

BE_BMS



State of Charge Control



CAN BUS Connection



Cooling Management



Heating Management



Cloud Connected



Battery State of Health

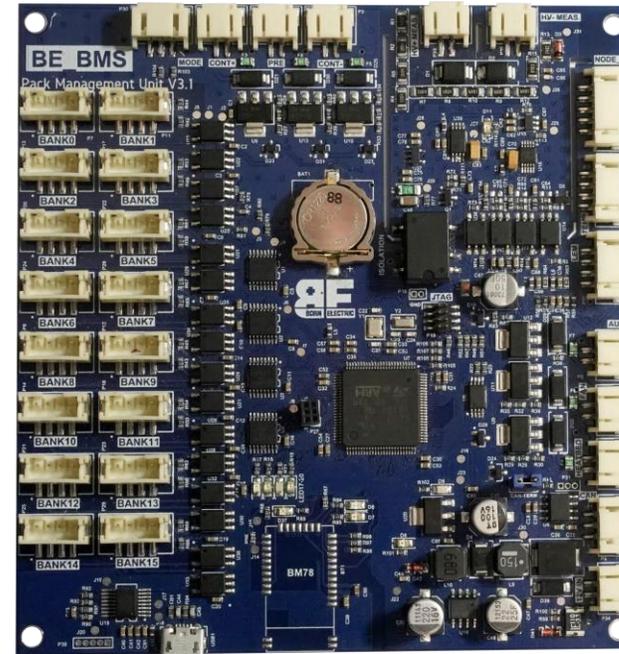


Pack Current Measurement



HV insulation

PMU



CMU



Cell Management Unit



Voltage Measurement

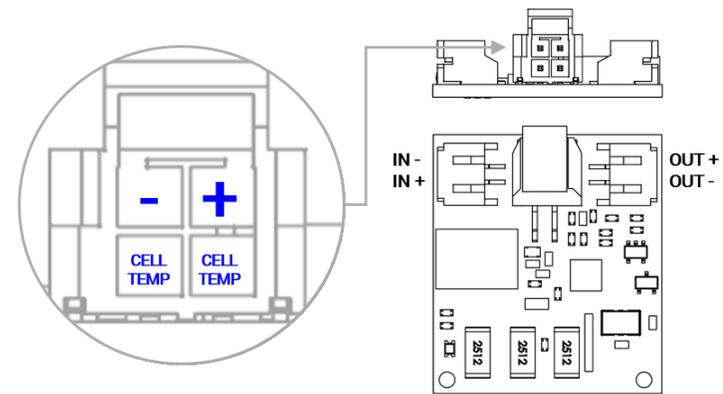
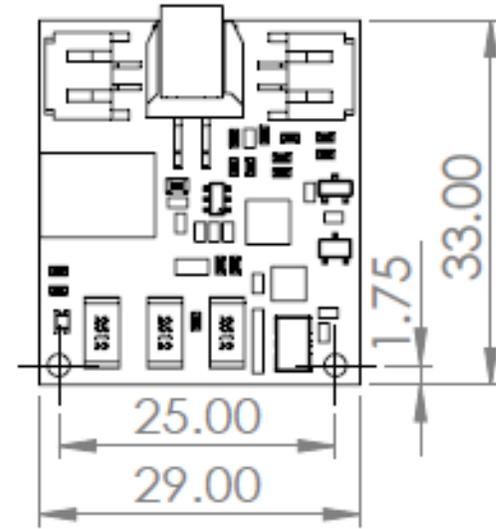


