Data Management

Business Domains

HASLERRail SAIRA ELECTRONICS

Maintenance
– Increase mean time between faults
– Improve infrastructure management identifying faults (WSP, sanding, overhead line voltage, etc.)
– Produce possible diagnosis and reduce "no fault found" outcomes
– Optimise maintenance program
– Improve fleet reliability and availability

Operation
– Improve fleet productivity
– Geo-information on vehicles and locations of problems
– Transparency of operational messages (ETCS)
– Monitor the correct track access surcharges
– Monitor technical and human behaviours

Performance
– Near real-time information processing
– Punctuality
– Path density / track usage
– Service availability

Safety
– Improve safety through the immediate identification of faults and the prevention of potential events
– Safety relevant records can trigger alarms
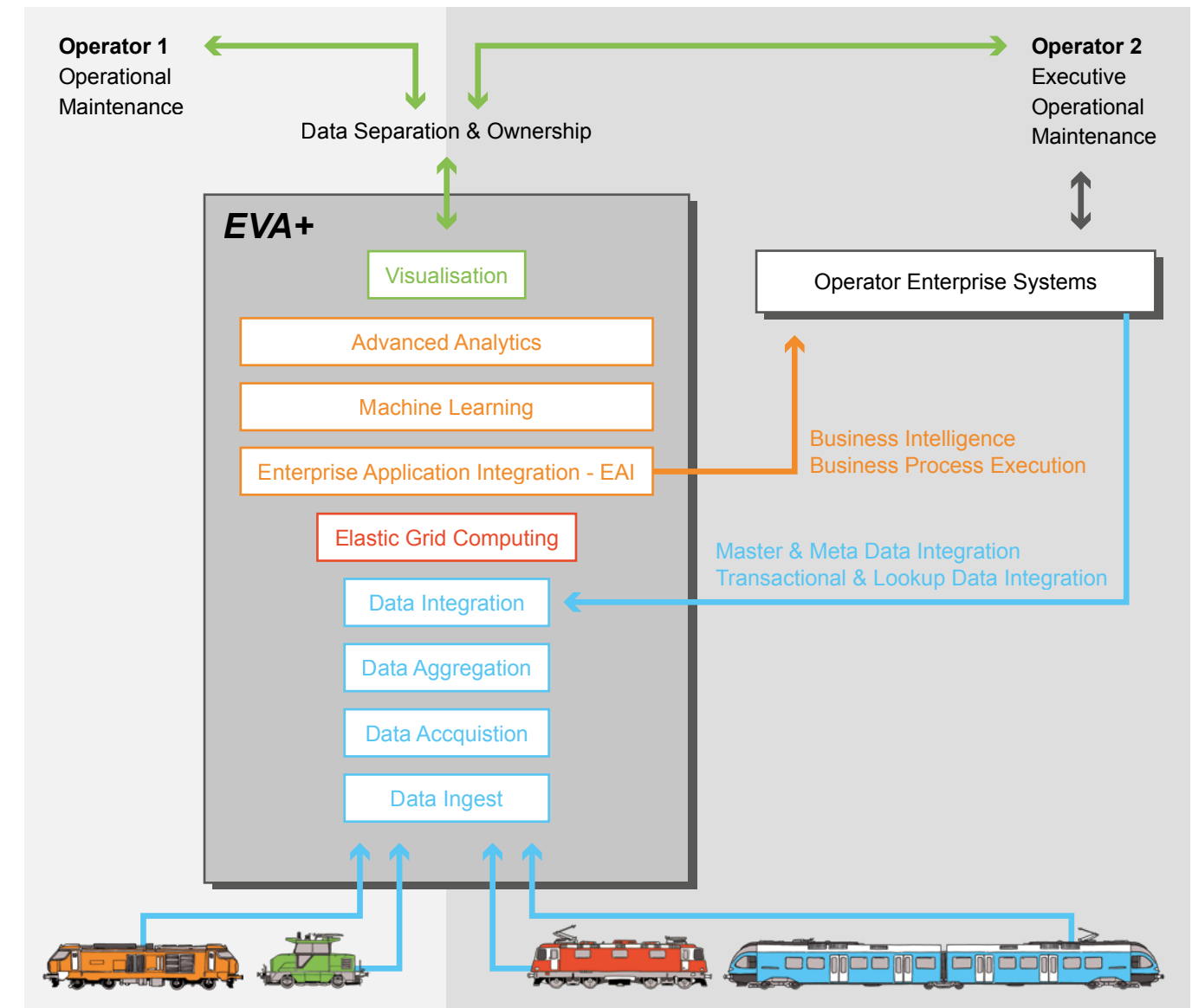– Supervision of safety relevant activities

