

Cam - ANPR

Simultaneous reading of several license plates

Reading all available license plates with the national license plate format

Registration of traffic counts of offending and non-offending cars

Reading the front or rear license plate of the car

Real-time ANPR

Ability to be used in high-traffic routes

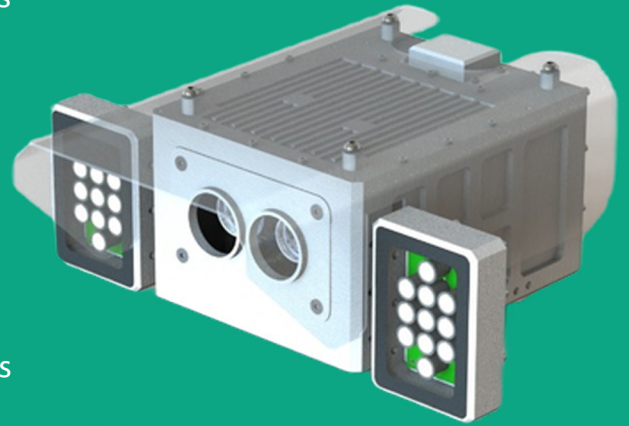
Software performance on new hardware

Identifying and providing high-quality images of passing vehicles

Extraction and separation of license plates of passing cars with a short distance

km/h ۳۲ · The ability to recognize the number plate of a passing vehicle with a maximum speed of

Monitoring and changing all camera settings through the server without the need to connect to the camera



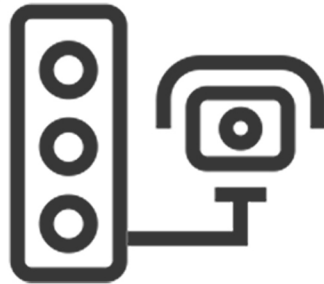
Cam - PR



Mobile violation camera

In the mobile violation recording camera system, by installing cameras and equipment on the car, it is possible to record traffic violations (double parking, parking at a stop and prohibited parking, passing and passing during traffic restrictions, etc.) and sent the relevant data to the center to enforce the law.

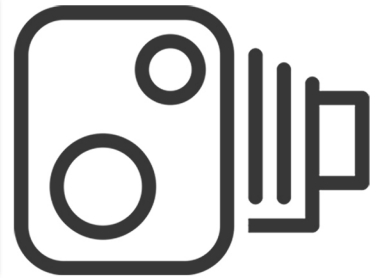
Cam - RL



Red light violation camera

By receiving the signal from the traffic light, the red light cameras are able to record violations related to the light (stopping on the crosswalk and crossing the red light). Also, the systems of this company are able to register vehicles passing through intersections.

Cam - SPD



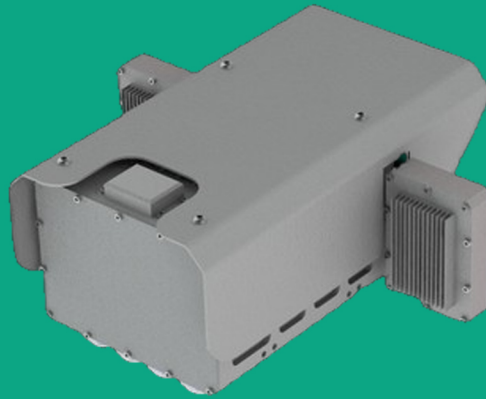
Speed violation camera

Using image processing and radar, the speedometer cameras of this company have the ability to measure the speed of all passing cars and also record all of them. This camera can be used to record speed violations and traffic records.

