Creating safety. With passion.

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DEVELOPMENT PLATFORM

NTBMS Module Platform for 48V to HV Systems: Ready-to-copy solution in compliance to ISO 26262 ASIL C/D

NTBMS Module Platform is an e-mobility ready to use design and complete safety solution for Battery Management Systems. It is constructed with a modular approach: A Battery Management System (BMS) control application board and additional modules for distributed HV applications.

The NTBMS Module Platform is designed for systems with high demand on reliability and safety targeting ISO 26262 ASIL C up to ASIL D.

The Battery Management System of Li-Ion battery includes cell monitoring, current sensing, passive cell balancing, battery breaker control, computation unit for Battery parameter extraction and communication to other ECU through LIN or CAN. Battery management systems are responsible to monitor and control low- and high-voltage batteries on Li-Ion technology of Electric and Hybrid Electric Vehicles. This control unit is essential since several battery cells are unified to a cluster to enhance battery capacity. Lithium-Ion batteries require a prevention of voltage fluctuation during the process of battery charging. Thus BMS are essential to monitor state of charge, load distribution, temperature of each battery cell as well as of the whole battery package and development of the charging capacity.

Typical applications

- _ Automotive BMS for Starter Battery with Li-lon battery
- _ Automotive BMS for Auxillary Battery
- Automotive BMS for Power Train
- Smart Grid BMS
- _ Other BMS opportunities
- (medical, eBike, light transportation, industrial)

Customer Benefits

- _ Accelerate time to market
- _ Reduction in costs for development and certification
- Safety Development Plattform for BMS
- _ Ready-to-copy

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System Overview



NTBMS in 48V configuration

How is the platform set up?

The heart of the BMS platform is ASIL D capable microcontroller architecture consisting of a safety and a diagnostic microcontroller for checking and monitoring safetycritical processes and functions or ASIL D capable microcontroller architecture based on a Lockstep microcontroller

Distributed ASIL D capable BMS architecture consisting of one or more modules based on NXPs BCC chip families (MC33771, MC33772) using a TPL communication with a central logic unit for battery systems > 48V (including HV systems according to LV-123).

Various additional modules are available:

- Module for system voltage measurement
- _ Current measuring module (measurement with shunt)
- Module for contactless current measurement
- _ Module for temperature measurement
- _ Module for cell voltage measurement
- _ Module for passive balancing of battery cells
- Module for controlling power isolators such as pyrofuses, mono- and bi-stable contactors or relays
- _ SBC module with vehicle interface (CAN / LIN), power supply, watchdog, etc.
- A module is a logically delimitable unit (element) and includes
 i.a. Documentation, circuit diagram, layout, SW driver of this subsystem

NTBMS in HV configuration

Key Features

Integrated system diagnostic functions targeting ASIL C

- _ Overcurrent protection
- _ Overcharge protection
- _ Overtemperature protection
- _ Overvoltage protection
- Undervoltage (short circuit) protection
- _ Unintended relay close protection
- _ Unintended relay open protection
- _ Crash detection

Battery Characteristics

- Intrusive diagnostics
 (performed by MCU)
- _ Memory storage (RAM & flash)
- Power management (low power and normal mode)
- _ LIN for starterbattery
- _ CAN for the auxiliary battery



