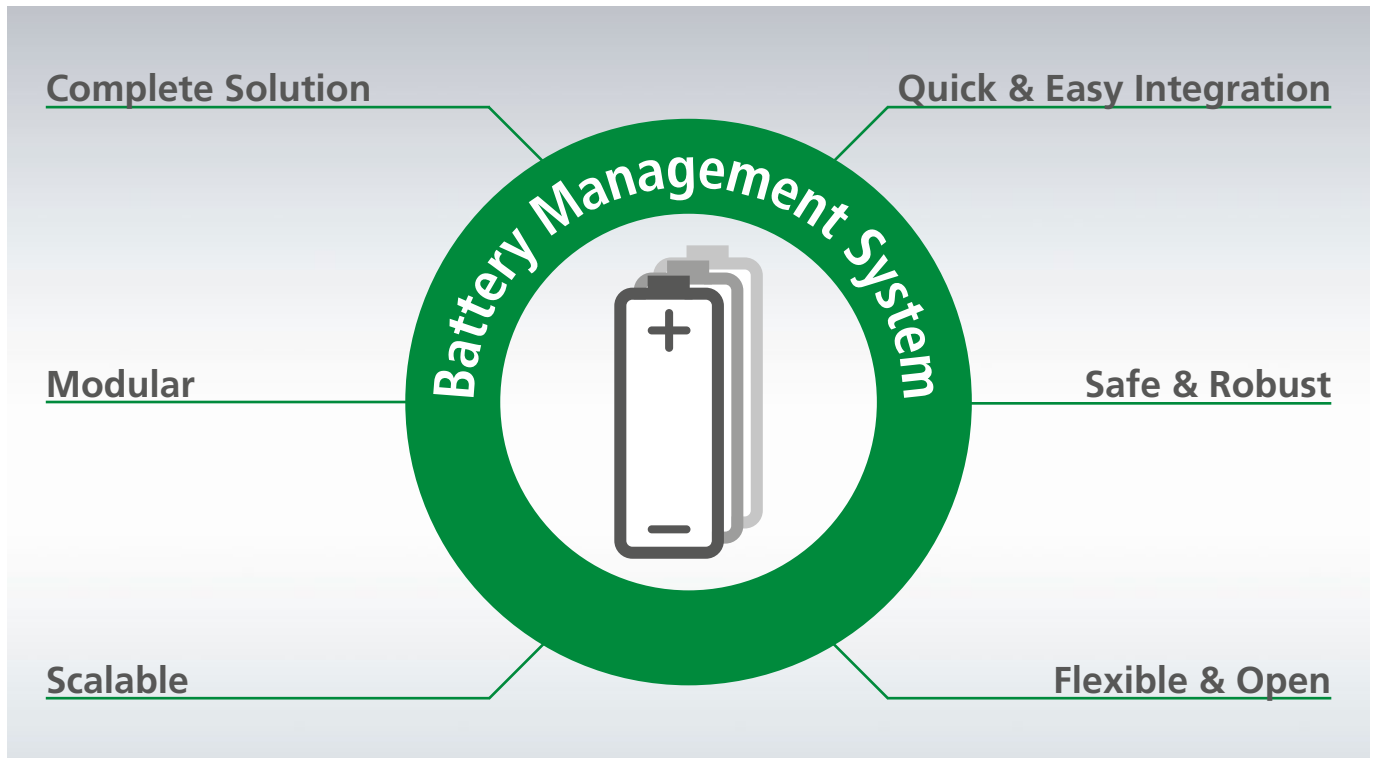


ELECTRIFICATION SOLUTIONS
Battery Management

SYSTEM OVERVIEW power **MELA-mBMS**
Battery-Management-System for Li-Ion Batteries

ELECTRIFICATION SOLUTIONS Battery Management



ELECTRIFICATION SOLUTIONS Battery Management

Customer specific and standardized Lithium-Ion batteries are the energy storage of choice for modern drive systems. The battery management system powerMELA-mBMS fits ideally to the drives of the powerMELA product family. The mBMS supports all kinds of popular cell chemistries within the Lithium-Ion family: LFP, NMC and LTO.

