TYVA BMS 6-25S

Battery Management System

Features

- Ultra-lightweight: 50 gr
- Manages from 6 to 25 battery cells
- Cell voltage up to 5V
- Stackable architecture based on slave boards, up to 810 V lithium battery pack
- Supports multiple battery chemistries
- Redundant analog and digital protections
- Below 220µA supply current in power saving mode
- Embedded smart power supply
- State of Charge (SOC) and State of Health (SOH) estimations based on advanced algorithms
- Stores up to 20 years of data history on µ SD card
- CAN-bus 2.0B interface
- Bluetooth 4.0 BLE monitoring capabilities with TYVA Android app
- Manages 1 external Solid state or standard switchbox up to 4 standard independent power outputs with DC contactors
- Current measurement through external Hall effect or shunt current sensor
- Embedded passive cell balancing up to 1W per cell
- 2 onboard temperature sensors and 3 thermistors inputs for external sensing
- Embedded Accelerometer 3 axes up to 16G
- Fully configurable
- High EMI immunity

Applications

Mobile and stationary electrical storage equipment:

- Industrial and home storage
- Electric and hybrid electric vehicles
- Backup battery systems
- Drones, robots, Street Lighting, …

Description

TYVA BMS is a battery management system providing high standards of security, optimal battery life-span, precise SOC (state of charge) and SOH (state of health) estimations and external data management (telemetry and onboard memory card). TYVA BMS has three main features: battery cells management, power line management and advanced communications features.

Cells management: TYVA BMS is an easy to use solution to manage large packs of batteries. The boards are easy and safe to connect or disconnect from the batteries.

- **Lightweight: 50 gr**
- **Compact: 110 x 62 x 15 mm**

TYVA BMS protects the batteries from over-voltage and under-voltage using redundant analog and digital safety features. A 1W cell balancing is used to equalize the cells voltages or SOC.

The built-in high efficiency smart DC converter of TYVA BMS enables self-sufficient operations without the need of external power supply. It also spares energy consumption by adapting to the battery conditions of use, down to 13mW in a 48V battery stack configuration.

While TYVA BMS is "plug and play" for all battery chemistries (NCA, NMC, LiFePo4); specific applications and other chemistries require custom settings. TYVA BMS can easily be adapted to specific applications by modifying the parameters on the configuration file of the BMS.

Communication: To ensure the proper use of the battery, TYVA BMS records all activities in an up to 20 years data history file. The communication between TYVA BMS and other devices is assured by CAN bus and 802.11 physical layers. TYVA BMS includes a comprehensive and universal opened CAN application layer and Bluetooth protocol application libraries.

Power line management: TYVA BMS can also be linked to a smart circuit breaker especially designed for high currents (solid state Switch box).

The current measurement is assured by a external SwitchBox (PDU) that must have a voltage output for the measurement. The accuracy of the measurements depends on the accuracy of the sensor. A 5V power supply is available for the sensor.

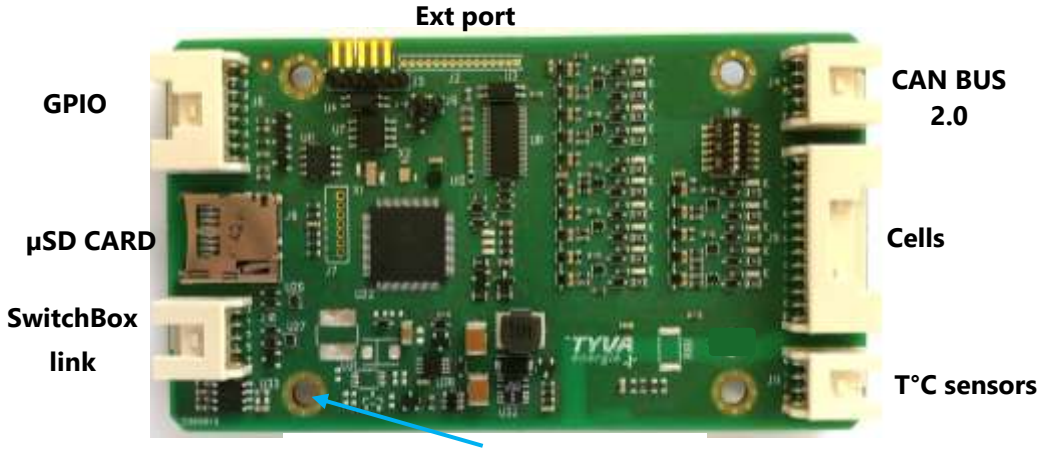
TYVA BMS cuts off the current when a short circuit is detected. The board can also react to over-current or over-temperature: these parameters are custom adapted as well as the time to react.

