

ADAPTIVE RECOGNITION

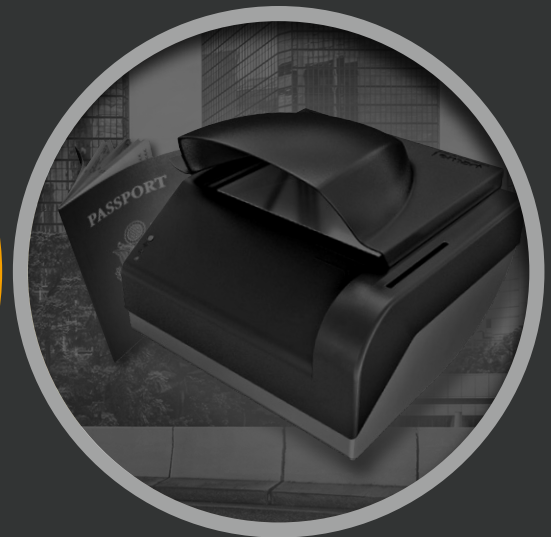
Image Recognition Products for Traffic, Security, ID Data Entry Automation and Biometric Identification



INTELLIGENT
TRANSPORT SYSTEMS



RECOGNITION
SOFTWARE & CAMERAS



IDENTITY DOCUMENT
READERS & BIOMETRICS



RECOGNITION CAMERAS & SENSORS

TYPICAL APPLICATIONS

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

TRAFFIC ENFORCEMENT

Parking revenue systems

LAW ENFORCEMENT

TRAFFIC SECURITY MONITORING

Company employee parking

Residential areas

Public parking lots

SPEED ENFORCEMENT

BARRIER/GATE CONTROL

Shopping mall parking

VEHICLE ACCESS CONTROL

ADR (HAZMAT) CODE RECOGNITION

ANPR IMAGING

BORDER CONTROL

Visitor parking

TOLL COLLECTION

AVERAGE SPEED MEASUREMENT

CONTAINER/RAILWAY CODE RECOGNITION



LITTLE KNOWN FACTS ABOUT ANPR CAMERAS

THE MEGAPIXEL MYTH

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

ILLUMINATION

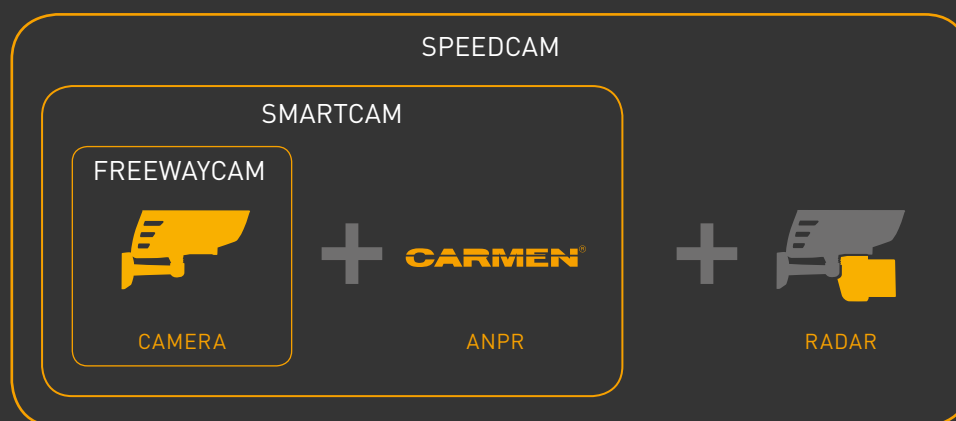
All of ARH's purpose-built ANPR cameras have integrated illumination – this is not the case for all manufacturers. ARH's range of LED illuminators include white or 2 different wavelengths of infrared light sources – preset to focus the maximum amount of light to the perfect distance for the actual camera.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

VEHICLE DETECTION (VEHDET)

