SELEA

EXPAND YOUR SENSES

TARGA 850

DATASHEET

- DUAL LANE: car plate reading with high precision in all environmental conditions.
- SCALABLE: change or add AI algorithms
- DUAL SENSOR: OCR for number plate reading and color context sensor

High resolution TCP/IP number plate (ANPR) recognition camera with an extensive series of embedded video analysis algorithms for more effective urban safety monitoring and efficient traffic analysis.

CAMERA

High resolution **dual sensor** camera (5+5 Megapixels) that comes standard with:

- **5 Megapixels** B/W Global Shutter CMOS OCR sensor for *plate reading*, 60 FPS frame rate, fitted with a 12~40 mm varifocal lens with F1.4 aperture and C/CS mount.
- **5 Megapixels** colour context sensor CMOS Rolling Shutter, fitted with 12 mm lens and IR filter for *panoramic view*.
- Optional colour context sensor CMOS Rolling Shutter, for *panoramic view* with **Full HD** resolution (**Night Vision**), fitted with 12 mm lens and IR filter.

ANPR-OCR

Triple OCR algorithm embedded directly into the camera that can read both number plates and *dangerous goods* codes (Kemler-UN) automatically (free flow) on single lanes without the need for external synchronisation devices. It should be remembered that unlike other systems, Selea character reading cameras **are not based on** imprecise motion detection systems. Number plates and Kemler codes can also be read even when the vehicle is stationary (0 Km/h = no motion detection).

The OCR recognizes the characters of the Latin alphabet and some Arabic letters (**Arabic characters**: Iran-Iraq, Morocco, Turkey and others). The camera is able to recognize the *nationality* of the vehicle without having to work with syntax limitations or constraints of syntax libraries of over 28 Member States of the European Community such as: *Austria, Belgium, Bulgaria, Cyprus, Croatia, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, the United Kingdom, the Czech Republic, Romania, Slovakia, Slovenia, Spain, Sweden, Hungary and non-EU countries such as Albania, Azerbaijan, Belarus, Bosnia and Herzegovina, the Vatican City, Florida, Georgia, Iceland, Kazakhstan, Kosovo, Macedonia, Moldova, Monaco, Montenegro, Nigeria, Norway, San Marino, Serbia, Switzerland, Turkey, Ukraine,* as well as character sets from countries such as Canada, Iran, South Africa and others, for a total of **over 50 countries**. The camera can work both with and without syntax and *without losing accuracy* when switching from one mode to another. In syntax-free mode, the camera offers the advantage of having no nationality limits, apart from constraints imposed by the character sets that the OCR is able to recognise. You can choose between operating modes that use syntax, which is useful where a well-defined syntax exists (such as in Italy) - and that don't use syntax (syntax free) like in most European countries, without the loss of reading accuracy.

The system recognises a wide range of vehicle types from cars to goods vehicles, mopeds and motorcycles, Law Enforcement vehicles, Military vehicles and Ambulances. It can read both front and rear number plates. Reading accuracy of up to 99% in various environmental conditions, even for dirty number plates.

STATISTICS

The camera provides data for the following statistics:

- Vehicle count.
- Traffic statistics.
- Colour class (*16 classes*).
- Vehicle class (*10 classes*).
- Transit times between entry and exit points from the town centre with graphic representation.
- Types of dangerous goods according to risk index.
- Country of registration.
- Province.
- Speed.
- Make (*+ 400 makes*).
- Model (*+ 9000 models*).

INTEGRATED ALGORITHMS AND FUNCTIONS

In addition to the OCR number plate and dangerous goods plate reading algorithm, the following algorithms and features are also embedded in the camera:

- *Dirt elimination:* to eliminate issues associated with dust, mud and insects on the body of the number plate.
- *Angle compensation:* to allow readings to be taken even at sharp angles.
- *Symbol elimination:* such as labels, badges, symbols or advertising.
- *Predictive character analysis:* probability based, to improve reading accuracy.
- *Magic spot:* which makes the number plate visible even if the image is dark.

