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Battery Management System (ECO-BMS)

Brief

BMS supports two architectures: three-level architecture (BMU+BCU+BAU) and two-level architecture (BMU+BCU). BMU, BCU and BAU respectively offer PACK-level, cluster-level and array-level protection against overcharging, over-discharging, overcurrent, overheat and short circuit for battery clusters. Real-time monitoring of battery safety status, fault diagnosis, and warnings are provided. The main control unit within the cluster can accurately estimate SOC/SOH (State of Charge/State of Health) and offers insulation detection function with precision requirements exceeding national standards, ensuring efficient, reliable, and safe operation of the energy storage system.

Features

Complete Architecture

Compatible with two-/three-level architectures, support distributed and centralized scenarios.

High-Precision Insulation Estimation

Flexible insulation diagnosis solution, compatible with two-/three-level architectures with high accuracy.

Multiple Interfaces

Multiple types of DI/DO interfaces, adaptive to status input and control of various equipment.

Various Applications

Supports air-/liquid-cooled scenarios.

Protocol Compatible

Support multiple PCS protocols.

SOC Estimation Accuracy

Error < 5%

Ultra-Low Consumption

Flexible power supply and hibernation function.

Real-Time Response

100ms sampling interval to ensure timeliness of data.

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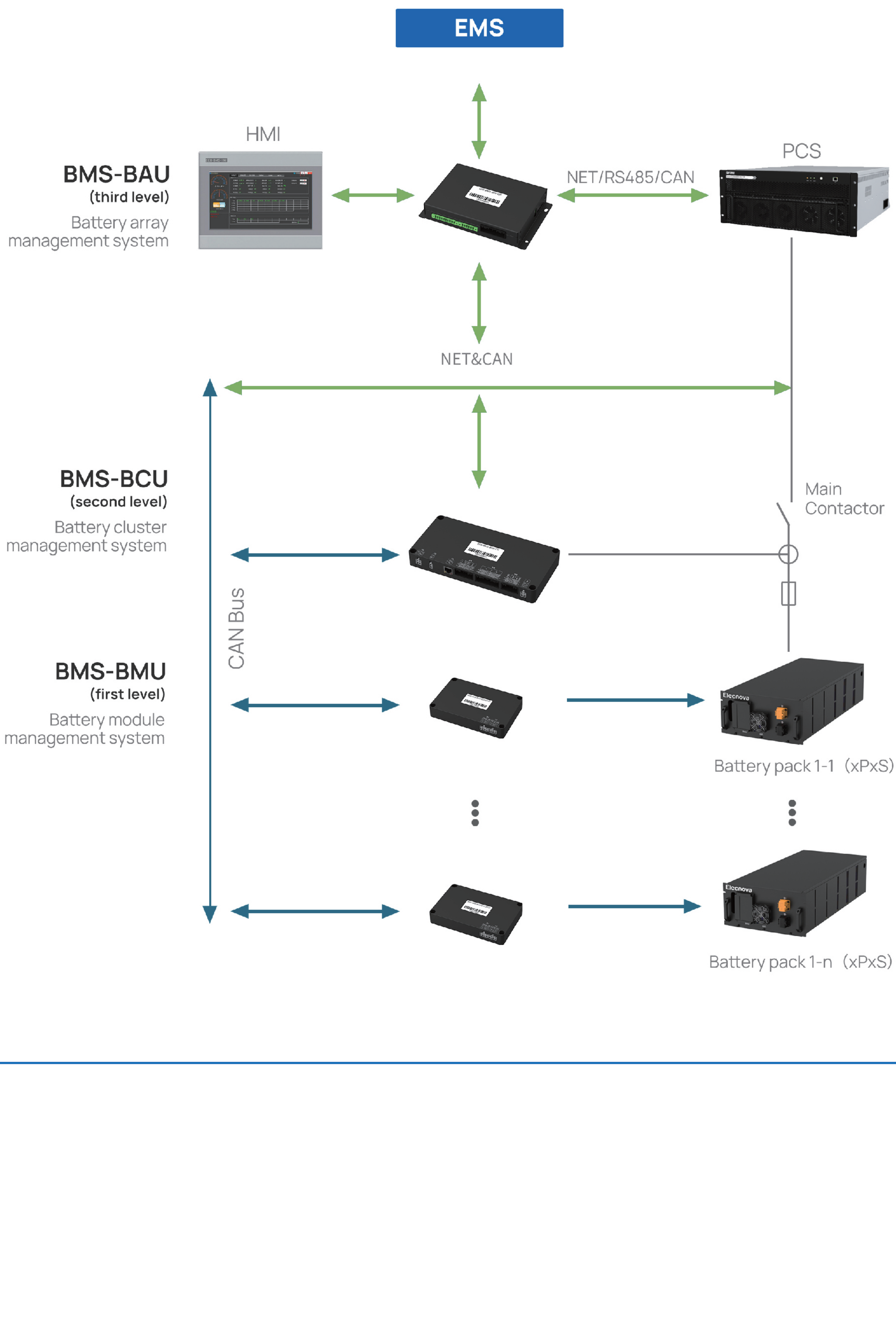
Typical Architecture