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

PROCESSING POWER

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



ParkIT Camera

SECOND GENERATION

IP CAMERA FOR ACCESS CONTROL DESIGNED FOR VEHICLE PLATE RECOGNITION

CAMERA FOR AUTOMATED ANPR-BASED ACCESS MANAGEMENT

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

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

MAIN BENEFITS

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

KEY FEATURES

- Accessibility via web browsers, with embedded web server
- Automated adaptive settings, tracking environmental changes
- Auto day & night switch, IR night illumination
- Still images and video stream outputs
- Remote control and access of camera settings
- Complex I/O capabilities: control barrier and receive trigger signal



PARKING
REVENUE
SYSTEMS



ACCESS
CONTROL



AIRPORT AND
HARBOR
LOGISTICS



TRAFFIC
SECURITY
MONITORING



BUS LANE
AND RED LIGHT
ENFORCEMENT



BORDER
CONTROL



COMMERCIAL
VEHICLE
APPLICATIONS

ONVIF



FreewayCAM

SECOND GENERATION

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

ANPR/LPR CAMERA DEVELOPED FOR HIGH SPEED TRAFFIC APPLICATIONS



FreewayCAM is a field-proven, widely used versatile digital IP camera designed specifically for ANPR/LPR (Automatic Number Plate Recognition) in low or high-speed traffic environments. The camera consistently captures high quality images in a variety of environments and light conditions.

The camera's unique optical module with auto-adjustable shutter time and real-time motion detection-based self-triggering function also ensure appropriate image capturing at virtually any speed – even up to 255 km/h (158 mph).

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

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

MAIN BENEFITS

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

KEY FEATURES

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

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



PARKING
SYSTEMS

FreewayCAM

THIRD GENERATION

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

UNIQUE IMAGE-BASED VEHICLE DETECTION MEANS NO LOST EVENTS

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

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

MAIN BENEFITS

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

KEY FEATURES

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

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


TOLL
SYSTEMS

JOURNEY TIME
MEASUREMENT

CONGESTION
CHARGING

ACCESS
CONTROL

AIRPORT AND
HARBOR
LOGISTICS

TRAFFIC
SECURITY
MONITORING

BUS LANE
AND RED LIGHT
ENFORCEMENT

BORDER
CONTROL

PARKING
SYSTEMS

Onvif



SmartCAM

THIRD GENERATION

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

EXTRA OVERVIEW LENS TO SEE THE BIG PICTURE

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

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

MAIN BENEFITS

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

KEY FEATURES

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

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

ONVIF



TOLLING
SYSTEMS



JOURNEY TIME
MEASUREMENT



GAS
STATION



VIDEO
ANALYTICS



TRAFFIC
MONITORING



ACCESS
CONTROL



TRAFFIC
SECURITY
MONITORING



BORDER
CONTROL



BUS LANE
AND RED LIGHT
ENFORCEMENT

SpeedCAM

THIRD GENERATION

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

SECONDARY SENSOR AND LENS FOR ENHANCED IMAGE AND ANPR+

The new SpeedCAM is a top-of-the-range camera with integrated speed radar and on-board ANPR. Its built-in radar, also functioning as a high-precision trigger, provides certified speed measuring up to 255 km/h (158.5 mph). As a deterring effect, SpeedCAM controls traffic 24/7, which means increasing road safety without the presence of law enforcement on site.

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

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

MAIN BENEFITS

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

KEY FEATURES

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

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



SPEED
ENFORCEMENT



TOLLING
SYSTEMS



JOURNEY TIME
MEASUREMENT



VIDEO
ANALYTICS



TRAFFIC
MONITORING



TRAFFIC
SECURITY
MONITORING



BUS LANE
AND RED LIGHT
ENFORCEMENT

ONVIF



ContainerCAM

THIRD GENERATION

DESIGNED AND BUILT FOR ACCR
AUTOMATIC CONTAINER CODE RECOGNITION

FINALLY A TRULY DEDICATED CAMERA FOR CONTAINER CODE RECOGNITION

The new ContainerCAM is an IP camera for tracking and identifying shipping containers on ships, trains or semi-trailer trucks. Shipping containers must resist harsh conditions; thus, a camera is required which can reliably function in these circumstances as well. ContainerCAM can indeed withstand wear and tear. The camera

can easily read close-range BIC and ILU container codes as well as UIC railway code even when the reporting mark (ownership code) is damaged or the printed surface is uneven.

