

Product Presentation

LIBALc-BMS24™

COMPACT BATTERY MANAGEMENT SYSTEM

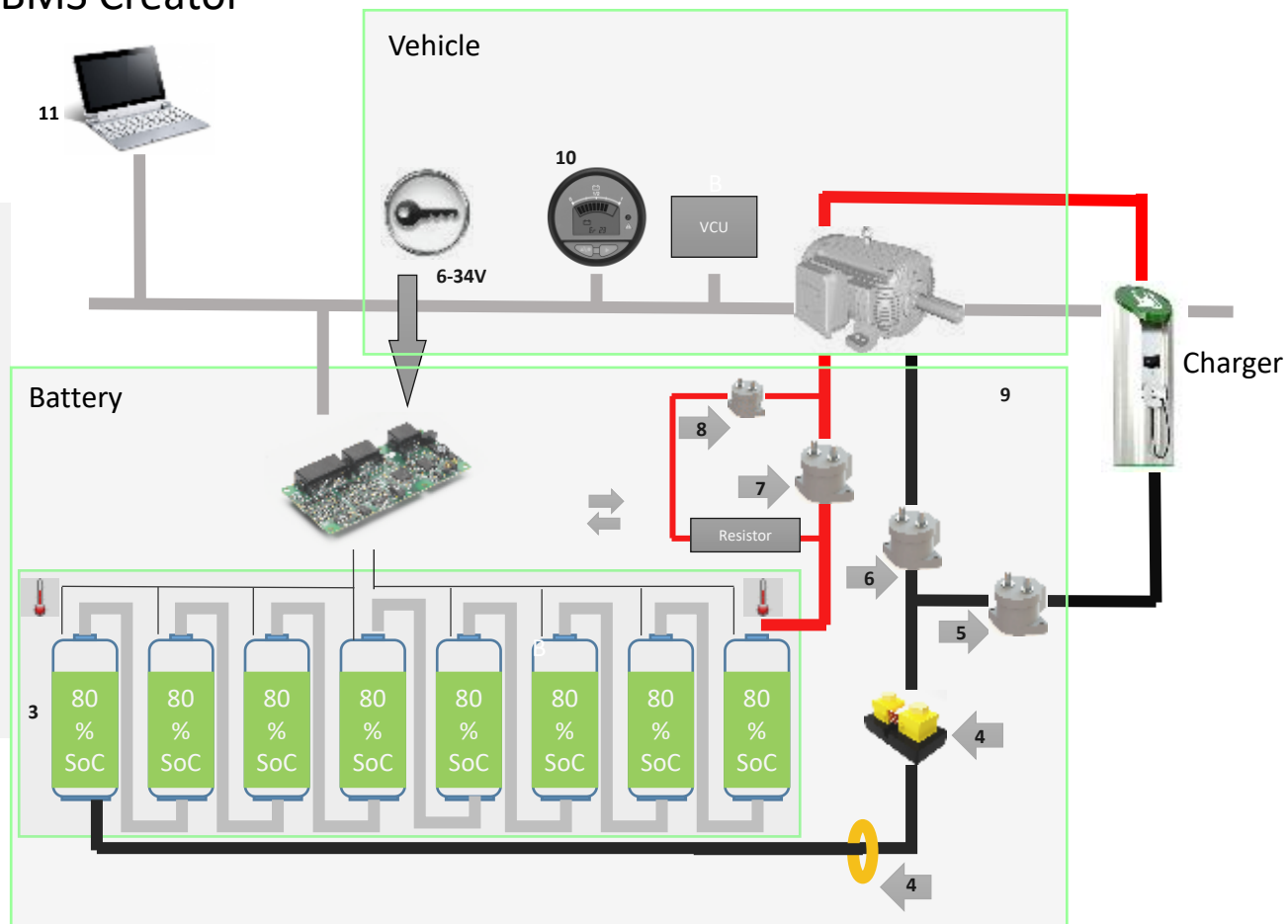
System overview



BMS Creator™

1. cBMS24
3. BATTERY PACK
4. SHUNT/HAL
5. CHARGE CONTACTOR
6. HV- MAIN CONTACTOR
7. HV+ MAIN CONTACTOR
8. PRE CHARGE CONTACTOR
9. CHARGER (CAN or PWM)
10. CAN DISPLAY
11. DIAGNOSTIC TOOL

