ADAPTIVE RECOGNITION

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

RECOGNITION
CAMERAS & SENSORS

RECOGNITION
SOFTWARE

IDENTITY DOCUMENT
READERS & BIOMETRICS

ARH

RECOGNITION CAMERAS & SENSORS

RECOGNITION SOFTWARE

IDENTITY DOCUMENT READERS & BIOMETRICS

TYPICAL APPLICATIONS

ARH ANPR/LPR technology: CARMEN® and ARH imaging devices help you fight against unlawful activities, provide 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

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

Journey time 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.

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

PARKING AND ACCESS CONTROL

Parking revenue systems
Integration of CARMEN® into any parking revenue system allows the setup of ticket-free systems 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.

LAW ENFORCEMENT

Speed enforcement
By using instant speed measurement or section speed calculation between two or more points, CARMEN® and SpeedCAM 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 driving through red lights.

Traffic security monitoring
Fixed and mobile systems powered by CARMEN® ensure continuous monitoring of high traffic areas.

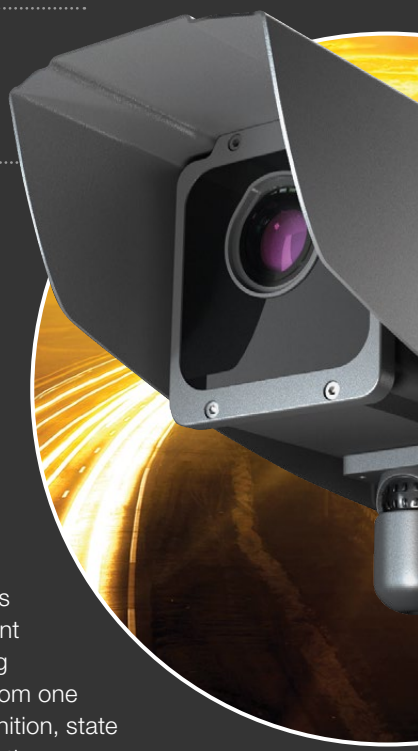
HOMELAND SECURITY AND COMMERCIAL VEHICLE MONITORING

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.

Commercial vehicle applications
CARMEN® can effectively help commercial organizations in a large number of applications such as gas station payments, hotel check-ins, and weigh station systems. It can also serve as a great marketing tool that logs frequent customers or users.

ARH

THE ANPR/LPR PROCESS



WHAT IS ANPR/LPR?

Automatic Number Plate Recognition/License Plate Recognition (ANPR/LPR) is also known as Car Plate Recognition (CPR) or Automatic Vehicle Identification (AVI). ARH's flagship ANPR/LPR technology is CARMEN®.

ANPR/LPR is a traffic surveillance method based on optical character recognition (OCR). A specific OCR algorithm processes captured images or video 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.

HOW DOES ANPR/LPR WORK IN PRACTICE?

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 that can be seamlessly integrated with any existing workflow.

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 as the quality of the captured images 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 that offers seamless compatibility to any ANPR/LPR system while boosting its capability to withstand every adverse environmental condition that may be encountered in the field.

2. Plate recognition

The main software aspect of an ANPR/LPR system is reading the plate text from the captured images.
This automated recognition is made of several steps, including image normalization and enhancement, detection of the vehicle plate and distinguishing of plate characters. The final step is taken by the OCR algorithm that recognizes the individual characters.

The CARMEN® ANPR/LPR is the world leader in ANPR software, and it's a result of over 22 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 at an extremely fast processing speed.

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. With all this information in hand, cars can be quickly allowed or denied entry to restricted parking areas based on a predetermined list. Law enforcement can also run the recognized plate against various national or international databases within seconds.

ARH ANPR/LPR CAMERAS

There are several possible difficulties that an ANPR/LPR system must be able to cope with. While most of the problems can be resolved by using advanced ANPR/LPR software, it is the primary task of the camera to solve some common challenges related to image capturing. Typical factors that pose difficulty for cameras in vehicle plate capturing are:

- high speed of vehicles may result in motion blur
- varying ambient light conditions (total darkness, direct sunlight or shadows)
- overexposure (due to sunlight or headlight glare)

ARH has always been a pioneer in designing advanced camera solutions that are specially developed for ANPR/LPR applications that significantly reduce these difficulties.

Easy installation, auto setup

The latest ARH cameras include auto setup functions making the proper adjustment very easy, even for users with no technical background. The built-in setup software is accessible via web browsers, through which adjustments can be made remotely at any time.

IP connectivity, built-in processing unit

ARH offers a wide range of IP camera models for all types of ANPR/LPR applications. Some camera models have a built-in processing unit running the ANPR/LPR inside the camera. The recognized information can be easily transmitted over an Ethernet network.

Day & night operation 24/7

High performance infrared (IR) LED illumination ensures capturing high quality images day and night. High MTBF LEDs deliver an exceptionally long service period before any maintenance is required.

Still images or MJPEG stream

The latest ARH cameras not only provide still images but also an MJPEG video stream to ensure easy integration with any DVR system.

All weather conditions

The cameras are up to IP67 rated, feature vandalism proof housing, and are manufactured using industrial components to ensure that the cameras hold up even in extreme weather conditions.

Low power requirement

Low energy consumption helps to reduce system operating costs and protect the environment.

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FreewayCAM

IP, ALL PURPOSE ANPR/LPR CAMERA
DESIGNED FOR VEHICLE PLATE RECOGNITION

ANPR/LPR CAMERA DEVELOPED FOR HIGH SPEED TRAFFIC APPLICATIONS

FreewayCAM is a family of modular IP cameras that are specifically designed for ANPR/LPR (vehicle plate recognition) in high speed traffic. FreewayCAM consistently captures high quality images in various environments; in glare from sunlight and reflections or in nighttime darkness; in temperatures ranging from freezing cold to direct sun in desert heat; in precipitation from rain, fog or snow and from measuring distances of 3 to 20 meters (9 to 60 feet). The unique optical module with auto-adjustable shutter time and real-time motion detection-based self-triggering ensures appropriate image capturing at virtually any speed – even up to 255 km/h (158 mph). Thanks to the solid-state internal components of FreewayCAMs, they flawlessly operate even in the most hostile environments. Due to cameras' modular design and various auxiliary components, they can perform a wide variety of specialized functions in complex ITS data point applications.

MAIN BENEFITS

- Capturing high quality images day or night, even vehicles at high speeds
- Increased recognition accuracy rates
- 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

- Built-in motion detection, accelerating hardware
- Auto day & night switch; adaptive settings to environmental conditions
- Automatic time synchronization (NTP)
- Adjustable image compression for maximum ANPR/LPR performance
- Still images (JPEG) and compressed live video streams (MJPEG)
- Powerful IR illumination with low power consumption

ONVIF

TOLLING SYSTEMS | JOURNEY TIME MEASUREMENT | CONGESTION CHARGING | ACCESS CONTROL | AIRPORT AND HARBOR LOGISTICS | TRAFFIC SECURITY MONITORING | BUS LANE AND RED LIGHT ENFORCEMENT | BORDER CONTROL

SmartCAM

INTELLIGENT ALL-IN-ONE CAMERA
WITH BUILT-IN ANPR/LPR SOFTWARE & SDK

ALL-IN-ONE CAMERA WITH INTEGRATED ANPR/LPR FOR ANY TRAFFIC SYSTEM

SmartCAM is an all-in-one IP camera, illuminator and integrated computer. The built-in computer within the camera makes this a standalone product. The camera itself is able to perform vehicle plate, container code, or USDOT code recognition and other applications or database checks. The device contains a built-in industrial PC with Windows or Linux operating system. In addition, the unit also has an embedded server that allows access via web browsers. With their integrated (Windows or Linux) computer, SmartCAMs can perform image acquisitions with digital signal processor (DSP), image compressions – with field-programmable gate array processor (FPGA) – and real-time image correction or enhancement tasks.
The solid-state internal components of SmartCAMs permit the devices to operate even in the most hostile environments. The cameras' modular design and various auxiliary components open the possibilities for autonomous operation and various specialized functions.

MAIN BENEFITS

- Simplifies applications, no need for complex external operating systems, appropriate even for low infrastructure systems
- Captures images of every vehicle, even at high speeds
- Frees personnel by automating a wide range of traffic monitoring functions
- Saves time; with large storage, only periodic downloading is necessary
- Constantly operates around the clock, switching automatically between day and night modes
- Simple installation that requires only power supply and standard IP connection

KEY FEATURES

- Combination of an ANPR/LPR camera, IR illumination, 3G modem, GPS, processor, communication in one unit and optional Doppler speed radar
- Proven ANPR/LPR results with included CARMEN® FreeFlow engine
- Accelerated image capturing with automatic time synchronization (NTP)
- Auto adaptation modifies camera settings as environmental conditions change
- Embedded web server, accessible via web browsers
- Traffic counting capabilities
- Traffic analysis with business intelligence option
- Industrial-grade vandalism proof housing that also withstands all weather conditions, with IP67 rating
- Ability to upload custom camera applications

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SpeedCAM

SPEED ENFORCEMENT CAMERA
WITH BUILT-IN ANPR/LPR SOFTWARE & SDK

SMART SOLUTION WITH INTEGRATED ANPR/LPR FOR SPEED ENFORCEMENT

SpeedCAM combines intelligent vehicle plate recognition and speed measuring radar to form a smart traffic sensor in a robust, single-sealed waterproof housing. The built-in smart camera provides all-in-one solution for intelligent traffic monitoring and plate recognition. SpeedCAM performs high quality image capturing (with the help of integrated illumination), vehicle plate recognition, automatic self-management and also allows remote access. All processing is done inside the unit: images, plate texts, time, vehicle moving direction and speeds are database-stored in SpeedCAM's memory for easy access through web servers.

