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

RECOGNITION CAMERAS & SENSORS

RECOGNITION SOFTWARE

IDENTITY DOCUMENT READERS & BIOMETRICS
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 26 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 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. Plate recognition
   The main software aspect of an ANPR/LPR system is reading the plate text from the captured images. This automated recognition has several steps, including image normalization and enhancement, detection of the vehicle. The final step is taken by the OCR algorithm that recognizes the individual characters. The 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, reading of multiple plates from one image, color recognition, state or country identification, accomplishing all of this extremely fast with high accuracy.

3. Data processing
   Besides the characters of the vehicle plate, CARMEN® also returns plenty of additional information, such as an image with the recognized plate(s), the confidence level assigned to each character as well as the whole plate, the identified country or state code, along with plate colors and position.
There are several possible difficulties that an ANPR system must be able to cope with. While most of the problems can be resolved by using advanced ANPR software, it is the primary task of the camera to solve some common challenges related to image capturing. Typical factors that pose difficulties for cameras in vehicle plate capturing are:

- high speed of vehicles that may result in motion blur
- varying ambient light conditions (total darkness, direct sunlight or shadows)
- overexposure (due to sunlight or headlight reflection on the plate)
- diversity of reflective and nonreflective plates

ARH has always been a pioneer in designing advanced camera solutions specially developed for ANPR applications that significantly reduce these difficulties in imaging and recognition.

Software and hardware design in one hand
As a leading software manufacturer, ARH knows exactly how to build dedicated ANPR cameras that, in seamless cooperation with ARH’s software, will produce the best recognition rates possible.

Easy installation, auto setup
ARH cameras include auto setup functions to keep optimal adjustments throughout the day. Setting up an ANPR camera is nice and easy. The built-in setup software is accessible via web browsers, through which adjustments can be made remotely at any time.

Intelligent IP cameras
ARH offers a wide range of IP camera models for all types of ANPR/LPR applications. Some camera models have onboard ANPR. The recognized information can then be easily transmitted over a wired/wireless network.

Multi-core processor
The latest ARH recognition cameras have multi-core processors: dual-core by default and quad-core for ANPR.
Vehicle detection (VehDet)
Vehicle identification is typically based on license plate recognition. However, there may be no front plate – or it was removed by criminals. The solution is ARH’s groundbreaking vehicle detection (vehdet) algorithm running aboard recognition cameras. The purely image-based algorithm is looking for the physical characteristics of vehicles, which means no lost event: the camera will take an image, even if the license plate is missing or damaged.

Non-stop operation
High performance LED illumination ensures capturing images optimized for ANPR – day and night. The LEDs of the camera will function reliably during the entire lifetime of the camera.

Still images or video stream
ARH cameras not only provide still images but also a video stream to ensure easy integration with any DVR system.

Low power requirement
The LEDs of the camera only operate when an image is captured. Low energy consumption helps to reduce system operating costs and protect the environment.
TYPICAL APPLICATIONS

ARH’s ANPR/LPR technology: CARMEN® engines and ARH imaging devices help you fight against unlawful activities, grant access, organize data in real time and make everyday life easier and safer through any traffic related application. Some typical utilizations and benefits are described below.

INTELLIGENT TRAFFIC SYSTEMS (ITS)

Toll collection
Integrating CARMEN® into open road systems allows automated toll collection in free flowing traffic.

Smart City – superior traffic monitoring potentials
CARMEN® helps intelligent traffic management in controlling complex traffic situations and improve traffic safety in the long run.

Congestion charging
CARMEN® allows automated identification and tolling of inner city drivers as they enter or leave a payment area.

WIM
Integrating CARMEN® into a weigh-in-motion (WIM) station facilitates the identification and registration of commercial vehicles as they drive through the measurement site.

