

CAR PLATES READING

for access control

PRK512MP



ANPR CAMERA

Reading Passion



Megapixel, webserver, OCR camera for automatic reading of car plates, with reduced size, useful in all applications overseen by entry barriers (barriers, gates, etc.).

All-in-one, easy to install system, which also works as a standalone and automatic system without the use of computer.



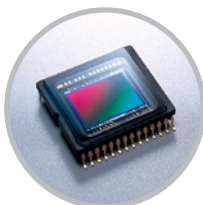
OCR CAMERA: The license plate recognition software is integrated on board to ensure bandwidth savings and unmatched accuracy: no license plate reading software for PC can do the same.



ACCURACY: the only true valid data is the accuracy that the reading system expresses when it is installed on the real field (on the road), in different weather conditions (sun, rain, snow, fog, night and day) when it has to read dirty, crumpled or deformed license plates. TARGHA provides accuracy in the reading of the plates without compromise, greater than 95% up to angles of 60 °.



HIGH DEFINITION: Selea uses megapixel sensors other than those used in standard CCTV cameras (30 fps). TARGHA is endowed with special sensors with high frame rate (60 fps) of Global Shutter type, to ensure a clear image (day and night) without any creep when shooting fast-moving objects.



HIGH FRAME RATE: A good product for license plate reading does not use sensors, such as those used in standard CCTV cameras (Rolling shutter). TARGHA is endowed with special sensors with high frame rate (60fps) and high sensitivity of Global Shutter type to ensure an increasingly sharp image even when shooting fast moving objects (especially in the dark).



DOUBLE EYE: One eye is not enough to do both things well: reading license plates and capture the context in color. So we developed Targha with two sensors: a sensor specialized for reading license plates; the other in color to resume the context. Both images can be stored in Picture in Picture (PIP), that is, the image of plate into the image of context.



VIDEO: TARGHA allows you to record both images of the capture of the plate (as snapshots) and the video clip of the passage of the vehicle and at the same time the video stream of context camera. All this, without interruption of the license plates reading process.



MULTI NATIONS: A well thought out system does not need special libraries (which limit its use) to read foreign number plates. The method which does not require the use of libraries is called “syntax free” in technical jargon. TARGHA is provided with an excellent syntax free neural network that recognizes all the different types of fonts.



FLEXIBILITY: Even knowing that in terms of reading accuracy the best results can be obtained when the angles between the camera and plate do not exceed 30 degrees, we still worked to provide maximum flexibility for extreme cases, getting results with angles at the limits of legibility of the characters.



OFFSET PLATES: There are vehicles such as Alfa Romeos, trucks, heavy vehicles, presenting plates unaligned with respect to the center of the vehicle. Car plates reading systems do not tolerate these issues failing reading. Targha correctly reads any vehicle with off-axis plate.



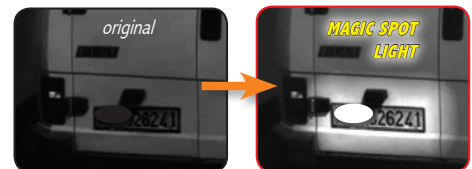
SPECIAL VEHICLES: Plate reading cameras by Selea offer a perfect license plate reading also of special vehicles, such as those of: Carabinieri, Italian Army, Ambulance, Police, Ministry and special vehicles.



BIKES AND MOTORCYCLES: Targha can also read the license plates of motorbikes and motorcycles. This is useful for citizen security but also for applications such as access control or camping resorts.



MAGIC SPOT LIGHT®: Unique function that makes a license plate readable even if the photographic image is dark and unreadable by human eye. This feature makes the reading of the code immediate during visual inspections.



DAY & NIGHT: As with all cameras of good quality, the sensor makes the difference: the use of megapixel sensors is not a sufficient condition to obtain good quality and accuracy. In the license plate we need specialized high-frame-rate and sensitive sensors.



ANTI - GLARE: When you read the license plates, the high beam is a problem for many plate reading systems. The only valid system to solve this problem is to totally eliminate the visible light and illuminate the plate with infrared. For this reason the illuminator is a very important part of a good plate reading system.