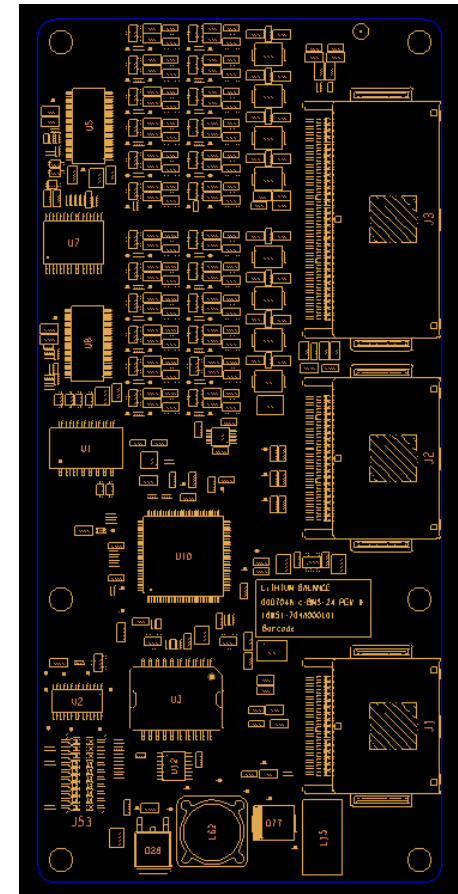
- HV +
- HV -
- CELL MONITORING
- TEMPERATURE MONITORING
- CAN 1
- CAN 2
- ← INPUT SIGNALS
- OUTPUT SIGNALS
- KEY SWITCH