Specifications (Battery Module Unit ECO-BMS-BMU)

BMU-S24PB-A

BMU-S64PB-A

Functions

- Acquisition of Cell Voltage
- Acquisition of battery temperature
- Module fan PWM speed adjustment
- Passive balancing execution
- Liquid leakage monitoring
- Module fan feedback
- Module fan control

Specifications		Min.	Typical	Max.		Unit
				BMU-S24PB-A	BMU-S64PB-A	
Auxiliary Power Supply	Voltage	9	24	32		V
Operating Environment	Temperature	-25	—	65		℃
	Humidity	5	—	95		%
Cell Voltage	Voltage Range	0	—	5		V
	Sampling channel	—	—	24	64	mV
	Insulation Resistance	—	100	—		MΩ
Voltage Resistance Insulation	Rated Operating Voltage			1500		V
	Voltage Resistance	50Hz 3,000VAC applied between voltage sampling terminal and housing and digital interface terminal for 1 minute without breakdown or flashover				
Temperature Sampling	Temperature Range	-40	—	125		℃
	Sampling Points	—	—	24	64	—
	Sampling Accuracy	—	1	—		℃
Passive Balancing	Current	—	—	100mA		mA
DI/DO	DI	—	—	2		Channel
	DO	—	—	1		Channel
Signal Wiring	Wiring	—	—	Side connection		—

Specifications (Battery Cluster Unit ECO-BMS-BCU)

Functions

- Total voltage acquisition, main circuit current, insulation resistance and temperature detection
- Control of main circuit contactor and pre-charge relay, as well as status detection of relay
- Communication with sub-control unit for information acquisition of sub-control individual voltage and temperature
- Communication with master control unit to upload battery system information
- Communication with display screen (only for two-level architecture), PCS and EMS to display battery system information
- Passive balancing control algorithm, single cluster SOC/SOH calculation
- Sub-control address allocation control, sub-control fan control, system alarm and protection operations
- System battery data storage
- Multiple digital input/output channels (active/passive)

Main Technical Parameters		Min.	Typical	Max.	Unit
Auxiliary Power Supply	Voltage	9	24	32	V
Operating Environment	Temperature	-25	—	65	°C
	Humidity	5	—	95	%
5V Output			1		Channel
12V Output			1		Channel
Total Voltage Sampling	Voltage Range	100	—	1500	V
	Sampling Accuracy		±0.5		%
Shunt Current Sampling	Current Range	-500	—	500	A
Hall Current Sampling	Sensor Power Supply Voltage		5		V
	Current Range	—	80	—	mA
Insulation Resistance	Detection Range	0	—	10	MΩ
Voltage Resistance Insulation	Rated Operating Voltage		1500		V
	Voltage Resistance		50Hz/3,000VAC applied between voltage sampling terminal and housing and digital interface terminal for 1 minute without breakdown or flashover		
AI	Voltage Range	0	—	3.3	V
	Temperature Sampling Accuracy		±1		°C
DI/DO	DI		8		Channel
	DO		8		Channel
SOC	Calculation Error		5		%
CAN			3		Channel
RS485			3		Channel
Ethernet			1		Channel

Specifications (Battery Array Unit BMS-BAU)

Product Functions

- Three-level architecture system management
- Communication with the main control unit to summarize information from the multi-cluster battery system
- Communication with the display screen, PCS and EMS to display all battery system information
- System alarms and protection operations
- Multiple digital input/output channels (active/passive)

Main Technical Parameters		Min.	Typical	Max.	Unit
Auxiliary Power Supply	Voltage	9	24	32	V
Operating Environment Quantity	Temperature	-25	—	65	℃
	Humidity	5	—	95	%
DI	High-level	4 high-level effective inputs			—
	Low-level	4 low-level effective inputs			—
Passive Dry Contact	Normally Open	12			Channel
	Normally Closed	2			Channel
CAN		3			Channel
RS485		5			Channel
Ethernet		1			Channel

Specifications (Human-machine Interface ECO-BMS-HMI)

Product Model	ECO-BMS-HMI-7	ECO-BMS-HMI-10.2
LCD Screen	7" TFT	10.2" TFT
Resolution	800×480	1024×600
Memory	128M	128M
Interface	2 channels serial interface, 2 channels USB Interface	2 channels serial interface, 2 channels USB interface, 1 channel Ethernet interface
Power Supply	24±20%V DC	24±20%V DC
Overall Dimensions	226mm×163mm	271mm×213mm
Hole Dimensions	215mm×152mm	260mm×202mm