MAIN BENEFITS

- Capturing high quality images of every vehicle
- Detecting and capturing speeders, even at high speeds of up to 250 km/h (155 mph)
- Reducing the need for time-consuming manual data entry through automated vehicle monitoring applications
- The new FPGA (field-programmable gate array processor) and the H.264 compression can provide up to ten times smaller video stream, needing less network traffic and storage space
- Simple installation that requires only power supply and standard IP connection

KEY FEATURES

- Combination of an ANPR/LPR camera, IR illumination, 3G modem, GPS, processor, communication in one unit and Doppler speed radar
- Continuous and accurate speed detection and image capturing in real time, up to 30 frames per second
- Highly accurate results with the CARMEN® FreeFlow engine installed
- Auto-adjusting for different weather conditions
- Optional business intelligence providing traffic analysis
- Embedded web server, accessible via web browsers
- Auto switch between day and night modes for 24/7 operation
- Industrial-grade vandalism proof housing that also withstands all weather conditions, with IP67 rating

SPEED ENFORCEMENT | TOLLING SYSTEMS | JOURNEY TIME MEASUREMENT | VIDEO ANALYTICS | TRAFFIC MONITORING | TRAFFIC SECURITY MONITORING | BUS LANE AND RED LIGHT ENFORCEMENT

Portable SpeedCAM

PORTABLE SPEED ENFORCEMENT CAMERA
WITH BUILT-IN ANPR/LPR SOFTWARE & SDK

SMART SOLUTION WITH INTEGRATED ANPR/LPR FOR PORTABLE SPEED ENFORCEMENT

Portable SpeedCAM combines intelligent vehicle plate recognition with speed measurement radar to form a smart traffic sensor in a single sealed, robust, and waterproof camera. The built-in smart camera provides an all-in-one solution for intelligent traffic monitoring and vehicle plate recognition. It includes high quality image capturing, built-in integrated illumination, processing unit for vehicle plate recognition, automatic self-control and remote access. All processing is done inside the unit: images, plate texts, time and vehicle speeds are stored in a database within the Portable SpeedCAM´s memory with easy access through a web-server.

MAIN BENEFITS

- Appropriate even for low infrastructure systems; no need for lane controller PC for ANPR/LPR or even communication (if 3G option is in use)
- Traffic counting, traffic analysis
- Simple installation; operates up to 16 hours on single charge
- Offering higher OCR accuracy

KEY FEATURES

- Built-in doppler radar and ANPR/LPR processing unit
- Continuous speed measurement and image capturing, max 30 FPS
- Vehicle classification and traffic counting capabilities
- World leading CARMEN® ANPR/LPR engine included (country-independent)

SPEED ENFORCEMENT | TOLLING SYSTEMS | JOURNEY TIME MEASUREMENT | VIDEO ANALYTICS | TRAFFIC MONITORING | TRAFFIC SECURITY MONITORING | BUS LANE AND RED LIGHT ENFORCEMENT

ARH

M202/402

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

EFFICIENT MOBILE ANPR SURVEILLANCE

The newly developed ARH CAM-M mobile camera series offers fast and reliable mobile ANPR/LPR performance with its low profile and small size that is ideal for discreet rooftop installation. Mounted on a patrol vehicle, the cameras are perfect for day and night all-weather operations. The devices' durable housing may be manually adjusted for solid performance in roaming parking and toll enforcement, or ANPR-based crime fighting from a stationary position or traveling at regular traffic speed.

MAIN BENEFITS

- Patrol car- (optional lightbar-), roadside-, barrier- and gate-mounting
- Quick and easy installation with single cable (POE+) connection
- Manual pan/tilt and external mounting on any vehicle
- Sideway image capturing of parking vehicle plates at regular traffic speed
- Flee-flow traffic image capturing
- Adjustable image compression
- Optimized for MobilSpot®

KEY FEATURES

- Intelligent IP camera with ANPR preselection (M202) and embedded ANPR (M402)
- IR illumination and automatic brightness control optimized for ANPR/LPR
- IP 67 rated weather-proof housing
- ONVIF certified video; JPEG still image / MJPEG output

ONVIF

TOLL COLLECTION | PARKING SYSTEMS | TRAFFIC MONITORING | LAW ENFORCEMENT | TRAFFIC SECURITY | VIDEO ANALYTICS

ARH S1

READY-TO-USE ROADSIDE ENFORCEMENT CAMERA
WITH ONBOARD ANPR/LPR AND COMMUNICATION

MORE THAN A STREET SMART SPEED CAMERA

A speed camera measures speed – in addition to that, ARH's S1 reads license plates, stores and transmits video and full-color still images of passing vehicles, recognizes traffic violation events, monitors several lanes at the same time and does all this on its own. Autonomous operation is possible from a patrol car or on a tripod, thanks to S1's battery and data storage and transmission technology.
S1 has a wide range of day and night vision, which is guaranteed by dual wavelength infrared illuminators, a dual camera and ARH's very own state-of-the-art CARMEN® number plate recognition engine. S1 is fast, reliable and detects vehicles from a distance equivalent to the length of 6 football fields. S1 can be safely transported in its rugged outdoor carrying case. Ready for service – wherever you need it.

MAIN BENEFITS

- Highly reliable real-time identification of each passing vehicle
- Data package of each passing event available online or offline, including full-color vehicle image and license plate
- Works on a tripod or from inside vehicle
- Laser allows pinpoint targeting: to effectively distinguish the speed and direction of vehicle in multi-lane traffic
- Laser beam trigger unseen by radar detectors
- Registers traffic violation events like speeding, illegal lane use or jumping a red light
- Fast and easy deployment: installed on location under 3 mins
- Anti-fraud / anti-corruption / no tamper design

KEY FEATURES

- Integrated ANPR/LPR engine
- 30× optical zoom camera with IR illumination
- Certified laser speed detection
- Built-in motion detection
- Communication, GPS, data processing inside the unit
- JPEG image/MJPEG and H.264 stream output, internal image buffer

TOLL COLLECTION | BUS LANE AND RED LIGHT ENFORCEMENT | TRAFFIC MONITORING | LAW ENFORCEMENT | TRAFFIC SECURITY | VIDEO ANALYTICS

ARH

ParkIT Camera

IP CAMERA FOR ACCESS CONTROL
DESIGNED FOR VEHICLE PLATE RECOGNITION

CAMERA FOR AUTOMATED ANPR-BASED ACCESS MANAGEMENT

ParkIT is a digital purpose made ANPR/LPR camera, optimized for slow speed or parking applications.

As a compact camera, the ParkIT is comprised of a resistant, single sealed waterproof enclosure with a single sealed IP65 (ingress protection) rated waterproof enclosure. The camera includes a synchronized infra red (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, barrier control functions (trigger in/out), and much more.

Access control (entry & exit) to restricted car park or vehicle storage areas, maximum stay car park management, pay-on-exit (POE) car park management, pay-on-foot (POF) car park management and security control or monitoring application areas can all benefit from the progressive capabilities of the ParkIT camera.

MAIN BENEFITS

- Capturing clearer day and night images to raise the accuracy rate of vehicle plate recognition
- Automating exits/entries in parking applications with barrier control capabilities (trigger in/out)
- Speeding up entry and exit times at parking areas
- Accelerating the image capturing with built-in motion detection
- Offering a simplified and user-friendly system for parking customers
- Facilitating 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
- Optional megapixel resolution and color image capturing
- JPEG and MJPEG stream output, for live and buffered images
- Multiple simultaneous image display
- Remote control and setup of camera settings

ONVIF

PARKING REVENUE SYSTEMS | ACCESS CONTROL | AIRPORT AND HARBOR LOGISTICS | TRAFFIC SECURITY MONITORING | BUS LANE AND RED LIGHT ENFORCEMENT | BORDER CONTROL | COMMERCIAL VEHICLE APPLICATIONS

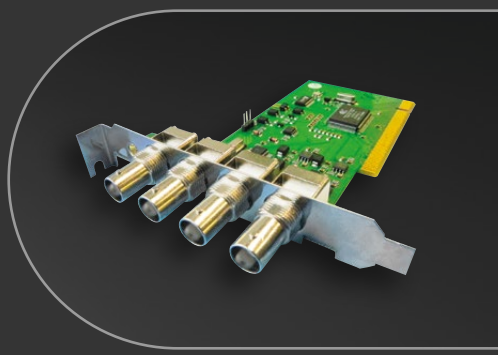
FreewayCAM^{RT} ANPR/LPR CAMERA

AND RADAR COMBO DEVELOPED FOR TRAFFIC SOLUTION

The radar-equipped FreewayCAM^{RT}, as a hardware-triggered IP camera, is ideal for zone-targeted traffic surveillance and automatic number plate recognition (ANPR). It is uniquely designed and built for motion-activated identification and superbly functions under various environmental conditions where other cameras fail to provide similarly positive results.
The attached Doppler radar, which can be configured through the camera's IP connection, is able to measure not just the target vehicle's speed but also its moving direction, dimensions, and works specifically as a trigger toward the camera and its built-in processing unit (PU).

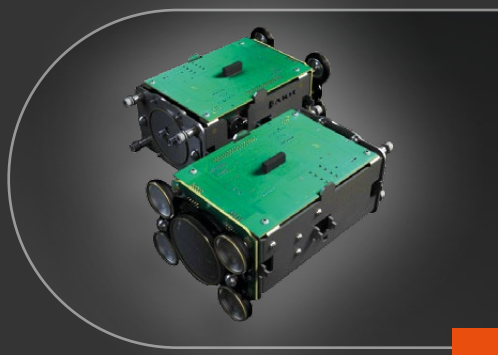
FXVD4 VIDEO CAPTURE CARDS

A 4-channel video capture card specifically developed for the CARMEN® systems. Apart from its primary function of digitising video signals, the chip communicates with the NNC (Neural Network Controller). This co-processor functions as integrated hardware protection for CARMEN® software. A watchdog function is another key feature of FXVD4. With its help the card can reboot computers in case of system crashes, which considerably improves the stability and reliability of stand-alone systems. The card is developed to handle both PAL and NTSC analog composite video signals, received through any of the four BNC input connectors. The switching times among the input channels of the card are 30 milliseconds, thus enabling the user to build high-speed sequential systems handling the signals of four video channels simultaneously.



OEM CAMERAS CUSTOMIZED SOLUTIONS

ARH is well known for its high quality OEM services, which go beyond simple relabeling. ARH is dedicated to meet all customer needs and ready to design modified product versions, as ARH has always done it in the past. Some examples for customisation include color or B&W sensors, IR or white light, wide range of LED selection (15-60 degrees), shield color modification for special environments or where the camera needs to be camouflaged. Our company has many years of experience and in-house knowledge, which delivers you the benefits from our highly innovative, cutting-edge technologies, product compliance with standards, best-in-class quality, high-level cost efficiency and long-term support. ARH can turn ideas into final products within a short time.