c-BMS24 overview

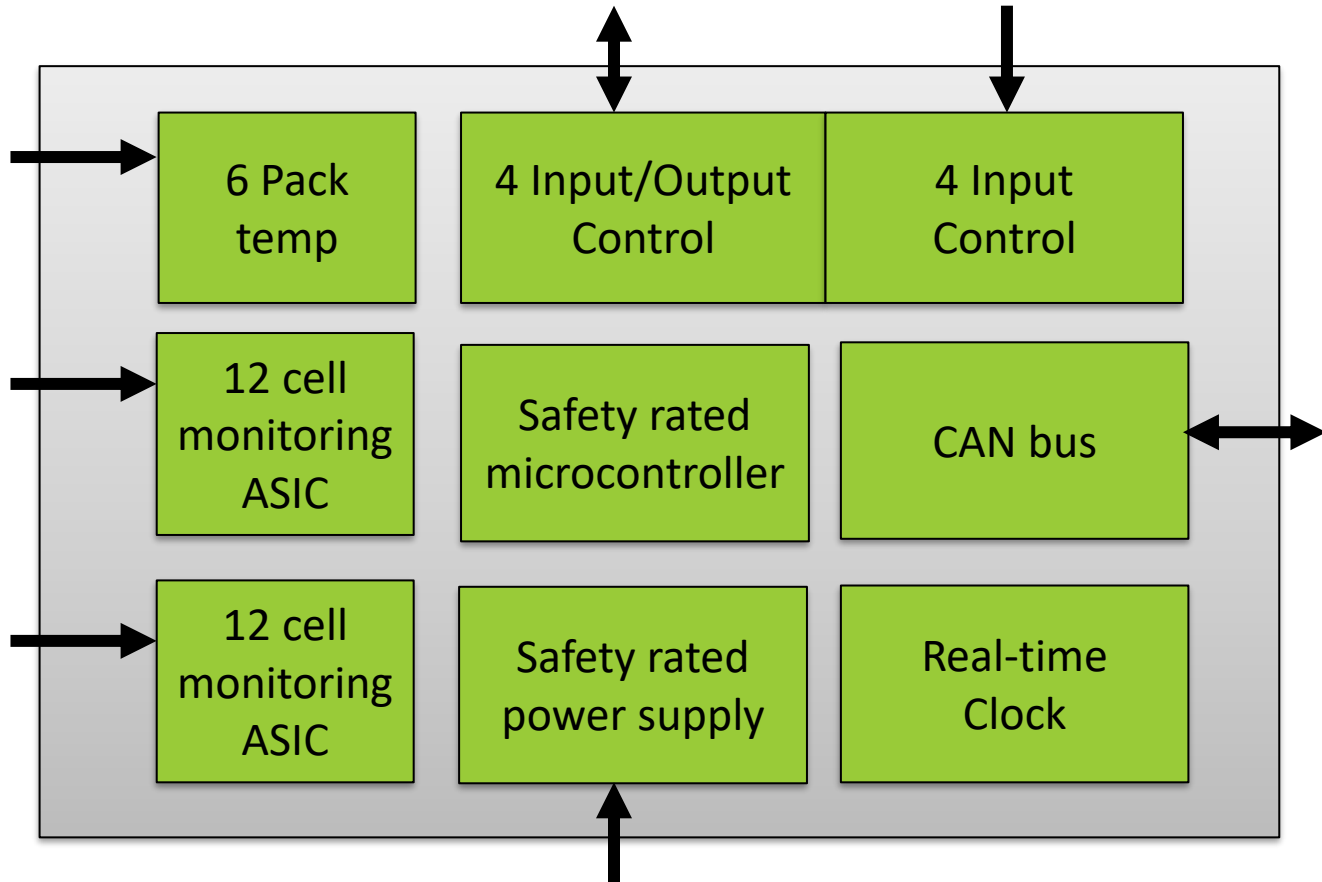


- Single PCB for up to 24 lithium-ion cells in series.
- 6 External temp sensors and 4 on-board
- 4 GPIO and 4 Input
- Compact design: 150 x 70 mm / 67g
- Designed for highest levels of functional safety on cell voltage, temperature and current
- Full industrial and automotive environmental specifications.



c-BMS electronic layout

Architecture



Safety

- Monitoring with open circuit protection and redundancy of safety critical circuits
 - Pack Temperature
 - Current
 - Cell voltage
 - Power supply
- Utilization of safety rated automotive standard components ensures highest possible levels of functional safety.



Functions



Reliability

- Extended temperature range (-40°C to +85°C)
- Tested to the most demanding standards in electromagnetic radiation (EMC) and electrostatic discharges (ESD).
- Tested to the most demanding standards in vibration, shock and impact.



Managed
by c-BMS

Compactness

- Size: 150 x 70 x 15 mm
- Weight: 67g

Functions



Performance

- State-of-the-art algorithms for estimation of;
 - State of Charge (SOC).
(Validated, 0.28 % accuracy)
 - State of Health (SOH)
- Dynamic charger control algorithms
(Control loop feed-back mechanism)
- Current, voltage and temperature measurements are synchronized at 150 mS sampling rate
- Applicable for all lithium ion battery chemistries.



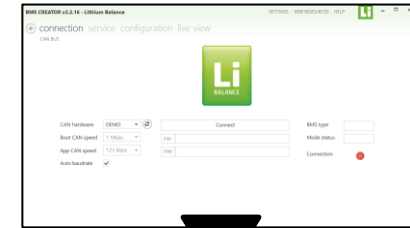
Power consumption and supply

- Broad supply power range: 6 – 35V
- < 2,7 W in operation
- <1,9 mW in sleepmode w. wake-up on CAN and ignition

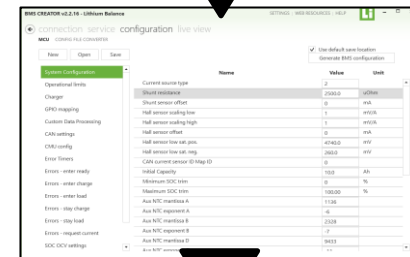
c-BMS CREATOR™



- PC configuration tool with comprehensive possibilities for customization
- Enables the battery designer to create a UNIQUE BMS based on HW and SW platform
- Key Parameter configuration:
 - Error settings
 - Battery model
 - SOC model based on OCV
 - Current regulation
 - I/O controls
 - CAN communication
 - Custom processing machine
- Live view monitoring and Control
- Service