ContainerCAM is a dual-sensor / dual-lens camera. The main super-wide-angle camera module is for container code recognition. The second Overview camera module offers a detailed image of the surroundings. The dual lenses and the integrated wide-angle white illumination LEDs are optimized for close-up ACCR or railway code recognition. They make sure that the OCR software will always get the best possible input.

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

MAIN BENEFITS

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

KEY FEATURES

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

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ONVIF



UIC
NUMBERS



HARBOUR
CARGO



SEMI
TRUCKS

EnforceCAM

THIRD GENERATION

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

TRAFFIC MONITORING CAMERA

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

MAIN BENEFITS

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

KEY FEATURES

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

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TRAFFIC
SECURITY
MONITORING



BUS LANE
AND RED LIGHT
ENFORCEMENT



GAS
STATION



VIDEO
ANALYTICS



TRAFFIC
MONITORING



LAW
ENFORCEMENT

ONVIF



MicroCAM

SECOND GENERATION

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

DASHBOARD/ROOFTOP ANPR CAMERA

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

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



MAIN BENEFITS

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

KEY FEATURES

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

ONVIF



TOLL
COLLECTION



PARKING
SYSTEMS



TRAFFIC
MONITORING



LAW
ENFORCEMENT



TRAFFIC
SECURITY



VIDEO
ANALYTICS



ON THE
MOVE

ARH S1

SECOND GENERATION

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

REDEFINES STANDARDS IN LAW ENFORCEMENT CAMERAS

A speed camera measures speed. ARH S1 does a lot more than that – quick setup, compact design, long-range detecting and ANPR, tamper-free system architecture and fully automatic operation make it ideal as a speed and traffic enforcement device.

Each passing vehicle is an event with its own data package containing vehicle speed, license plate data, time and place stamp and recorded video/images. The camera detects speeding and also identifies traffic violations like illegal lane use. Autonomous operation is possible from a patrol car or tripod, and as a practical feature, the camera can be accessed remotely. S1's wide range of day and night vision is guaranteed by built-in IR lights and ARH's very own state-of-the-art CARMEN® automatic number plate recognition (ANPR) engine.

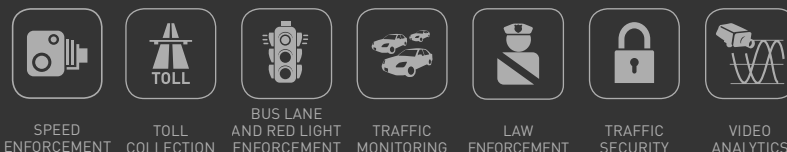
S1 is years ahead of its competitors. With 2 cameras, integrated LED illumination and an intuitive touchscreen in a robust stylish housing, S1 is fast, reliable and performs valid speed measurement from 600 m (1968 ft) away. S1 has an internal and an external battery and can be safely transported in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

MAIN BENEFITS

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

KEY FEATURES

- Compact all-in-one design: camera, illuminator, GPS and laser integrated into a sturdy housing
- Laser beam measurement – impossible for drivers to detect if their speed is being monitored
- Works on a tripod or from inside patrol vehicle
- Time and location data (GPS coordinates)
- Laser, Wi-Fi, 4G, GPS
- Detects violations: bus lane or emergency lane use, ignoring a no-entry sign



FreewayCAM IR-LIGHT

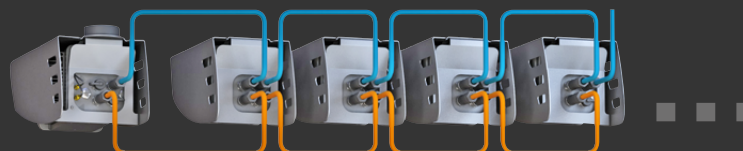
SECOND AND THIRD GENERATION

IR LIGHT SOURCE EXTENSION
TO MAXIMIZE ANPR/LPR RESULTS

ILLUMINATOR ACCESSORIES

The FreewayCAM IR-LIGHT series are extra illumination components available for ARH's 2nd and 3rd generation cameras. These extra light sources can be used to achieve brighter overview images or increase the recognition accuracy for non-reflective license plates. The white LED version is available for container code recognition or color license plates.

