

ADAPTIVE RECOGNITION

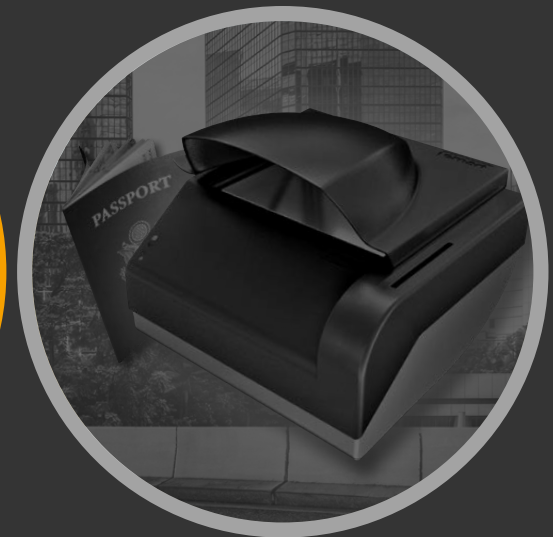
Image Recognition Products for Traffic, Security, ID Data Entry Automation and Biometric Identification



INTELLIGENT
TRANSPORTATION
SYSTEMS



RECOGNITION
SOFTWARE
& CAMERAS



IDENTITY DOCUMENT
READERS
& BIOMETRICS



market presence in
220+ countries worldwide



10,000+
satisfied partners



300+ employees



50,000+ ID scanning systems



80,000+ traffic systems

RECOGNITION SOFTWARE

SMART SURVEILLANCE



INTELLIGENT TRAFFIC SYSTEMS

IDENTITY DOCUMENT READERS & BIOMETRICS

RECOGNITION CAMERAS

OCR RESULTS:

 ARH 001

- 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

CARMEN[®] **GO**

CARMEN[®]

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



- NUMBER PLATE: 6006 JAA / ٦٠٠٦-٢١١
- VEHICLE TYPE: FERRARI
- NATIONALITY: KSA
- SPEED: 122 MPH / 196 KM/H
- BLACKLIST: --- NO ---
- COLOR: RED
- OWNER: AHMED ABANA
- RECOGNITION TIME: 2018-01-12T15:19:21+00:00

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.

ANPR RESULTS:



- NUMBER PLATE: ARH 001
- NATIONALITY: EU-HUNGARY
- RECOGNITION TIME: 2018-01-01T15:19:20+00:00



CARMEN® ANPR FREEFLOW LICENSE PLATE RECOGNITION SOFTWARE LIBRARY & SDK

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.

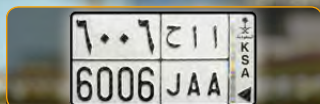
Other applications that can benefit from its fast and accurate automatic recognition capabilities include speed and journey time measurement, access control, parking management, bus lane enforcement, border control or gas station monitoring, etc. CARMEN® ANPR FreeFlow reads license plates from any image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

CARMEN®

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: 2017-05-12T15:19:21+03:00



- NUMBER PLATE: 6006 JAA / ٦٠٠٦ ج ا ا
- VEHICLE TYPE: FERRARI
- NATIONALITY: KSA
- SPEED: 122 MPH / 196 KMH
- BLACKLIST: --- NO ---
- COLOR: RED
- OWNER: AHMED ABANA
- RECOGNITION TIME: 2017-05-12T15:19:21+04:00

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.



TRAFFIC MONITORING



TOLLING SYSTEMS



JOURNEY TIME MEASUREMENT



ACCESS CONTROL



BUS LANE AND RED LIGHT ENFORCEMENT



TRAFFIC SECURITY MONITORING



VIDEO ANALYTICS



BORDER CONTROL



GAS STATION

CARMEN® ANPR 5K, 8K and 11K LICENSE PLATE RECOGNITION SOFTWARE LIBRARY & SDK

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



VEHICLE ACCESS CONTROL SYSTEMS



CORPORATE PARKING FACILITIES



PARKING MANAGEMENT



HOTELS OR RESIDENTIAL AREAS



AIRPORT AND HARBOUR LOGISTICS



BORDER CONTROL



GAS STATION



CARMEN® GO

LICENSE PLATE RECOGNITION CLOUD AND PLUG & PLAY ANPR

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

TOWARDS THE CLOUD

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



TRAFFIC
MONITORING



TOLLING
SYSTEMS



JOURNEY TIME
MEASUREMENT



ACCESS
CONTROL



BUS LANE
AND RED LIGHT
ENFORCEMENT



TRAFFIC
SECURITY
MONITORING



VIDEO
ANALYTICS



BORDER
CONTROL

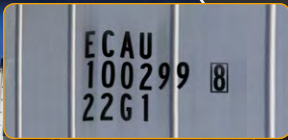


GAS
STATION



CARMEN® ACCR ISO CONTAINER CODE RECOGNITION SOFTWARE LIBRARY & SDK

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.



