



Wayside Monitoring Systems

Global product and software solutions for the rail industry

www.trackiq.com.au





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About Track IQ®

Trackside Intelligence® (Track IQ) has a global reputation for being specialist manufacturers and suppliers of wayside detection equipment to the railway industry.

Track IQ develops, manufactures, sells and supports wayside sensor systems used to measure the operating condition of rail vehicles. Products include FleetONE®, RailBAM®, WCM®, Rail LV, RailSQAD®, RailCAM™, OnePASS™, and Train Noise Monitor.

Track IQ works with other industry specialists to integrate a wide range of wayside sensors (Hot Bearing Detectors, WILD, Bogie Geometry, Wheel Profile, Brake Shoe Wear) on asset monitoring 'Supersites' where sensor data is integrated into the Track IQ wayside monitoring system database FleetONE.

In 2014 SNCF presented Track IQ with an award for Innovation Excellence for RailBAM. The prestigious SNCF awards, which recognised Track IQ as an outstanding supplier, showcase the very best product innovations and service delivery in engineering, science and technology.

Trackside Intelligence is a division of Wabtec Control Systems P/L







Global Solutions



Track IQ provides global product and software solutions to the rail industry, has contracts worldwide and in excess of 180 systems installed. Countries currently serviced include Australia, New Zealand, Brasil, USA, Canada, Mexico, South Africa, India, China, United Kingdom, France and Norway.

Track IQ has a diverse global client base, ranging from metropolitan and regional trains, mixed freight, heavy haul and HSR (High Speed Rail).

Track IQ's Australian office is supported by regional offices in Paris, France and South Carolina, USA.

Map Key



Track IQ office locations



Countries with Track IQ systems

Adelaide, Australia

New Zealand



FleetONE

Imports, aggregates and unifies wayside rolling stock data.

Benefits at a glance:

- Standard reporting functions including:
 - Alerts
 - Component history
 - Vehicle mimic
 - Train load profile
 - Axle loads
 - Wheel condition
 - Bearing condition
 - “Worst” wheel/vehicle by sensor class.
- Integrates with your maintenance system to generate work orders
- Web application delivered
- Intuitive functions
- Advanced search function
- Password protection
- System expandable
- Help desk support
- Role based privileges and administration

FleetONE unifies all of your wayside monitoring data into a single system. FleetONE presents a holistic set of views of the data, from individual component measurement and trends through to fleet-wide metrics.

FleetONE supports data feeds from RailBAM, WCM, RailCAM, and other wayside detectors including Wheel Profile, HABD, HWD, WILD and Brake Shoe Wear.

Advanced search and reporting functions enable rapid identification of condition monitoring faults. These faults can be automatically raised as work orders in an external maintenance system such as SAP.

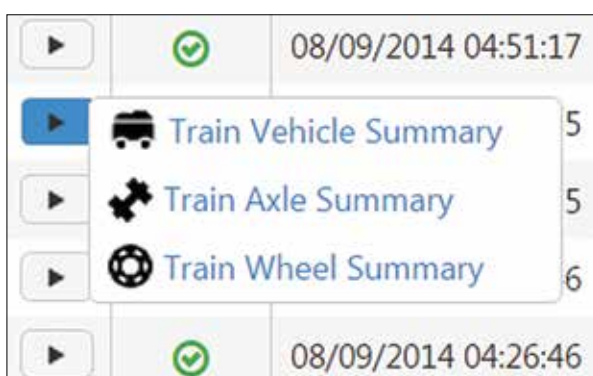
Proprietary software is not required for your multi user work stations as FleetONE is delivered as a web based application – key personnel will have access to FleetONE via their web browser.



Feature Rich User Interface

The FleetONE user interface features a customisable set of data views – allowing the user to sort, filter, resize and enable/disable all data-grid columns.

FleetONE supports multiple languages, both metric and imperial measurements, and user assigned profiles and privileges.



FleetONE General Specifications

Summary and history lists The “Train List” presents a list of trains that have passed all sensor sites. From this view, the user can navigate to summaries of the train by vehicle, axle and bearing/wheel. These views show all measurements and alerts recorded for that train pass. From there, users can select individual component records and navigate to show the measurement history of that component.