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



MAIN BENEFITS

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

KEY FEATURES

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

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FreewayCAM RAD-AR

THIRD GENERATION

RADAR EXTENSION HARDWARE TRIGGER ACCESSORY FOR ARH CAMERAS

IMPROVES CAMERA RECOGNITION RATES

The separately available RAD-AR extension is a great way to boost the recognition rates and reduce the workload of your ANPR system. How? Without a trigger (a signal which initiates an ANPR event) the system must run the license plate recognition process on every single frame. This requires huge processing power. To resolve this problem, when RAD-AR senses a passing vehicle, it sends a trigger signal to the camera which marks the frames where the recognition process must run. Moreover, RAD-AR is the most efficient, hardware-based trigger accessory available for third generation cameras. As a result, the system will run faster and more efficiently than a system without a trigger. The RAD-AR is delivered as a kit, containing the RAD-AR bracket so nothing else than common tools are required to mount it.

MAIN BENEFITS

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

KEY FEATURES

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



RADAR
TRIGGERING



DELIVERED
AS A KIT



EASY
INSTALLATION



COMPARISON CHART

	ParkIT Camera		FreewayCAM			SmartCAM			
MODEL	WVGA	3C	WVGA	HDx	FHD DUAL	HDx	HDx Dual	HDx Dual Plus	FHD Dual Plus
Production Code	ParkITCAM-01-1150	ParkITCAM-01-7250	FreewayCAM-02-1150	FreewayCAM-03-6350 (IR850) FreewayCAM-03-6354 (white)	FreewayCAM-03-4362 (IR850) FreewayCAM-03-436A (IR760)	SmartCAM-03-6450	SmartCAM-03-6452	SmartCAM-03-6552 (IR850) SmartCAM-03-655A (IR760)	SmartCAM-03-4562
Generation	second		second	third		third			
Function of the second sensor	–		–		Advanced Vision	–	Overview		Advanced Vision
Resolution (primary + secondary sensor)	752 × 480	2048 × 1536	752 × 480	1440 × 1080	2048 × 1536 + 1280 × 960	1440 × 1080	1440 × 1080 + 1920 × 1080		2048 × 1536 + 1280 × 960
Typical frame rate (primary + secondary)	60	30	60	60	30 + 54	60	60 + 30		30 + 54
Optical zoom (primary camera)	11×		11×		3.3×	11×			3.3×
Image Buffer / Event Storage (approx.)	500 / –	150 / –	500 / –	1K / –		1K / 60K	800 / 40K		500 / 30K
Built-in LED illumination wavelength	850 nm		850 nm	850 nm / white	760 nm / 850 nm	850 nm		760 nm / 850 nm	850 nm
Optimal OCR range at ambient light	4 m – 20 m (13 feet – 65 feet)		4 m – 20 m (13 feet – 65 feet)		10 m – 20 m (33 feet – 65 feet)	4 m – 20 m (13 feet – 65 feet)			10 m – 20 m (33 feet – 65 feet)
Built-in Vehicle Detection	–		–	YES		YES			
Built-in RADAR / LASER	–		optional RADAR			optional RADAR			
Onboard ANPR	–		–			ANPR		ANPR+	
On-board computer (independent CPU cores)	400 MHz	500 MHz	400 MHz	ARM 2×766 MHz		ARM 2×766 MHz + 4×1 GHz		ARM 2×766 MHz + Intel Atom 4×1.9 GHz	
Operating temperature range	-30 °C – 70 °C (-4 °F – 158 °F)		-45 ° – 70 °C* (-49 °F – 158 °F)*		-40 °C – 70 °C* (-40 °F – 158 °F)*	-40 °C – 70 °C* (-40 °F – 158 °F)*			
IP Rating	IP65		IP67			IP67			
Full remote access	YES		YES	YES (HTTPs)		YES (HTTPs)			
4G & GPS	NO		NO			optional			
Optional accessories	Junction box for ParkIT camera		FreewayCAM RAD-AR Trigger, FreewayCAM IR-LIGHT 2, FreewayCAM junction box	IO cables, FreewayCAM RAD-AR Trigger, FreewayCAM IR-LIGHT 3, FreewayCAM junction box		IO cables, FreewayCAM RAD-AR Trigger, FreewayCAM IR-LIGHT 3, FreewayCAM junction box			

