28 years of experience, we have created the forward-thinking Carmen® GO, the plug and play ANPR solution. 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

<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>Available versions</td>
<td>QUAD</td>
<td>SINGLE / DUAL / QUAD</td>
</tr>
<tr>
<td>Supported operating systems</td>
<td>Windows, LINUX</td>
<td></td>
</tr>
<tr>
<td>Supported platforms</td>
<td>x86_32</td>
<td>x86_64</td>
</tr>
<tr>
<td>Suggested CPU cores</td>
<td>1–4</td>
<td>2 / 2 / 4</td>
</tr>
<tr>
<td>NNC required, available NNC types</td>
<td>USB (internal 4 pin or type A), PCIe card (X1), Mini PCIe</td>
<td></td>
</tr>
<tr>
<td>Available tools</td>
<td>SDK/API, license manager, engine manager (for Windows) ADI demo, AVI Demo *</td>
<td>SDK/API, license manager, engine manager (for Windows)</td>
</tr>
<tr>
<td>Supported programming languages</td>
<td>Windows and Linux: C/C++, Java Windows only: C#, Visual Basic .NET</td>
<td>Windows and Linux: C/C++, Java Windows only: C#, Visual Basic .NET</td>
</tr>
<tr>
<td>Engine update availability</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>
<tr>
<td>Capacity (images/day)</td>
<td>5760 / 8640 / 11250</td>
<td>unlimited**</td>
</tr>
<tr>
<td>Processing threads</td>
<td>4 parallel threads</td>
<td>1 / 2 / 4 parallel threads</td>
</tr>
<tr>
<td>Credit buffer</td>
<td>300 / 240 / 200</td>
<td>unlimited</td>
</tr>
<tr>
<td>Time for 4 new credits (sec)</td>
<td>60 / 40 / 30</td>
<td>–</td>
</tr>
</tbody>
</table>

## INTERFACE

<table>
<thead>
<tr>
<th>Input</th>
<th>Image (1 still image or 1 frame from a video stream)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td>Through SDK functions: NUMBER PLATE RESULTS (multiple if applicable), COUNTRY/STATE, PLATE TYPE, TIP LIST, COLOR, CONFIDENCE LEVEL, POSITION, etc.</td>
</tr>
</tbody>
</table>

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

** Depends on CPU speed, settings, engine type
CARMEN® ANPR/ADR SERVER | CARMEN® GO ANPR | CARMEN® ACCR/DOT/UIC
--- | --- | ---
32 / 64 / 128 / 256 | SINGLE / DUAL / QUAD | SINGLE / DUAL / QUAD
Windows, LINUX | Windows 10 | Windows, LINUX
x86_32 | x86_64 | x86_32 | x86_64 | ARMv7 or higher
32–256 | 2 / 4 / 6 | 2 / 2 / 4
NNC SERVER | USB (internal 4 pin or type A), PCIe card (X1), Mini PCIe | USB (internal 4 pin or type A), PCIe card (X1), Mini PCIe
SDK/API, license manager, engine manager(for Windows) ADI demo, AVI Demo * | Carmen GO service application, web interface, license manager, SDK for the stream output | SDK/API, license manager, engine manager(for Windows) ADI demo, AVI Demo *
one year from purchase included, optional subscription available on yearly basis | one year from purchase included, optional subscription available on yearly basis | one year from purchase included, optional subscription available on yearly basis
unlimited** | unlimited** | unlimited**
scaleable: 32 to 256 / RACK | 1 / 2 / 4 parallel threads | 1 / 2 / 4 parallel threads
unlimited | unlimited | unlimited

** interfaces:

- Input Image (1 still image or 1 frame from a video)
- Output
  - Through SDK functions: NUMBER PLATE RESULTS (multiple if applicable), COUNTRY/STATE, PLATE TYPE, TIP LIST, COLOR, CONFIDENCE LEVEL, POSITION, etc.
  - Direct output to FTP, CSV, DATA STREAM, INTERNAL DB and REST API. Output data: NUMBER PLATE RESULTS, Plate country/state, 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
TYPICAL APPLICATIONS

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.

