BMS
Safe
THE BMS COMPANY

THE BRAIN
OF YOUR BATTERY SYSTEM

Improve your batteries safety with the most innovative BMS boards

Catalog

We support you at every step of your project

R&D DEVELOPMENT

- Tailor-made BMS solutions

- Specialized in the intelligence of embedded systems

- BMS from 12V to 1000V adaptable to all chemistries

- Development of battery optimization algorithms

- Hot Swap paralleling technology

- Management of hydrogen systems (fuel cell / Lithium-ion battery)

- Many references in electromobility, robotics and aero-defense
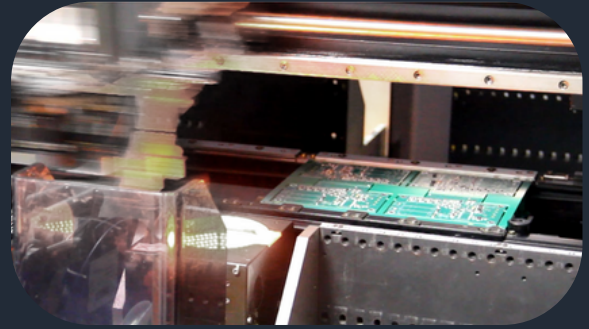
PRODUCTION

- Management of all phases of industrialisation through hardware & software developments:

  - Development *INTERNAL / REACTIVITY*
  - Prototypes *INTERNAL / REACTIVITY*
  - Pre series *EMS / QUALITY / COST*
  - Series *EMS / QUALITY / COST*

- Capacity of production: No limit

- Final test at BMS PowerSafe

- Potential License Agreement for high volume for export

A wide range of markets including yours

- Storage systems
- Aero and Defense
- Racing
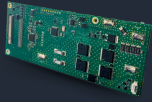- eBike, eScooter, eMotorbike, electric boat
- Robotics
- Automotive

bmspowerfafe.com

Over 25,000 BMS boards produced each year.
Here are some examples :
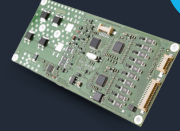
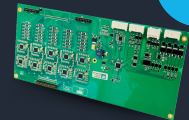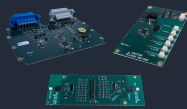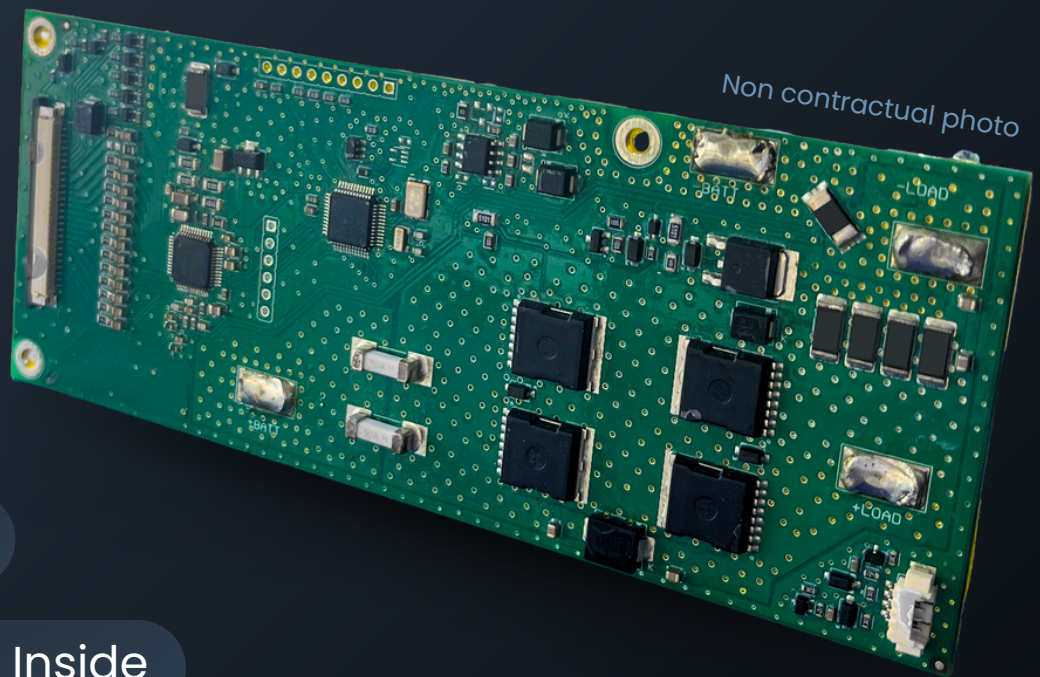|		
3-16S *p.4*	4S *p.6*	6-10S *p.8*
6-18S *p.10*	6S *p.12*	7-8S *p.14*
8-16S *p.16*	8-18S *p.18*	10S *p.20*
10S CAN *p.22*	14S *p.24*	19-30S *p.26*
MOBY *p.28*	HiVO *p.30*	From small-scale electric mobility to the biggest aerospace applications, our ambition is to guarantee a safe, high-performance system.
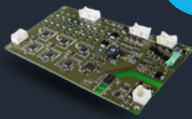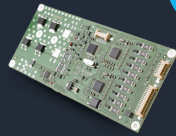
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3-16S OPTIMA BMS PowerSafe