ARH

COMPARISON CHART

	ParkIT Camera		FreewayCAM				SmartCAM				
MODELL	WVGA	1.3C	WVGA	HD, HD760	HD W	FHD Dual, FHD Dual 760	HD	HD Dual	HD Dual Plus, HD Dual 760 Plus	FHD Dual	FHD Dual Plus
Generation	second		second			third	third				
Resolution (primary+secondary)	WVGA	1.3M	WVGA	HD		3M + 1.3M	HD	HD + FHD		3M + 1.3M	
Day / Night mode	BW / BW	Color / BW	BW / BW	Color / BW	Color / Color	Color / BW + BW	Color / BW	Color / BW + Color / BW		Color / BW + BW	
Typically frame rate	60	45	60	30		30	30				
Optical zoom (primary camera)	11×		11×			3.3×	11×			3.3×	
Image Buffer/Event Storage (approx.)	1 K / –	500 / –	1 K / –			500 / –	1 K / 60 K	1 K / 40 K	1 K / 40 K	500 / 50 K	500 / 30 K
Optimal ANPR range at ambient light	4 m – 20 m		4 m – 20 m			10 m – 25 m	4 m – 20 m			10 m – 25 m	
Optimal ANPR range at "0" LUX	4 m – 12 m		4 m – 20 m			10 m – 20 m	4 m – 20 m			10 m – 20 m	
Built in Vehicle Detection	–		–			YES	YES				
Built in RADAR / LASER	–		optional			optional	optional				
Built in ANPR	–		–			–	ANPR	ANPR+	ANPR	ANPR+	
Operating temperature range	-40 °C – 55 °C (-40 °F – 130 °F)	-40 °C – 40 °C (-40 °F – 104 °F)	-45 °C – 70 °C* (-49 °F – 158 °F)*			-40 °C – 70 °C* (-40 °F – 158 °F)*	-40 °C – 70 °C* (-40 °F – 158 °F)*				
IP Rating	IP 65		IP 67			IP 67	IP 67				
Weight (without bracket)	1.2 kg (2.7 lbs)		4.5 kg (9.9 lbs)			4.6 kg (10.1 lbs)	4.6 kg (10.1 lbs)				
Remote control	YES		YES			YES	YES				
Built in Brightness Control	YES		YES			YES	YES				
In the box	Camera, console, data cable, power cable, user cable, install guide		Camera, console, data cable, power cable, user cable, install guide			Camera, console, data cable, power cable, install guide	Camera, console, data cable, power cable, install guide				
Optional accesories	–		External RAD-AR Trigger, Illuminator 2			IO cables, external RAD-AR Trigger, Illuminator 3	IO cables, external RAD-AR Trigger, Illuminator 3				

RECOGNITION CAMERAS & SENSORS

	SpeedCAM		ContainerCAM	MicroCAM M202		MicroCAM M402		ARH S1
MODELL	HD Dual Plus	FHD Dual Plus	HD Dual	HD Wide	HD	HD Wide, HD760 Wide	HD, HD760	S1
Generation	third		third	third				first
Resolution (primary+secondary)	HD + FHD	3M + 1.3M	1.3M + FHD	HD				HD + 3M
Day / Night mode	Color / BW + Color / BW	Color / BW + BW	Color / BW + Color / BW	Color / BW				Color / BW + Color / BW
Typically frame rate	30		54	30				30
Optical zoom (primary camera)	11×	3.3×	3×	–				30×
Image Buffer/Event Storage (approx.)	1 K / 50 K	500 / 30 K	500 / –	800 / –	800 / 60 K	800 / –	800 / 60 K	no / 15 K
Optimal ANPR range at ambient light	4 m – 20 m	10 m – 25 m	2 m – 8 m	2 m – 5 m	10 m – 16 m	2 m – 5 m	10 m – 16 m	20 m – 150 m
Optimal ANPR range at "0" LUX	4 m – 20 m	10 m – 20 m	2 m – 4 m	2 m – 5 m	10 m – 16 m	2 m – 5 m	10 m – 16 m	20 m – 100 m
Built in Vehicle Detection	–		–	YES				–
Built in RADAR / LASER	RADAR		–	–				LASER
Built in ANPR	ANPR+		–	–		ANPR		ANPR+
Operating temperature range	-40 °C – 70 °C* (-40 °F – 158 °F)*		-40 °C – 70 °C* (-40 °F – 158 °F)*	-30 °C – 70 °C* (-22 °F – 158 °F)*				-20 °C – 50 °C (-4 °F – 122 °F)
IP Rating	IP 67		IP 67	IP 67				IP 54
Weight (without bracket)	6.4 kg (14.1 lbs)		4.5 kg (9.9 lbs)	1.6 kg (3.5 lbs)				10.2 kg (22.5 lbs)
Remote control	YES		YES	YES				YES
Built in Brightness Control	YES		YES	YES				YES
In the box	Camera, console, data cable, power cable, install guide		Camera, console, data cable, power cable, install guide	Camera, console + 5 m cable				Camera, carrying case, GPS with USB cable, touchscreen stylus, external battery cable, cigarette lighter adapter, ethernet cable, special mounting screw, user guide
Optional accesories	IO cables, Illuminator 3		IO cable, external RAD-AR Trigger, Illuminator 3	Tripod mounting console, 5/10 m spare data cable				Tripod, battery charger, external battery, seat adapter, soft case

*internal temperature / ambient 55 °C (130 °F)

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: 2017-01-12T15:19:21+00:00

CARMEN®

- NUMBER PLATE: 6006 JAA /٦٠٠٦-ح١١
- VEHICLE TYPE: FERRARI
- NATIONALITY: KSA
- SPEED: 122 MPH / 196 KMH
- BLACKLIST: --- NO ---
- COLOR: RED
- OWNER: AHMED ABANA
- RECOGNITION TIME: 2017-01-12T15:19:21+00:00

CARMEN® – The ANPR/LPR engine

CARMEN® is the brand name of ARH's ANPR/LPR technology. It refers to the CARMEN® software family that includes several ANPR/LPR software versions suitable for different application environments. CARMEN® offers a flexible API that ensures easy integration into any type of security system. CARMEN® is used by integrator companies as an OEM component in applications ranging from Intelligent Transportation Systems (ITS), law enforcement, parking systems, and traffic analysis/management systems. Each CARMEN® version uses the same ANPR/LPR engine that is regarded as the most accurate, flexible, and sophisticated ANPR/LPR engine in the world.

CARMEN® ANPR/LPR SOFTWARE VERSIONS

CARMEN® ANPR FreeFlow

The ideal choice for fast moving (up to 250km/h /155 mph) and static vehicle plates on busy or multi-lane roads or vehicle access control points, where high performance is a must. Works with any digital (IP) and analog camera.

CARMEN 5K, 8K and 11K

An affordable version of the CARMEN ANPR engine: for the same fields of use as the CARMEN ANPR Freeflow. Ideal choices for common user needs.

MAIN BENEFITS

- Exceptionally fast speed: processing of one image takes less than 10 ms*
- Supports both Windows and Linux platforms**
- Generic and multiple specific engines: Korean, Chinese, Arabic, Thai, etc.
- The market leader global ANPR/LPR engine

*Measured on EU plates using 2.6 GHz Dual Core CPU

**Supported input types (analog / digital / still images / MJPEG video streams) depend on the CARMEN® version

KEY FEATURES

- Flexible, user-friendly API, designed to ensure easy integration
- Country-, State-, Province-, and plate type recognition
- Recognition of plate color, even on some B&W images
- Hardware independent: works with any camera or still images**
- Auto-adjusts to the environment
- High tolerance of diverse plate sizes, syntaxes and distorted plate images

OEM CUSTOMIZED ENGINE

The neural network technology of CARMEN® gives the engine the ability to learn. ARH can meet various requests, such as reading aircraft registrations, vessel numbers, utility meters, bib numbers of sporting event participants and many other exciting demands with a branded or generic version of the software.

ARH

RECOGNITION SOFTWARE: GENERAL OVERVIEW

ARH designs, manufactures and sells both OCR software and integrated OCR devices for automatic recognition of vehicle plates, which automatically facilitate the processing of vehicle registration numbers (number plates) by computer systems.

Flexibility is the key word to describe the range of CARMEN® versions available.

First and foremost, CARMEN ANPR SW is a dedicated automatic license plate recognition engine. It is available as software or as part of a device/system – for details see the description of recognition cameras or Trafficspot.

Turnkey solution or engine only?

As end users, CARMEN® buyers may want to purchase a turnkey solution, where the tedious and time-consuming task of system integration has been done by engineers at ARH, who turned their expertise and experience into a smoothly running mechanism reading images and churning out data. ARH's integrated solutions – Globessey Data Server, Trafficspot and ParkIT System® – are described in the solutions section.

As system integrators, CARMEN® buyers may want to purchase the engine only – and incorporate it into their own license plate recognition technology or product.

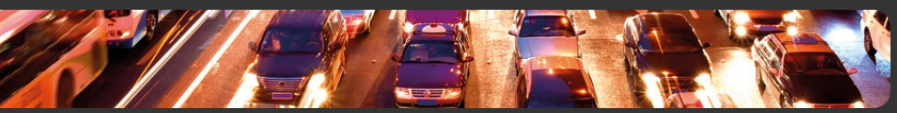
CARMEN's most important field of use, by far, is Automatic Number Plate Recognition (ANPR) also known as License PLate Recognition (LPR). For other uses, such as container code recognition, railway code recognition or hazardous material code reading, see the description of CARMEN® ACCR, CARMEN® ADR, CARMEN® DOT and CARMEN® UIC.

CARMEN's success has been proven by the approximately 5,500 working relationships that ARH Inc. maintains with systems integration clients across the globe, as well as the many thousands of CARMEN® ANPR/LPR systems operating worldwide. CARMEN® ANPR is an innovative identification technology for traffic surveillance, toll collection, traffic management and many other projects where accuracy, speed, and automation are essential objectives.

Due to its cutting-edge technology, high accuracy rate, adaptability and rapid image processing, CARMEN® ANPR is among the best of its class. In addition to recognizing Latin characters, the CARMEN® ANPR/LPR engine can read Arabic, Chinese, Cyrillic, and (with special training), any other types of number plates as well. The software can execute continuous vehicle plate reading even for speeds of up to 250 km/h (155 mph). This feature is especially important, for instance, in convicting speeding violations or within automatic toll collection projects, just to mention a few. CARMEN® FreeFlow is a core technology rather than a complete application, and it was specifically designed and developed to easily integrate into complex intelligent traffic applications. It is a flexible system that can be tailored to meet specific customer requirements through its comprehensive functional libraries.

