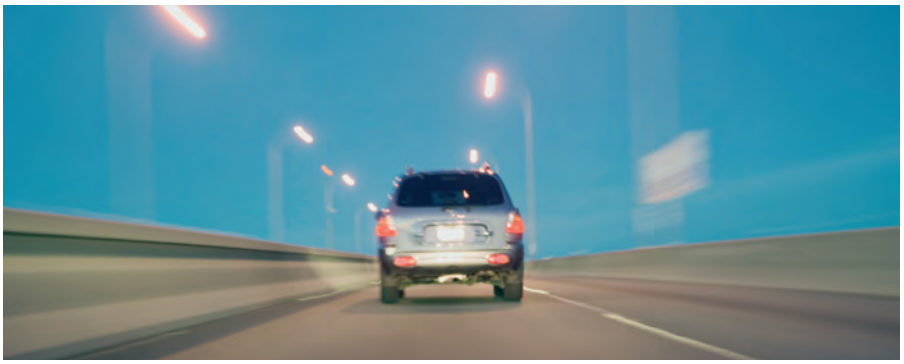
Kapsch VR-2:
License plate recognition.



Kapsch VR-2 license plate recognition is designed to in real time register vehicles in tolling systems. Kapsch VR-2 license plate recognition is an all-digital triggerable image capturing system which is optimised for reading license plates and for documentation of traffic scenes.

The VR-2 license plate recognition is based on a high quality, high resolution camera tuned to provide the best possible performance with regards to capture accuracy and automatic licence plate reading accuracy. The high-resolution capability provides a wide field-of-view that enables the system to have only one VR-2 camera per lane, still providing full road coverage with overlapping fields of view. Kapsch VR-2 license plate recognition has an ANPR/LPR (Automatic Number Plate Recognition / License Plate Recognition) engine that is able to perform analysis of all captured images. The images and data produced by the Kapsch VR-2 license plate recognition meet evidential enforcement requirements in multiple countries. The exchangeability of cameras and image processing algorithms guarantees that Kapsch VR-2 can be adapted to specific customers' needs. By using a fibre-optic signal transmission, a safe triggering is guaranteed as well as reliable broadband image transmission also over long distances.

A Kapsch VR-2 system consists of up to twelve camera units with integrated or external illumination connected to a central controller. The controller consists of a industrial PC with the acquisition modules and software. The acquisition module receives and directly handles trigger events supplied either by a digital input or by a RS-232 interface.

The VR-2 camera consists of the camera enclosure with sunshield, heater and ventilation, power supply and over-voltage protection, the camera module and the image sensor. The camera module is the interface converter to the camera and communicates over fibre optic cable with the acquisition module, located in the controller.

Kapsch VR-2 has encapsulated all real-time tasks in dedicated hardware, to execute highly dynamic processes on a standard operating system in a deterministic manner.

Kapsch VR-2 uses multiple security features to guarantee doubtless image capturing:

- Continuous monitoring of the functionality ensures that sabotage and faults are recognized and reported
- Authentication between camera unit and controller
- Signature of the acquired images

The Kapsch VR-2 Remote Manager Application allows a one-person adjustment with real time display and multi camera view. It can be installed on any Windows PC / Notebook as well as the VR-2 Controller.

Technical Features

VR-2 System

- Up to 12 cameras connected to a common controller via fibre optic.
- Depending on the application, various camera types, resolutions, lenses and filters.
- Triggering is either digital, serial or over the PCI bus.
- Image capture is in real-time (trigger delay max. 2ms) or by post-trigger.
- Camera authentication in hardware.
- Signature of the image using WindowsCrypto API, hash algorithm, RSA encryption.
- Various generic or specially trained software packages (also third party) for ANPR/LPR may be used.
- Data-bar / black strip in the image and JPEG compression.
- Automatic exposure control based on the brightness of the license plate or image as a whole.
- Continuous monitoring and status information (SNMP).
- Image storage local (transfer via FTP) or on network share.
- TCP/IP result and control interface.

