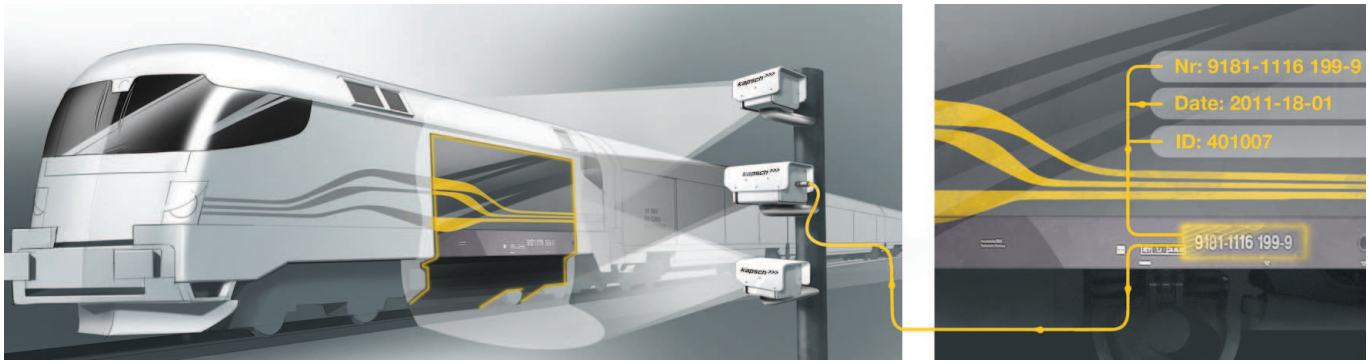
Kapsch **RW-ID**
Railroad Wagon Identification



Thousands of moved, ranked, distributed, loaded or unloaded railroad wagons in daily rail traffic require intelligent solutions for an efficient handling. However, the administration and control of trains and wagons in terminals or loading stations is comprehensive and the operation is still insufficiently automated. Kapsch Railroad Wagon Identification (RW-ID) enables increased automation of the rail vehicle administration by automatically detecting the UIC wagon number of passing rail vehicles. This allows a fast and reliable service of trains for logistic, service, and maintenance.

Wagon numbers are typically read at junctions, switches or gates of terminals or regularly monitored at train control checkpoints for further processing. Manual recordings cause delays in the administrative process. The Kapsch railroad wagon identification, based on Video and Optical Character Recognition (OCR), provides full automation of the railroad wagon identification process. The system is capable to localize and extract the UIC wagon number and consequently identifies passing rail vehicles automatically. This automated recording process improves the ascertainment of the sequence of rail vehicles and reduces the amount of wasted time.

Each rail vehicle is identified with a 12-digit wagon number according to the International Union of Railways UIC[1].
The automatic recognition of the UIC wagon number is based on side view images during the train passes.
The system is designed for passing by train speeds up to 140 km/h and for operating at all conditions of illumination.
An intelligent algorithm to recognize the UIC wagon number includes a plausibility check for verification and allows the reconstruction of possible missing digits.

[1] Union internationale des chemins de fer

The system consists of a high quality, high resolution VR-2 camera tuned to provide the best possible performance with regards to capture and reading accuracy, an illumination unit, and a controller with specially designed software.

In combination with wheel sensors the system allows capturing the train speed, the number of axles or the distance between axles and provides information about the wagon type using axle distance and symmetry.

Provided information includes the generation and transmission of a data package per train containing a time stamp, the UIC wagon number, an image of the separate wagons and the option to generate a panorama image of the whole train with the complete lateral view.

For ease integration into existing solutions Kapsch Railroad Wagon Identification is available with standardized interface and can be integrated into a variety of applications.

Already existing access or checkpoint systems for train supervision (e.g. hot box detector or wagon weighbridge) or terminals can be easily updated with the Kapsch Railroad Wagon Identification system.