ANTI - REFLEX: In technical jargon it is called “smeering” or “blooming” the reflection of sunlight on highly reflective objects (particularly objects with chrome) which make license plate illegible even with sophisticated OCR. Through the use of specific sensors Selea has eliminated this phenomenon.



ANTI - CREEPING: The “creeping” of images prevents a correct characters reading. The phenomenon occurs with cameras with standard sensors (30 fps) in low light conditions. The solution is to use cameras with sensors at high speed (60 fps) of Global Shutter type.



ANTI - DIRTY: When a plate is perfectly clean, even the more “shoddy” license plate reading system is able to read the number plate. Too bad that in the real world we are increasingly coming to terms with dirty plates (especially in autumn / winter). Products by Selea particularly stand in front of difficult characters reading on dirty plates.



ANTI - SHADOW: Obscuring part of the license plate number sharp shadows make up a real problem that invalidates recognition in many reading systems. Selea has cleared and solved this problem through the use of multi-exposure illuminators and anti-shadow algorithms.



ANTI - OVEREXPOSURE: In different times of year, the sun emits a high amount of infrared light that put characters in overexposure. Using cameras with fixed, not adaptive illuminator means worse the situation. Targha solves this problem by using an intelligent auto-illuminator ranging from full power to switch off.



DETERIORATED CHARACTERS: It is not so rare to deal with the recognition of license plates deteriorated by time or wear (especially on front plates). A good number plate reading system, as Targha is, integrates algorithms of probabilistic analysis and virtual reconstruction of characters to ensure maximum results.



MULTI EXPOSURE: It is frequent to face sequential steps of cars with dirty license plates followed by other vehicles with gleaming license plates just out from the carwash. It is fundamental, in these cases, to possess cameras with powerful illuminators and pulsed to multi-exposure that adapt to the reflectance of each plate in order to get the best result of reading.



POWER REGULATION: The correct procedure to obtain perfect images is to regulate the power of the flash and the exposure of the camera, just as a good photographer would do. TARGHA rules the power output of the illuminator in automatic mode, operating also on the parameters of the sensor according to the lighting conditions in the environment and on the plate.



MEMORY CARD: The camera TARGHA has a solid-state memory useful to save lists (white / black list) or images of the license plates captured on board when problems of disconnection between the camera and the control center occur, never to miss a single reading.



AUDIO: TARGHA is provided with a pre-amplified audio output and a microphone input. Both can be used to create an SOS intercome column or a simple request for help for an access control. The camera is equipped with two-way audio anti-echo features in either half or full duplex.



COMMUNICATION INTERFACE: In addition to TCP / IP (Ethernet) communication, the camera is also equipped with serial RS232, RS485 and Wiegand communication interfaces useful for the integration of the device into any access control system.



SWITCHES: TARGHA has a relay with dry contacts to activate alarm signals or to open gates / barriers. Since the camera is a web-server you can virtualize the opening through buttons to be entered on the desktop of remote computers. Using white-lists in the internal memory Targha can operate as an automatic and independent stand-alone access control system (that is, without use of PC).



PRK512MP

Images taken with the camera on the field:



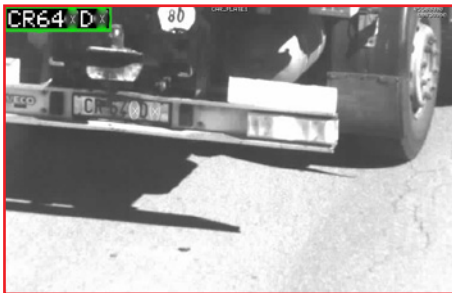
HALF-COVERED



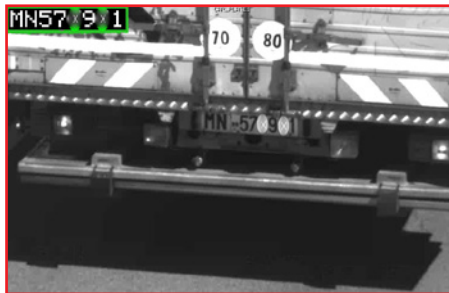
HALF-COVERED



DIRTY



DIRTY AND DEFORMED



HIDDEN UNDER THE FLOORING



DIRTY AND DEFORMED



NET SHADOW



MOTORCYCLE



NET SHADOW



DIRTY



DAMAGED CHARACTERS



DAMAGED CHARACTERS

PRK512MP



Images taken with the camera on the field:



FOREIGN WITH SYMBOLS



FOREIGN WITH SYMBOLS



MOTORCYCLE



FOREIGN



FOREIGN WITH SYMBOLS



VERY ANGLED WITH NET SHADOW



OVERENLIGHTENED BY THE SUN



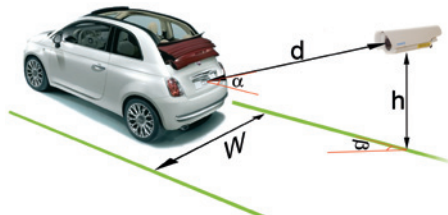
PICTURE-IN-PICTURE PLATE READING AND BACKGROUND



DOUBLE REFLECTIVITY



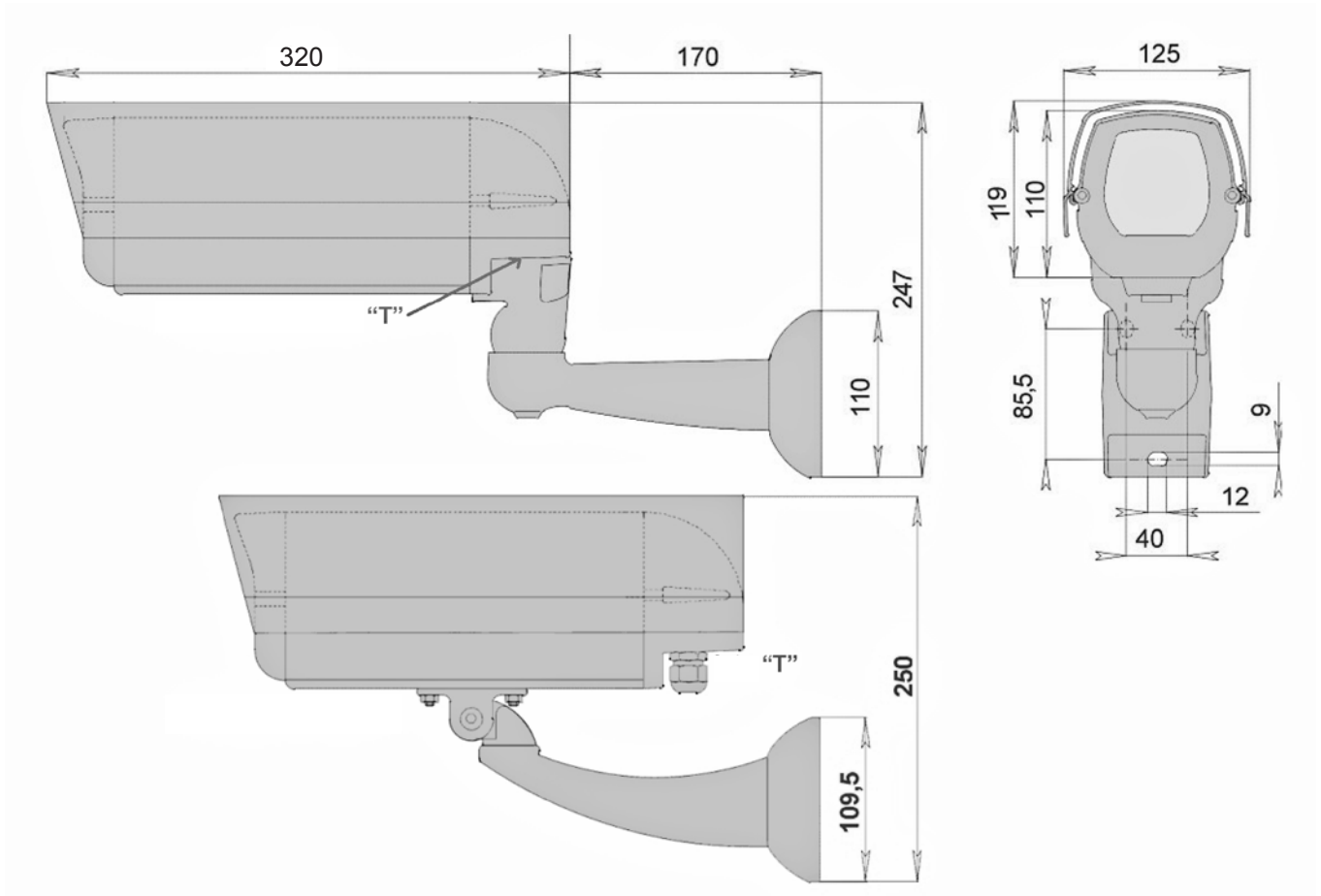
DESCRIPTION	FEATURES
SENSORE	
Sensor	Professional CMOS sensor - very high speed
Sensor resolution	2 Megapixel - FULL HD - 1980 x 1024 pixel
Sensor type	Global Shutter
Sensor frame rate	60 Fps
LENS	
Series lens	Manual fixed focus IR available in 8 or 16 mm focal lenses
Binding	CS interchangeable
CHARACTERS RECOGNITION – OCR	
Plates and characters reading	On-board car plates reading OCR .
Reading/capturing synchronism	Automatic (free flow) without the use of coils or apparatus of synchronism
READING ACCURACY	
A= ON ROAD reading accuracy	> 95%
The method used to calculate accuracy (A) is the manual one.	The reading accuracy (A) on road corresponds to services provided by camera when installed in the field. The given precision is achieved by verifying a sample of over 5000 images one by one, captured in time span of 12 months, in different weather conditions (fog, snow, rain, sun etc.) and with plates of any type and condition: dirty, deformed, poorly reflecting, etc.
The data with (D1), indicate that they are connected with each other (data correlation)	
On-road accuracy with syntax	> 98% (test on Italian plates)
Syntax-free on-road accuracy	> 95%
Membership class	"A class" ⁽¹⁾ with ref. to UNI 10772
NORME RISPETTATE	
2004/108/CEE - EN 55022 - EN 55024 - EN 61000 - 2006/95/CEE - EN60950 - EN 62471:2008 - EN 60529 - EN 60068 - EN 60721 - 2011/65/CE - RoHS2 - UNI 10772 ⁽¹⁾	
(1) it should be noted that the OCR content in this product is the same of the car plate reading camera that Selea certified by INRIM in A class, according to UNI 10772, with 100% accuracy at 60 °. Please note that the certification is required solely for the homologation of the following automatic sanction mechanisms: LTZ, Red Light and Speed Cameras. The certification is not helpful nor even required for all other fields of application and use.	