RECOGNITION CAMERAS & SENSORS

SpeedCAM	ContainerCAM	EnforceCAM	MicroCAM M202		MicroCAM M402		ARH S1
FHD Dual Plus	ContainerCAM	EnforceCAM	FHD Wide	FHD	FHD Wide	FHD	S1
SpeedCAM-03-4562	ContainerCam-03-5346	EnforceCAM-03-7880	MicroCAM-02-4390 (IR850) MicroCAM-02-4398 (IR760)	MicroCAM-02-4330 (IR850) MicroCAM-02-4338 (IR760)	MicroCAM-02-4490	MicroCAM-02-4430	ARHCAMS1-01-3573
third	third	third	second				second
Advanced Vision	Overview	–	–				Overview
2048 × 1536 + 1280 × 960	1280 × 960 + 1920 × 1080	2048 × 1536 or 2048 × 1152	2048 × 1536				1280 × 720 + 2048 × 1536
30 + 54	54 + 30	30	30				30 + 25
3.3×	3×	3.5×	–				30×
500 / 30K	500 / –	– / 5K+	800 / –		800 / 60K		1K / 15K
850 nm	white	850 nm	760 nm / 850 nm		850 nm		Mixed: 760 & 850 nm
10 m – 20 m (33 feet – 65 feet)	2 m – 4 m (6.6 feet – 13 feet)	5 m – 50 m (16.5 feet – 165 feet)	1.0 m – 4 m (3.3 feet – 13 feet)	8 m – 15 m (26.2 feet – 49.2 feet)	1.0 m – 4 m (3.3 feet – 13 feet)	8 m – 15 m (26.2 feet – 49.2 feet)	20 m – 150 m (65 feet – 500 feet)
YES	–	Motion detection + intelligent traffic detectors	YES				YES
RADAR	–	–	–				LASER
ANPR+	–	–	–		ANPR		ANPR+
ARM 2×766 MHz + Intel Atom 4×1.9 GHz	ARM 2×766 MHz	ARM Cortex 1 GHz	ARM 2×766 MHz		ARM 2×766 MHz + 4×1 GHz		ARM 2×766 MHz + 4×1.9 GHz
-40 °C – 70 °C* (-40 °F – 158 °F)*	-40 °C – 70 °C* (-40 °F – 158 °F)*	-40 °C – +55 °C (-40 °F – 131 °F)*	-30 °C – 70 °C* (-22 °F – 158 °F)*				-20 °C – 50 °C (-4 °F – 122 °F)
IP67	IP67	IP67	IP67				IP54
YES (HTTPs)	YES (HTTPs)	YES	YES (HTTPs)				YES (HTTPs or WiFi)
YES	NO	–	NO				YES
IO cables, FreewayCAM IR-LIGHT 3, FreewayCAM junction box	IO cables, FreewayCAM RAD-AR Trigger, FreewayCAM IR-LIGHT 3, FreewayCAM junction box	FreewayCAM IR-LIGHT 3	Tripod mounting console, 5/10 m spare data cable				Tripod, battery charger, external battery, seat adapter, soft case

*internal temperature / ambient 40 – 55 °C (104 – 130 °F)