

n-BMS™

Next Generation Battery Management System

The n-BMS is developed to meet all relevant automotive requirements. Featuring functionally safe design with key components such as Processor, ASIC and PSU carefully selected to meet functional safety at ASIL C level.

With several off-the-shelf CMU variants suited for diverse application and end-user needs, the n-BMS has a high degree of flexibility and supports various battery design choices.

The 12 voltage channel “100809” cell monitoring unit is compatible with both the n-BMS and the fully ISO26262 certified n3-BMS, providing a convenient upgrade path for n-BMS users for an safety rated key components certified system.

Both CMU boards are extremely compact, measuring only 65 x 75 mm for the 12 channel and 55 x 89 mm for the 15 channel CMU.

The n-BMS uses the Creator™ software, which enables the battery designer to create a unique, application specific battery characteristics and safety strategies, while ensuring optimal performance, charge time, and overall battery life.

Highlights

Safety

- Self-test and redundancy in safety critical measurement circuits
- Open circuit detection

Usability

- RTC + logging of events, errors and warnings
- BMS Creator PC tool for easy configuration
- Optional current sensing (Hall effect or Shunt)
- CAN UDS tool

Battery Life

- High frequency sampling of current (100 mS) allows optimal detection of pulses
- Powerful and intelligent dissipative balancing at 170 mA per cell
- -40° to +85°C operational range

Performance

- ±1,6 mV at 25°C at individual cell level
- Optimized low power consumption mode
- ±1°C accuracy in temperature measurement
- Advanced SOC algorithm with OCV compensation
- Advanced SOH, SOP algorithm

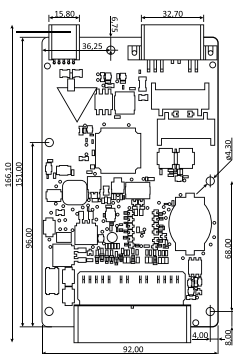
Features

- For applications up to 1000 V and 1000 A
- Safety rated key components
- ISO26262 certification capable monitoring unit (CMU12)
- 12 and 15 voltage channel CMU options

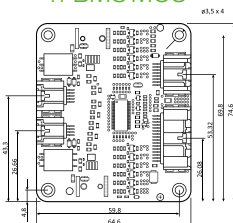
Applications



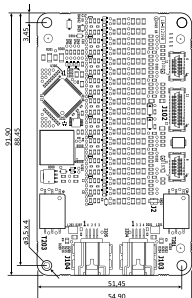
Next Generation Battery Management System



n-BMS MCU



n-BMS CMU12 100809



n-BMS CMU15 100820

Parameters	Specifications
Master Control Unit (MCU)	
Power supply	6-35 V
Range of high voltage measurement	0 - 1000 VDC
Accuracy of high voltage measurement	±1 VDC
Range of current measurement input Shunt	±150 mV
Accuracy of current measurement input Shunt	±1.0 mV -40 – 85 °C
Range of current measurement input (Hall effect sensor)	0.0 – 5.0 V, 0.0 -2.5 V current in, 2.5 V – 5.0 V current out
Accuracy of current measurement input (Hall effect sensor)	±1.5 mV -40 – 85 °C
Accuracy of temperature (NTC)	±1 °C -40 – 85 °C
Ground fault detection (leakage) levels	250/500/1000 Ω/V Between GND and HV+/-
Standby Consumption	<8,5 mW at 12V supply
Active Consumption	<3,5 W at 12 V supply
Communication interface, master-slave	isoSPI
Supported CAN communication type	CAN 2.0A/B 11 bit and 29 bit IDs
Supported CAN speeds	125, 250, 500, 1000 kbit/sec
Number of CAN ports	2, one isolated CAN, one non-isolated CAN.
External GPIOs	16 (Active Low)
Charger control interfaces	CAN