Legal
– Prove compliance with law and legislation
– Improved infrastructure management identifying faults (WSP, sanding, overhead line voltage, etc.)
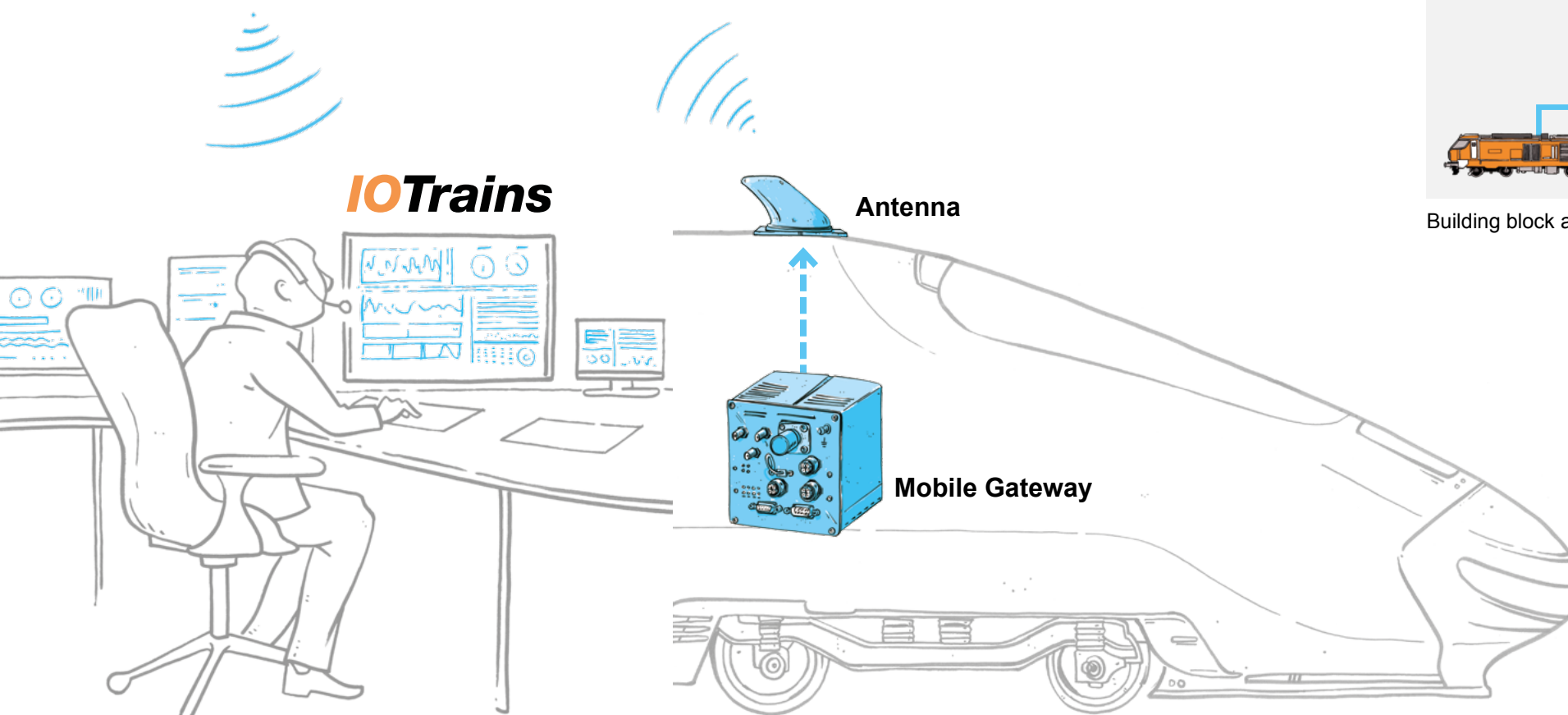– Incident and accident investigations