OCR RESULT:
ECAU 100299 8 22G1

ADR/HIN (KEMLER) CODE RECOGNITION CARMEN® ADR SOFTWARE LIBRARY & SDK

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.

33
1088

OCR RESULT:
33 1088

CARMEN® DOT USDOT (DOT) NUMBER RECOGNITION SOFTWARE LIBRARY & SDK

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.

US DOT 1045759

OCR RESULT:
1045759

UIC RAILWAY CODE RECOGNITION CARMEN® UIC SOFTWARE LIBRARY & SDK

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.



33 RIV
80 Q-PCM
792 0 077-4

OCR RESULT:
33-80-7920077-4

COMPARISON CHART

AVAILABLE VERSIONS	CARMEN® ANPR 5K / 8K / 11K	CARMEN® ANPR/ADR FREEFLOW
Available versions	QUAD	SINGLE / DUAL / QUAD
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		
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

CARMEN® ANPR/ADR SERVER	CARMEN® GO ANPR	CARMEN® ACCR/DOT/UIC
32 / 64 / 128 / 256	SINGLE / DUAL / QUAD	SINGLE / DUAL / QUAD
Windows, LINUX	Windows	Windows, LINUX
x86_32 x86_64 server cloud virtual machines	x86_32 x86_64	x86_32 x86_64 ARMv7 or higher
32-256	2 / 2 / 4	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 *
Windows and Linux: C/C++, Java Windows only: C#, Visual Basic .NET	-	Windows and Linux: C/C++, Java Windows only: C#, Visual Basic .NET
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**
scalable: 32 to 256 / RACK	1 / 2 / 4 parallel threads	1 / 2 / 4 parallel threads
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



RECOGNITION CAMERAS & SENSORS

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

LAW ENFORCEMENT

TRAFFIC SECURITY MONITORING

Company employee parking

Residential areas

Public parking lots

SPEED ENFORCEMENT

BARRIER/GATE CONTROL

Shopping mall parking

VEHICLE ACCESS CONTROL

ADR (HAZMAT) CODE RECOGNITION

ANPR IMAGING

BORDER CONTROL

Visitor parking

TOLL COLLECTION

AVERAGE SPEED MEASUREMENT

CONTAINER/RAILWAY CODE RECOGNITION



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

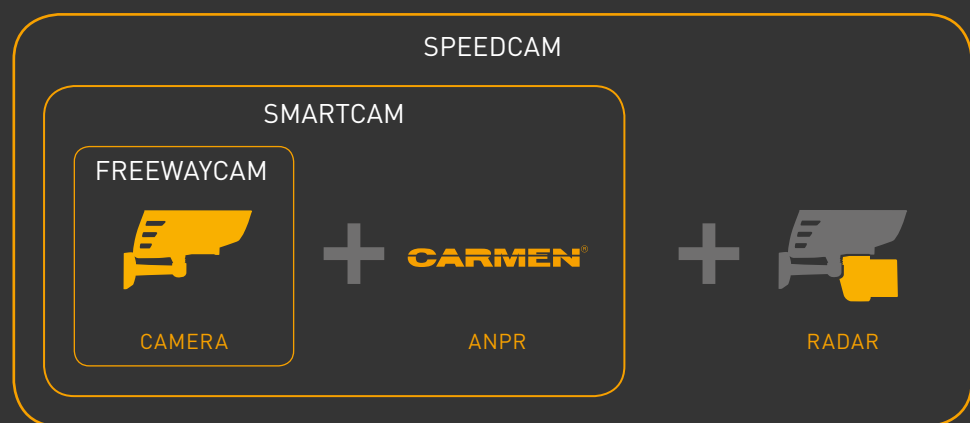
All of ARH's purpose-built ANPR cameras have integrated illumination – this is not the case for all manufacturers. ARH's range of LED illuminators include white or 2 different wavelengths of infrared light sources – preset to focus the maximum amount of light to the perfect distance for the actual camera. 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 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