DESCRIPTION	FEATURES		
INSTALLATION TIPS			
	<i>Reading geometry :</i> $\beta = 30^\circ$ advice $\alpha = 30^\circ$ advice $d= 10 \text{ m max}$ $h= 2 \text{ m max (1 m advice)}$ $W= 5 \text{ m max (3,5 m advice)}$		
	<i>Reading area : pointing and focus at half dmax</i>		
	Series lens	L8 - 8 mm	L16 - 16 mm
	RS=reading space	4m (1 to 4 m)	8m (2 to 10m)
	dmax	5m	10 m
	TARGHA boasts a unique reading hike. This feature solves many problems for installation: pointing, focusing and implementation, making Targha a Plug & Play camera.		
Angles allowed by accepting a reduction in accuracy	$\beta = \text{ up to } 60^\circ$ $\alpha = \text{ up to } 40^\circ$		
Optimal reading angles in relation to reading accuracy (A)	$\beta = 30^\circ$ $\alpha = 30^\circ$		
Optimal installation height in relation to reading accuracy (A)	$h= 1 \text{ m for } 8 \text{ mm lens}$ $h= 2 \text{ m for } 16 \text{ mm lens}$		
Optimum gate width in relation to reading accuracy (A)	$W= 3.5 \text{ m (useful framing)}$ - taking into account the margins required by the vehicles the true width of the gate road is 5 m.		
Capture speed in relation to declared reading accuracy (A)	Up to 40Km/h without synchronism (free flow)		
ON-BOARD ALGORITHMS			
No shadows	Algorithm of choice for the elimination of all forms of shadow, (be it vertical or oblique, weak or strong contrast) from the plate.		
No over-exposure	Algorithm for lighting control, variable according to reflectance of the plate and environmental conditions.		
No double reflectance	Algorithm for the search of proper exposure, for plates that own reflective new parts and no longer reflective old parts.		
No smearing and blooming effect	The camera is insensitive to light beams reflected from chrome or high-reflectance objects.		
No dirt	Algorithm to eliminate problems introduced by the deposit material on license plate characters, like snow, soil, dust, insects ...		
Multi-exposure	Video analysis algorithm that allows you to choose the best picture among those obtained from multiple exposures.		
Angles compensation	Correction algorithm of the deformation of characters also with pushed shooting angles.		
No symbols and emblems	Algorithm for eliminating disturbing elements as labels, badges, symbols or advertising signs.		
Predictive analysis	Predictive analysis probability-based algorithm, for letters and numbers. It increases accuracy even when the characters are deformed, partially damaged or covered with snow, objects and dirt.		