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Specification					
	Radar Speed	Speed	ANPR	Red Light	
Technical Data	Operating & Storage Humidity	Up to 90% non condensing			
	IP Protection	Waterproof IP67			
	Storage & Operating Temperature	-40°C ~ +70 °C (Fanless)			
	Heat Dissipation Method	Fanless heat dissipation directly to the outside			
	Dimensions(LxWxH)	Depended on the radar size	390(with sun shield)x268.2(with sun shield)x184 (mm)		
			233(without sun shield)x250(without sun shield)x184 (mm)		
	Weight	Depending on the radar weight	6 Kg		
	Power supply voltage	24-48 VDC (Reverse, ESD, Over Voltage, Under Voltage, EMI Protected & Current Monitored)			
Power consumption	30W Max				
System	Cameras	Embedded system with Mono and Color Cameras used separately for greater accuracy in reading			
	Illuminator	40 x(3Watt High Power Infrared) & 10 x(3Watt day light High Power) LEDs			
	Digital I/O	3 Optoisolated input - 4 Optoisolated Output (Extendable)			
	Ethernet	GigaBit Ethernet 10/100/1000			
	Storage	up to 512 GB SSD			
	Lenses	C-Mount. Many focal lengths available(25mm default)		C-Mount. Many focal lengths available	
	GPS	Optional	Optional	Optional	Optional
	Connectors	Mini Phoenix connector/RJ45/Serial/Input & Outputs Port			
	Watchdog	Internal hardware watchdog for control and monitor systems			
	Features	Max Vehicle Speed	310 Km/h (250 Km/h Tested)		
Detection		99%	99%	99%	99%
Reading		98%	98%	98%	98%
Compression		JPG			
Date and Hour		Synchronization via NTP protocol, GPS(optional)-Support Solar Hijri			
No. of lanes detection		2 (8 Meter Max)			
Speed enforcement (spot/average)		Spot & Average	Spot & Average	None	None
Data Transmission		FTP,TCP/IP (with Simple Network Management Protocol (SNMP))			
Software/Control Board Update		Upgrading via Web Interface			
Data transfer Protocol		RS485,RS232,Network			
Direction		Receding via Web Interface		Receding	
Ability to connect the outer watchdog		Monitor, control & manage the Equipments (Power, Network &...) of the system			
System Energy Management (device not included)		There is an optional device that can be used for a system of cameras to improve and maintain the efficient syntonization abilities of the system without being dependent on any cameras. This feature for example is good for using pulse projectors to improve the quality of night images and reduce energy consumption...			

Cam - ANPR



The camera that is designed and produced for license plate reading is of embedded type and all the equipment needed for license plate reading including sensors for receiving images, processor, controller boards and automatic fault finder along with required protections (Watchdog) as well as lighting system etc. It has a package in one place and according to the web user interface of the camera, Plug & Play conditions are provided along with proper interaction between the user and the camera.

The extent of weather and temperature conditions of the places where the cameras are used has been taken into account as one of the important parameters in the design and manufacture of this product. Used. The result, together with the special design of the housing, as well as the transfer of infrared projectors and white light to both sides of the housing, in order to directly dissipate the heat of the parts to the external environment and not transfer the heat of the different parts of the camera to each other, as well as not using an internal fan, provides optimal performance and with The stability of the camera is in the temperature range of +70 to -40 degrees Celsius while maintaining the IP67 environmental protection standard. Regarding the cable connection mechanism and the type of camera connectors, integration with the camera package has been prioritized in order to maintain IP67 environmental conditions, and also in order to facilitate implementation and reduce installation time and consequently reduce the cost of installation and maintenance in projects. The Mini-Phoenix connector is used along with IP67 glands, which has brought us a stable and reliable connection.

Introducing the specifications of the license plate reader camera

1. Infrared and color sensors responsible for producing images
2. Various projectors or flashes are also responsible for lighting the environment to improve the performance of cameras in all light conditions day and night
3. The camera processor, which is responsible for executing the commands of all software and services related to image processing, monitoring, integration, compressing, storing and sending information in the desired format and interacting with the controller board and internal watchdog.
4. Internal controller and watchdog board, which, while guaranteeing the delivery of suitable electrical energy to other sensitive components of the camera, communicates with the internal processor, monitors the performance and control of the internal hardware, and communicates with the outside world
5. The brain of the system or advanced artificial intelligence designed by local experts, and the same thing, considering the special conditions of license plates in Iran, both in terms of color diversity (police, administrative, military, etc.) and in terms of character similarity has become one of the strong points of this product compared to similar foreign products. Also, due to the prediction of different functions and access to the deepest layers of hardware and the high flexibility achieved between hardware and software through the controller board, it will easily handle various ITS projects.

Two sensors or one image sensor?

Maybe some brands want to use a single color sensor in the structure in order to save the production cost of the license plate reader camera, and thus the total price of the camera will be much lower than the type of two sensors (monochrome and color), but It should be checked at what price this savings was in terms of functionality and technology! The factors that can be considered in this regard are as follows.

1. Local variables related to the type and type of license plate

In most countries, including European countries, American countries, etc., the type and material of car license plates are infrared reflective, and the mechanism used in the ITS equipment of these countries, such as Iran, is the use of two color and monochrome sensors to improve It is the function of the camera. In China, due to the use of plates that are not infrared reflectors, only color sensors have been used in ITS equipment, and for this reason, they suffer from performance loss when used in projects in Iran.