Parameters	Specifications	
	CMU 12	CMU 15
Cell Monitoring Unit (CMU)	CMU 12	CMU 15
Number of CMU's supported		1 - 32
Number of cells in series for total system	384	390
Number of cells per unit	4 – 12 (minimum 12 V to power the CMU)	6 – 15 (minimum 17 V to power the CMU)
Detectable cell voltage		0 - 5 VDC
Number of temperature sensors per unit	4 (NTC based)	8 (NTC based)
Cell balancing topology		Dissipative
Cell balancing current	200 mA, at cell voltage 4.2 V	170 mA at cell Voltage 4.2 V
Cell voltage typical sampling time		100 ms
Accuracy of single cell voltage		±1,6 mV at 25 °C
Communication interface	isoSPI (Max. 5 m shielded cable between boards)	
Accuracy of cell temperature (NTC)	± 2 °C -40 - 0 °C ± 1 °C 0 - 40 °C ± 2 °C 40 - 85 °C	
Standby Consumption	~460 μW (12 μA) - with 12 cells @ 3,2 V	~528 μW (12 μA) - with 12 cells @ 3,2 V
Active Consumption	~690 mW (18 mA) - with 12 cells @ 3,2 V	~960 mW (18 mA) - with 12 cells @ 3,2 V
Patents	ZT 200780048774, EP 0781788.6, US 8.350.529	

Datasheets provided by Sensata Technologies, Inc., its subsidiaries and/or affiliates ("Sensata") are solely intended to assist third parties ("Buyers") who are developing systems that incorporate Sensata products (also referred to herein as "components"). Buyer understands and agrees that Buyer remains responsible for using its independent analysis, valuation, and judgment in designing Buyer's systems and products. Sensata datasheets have been created using standard laboratory conditions and engineering practices. Sensata has not conducted any testing other than that specifically described in the published documentation for a particular datasheet. Sensata may make corrections, enhancements, improvements, and other changes to its datasheets or components without notice. Buyers are authorized to use Sensata datasheets with the Sensata component(s) identified in each particular datasheet. HOWEVER, NO OTHER LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE TO ANY OTHER SENSATA INTELLECTUAL PROPERTY RIGHT, AND NO LICENSE TO ANY THIRD PARTY TECHNOLOGY OR INTELLECTUAL PROPERTY RIGHT, IS GRANTED HEREIN. SENSATA DATASHEETS ARE PROVIDED "AS IS". SENSATA MAKES NO WARRANTIES OR REPRESENTATIONS WITH REGARD TO THE DATASHEETS OR USE OF THE DATASHEETS, EXPRESS, IMPLIED, OR STATUTORY, INCLUDING ACCURACY OR COMPLETENESS. SENSATA DISCLAIMS ANY WARRANTY OF TITLE AND ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, QUIET ENJOYMENT, QUIET POSSESSION, AND NON-INFRINGEMENT OF ANY THIRD PARTY INTELLECTUAL PROPERTY RIGHTS WITH REGARD TO SENSATA DATASHEETS OR USE THEREOF. All products are sold subject to Sensata's terms and conditions of sale supplied at www.sensata.com. SENSATA ASSUMES NO LIABILITY FOR APPLICATIONS ASSISTANCE OR THE DESIGN OF BUYERS' PRODUCTS. BUYER ACKNOWLEDGES AND AGREES THAT IT IS SOLELY RESPONSIBLE FOR COMPLIANCE WITH ALL LEGAL, REGULATORY, AND SAFETY-RELATED REQUIREMENTS CONCERNING ITS PRODUCTS, AND ANY USE OF SENSATA COMPONENTS IN ITS APPLICATIONS, NOTWITHSTANDING ANY APPLICATIONS-RELATED INFORMATION OR SUPPORT THAT MAY BE PROVIDED BY SENSATA. Mailing Address: Sensata Technologies, Inc., 529 Pleasant Street, Attleboro, MA 02703, USA

Sensata Technologies
Denmark A/S
Greater Copenhagen
Phone: +45 5851 5104
Email: lb_contact@sensata.com

Regional head offices:
United States of America
Sensata Technologies
Attleboro, MA
Phone: 508-236-3800
E-mail: support@sensata.com

Netherlands
Sensata Technologies Holland B.V.
Hengelo
Phone: +31 74 357 8000
E-mail: support@sensata.com

China
Sensata Technologies China Co., Ltd.
Shanghai
Phone: +8621 2306 1500
E-mail: support@sensata.com

sensata.com