- **Speed**: to send alerts about vehicles travelling at dangerous speeds or to calculate the average speed of travel.
- **Class**: to statistically analyse the classes of vehicles that pass under the reading system and to report heavy goods vehicles, mopeds or motorcycles that use roads on which their transit is prohibited - recognises up to 10 classes.
- **Colour**: useful when searching for vehicles when the number plate is not available - recognises up to 16 colour classes.
- **Country** of registration: useful for finding vehicles coming from foreign countries or vice versa.
- **Province** of registration: useful for statistics or searching for vehicles.
- **Make** of vehicle: able to recognize over **400 makes** from the best known vehicle manufacturers *(optional)*.
- **Model** of vehicle: able to recognize over **9000 models** (heavy goods vehicles, vans and cars) *(optional)*.

- **Direction of travel** recognition.
- Plate recognition on **priority lanes**.
- Recognition of heavy goods vehicles on roads where their **transit is prohibited**.
- Recognition of motorcycles / mopeds on roads where **their transit is prohibited**.

SECURITY AND PRIVACY

Data and image security is ensured both by encryption and the following functions:

- HTTPS encryption.
- FTPS (FTP over TLS/SSL) encryption.
- MicroSD memory encryption.
- Automatic deletion of data and images after a specified period of time (privacy management).
- AES256 Advanced Encryption Standard.
- SHA2 Secure Hash Algorithm 2.

STANDARD FUNCTIONS

The camera, with embedded Linux OS, has the following built-in functions:

- Embedded FPGA video signal processing.
- Double FTP server and double IP notification server.
- Dynamic FTP notification forwarding customization.
- IP notification customization.
- Multiple user management using HTTPS protocol protected access credentials for accessing the camera.
- List management (white/black list, no list) with independent actions for each list.
- Synchronized recording of metadata and captured code/number plate image.
- Integration and saving of context camera images.
- Privacy management with automatic deletion of image data after a specified period of time.
- Integration with third party VMS video surveillance software solutions.
- Save data on a local server or remote NAS.
- HTTPS security management.
- FTPS (FTP over TLS/SSL) security management.
- E-mail forwarding security using TLS/SSL protocol.
- Multiple action alarm management.
- Live and check control function for checking the operation of the entire system.
- Synchronization of date and time via NTP, IEEE1588 protocol.
- Possibility of updating firmware from a web page.

OCR ACCURACY

Unlike other systems, the SELEA cameras character reading **does not depend** on the activation of the motion detection system. So the camera can read even when a vehicle is stationary. The camera is also able to read number plates at speeds up to 250 km/h, bearing in mind that the higher the speed the more the accuracy will depend on the actual environmental conditions and the condition of the number plate (dirty, non-reflective etc.).

On roads Selea guarantees an accuracy of:

- Up to 99% of number plate reading transits, in all conditions, for speeds from 0 km/h (vehicle stationary) to 160 km/h for the standard system: PAN ≤ 30°; TILT ≤ 25°; H ≤ 4 m.
- Up to 96% of front ADR (Kemler-UN) panel reading transits, in all conditions, for speeds from 0 km/h (vehicle stationary) to 140 km/h for the standard system: PAN ≤ 30°; TILT ≤ 25°; H ≤ 4 m.
- 100% accuracy according to UNI 10772:2016 class A parameters for rear, two-line, motorcycle and moped number plates.

INSTALLATION

Number plate and ADR tables reading on a single lane. The system will work best when the camera is installed to read:

- Rear number plates. The recommended reading distance is 27 m; Mounting height = 4 m; Lane width = 7 m; TILT = 7.1°.
- Oncoming front ADR panels (Kemler-UN). The recommended reading distance is 27 m; Mounting height = 4 m; Lane width = 7 m; TILT = 7.1°.

INTEGRATION

The camera is compatible with the most widely used plate reading and video surveillance software platforms on the market and with CPS, a software developed in-house by Selea, which being an open platform, is able to integrate standard third party ANPR-OCR cameras.

INTERNAL MEMORY

The camera is fitted with an internal 16 GB (expandable on request up to 256 GB of MLC type) *High Endurance* (from -40° to +85°) industrial microSD SLC memory card as standard, which is used for entering number plates (white/black list) and for saving captured images. When the memory is full, the camera will automatically delete the oldest files to free up space for new ones (Fi.Fo method). If the data connection is lost, the camera automatically stores all transits locally. When the connection is restored, the camera automatically updates the operations centre database. The memory can be expanded using the USB interface provided to connect storage disks of the capacity currently available on the market (≤ 1TB - optional).