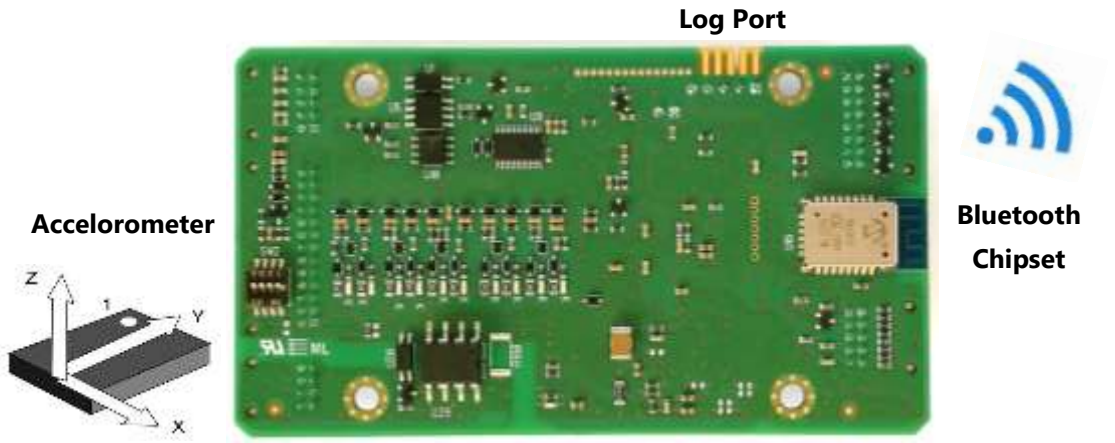
With an extension board, the BMS can drive up to 4 external devices such as power switches or fans, powered by the supply dedicated to the circuit breaker (an external power source or the battery itself).

1 Overview

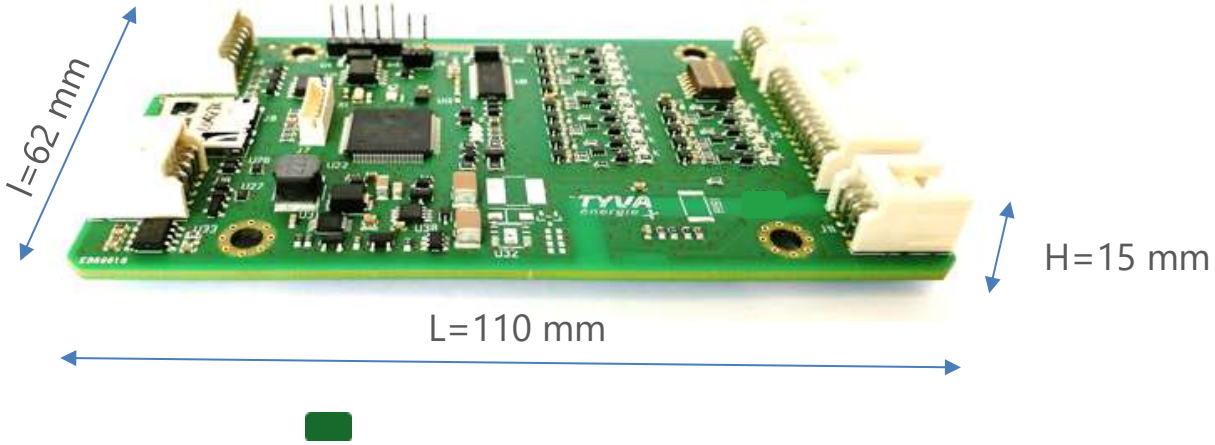
1.1 General Specifications

ITEM	VALUE
Board Battery Voltage	19.2 to 100 VDC
Cells per Board	6-10 cells (TYVA BMS Pro) 10-15 cells (TYVA BMS Pro) 15-25 cells (TYVA BMS Expert)
Maximum battery voltage	810 V (up to 8 x TYVA BMS Expert 25S in serial)
Balancing current	0.2 A
Temperature sensors	2 on the board + 3 to 5 external T°C sensors
Control IO's	8 GPIO outputs : fan control, heater control, HV interlock, ignition key,...etc
Communication	CAN 2.0 B for system integration
Temperature range	-40°C to 85°C
Dimensions	110 x 62 x 15 mm
Weight	50 gr