THE CARMEN® ANPR/LPR PACKAGE CONTAINS THE FOLLOWING ELEMENTS

- Automatic vehicle plate recognition engine
- Neural Network Controller
- Functions libraries
- Demo and test applications
- Tutorial and sample programs both in executable and source code



Optional devices:

- To achieve the highest possible recognition rate, the image quality is a key factor. ARH offers professional quality cameras specifically designed for vehicle plate recognition. Different models are available to meet all the customer requirements.
- To achieve the best image quality and to avoid incompatibility issues, CARMEN® ANPR Freeflow can be delivered with a proprietary video capture card which also serves as a neural network controller. The system may be used on any existing PC system running under Windows or Linux.

An intelligent transportation system equipped with CARMEN® ANPR can provide:

- Flexible and automatic highway toll collection systems
- Better traffic flow
- Automatic access control point management
- Analysis of city traffic during peak periods
- Automation of weigh-in-motion systems
- Stolen vehicle recovery
- Effective law enforcement
- Highest efficiency for border control systems, etc.

CARMEN® ANPR FREEFLOW

LICENSE PLATE RECOGNITION
SOFTWARE LIBRARY & SDK

GLOBAL LICENSE PLATE RECOGNITION SOFTWARE FOR TRAFFIC

The CARMEN® ANPR software is the flagship of the CARMEN® Recognition Software family. CARMEN® ANPR is designed to read vehicle plates of automobiles. Registration plates are the most common and obvious means of motor vehicle identification worldwide. Traffic monitoring and security, tolling and congestion charging systems, speed and journey time measurement, access control, parking management, bus lane enforcement, border control or gas station monitoring are among many other systems that can benefit from fast and accurate automatic identification and recognition capabilities. CARMEN® ANPR reads vehicle plates from any image source extremely fast and with outstanding accuracy. It offers country-independent recognition as well as recognition of vehicle plates written, not only in the Latin characters, but also in Arabic, Cyrillic, Chinese, Korean, Thai and many more.

MAIN BENEFITS

- Saves time and energy in data entry, automating vehicle plate reading
- Decreases data entry errors with improved accuracy and recognition rates
- 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
- Ensures easy installation through SDK user-friendly API

*Special ANPR/LPR cameras are available for higher quality images and recognitions rates.

KEY FEATURES

- Automatic recognition of vehicle plates in free flowing traffic
- 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 characters, and many more
- Plate color recognition even on some B&W images

TRAFFIC MONITORING | TOLLING SYSTEMS | JOURNEY TIME MEASUREMENT | ACCESS CONTROL | BUS LANE AND RED LIGHT ENFORCEMENT | TRAFFIC SECURITY MONITORING | VIDEO ANALYTICS | BORDER CONTROL | GAS STATION

ARH

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

COUNTRY-INDEPENDENT LICENSE PLATE RECOGNITION SOFTWARE

System integrators have a choice to make according to the needs of their field of use: high volume or low volume engine? The CARMEN® FreeFlow version recognizes hundreds of thousands of plates per day. In applications where such a vast potential 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 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 credits is limited by the buffer size – hence the name 5K, 8K and 11K. In the new versions of CARMEN®, operation is dependent on 2 parameters: one is a time factor indicating the time lag between two credits; the other is buffer size determining the total number of images lined up in the pre-storage awaiting processing. Calculating with 3 images per vehicle, there are enough credits for 180-200-220 vehicles per hour. These CARMEN® versions are ideally used for vehicle access control in corporate headquarters or ANPR-based parking facilities, as well as in roads with low traffic density – where the SMART cameras installed have lower performance processors.

MAIN BENEFITS

- Saving time and energy in data entry by automating plate reading
- Reducing data entry errors through high accuracy and recognition rates
- 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

*Special ANPR/LPR cameras are available for higher quality images and recognitions rates.

KEY FEATURES

- Automatic recognition of analog/digital input plate images of vehicles in static 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
- Multiple-image processing with multiple sources for the same vehicle to ensure high recognition accuracy
- Plate color recognition even on some B&W images

VEHICLE ACCESS CONTROL SYSTEMS | CORPORATE PARKING FACILITIES | PARKING MANAGEMENT | HOTELS OR RESIDENTIAL AREAS | AIRPORT AND HARBOUR LOGISTICS | BORDER CONTROL | GAS STATION

A POPULAR FIELD OF USE: VEHICLE ACCESS CONTROL

Probably the most common ANPR/LPR applications are parking and access control. Both the CARMEN ANPR Freeflow and the CARMEN ANPR 5K/8K/11K versions of the engine are commonly used for this purpose.

The following plate recognition example will introduce a simple, but typical, ANPR/LPR system for access control. (Note that in most cases the ANPR/LPR system is only a part of an integrated access control system like ARH's ParkIT System®.)

The vehicle approaches the gate of the restricted area it wants to enter. There can be a barrier and a traffic light showing red as an indication to stop. An inductive loop is installed at the entrance in order to sense the arrival (and the presence) of the vehicle. There is also a CCTV camera mounted to monitor the entrance.

The inductive loop, the camera, the traffic light, and the barrier are all connected to a control PC. The PC is running an access control application, which coordinates the entire operation of the system (cameras, database, and barrier).
As the vehicle arrives, the inductive loop senses the event and signals to the PC: "car arrived".

The access control application processes and interprets the signal. The access control application – via driving a frame grabber card – captures the video signal of the camera and creates a digital picture of the vehicle in the memory (RAM) of the PC.

With the digitized picture of the vehicle in RAM, the access control application requests the vehicle plate reader module to analyse the digitized picture and read the plate number of the vehicle.

After reading the plate number, the ANPR/LPR module returns this information in ASCII to the access control application. The access control application takes the vehicle number in ASCII and passes it to a database module.

The database module checks the plate number against different permission lists, and returns an "access granted" or "access denied" flag. Based on the flag, the access control application decides whether or not to open the barrier and set the traffic light green.

The access control application may also record relevant information – such as date and time of access – in the database module in order to build an access diary. After the vehicle moves away from the gate, (either by passing through or leaving), the system gets ready to start the entire process again for the next arriving vehicle.

ARH

CARMEN® ACCR

ISO CONTAINER CODE RECOGNITION
SOFTWARE LIBRARY & SDK

The CARMEN® Automatic Container Code Recognition (CARMEN® ACCR) software is a dedicated version of the CARMEN® Recognition Software family. CARMEN® ACCR is created to extract and read the Container Codes of ISO containers. The ISO Container Code – defined by the ISO 6346 international standard – is the primary identification number of intermodal (shipping) containers.

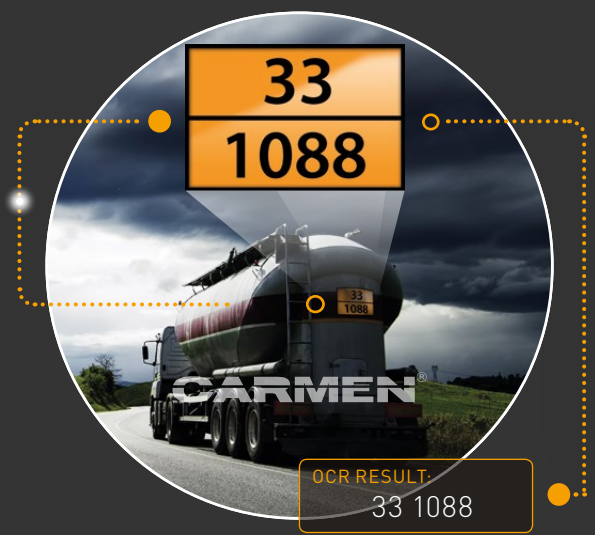
This code identifies the owner, the type/category of the container, as well as its unique serial number.

The capability of reading the ISO container codes of shipping containers makes harbor, port, and logistic environments much more intelligent.

The CARMEN® ACCR software can help build comprehensive databases of traffic movement, automate and simplify airport, railway, or harbor operations, as well as manage border control inventory and container surveillance systems.

CARMEN® ADR

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



The CARMEN® Automatic Dangerous Goods Recognition (CARMEN® ADR) software is a special version of the CARMEN® Recognition Software family.

CARMEN® ADR is developed to recognise and decipher the Hazard Identification Numbers (Kemler codes) of vehicles carrying hazardous materials. Reading of Hazard Identification Numbers (HIN) in a traffic monitoring or safety system can become highly automated, which helps maintain more safety on the roads, bridges, in tunnels, etc. 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. The CARMEN® ADR software offers great flexibility, as it is able to successfully recognize transport vehicle HIN codes from a variety of image sources. Manufacturers and integrators of various recognition systems will be able to receive HIN code readings with the highest efficiency and reliability.

CARMEN® DOT

USDOT (DOT) NUMBER RECOGNITION
SOFTWARE LIBRARY & SDK

The CARMEN® DOT software is a specialized version of the CARMEN® Recognition Software family. CARMEN® DOT is engineered to extract and read the DOT number of a CMV (Commercial Motor Vehicle) from captured images. All commercial vehicles have to have a unique identification number obtained from their respective Dept. of Transportation. This number is the USDOT (or DOT) number. CARMEN® DOT provides US trucking and other traffic systems with a highly accurate and responsive tool for performing automatic identification and tracking, as well as building of complex databases and inventory control systems. CARMEN® DOT enables traffic and security systems to automatically identify and verify commercial vehicles from a variety of image sources with the highest recognition accuracy rates available in the market today. The software is also capable of collecting audit, inspection, and compliance information.
CARMEN® DOT returns the DOT number, date, time, and location information to CMV systems, which can run the data against key state and national databases in real time.

CARMEN® UIC

UIC RAILWAY CODE RECOGNITION
SOFTWARE LIBRARY & SDK

The CARMEN® Railway Code Recognition software, (CARMEN® UIC) is a unique version of the CARMEN® Recognition Software family. CARMEN® UIC is created to extract and read the UIC numbers from railway wagons.
Much like commercial motor vehicles and ISO containers, railroad cars also have unique and internationally standardized identification numbers, which are called UIC numbers.
This identification number on a railroad wagon or coach is called the UIC number.
By recognising the UIC codes on train cars, CARMEN® UIC provides unparalleled accuracy and speed for railroad transportation applications. The software works with commercial railway systems that carry freight or passengers, and it can virtually eliminate the possibility of human error by facilitating automatic data entry and reporting for further processing. International and logistics operations can benefit significantly from implementing CARMEN® UIC which can read railroad car UIC codes from either an image or video signal with the highest accuracy possible. This enables railroad systems to access important data about the content of each freight car, along with dates and times, as well as location of the car.