HOME LAND SECURITY AND COMMERCIAL VEHICLE MONITORING

Border control
Used at numerous border control points, CARMEN® provides an efficient solution in the fight against terrorism. By monitoring and registering traffic in diverse applications, CARMEN® and ARH cameras can be valuable tools helping to protect your country and to preserve national security.
PARKING AND ACCESS CONTROL

Parking revenue systems
Integration of CARMEN® into any parking revenue system allows the setup of ticket-free solutions with fully automated operation.

Access control
CARMEN® can be used to identify and verify whether a certain vehicle is authorized to access a restricted area.

Airport and harbour logistics
All vehicle plates and container codes can be identified by using CARMEN® to improve security and to reduce waiting time at the gates.

Gas station security
CARMEN® is an efficient tool to fight fill-and-fly gasoline theft by identifying the vehicle of those attempting to drive off a gas station without paying for the fuel.

LAW ENFORCEMENT

Speed enforcement
By using instant speed measurement or section speed calculation between two or more metering points, CARMEN®, SpeedCAM and S1 can efficiently help identify speeding violations.

Bus lane – red light enforcement
CARMEN® is a highly efficient tool to help police stop violators driving in bus lanes or crossing red lights.

Average speed measurement
CARMEN® can easily identify the same vehicle at two or more points on the road, which the system can use for calculating travel time and average travel speed.
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 2-megapixel resolution camera is more than enough to cover one lane of the road for license plate recognition. Higher resolution than that, like 3-5-7 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. Also, ARH introduced the world’s first 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, 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 IO capabilities: control barrier and receive trigger signal
FreewayCAM
SECOND GENERATION

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

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 highspeed roads and traffic congestion. The GPS and 3G add-on modules are available.

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

Onvif
TOLL
JOURNEY TIME MEASUREMENT
CONGESTION CHARGING
ACCESS CONTROL
AIRPORT AND HARBOR LOGISTICS
TRAFFIC SECURITY MONITORING
BUS LANE AND RED LIGHT ENFORCEMENT
BORDER CONTROL
PARKING SYSTEMS
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 enhanced with two camera modules: a main FullHD sensor and an Advanced Vision second sensor. The main sensor delivers ARH’s usual high-standard ANPR output but now in FullHD resolution. 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 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.**
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 HD camera, which offers supreme ANPR imaging at a very competitive price. With the on-board Vehicle Detection, it keeps tracking of every vehicle even when the license plate is damaged or missing. In the middle of the range is our dual Overview camera. Its primary lens and sensor focus on the license plate, while the second Overview lens makes sure that you won’t have to take your ‘eyes’ off of the surroundings. At the other end of the range you can find our FHD DUAL PLUS Advanced Vision camera, which is one of our most powerful smart camera yet.

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

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

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

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

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

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

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

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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 codes or CSC plates 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. 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 ACCR
- Reads BIC codes and CSC plates
- 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 codes or CSC plates
- Built-in white LED illumination
- Motion detection analytics to maximize efficiency
- Dual lens setup with a second Overview lens

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EnforceCAM
THIRD GENERATION

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.
Automatic Number Plate Recognition technologies are on the move. Today’s markets demand hardware and software solutions that can automatically read license plates while the camera itself is in motion. Up until now, with no reliable way to trigger, the processing power needed for these applications ranged from immense to non-existent.

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

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

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

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

REDEFINES STANDARDS IN LAW ENFORCEMENT CAMERAS

A speed camera measures speed. ARH S1 does a lot more than that – it is an end-to-end solution with event monitoring. 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. The good news: S1 does all this on its own. Autonomous operation is possible from a patrol car or tripod, and as a practical feature, the camera can be accessed remotely. S1’s wide range of day and night vision is guaranteed by built-in IR lights and ARH’s very own state-of-the-art CARMEN® automatic number plate recognition (ANPR) engine.