Non contractual photo

40A

CAN BUS

Powerbox Inside

eMobility

Energy storage

ENERGY STORAGE

Technical Description

3-16S OPTIMA

Cells management

* Factory setting

- Management from 3 to 16 lithium cells in series*, compatible with all cell technologies (NMC, LiFe, LiPo...), (16S possible with rerouting).
- Management of 2 NTC temperature sensors
- Measurements accuracy:
  - Cell voltages: +/- 5 mV
  - Temperatures: +/- 1°C

Protections

- Overcurrent software protection
  - several configurable levels in charge and discharge
- Overdischarge, overcharge, overtemperature protection
- Short circuit hardware protection (electronic fuse) :
  - Above 120 A for more than 150 µs

Balancing

- Passive balancing with 50 mA of bypass current

Power Box

- Integrated power box with MOSFET technology :
  - 30 A continuous current in discharge
  - 40 A maximum peak current (20 sec) in discharge
  - 30 A continuous current in charge
- Bidirectional current measurement
- Charge and discharge management
- Precharge circuit included on the BMS

Smart functions

- SOC and SOH calculation
- Possibility to connect 5 external LEDs to have a visual HMI
- Wake up using a switch
- Automatic BMS wake up on detection of the charger connection
- External communication via CAN bus 2.0B
- Auto diagnostic of the BMS
- Black box integrated with defaults history storage and life counters
- Optional hot swap paralleling technology (extra adaptation)

Power supply/consumption

- Supply of the BMS directly on the battery pack
- Very low consumption in deep sleep mode: < 50 µA