ARH

COMPARISON CHART

CARMEN ANPR AND ADR VERSIONS

AVAILABLE VERSIONS	CARMEN 5K	CARMEN 8K	CARMEN 11K	CARMEN FREEFLOW	CARMEN FREEFLOW DUAL	CARMEN FREEFLOW QUAD
Supported operating systems	Windows, LINUX					
Supported platforms	x86_32 | x86_64 | ARMv7 or higher					
Other requirements	NNC					
Available NNC types	USB (internal 5 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)	5 760 (on four parallel threads)	8640 (on four parallel threads)	11520 (on four parallel threads)	unlimited**, on one thread	unlimited**, two parallel threads	unlimited**, four parallel threads
Credit buffer	300	240	200	unlimited	unlimited	unlimited
Time for new credit (sec)	15 (60/4)	10 (40/4)	7.5 (30/4)	0	0	0
INTERFACE						
Input	image (1 still image or 1 frame from a video)					
Output	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

MORE INFO:

Web

CARMEN® ANPR 5K/8K/11K

CARMEN® ANPR FreeFlow

ADR

SOFTWARE & SDK

CARMEN ISO CONTAINER, US DOT AND UIC VERSIONS

CARMEN ACCR	CARMEN ACCR DUAL	CARMEN ACCR QUAD
Windows, LINUX		
x86_32 | x86_64 | ARMv7 or higher		
NNC		
USB (internal 5 pin or type A), PCIe card (x1), Mini PCIe		
SDK/API, license manager, engine manager (for Windows), ACCR Demo (for images)		
Windows and Linux: C/C++, Java Windows only: C#, Visual Basic .NET		
one year from purchase included, optional subscription available on yearly basis		
unlimited**, on one thread	unlimited**, two parallel threads	unlimited**, four parallel threads
unlimited	unlimited	unlimited
0	0	0
set of images (multiple still images or frames from videos)		
best OCR RESULT, CONFIDENCE, TIP LIST, Check SUM (if available), etc.		

* For more TOOLS: check our SOLUTIONs or SMARTCAM product range
** Depends on CPU speed, settings, engine type

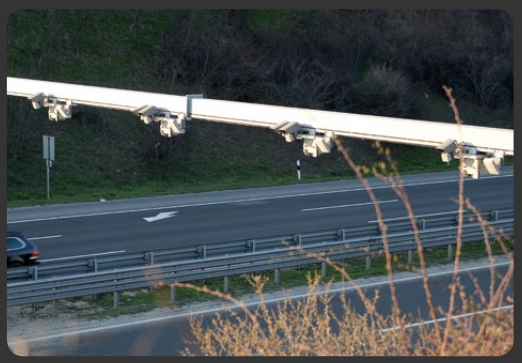
ACCR

DOT

UIC

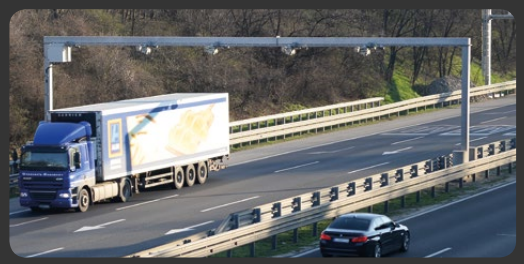
INTEGRATED SOLUTIONS

ARH recognizes the particular challenges of its partners, which they often face when trying to combine different software and hardware components from various sources. Integrated Solutions provide the straightforward answer to easily tackle such a task.



ARH INTEGRATED SOLUTIONS

More than two decades of expertise in developing a wide range of purpose-built devices and market-leading software has led ARH toward the natural progression at the present to offer its partners several unified solutions. As always, the collective know-how is strongly manifested in this new group of products, and it represents the latest technical innovations of the company.



BENEFITS OF ARH INTEGRATED SOLUTIONS:

1. SEAMLESS COMPONENT INTEGRATION

Since all the hardware and software components were specifically designed and manufactured to work together, ARH is also the best equipped to assure their optimal performance together.

2. FAST AND SIMPLE SETUP

By the time all the components arrive to their final destination, the devices are pre-installed and calibrated, so they only need final adjustments to meet local conditions and settings.

3. SINGLE-SOURCE PROVIDER

ARH designs, manufactures and provides customer support for all of its products.
The company's partners can always turn to a single trusted source with any question or request for assistance.

UTILIZED COMPONENTS

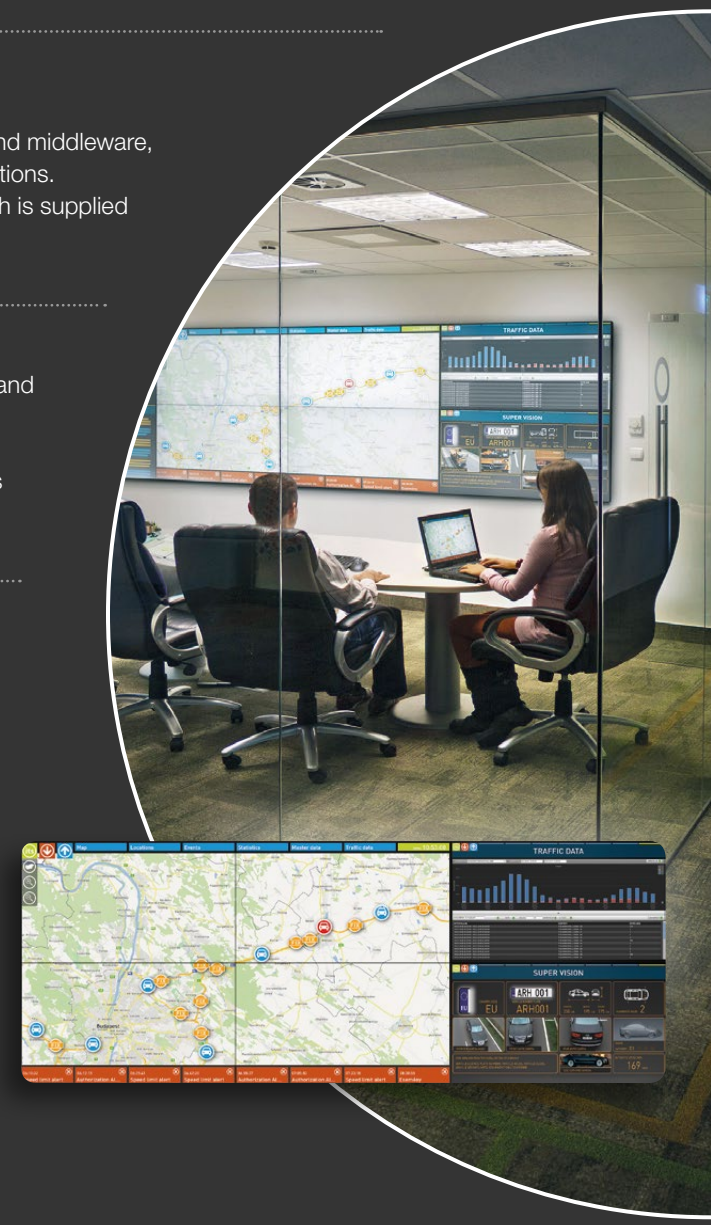
- **Hardware:** ARH purpose-builds all of its hardware locally and in an uncompromising quality. The company is certified by ISO 9001 standard.
- **Software:** CARMEN® engine and other ARH OCR solutions are the most recognized products in the world of license plate and document reading, and continue to return the best results in all their applications.
- **Data management:** Several of the company's latest integrated projects have proven to be breakthrough solutions in simplified data processing and management.
- **GUI, modules, SDK:** The added value in ARH Integrated Solutions comes from intuitive GUIs, several custom modules and flexible SDKs that assist in the connection and customization of end user applications.

GLOBESSEY® DATA SERVER

DATA SERVER + MIDDLEWARE
FOR ITS SOLUTIONS AND MASS DATA PROCESSING

AGILE AND VERSATILE SYSTEM WITH DEDICATED GUI FOR VARIOUS END USER APPLICATIONS

Globessey® Data Server (GDS), the intelligent traffic system of ARH in 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.



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.)

KEY FEATURES

- **DATA FROM 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

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

- **CONNECTION TO END USER APPLICATIONS**
- Simultaneous end user applications management with standard interface and SDK
- Wide selection of premade modules available (e.g.: stolen vehicle search)

- **GRAPHICAL USER INTERFACE (GUI) CHARACTERISTICS**
- 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

TOLL COLLECTION | TRAFFIC SECURITY MONITORING | JOURNEY TIME MEASUREMENT | SPEED ENFORCEMENT | CONGESTION CHARGING | BUS LANE AND RED LIGHT ENFORCEMENT

ARH

TRAFFICSPOT®

ROADSIDE TRAFFIC MONITORING AND DATA PROCESSING

SINGLE-GANTRY SOLUTION FOR FREE-FLOWING TRAFFIC MONITORING

TrafficSpot® is a variable sensing and monitoring system installed on a single, fixed detection point (i.e.: traffic gantry or bridge) for accurate surveillance and data gathering. The standard list of components includes: radar, laser, overview camera, DSRC antenna 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. Besides toll collection and traffic monitoring, the added camera 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% passing vehicle detection; three separate types of detectors (radar trigger, virtual loop, laser trigger)
- 98.5%+ (TÜV-audited) detection accuracy even during heavy traffic, limited visibility and at speeds of up to 250 km/h (155 mph)
- Purpose-built hardware
- 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
- Modular scalability for individual needs
- Monitoring and management of each components through ARH GLOBESSEY® Data Server

TOLL COLLECTION | TRAFFIC SECURITY MONITORING | JOURNEY TIME MEASUREMENT | SPEED ENFORCEMENT | CONGESTION CHARGING | BUS LANE AND RED LIGHT ENFORCEMENT

PARKIT SYSTEM®

SERVER, ANPR/LPR CAMERA, APPLICATION AND GRAPHICAL INTERFACE FOR PARKING AND ACCESS CONTROL

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

ParkIT SYSTEM® = SERVER + PARKIT CAMERAS + PARKIT APPLICATION

ParkIT System® is a complete end user access control and parking management system that is highly flexible and customizable for use from a small residential to any size of industrial, commercial or government installation – even 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, expandable server structure and customizable graphical management and user interface (GMI/GUI) for all levels. The entire secure system is encrypted and accessible through thin client or other (even mobile) IP-based connections.