DESCRIPTION	FEATURES
CAR PLATES AND NATIONALITY	
Recognized characters set	All those in the West (Latin alphabet): European, Canadians, Americans (USA), Turkish, Nigerian, South African plates and many more.
Syntax and nationalities (syntax-free mode)	Targha does not contain libraries that limit its use. Therefore there are no syntax and nationalities limits except those relating to the character set that the OCR can recognize (you can train the OCR to recognize any kind of character).
Recognition of Nationality	Multicam and CPS software are able to provide the Nationality of the vehicle and create black / white lists for specific Nationality. Note that these are probabilistic systems being multiple the syntaxes even within an individual Country and often similar to other Countries.
Nationality filter	You can choose between modes with syntax - useful where there are well defined syntax (like Italy) - and without syntax (syntax free).
Type of vehicles recognized	Cars, motorbikes and motorcycles, trucks, Military Forces vehicles, ambulances
Type of license plates read	Both front and rear.
Non-reflective plates	In daylight the camera can also read non-reflective license plates.
IR ILLUMINATOR	
Led IR	No.6 led IR - High power
Type of IR illuminator	Complies with EN 62471: 2008 Photobiological safety (eyes)
Automatic power adjustment	Pulsed illuminator able to adjust the power delivered to the conditions of reflectance and lighting in the environment.
Exposure modes and lighting	At each step the vehicle is subjected to more flash with different light intensity values (multi-exposure mode).
Optimal lighting distance in relation to reading accuracy (A)	1 or 2 m
Maximum Lighting distance permitted NOT in relation to reading accuracy	10 m
MEMORY - HARD DISK	
Memory type (storage)	Solid state CF card with expansion up to 32 GB
Internal storage capacity (plates)	Consider that with a memory of only 2 GB you can save more than 60,000 images in the expected format with resolution 752x480 pixels (WVGA)
Internal management of White / Black lists	Unlimited with recognition and automatic signal function
Memory management	Automatic: when the memory is full the camera performs the auto-delete of images by eliminating filming older (FIFO method). In case of disconnection from the server, the camera memorizes license plates and on recovery connection, downloads saved plates on the central server. The memory can be viewed and downloaded via browser (HTTP).
AUDIO	
Audio input	Input for condenser microphone.
Audio output	250 mW preamp output.
Audio quality	G723-G711
Functioning mode	Half or Full duplex with anti-echo algorithm useful to the realization of SOS columns or video call.

