BATTERY MANAGEMENT SYSTEM (BMS) MONITORING WITH TFT100 IN INDIA

INTRO

With the global trend towards the electrification of transport, the demand for batteries is skyrocketing in the major markets. However, it is necessary to ensure the safety of the electric vehicle by monitoring the Battery Management System (BMS). Teltonika Telematics offers a multifunctional e-mobility GPS tracker to ensure the safety of electric vehicle batteries, optimising their performance, reliability, and fault prevention.

CHALLENGE

According to Autocar India, electric two-wheeler (E2W) sales were up 305% in 2022. With the growing popularity and number of electric bikes and electric scooters, a series of incidents with e-vehicle batteries took place in India in 2022. Following the investigation, the government announced mandatory safety standards to be implemented in two steps.

From 31 March 2023, AIS 156 (Phase II) certification is required, meaning that electric two-wheelers, three-wheelers and quadricycles need to be fitted with smart battery management systems to meet the additional safety requirements. The GPS tracker combined with the BMS is essential to ensure the safety, reliability and fault tolerance of electric vehicle batteries.

External short-circuiting, overcharging, over-discharging and over-temperature can lead to battery crash and rupture, vehicle breakdown, fire and explosion. It's therefore vital that the battery is used according to established guidelines to meet warranty standards. For example, regular BMS monitoring and data logging helps OEMs track the causes of battery problems and provide evidence in the event of a warranty claim.

In addition, rental companies want to have full control of their e-fleet remotely: perform engine cut-offs when user payments are overdue, know the location of the e-vehicle, monitor battery health and performance aspects, identify maintenance or repair issues, etc. Teltonika Telematics offers an e-mobility GPS tracker to ensure that the challenges of BMS monitoring are met.

SOLUTION

To solve this challenge, we chose the TFT100 model - the ultimate e-mobility GPS tracker for timely collection and monitoring of essential BMS data. This versatile tracking device can be used with a wide range of electric vehicle (EV) batteries due to its wide voltage range of 10-97 V.

Manual CAN functionality allows the tracker to read CAN data from the battery's ECU without the need to develop a custom CAN protocol. Manual CAN Commands functionality allows fleet managers to send configurable commands on the CAN network to perform specific actions available in the BMS functionality.

How it works - to take full advantage of BMS monitoring, the TFT100 needs to be connected to each EV battery in the fleet and configured according to a customer's needs. The e-mobility GPS tracker collects multiple real-time metrics, such as real-time location, sensor data, ignition on counter, tracker battery level, input/output data and with the help of Manual CAN functionality – CAN bus data - such as battery level, current, voltage, charge status, fault codes, etc.

The information gathered is transmitted to the tracking platform via a GPRS network. This enables fleet managers to track each TFT100-equipped battery and gather vital information about its operational status, correct/incorrect usage, location, etc. This allows them to detect battery problems at an early stage, streamline the malfunction diagnosis process and initiate predictive maintenance.