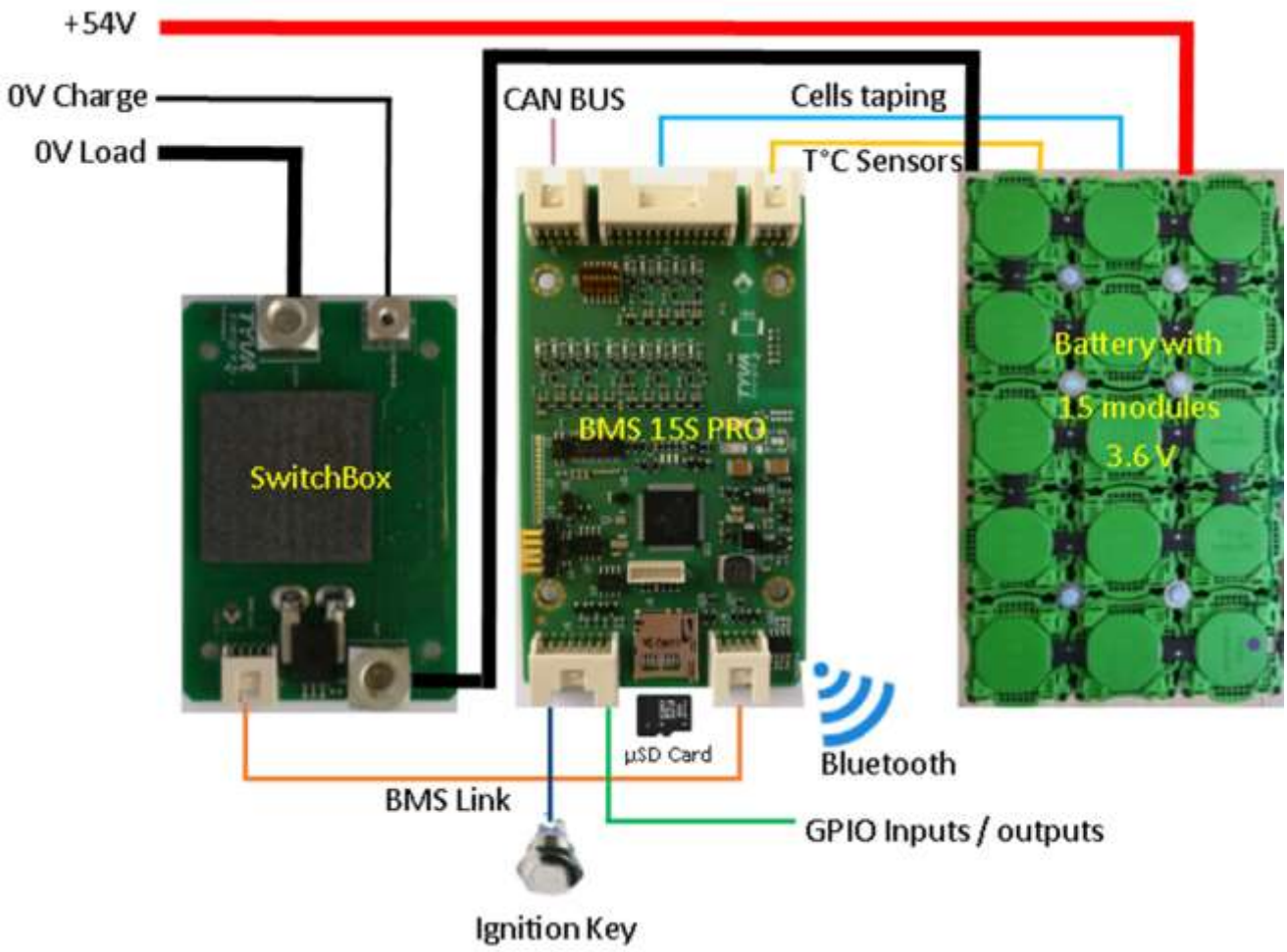




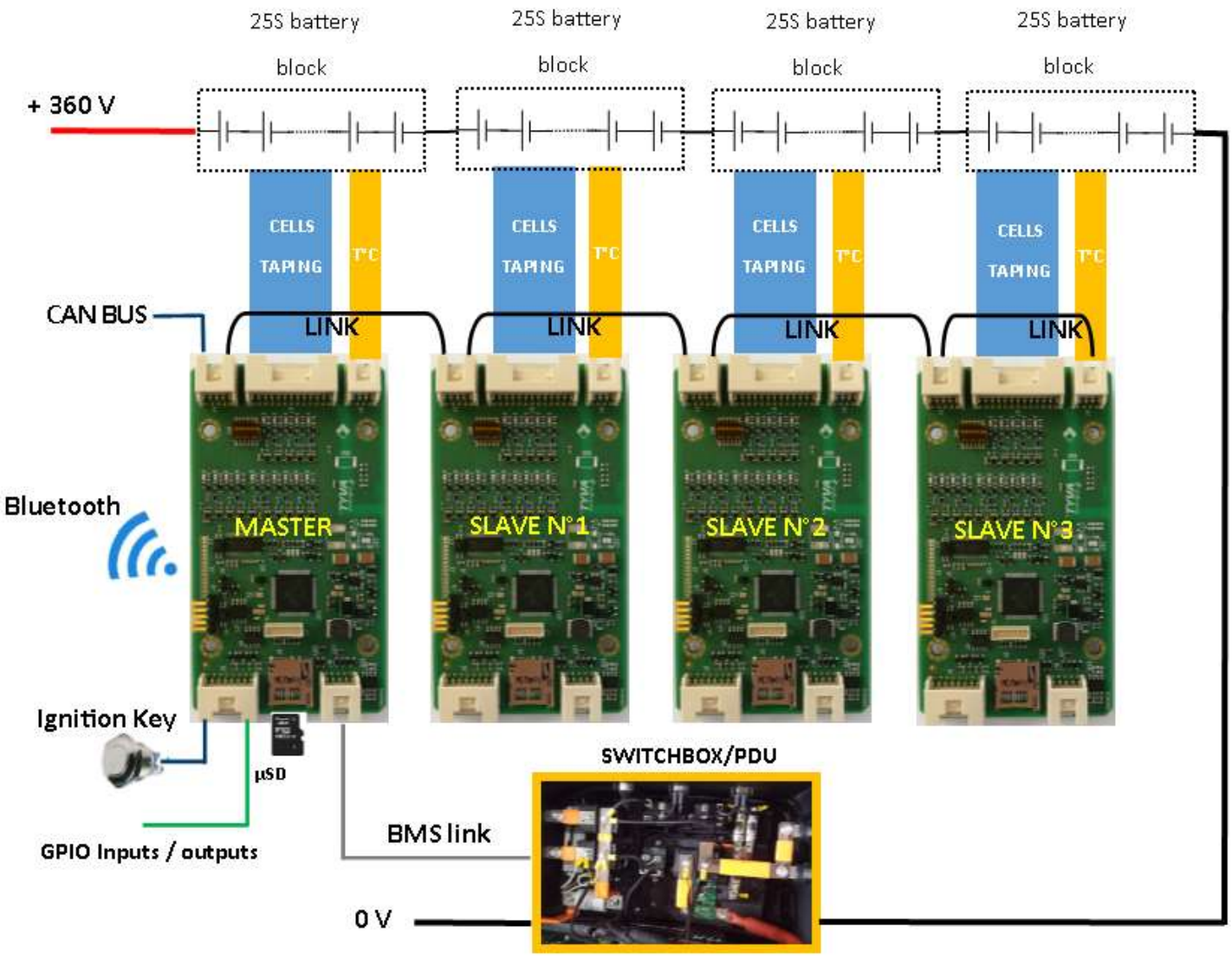
1.2 Mechanical Characteristics



1.3 54V Typical Lithium Battery Application



1.4 360V Typical Lithium Battery Application



1.5 TYVA BMS ANDROID APPLICATION

Main Features

- Wifi and Bluetooth 4.0 BLE compatibility
- All BMS data in Real time in your pocket
- Battery voltage and current
- Cells voltage with 8 mV accuracy
- Temperature of each BMS and Battery sensors
- SOC (state of charge)
- SOH (state of health)
- SOP (state of power)
- Cell balancing information
- Status of power channels, charge, discharge, precharge
- Cloud Synchronization for battery fleet management
- Compliance with all Android devices, tablet, smartphone
- Available on Play store