Energy
– Monitor and measure energy consumption
– Driver advisory system
– Reporting
– Billing

Software Architecture
Performance, Scalability, Quality and Security

Operator 1 Operational Maintenance

Operator 2 Executive Operational Maintenance

Data Separation & Ownership

EVA+
- Visualisation
- Advanced Analytics
- Machine Learning
- Enterprise Application Integration - EAI
- Elastic Grid Computing
- Data Integration
- Data Aggregation
- Data Accquistion
- Data Ingest

Operator Enterprise Systems

Business Intelligence
Business Process Execution

Master & Meta Data Integration
Transactional & Lookup Data Integration

Building block architecture of EVA+

IOTrains

Antenna

Mobile Gateway

Supported Hardware Systems
– Data recorder unit (DRU): TELOC® 1500, TELOC® 2200, TELOC® 2500, TELOC® 3000, and new generations
– Juridical recorder unit (JRU): TELOC® 2500, TELOC® 3000
– Energy meter
– Other on-board data sources

Supported ETCS Systems
– Baseline 2
– Bombardier – EBICAB 2000
– Siemens – Trainguard 100
– Siemens – Trainguard 200
– Invensys / Dimetronic – EVC
– Ansaldo – EVC ATPRD
– Ansaldo – EVC generic
– Hitachi – EVC
– CAF Seinalia – EVC
– Alstom – EVC
– Baseline 3
– Bombardier – EBICAB 2000 – SS027 v3.1.0
– Hitachi – EVC SS027 v3.1.0
More under development

HASLERRail **SAIRA ELECTRONICS**

Functional Principle

Train data which is recorded on a event recorder is imported into the EVA+ databases either via an appropriate communication channel with the auto-transfer service or manually via the USB interface.

The number of recorders and trains is almost unlimited thanks to the scalable architecture, therefore multiple memory cross analysis is provided.

Security

State of the art security mechanisms are put in place to prevent attacks and protect your data network. A data security breach and tampering with your databases is practically impossible and your data integrity is guaranteed.