Temperature Measurement



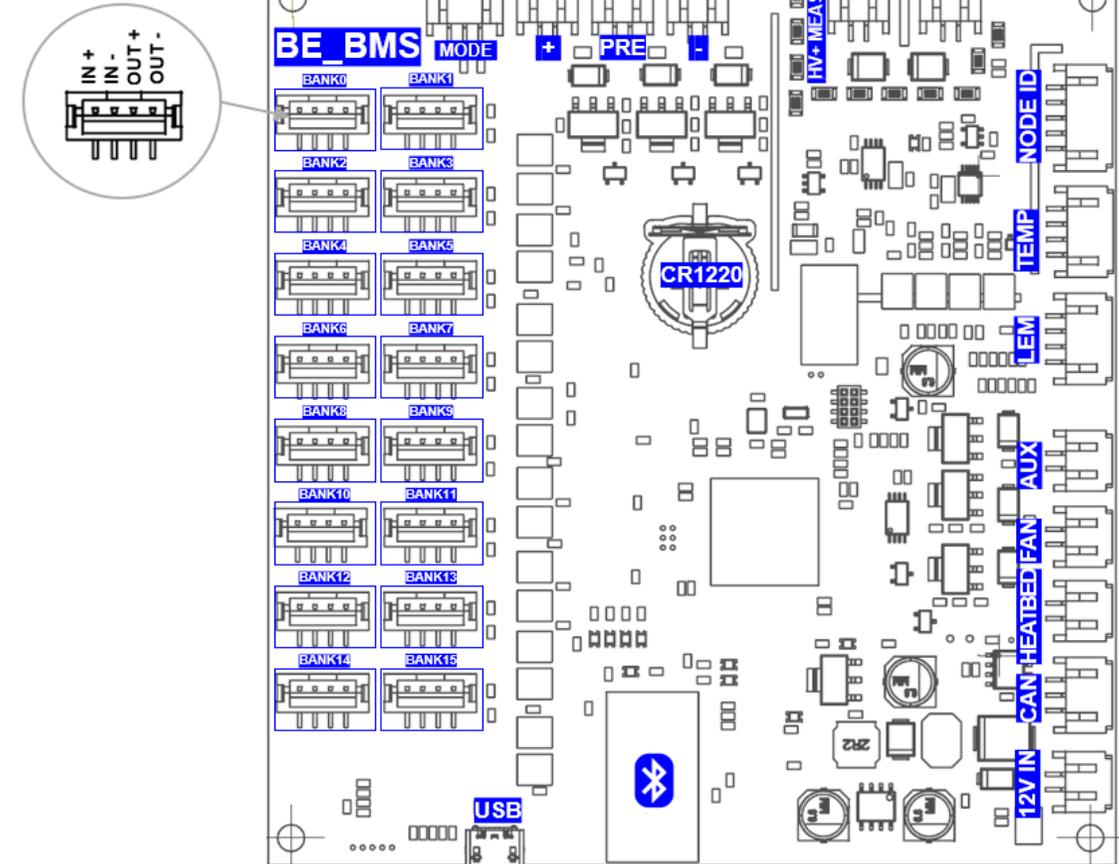
Passive Balance

Cell voltage range	2.1 - 4.5 V
Cell voltage accuracy	± 5 mV
Temperature range	-35 ÷ 85 °C
Balance current	Min 650 mA, typical 1300 mA, max 1500 mA
Cell balance method	Passive
Power consumption (Active)	2.0 mW
Power consumption (Sleep)	0.1 mW