Graphs Per detector trend graphs – for RailBAM, Wheel profile, WILD and HBD data.
Per train graphs – axle load profile, STS and ETE imbalance profile, HBD temperature profile.
Fleet reports – HBD alarm summaries by time, histograms for wheel profile and RailBAM statistics.
All graphs support dynamic modification of time ranges and other input parameters.

Maintenance system integration Maintenance planners are provided with tools that allow them to search for and retrieve the set of components with measured defects. Planners can then raise those defects in external systems (e.g. SAP) as work orders, at the click of a button.

Log in Password protection via FleetONE local password or Windows Active Directory login.

Configurable alert levels WIM: Vehicle and axle weight overload alerts. Vehicle STS and ETE imbalance alerts, WILD: Wheel Impact Alerts – peak force, impact ratio.

Acoustic Bearing Monitor: Defect classifications are grouped to determine alert levels
Brake Shoe Wear alert
Wheel profile: flange, rim, hollow
HBD: Hot Bearing/Hot Wheel alarms retrieved from the remote site and displayed

Data health Shows trends and alerts on wayside detector status – last communication time, quality of data.

Data protection Users associated with owner/operator organisations are restricted to viewing measurement data for vehicles that belong to that organisation.



RailBAM

Bearing Acoustic Monitor

Benefits at a glance:

- Reliably detects bearing faults
- Early and consistent fault detection
- Provides accurate fleet-wide statistical data.
- Ability to issue alarms and alerts
- Automated system health checks
- Multiple bearing classes
- Minimal traffic interruption for system installation
- Web-based trending database
- Wheel diameter measurement
- Axle count
- AAR rules compliant
- Mixed traffic environment

The RailBAM bearing acoustic monitor detects early and advanced bearing defects including extended surface, cone, cup, roller and audible faults on rolling stock wheels during train pass-by at line speed.

Collected data is analysed and forwarded to the user in alert, tabular, graphical and historical formats. Together with these reports and the associated wave files, bearings are able to be scheduled for change out in a systematic and cost effective manner.

The advanced FleetONE database is user friendly with automated report functions and scenario settings for bearing and fleet analysis.

RailBAM uses two cabinets, sleeper mounted auxiliary sensors and a signal processing electronics rack located in a wayside enclosure.

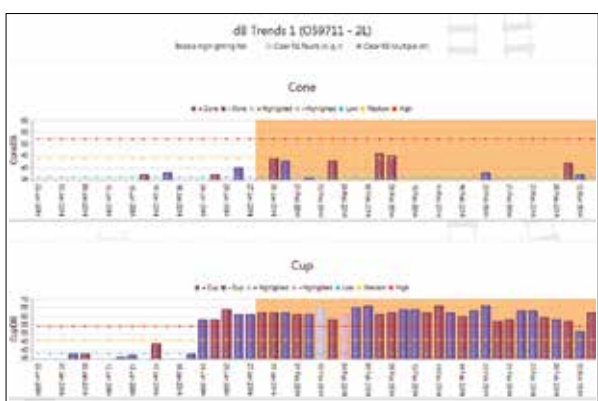
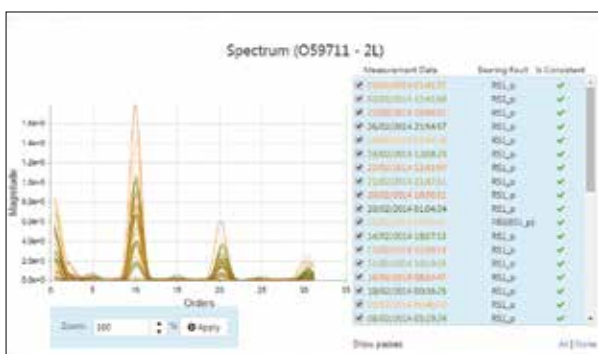
Monitoring bearing condition in a dynamic environment ensures that maintenance is able to be systematically planned – providing maximum asset performance and security.



FleetONE Web Application Intelligent Software

The RailBAM data is presented in a web interface enabling users throughout your enterprise to seamlessly receive vehicle details in “real time” and at their fixed or mobile workstations.

