



COMMbatt monitoring system

COMMbatt provides real-time remote monitoring for onboard nickel-technology rail batteries to enable predictive maintenance for longer life and lower operational costs.



Through continuous, real-time measurement of operational data, COMMbatt indicates the capability of the battery to fulfill its mission profile and provides remote monitoring for onboard nickel-technology batteries. By applying Saft's proprietary modeling algorithms to this data, COMMbatt offers an accurate picture of battery system health to enhance battery management, diagnostics, maintenance and service.

By putting the emphasis on predictive maintenance, rather than conventional periodic, corrective or preventive maintenance, COMMbatt reduces maintenance costs, cuts downtime and associated revenue losses, increases fleet availability and optimizes fleet management.

COMMbatt is an innovative step within Saft's global LCC (Life Cycle Cost) improvement program. It benefits from a specially developed in-built algorithm – based on Saft's extensive global experience of real-world battery installations – to monitor and evaluate battery status. This algorithm uses data including:

- Saft's proprietary cell models and field data
- Temperature, Ah charged and discharged, number of cycles, and current profile measurements

Moving from preventive to predictive maintenance

- ▶ Get the most from your rolling stock battery fleets
- ▶ Implement remote battery performance monitoring
- ▶ Increase the efficiency of maintenance operations
- ▶ Receive advanced warnings to avoid unplanned downtime
- ▶ Optimize operations to save on resources and costs.



Taking the digital track: rail batteries join the Internet of Things for predictive maintenance at every stage of the journey



Before starting

Clear indication that the battery has sufficient charge to deliver the required duty profile



During the journey

Real-time indication of battery status and alerts in the event of an emergency



At the depot

Accurate maintenance forecasts, adapted to operator needs

Make fully informed decisions

COMMbatt gives train operators information on the battery system's ability to perform the defined duty cycle (under worst-case conditions), taking into account the state of charge and degree of ageing. This enables informed decisions to be taken about train operations, for example before departure, after an incident or in any situation where the battery condition may be a concern.

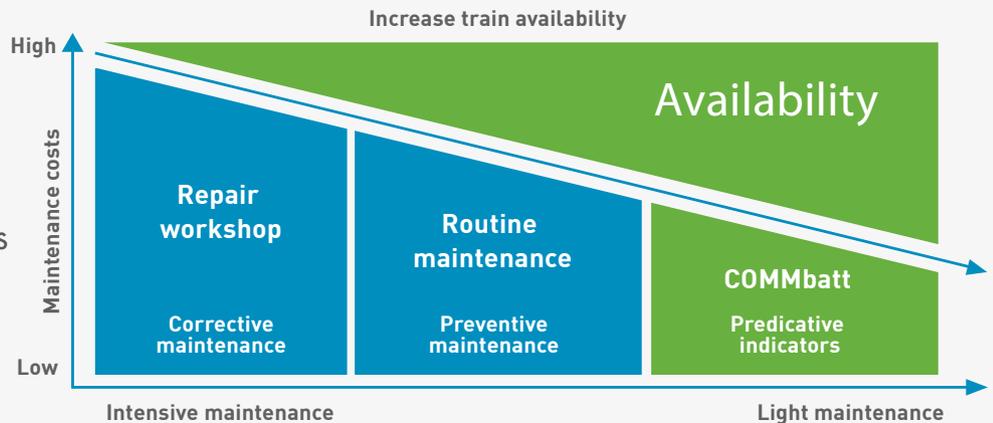
Improve productivity

COMMbatt gives maintenance teams remote access to key battery data and value-added predictive maintenance services that highlight any potential issues before an actual failure occurs. This drives up productivity by enabling planned maintenance and parts ordering to take advance action, ensures near-zero unplanned downtime, and eliminates unplanned shipment and possible passenger or track owner compensation costs.

Lower maintenance costs

COMMbatt eliminates the need for electrical inspection checks by providing up-to-date information on topping-up and reconditioning intervals. Routine maintenance is only performed when needed – usually at intervals of between five and ten years – with no risk to battery life or reliability. Downtime and maintenance costs are kept to the absolute minimum.