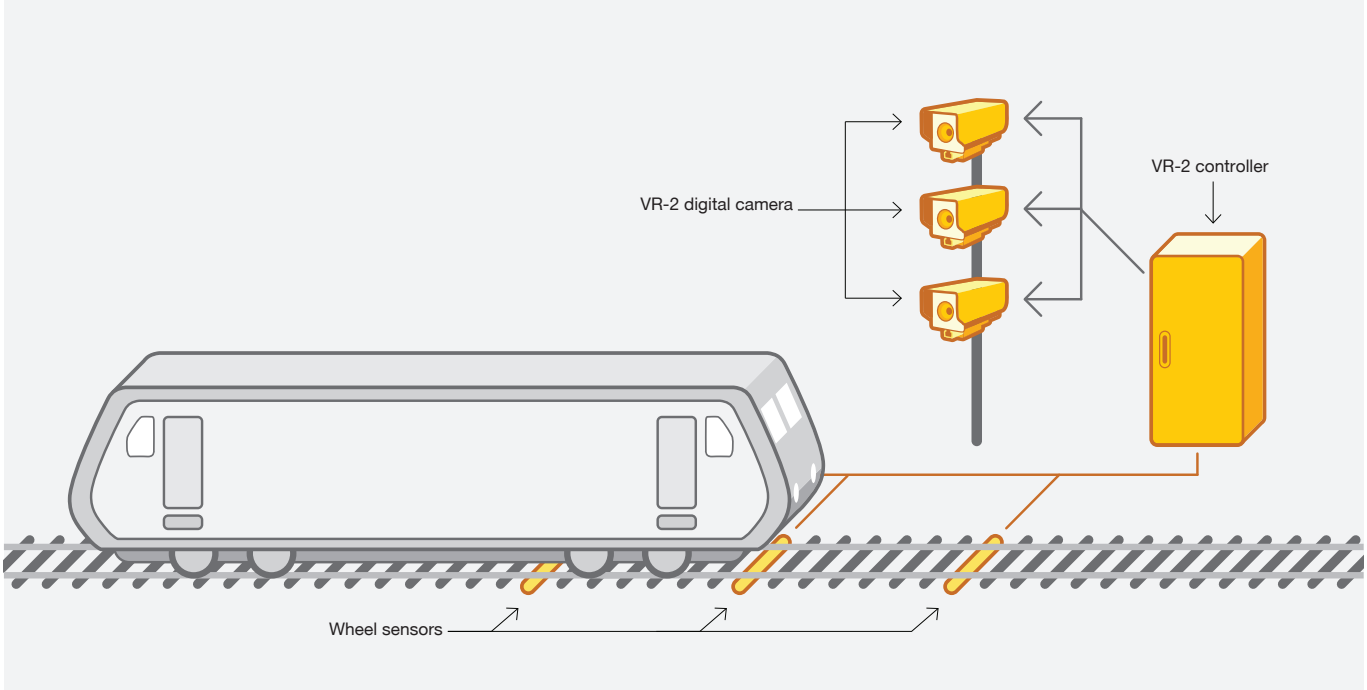
Incorporated our experiences from road tolling systems Kapsch Railroad Wagon Identification sets a new standard for high performance UIC wagon number identification.

Features

- Intelligent image processing algorithm for the detection of UIC wagon numbers
- Tested for train speeds up to 140 km/h
- Identification of wagon types by means of wagon number
- Usage in combination with wheel sensors for axle detection, measuring, and counting
- Documentation of each wagon by means of images
- Panorama images of trains

Kapsch RW-ID enables opportunities for a variety of applications:

- Automatic registration and control of the rail vehicle sequence
- Assignment of the wagon number to rail vehicles in checkpoints for e.g.:
  - Hot boxes, flat wheels, blocked brakes or broken axles
  - Derailed vehicles
  - Broken bearing-springs
  - Displaced cargo
- Optical recording of trains
- Rail control systems
- Realtime disposition
- Rolling stock management
- Tracking of containers
- Access control in terminals



Technical Features

VR-2 digital camera
- 1.4 Megapixels
- Aluminium housing
- Over voltage protection
- Operating ambient temperature -33°C to +45°C
- Operating relative humidity 4% to 100%
- Operating protection rating IP66

VR-2 controller
- Industrial PC
- Hard disk for 24h/7d use
- Operating ambient temperature +5°C to +50°C
- Operating relative humidity 5% to 95%
- Operating protection rating IP20
- Camera trigger

VR-2 illumination unit

Wheel sensors

Power supply

Kapsch Group
The companies of the Kapsch Group – Kapsch TrafficCom, Kapsch CarrierCom and Kapsch BusinessCom – are leading the international markets for Intelligent Transportation Systems (ITS) and Information and Communication Technologies (ICT). Kapsch. Always one step ahead.

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