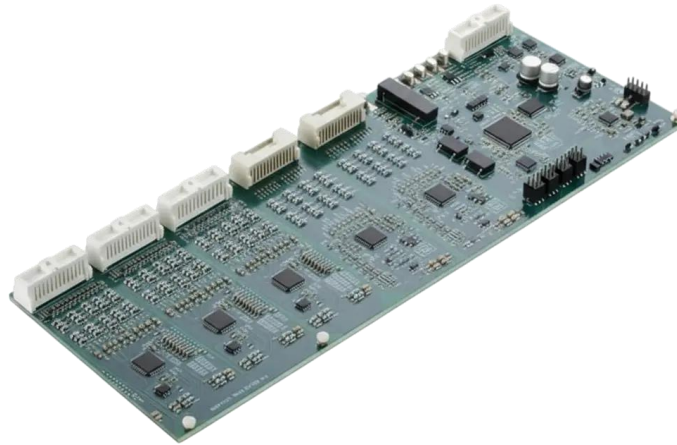




FEATURES

- Designed for Indian EV & ESS applications
- LFP-optimized; up to 136 cells in series (≈436.4 V nominal)
- Up to 200 A continuous / 400 A peak discharge variants
- Passive cell balancing at 200 mA
- CAN (UDS) + UART tool interface
- FOTA - firmware over-the-air updates

INTRODUCTION

The Xbattery BharatBMS™ (400V) is a compact, LFP-optimized Battery Management System engineered in India for the next generation of electric mobility and stationary energy-storage applications. Built around three high-precision cell-monitoring ICs and a robust MCU, it manages up to 136 series-connected LFP cells with ± 10 mV cell-voltage accuracy and 100ms sampling.

The platform operates from a 12 V logic supply and provides four high-side contactor drivers with feedback plus a pre-charge relay output. Fourteen internal and fifty external NTC channels deliver comprehensive thermal coverage across the pack.

Communications include one isolated CAN and one non-isolated CAN - both with UDS (ISO 14229) protocol support - plus two UART ports that carry a proprietary protocol for the Xbattery PC tool. The PC tool provides live monitoring, parameter configuration, and FOTA updates for fleet-wide rollouts.

KEY CAPABILITIES

SAFETY	USABILITY	BATTERY LIFE	PERFORMANCE
▶ Insulation / ground-fault detection (250 Ω/V – 1000 Ω/V) ▶ Open-circuit detection ▶ Configurable OV/UV/OT/OC thresholds ▶ 4 × contactor feedback + pre-charge	▶ PC tool: live monitoring & configuration ▶ FOTA — firmware over-the-air updates ▶ Event, error and warning logging ▶ Standby / sleep mode supported	▶ ± 10 mV cell-voltage accuracy ▶ 100 ms cell sampling ▶ Passive balancing at 200 mA ▶ 64 NTC channels for thermal mapping	▶ Up to 136S LFP, 436.4 V nominal ▶ 100 / 150 / 200 A continuous variants ▶ Peak 150 / 300 / 400 A @ 10 s ▶ 1 isolated + 1 non-isolated CAN, 2 × UART

APPLICATIONS



Passenger EV



e-LCV / Truck



Stationary ESS



Industrial / AGV

XBattery BharatBMS™ —400V class, LFP-optimised, 136S

MASTER CONTROL UNIT (MCU)	
Power supply	12 V DC
Cell chemistry supported	Lithium Iron Phosphate (LFP) optimized
Number of cell-monitoring ICs	8
Maximum cells in series	136 (Configurable up to 136 as per requirement)
Nominal pack voltage	436.4 V DC (136S × 3.212 V/cell)
Range of high-voltage measurement	0 – 496.4V DC
Accuracy of high-voltage measurement	±1.5 % @ –40 °C to +85 °C
Pack current measurement range	Matches connected current-sensor range
Range of current measurement input (Shunt)	Configurable, 40 mV to 75 mV full-scale differential
Accuracy of current measurement input (Shunt)	±0.7 % of reading –40 °C to +85 °C (additive to sensor accuracy)
Ground-fault detection (leakage) levels	Calibratable, 250 Ω/V – 1000 Ω/V
Continuous discharge current	100 / 150 / 200 A (variant dependent)
Peak discharge current	150 / 300 / 400 A @ 10 s (variant dependent)
Contactors / relays	4 × contactors with auxiliary feedback, 1 × pre-charge relay output
COMMUNICATION & SOFTWARE	
CAN interfaces	1 × isolated CAN + 1 × non-isolated CAN
CAN protocol support	CAN 2.0A (11-bit) / CAN 2.0B (29-bit); UDS (ISO 14229)
UART interfaces	2 × UART ports
UART protocol	XBattery proprietary protocol (PC tool communication)
PC tool	Live monitoring, parameter configuration, diagnostics
FOTA	Firmware Over-The-Air updates supported
Standby / sleep mode	Supported
CELL & THERMAL MONITORING	
Detectable cell voltage	0.5 – 5.0 V DC
Cell-voltage accuracy	±10 mV
Cell-voltage sampling time	100 ms
Cell balancing topology	Passive
Cell balancing current	200 mA per cell
Internal temperature sensors	14
External temperature sensors (NTC)	50
Temperature accuracy	±1 °C
MECHANICAL & ENV.	
Dimensions (PCB)	460mm × 110mm × 30mm
Operating Temperature	–20 °C to +85 °C
Storage Temperature	–40 °C to +85 °C
Ingress Protection	IP20 – IP65 (enclosure dependent)