On-board event recorder

Ethernet Wi-Fi 3G / 4G

Notebook USB-Stick

EVA+ Central Infrastructure

Clients
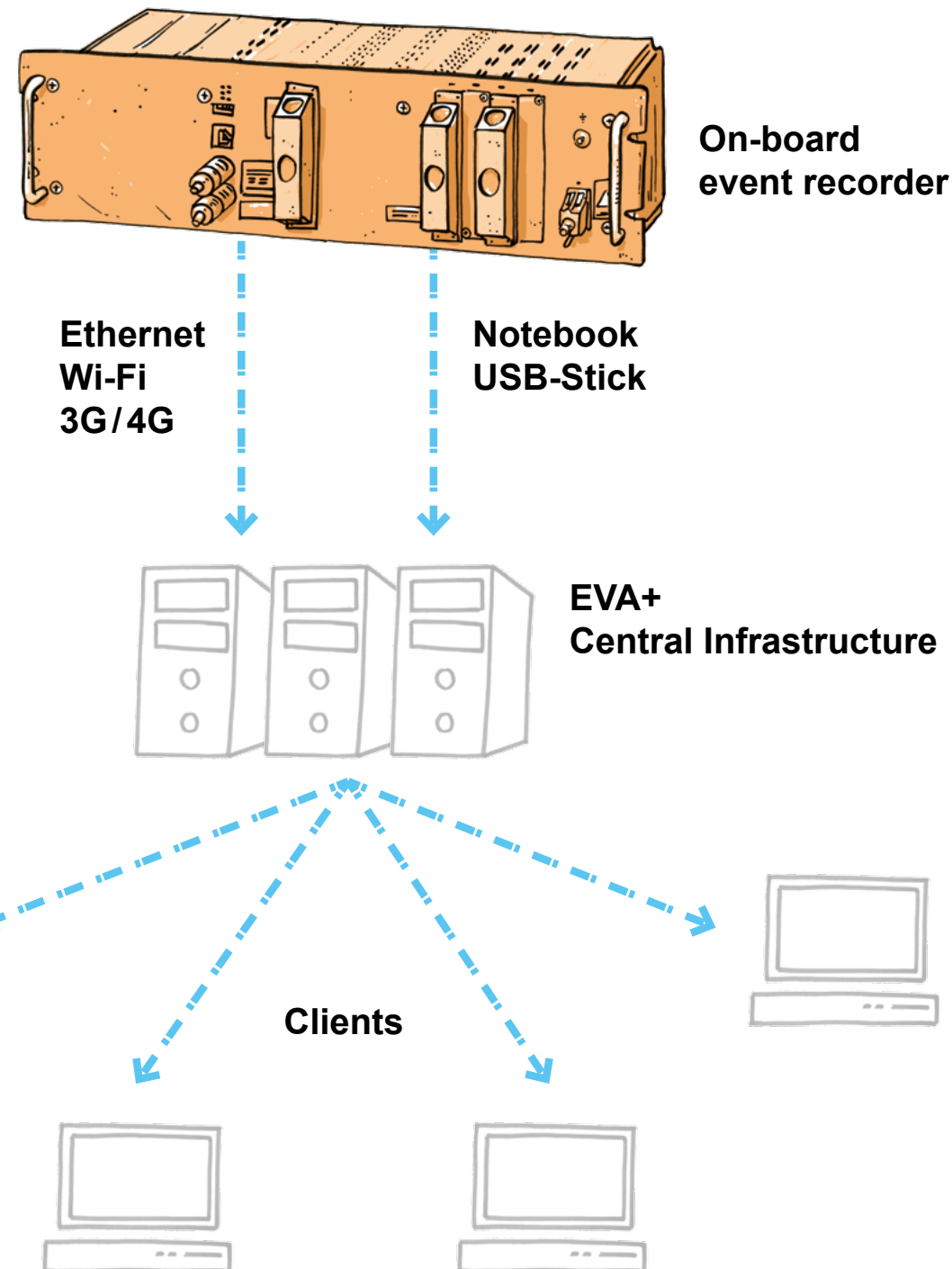
EVA+ Benefits

Reducing downtime
Reduction of reaction time on system failures on track can influence delays directly. Improve the uptime of your services and become more productive.

Reducing maintenance time
Maintenance activities can be planned ahead of a vehicle arriving at the workshop. This significantly lowers the workshop time to fix the vehicle and reduces the overall downtime of the vehicle.

Operational accuracy
EVA+ leads to improved operational information since this is based on real (recorded) data instead of planning information. This reduces the tolerance of vehicle usage and therefore optimises the maintenance cycles or improves the service quality due to decisions based on better information.

Mileage reminder
A so-called mileage reminder could be used in many ways. As a static value for recurring maintenance work on the vehicle, mission calculation in order to hit the maintenance slot or to support the operational planning of the vehicle while in service.

Informative capability
Questions regarding vehicles can be answered anytime without complicated investigation (e.g. calling and distracting the driver).

Business Control
By having detailed information on the location of all vehicles and drivers, executive managers are far more in touch with their business operations, meaning they have greater levels of control over their company and an improved business insight.

Customer friendly
EVA+ supports operators becoming more customer friendly. For instance, a company that is using EVA+ can tell a customer exactly where their vehicles are, which allows them to understand what has happened in case of an incident.

Enhanced customer experience
Minimise delays for passengers with smart and self-learning tools for real-time dispatching and detour management. Integration with 3rd Party Systems enables operators to deliver accurate and timely information on service changes, delays and connection updates to passengers.

More business insight
The EVA+ user can use data analysis features in EVA+ to gain new insight into reliability and availability versus targets and objectives, supporting them in making smart, evidence-based decisions. It will become evident that fleet performance is a key performance indicator for strategic planning.

Streamlined operations
EVA+ allows operations to be streamlined based on an accurate and real-time view of service disruptions and bottlenecks in the technical availability of assets and resources.