Predictive maintenance for optimized operations: take control of your batteries

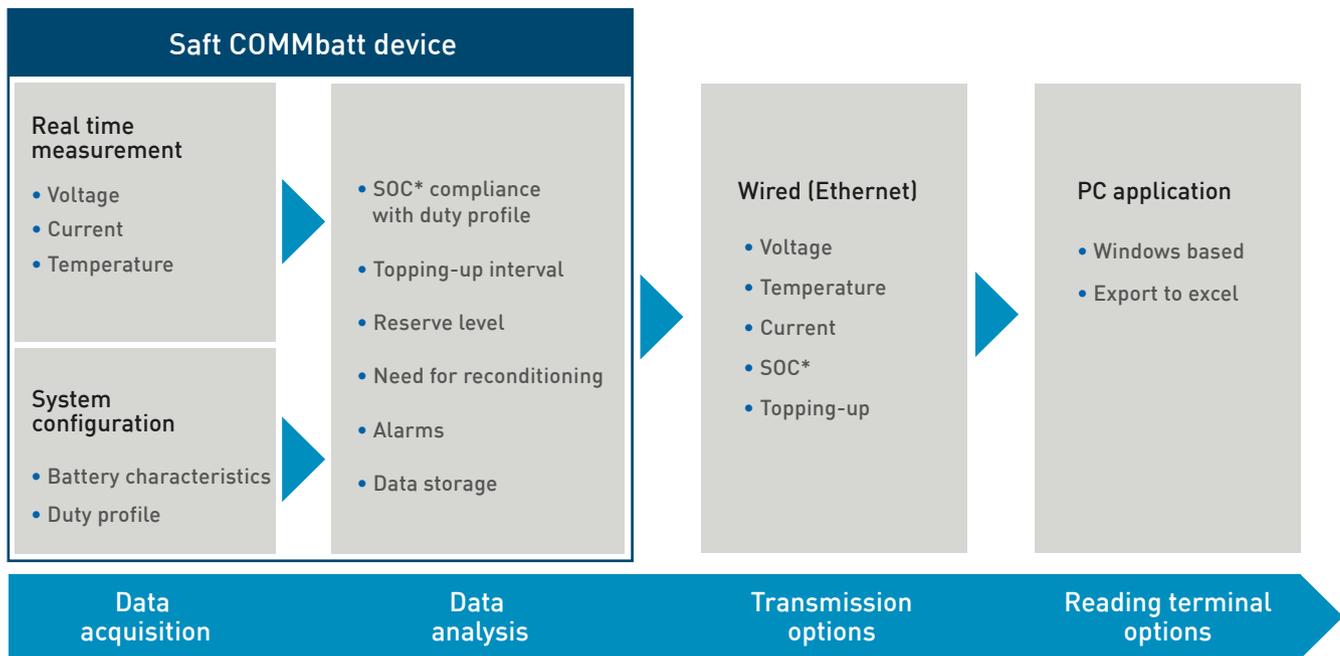


Easy to fit and use

COMMbatt is easy to fit in new or existing applications, for backup. Sensors fitted to each battery measure and transmit key parameters to the COMMbatt control unit, which determines the different operation and maintenance indicators, sends real-time alerts if any parameter is out of range and stores operational data. Alert parameter settings can be customized to the operator's maintenance intervals and strategy.

Operators can see this data on a built-in screen or on a PC connected via an ethernet cable for a more detailed view. Interfaces can also be customized to individual needs.

COMMbatt system overview



*SOC: State Of Charge

Build a complete picture of battery health

-  **C**harge condition: the battery's ability to perform the intended operation profile
-  **O**peration: the battery's functional data, and alerts under abnormal conditions
-  **M**aintenance: information on topping-up and reconditioning intervals
-  **M**emory: storage of historical operational data over extended periods.

Longer life for more availability, less maintenance

- Direct maintenance costs are reduced
- Increased fleet availability
- Reduced unplanned downtime
- Optimized battery operation for longer battery life.





Technical data

- Operating voltage min/max: 9 V/185 V
- Voltage: $V_{batt} \pm 5\%$
- Current: -500 A to $+500 \text{ A} \pm 2\%$
- I/O contact available (optional feature)
- Temperature range: from -40°C to $+70^\circ\text{C}$
- Thermal sensor accuracy $\pm 1\%$
- Dimensions: 147 x 102 x 42 mm
- Weight: 550 g
- No maintenance of the device is required
- Designed to main railway standards



Saft is your highly responsive expert partner

Saft has proven global expertise going back over a century – ranging from civil and military applications through stationary, telecommunications, railways, hybrid and electric vehicles and energy storage systems, to space, defense, aviation and marine applications.

Our deep knowledge of the market segments we operate in means we can tailor our battery systems and services precisely to meet individual needs and overall market trends.

Saft focuses on delivering high-quality systems that incorporate world leading innovation and design expertise. Our services have been developed to the same exacting standards, covering training, installation, maintenance, fleet management and e-supervision.

Saft

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