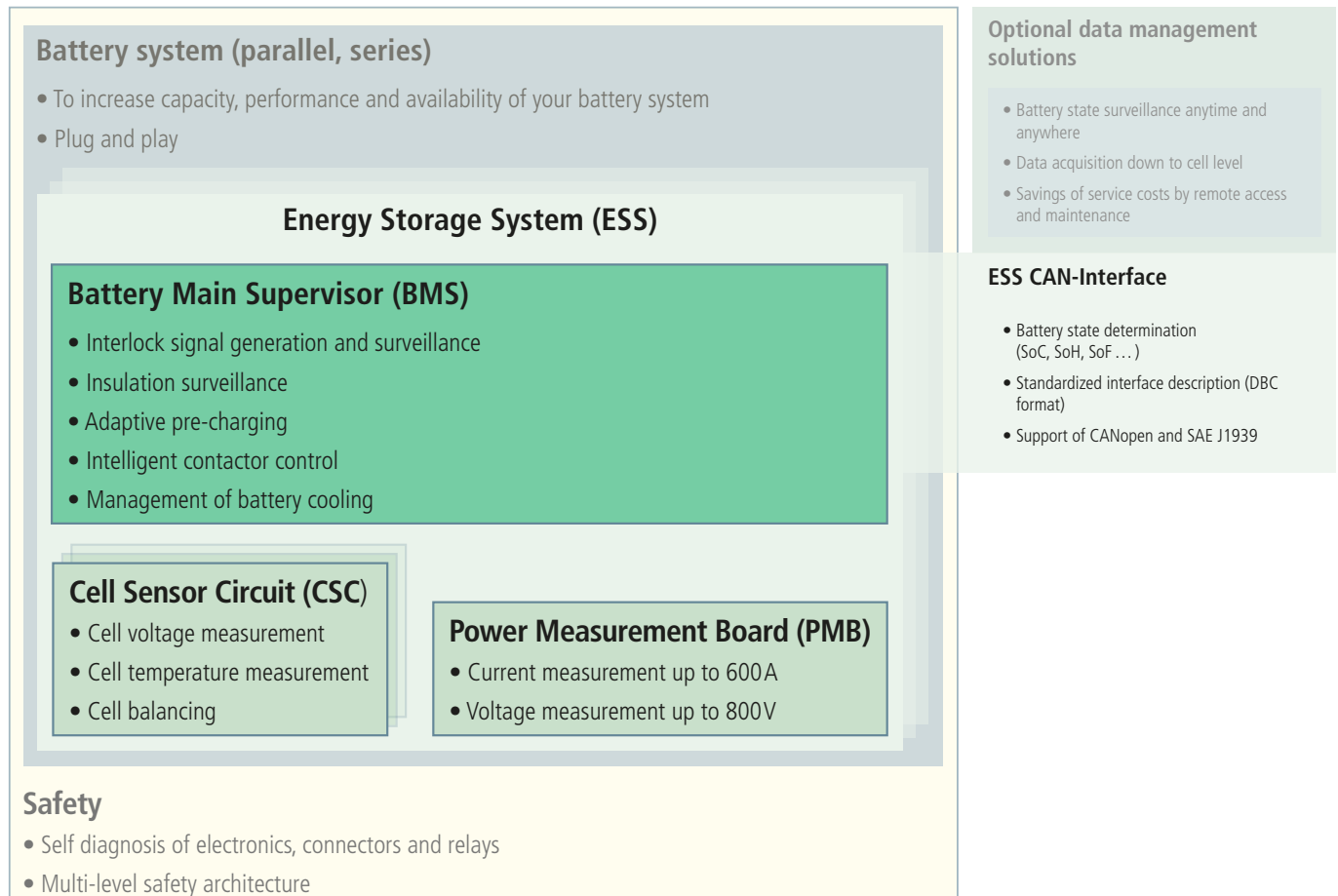
The powerMELA-mBMS is a mature and complete solution for your battery. It covers all electrical functions of a Lithium-Ion battery:

- from the sensors to status supervision of the storage.
- from balancing the cells to self-diagnosis of the electronics to an insulation guard.

ELECTRIFICATION SOLUTIONS

Battery Management

STW will support you when deploying your battery system. If you plan a customer specific adaptation STW offers cost-efficient development and series production based on the mBMS reference design – the fastest and easiest way to a sophisticated, tailored solution.