Service monitoring
EVA+ with its different views of services in the GUI can be tailored to be based on vehicle classes, specific lines, a network map or other customised dimensions.

Scalability
EVA+ is suitable for all types of operators. Solutions can be easily scaled and customised to meet the needs of small or large, urban or regional, passenger or maintenance operators and infrastructure managers.

Lower TCO
As an overall result operators can reduce operational costs with EVA+ functionalities delivered on a single, cost-effective hardware and software platform or in the cloud as a fully service based approach (SaaS).

EVA+ for a better passenger experience — performance, safety, legal, operation, energy, maintenance

Visit www.IOTrains.com

EVA+ ERTMS Monitor

On-line system monitoring is a growing trend within the rail industry. Whenever a JRU (juridical recording unit) is installed on a vehicle according to ERTMS/ETCS specifications (TSI CCS/Subset-027), the JRU data can be analysed live with EVA+. Furthermore EVA+ is capable of analysing any ETCS message which is recorded and/or sent to the EVA+ system. This makes EVA+ an ERTMS/ETCS monitor for the supervision of daily operations or the assessment of special missions like testing, commissioning or other investigations.

ETCS monitor on specific events as per vehicle.

Balise Group Error Check

Locate balise groups (BG) which report an error message when a train is passing by. The BG's location can be displayed on a map or with GPS coordinates in a table. BG ID and other information can be passed on in order to prepare the maintenance staff to take action.

Mileage overview per vehicle and day.
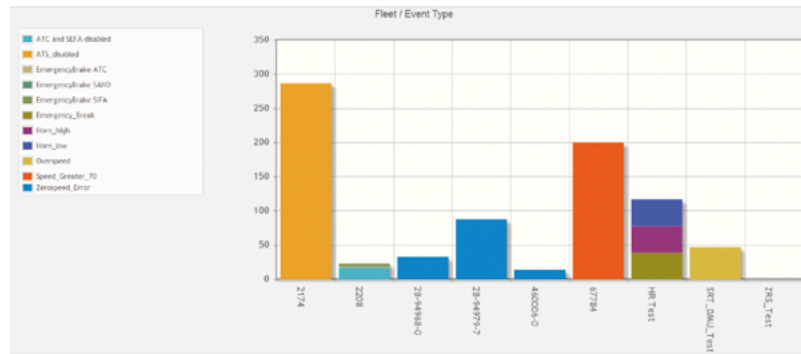
Odometer Quality Check

Odometer accuracy and performance is still a big challenge for daily ERTMS operations. To assist with this issue EVA+ can evaluate the odometer performance by using the relevant information from the confidential interval given from the ERTMS/ETCS system.

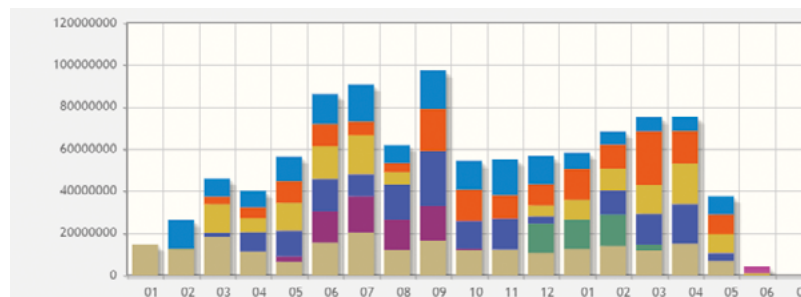### Evaluation of system performance

Today's reliability and availability of railway vehicles is a key for success when providing a high quality service. Calculation of those parameters is possible and related reports show the necessary information to check if the requirements are met.