TRAFFIC ENFORCEMENT

Parking revenue systems
TRAFFIC SECURITY MONITORING
Residential areas

LAW ENFORCEMENT
Company employee parking
Public parking lots

SPEED ENFORCEMENT
Shopping mall parking

BARRIER/GATE CONTROL

ADR (HAZMAT) CODE RECOGNITION
Visitor parking

VEHICLE ACCESS CONTROL

ANPR IMAGING

BORDER CONTROL

TOLL COLLECTION

CONTAINER/RAILWAY CODE RECOGNITION

AVERAGE SPEED MEASUREMENT
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, 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 an image-based trigger spotting a vehicle in the live view of the camera, then the ANPR 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

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: to control gate/barrier and to receive trigger signal
FreewayCAM
SECOND GENERATION

ALL PURPOSE ANPR/LPR CAMERA
DESIGNED FOR VEHICLE PLATE RECOGNITION AT ANY SPEED

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 300+ km/h (186+ 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
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 300+ km/h (186+ 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 – 28 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.
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 300+ km/h (186+ 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 300+ km/h (186+ 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

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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.

TRAFFIC SECURITY
MONITORING
BUS LANE
AND RED LIGHT
ENFORCEMENT
GAS STATION
VIDEO ANALYTICS
TRAFFIC MONITORING
LAW ENFORCEMENT
Onvif

© ARH
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.

**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

**MAIN BENEFITS**

- Small form factor enables patrol car rooftop-, roadside-, barrier- and gate-mounting
- Reads license plates while operating from a moving vehicle
- 3 MP, FullHD resolution
- 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
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 (video included) 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
FreewayCAM IR-LIGHT
SECOND AND THIRD GENERATION

ILLUMINATOR ACCESSORIES

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 image or increase the recognition range. 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.
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</td>
<td>FreewayCAM-02-1150</td>
<td>SmartCAM-03-6450</td>
</tr>
<tr>
<td>Generation</td>
<td>second</td>
<td>third</td>
<td>third</td>
</tr>
<tr>
<td>Function of the second sensor</td>
<td>–</td>
<td>Advanced Vision</td>
<td>Advanced Vision</td>
</tr>
<tr>
<td>Resolution (primary + secondary sensor)</td>
<td>752 × 480</td>
<td>2048 × 1536</td>
<td>1440 × 1080</td>
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<tr>
<td>Typical frame rate (primary + secondary)</td>
<td>60</td>
<td>30</td>
<td>60</td>
</tr>
<tr>
<td>Optical zoom (primary camera)</td>
<td>11×</td>
<td>11×</td>
<td>3.3×</td>
</tr>
<tr>
<td>Image Buffer / Event Storage (approx.)</td>
<td>500 / –</td>
<td>150 / –</td>
<td>1K / –</td>
</tr>
<tr>
<td>Built-in LED illumination wavelength</td>
<td>850 nm</td>
<td>850 nm</td>
<td>850 nm</td>
</tr>
<tr>
<td>Optimal OCR range at ambient light</td>
<td>4 m – 20 m (13 feet – 65 feet)</td>
<td>4 m – 20 m (13 feet – 65 feet)</td>
<td>4 m – 20 m (13 feet – 65 feet)</td>
</tr>
<tr>
<td>Built-in Vehicle Detection</td>
<td>–</td>
<td>–</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>On-board ANPR</td>
<td>–</td>
<td>–</td>
<td>ANPR</td>
</tr>
<tr>
<td>On-board computer (independent CPU cores)</td>
<td>400 MHz</td>
<td>500 MHz</td>
<td>ARM 2×766 MHz</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>-20 °C – 70 °C (-4 °F – 158 °F)</td>
<td>-45 ° – 70 °C (-49 °F – 158 °F)</td>
<td>-40 °C – 70 °C (-40 °F – 158 °F)</td>
</tr>
<tr>
<td>IP Rating</td>
<td>IP65</td>
<td>IP67</td>
<td>IP67</td>
</tr>
<tr>
<td>Full remote access</td>
<td>YES</td>
<td>YES</td>
<td>YES (HTTPs)</td>
</tr>
<tr>
<td>4G &amp; GPS</td>
<td>NO</td>
<td>NO</td>
<td>optional</td>
</tr>
<tr>
<td>Optional accessories</td>
<td>Junction box for ParkIT camera</td>
<td>IO cables, 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>
</tr>
</tbody>
</table>
### RECOGNITION CAMERAS & SENSORS