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

MAIN BENEFITS

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

KEY FEATURES

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

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

**ILLUMINATOR ACCESSORIES**

- 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
- Continuous operating feature in case of third generation series
- 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 itself, an IO cable and a 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

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<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>SmartITCAM-01-3552</td>
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<tr>
<td>Generation</td>
<td>second</td>
<td>second</td>
<td>third</td>
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<tr>
<td>Function of the second sensor</td>
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<td>Advanced Vision</td>
<td>Overview</td>
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<tr>
<td>Resolution (primary + secondary)</td>
<td>752 × 480</td>
<td>1280 × 960</td>
<td>2048 × 1536 + 1280 × 960</td>
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<tr>
<td>Typical frame rate (primary + secondary)</td>
<td>60</td>
<td>45</td>
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<td>Optical zoom (primary camera)</td>
<td>11x</td>
<td>11x</td>
<td>3.3x</td>
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<tr>
<td>Image Buffer / Event Storage (approx.)</td>
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<td>150 / –</td>
<td>1K / –</td>
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<tr>
<td>IR Illumination wavelength</td>
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<td>Optimal OCR range at ambient light</td>
<td>4 m – 20 m (13 feet – 65 feet)</td>
<td>10 m – 20 m (33 feet – 65 feet)</td>
<td>4 m – 20 m (13 feet – 65 feet)</td>
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<tr>
<td>Built-in Vehicle Detection</td>
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<td>YES</td>
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<tr>
<td>Built-in RADAR / LASER</td>
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<td>optional RADAR</td>
<td>optional RADAR</td>
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<td>Onboard ANPR</td>
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<td>Operating temperature range</td>
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<td>3-year</td>
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<td>Optional accessories</td>
<td>FreewayCAM RAD-AR Trigger, FreewayCAM IR-LIGHT 2</td>
<td>IO cables, FreewayCAM RAD-AR Trigger, FreewayCAM IR-LIGHT 3</td>
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### RECOGNITION CAMERAS & SENSORS

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<tbody>
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<td>HD Dual Plus</td>
<td>HD Dual</td>
<td>EnforceCAM 3M</td>
<td>HD Wide</td>
<td>HD Wide</td>
<td>S1</td>
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<tr>
<td>SpeedCAM-03-3552</td>
<td>ContainerCam-03-5346</td>
<td>EnforceCAM-03-7880</td>
<td>MicroCAM-01-3310</td>
<td>MicroCAM-01-3330</td>
<td>ARHCAM-01-3573</td>
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#### Overview

<table>
<thead>
<tr>
<th>Overview</th>
<th>Advanced Vision</th>
<th>Overview</th>
<th>–</th>
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<th>Overview</th>
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<tbody>
<tr>
<td>1280 x 720 + 2048 x 1536 + 1280 x 960</td>
<td>1280 x 960 + 2048 x 1536 (4:3) or 2048 x 1152 (16:9)</td>
<td>2048 x 1536 (4:3) or 2048 x 1152 (16:9)</td>
<td>1280 x 720</td>
<td>1280 x 720 + 2048 x 1536</td>
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#### Camera Specifications

<table>
<thead>
<tr>
<th>Camera Type</th>
<th>Resolution</th>
<th>Resolution</th>
<th>Resolution</th>
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<tbody>
<tr>
<td>SpeedCAM</td>
<td>1920 x 1080</td>
<td>2048 x 1536</td>
<td>1920 x 1080</td>
<td>2048 x 1536</td>
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<tr>
<td>ContainerCAM</td>
<td>1280 x 960</td>
<td>1280 x 960</td>
<td>1280 x 960</td>
<td>1280 x 960</td>
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<tr>
<td>EnforceCAM</td>
<td>1280 x 720</td>
<td>1280 x 720</td>
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#### Optical Zoom

<table>
<thead>
<tr>
<th>Camera Type</th>
<th>Optical Zoom</th>
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<tbody>
<tr>
<td>SpeedCAM</td>
<td>11x</td>
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<tr>
<td>ContainerCAM</td>
<td>3x</td>
</tr>
<tr>
<td>EnforceCAM</td>
<td>3.5x</td>
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#### Image Buffer / Event Generation