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



PARKING
REVENUE
SYSTEMS



ACCESS
CONTROL



AIRPORT AND
HARBOR
LOGISTICS



TRAFFIC
SECURITY
MONITORING



BUS LANE
AND RED LIGHT
ENFORCEMENT



BORDER
CONTROL



COMMERCIAL
VEHICLE
APPLICATIONS

ONVIF

 **ARH**

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 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



TOLLING SYSTEMS



JOURNEY TIME MEASUREMENT



CONGESTION CHARGING



ACCESS CONTROL



AIRPORT AND HARBOR LOGISTICS



TRAFFIC SECURITY MONITORING



BUS LANE AND RED LIGHT ENFORCEMENT



BORDER CONTROL



PARKING SYSTEMS

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.



TOLLING SYSTEMS



JOURNEY TIME MEASUREMENT



CONGESTION CHARGING



ACCESS CONTROL



AIRPORT AND HARBOR LOGISTICS



TRAFFIC SECURITY MONITORING



BUS LANE AND RED LIGHT ENFORCEMENT



BORDER CONTROL



PARKING SYSTEMS

ONVIF



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.

• NUMBER PLATE: ٦٠٠٦٢١١ / 6006 JAA
 • VEHICLE TYPE: FERRARI
 • NATIONALITY: KSA
 • BLACKLIST: --- NO ---
 • COLOR: WHITE
 • RECOGNITION TIME: 2018-02-12T15:19:21+04:00



TOLLING SYSTEMS



JOURNEY TIME MEASUREMENT



GAS STATION



VIDEO ANALYTICS



TRAFFIC MONITORING



ACCESS CONTROL



TRAFFIC SECURITY MONITORING



BORDER CONTROL



BUS LANE AND RED LIGHT ENFORCEMENT

SpeedCAM
THIRD GENERATION

INTELLIGENT ALL-IN-ONE ANPR SPEED CAMERA A PROVEN STANDALONE TRAFFIC SOLUTION

SECONDARY SENSOR AND LENS FOR ENHANCED IMAGE AND ANPR+

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.

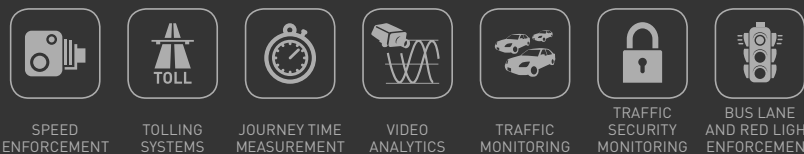
MAIN BENEFITS

- 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.



ONVIF

ARH

ContainerCAM

THIRD GENERATION

DESIGNED AND BUILT FOR ACCR
AUTOMATIC CONTAINER CODE RECOGNITION

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.

ONVIF



UIC
NUMBERS



HARBOUR
CARGO



SEMI
TRUCKS

EnforceCAM

THIRD GENERATION

INTELLIGENT TRAFFIC ENFORCEMENT CAMERA PURELY VIDEO BASED, ON-BOARD DETECTORS

TRAFFIC MONITORING CAMERA

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



MicroCAM

SECOND GENERATION

DAY AND NIGHT MOBILE ANPR CAMERA FOR TRAFFIC, PARKING AND LAW ENFORCEMENT

DASHBOARD/ROOFTOP ANPR CAMERA

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

ONVIF



TOLL
COLLECTION



PARKING
SYSTEMS



TRAFFIC
MONITORING



LAW
ENFORCEMENT



TRAFFIC
SECURITY



VIDEO
ANALYTICS



ON THE
MOVE

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



SPEED
ENFORCEMENT



TOLL
COLLECTION



BUS LANE
AND RED LIGHT
ENFORCEMENT



TRAFFIC
MONITORING



LAW
ENFORCEMENT



TRAFFIC
SECURITY



VIDEO
ANALYTICS



FreewayCAM IR-LIGHT

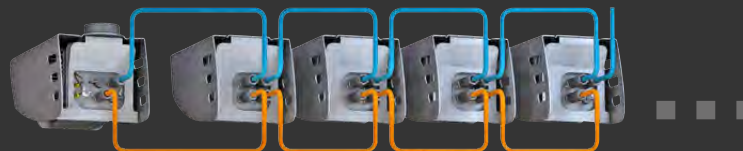
SECOND AND THIRD GENERATION

IR LIGHT SOURCE EXTENSION
TO MAXIMIZE ANPR/LPR RESULTS

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 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 μ s
 - 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.

