



# TrainView



## TRIMBLE TRAINVIEW SYSTEM

### FULL SCALE TRAIN IMAGING & INSPECTION

Trimble® TrainView® is an automatic full scale train imaging and inspection system that images and inspects train body/roof area at mainline operational speeds.

Trimble TrainView system uses high-speed and high-definition digital imaging together with specially designed illumination sources to produce multiple high resolution images of side and top of every car (wagon). For reliable automatic inspections and to capture all externally visible components, multiple imaging scanner units are employed in the TrainView system. The number and configuration of the scanner boxes can be adapted to the specific site and customer requirements.

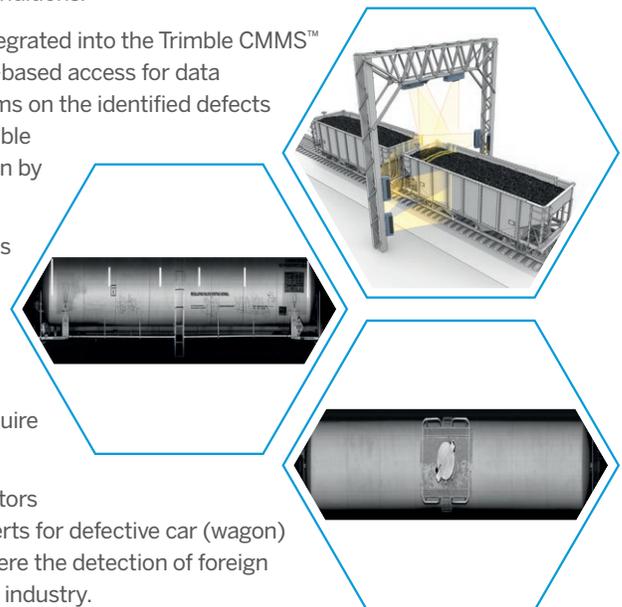
Acquired images are processed by a set of image processing algorithms to assess the condition of the cars (wagons) and report defects. For car (wagon) based viewing and analysis, the system utilizes multiple sensors and algorithms to pinpoint axle position, car (wagon) beginning and car (wagon) end positions. The system automates the inspection of car (wagon) components such as safety appliances, hand brake wheels, car (wagon) identifiers, reflectors, load securement conditions, etc. The TrainView imaging system and processing algorithms are designed to operate in all ambient light and weather conditions.

Processed data and images from the Trimble TrainView system are integrated into the Trimble CMMS™ (Condition Monitoring Management System) software to provide web-based access for data visualization, alarm management, and data analytics. Automated alarms on the identified defects can be used to facilitate condition based maintenance workflows. Trimble TrainWatch™ software can also be utilized for the virtual train inspection by using the generated images.

TrainView's rugged design enables operation in harsh rail environments and at mainline operational speeds. The system is designed for continual operation with minimum manual maintenance.

"The system's scanner boxes are mounted on towers on each side of the track (or on a full gantry). The TrainView is installed at a safe distance from the center of the track. System installation does not require any track modifications or extended closures.

The system benefits rail operators by assisting rail car (wagon) inspectors with visual inspection processes and by providing the maintenance alerts for defective car (wagon) components. TrainView is also of relevance in the security industry where the detection of foreign objects on trains is becoming a critical issue for the rail transportation industry.



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### INSPECTIONS & MEASUREMENTS

Trimble TrainView system inspections and measurements include:

- ▶ Car (wagon) tag identification.
- ▶ Missing/damaged reflective decals detection.
- ▶ Missing label holder detection.
- ▶ Missing brake wheel detection.
- ▶ Missing/broken shedding shields detection.
- ▶ Bent top chord detection.

Depending on the rolling stock types and requirements, the system's inspection outputs may require optimization or customization.

Trimble TrainView system provides a full image of the train body/roof area that will include different car (wagon) parts and components:

- ▶ Car (wagon) body sides.
- ▶ Car (wagon) body ends.
- ▶ Car (wagon) roof.
- ▶ All safety appliances.
- ▶ Doors.

Using Trimble TrainView image outputs many other measurements, inspections, and detections of the condition of parts and components in the train body/roof area are possible, though may require the development of further Machine Vision Algorithms (MVAs) depending on requirements.

If the Trimble TrainView system is combined with Trimble TruckView scanner boxes then trucks (bogies) and their components also can be inspected. This provides a full train imaging from top of the rail to top of the car (wagon) including, truck (bogie), car (wagon) body, and car (wagon) roof.

Specifications subject to change without notice.

### FEATURES

#### System Features

- ▶ Bi-directional system.
- ▶ Inspection and measurement at mainline operational speeds.
- ▶ Operates in extreme environments.
- ▶ Installed off track on tower or pole (concrete or steel base) with no track interference.
- ▶ Easy maintenance.
- ▶ Automatic defect reporting.

#### Software Features

- ▶ Digital image acquisition/processing.
- ▶ AEI (RFID) integration.
- ▶ Automatic reporting.
- ▶ Web-based database/visualization (with Trimble CMMS™ (Condition Monitoring Management System) or TrainWatch™ software).
- ▶ Remote monitoring/control.