Agricultural



Railway



Transportation



Maritime



Automotive

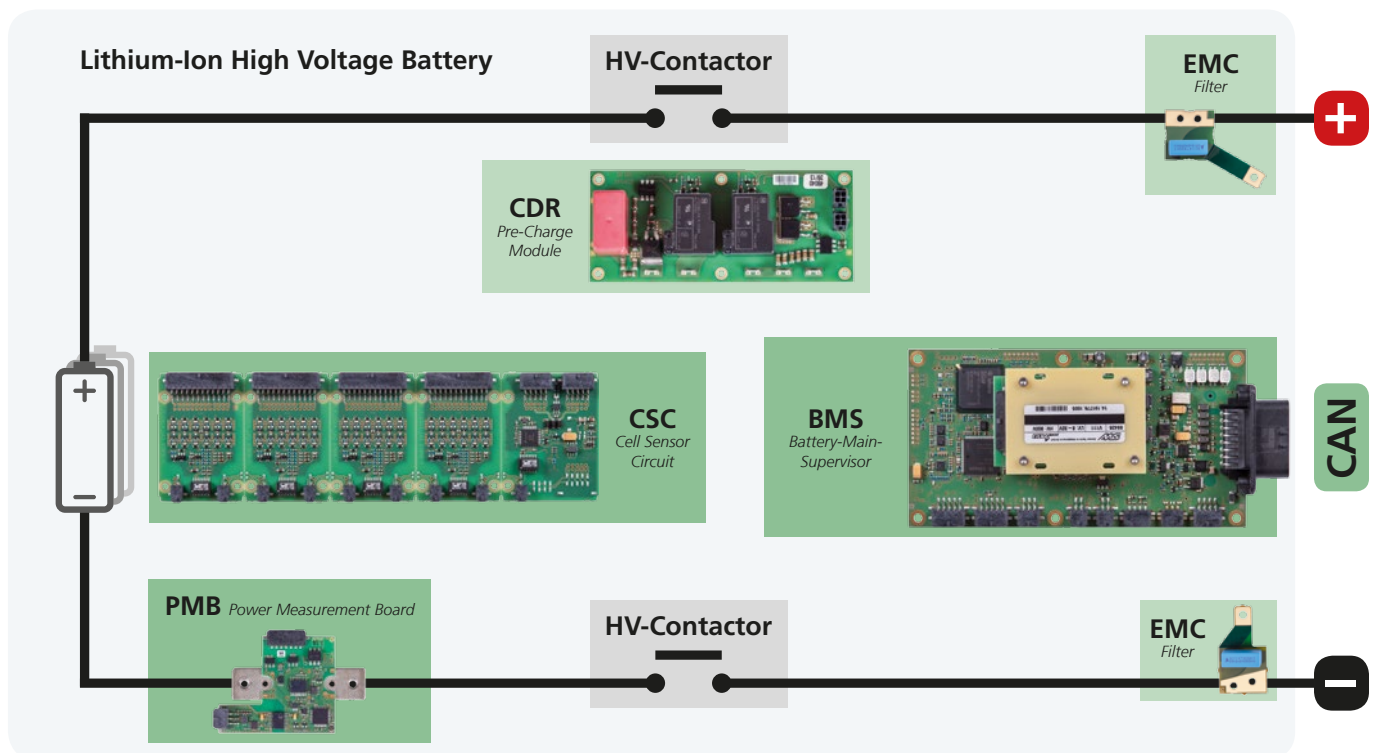


Stationary

ELECTRIFICATION SOLUTIONS
powerMELA-mBMS Components

powerMELA-mBMS components for realization of your complete solution




The Battery Main Supervisor (BMS) is the central control unit of the battery system. It includes three processors for highest levels of reliability and safety. It collects all information from the sensor modules, from the Cell Sensor Circuits and from the Power Measurement Board, calculates the status of the battery system and controls the HV contactors.



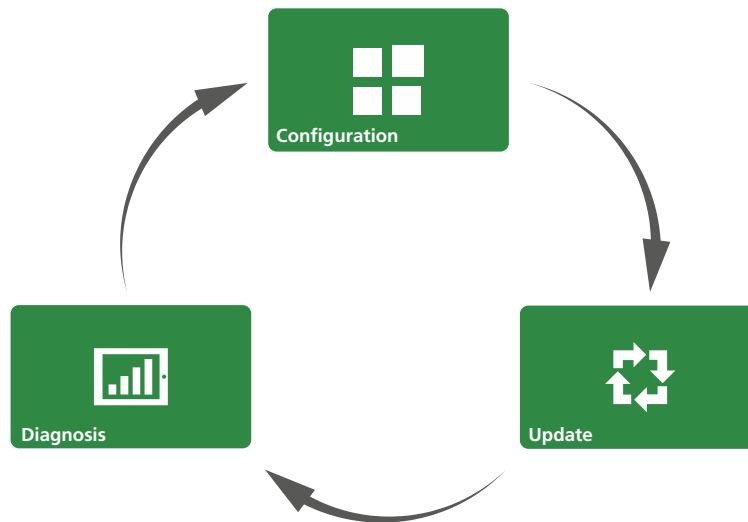
ELECTRIFICATION SOLUTIONS

Battery Management

powerMELA-mBMS Components

Component	BMS – Battery Main Supervisor	PMB – Power Measurement Board	CSC – Cell Sensor Circuit
			
