

TrackVue

Track Imaging System

TrackVue is Rail Vision's image and laser capture system with on-board data management. TrackVue hardware can be configured for use on inspection trains, hi-rail vehicles and push-trolleys. It can record high speed image data for visual track inspection, and with additional sensors it can be used for making measurements on track geometry and rail profiling. TrackVue uses "line-scan cameras" for track imaging, and "area-scan cameras" for forward facing and overhead imagery. The number and type of cameras used depends on the application and end-user requirements. The data is processed online or offline using Enhanced Visual Inspection software.

TrackVue Data Capture

Cameras	<ul style="list-style-type: none"> Colour line-scan cameras for downward facing views recording at speeds of up to 56 KHZ Colour high definition cameras for forward facing and overhead facing views
Camera enclosure	Stainless steel, waterproof, internally cooled and designed to work in harsh environments
Line-scan pixel resolution	Typical resolution 1 pixel <= 1mm Image size typically 2048 x 2048, or 4096x 2048
Area-scan pixel resolution	<ul style="list-style-type: none"> Depends on Field of View (FOV) Image resolution typically 1920x1080 pixels
Number of line-scan cameras	These vary between 2 to 8 cameras for track imaging, and further 2 cameras for 3 rd rail imaging
Number of area-scan cameras	Forward or rear facing (1), overhead imaging (1), side imaging (2) ballast shoulder imaging (2), rail-wheel interface analysis (2), plate-cutting (4)
Image synchronisation	All line-scan cameras are fully synchronised to deliver a seamless image of the track. (Image trigger offset can be applied where cameras are not linear)
Vehicle speed	0- 350 km/hr
Lighting	<ul style="list-style-type: none"> Dedicated high power white lighting array with minimal heat signature for track imaging is used with line-scan cameras No lighting for outdoor area scan imaging
Operation	System designed to function all year round, 24 hours a day
Camera and light cut-off	Cameras and lights only operate when vehicle speed is greater than preset vehicle speed (say 5km/hr)
Height of cameras above rail surface	<ul style="list-style-type: none"> Optimal height: 700-900mm distance views and 400-600 mm for close-up views Minimum height: 300mm (restricted FOV)
Field of View (FOV)	Ratio of distance to ground with width measured: Normal lens (1:1), Wide angled lens (1: 1.5)
Control units	<ul style="list-style-type: none"> Main control unit: 3/4U rack mounted. Light control unit: electrical enclosure -25° to 60°C operational temperature
User interface	<ul style="list-style-type: none"> Camera management software provided to record and playback data (system fully automated or user assisted) User can control playback, enter information or tag locations for interesting features during a run Microsoft Windows compatible
Tacho	<ul style="list-style-type: none"> System is integrated with client's tacho or optionally a wheel encoder can be installed Expected pulse rate > 250 pulses per foot
GPS	System integrated with client's GPS or optional GPS module with "Inertial Technology"
Power consumption	Example system with 2 light banks and 3 cameras: <ul style="list-style-type: none"> Overall: 5000W Components: Lights: 4000W; Control: 500W; Servers/storage: 500W

TrackVue Data Management

On-board Storage	<ul style="list-style-type: none"> 4U Rugged (military Spec) raided unit with max capacity of 16TB Example system: 7Tb (RAID 6) (with redundant "Hot Swap" drive) provides enough storage for 10000 km data captured from three cameras
Disk swap	<ul style="list-style-type: none"> Optional back-up disks are supplied to swap damaged or faulty drives on the fly "Hot Swap" drive bay may be used to transfer data on/off vehicle
Off-line data storage	Client needs to have a backup or archiving storage facility. Optional non-rugged 4U storage banks (compatible with on-board storage) are available
Data playback software	Optional viewer to review all stored data and its management prior to processing

TrackVue on-board data analysis

Additional data storage	<ul style="list-style-type: none"> 4U Rugged (military spec) raided unit with max capacity of 16TB. Example system: 4-6 TB (RAID 6)
Servers	Database server stores analysis information
Distributed data processing	A cluster of high speed data analysis machines are configured to operate image library tools for the analysis of data captured in real-time data and storage of images and results in a database.
Operator software	Designed to show near-real-time analysis to the operator with alerts
Data import	Option available to import geometry, profile and landmark data
Reports and printing	Option available within operator software to generate, filter and print reports
GIS	Option available within operator software to review analysis on a GIS map
Near real-time measurements	Track Imaging examples include: <ul style="list-style-type: none"> Fishplates/ Jointbars defects Damaged joints Broken rail 3rd rail defects
Near real-time measurements	Overhead Imaging examples include: <ul style="list-style-type: none"> Exceptions on vegetation encroachment towards track and overhead lines
Geometry (optional)	Gauge, Vertical profile, Horizontal profile, Super-elevation (cant), Twist, Curvature, Tilt, Inertial measurements
Rail Profile (optional)	Vertical rail wear, Side rail wear, Field rail wear, Gauge rail wear, Gauge and field lip, Cross-sectional area, Head surface defects

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