<table>
<thead>
<tr>
<th>Camera Type</th>
<th>Image Buffer / Event Generation</th>
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</thead>
<tbody>
<tr>
<td>SpeedCAM</td>
<td>1st</td>
</tr>
<tr>
<td>ContainerCAM</td>
<td>2nd</td>
</tr>
<tr>
<td>EnforceCAM</td>
<td>3rd</td>
</tr>
</tbody>
</table>

#### Ambient Light Generation

<table>
<thead>
<tr>
<th>Camera Type</th>
<th>Ambient Light Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>SpeedCAM</td>
<td>2nd</td>
</tr>
<tr>
<td>ContainerCAM</td>
<td>3rd</td>
</tr>
<tr>
<td>EnforceCAM</td>
<td>3rd</td>
</tr>
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</table>

#### Image Buffer / Event Generation

<table>
<thead>
<tr>
<th>Camera Type</th>
<th>Warranty</th>
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</thead>
<tbody>
<tr>
<td>SpeedCAM</td>
<td>1-year</td>
</tr>
<tr>
<td>ContainerCAM</td>
<td>1-year</td>
</tr>
<tr>
<td>EnforceCAM</td>
<td>3-year</td>
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</table>

#### IP Rating

<table>
<thead>
<tr>
<th>Camera Type</th>
<th>IP Rating</th>
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</thead>
<tbody>
<tr>
<td>SpeedCAM</td>
<td>IP65</td>
</tr>
<tr>
<td>ContainerCAM</td>
<td>IP67</td>
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<tr>
<td>EnforceCAM</td>
<td>IP67</td>
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#### Thermal Range

<table>
<thead>
<tr>
<th>Camera Type</th>
<th>Thermal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>SpeedCAM</td>
<td>-40 °C – 70 °C (-40 °F – 158 °F)</td>
</tr>
<tr>
<td>ContainerCAM</td>
<td>-40 °C – 70 °C (-40 °F – 158 °F)</td>
</tr>
<tr>
<td>EnforceCAM</td>
<td>-40 °C – 70 °C (-40 °F – 158 °F)</td>
</tr>
</tbody>
</table>

#### Additional Features

<table>
<thead>
<tr>
<th>Camera Type</th>
<th>Additional Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>SpeedCAM</td>
<td>Radar, Laser, IP67</td>
</tr>
<tr>
<td>ContainerCAM</td>
<td>Radar, Laser, IP67</td>
</tr>
<tr>
<td>EnforceCAM</td>
<td>Radar, Laser, IP67</td>
</tr>
</tbody>
</table>

#### Technical Specifications

- *internal temperature / ambient 50-55 °C (122-130 °F)
- Technical specifications are subject to change without prior notice. This document does not constitute an offer.
CUSTOM MADE PRODUCTS

Still not found what you were looking for? We are keen to listen to the specific needs of our customers and ready to utilize our vast engineering expertise to create a customized product for you. By having all the essential know-how, hands-on-experience and our own manufacturing and fast prototyping facility, we can deliver custom-made products based on your requirements in a short time, meeting strict quality control standards.

PRODUCT DEFINED BY CLIENT

Not many independent developer-manufacturer companies remain active in this industry for 26 years – savvy, experienced, with their own production line – in short, having all the key ingredients for the development of highly specific products. ARH is one of the few such corporations.

OEM products have always been a prominent field for ARH and they will remain a high priority and source of self-esteem. So far, ARH has performed over 500 OEM assignments. Some of our off-the-shelf products have originally been developed in an OEM project.

KEYWORD: FLEXIBILITY

All OEM challenges are welcome, whether it is re-branding, changing the color scheme, or the complete redesign of a product from scratch or serial production.

1. ARH’s own SW and HW engineering teams have vast experience in creating prototypes.
2. The easy and cost-effective way to impact your potential client is impressive design. ARH’s own product design team will find the perfect form – innovative, functional and eye-catching combination.
3. Within tight deadlines, ARH can produce 3D-printed housing or even working prototypes.
4. Products are regularly tested in ARH’s own labs (EMC, radio and other).
5. Approved prototypes are soon turned into serial production models.