MAIN BENEFITS

- Fast automated or predetermined vehicle access
- 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
- User-level management w/customizable interface
- License plate-based security and surveillance functions
- Black- and whitelist management
- Analytical and statistical functions
- Multi-language GMI / GUI

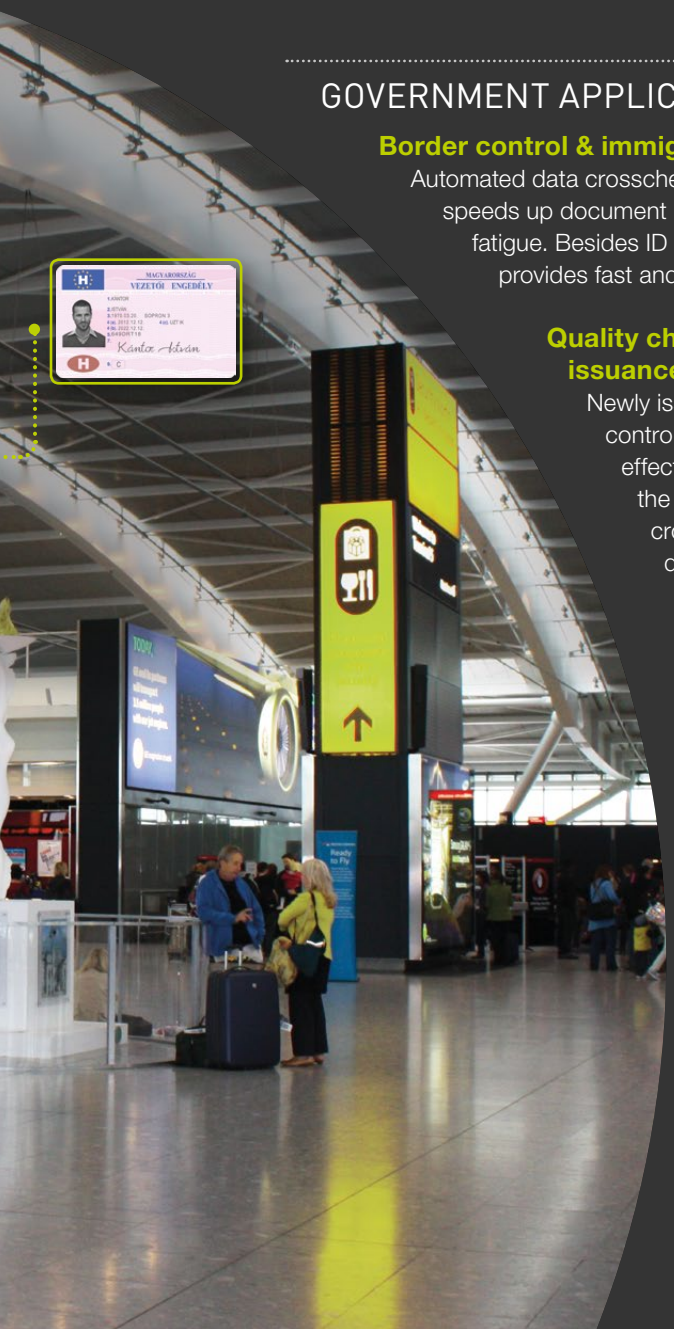
COMPANY EMPLOYEE PARKING LOCATIONS | PUBLIC PARKING LOTS | HOTELS, RESORTS, PUBS | RESIDENTIAL AREAS | SHOPPING CENTER TRUCK LOADING AND PARKING AREAS | COMMERCIAL LOCATIONS | MILITARY LOCATIONS

ARH


DRIVER LICENSE CARD
ENHANCED
DRIVER LICENSE
SMART ID CARD
ID: 230 578 657
VEZETŐI ENGEDÉLY
USA
C000254789
UNITED STATES OF AMERICA
EP Exemplar Book
BRITISH AIRWAYS

TYPICAL APPLICATIONS

ARH's industry leader identity document scanners help to fulfill your business needs with easy to operate, accurate and adaptable ID data capture and ID authentication solutions. ARH provides a broad range of scanners with scalable options, as well as software that can be easily integrated to your existing workflow. The following examples present some typical applications and highlights the benefits of ARH solutions.



GOVERNMENT APPLICATIONS

Border control & immigration

Automated data crosscheck and authentication in 24/7 operation speeds up document inspection, decreases human errors from fatigue. Besides ID processing, ARH's live fingerprint scanner provides fast and comfortable print enrollment of passengers.

Quality check during identity document issuance

Newly issued documents should pass strict quality control before being released. ARH scanners effectively assist in quality control by measuring the position and printing quality of MRZ lines and crosscheck the data of the document with the data stored on the RFID chip.

Law enforcement & criminal applications

Registering criminal data and crosschecking it with various national and international databases can be done in a few seconds. Furthermore, the live fingerprint scanner from ARH can assist in fast and forensic quality fingerprint enrollment.

COMMERCIAL APPLICATIONS

Hotel check-in

Efficient ID data capture solution ensures a fast and easy check-in process that also helps hotels register guests. The system functions as a secure closed application to protect guest information from data intrusions.

Banking / Retail

ARH provides a quick, accurate and fully compatible solution for registering client ID information, while strengthening protection against identity theft and offering easy integration to customer loyalty programs.

Casinos / Gaming / Liquor stores

Enhance any casino's operational intelligence by automatic ID data capture and authentication that even allows an ID-based VIP system for visitors. It also increases security and reduces losses with quick and reliable age verification.

Car rental / CSP retail locations

Quick and accurate automated ID data capture & authentication means convenience for clients and better security for the business. It can reduce operational costs and losses due to ID fraud.

ARH

IDENTITY DOCUMENT SCANNING PROCESS

While identity document scanners have undergone remarkable changes over the past decade, ARH's document scanning solutions have always represented the latest technology. The devices perform complex ID data capture and authentication, yet the simple usage and high level of automation always ensures fast and easy operation with minimal required training.

ARH IDENTITY DOCUMENT SCANNERS

Each ARH document reader combines well-designed scanner hardware with versatile software that includes a wide range of image processing, OCR, barcode reading, and authentication functions.

A TYPICAL SCANNING PROCESS CONSISTS OF THREE STEPS:

1. DATA CAPTURE:

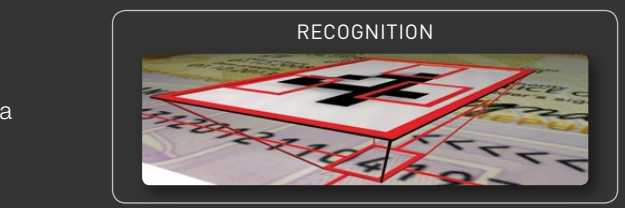
The scanner extracts optical data by capturing various images under different illuminations, as well as data from the RFID chip (where applicable).

2. RECOGNITION:

ARH's world-leading OCR software recognizes all text-based information in addition to data extracted from any common 1D and 2D barcodes.

3. AUTHENTICATION:

The scanner performs multiple security checks on the captured images and extracted data for high-level document validation. Performing all the steps takes only a few seconds and requires minimal user intervention.



DATA CAPTURE

- Scanning of the document starts automatically once it is placed on the scanner
- Multiple high resolution images are captured under different illuminations: visible white, IR and UV
- Textual and biometric data (face photo, fingerprint) are retrieved from the RFID chip
- All extracted data are transmitted via commonly used USB 2.0 interface

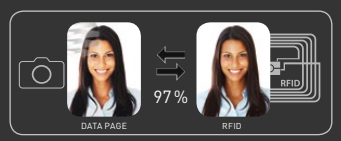
Passport images are cortesy of Keesing Reference Systems

AUTHENTICATION + OCR

THE FOLLOWING DATA FIELDS CAN BE RECOGNIZED AND EXTRACTED:

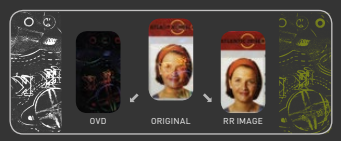
AUTHENTICATION

Captured images and extracted data are validated through various security checks: the checked data sets include MRZ checksums, expiration date, UV dullness, presence of B900 ink, data integrity between MRZ vs. RFID, biometric integrity and optional special features like advanced pattern matching or JURA IPI decoding. Some of the unique security functions are described below.



BIOMETRIC INTEGRITY CHECK: FACE COMPARE

Automated cross checking of the photo from the data page and the photo stored in the RFID. This feature effectively grants protection against altered photos on the data page.



OVD VISUALIZATION, REFLECTION REMOVAL

The new Combo Reader series offers OVD (Optical Variable Device) visualization like holograms on the captured images. The Reflection Removal (RR) technology ensures that captured images are free of reflective security signs like OVDs resulting in higher accuracy and better security.

IPI* DECODING

IPI (Invisible Personal Information) encodes personal data into the photo of the data page, linking the photo of the owner and the ID together. The IPI is invisible to the naked eye; only authorized people are able to verify it manually with a special decoding lens or automatically by using ARH scanners.

*JURA JSP patented feature

SOFTWARE INTEGRATION

Each of the ARH document scanning solutions present a universal tool suitable for any application.
To ensure that ARH scanners fit any custom workflow, all scanners are delivered with a versatile SDK that contains a comprehensive API for seamless integration.
Since all ARH scanners use the same, unified SDK, once the integration is completed, any ARH device is compatible with the developed application.

ARH

COMBO SCAN

DRIVER LICENSE SCANNER
WITH OCR SOFTWARE LIBRARY & SDK

UNIVERSAL IDENTITY DOCUMENT READER

Combo Scan is an extremely compact, fast and fully automated ID and passport scanner designed for data entry applications. Its accuracy and efficiency combined with ease of use ensure peace of mind for any business where scanning and authentication of IDs or passport are required. Hotel check-in, casinos, car rental or retail locations and liquor stores are just a few of the possibilities for utilization. The scanning process automatically starts when the document is placed in the reader. Several, high resolution images are captured, processed, and even the glossy reflections caused by laminated documents are removed for the best OCR results. Within two seconds not only OCR, (optional) RFID chip and bar code data but the authentication checks are also available. This saves a lot of time – approximately 2-3 minutes per customer – and greatly improves the accuracy of the data compared to manual input. Maintenance-free operation is ensured by the no-moving parts design. The scanner operates on a single USB; no external power supply is required.

