

Features

- ISO 26262 certification provided by TÜV SÜD
- Adjustable Functional Safety related parameters
- High Voltage scalable system for up to 360 cells or 1000V



INTRODUCTION

The n3-BMS is an ISO 26262 certified, flexible, cell chemistry agnostic distributed BMS with next-gen features implemented to address some of the most pressing automotive, safety, and performance challenges heavy vehicle OEMs face.

While the n3-BMS is certified, it remains an off-the-shelf, flexible solution, offering significantly decreased time to market by cutting down years of work involved with the development and the certification process, which involves submitting hundreds of documents to an accredited organization, rigorous testing, and in-depth safety considerations.

The n3-BMS features a unique software structure that separates functional safety-related features of the BMS to a Base Software Layer (BSW), while the rest of the functionality is under an Application Software Layer (ASW). This allows users to adjust key BMS parameters without any risk on the ISO 26262 certification. In addition, customers have the flexibility to use any number of CMU channels between 6 and 12.

Furthermore, with its dual core lockstep CPU and ASIL C compliant ASIC, along with advanced algorithms, the n3-BMS is capable of high measurement accuracy.

SAFETY

ISO 26262 ASIL-C certified

No undetected single-point failures

Integrator configurable safety parameters without re-certification

Open circuit detection

USABILITY

RTC + logging of events, errors, and warnings

BMS Creator PC tool for easy configuration

Compact Cell Monitoring Units (CMU) for easy integration

Battery passport support

BATTERY LIFE

High frequency sampling of current (6 ms) allows optimal detection of pulses

Powerful and intelligent passive balancing at 200mA per cell

PERFORMANCE

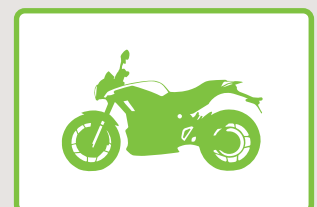
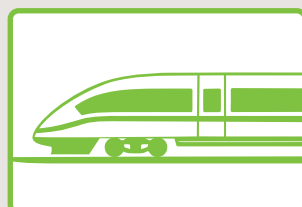
Certified at 34.03 FIT rate (1x MCU 8x CMU)

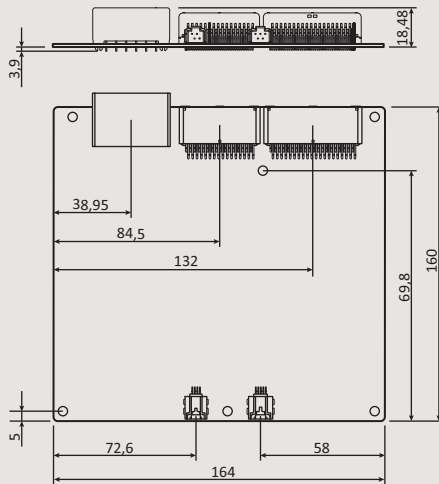
Flexible Base Layer Software/API/Application Layer Software architecture

Calibrate safety and non-safety parameters in the battery

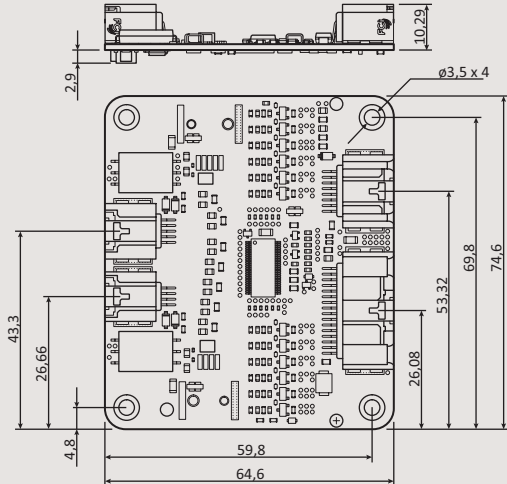
Parallel pack capability (10 packs)

Applications





n3-BMS MCU 100816



n3-BMS CMU 100809

Dimensions in mm

PARAMETERS		SPECIFICATIONS
Master Control Unit (MCU)		
Power supply		9 – 32 VDC
Number of CMU's supported		2 - 30
Maximum number of cells in series for a complete system		360
Range of high voltage measurement		0 - 1000 VDC
Accuracy of high voltage measurement		+/-1.5% @ -40 to+85 °C
Pack current measurement range		Shall match the range of current measurement input
Range of current measurement input (Shunt)		Configurable, 40mV to 75 mV output voltage at rated current
Range of current measurement input (Hall effect sensor)		+/- 2 Volt at rated current (two ranges for low/high current) - DHAB2 compatible type shall be used
Accuracy of current measurement input (Shunt)		+/- 0.7% at -40 °C..+85 °C (to be added to the sensor accuracy)
Accuracy of current measurement input (Hall Effect Sensor)		±0,5% @ -40 – 85 °C (to be added to the sensor accuracy)
Accuracy of auxiliary temperature measurement (NTC)		0 °C to 40 °C: +/-1 °C; -35 °C to +85 °C: +/-2 °C
Ground fault detection (leakage) levels		Calibratable, ranges from 250 Ω/V - 1000 Ω/V
Standby Consumption		< 200 µA from LV battery, < 160 µA from HV battery
Active Consumption		3 W (Average) from LV battery, < 160 µA from HV battery
Supported CAN communication type		CAN 2.0A (11-bit identifiers), and CAN 2.0B (29-bit identifiers)
Number of CAN ports		3 non-isolated (125, 250, 500, and 1000 kbs, configurable)
External GPIOs		5 Aux temperature inputs; 2 Digital inputs; 2 Digital outputs; 1 Analog input; 2 PWM in (configurable as digital inputs); 2 PWM outputs;
Contactors / relays		4x contactors (with auxiliary feedback), 1x pre-charge relay (without aux. feedback)
Cell Monitoring Unit (CMU)		
Number of cells per unit		6 - 12 Cells (min. 11V to power the CMU)
Detectable cell voltage		0.5 - 5 VDC
Number of temperature sensors per unit		2x2 redundant measurements (configurable nr. of pairs: 0 -1 – 2). NTC based
Cell balancing topology		Dissipative
Cell balancing current		200 mA @ 4.2 V
Cell voltage typical sampling time		< 100 ms
Accuracy of single cell voltage		+/- 3mV @ 25 °C
Range of Temperature measurements		-40 to +85 °C
Accuracy of cell temperature (NTC)		± 2 °C @ -40 - 0 °C & 40 - 85 °C ± 1 °C @ 0 - 40 °C
Communication interface		isoSPI (Max. 5 m shielded cable between boards)
Standby Consumption	Typical	~460 µW (12 µA) - with 12 cells @ 3,2 V from HV battery
Active Consumption	Typical	~690 mW (18 mA) - with 12 cells @ 3,2 V from HV battery
Patents		ZT 200780048774, EP 0781788.6, US 8.350.529