Measurement and evaluation of recorded analogue and/or digital signal.
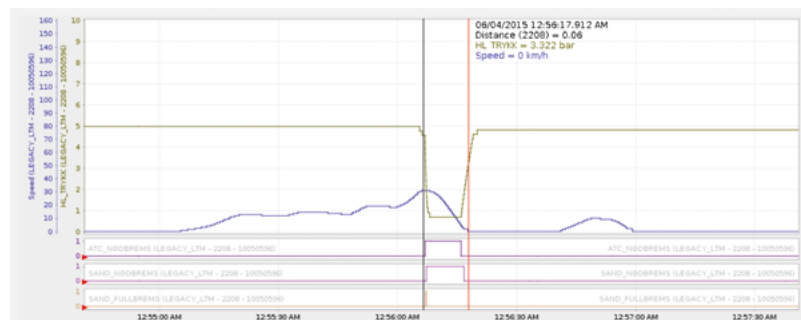
Mileage calculation for ERTMS operations

Railway infrastructure managers have the possibility to charge different track access fees depending on the operational mode in which a railway undertaking is using the network. Data analysis with EVA+ allows the calculation of the operated distance for each operational situation. Therefore the travelled distance when ERTMS was active can be calculated.

EVA+ Fleet Management

HaslerRail's EVA+ software supports train operating companies during operations by providing operational information to the relevant team. The vehicle data is transferred automatically into the EVA+ central infrastructure and therefore can be analysed while the vehicle is in service or in any other location.
For certain alerts such as emergency brake on track, a message can be pushed to a mobile device, which allows the fastest possible reaction.
All recorded signals can be taken into account to judge the health of a vehicle. Fuel level, subsystem failures, speed, safety events, or environmental measures such as GPS, temperature or any other signal communicated to the TELOC®. A vehicle can be located on a map and highlighted based on signal values.

Geo-location information for a better operational insight.

Live fleet location services

EVA+ makes train and vehicle location services available
– Search any asset directly on the map, or filter the map by fleet, vehicle class or train status.
– See where the fleet is in operation, where it is idling or where problems occur.
– Observe when a vehicle has an issue as soon as it becomes an indication on the map.

Let your operations team work proactively rather than reactively when it becomes necessary. Bookmark points of interest such as ends of mission, workshops or fuel stations to reroute trains efficiently in case of an incident. Geo-fencing features are also available.

Verify timetable accuracy

– Decision support for daily operations through automatic alerts when trains are not running on time. Delayed trains are automatically indicated on the live map view and alerts are sent to the relevant staff in order to take action and plan ahead.
– Provide customer information about delays or about passage time at specific points of interest.
– Automatic reporting of departure and arrival time, delay time, km travelled, fuel and energy consumption, etc. as per traffic category.
– The operator is able to obtain coherent information on planned verses realised production and can analyse the traffic profitability, cost per km, fuel/energy consumption, fleet utilisation, availability and performance.

Proactive fault management

– Be alerted automatically when the battery voltage drops low on a parked train and avoid train cancellation costs.
– Plan refuelling events without surprises by knowing when the fuel level runs low.
– Act swiftly on high coolant temperature alerts to avoid catastrophic in-line failure.
– Automate alerts to be immediately informed when the train enters and leaves the workshop.

Monitor availability & reliability

– Capture crucial availability and reliability information in a few clicks.
– Inform the operations and maintenance teams immediately.
– Manage disruption efficiently
– Identify costs, penalties and downtime generated by failures.
Managers finally have a reliable source of information in order to perform improvements in fleet performance.

Fleet management with EVA+

EVA+ provides rail operators with a live, fleet-wide view of the performance of their rolling-stock assets. Fleet management can include a range of functions, such as vehicle financing, vehicle maintenance, vehicle telematics (tracking and diagnostics), driver management, speed management, fuel management and health and safety management. Fleet Management allows the removal or minimization of the risks associated with vehicle investment, improving efficiency, productivity and reducing overall transportation and staff costs, providing 100 % compliance with government legislation (duty of care) and much more.

Your Global Partner with Local Support

● Headquarters and Offices
● Agencies

HASLER*Rail*

SAIRA ELECTRONICS

HaslerRail AG
Freiburgstrasse 251
3018 Berne
Switzerland
T +41 (0) 31 990 71 11
F +41 (0) 31 990 72 27
info@haslerrail.com
www.haslerrail.com

SAIRA Electronics S.r.l.
Via Olanda, 1
37069 - Villafranca di Verona
Italy
T +39 (0) 45 630 45 58
F +39 (0) 45 790 33 71
saira@sairaelectronics.com
www.sairaelectronics.com