VR-2 Camera

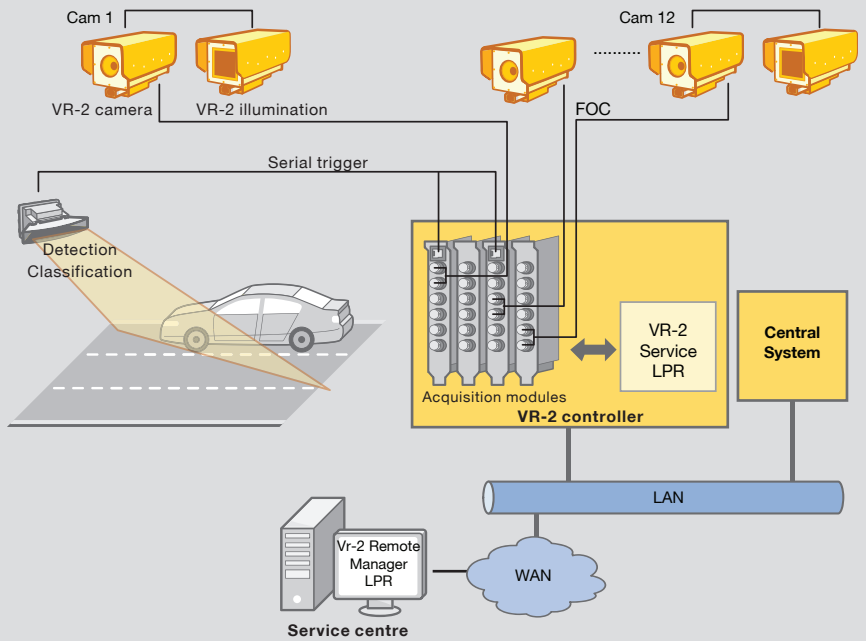
- Camera sensor: 1392x1032 pixels, up to 12 bits per pixel dynamic range (other camera sensors available on request).
- Field of view: 4m at 11,5m (other lenses available on request).
- Integrated or external illumination: Up to 120W (± 10° FWHM).
- Enclosure: Extruded aluminium alloy, corrosion resistant.
- Dimensions (W x H x L): 197 x 228 x 459mm.
- Weight: < 10kg.
- Ambient temperature (operating): -33 to +45°C.
- Ambient temperature (non-operating): -25 to +55°C.
- Relative humidity (operating): 4% to 100%.
- IEC protection rating: IP65.
- Power supply: 24VDC, max. 30W (without heating).
- MTBF: > 50.000h.
- Vibration: 1-9Hz 3.5mm, 9-150Hz 10m/s².
- Shock: 200m/s², 11ms.
- EMC: 2004/108/EC LVD: 2006/95/EC.
- UL: E323290 FCC: 47CFR15 (US variants).
- Controller interface: 2 x FOC multimode 50 / 125µm, data rate 100MBit/s.

VR-2 External Illumination

- Optical power: 120W (± 10° FWHM).
- Peak wavelength 870nm / 830nm (other wavelengths available on request, also white light).
- Spectral bandwidth 40nm.
- Light emitting aperture app. 130 x 130mm.
- Pulse width max. 400µs / 700µs.
- Frequency max. 30Hz / 15Hz.
- Daisy-chaining.
- Enclosure: Extruded aluminium alloy, corrosion resistant.
- Dimensions (W x H x L): 197 x 228 x 334mm.
- Weight: < 6kg.
- Ambient temperature (operating): -33 to +45°C.
- Ambient temperature (non-operating): -25 to +55°C.
- Relative humidity (operating): 4% to 100%.
- IEC protection rating: IP65.
- Power supply: 24VDC, max. 25W.
- MTBF: > 50.000h.
- Vibration: 1-9Hz 3.5mm, 9-150Hz 10m/s².
- Shock: 200m/s², 11ms.
- EMC: 2004/108/EC LVD: 2006/95/EC.
- UL: E323290 FCC: 47CFR15 (US variants).

VR-2 Controller (example, other variants on request)

- Ruggedized industrial PC, Windows® 7 Embedded.
- Intel® Core™ 2 DuoT7400, 2.16GHz, 3GB DDR2 RAM.
- 160GB hard disk for 24/7 use
- Acquisition modules for up to 12 VR-2 cameras.
- Dimensions (W x H x L): 205 x 270 x 255mm.
- Weight: < 9kg
- Ambient temperature (operating): 0 to +45°C.
- Ambient temperature (non-operating): -20 to +60°C.
- Relative humidity (operating): 10% to 80% (non-condensing).
- IEC protection rating: IP20.
- Power supply: 24VDC, max. 150W.
- EMC: 2004/108/EC LVD: 2006/95/EC.
- UL: E115267 FCC: 47CFR15.



System architecture

Kapsch Group

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