FreewayCAM RAD-AR

THIRD GENERATION

RADAR EXTENSION HARDWARE TRIGGER ACCESSORY FOR ARH CAMERAS

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



RADAR
TRIGGERING



DELIVERED
AS A KIT



EASY
INSTALLATION

COMPARISON CHART

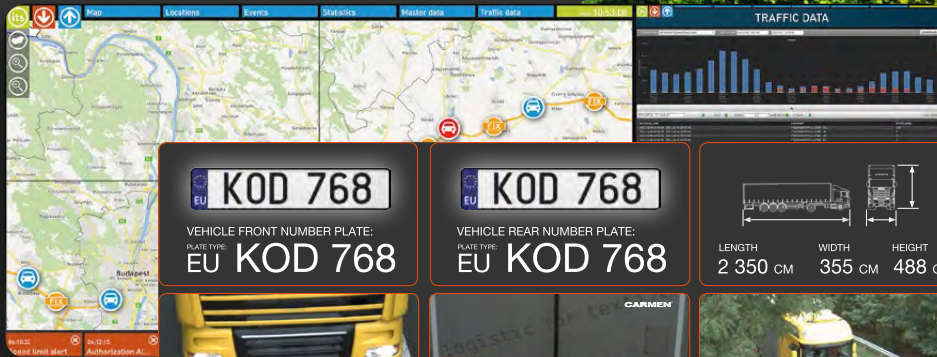
MODEL	ParkIT Camera		FreewayCAM			SmartCAM				
	WVGA	3C	WVGA	HDx	FHD DUAL	HDx	HDx Dual	HDx Dual Plus	FHD Dual Plus	
Production Code	ParkITCAM-01-1150	ParkITCAM-01-7250	FreewayCAM-02-1150	FreewayCAM-03-6350 (IR850) FreewayCAM-03-6354 (white)	FreewayCAM-03-4362 (IR850)	SmartCAM-03-6450	SmartCAM-03-6452	SmartCAM-03-6552 (IR850)	SmartCAM-03-4562	
Generation	second		second	third			third			
Function of the second sensor	-		-	Advanced Vision			-	Overview		Advanced Vision
Resolution (primary + secondary sensor)	752 × 480	2048 × 1536	752 × 480	1440 × 1080	2048 × 1536 + 1280 × 960	1440 × 1080	1440 × 1080 + 1920 × 1080		2048 × 1536 + 1280 × 960	
Typical frame rate (primary + secondary)	60	30	60	60	30 + 54	60	60 + 30		30 + 54	
Optical zoom (primary camera)	11×		11×			3.3×	11×		3.3×	
Image Buffer / Event Storage (approx.)	500 / -	150 / -	500 / -	1K / -			1K / 60K	800 / 40K		500 / 30K
Built-in LED illumination wavelength	850 nm		850 nm	850 nm / white	760 nm** / 850 nm	850 nm		760 nm** / 850 nm	850 nm	
Optimal OCR range at ambient light	4 m – 20 m (13 feet – 65 feet)		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)	
Built-in Vehicle Detection	-		-	YES			YES			
Built-in RADAR / LASER	-		optional RADAR				optional RADAR			
Onboard ANPR	-		-			ANPR		ANPR+		
On-board computer (independent CPU cores)	400 MHz	500 MHz	400 MHz	ARM 2×766 MHz			ARM 2×766 MHz + 4×1 GHz		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)*		
IP Rating	IP65		IP67			IP67				
Full remote access	YES		YES	YES (HTTPs)			YES (HTTPs)			
4G & GPS	NO		NO			optional				
Optional accessories	Junction box for ParkIT camera		FreewayCAM RAD-AR Trigger, FreewayCAM IR-LIGHT 2, FreewayCAM junction box	IO cables, FreewayCAM RAD-AR Trigger, FreewayCAM IR-LIGHT 3, FreewayCAM junction box			IO cables, FreewayCAM RAD-AR Trigger, FreewayCAM IR-LIGHT 3, FreewayCAM junction box			