<table>
<thead>
<tr>
<th>SpeedCAM</th>
<th>ContainerCAM</th>
<th>EnforceCAM</th>
<th>MicroCAM M202</th>
<th>MicroCAM M402</th>
<th>ARH S1</th>
</tr>
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<tbody>
<tr>
<td>FHD Dual Plus</td>
<td>ContainerCAM</td>
<td>EnforceCAM</td>
<td>FHD Wide</td>
<td>FHD Wide</td>
<td>S1</td>
</tr>
<tr>
<td>SpeedCAM-03-4562</td>
<td>ContainerCam-03-5346</td>
<td>EnforceCAM-03-7880</td>
<td>MicroCAM-02-4330 (IR850)</td>
<td>MicroCAM-02-4430 (IR760)</td>
<td>ARHCAMS1-01-3573</td>
</tr>
<tr>
<td>third</td>
<td>third</td>
<td>third</td>
<td>second</td>
<td>second</td>
<td></td>
</tr>
<tr>
<td>Advanced Vision</td>
<td>Overview</td>
<td>–</td>
<td>–</td>
<td>Overview</td>
<td></td>
</tr>
<tr>
<td>2048 x 1536 + 1280 x 960</td>
<td>1280 x 960 + 1920 x 1080</td>
<td>2048 x 1536 or 2048 x 1152</td>
<td>2048 x 1536</td>
<td>1280 x 720 + 2048 x 1536</td>
<td></td>
</tr>
<tr>
<td>30 + 54</td>
<td>54 + 30</td>
<td>30</td>
<td>30</td>
<td>30 + 25</td>
<td></td>
</tr>
<tr>
<td>3.3×</td>
<td>3×</td>
<td>3.5×</td>
<td>–</td>
<td>30×</td>
<td></td>
</tr>
<tr>
<td>500 / 30K</td>
<td>500 / –</td>
<td>– / 5K+</td>
<td>800 / –</td>
<td>800 / 60K</td>
<td>1K / 15K</td>
</tr>
<tr>
<td>850 nm</td>
<td>white</td>
<td>850 nm</td>
<td>760 nm / 850 nm</td>
<td>850 nm</td>
<td>Mixed: 760 &amp; 850 nm</td>
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<tr>
<td>10 m – 20 m (33 feet – 65 feet)</td>
<td>2 m – 4 m (6.6 feet – 13 feet)</td>
<td>5 m – 50 m (16.5 feet – 165 feet)</td>
<td>1.0 m – 4 m (3.3 feet – 13 feet)</td>
<td>8 m – 15 m (26.2 feet – 49.2 feet)</td>
<td>8 m – 15 m (26.2 feet – 49.2 feet)</td>
</tr>
<tr>
<td>8 m – 15 m (26.2 feet – 49.2 feet)</td>
<td>20 m – 150 m (65 feet – 500 feet)</td>
<td>20 m – 150 m (65 feet – 500 feet)</td>
<td>5 m – 70 m (16.5 feet – 230 feet)</td>
<td>5 m – 100 m (16.5 feet – 328 feet)</td>
<td>5 m – 100 m (16.5 feet – 328 feet)</td>
</tr>
<tr>
<td>YES</td>
<td>–</td>
<td>Motion detection + intelligent traffic detectors</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>RADAR</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>LASER</td>
<td></td>
</tr>
<tr>
<td>ANPR+</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>ANPR</td>
<td>ANPR+</td>
</tr>
<tr>
<td>ARM 2×766 MHz + Intel Atom 4×1.9 GHz</td>
<td>ARM 2×766 MHz</td>
<td>ARM Cortex 1 GHz</td>
<td>ARM 2×766 MHz</td>
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<td>ARM 2×766 MHz + 4×1.9 GHz</td>
</tr>
<tr>
<td>IP67</td>
<td>IP67</td>
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<td>IP67</td>
<td>IP54</td>
<td></td>
</tr>
<tr>
<td>YES (HTTPs)</td>
<td>YES (HTTPs)</td>
<td>YES</td>
<td>YES (HTTPs)</td>
<td>YES (HTTPs or WiFi)</td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>NO</td>
<td>–</td>
<td>NO</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>IO cables, FreewayCAM IR-LIGHT 3, FreewayCAM junction box</td>
<td>IO cables, FreewayCAM RAD-AR Trigger, FreewayCAM IR-LIGHT 3, FreewayCAM junction box</td>
<td>FreewayCam IR-LIGHT 3</td>
<td>Tripod mounting console, 5/10 m spare data cable</td>
<td>Tripod, battery charger, external battery, seat adapter, soft case</td>
<td></td>
</tr>
</tbody>
</table>

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