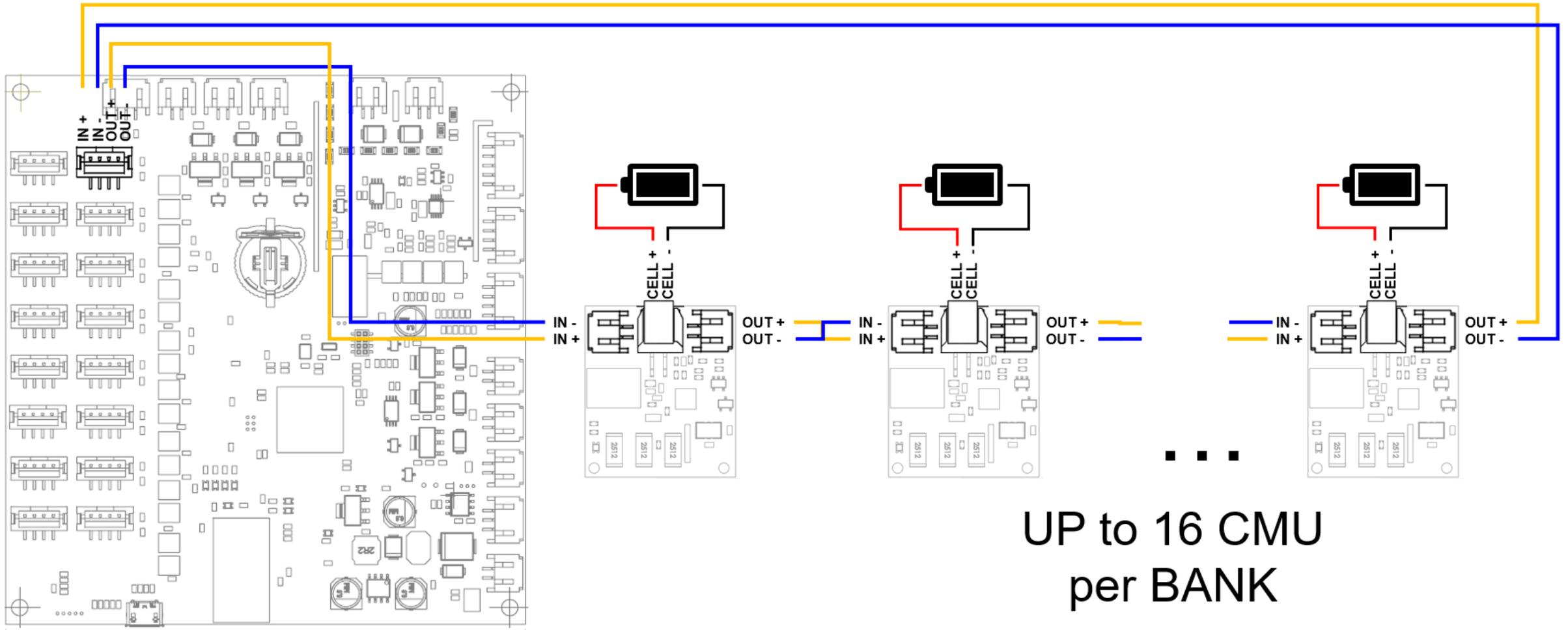


Pack Management Unit

Power supply	12 V
Number of banks	16
Number of CMU in banks	16
Maximum number of cells	256
High voltage range	0-1000 VDC
High voltage accuracy	1V
Operating temperature	-35 ÷ 85 °C
Charger and Onboard communication	CAN
CAN speed	125, 250, 500, 1000 kbit/s
CAN supported protocol	CAN OPEN
Power consumption (Active)	1.5 W (board only)
Power consumption (Idle)	1.1 W (board only)
Voltage/temperature cell sampling rate	150 ÷ 550 ms