RECOGNITION CAMERAS & SENSORS

SpeedCAM	MicroCAM M202		MicroCAM M402		ARH S1
	FHD Wide	FHD	FHD Wide	FHD	
FHD Dual Plus					S1
SpeedCAM-03-4562	MicroCAM-02-4390 (IR850) MicroCAM-02-4398 (IR760)	MicroCAM-02-4330 (IR850) MicroCAM-02-4338 (IR760)	MicroCAM-02-4490	MicroCAM-02-4430	ARHCAMS1-01-3573
third	second				second
Advanced Vision			-		Overview
2048 × 1536 + 1280 × 960	2048 × 1536				1280 × 720 + 2048 × 1536
30 + 54	30				30 + 25
3.3x	-				30x
500 / 30K	800 / -		800 / 60K		1K / 15K
850 nm	760 nm / 850 nm		850 nm		Mixed: 760 & 850 nm
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)
YES	YES				YES
RADAR	-				LASER
ANPR+	-		ANPR		ANPR+
ARM 2×766 MHz + Intel Atom 4×1.9 GHz	ARM 2×766 MHz		ARM 2×766 MHz + 4×1 GHz		ARM 2×766 MHz + 4×1.9 GHz
-40 °C – 70 °C* (-40 °F – 158 °F)*	-30 °C – 70 °C* (-22 °F – 158 °F)*				-20 °C – 50 °C (-4 °F – 122 °F)
IP67	IP67				IP54
YES (HTTPs)	YES (HTTPs)				YES (HTTPs or WiFi)
YES	NO				YES
IO cables, FreewayCAM IR-LIGHT 3, FreewayCAM junction box	Tripod mounting console, 5/10 m spare data cable				Tripod, battery charger, external battery, seat adapter, soft case



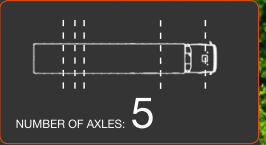
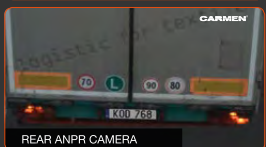
*internal temperature / ambient 40 – 55 °C (104 – 130 °F)
**available as an OEM product



KOD 768
 VEHICLE FRONT NUMBER PLATE:
 PLATE TYPE: EU
EU KOD 768



KOD 768
 VEHICLE REAR NUMBER PLATE:
 PLATE TYPE: EU
EU KOD 768



DATA OBTAINED FROM THE INSTALLED OBU OF A VEHICLE
 VEHICLE LICENCE PLATE NUMBER, VEHICLE AXLES, VEHICLE CLASS,
 VEHICLE WEIGHT LIMITS, EQUIPMENT OBU IDENTIFIER



CERTIFIED SPEED DATA
82 KM/H

TYPICAL APPLICATIONS

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.

WEIGH-IN-MOTION

Waiting time detection (ELI)

Bus lane enforcement

TRAFFIC ENFORCEMENT

TRAFFIC SECURITY MONITORING

Red light enforcement

Level crossing monitoring

100% Video based detection

LAW ENFORCEMENT

TOLL COLLECTION

AUTOMATED BORDER CONTROL

PARKING MANAGEMENT

Journey time monitoring

SMART CITY

SPEED ENFORCEMENT

Stolen vehicle recovery

CONGESTION CHARGING

VEHICLE CATEGORISATION

AVERAGE SPEED MEASUREMENT

SMART CITY / SAFE CITY SOLUTIONS

VIDEO ANALYTICS BASED TRAFFIC MONITORING
COMBINED WITH ANPR

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.

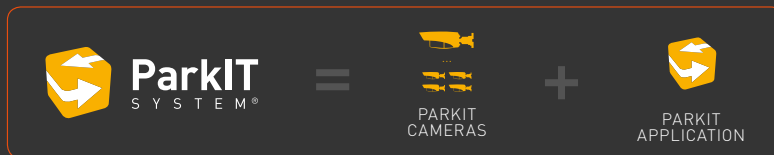
On the following pages you will find further information on ARH's intelligent traffic solutions that provide prosperity, safety and a more liveable urban environment.



