edris | POWER SAVING AND ENERGY EFFICIENCY SOLUTIONS

- Energy measurement and management.
- Calculation of optimal driving profiles.
- Optimal coordination between onboard systems.
- Analysis aimed at improving driving.
- Global fleet management .

DESCRIPTION

The railway sector essentially means clean transport. However, there is certainly room for improvement due to:

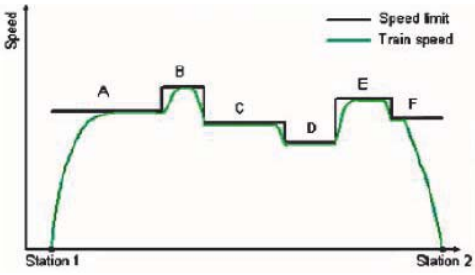
- The lack of optimized driving models. Each driver has their own driving style, and the energy consumption derived from this is highly variable.
- There are great differences in energy consumption over the same route under identical passenger traffic or loads.
- The lack of resources and parameters to control and optimize the energy consumption in the event of events due to circumstances related or external to the running of the train.
- Energy consumption is not optimized when the train is stopped.
- Electromechanical equipment suffers greater wear and tear as there are no efficient driving practices in place.

EDRIS improves energy consumption in trains through efficient driving and energy consumption optimization while the train is stationary.

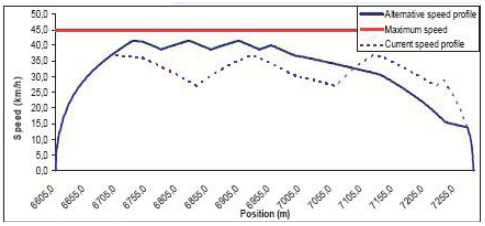
Thanks to the data obtained from onboard equipment (such as SIGNALLING, TCMS, PIS, TRACTION, etc.) and also from land-based equipment (such as OPERATING CENTRES, DEPOT, SAE, etc.) TRAINTIC can deliver a train to its destination at a scheduled time with optimal energy consumption (fuel or electricity).

This is delivered recognising internal factors such as the orography of the terrain, train loading conditions, speed limits, track gauge, tunnels, etc., as well as external factors such as the traffic situation, sporadic incidents on the line, etc., which occur unexpectedly during the day to day management of a fleet.

TRAINTIC provides different approaches in the reduction of energy consumption for both **existing trains** and **new tender projects**, by applying our in-house *know-how* in the following fields:



- Energy **measurement and management:**
  Energy bill management: the power consumption is calculated in relation to the distance covered by the train. This consumption information can be simply viewed or stored for further analysis and to contribute to the definition of efficient driving strategies.



- **Calculation of optimal driving profiles** which **minimize energy consumption** for scheduled timetables between two stations or kilometric points.
  It involves **off-line calculations of speed profiles**. The main information required is the track and the train characteristics, as well as operating times (times between stations). To achieve this, the final customer needs to provide the required data to define a model of the track, including the following parameters among others: control points, track profile, track plan, permanent speed limits, temporary speed limits, track gauges, tunnels, electric sections… as well as any other parameter considered necessary.

  On the basis of this information, **different simulations to define efficient times/consumptions** can be carried out.

- **Optimal coordination** between onboard systems through the application of **MAS** (Multi Agent Systems) algorithms.
  > Coordination of systems involved in energy functions: traction; energy storage/consumption modules such as air conditioning, lighting, converters, etc.
  > Parking mode: load management while the train is stationary.

- Analysis **aimed at improving driving:**
  A different approach may involve the processing of data related to driving with the aim of:
  > Recording and further statistical analysis of driving parameters.
  > Generating graphics and best driving ranking.
  This helps us to obtain the driving patterns of each driver, services, tracks, trains, etc.

- **Global fleet management:**
  > Global fleet management (including trains, substations, control station) to allow optimal coordination of the different stakeholders.
  > Train charting calculation: taking into account energy efficiency criteria as well as the train operating needs.

- **Algorithm** application for critical scenarios in **catenary-free track sections.**

It is worth highlighting that the system proposed can be compared to an **energy-efficient ATO system**, but without the safety implications. This service is based on the existence of an onboard safety system, ATP, which is ultimately responsible of the safety of the train.