Dimensions (approx.)	212 x 100 x 33 mm (8.3" x 3.9" x 1.3")	95 x 61 x 15 mm (3.7" x 2.4" x 0.6")	300 x 75 x 13 mm (11.8" x 3.0" x 0.5")
Weight (approx.)	230 g (0.51 lbs.)	100 g (0.22 lbs.)	260 g (0.57 lbs.)
Temperature range	-40° C ... +80° C (-40° F ... 176° F) environment temperature		
Connector	23-pole AMPSEAL (TE connectivity)	Micro-Fit (Molex)	Micro-Fit (Molex)
Power supply	8 ... 32V DC	powered by the BMS	powered by the BMS and battery cells
Power consumption (in operation)	350 mA @ UB = 12V	included in the BMS consumption	10 mA @ Ucell = 4.2V
Power consumption (sleep mode)	< 0.1 mA @ UB = 12V	–	< 0.01 mA @ Ucell = 4.2V
Communication Interfaces	4x CAN 2.0B CAN Wakeup	1x CAN 2.0B	1x CAN 2.0B
I/O's	3x 2A digital outputs 1x analog input Interlock detector & driver	Shunt for current measurement 3 inputs for high voltage measurement	48x cell voltage measurement inputs 16x Temperature sensor inputs (10k NTC)
Operation	Coolant temperature measurement Range: -55 ... +125° C (-67 ... 257° F) Accuracy: ±2K plus sensor tolerance Insulation measurement Range: 1 ... 4500 kΩ Accuracy: 0 ... -5 kΩ @ 1 ... 20 kΩ 0 ... -25% @ 20 ... 1000 kΩ	Current measurement Range: ± 1000A (1 s), ± 600A (10 s) @ 100 μΩ ± 2000A (1 s), ± 900A (10 s) @ 50 μΩ Accuracy: Offset ±0.1A, gain 1 % High voltage measurement Range: 0 ... 800V Accuracy: Offset ±0.1V, Gain 1 %	Cell voltage measurement Range: 1 ... 5V Accuracy: 2.5 mV @ 2.5 ... 4.3V Cell temperature measurement Range: -55 ... +125° C (-67 ... 257° F) Accuracy: ±2K plus sensor tolerance Cell balancing (passive) Current: 120 mA @ Ucell = 3.6V

ELECTRIFICATION SOLUTIONS
powerMELA-mBMS Software



The powerMELA-mBMS toolchain provides the straightforward solution to configure, update and diagnose your battery system.

powerMELA-mBMS Toolchain

powerMELA-mBMS Toolchain		
Configuration	Configuring the mBMS to suit your application.	
	Safety parameters	Define and manage system security limits
	Application parameters	Illustration of cell characteristics Define the battery application strategy
Update	Software update of the complete energy storage system (ESS)	
	One-Click-Update	Simple and convenient system update
	Version Management	Software packages for easiest version management

ELECTRIFICATION SOLUTIONS Battery Management

powerMELA-mBMS Toolchain

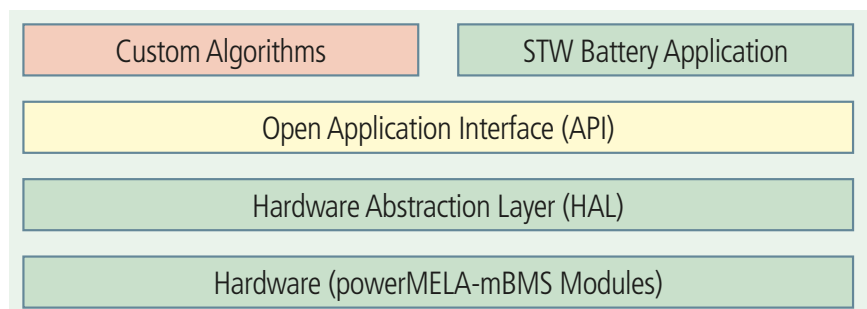
Diagnosis	Allows easy and quick commissioning of the energy storage system (ESS)	
	Battery data	Running mBMS functions and displaying battery data
	Failure diagnosis	Supports fault diagnosis by visualization of all sensor data

powerMELA-mBMS Diagnostic Tool



Open Architecture

With the help of an open code basis (Standard ANSI-C99 API) the battery application can be adapted to individual requirements. Specific functions and algorithms (SoC, SoH, ...) can be integrated in a flexible way.





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