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



COMPANY
EMPLOYEE
PARKING
LOCATIONS



PUBLIC
PARKING
LOTS



HOTELS,
RESORTS,
PUBS



RESIDENTIAL
AREAS



SHOPPING CENTER
TRUCK LOADING
AND PARKING AREAS



COMMERCIAL
LOCATIONS



MILITARY
LOCATIONS

TRAFFICSPOT®

MULTI-LANE FIXED TRAFFIC MONITORING AND DATA PROCESSING

SINGLE-GANTRY LANE CONTROLLER SOLUTION

<p>VEHICLE FRONT NUMBER PLATE: EU KOD 768</p>	<p>VEHICLE REAR NUMBER PLATE: EU KOD 768</p>	<p>LENGTH: 2350 CM WIDTH: 355 CM HEIGHT: 488 CM</p>	<p>NUMBER OF AXLES: 5</p>
<p>FRONT ANPR CAMERA</p>	<p>REAR ANPR CAMERA</p>	<p>OVERVIEW CAMERA IMAGE</p>	<p>SHAPE CATEGORY: (J2, J3, J4)</p>
<p>DATA OBTAINED FROM THE INSTALLED OBU OF A VEHICLE VEHICLE LICENCE PLATE NUMBER, VEHICLE AXLES, VEHICLE CLASS, VEHICLE WEIGHT LIMITS, EQUIPMENT OBU IDENTIFIER</p>		<p>SIDE SCANNING CAMERA</p>	<p>CERTIFIED SPEED DATA 82 KM/H</p>

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)



TOLL
COLLECTION



TRAFFIC
SECURITY
MONITORING



JOURNEY TIME
MEASUREMENT



SPEED
ENFORCEMENT



CONGESTION
CHARGING



BUS LANE
AND RED LIGHT
ENFORCEMENT

GLOBESSEY® DATA SERVER (GDS)

DATA SERVER + MIDDLEWARE
FOR ITS SOLUTIONS AND MASS DATA PROCESSING

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

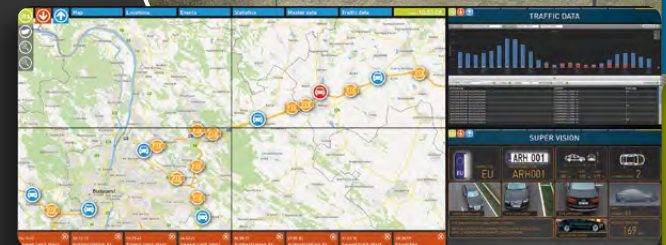
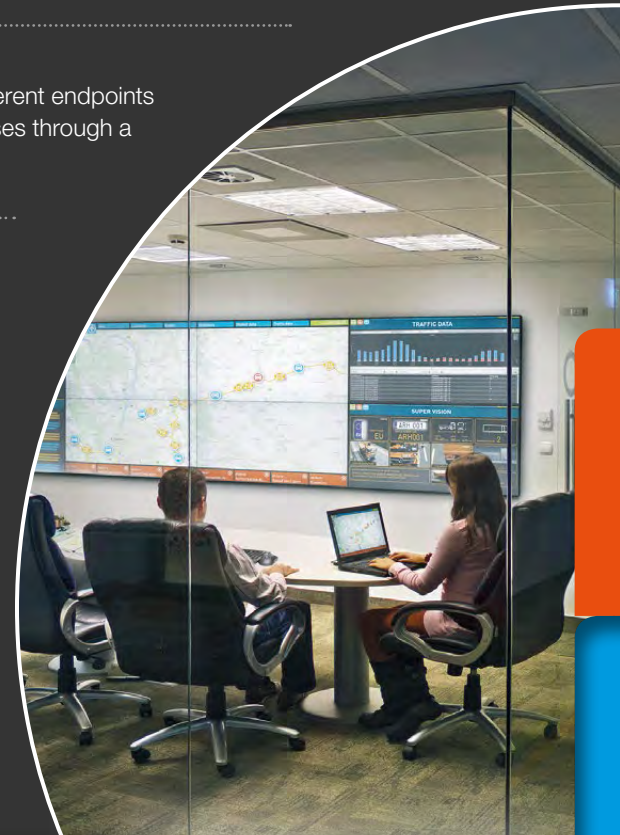
- Data redundancy through high-availability replication and clustered storage
- Highly efficient image storage
- Dynamic hardware scalability without maximum limits

• 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



TOLL
COLLECTION



TRAFFIC
SECURITY
MONITORING



JOURNEY TIME
MEASUREMENT



SPEED
ENFORCEMENT



CONGESTION
CHARGING



BUS LANE
AND RED LIGHT
ENFORCEMENT

COMPARISON CHART

TRAFFICSPOT® LIGHT
(WITH SMARTCAM OR SPEEDCAM)