User configured alerts allows the system administrator to adapt your reports to the specific needs of stakeholders.



RailBAM General Specifications

Capacity	Train length – unlimited
RF tags	Suitable for RF tagged vehicles (or virtual tagging reports)
Alarms	User configurable, delivered via SMS, email or message to Central Train Control
Operating environment	Main Line/Depot
Fleet	Mixed fleet – heavy haul, inter-modal and passenger
Bearing type	Package, Axle Box and Passenger
Environment	Rail hardware and wayside hut equipment suitable for arctic, tropical and desert environment Rail hardware IP65 or greater
Database	RailBAM information presented by the FleetONE database
General	DC/AC power compatible, TCP/IP data transfer, suitable for electrified environment, all hardware isolated from the rail
Compliance	Outputs in compliance with AAR rules and CE compliant
Standards	Manufactured to ISO 9001/EN 50125 quality standard



WCM

Wheel Condition Monitor

Benefits at a glance:

- Modular design
- Routine track maintenance without removal
- No requirement to modify the track structure.
- Ability to issue alarms and alerts
- Vehicle Weight Accuracy $\leq 3\%$
- Quick installation reducing track shut-down and maintenance times.
- Low whole of life cost compared to traditional strain gauge based WILDs.
- Minimal ongoing maintenance, only requiring an annual check of the sensor clamps.

Track IQ's Wheel Condition Monitor (WCM) provides a cost effective solution for optimizing your wheel maintenance program. Wheel defects are identified at an early stage, before affecting the condition of other wagon components. Excessive wheel impact loads are detected (**WCM-WILD**) so you can mitigate the risk of track damage. A range of wheel defects are detected including spalls, out-of-roundness, flats, shelling and roughness.

Our WCM comes with weigh -in-motion functionality (**WCM-WIM**). This allows you to detect vehicle and axle overloads as well as vehicle imbalances. Additional sensors are added to provide L/V measurement capability.

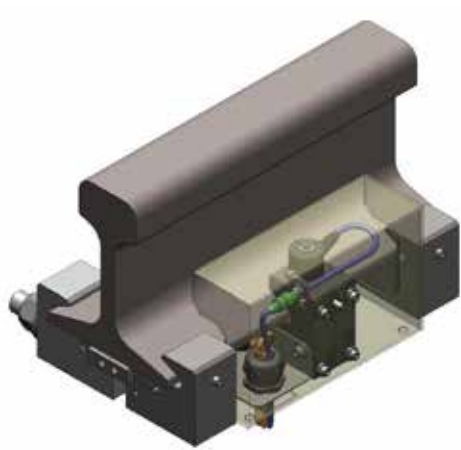
The modular design makes replacement of system components easy. Sensors can remain in-site during routine track maintenance. They are electrically insulated, do not compromise signalling and are unaffected by dragging equipment. Automatic Vehicle Identification (AVI) readers can be integrated.



Reliable Analysis with the FleetONE Web Application

The WCM is “System Ready” ensuring rapid introduction in your network. Each WCM is delivered with FleetONE - our user friendly software that integrates all your wayside system data. This gives you alarming, trending and data analysis capability.

Date	Vehicle Number	Vehicle Tag	Load	Train	Vehicle	Size	Side	Size	Wheel	Wheel	Rail	Rail
1	22706	B	0	0	0	R	8	8	18.50	18.70	189.00	189.00
1	22706	B	0	0	0	L	8	8	18.50	18.70	189.00	189.00
1	22706	B	0	0	0	R	9	9	18.50	18.80	189.00	189.00
1	22706	B	0	0	0	L	9	9	18.50	18.80	189.00	189.00
2	26200	A	7	0	0	R	8	8	18.50	17.70	179.00	179.00
2	26200	A	7	0	0	L	8	8	18.50	18.00	189.00	189.00
2	26200	A	0	0	0	R	8	8	18.50	18.80	189.00	189.00
2	26200	A	0	0	0	L	8	8	18.50	18.80	189.00	189.00
2	26200	A	0	0	0	R	4	4	18.50	18.00	189.00	189.00
2	26200	A	0	0	0	L	4	4	18.50	18.00	189.00	189.00
2	26200	A	20	0	0	R	8	8	18.50	17.80	179.00	179.00
2	26200	A	20	0	0	L	8	8	18.50	17.80	179.00	179.00
2	26200	A	11	0	0	R	2	2	17.00	17.10	179.00	179.00



