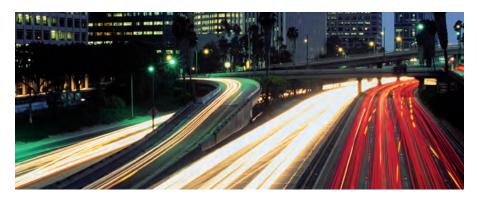*kapsch* >>>

VDR: Vehicle Detection and Registration Sensor.

The VDR is designed to in real time detect and register vehicles in our increasingly congested world. The VDR is an IR-sensitive fully integrated camera with built-in automatic vehicle detection and licence plate reader. The VDR is based on a high quality, high resolution camera with built in IR-illumination, both tuned to provide the best possible performance with regards to detection, capture accuracy and automatic licence plate reading accuracy.

The imaging platform contains the hardware and software needed to form a complete self- contained unit that is able to perform all needed operations such as vehicle detection, image capture, ANPR/LPR (Automatic Number Plate Recognition/License Plate Recognition) analysis, security processing and host communication. The high-resolution capability provides a wide field-of-view that enables the system to have one VDR per lane, still providing full road coverage with overlapping fields of view.

The VDR has an internal ANPR/LPR engine that is able to perform analysis of all captured images. As with the capture accuracy, the ANPR/LPR processing benefits from the high quality, high resolution images and the tuned illumination, enabling the highest possible accuracy.

The images and data produced by the VDR meet evidential enforcement requirements in multiple countries and can further be adapted to meet specific local legal requirements.

The VDR is supported by an extensive library of cryptographic and image processing capabilities. Physical security includes internal tamper detection.

The data delivered from the VDR for each vehicle passage, normally images together with passage and security information, can be sent in real time to a remote central system over a TCP/IP network. Passage information includes licence plate number, time-stamp, vehicle speed, direction and vehicle tracking positions for accurate matching with data from another sub-system such as DSRC equipment for tolling. The VDR can also be configured to provide streaming video images in parallel to normal functionality, and due to its

image-processing capabilities even to classify the vehicles (large / small only). Remote monitoring and control of the VDR is supported.

The VDR is designed to fit in the complex urban environment with a low visual impact. The VDR is designed for high reliability providing the operator with a long equipment operational life with high availability and low maintenance costs.

The VDR is available in a colour overview version which cooperates with the VDR. In this configuration, the VDR triggers the Overview VDR unit to provide a wide angle colour overview image of the event. The Overview VDR can be configured to capture a sequence of images before and after the VDR image. The combined images give an unambiguous picture of the traffic event.

Technical Features

Components
- VDR (LPN VDR).
- Colour Overview VDR.

VDR
- High-performance, fully autonomous ANPR camera.
- Camera sensor: 1280x1024 pixels, 12 bits per pixel dynamic range (other camera sensors available on request).
- Field of view: 4m at 11m or at 17m object distance (other lenses available on request).
- Standalone buffering: 40.000 images (optionally higher).
- Integrated IR illumination: 40W (optical).
- High-performance local ANPR/LPR engine, usage of external engine possible.
- High-performance autonomous real-time triggering / SW post-triggering.
- Classification into two vehicle classes (large / small).

Colour overview VDR
- High-quality colour contextual overview / scene camera synchronised with LPN VDR.
- Camera sensor: 1280x1024 pixels, colour, 8 bits per pixel dynamic range (other camera sensors available on request).
- Field of view: 12m at 11m or at 17m object distance (other lenses available on request).
- Standalone buffering: 65.000 images (optionally higher).
- SW triggering by LPN VDR.
- One overview VDR can serve up to three LPN VDR.
- Configurable number of contextual overview images for each passage, before and after passage.

Technical data
- Linux based operating system.
- Image compression (JPEG).
- Real-time full-resolution streaming.
- Integrated web-server.
- Host system interface: TCP/IP 100Base-T / 100Base-FX.
- Real-time data or file transfer.
- Real-time status information to host system.
- QFD (Quick Fastening Device).
- Available in black or light grey colour.
- Dimensions (W x H x L): 160 x 182 x 540mm.
- Weight: < 7kg.
- Power supply: 230VAC, or 24-48VDC, typically 40W.
- MTBF: > 50.000h.

Security functions
- Image encryption and signature.
- DES, Triple DES or AES encryption and MACs, SHA-256 hash.
- Kapsch Secure Application Module SAM 4000:
  - Secure remote key distribution and key storage.
  - ISO 7816.
- Physical tamper alarm.
- Data-bar / black strip in the image.

Environmental
- IEC protection rating: IP66.
- Enclosure: Extruded aluminium alloy, corrosion resistant.
- Ambient temperature (operating): -40 to +55°C.
- Ambient temperature (non-operating): -25 to +55°C.
- Relative humidity (operating): 5% to 100%.
- Vibration: 2-9Hz 3mm, 9-200Hz 10m/s².
- Shock: 100m/s², 11ms.
- EMC: 2004/108/EC LVD: 2006/95/EC.
- UL: E323290 FCC: 47CFR15 (US variants).