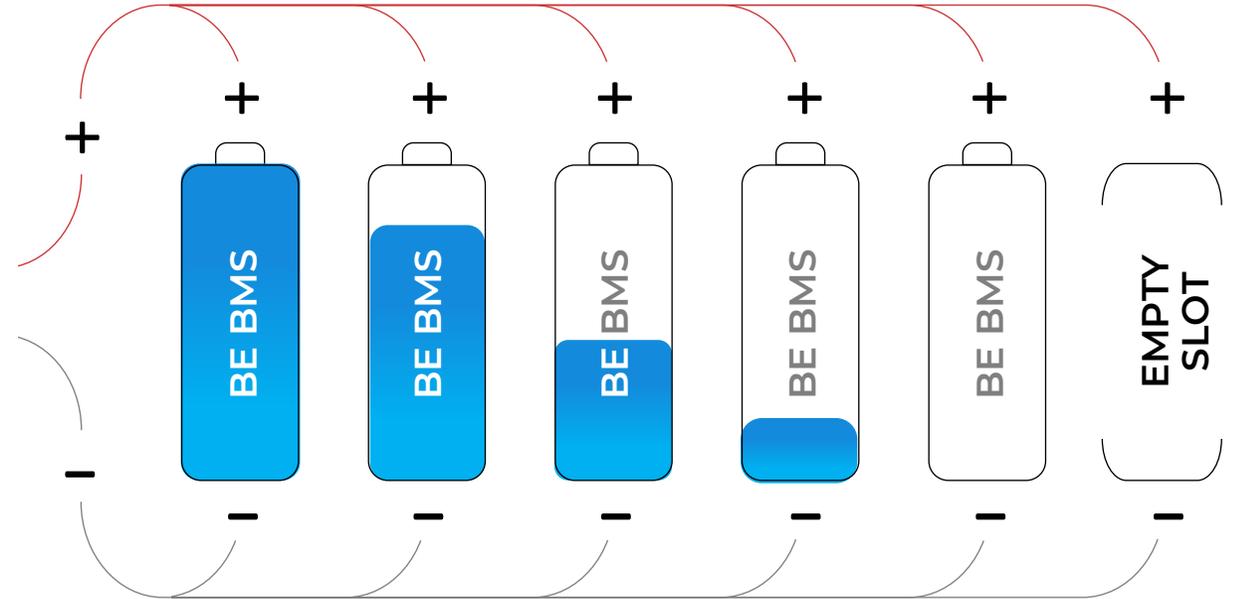
System architecture



UP to 16 CMU
per BANK

UP to 256 cells

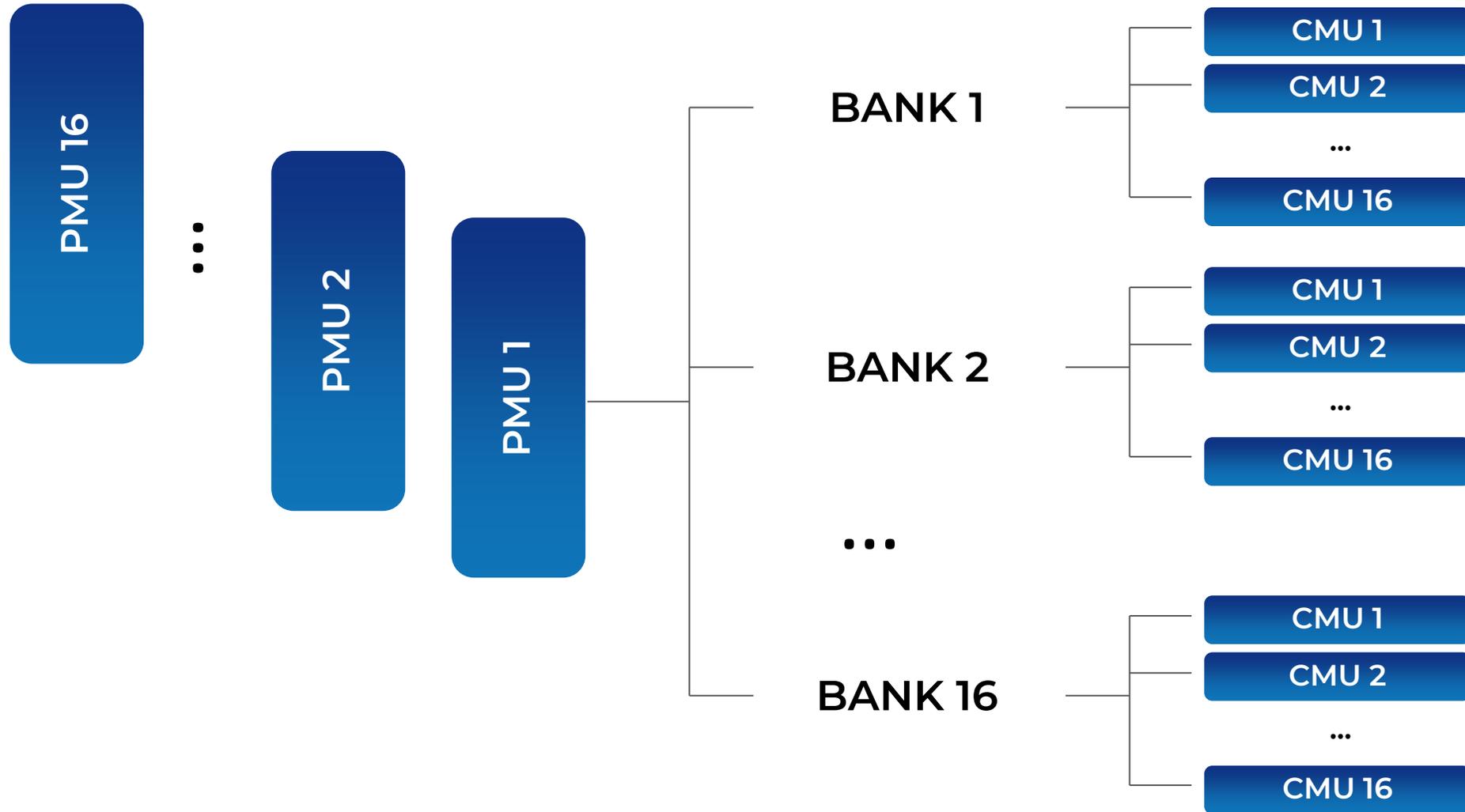
The system enables the parallel connection of batteries seen as one



The solution has been tested in a number of use cases



Scalability of the BE_BMS



BE BATTERY MANAGEMENT
BORN ELECTRIC
✖

Overview

- GENERAL
- CELL
- GRAPHS
- DIAGNOSTICS

Configure

- GENERAL
- STATE OF CHARGE
- OPERATION

72%

SoH	100 %
Voltage	47.5 V
Current	-3.0 A
Pack Temperature	32.0 °C
Voltage Delta	8 mV
Contactors On	True
Is Balancing	False
Warning	False
Error	False

Pack Info Pack Voltage (V)

Printed points: Total points: 21

+ - 20 Export

Cell Info Cell Voltage (mV)

Overview

- GENERAL
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0%

SoH	100 %
Voltage	53.4 V
Current	0.0 A
Pack Temperature	21.0 °C
Voltage Delta	8 mV
Contactors On	False

