

# 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, OCR analysis, security processing and host communication. The high-resolution capability provides a wide field-of-view that enables the system only to have one VDR per lane, still providing full road coverage with overlapping fields of view.

The VDR has an internal OCR engine that is able to perform OCR analysis of all captured images. As with the capture accuracy, the OCR processing benefits from the high quality, high resolution images and the tuned illumination, enabling the highest possible OCR 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. The VDR can also be configured to provide streaming video images and accurate vehicle tracking positions within the camera field-of-view. 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 also in a colour overview version which operates integrated with the VDR. In this configuration, the VDR triggers the Overview VDR unit to provide a wider field-of-view colour overview image of the event if required.

It is possible to configure the Overview VDR to capture a sequence of images that can be used to capture the traffic event, this ranging before and after the captured VDR image.

**Applications:**

The VDR can be used in a range of applications including congestion charging and tolling, integrated with DSRC equipment for payment, or for video-based payment. The VDR is also suited for e.g. security and access applications, speed over distance enforcement, bus lane enforcement and travel time measurement.



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<b>Components</b>	<ul style="list-style-type: none"> <li>Perform OCR</li> </ul>	or 48 VAC, 100W
<ul style="list-style-type: none"> <li>VDR</li> </ul>	<ul style="list-style-type: none"> <li>Compress licence plate image</li> </ul>	<ul style="list-style-type: none"> <li>MTBF: &gt; 50.000 hours</li> </ul>
<ul style="list-style-type: none"> <li>Colour Overview VDR</li> </ul>	<ul style="list-style-type: none"> <li>Perform security processing</li> </ul>	<ul style="list-style-type: none"> <li>Degree of protection: IP65</li> </ul>
<b>VDR</b>	<ul style="list-style-type: none"> <li>High OCR rate enabled by high image quality</li> </ul>	<ul style="list-style-type: none"> <li>Available in black and light grey colour</li> </ul>
<ul style="list-style-type: none"> <li>Linux based operating system</li> </ul>	<b>Host Computer Interface</b>	<b>Temperature Range</b>
<ul style="list-style-type: none"> <li>Camera resolution: 1280x1024 pixels</li> </ul>	<ul style="list-style-type: none"> <li>Physical: TCP/IP 100BaseT, 100BaseFX, or GPRS</li> </ul>	<ul style="list-style-type: none"> <li>Non-operating: Storage: - 5°C to + 45°C</li> </ul>
<ul style="list-style-type: none"> <li>Dynamic range: 12 bits per pixel</li> </ul>	<ul style="list-style-type: none"> <li>Protocol: TCP/IP</li> </ul>	<ul style="list-style-type: none"> <li>Transportation: - 5°C to + 45°C</li> </ul>
<ul style="list-style-type: none"> <li>Field of view: 4m</li> </ul>	<ul style="list-style-type: none"> <li>Real-Time data or File Transfer</li> </ul>	<ul style="list-style-type: none"> <li>ref: IEC60721-3-1 Class 1K3, 2K2</li> </ul>
<ul style="list-style-type: none"> <li>Standalone buffering: 10.000 images (optionally higher)</li> </ul>	<ul style="list-style-type: none"> <li>Real-time alarms to host system</li> </ul>	<ul style="list-style-type: none"> <li>Operating: - 33°C to + 40°C plus solar radiation</li> </ul>
<ul style="list-style-type: none"> <li>Integrated IR illumination: 15W (optical) Laser class 1M ref IEC 60825-1</li> </ul>	<b>Security functions</b>	<ul style="list-style-type: none"> <li>ref: IEC60721-3-2 Class 4K2</li> </ul>
<ul style="list-style-type: none"> <li>Internal smart card for encryption and signature key storage</li> </ul>	<ul style="list-style-type: none"> <li>DES, Triple DES or AES encryption and MACs</li> </ul>	<b>Humidity</b>
<b>Overview VDR</b>	<ul style="list-style-type: none"> <li>Hash algorithms SHA-1 and MD5</li> </ul>	<ul style="list-style-type: none"> <li>5 – 100%, Condensing</li> </ul>
<ul style="list-style-type: none"> <li>Linux based operating system</li> </ul>	<ul style="list-style-type: none"> <li>Secure key storage in Smart Card certified according to FIPS 140 level 2</li> </ul>	<ul style="list-style-type: none"> <li>ref: IEC60721-3-2 Class 4K2</li> </ul>
<ul style="list-style-type: none"> <li>Camera resolution: 1280x1024 pixels</li> </ul>	<ul style="list-style-type: none"> <li>Physical tamper alarm</li> </ul>	<b>Mechanical</b>
<ul style="list-style-type: none"> <li>Dynamic range: 8 bits per pixel</li> </ul>	<ul style="list-style-type: none"> <li>Text overlay, watermarking etc.</li> </ul>	<ul style="list-style-type: none"> <li>Vibration: 2-9Hz 3 mm, 9-200 Hz 10 m/s<sup>2</sup></li> </ul>
<ul style="list-style-type: none"> <li>Field of view: 12m</li> </ul>	<b>Accessories</b>	<ul style="list-style-type: none"> <li>ref: IEC60721-3-3,4 Class 4M4</li> </ul>
<ul style="list-style-type: none"> <li>Standalone buffering: 65.000 images (optionally higher)</li> </ul>	<ul style="list-style-type: none"> <li>QFD (Quick Fastening Device)</li> </ul>	<ul style="list-style-type: none"> <li>Shock: 100 m/s<sup>2</sup> , 11ms, Type I</li> </ul>
<ul style="list-style-type: none"> <li>Internal smart card for encryption and signature key storage</li> </ul>	<ul style="list-style-type: none"> <li>Pre-terminated cables</li> </ul>	<ul style="list-style-type: none"> <li>ref: IEC60721-3-3,4 Class 4M4</li> </ul>
<ul style="list-style-type: none"> <li>Image capture initiated by one or more LPN VDR units</li> </ul>	<ul style="list-style-type: none"> <li>DSRC transaction system interface</li> </ul>	<b>CE Conformity</b>
<b>Vehicle registration</b>	<ul style="list-style-type: none"> <li>Field test and maintenance terminal</li> </ul>	<ul style="list-style-type: none"> <li>EMC: 89/336/EEC, 92/31/ EEC, 93/68/EEC</li> </ul>
<ul style="list-style-type: none"> <li>Capture licence plate image</li> </ul>	<b>Technical Data</b>	<ul style="list-style-type: none"> <li>LVD: 73/23/EEG, 93/68/EEC</li> </ul>
<ul style="list-style-type: none"> <li>Power supply: 240 VAC, 100W</li> </ul>		

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