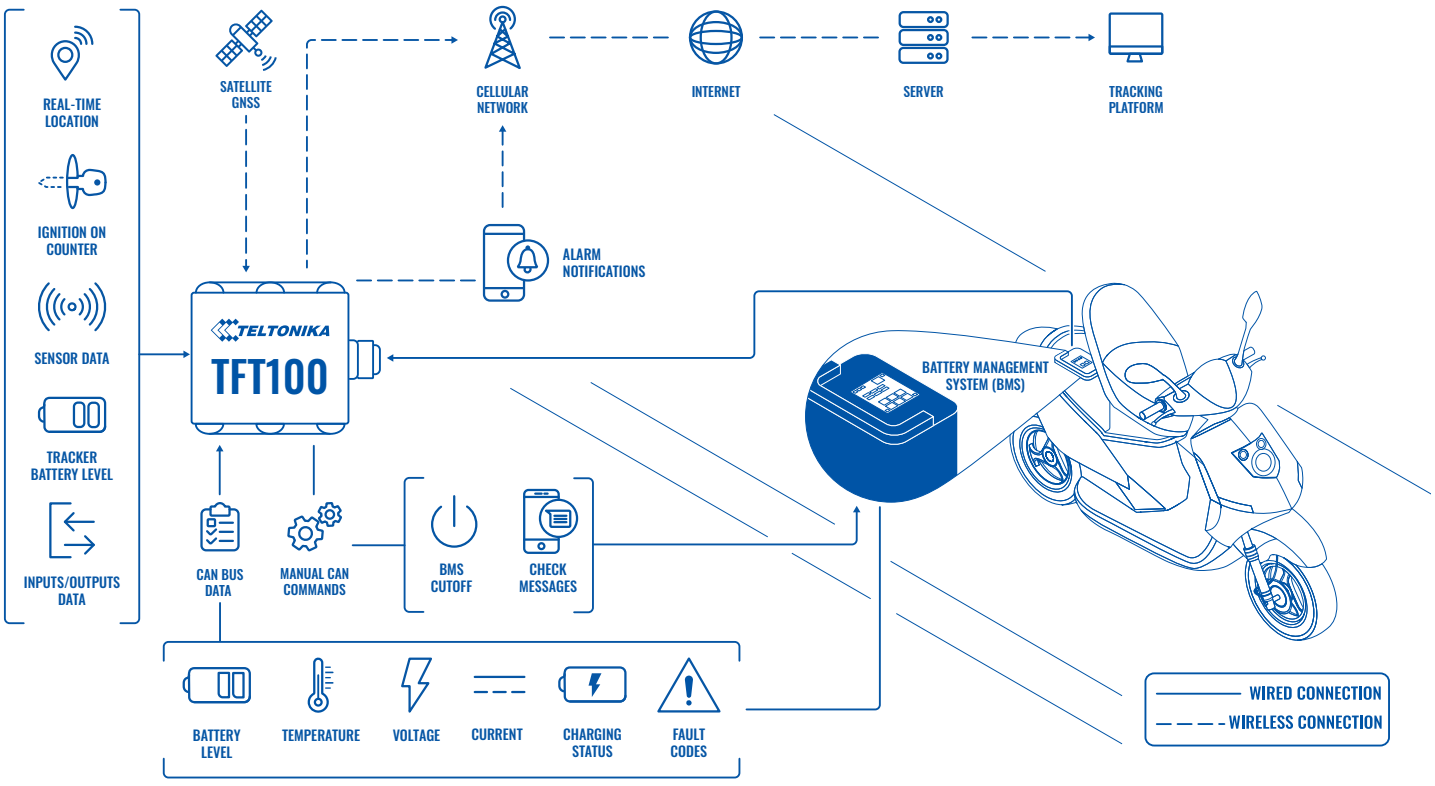
The flexibility of the **Manual CAN** functionality allows fleet managers to choose which specific parameters they wish to read from a battery's ECU. It is possible to configure up to 30 periodic/requestable CAN IDs based on a manufacturer's protocol documentation to read RAW CAN data. By getting timely data on battery performance, it's possible to minimise unexpected failures and avoid downtime of EVs and machinery.

The **Manual CAN Commands** functionality ensures two-way communication between the tracker and the BMS. Fleet managers can configure up to 10 Manual CAN Commands to be executed on the BMS side, ensuring maximum safety by responding immediately to any faulty alerts received from the BMS, such as over-temperature alerts. Through the cloud, the TFT100 activates the BMS cut-off, immediately halting the supply of power from the battery.

The BMS will then put the battery into sleep mode until the alarm is cleared, giving fleet owners peace of mind. The Manual CAN Commands functionality is widely used in rental applications. It allows battery owners to remotely initiate the BMS cut-off when rental payments are overdue. This gives Teltonika customers ownership of the battery packs and control of the ignition - the most important aspects of efficient rental solutions.

In addition, if the BMS does not have a cut-off function in its internal circuit, the TFT100 has a digital output (DOUT) function that can easily trigger the cut-off circuit and initiate the BMS cut-off precisely when required. Typically, the shutdown action is required when voltage levels fall below or rise above certain thresholds. This seamless interaction ensures the safety and optimum performance of the BMS.

TOPOLOGY



BENEFITS

- **Increase safety and reliability -** constantly monitor the battery's critical parameters to protect it from hazardous situations and reduce the risk of incidents.
- **Predictive and timely maintenance -** receive early warning signs of battery degradation or failure to take preventative action before safety or performance issues arise.
- **Improve efficiency and save costs -** improve battery efficiency and extend battery life to significantly reduce or eliminate unexpected costs.
- **Warranty compliance –** utilise the battery according to OEM guidelines to ensure warranty standards are met.
- **Regulatory compliance –** monitoring helps to comply with government regulations and avoid penalties, fines, and potential lawsuits that can damage a company's reputation and financial stability.

WHY TELTONIKA?

We offer a wide range of tracking devices to suit various needs and applications. Whether you are looking for GPS trackers for vehicles, assets or personal use, Teltonika Telematics has a diverse range of products to choose from. Our tracking devices and accessories are widely used in various sectors including transport, logistics, fleet management, and personal tracking.

Teltonika is a recognised leader in the telematics and IoT industry, with over 25 years of experience and an impressive 24 million IoT devices produced. Our extensive expertise and knowledge make us an ideal business partner for companies looking to achieve their goals. Teltonika team has been helping thousands of businesses and organisations save time, money, and hassle for over two decades. If you have any questions or need assistance, please do not hesitate to contact us, and we will do our best to help.

FEATURED PRODUCT

TFT100