MAIN BENEFITS

- Saves time: complete scanning process takes less than 1.0 second
- Reduces data entry errors, all information is extracted automatically
- Identifies fake IDs, blocking minors from entering age restricted areas
- Easy to use, P&P, no need for special training, comfortable ergonomic design
- Seamless integration into any existing government or commercial workflow with flexible SDK
- Highly reliable, no moving parts

KEY FEATURES

- Full page ID-1 and MRZ passport & visa scanning with automatic document detection
- Lay-on document scanning in an ultra-compact, stylish and ergonomic design
- High-resolution 500 PPI imaging, LED based visible white and IR illumination
- Power supply and communication via a single USB connection
- OVD visualization and Reflection Removal (RR) technology to aid OCR and verification
- Dustproof IP53 optical module

HOTEL CHECK-IN · CASINO GAMING · CAR RENTAL · RETAIL SHOPS · MOBILE OPERATORS

COMBO SMART

FULL-PAGE E-PASSPORT SCANNER
WITH OCR SOFTWARE LIBRARY & SDK

COMPACT, SINGLE-STEP, FULL-PAGE SCANNER SERIES WITH VERSATILE FUNCTIONS

The Combo Smart document reader product line features remarkably compact full-page scanner models that extract customer or passenger data from all sorts of identification documents for verification against misuse, alteration or forgery. The speed and precision of Combo Smart scanners provide several advantages to border control, immigration, banks, hotels, car rental companies, and many other environments where secure identity verification is essential. The device's modular design allows 32 different configurations and options to be powered by USB or an external power source. OEM versions are also available.

MAIN BENEFITS

- Speedy authentication with automatic document detection; complete image capture and data reading in a single step, which only takes a few seconds
- Avoiding errors in data entry
- Easy to use; plug & play with no need for special training
- Sustaining reliability with a solid, ergonomic design and dust-proof IP53 optical module
- Seamless integration into any existing government or commercial workflow with flexible SDK
- Saving workspace with a very small footprint

KEY FEATURES

- Full-page scanning of passports, e-passports, visas, ID cards and driver licenses, credit cards, boarding passes, tickets, etc.
- High-resolution 500 PPI imaging
- LED-based visible white, IR and UV illumination
- OVD visualization and Reflection Removal (RR) technology
- Regular 1D and 2D barcode reading from printed documents or smartphone screens
- Modular design with options: IR, UV, RFID, magstripe & smartcard
- Compliance to ISO & ICAO standards, supports BAC, PACE, EAC, AA and PA as well as CA, TA, BAP and EAP
- Two auxiliary USB ports to connect external devices
- Automated face comparison (printed photo & RFID photo)
- SAM slots for secure certificates and digital signatures

BORDER CONTROL | QUALITY ASSURANCE | LAW ENFORCEMENT | BANKING | HOTEL CHECK-IN | MOBILE OPERATORS

ARH

KIOSK SCAN MODULE

ID SCANNER FOR KIOSKS
WITH OCR SOFTWARE LIBRARY & SDK

UNIVERSAL IDENTITY DOCUMENT READER MODULE FOR BUILT-IN USE

The Kiosk Scan reader is an ultra-compact scanner that extracts customer and passenger data from both national IDs and international passports for verification against alteration, forgery or misuse. It is specifically designed for installation into self-service kiosks, e-gates, and other service desks.

The many advantages of Kiosk Scan include efficient image processing, optical character recognition (OCR), barcode reading and authentication functions – ideal in hotel check-in, casino, car rental, retail or liquor stores, and many other environments where identification is required. The Kiosk Scan's automatic detection of IDs can save several minutes per customer compared to manual data input – substantially reducing the time it takes to perform accurate authentication of various identity documents such as driver licenses, visas, passports, or credit cards. The image capture, optical reading, and authentication is done in a single step, without the need to move or reposition the document, which makes the device very simple to use.

MAIN BENEFITS

- Saving several minutes per customer vs. manual data input
- Taking only 1 to 2 seconds to complete an entire scanning process
- Preventing minors from entering or making purchases in age restricted areas
- Ensuring comfort with ergonomic design
- Single-step authentication is simple to use even for inexperienced users

KEY FEATURES

- Ultra compact full-page ID card (ID-1) and MRZ passport/visa scanning with automatic document detection
- 1D/2D barcode reading from paper based documents and mobile phones
- Specially designed housing for kiosk integration
- Power supply and communication via a single USB connection
- Durable metal housing and no moving parts for maximum reliability

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KIOSK SMART

PASSPORT AND ID SCANNER
WITH OCR SOFTWARE LIBRARY & SDK

FULL PAGE E-PASSPORT READER MODULE FOR BUILT-IN USE

Kiosk Smart is a full-page ePassport/ID reader for kiosks and automatic security gate applications. The reader module appears in an incredibly compact – 10 cm / 4 inches tall – brick design with mounting points, recessed connections, replaceable document guide bracket and status LEDs. The device has a full-size ID-3 type document reading glass platen that is factory-installed to be easily exchangeable even after the unit is in its set position for utilization. Kiosk Smart is physical form factor optimized for e-gates and other CUSS projects. Its mounting bracket is fully 180 degrees reversible during installation, which allows the reading glass better exposure and more convenient use. Similarly to Combo Smart, except its ability to read smart card chips and magnetic strips, the module is able to perform full spectrum authentication and data reading tasks and also manufactured with consideration for intuitive customer experience.

MAIN BENEFITS

- Accurate reading and verifying of ICAO and non-ICAO compliant identity documents
- Processing complete passports (ICAO MRZ, general VIZ, RFID and more)
- Single step OCR and RFID reading for higher security and better speed
- Variable configurations for built-in installation

KEY FEATURES

- Full page ID-1 and MRZ passport & visa scanning with automatic document detection
- Lay-on document scanning in an ultra-compact, stylish and ergonomic design
- High-resolution 500 PPI imaging, LED based visible white and IR illumination
- Power supply and communication via a single USB connection
- OVD visualization and Reflection Removal (RR) technology to aid OCR and verification
- Durable composite housing and no moving parts for maximum reliability

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ARH

PRMc

FULL-PAGE E-PASSPORT SCANNER
WITH OCR SOFTWARE LIBRARY & SDK

COMPACT, SINGLE-STEP, FULL-PAGE E-PASSPORT SCANNER SERIES WITH VERSATILE FUNCTIONS

The PRMc document reader offers fast and accurate full-page scans with reading, authenticating and verifying passports, visas, electronic IDs, driver licenses and other personal identification documents. Many security operations – including border control, immigration, consulates, banks, hotels, car rental companies and any other industry where identification is required – can benefit from the PRMc's efficient image processing, optical character recognition (OCR), barcode reading and authentication functions.

MAIN BENEFITS

- Speeding up authentication with automatic motion detection based single-hand operation
- Simplifying data entry and reducing errors through automatic data transfer
- Single step OCR and RFID reading for better security and higher speed regardless of chip position in passport; no need to reposition the document
- Eliminating verification errors by automated face comparison of data page photo and RFID-stored image
- Installed seamlessly into systems with SDK

KEY FEATURES

- Full-page, single-step passport and identity document scanning, RFID function
- High resolution, 475 PPI imaging in LED based visible, IR and UV light illumination
- Ability to read OCR lines, 1D & 2D barcodes, MRZ, VIZ and printed characters from boarding passes
- Additional 960 PPI camera offering 24 bits/pixel color or 8 bits/pixel monochrome in IR pictures
- Handling of non-standard documents with an optional extended document window
- Compliance with ISO and ICAO standards, supports BAC, PACE, EAC, AA and PA as well as CA, TA, BAP and EAP
- High color fidelity (extended color fidelity or XCF) with calibration
- Hardware-assisted reflection removal (RR) and OVD visualization

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IDENTITY DOCUMENT READING AND VERIFICATION SOFTWARE

DOCUMENT READER OCR
SOFTWARE LIBRARY & SDK

ARH offers reliable and high-speed data reading and verification software for all identity document types worldwide. These SW modules are available for ARH ID and passport scanning devices.

VERSIONS & FEATURES

• DATA READING

OCR utilization – The optical character recognition (OCR) software automatically extracts the text-based information from identity documents and converts it to digital data. This data may be saved in a dedicated application, such as hotel reservation software, visitor management system, banking application, casino registration, etc. Automatic verification – executed with the aid of a template database – is also done at this point. The entire process is performed within few seconds resulting in saved time and increased accuracy.

• DATA READING + VERIFICATION

By automatically analyzing the scanned images under different illuminations, the application is capable of detecting counterfeit or tampered IDs. The high-level sophistication of security checks – originally developed for deployment at border crossings – becomes commercially accessible with the use of the software. As a result, regular employees without special training can help to protect their companies' bottom line.

• SUPPORTED DOCUMENT TYPES:

- internationally accepted travel documents (different types of passports, visas)
- local identification documents like ID cards, driver licenses
- local residence permits, address cards, health insurance cards, etc.

MAIN BENEFITS

- Fast – the data reading and verification checks are performed within a few seconds compared to manually entering the ID data that takes several minutes to complete.
- Accurate – no mistakes compared to error-prone manual entries
- Reliable – high-reliability verification checks allow this solution to be deployed at heavy demand border crossings
- Worldwide – internationally accepted travel documents and local IDs are both supported
- Flexible – new document type inclusions can be quickly executed per customer request

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ARH

AFS 510

FINGERPRINT SCANNER
WITH OCR SOFTWARE LIBRARY & SDK

4+4+2 FLAT OR ROLL FINGERPRINT SCANNER

The AFS-510 is a compact live scanner for 4+4+2 flat or single-rolled fingerprint capture. It is designed for fast, forensic-quality image capture that is certified by FBI IAFIS Appendix F.

The advanced optical scanning technology and robust design provides a reliable solution for both civil and criminal application. The scanning process is fully configurable: sequence of capture, available time and required fingerprint quality can be set by the operator. The smart LED-based user interface guides the user through the entire enrollment process.