WCM General Specifications

Capacity	Train length – unlimited
RF tags	Supports RF tagged vehicles (and visual imaging or virtual tagging)
Alarms	User configurable, impacts to four levels, loads to three levels, plus lateral imbalance to three levels
Resolution	5 mm spall detection (nominal)
Environmental	Wayside rack mounted equipment and rail hardware are suitable for arctic, tropical and desert environment. Rail hardware IP65 or greater
Database	WCM information presented by the FleetONE database
Shipping weight	Nominally 600 kg

Please Note:

Outputs are derived from measured wheel forces, speed dependence exists – repeatability requires consistent pass by speeds.



OnePASS

The entry level to an integrated wayside monitoring site

Benefits at a glance:

- Bearing fault alerts
- Rolling wheel surface condition reporting
- Weight measurement – gross and imbalances
- Wheel diameter measurement
- Axle count
- Automated system health checks
- Mixed traffic environment
- Minimal traffic interruption for installation
- Ability to issue alerts to system stakeholders
- Early and consistent fault detection
- Provides fleet-wide statistical data.

Automated vehicle condition reporting sets the standard for ensuring minimal downtime of vehicles – Track IQ provides technically advanced instrumentation for the dynamic checking of rolling wheel parameters with OnePASS.

During vehicle pass-by data is collected and analysed and then forwarded to the user in alert, tabular, graphical and historical formats. Key parameters are checked including bearing condition, wheel rolling surface, load imbalance and gross vehicle weight with imbalance measurements.

This advanced integrated monitor utilises the field proven RailBAM – bearing acoustic monitor and the second generation WCM – wheel condition monitor. These systems installed in parallel provide a high level of accuracy in detecting and monitoring wheel surface condition and bearing defects.

Monitoring wheel and bearing condition in a dynamic environment ensures that early defects are detected and that maintenance is able to be systematically planned – providing maximum asset performance and security.

Using advanced technologies OnePASS delivers the optimum in vehicle monitoring solutions. Additional sensor systems (wheel profile, angle of attack, etc.) can be added.

The OnePASS data is presented in the wayside



OnePASS is supported by the FleetONE Intelligent Software by Track IQ

monitoring system web interface FleetONE, enabling users throughout your enterprise to seamlessly receive vehicle details in “real time” at their fixed or mobile workstations.

User configured alerts allow the system administrator to adapt reports to the specific needs of stakeholders.

Date	Vehicle ID	Vehicle Tag	Lead	Trailer	Side of Vehicle	Side of Train	Wheel Height (in)	Wheel Impact Force (lb)	Wheel Impact Force (kN)	Train Impact Force
2/27/20	2 82720	8	8	8 8	Front	R	29.80	28.70	29227	
2/27/20	2 82720	8	8	8 8	Front	L	27.40	28.70	28247	
2/27/20	2 82720	8	8	8 8	Front	R	25.30	25.30	25197	
2/27/20	2 82720	8	8	8 8	Front	L	27.20	25.30	27627	
2/28/20	2 82800	8	8	8 8	Front	R	28.40	27.70	27200	
2/28/20	2 82800	8	8	8 8	Front	L	25.10	25.30	24820	
2/28/20	2 82800	8	8	8 8	Front	R	28.00	28.00	28740	
2/28/20	2 82800	8	8	8 8	Front	L	28.20	27.90	27920	
2/28/20	2 82800	8	8	8 8	Front	R	27.90	24.00	25250	
2/28/20	2 82800	8	8	8 8	Front	L	26.70	26.20	26020	
2/28/20	2 82800	8	22	2 2	Axis	R	28.20	27.80	27620	
2/28/20	2 82800	8	22	2 2	Axis	L	28.20	27.80	27620	
2/28/20	2 82800	8	22	2 2	Axis	R	27.80	22.20	22080	