Overview

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Configure

- GENERAL
- STATE OF CHARGE
- OPERATION

0%

SoH	100 %
Voltage	53.4 V
Current	0.0 A
Pack Temperature	22.0 °C
Voltage Delta	8 mV
Contactors On	False
Is Balancing	False
Warning	True
Error	True

Write to File Load from File Write to BMS Load from BMS

General

User Defined ID:

Capacity (Wh):

CellType:

Cell Manufacturer:

Cell Model:

Contactors

Pack:

Multimaster:

CAN controlled: Off

Precharge Time:

Precharge Current:

Charging

Max. Current:

EOC Current:

EOC Voltage:

Current Warning:

Current Sensor

Model:

Max. Voltage:

Max. Current:

Auto zeroing: On

Manual Offset:

Balancing

Min. Voltage:

Min. Cell Delta:

Max. Overshoot:

Max. CMU Temp.:

Min. CMU Temp.:

Utilities

CAN Speed:

Charger:

Fan: Off

Heatbed: Off

Number of CMU in Banks

Bank 0	<input type="text" value="16"/>
Bank 1	<input type="text" value="0"/>
Bank 2	<input type="text" value="0"/>
Bank 3	<input type="text" value="0"/>
Bank 4	<input type="text" value="0"/>
Bank 5	<input type="text" value="0"/>
Bank 6	<input type="text" value="0"/>
Bank 7	<input type="text" value="0"/>
Bank 8	<input type="text" value="0"/>
Bank 9	<input type="text" value="0"/>
Bank 10	<input type="text" value="0"/>
Bank 11	<input type="text" value="0"/>
Bank 12	<input type="text" value="0"/>
Bank 13	<input type="text" value="0"/>
Bank 14	<input type="text" value="0"/>
Bank 15	<input type="text" value="0"/>

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Overview

- GENERAL
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- DIAGNOSTICS

Device Info

User ID: 49

Cell Count: 16

Device Type: BE_BMS_Classic

Operation Time

Cycle Number: 0

Discharging: 7 min

Charging: 5 min

Detected Cells

Bank 0	16
Bank 1	0
Bank 2	0
Bank 3	0
Bank 4	0
Bank 5	0
Bank 6	0
Bank 7	0
Bank 8	0
Bank 9	0
Bank 10	0
Bank 11	0
Bank 12	0
Bank 13	0

Overview

- GENERAL
- STATE OF CHARGE
- OPERATION

Operation State

Discharge State: Off

Charge State: Off

Main Contactor: Off

Charge Complete: False

Charging: False

Cooling: Off

Heating: Off

Cell Values

Min. CMU Temp.: 24 °C

Max. CMU Temp.: 26 °C

Min. Cell Temp.: 0 °C

Max. Cell Temp.: 0 °C

Min. Voltage: 3336 mV

Max. Voltage: 3344 mV

Cell Voltage Delta: 8 mV

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Overview

- GENERAL
- CELL
- GRAPHS
- DIAGNOSTICS

Configure

- GENERAL
- STATE OF CHARGE
- OPERATION

General

User Defined ID:

Capacity (Wh):

CellType:

Cell Manufacturer:

Cell Model:

Contactors

Pack:

Multimaster:

CAN controlled: Off

Precharge Time:

Precharge Current:

Charging

Max. Current:

EOC Current:

EOC Voltage:

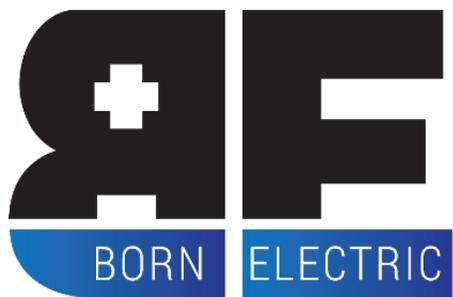
Current Warning:

Number of CMU in Banks

Bank 0	<input type="text" value="16"/>
Bank 1	<input type="text" value="0"/>
Bank 2	<input type="text" value="0"/>
Bank 3	<input type="text" value="0"/>
Bank 4	<input type="text" value="0"/>
Bank 5	<input type="text" value="0"/>
Bank 6	<input type="text" value="0"/>
Bank 7	<input type="text" value="0"/>
Bank 8	<input type="text" value="0"/>
Bank 9	<input type="text" value="0"/>
Bank 10	<input type="text" value="0"/>
Bank 11	<input type="text" value="0"/>
Bank 12	<input type="text" value="0"/>
Bank 13	<input type="text" value="0"/>
Bank 14	<input type="text" value="0"/>
Bank 15	<input type="text" value="0"/>

App version: 0.1.7370.21800





BE_BMS

Confidential

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