Tell us your problem and we’ll help you find a solution.
SOME EXAMPLES OF OUR LATEST CUSTOM MADE PROJECTS

1. ARH 25MP DUAL LENS ANPR SMART CAMERA

ARH 25 MP Ultra High Resolution Traffic Camera deploys its unmatched optical sensitivity to produce exceptional ANPR results and identify/recognize other optical marks, e.g. the visual characteristics – even punch holes – of toll stickers. The camera is sensitive to the smallest optical details, thanks to the exceptionally high 1.4 pixel = 1 millimeter resolution. The camera’s built-in laser beam has 2 roles: the high precision detection of passing vehicles (triggering) and vehicle categorization – based on physical dimensions. The captured images are processed by the industry’s best, state-of-the-art CARMEN® ANPR engine. The moving-part-free design ensures solid, reliable functioning in harsh environments like operating while mounted on a continuously vibrating gantry. Besides high detail images and ANPR, the camera is great for tasks including finding blacklist/stolen vehicles.

2. E-PASSPORT READER WITH AN EXTRA LARGE SCANNING WINDOW

ARH’s client wanted a stylish fully featured e-passport reader to scan landing cards, which are twice as large as a passport data page. Besides designing the appropriate lighting, the real challenge was to integrate and fine-tune the oversize RFID antenna. The relevant ISO and ICAO specifications had ID-1 antenna size (54 × 86 mm) in the new product chips had to communicate with an antenna 4.5 times larger than that. ARH’s professional design team worked hard to achieve what at first sight had seemed mission impossible. In the end, the reader got an extra ID face photo recognition camera, built-in reflection removal technology and a sleek design. The project turned out to be a success story in its 5th generation today, with more than 3000 units delivered.
ARH INC.

As an essentially innovation-driven company, the success of ARH lies in its strong focus on continuous research and development to create new technologies and in its ability to apply these achievements to meet continuously changing customer demands.

When you do business with ARH, you are backed by over two decades of expertise and hands-on experience in optical character recognition (OCR) and imaging technologies. The know-how of ARH is manifested in two main product lines:

- Automatic number plate / license plate recognition (ANPR/LPR) software and purpose-built cameras optimized for such applications
- ID scanners with high-end OCR and authentication software for the automatic processing of identity cards, driving licences and passports
- ARH’s Intellio brand offers complex surveillance systems featuring cameras and video management software
- Intelligent Traffic Solutions (ITS) offers integrated turnkey solutions with multi-sensor traffic monitoring as well as a scalable, flexible, robust and super-fast central system to store all records including visual data

The name ARH stands for Adaptive Recognition Hungary that reflects to the state-of-the-art OCR know-how of the company and its Hungarian origin.

ARH’S FACTS & FIGURES

- Established in 1991 as a privately held corporation
- Number of ANPR/LPR installations: over 80,000 worldwide
- Number of ID document scanner installations: over 30,000 worldwide
- In total, more than 2500 system integrators companies deployed ARH technology
- Five times awarded the “Technology Fast 50 Central Europe” prize by Deloitte

ARH VALUES

- Dedication to customers’ success, understanding customer needs
- Innovation that matters – continuous in-house development
- Trust and personal responsibility – excellent pre- and after sales service
CERTIFICATIONS

ARH is committed to provide uncompromising quality in all of its products at all times. ARH is certified by three ISO standards, ensuring that the company’s operation conforms to the highest international standards.

ISO 9001:2008
Quality management system that embraces the entire operation workflow: manufacturing, sales, marketing and customer support.

ISO 14001:2004
Environmental management system that helps ARH to minimize the negative environmental effect of its operations. ARH is committed to be a green company.

ISO 27001:2013
Information security management system that ensures the protection of confidentiality, integrity and availability of sensitive data at ARH.

GDPR
GDPR sets the bar for how we and our organisations look after the personal data of our customers, our staff and ourselves. As a responsible corporation, ARH takes great care of sensitive client information. Actively complying with the spirit of the law, ethical standards and national or international norms, ARH is GDPR ready.
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