VIDEO OUTPUT

The camera is able to send:

- HD JPEG images and video streams for OCR in RTP/RTSP format with MPEG4 encoding.
- 5 MPixels images and video streams for the context sensor in RTP/RTSP or HTTP format with MJPEG4 encoding.

IR ILLUMINATOR

The camera is fitted with a CLASS 1M IEC EN69825-1 ED.4 IR illuminator consisting of 12 high power 820 nm/47° (940 nm on request) IR LEDs that are compliant with the EN62471:2008 standard on photobiological safety. The multiple exposure pulsed lamp is able to regulate the output power according to the lighting in the environment and the reflectance of the number plate. This avoids underexposed or overexposed images, which improves number plate reading and recognition accuracy. The recommended lighting distance for maximum reading accuracy for dirty or non-reflective number plates is between 15 and 30 metres.

DATA INTERFACE

The camera is a web-server device, i.e. a device that allows the images to be viewed, the memory to be accessed and the parameters to be configured via a browser.

- It is fitted with a 10/100 Mbps standard 802.3 Ethernet/IEEE port and uses standard communication protocols such as TCP/IP, UDP, HTTP, HTTPS, FTP, FTPS, RTP/RTSP and DHCP.
- It is also fitted with standard interfaces such as RS232, RS485 half duplex, and optionally also
  - Wiegand
  - OSDP
  - MODBUS

DATA COMMUNICATION

- **ONVIF** communication protocol.
- Save data directly to local server or remote NAS.
- Integration with third party VMS software solutions.
- Synchronized recording of metadata, number plate/Kemler code and context image.
- Context images synchronised with number plate/Kemler panel.
- Dynamic creation and updating of multiple lists (black/white list).
- Integration and HTTP storage of JPEG snapshot images of external TCP/IP context cameras of any make or model.
- Multiple action alarm management.
- Different alarms for each type of traffic offence.
- Alarm-triggered transmission of the image associated with the captured number plate to remote devices (such as MOTOROLA and HYTERA mobile radio communication equipment, PC, Tablet etc.) with *vocal reception* of the number plate.
- Double (triple on request) FTP and/or TCP/IP server.

I/O, INPUTS-OUTPUTS

The camera is fitted with 10A - 250 Vac, 30 Vdc volt-free contact relays for opening the barrier/gate automatically. It also has 2 digital inputs for synchronization devices, if required.
The capturing and processing of images can be activated by a digital command or by an Ethernet command.

INBUILT PROTECTION

The camera is protected against:

- reverse polarity.
- voltage fluctuations greater than 30 Vdc.
- overloads with thermal protection.
- overvoltages (TVS) on USB and Ethernet ports.

POWER SUPPLY

The camera is fitted with a 230 Vac, and on request a 24 Vdc and PoE+ ("T" option) power supply including high power injector. Absorbed power max. 15 W.