MAIN BENEFITS

- Ideal for both large and small scale applications
- Smart interface guides users with illuminated pictograms
- Built-in signal and ergonomic design to enhance user comfort
- Automatically checking the correct sequence and vertical position
- Easy integration with any system through a flexible SDK

KEY FEATURES

- 4+4+2 flat and single rolled, forensic-quality fingerprint capabilities
- High resolution 500 PPI imaging, compliant with the FBI's IAFIS App. F
- Large scanning plate, effective size: 84 × 77 mm (3.31 × 3.03")
- Factory calibrated auto-capture and auto-segmentation
- Durable metal housing for heavy-duty operation
- Dual power system: via two USB ports or external power supply

IMMIGRATION · E-GATE · CRIMINAL APPLICATIONS · RESTRICTED AREAS · LAW ENFORCEMENT · BORDER CONTROL · VISA ISSUING · KIOSK INTEGRATION · FBI CERTIFICATE

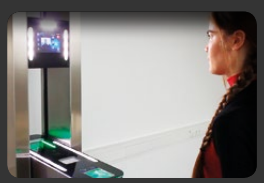
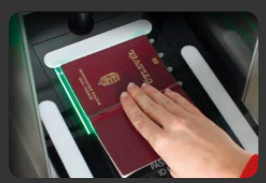
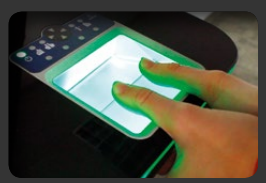
ENROLLMENT KIOSK

LIVE FACE CAPTURE • PASSPORT READER • FINGERPRINT SCANNER • SIGNATURE PAD

The ARH Enrollment Kiosk is a configurable, self-service data collecting station that provides complete biometric enrollment capabilities and identity document reading. It collects the face photo, ID data, fingerprints, signature, and height information of any person in a single session – in less than 30 seconds.

Collected data can be used in various applications, such as:

- Visa, ID card, passport and driver license issuing
- Issuing identification badges in secure environments, like power plants, military installations, R&D centers
- Collecting biometric data of visitors at closed events like conventions and conferences
- Enroll all biometric data of inmates at prisons


OEM PRODUCTS

CUSTOMIZED SOLUTIONS

ARH is well-known for its high quality OEM services, which go beyond simple relabeling. If you have not found the product you are looking for, ARH's expert development team is happy to help you customize an existing product or build a new version.
You will benefit from our highly innovative technologies, certified product compliance with standards, best-in-class quality, high level of cost efficiency and long term support. ARH works on your behalf in R&D, software- and hardware engineering, testing and prototyping. Take advantage of ARH's many years of experience and in-house knowledge. ARH controls all steps of the process to successfully accomplish OEM developments, while keeping up strict QA and meet specified deadlines. OEM services provided by ARH include:

- Consultation
- Design
- Integration of other OEM modules
- Prototype manufacturing
- Testing and certification
- "Train the trainer" concepts
- Mass production

Definitions

OEM products are:

- Original ARH products sold under your own label
- Specially modified products
- Completely new products developed from a concept

ARH can turn ideas into actual final products within a short amount of time.

COMPARISON CHART

		COMBO SCAN		COMBO SCAN KIOSK	COMBO SMART		
	MODELL	COMBO SCAN	COMBO SCAN R	COMBO SCAN KIOSK	COMBO SMART	COMBO SMART R	COMBO SMART L
IMAGING	Active scan area	125 mm × 55 mm (4.92" × 2.17")			125 mm × 88 mm (4.92" × 3.46")		
	Resolution	500 dpi			500 dpi		
Illumination sources	Visible white	YES			YES		
	Infrared	YES			YES		
	UV	–			–	–	YES
	Automatic Document Detection (ADD)	YES			YES		
	Reflection Removal (RR)	YES			YES		
	OVD visualization	YES			YES		

	READING CAPABILITY	COMBO SCAN	COMBO SCAN R	COMBO SCAN KIOSK	COMBO SMART	COMBO SMART R	COMBO SMART L
Printed data	MRZ ID-1, ID-2 & ID-3 according to ICAO9303	YES			YES		
	VIZ Reading	YES			YES		
	Barcode	YES			YES		
Electronic data	RFID (reading & writing) ISO 14443	–	YES	–	–	YES	–
	RFID VHBR	–	YES	–	–	YES	–
	Contact chip ISO 7816 Class A, AB, C EMV 2000 Level 1	–			–		

AUTHENTICATION	COMBO SCAN	COMBO SCAN R	COMBO SCAN KIOSK	COMBO SMART	COMBO SMART R	COMBO SMART L
Standardized checks	MRZ consistency check, B900 ink check, UV dullness check, MRZ-RFID DG1 data crosscheck, printed photo vs. RFID photo crosscheck					
Document-specific checks	available with optional VIZ OCR + AUTH software module					
JURA IPI & LetterScreen	–					
RFID authentications (where applicable)	ICAO Doc. 9303 LDS 1.7, ISO 18013 (Drivers License) PKI 1.1, BAC, EAC, EAC2.0, PACE, PACE-CAM, AA, PA, TA, CA, BAP, EAP					

COMMUNICATION	
	USB

	PROGRAMMING & INTERFACES	COMBO SCAN	COMBO SCAN R	COMBO SCAN KIOSK	COMBO SMART	COMBO SMART R	COMBO SMART L
	Supported operating systems	Windows, Linux					
	Software Development Kit (SDK)	included for all models					
	Programming languages	C/C++, C#, Visual Basic 6.0, Delphi, VB.NET, Java					
Output formats	OCR data & authentication results	xml, csv					
	Scanned images	BMP, JPG, JPG2000 and PNG					

	MECHANICAL & OTHER DATA	COMBO SCAN	COMBO SCAN R	COMBO SCAN KIOSK	COMBO SMART	COMBO SMART R	COMBO SMART L
	Size (width × depth × height)	152 mm × 130 mm × 82 mm (5.98" × 5.12" × 3.23")			178 mm × 176 mm × 146 mm (7.01" × 6.93" × 5.75")		
	Weight	0.6 kg (1.32 lbs)			1.1 kg (2.43 lbs)		
	Power supply	USB			Universal external power supply (100-240 V AC, 50/60 Hz)		
	Operating temperature	5 °C – 45 °C (41 °F – 113 °F)					
	Operating humidity	0 – 95 % (non-condensing)					
	Compliances	FCC, CE, WEEE, RoHS					

IDENTITY DOCUMENT READERS & BIOMETRICS

COMBO SMART			COMBO SMART N	COMBO SMART Kiosk		PRMc II
COMBO SMART RL	COMBO SMART S	COMBO SMART RLS	COMBO SMART N RLSW	COMBO SMART KIOSK L	COMBO SMART KIOSK RL	PRMc II
125 mm × 88 mm (4.92" × 3.46")				130 mm × 90 mm (5.12" × 3.55")		130 mm × 98 mm (5.12" × 3.86")
500 dpi				500 dpi		475 dpi / 960 dpi (for photo area)
YES				YES		YES
YES				YES		YES
YES	–	YES	YES	YES		YES
YES				YES		YES
YES				YES		YES
YES				YES		YES

COMBO SMART RL	COMBO SMART S	COMBO SMART RLS	COMBO SMART N RLSW	COMBO SMART KIOSK L	COMBO SMART KIOSK RL	PRMc II
YES			YES	YES		YES
YES			YES	YES		YES
YES			YES	YES		YES
YES	–	YES	YES	–	YES	YES
YES	–	YES	YES	–	YES	–
–	YES	YES	YES	–		–

COMBO SMART RL	COMBO SMART S	COMBO SMART RLS	COMBO SMART N RLSW	COMBO SMART KIOSK L	COMBO SMART KIOSK RL	PRMc II
MRZ consistency check, B900 ink check, UV dullness check, MRZ-RFID DG1 data crosscheck, printed photo vs. RFID photo crosscheck						
available with optional VIZ OCR + AUTH software module						
–						YES
ICAO Doc. 9303 LDS 1.7, ISO 18013 (Drivers License) PKI 1.1, BAC, EAC, EAC2.0, PACE, PACE-CAM, AA, PA, TA, CA, BAP, EAP						

USB			Ethernet + wifi	USB		USB

COMBO SMART RL	COMBO SMART S	COMBO SMART RLS	COMBO SMART N RLSW	COMBO SMART KIOSK L	COMBO SMART KIOSK RL	PRMc II
Windows, Linux						
included for all models						
C/C++, C#, Visual Basic 6.0, Delphi, VB.NET, Java						
xml, csv						
BMP, JPG, JPG2000 and PNG						

COMBO SMART RL	COMBO SMART S	COMBO SMART RLS	COMBO SMART N RLSW	COMBO SMART KIOSK L	COMBO SMART KIOSK RL	PRMc II
178 mm × 176 mm × 146 mm (7.01" × 6.93" × 5.75")				150 mm × 195 mm × 117 mm (5.9" × 7.68" × 4.60")		213 mm × 173 mm × 179 mm (8.39" × 6.81" × 7.08")
1.1 kg (2.43 lbs)				1.1 kg (2.43 lbs)		1.9 kg (4.19 lbs)
Universal external power supply (100-240 V AC, 50/60 Hz)				Universal external power supply (12V DC)		Universal external power supply (100-240 V AC, 50/60 Hz)
5 °C - 45 °C (41 °F - 113 °F)						
0-95 % (non-condensing)						
FCC, CE, WEEE, RoHS						

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

ABOUT ARH

COMMITTED TO INNOVATION
QUALITY AND CUSTOMER SERVICE

Headquarters, Europe

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 collaborate with ARH, your project is backed by 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
- Identity document readers and biometrics: advanced ID document scanners and fingerprint live scanner

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
- HQ: Budapest, Hungary (EU), Innovation Center: Perbal, Hungary (EU), USA office: Clearwater, FL
- Number of ANPR/LPR installations: over 50,000 worldwide
- Number of ID document scanner installations: over 30,000 worldwide
- In total, more than 2,500 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.

Innovation Center, Europe

ARH

CONTACT ARH

Office of ARH America

ARH INC. – HUNGARY, EUROPE

ALKOTAS UTCA 41
BUDAPEST, 1123 HUNGARY
PHONE: +36 1 201 9650
FAX: +36 1 201 9651

WWW.ARH.HU
SENDINFO@ARH.HU

ARH AMERICA

28059 US HIGHWAY 19 NORTH
SUITE 203, CLEARWATER
FLORIDA 33761
PHONE: 727-724-4219
FAX: 727-724-4290

WWW.ADAPTIVERECOGNITION.COM
FLYER@ADAPTIVERECOGNITION.COM

INNOVATION CENTER, EUROPE

PERBAL, 2074 HUNGARY

DIGITAL VERSION:

ARH Inc.

ALKOTAS UTCA 41
BUDAPEST, 1123 HUNGARY
PHONE: +36 1 201 9650
FAX: +36 1 201 9651
EMAIL: SENDINFO@ARH.HU
WWW.ARH.HU

ARH AMERICA

28059 US HIGHWAY 19 NORTH
SUITE 203, CLEARWATER
FLORIDA 33761
PHONE: 727-724-4219 • FAX: 727-724-4290
EMAIL: FLYER@ADAPTIVERECOGNITION.COM
WWW.ADAPTIVERECOGNITION.COM