CLAIMS

I/We claim:

1. A battery (100) comprising:

a battery management module (BMM) (101) configured for:

authenticating a user of the battery (100) and a host device where the battery (100) is being used;

computing State of Charge (SOC), State of Health (SOH) and State of Function (SOF) of the battery (100), wherein the BMM (101) is configured to determine SOH of the battery (100) using a pressure sensor, wherein the BMM (101) determines level of expansion of a plurality of cells (102) using inputs from the pressure sensor;

ensuring operation of the battery (100) under defined operating conditions during charging of the battery (100) and discharging of the battery (100);

checking for tampering with the battery (100) by checking if a docking mechanism (109) is at least one of disabled; and broken;

checking for an undesired variation in the battery (100) using inputs from at least one sensor (105); and

providing an alert if the battery (100) has been tampered or there is an undesired variation in the battery (100), wherein the BMM (101) checks for the undesired variation by checking for a

sudden change in at least one height, orientation, acceleration, and deceleration, of the battery (100) using inputs from the at least one sensor (105), wherein the BMM (101) provides the alert if the sudden change exceeds at least one pre-defined threshold;

the plurality of cells (102) for storing energy, wherein the plurality of cells (101) are arranged modularly in at least one of a series, parallel or hybrid manner;

a Telematics control unit (TCU) (103) configured for:

managing transmission and receiving of data over a communication interface (108); and

computing a distance to Empty (DTE) using the State of Charge (SOC), State of Health (SOH), State of Function (SOF) of the battery (100), vehicle information, and user information;

a switching control unit (SCU) (104) configured for controlling connection and disconnection to the host device using the docking mechanism (109) and a power interface (110), wherein the SCU (104) is configured for enabling the battery (100) to share energy with at least one other battery based on a command structure; and

at least one thermal element (106) configured for maintaining the battery (100) at a pre-defined temperature.

2. The battery, as claimed in claim 1, wherein the BMM (101) is configured to authenticate the user of the battery (100) and the host device by performing a plurality of security and authentication functions by using external entities.

3. The battery, as claimed in claim 1, wherein the at least one sensor (105) comprises at least one of a temperature sensor, a current sensor, a voltage sensor, a location sensor, an external environment sensor, an accelerometer, a gyroscope, a shock sensor, the pressure sensor and at least one biometric sensor.

4. The battery, as claimed in claim 1, wherein the at least one thermal element (106) comprises at least one of electric heaters, thermoelectric devices, thermal insulators, heat pipe(s), fans, mechanical heat conduction means, phase change material, heat sinks, thermal blankets, thermal enclosures, and at least one portion of a body of the battery (100).

5. The battery, as claimed in claim 1, wherein the BMM (101) is configured for checking for tampering by checking for at least one of a mechanical and/or electronic lock being disabled and/or broken, and communication being lost with the host device without proper authentication.

6. The battery, as claimed in claim 1, wherein the battery (100) further comprises a Real time clock (RTC) (111) to perform timestamping of readings and events related to the battery (100).

7. The battery, as claimed in claim 1, wherein the battery (100) further comprises a DC/DC converter (112).

8. The battery, as claimed in claim 1, wherein the battery (100) is further configured for connecting at least one other battery (100) to form a battery pack.

9. The battery, as claimed in claim 1, wherein the BMM (101) is further configured for collecting and aggregating information about the host device.

10. The battery, as claimed in claim 1, wherein the battery (100) is configured using over the air updates.

11. The battery, as claimed in claim 10, wherein the updates are customized for the battery (100).