OnePASS General Specifications

Capacity	Train length – unlimited
RF tags	Suitable for RF tagged vehicles (and visual imaging or virtual tagging reports)
Alarms	User configurable, delivered via SMS, email or message to Central Train Control
Track environment	Suitable for single/bidirectional track and dual track
Fleet	Mixed freight – heavy haul, passenger and HSR (High Speed Rail)
Bearing type	Package, and Axle Box and Passenger
Environment	Rail hardware equipment suitable for arctic, tropical and desert environment Rail hardware IP65 or greater.
Database	FleetONE supports multiple users/different user privileges able to be applied
General	DC/AC power compatible, TCP/IP data transfer, suitable for electrified environment, all hardware isolated from the rail
Compliance	Outputs in compliance with AAR rules, ARTC standards and CE compliant – EN 50125



RailCAM

Advanced Video Recording System

Benefits at a glance:

- Visually verify out of balance and overloading
- Instantly provide visual evidence to operators
- Optical Character Recognition for wagon identification
- Generate photographic evidence
- Verify RF tags read by WCM or RailBAM
- Find relevant pass-by footage
- Enhanced video playback.

RailCAM by Track IQ is an advanced wayside video recording system.

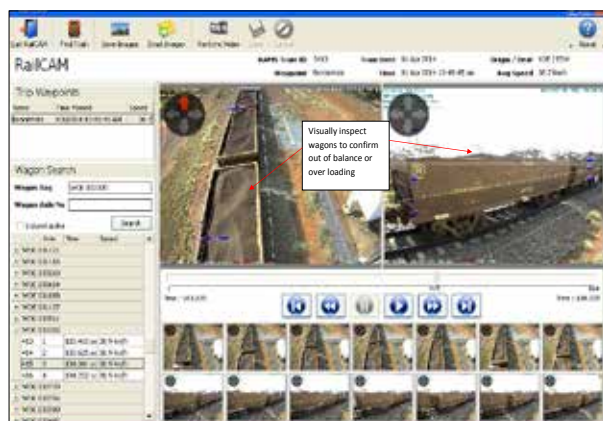
The system enables fleet managers to see and make informed decisions about the assets they manage, providing instant images and video evidence of occurrences including:

- Out of balance wagons
- Overloaded wagons
- Changing loads
- Dragging equipment
- Damaged wagons
- Incorrect RFID tags.

RailCAM seamlessly integrates with FleetONE. This provides a holistic view of images and video along with all wayside monitoring data in your web browser.

With enhanced video playback and search options, RailCAM enables the operator to search recordings by wagon ID, date or pass-by location and position the video at the relevant frame without the need for manual searching.

RailCAM can be used to visually track specific rolling stock at each wayside monitoring location along its journey. With the additional option of OCR (Optical Character Recognition) it can be used as an effective alternative to RFID (Radio Frequency Identification) tagging.





Train Noise Monitor

Benefits at a glance:

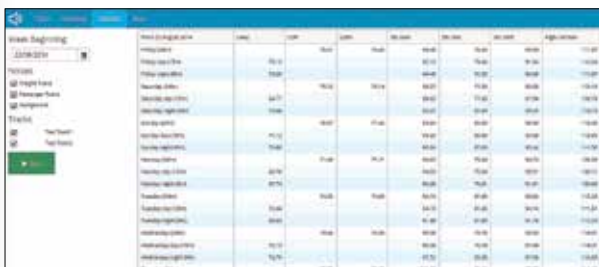
- Standalone sound level measurement
- Web-based database for evaluating train noise levels
- Day/Night view
- Anti-vandalism mounting
- Solar powered
- Data is imported into FleetONE.

Train Noise Monitor uses a wayside mounted camera combined with a high precision microphone to record the sound levels associated with a train passby. High noise levels can be identified and a matched image can be used to identify offending vehicles.

The system uses a non-contact distance sensor to identify the presence of a train. One system can even be used to monitor multiple tracks at a location. No part of the equipment is installed within three metres of the track centre.

The system interfaces with Track IQ's wayside database FleetONE. A comprehensive set of statistics is available to track the performance of any train noise control programs or monitor environmental noise near residential areas.

Suitable for environmental extremes and day/night applications. The system is totally self-contained and uses a solar array for power and a 3G connection to transfer data from the site to the FleetONE database.





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