CONNECT



CONFIGURE



CONTROL

#	Status	Timestamp	Origin	Code	Description
001	Detected	2020-11-02 13:00:02	06	0568	ADC_04T REPORTED UNUSUAL ERROR CODE
002	Detected	2020-05-19 10:00:00	12	1010	CCP REPORTED UNUSUAL ERROR CODE
003	Checked	2020-11-14 00:00:00	23	1946	FLASG_07E REPORTED UNUSUAL ERROR CODE
004	Detected	2020-08-20 00:00:00	23	0910	BMS REPORTED UNUSUAL ERROR CODE
005	Checked	2020-10-23 04:45:53	14	1071	BAL (JMS) REPORTED UNUSUAL ERROR CODE
006	Checked	2020-04-10 01:00:00	06	0602	CPU_07E REPORTED UNUSUAL ERROR CODE
007	Detected	2020-08-15 14:00:04	12	1160	PGA_ANALOGSR REPORTED UNUSUAL ERROR CODE
008	Detected	2020-08-23 06:26:26	20	0730	TRM_ANALOGSR REPORTED UNUSUAL ERROR CODE
009	Detected	2020-05-28 08:24:42	20	1272	SRM_ANALOGSR REPORTED UNUSUAL ERROR CODE
010	Checked	2020-08-01 16:28:20	22	0607	BCP REPORTED UNUSUAL ERROR CODE
011	Checked	2020-08-03 19:52:50	12	1434	CPM_07E REPORTED UNUSUAL ERROR CODE
012	Checked	2020-10-16 22:02:57	21	1027	MSM REPORTED UNUSUAL ERROR CODE
013	Checked	2020-05-05 19:02:02	07	0538	CPM REPORTED UNUSUAL ERROR CODE
014	Checked	2020-04-20 04:47:12	20	0439	IPSDIAGNOSTIC REPORTED UNUSUAL ERROR CODE
015	Checked	2020-03-03 11:30:05	00	0717	ADC_04M REPORTED UNUSUAL ERROR CODE
016	Checked	2020-11-08 01:40:00	12	0988	CCP REPORTED UNUSUAL ERROR CODE
017	Checked	2020-09-17 12:29:00	29	1426	POST_27 REPORTED UNUSUAL ERROR CODE
018	Checked	2020-02-06 14:47:00	14	0909	BAL (JMS) REPORTED UNUSUAL ERROR CODE
019	Detected	2020-10-11 23:51:58	16	0534	USB REPORTED UNUSUAL ERROR CODE

SERVICE

Specifications



Module Specification	Value
Cells to be monitored	Up to 24 cells, minimum 11V
Cell voltage range	0.0 – 5.0 V
Cell voltage measurement accuracy.	$\pm 1,5$ mV (-40 to 85 °C)
Cell voltage sampling	150 mS
Temperature sensors	Up to 6
Temp. Measurement acc.	$\pm 1^{\circ}\text{C}$ (-40 to 85 °C)
Pack temperature sampling rate	150 mS
Communication	CAN bus (non-isolated). Isolated between 12V and ground
Dimensions	150 mm x 70 mm x 15 mm
Weight	67 g
Balancing current	Up to 200 mA/cell
I/O ports	4
Input ports	4

Specifications



System specifications	Value
Pack voltage range	Up to 100V
Pack current range	Up to 2000 A
Pack current measurement accuracy	±1%
Pack voltage accuracy	±1,0 VDC
Pack current measurement sampling rate	150 mS
Temperature range	-40°C to 85°C
Stanby consumption (sleep mode)	< 2,5 mW
Active consumption	< 2.7 W
Current measurement	Shunt or Hall effect sensor
Power Supply	6-35 V

Test/Certification



Tests	Standards
EMC	CISPR 12, 16, 22, 25 IEC EN 61000-4-4 ISO 11452/11452-4/2 ISO 16750-2 ISO 7637-2
Vibration	ISO 16750-3
Temperature	ISO 16750-4
Humidity	ISO 16750-4