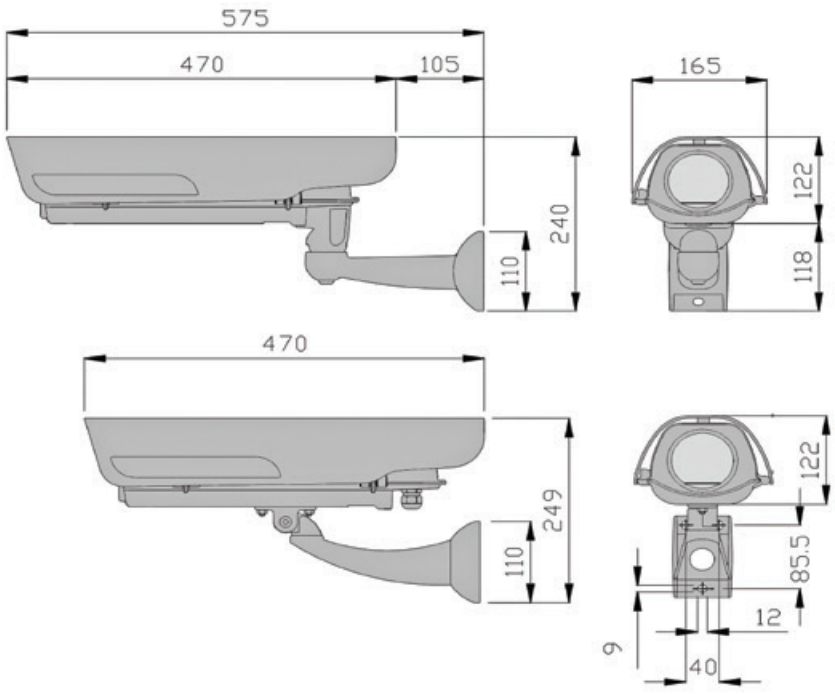
GENERAL

The camera is made of powder coated die-cast aluminium with an ABS weather-shield. It can operate in temperatures from -40°C to +65 °C without the need for fans or heaters. Protection rating IP66. IP67 and IK10 on request. Its dimensions are: L=165 H=122 D=470 mm - Weight: 3 kg.

ACCESSORIES

The camera can be equipped with the following accessories:

N8 **N12**	**C**olour sensor CMOS Rolling Shutter, Night Vision with high sensitivity and Full HD resolution, fitted with an 8 or 12 mm fixed focus lens with an M12 mount. We recommend using the sensor even in poor public lighting conditions.
MM	**M**ake and Model of vehicles, thanks to an additional convolutional network trained to recognize over 400 makes from the world's best known vehicle manufacturers and over 9000 models of both heavy vehicles, vans and cars.
S	**I**ndustrial Ethernet Switch10/100 developed by Selea to be installed inside the camera, with 3 LAN ports, one of which with P.O.E. 802.3at to power any type of external IP camera or any type of Wireless, Wi-Fi or GPRS/UMTS device with a single network cable.
I	**I**lluminator invisible to the human eye, consisting of 940 nm IR LEDs instead of standard 820nm LEDs. The invisible illuminator is suitable for all applications where discretion and confidentiality are required.
B	**P**ower supply from 10 to 32 Vdc.
T	**P**oE+ (Power Over Ethernet Plus) power supply including high power injector.
Z	**N**atural white light, replacing the standard IR illuminator, for reading car plates with red characters.



COMPARISON TABLE showing the main differences

● = *included (built-in)* ○ = *optional (on request)*	TARGA **205**	TARGA **704**	TARGA **805**	TARGA **750**	TARGA **850**
Lanes	1	1	1	2	2
Built-in OCR sensor	2 Mpx	2 Mpx	5 Mpx	3,2 Mpx	5 Mpx
5 MPX colour panoramic sensor	●	○	●	○	●
Dangerous goods tables reading (Kemler)		●	●	●	●
Nationality recognition	●	●	●	●	●
Speed detection			○		●
Vehicle Type recognition			○		●
Colour recognition			○		●
Make & Model recognition (on board)			○		○
Memory expansion ports		●	●	●	●
Expansion ports of deep learning (AI) - future modules			○		○
White/Black list storage and backup		●	●	●	●
PoE+ power supply with power injector	○	○	○	○	○

SELEA

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WHERE TO BUY

Selea has a network of authorised Distributors throughout the country with whom it establishes design and market protection policies.

SUPPORT

We provide both a pre-sales and after-sales technical support service to customers.

About us

SELEA is specialized in the manufacture of number plate reading solutions, both for vehicle access control and for territorial security and traffic control. All of our products are developed and manufactured entirely in Italy. This means that our customers benefit from continuous and comprehensive technical support.

The experience accumulated in over 10 years of collaboration with various law enforcement agencies on video surveillance and license plate reading systems, give us today the opportunity to offer solutions capable of guaranteeing excellent results, and advanced tools for the **repression and prevention of crimes** (search for accomplices, stolen vehicles, vehicles without insurance/roadworthiness certificate, traffic analysis, and much more). These products can be part of an integrated urban security system, allowing the sharing of information between law enforcement and smart cities.

- **HARDWARE** MANUFACTURING
- **SOFTWARE** DEVELOPMENT
- IN-HOUSE RESEARCH & DEVELOPMENT
- 100% MADE in ITALY by SELEA