2. Higher quantum efficiency!

In color sensors, there is a filter to prevent the passage of infrared (IR-cut), which delivers a smaller amount of photons to the sensor, without these filters, red, green, and blue pixels are also at different wavelengths in the NIR (Near InfraRed) band. They react and lead to the production of strange and inaccurate colors, also the main difference between monochrome and color sensor is the absence of CFA (color filter array). Removing this filter allows more photons to reach the surface.

sensitive to the light of the sensor and makes it more sensitive to light, which is equivalent to higher quantum efficiency. Since each pixel of a monochrome sensor can detect a wider range of light due to the absence of CFA and IR-cut filter, the overall performance of the sensor in low light conditions is significantly improved. Therefore, greater efficiency is observed at higher wavelengths, especially more than 650 nm, where NIR begins, as a result, for the same amount of radiation, a much clearer and brighter image of the plaque is recorded by the sensor.

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3. Impact on Bit Depth or image depth

Removing CFA reduces the file size of the monochrome image. Since monochrome image information does not contain specific color channel information, the image size is reduced up to three times. This reduction allows us to increase the depth of the image sent to the camera processing unit, which leads to an increase in the efficiency of the processing unit.

4. No need to direct intense white light

In the single camera mode, in order to provide the required light when the ambient light is low, it is necessary to emit strong white light completely directly. Therefore, in the case where the camera is installed to read the license plate in front of the car, sometimes an annoying light shines into the eyes of the passing drivers, which leads to the lowering of the drivers' visibility and the occurrence of many dangers, while in the case of two invisible infrared light sensors, the task of lighting it has a license plate that, in addition to the mentioned technical merits, no annoying visible light is emitted from the camera side, of course, in places where the user deems it necessary, very little white light is emitted only to record the license plate in a color photo of the camera, so that there is no disturbance in the vision of the drivers.

According to the above description, high-quality images from passing vehicles are provided to the camera image processing unit, and by performing operations by the artificial intelligence unit and the image processing engine, the required information is extracted from the images.

Advantages of license plate reader camera

1. Equipped with the most advanced internal controller and watchdog system

Camera is equipped with the most advanced controller and internal watchdog system that monitors and controls the deepest layers of hardware. It also has the control of the parameters of color and monochrome industrial sensors and high power LEDs in its list of tasks, the result of which is to record stable images and maintain the best light conditions, and with the help of this connection between the artificial intelligence unit and the controller board, it is designed to adjust the pulse parameters of the projectors. Infrared and sensors are completely controlled by artificial intelligence.

2. Realtime communication of the internal controller board with the camera processor

Another thing worth mentioning is the real-time connection of the internal controller board with the camera processor, which brings a variety of possibilities to improve the performance of the camera and even other equipment of which the camera is a part, which is briefly mentioned

Ability to communicate with external camera equipment through RS232, RS485 communication protocol and send and receive specified commands and reports.

Performing troubleshooting algorithms and fixing that fault, including checking the communication equipment step by step when the connection is interrupted and restarting them with the help of the external controller board of the camera (the external controller must be prepared separately)

Prepare and record the status report of the input power of the system and send it to the center

Communicating with UPS and sending its status

3. Power consumption of the system

Another new and practical feature of the camera is the significant reduction in system power consumption through increasing efficiency, which reduces the cost of energy consumption and increases the UPS charging time, as well as the possibility of using the solar system. Knowing that the largest share of energy consumption in the system is related to the projectors, it is necessary for the external side projectors that are responsible for the lighting of the passageway to operate in a pulsed manner, thus reducing the energy consumption of the system's projectors to less than a tenth of the current consumption! And their life span increases, it is necessary to explain that due to the possibility of communication between UPS or solar and the camera, this pulse lighting mode can be activated only in special modes and in normal mode, normal and continuous lighting can be used.

4. Independent and automatic coordination of cameras with each other

In the previously described pulse lighting method, the conventional method is that one of the cameras acts as the master camera and synchronizes the pulse with other cameras, produces it and sends it to the projectors. The problem in this method is the dependence of the system on the Master camera, which in case of failure or malfunction of this camera, disrupts the entire system. In the design of this camera, a method has been implemented that each camera is independently and automatically able to coordinate with other cameras and send a single coordinated pulse to the lighting projectors without depending on a specific camera in the system, so there is no disruption in case of failure of one of the cameras. It does not affect the system performance.