DESCRIPTION	FEATURES
VIDEO	
Capturing screenshots	JPEG format – transferred via FTP
Video streaming	MPEG4 - transferable via UDP-TCP / IP in RTP / RTSP format. The FTP and UDP-TCP / IP are independent. Therefore simultaneous recording of both video and image capture is possible.
CONTEXT CAMERA	
Context camera	The camera is endowed with a web-server to connect any analog PAL / NTSC, and also PTZ camera. Those who choose the optional A form can no longer use this input.
Camera positioning	Adjustable to any strategic objective, Targha can also be placed at distances above 150 meters from the sensor to capture license plates.
Correlation between “context” image and “plate” image	Possibility of receiving a separate stream of images (plate and context) or a unique image containing image context + plate or vice versa (Picture-in-Picture mode).
DATA INTERFACE and I/O	
Data interface transmission	LAN-Ethernet 10/100 Mbit - RJ45
Access mode to the camera	The camera is TCP / IP and Web-server. Allows direct image viewing, memory access, parameters configuration through HTTP browser.
Images format	Mpeg4 e/o Jpeg
Transmission mode (protocols)	TCP/IP, UDP, HHTP, RTP/RTSP, DHCP, PTZ(Pelco, Samsung, Sony, Panasonic)
Serial interfaces (optional)	Wiegand, OSDP e RS232/485
Input	No.2 digital inputs
Output	No.1 digital output or dry contact (relay)
GENERALS	
Updates and maintenance	Selea owns 100% of knowledge and intellectual property of the product including algorithms, ensuring their changeability and constant updating.
Integration	The device can be integrated into best known video management platforms and video surveillance as Genetec and Milestone.
SDK	The camera is provided with the SDK and / or all of the data necessary for the integration of any third party software solution.
Operating temperatures	-25°C to +50 °C ambient temperature
Power supply	220 Vac and 12 Vdc $\pm$ 20% (produced with 220 Vac embedded power supply)
Absorbed power	8 Watt max
Dimensions (mm)	W=120 : H=130; D=410
Weight	4,5 Kg
Casing	Cast aluminum and polyester powder coated light gray RAL 7035
Degree of protection	IP66

	The camera is provided with Wiegand interface for integration within access control systems.
O = RS485 OSDP 	The camera is provided with RS485 interface with standard OSDP communication protocol for integration within access control systems requiring high-distance connection.
A = Double eye 	PAL color sensor, Rolling Shutter, 720x576 pixel resolution, sensitivity 12V / (lux-sec), equipped with 12 mm fixed focus lens with M12 binding. If IR filter is removed, we recommend the use in environments with sufficient lighting.





SOFTWARE SOLUTIONS

As well as designing hardware devices, SELEA developed in-house software solutions useful to provide customers with a turnkey package and unified assistance. This also allows us to modify existing solutions to customize them according to design specifications.

Milestone - Genetec integration

Selea's effort is to make its products as integrated within the different platforms on the market. Targha communicates using standard communication protocols such as RTP / RTSP and FTP for video component and M2M XML for meta data component. Together with these protocols SDK and plug-in integration have been developed for platforms like Xprotect / Transact by Milestone and Omnicast by Genetec. Selea is also willing to provide technical support to anyone who wants to integrate Targha within their solutions.

Genetec



Parking Management (PAM)

PAM is the solution for those who want to create management and access control systems. Also ideal for the management of private, fee and residential parking.

The solution:

- ⊗ allows access only to authorized users;
- ⊗ lets you view and store the face of who goes in and out, with visualization of date and description of the vehicle;
- ⊗ allows free access in predetermined time / date;
- ⊗ every category of users is assigned with predetermined number of parking spaces and number of plates;
- ⊗ allows to deny access when the number of parking spaces is exhausted.

Car Plate Server (CPS)

Installed on a server, CPS is a software solution that transforms the latter into an FTP database useful for storage and management of car plates on large databases. CPS is advantageous in saving bandwidth communication (Wi-Fi networks) being sent capture images only and not video streaming. The solution allows to:

- ⊗ vstore the plates in a large database;
- ⊗ quickly search in large database by typing the individual parts of the plate or wildcards;
- ⊗ record pictures / movies both of captured plates and from the context camera;
- ⊗ manage multi-lists (White / Black list etc.);
- ⊗ show statistical analysis of traffic;
- ⊗ save bandwidth.v

More information is available on CPS datasheet.

Multicam

Multicam software solution comes with the camera for an easy management of captured license plates and allows to:

- ⊗ store the plates in a database;
- ⊗ instant search through even the individual parts of the plate or wildcards;
- ⊗ record images or movies both of both of captured plates and from the context camera connected to Targha via secondary analog input;
- ⊗ view images;
- ⊗ manage lists with permissions (white list);
- ⊗ manage lists of stolen plates (black list);
- ⊗ activate alarm events or reporting.

More information is available on Multicam datasheet.