TRAFFICSPOT®
(WITH 2D SCANNER)



TRAFFICSPOT® PRO
(WITH 3D SCANNER)



TRAFFICSPOT® LIGHT
(WITH SMARTCAM OR SPEEDCAM)

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

– : not included
• : included

TRAFFICSPOT®

	TRAFFICSPOT® (WITH 2D SCANNER)	TRAFFICSPOT® PRO (WITH 3D SCANNER)
Non-intrusive		•
Mounting options		single gantry
Traffic situation	free-flow	free-flow and stop-n-go
Multi-lane management		•
Detection rate	over 95%	100%, TÜV certified
Front and rear ANPR		•
ANPR accuracy		up to 98,5%
Overview imaging		•
Side-view imaging		optional
Speed measurement		optional (radar based)
Traffic enforcement (red-light-, emergency/bus lane-, forbidden zone-, white line crossing-, wrong way/turn detectors)		optional
Vehicle categorization	8+1 categories	28+1 categories
Vehicle categorization accuracy	approx. 96%	approx. 98%
Vehicle dimension measurement	width and height	width, height and length
Dimension measurement accuracy	approx. 10 cm	approx. 10 cm
Axle counting		optional (indirect or direct)
WIM – Weigh-In-Motion (integrated into road pavement)		optional
WIM accuracy		15 to 5 %
DSRC		optional
Onsite processing		•
Encrypted data storing at the site		•
Encrypted data forwarding		•
3rd party support		•
GDS compatibility		•
Device health monitoring		•
24/7 operation		•

– : not included
• : included

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 security 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.

CONTACT ARH



ARH INC. - HUNGARY, EU

ALKOTAS UTCA 41
BUDAPEST, 1123 HUNGARY
PHONE: +36 1 201 9650

☆ WWW.ARH.HU
✉ FLYER@ARH.HU



INNOVATION CENTER, EU

PERBAL, 2074 HUNGARY

☆ WWW.ARH.HU
✉ FLYER@ARH.HU



ARA CORP. - FLORIDA, US

28059 US HIGHWAY 19 NORTH
SUITE 203, CLEARWATER
FLORIDA 33761
PHONE: 727-724-4219

☆ WWW.ADAPTIVERECOGNITION.COM
✉ ARA000@ADAPTIVERECOGNITION.COM



ADAPTIVE RECOGNITION S.R.O. - BRNO, CZ

HOLANDSKÁ 878/2, 639 00
BRNO - ŠTÝŘICE, CZECH REPUBLIC
PHONE: +42 0 537 022 131

☆ WWW.ADAPTIVERECOGNITION.CZ
✉ MARTINA.SLACHOVA@ADAPTIVERECOGNITION.CZ



ADAPTIVE RECOGNITION PTE LTD. - SG

2 BALESTIER ROAD #04-665
SINGAPORE 320002
PHONE: +65 9681 1808

☆ WWW.ADAPTIVERECOGNITION.SG
✉ PHNG@ADAPTIVERECOGNITION.SG



ARH NORDIC

KOLLUNDVEJ 21,
DK-2770 KASTRUP, DENMARK
PHONE: +45 31 100 300

☆ WWW.ARHNORDIC.COM
✉ ATO@ARHNORDIC.COM

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://www.linkedin.com/company/adaptive-recognition)



[youtube.com/arhungary](https://www.youtube.com/arhungary)



twitter.com/aracorpora



MICROSITES

<https://carmen.hu/>



<https://carmen-go.com/>



<http://prmc.eu/>



Specifications are subject to change without prior notice. Copyright © 2019/Q1 ARH Inc.

All rights reserved. No part of this document may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language or computer language, in any form or by any means (electronic, mechanical, photocopying, recording or otherwise), without the express written permission of ARH Inc. CARMEN®, ParkIT®, FreewayCAM®, SmartCAM®, SpeedCAM®, Combo Scan®, Combo Smart® and PRMc® are trademarks or registered trademarks of ARH Inc.

All data is for information purposes only and not guaranteed for legal purposes. Information has been carefully checked and is believed to be accurate; however, no responsibility is assumed for inaccuracies. ARH and the ARH logo are registered trademarks of ARH Inc. All other brand product names are trademarks or registered trademarks or copyrights by their respective owners and are recognized.

DIGITAL VERSION:





2019/Q1