Mechanical format

- 150 mm x 60 mm x 10 mm

4S BMS PowerSafe
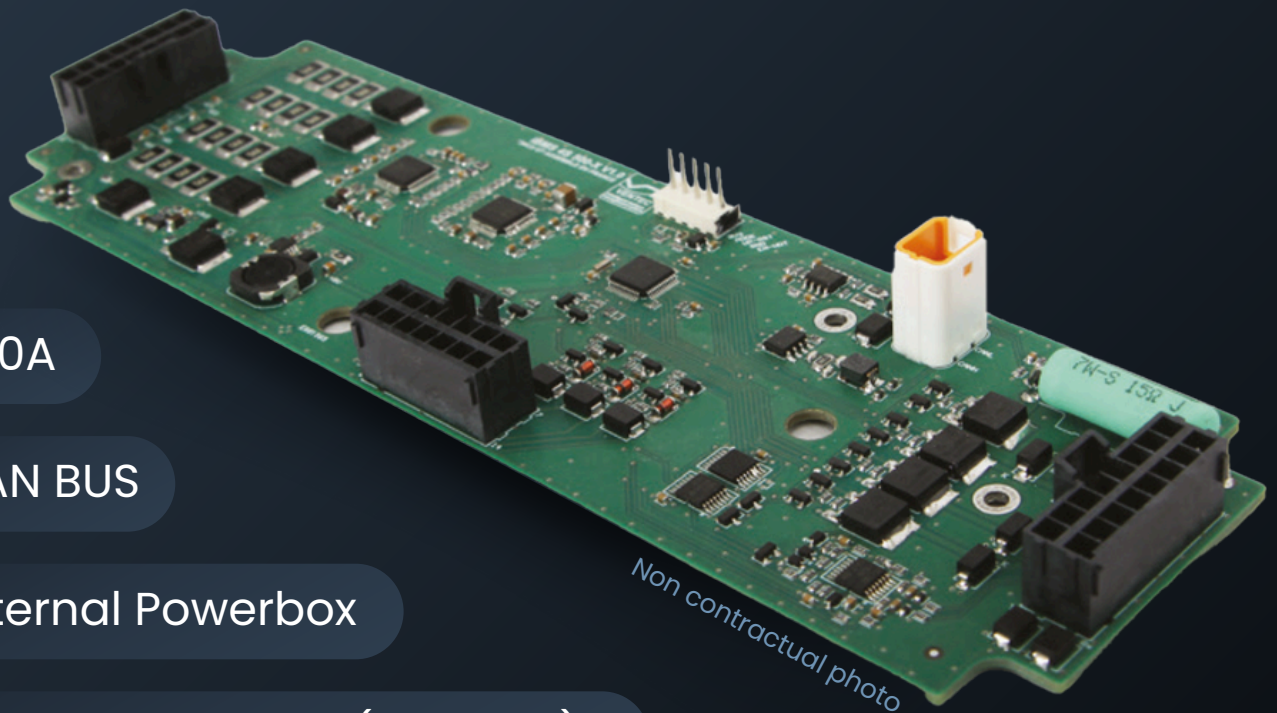

Non contractual photo

- 750A
- CAN BUS
- External Powerbox
- Equivalent to SIL2 (EN61508)

> Automotive

> Energy storage

Technical Description

Cells management

- Management of 4 lithium cells in series, compatible with all cell technologies (NMC, LiFe, LiPo…)
- Management of 3 NTC temperature sensors
  - 2 digital measurements used by the software
  - 1 analog measurement used by the hardware redundancy
- Measurements accuracy :
  - Cell voltages: +/- 5 mV
  - Temperatures: +/- 1°C

Protections

- Hardware redundancy for voltage and temperature measurements in order to reach a high level of safety (SIL2 of EN61508 standard)
- Overcharge and undercharge, tunable by software
- Overtemperature and undertemperature, tunable by software
- Overcurrent : 2 levels in discharge, 1 level in charge tunable by software
- Short circuit hardware protection (resettable electronic fuse)

Balancing

- Passive balancing with a 500 mA bypass current per cell (on the BMS)

Power box

- Requires an external power box (contactors, hall effect current sensor)
- Bidirectional measurement of the battery current with an external hall effect sensor
- Power box management up to 750 A :
  - Management of up to 3 external electromechanical contactors
  - Precharge circuit included on the BMS

Production

- SOC and SOH calculation
- Advanced self-diagnostic of the board
- Communication by CAN bus 2.0B
  - Possibility to manage the motor controller and the charger
- Advanced supervision software
- Black box integrated with defaults history storage and life counters

Power supply/consumption

- Supply of the BMS directly on the battery pack
- Low consumption in sleep mode: < 500 µA

Mechanical format

- 66 mm x 213 mm x 22 mm
- Can be potted to be used in harsh environment.

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— 6-10S BMS PowerSafe
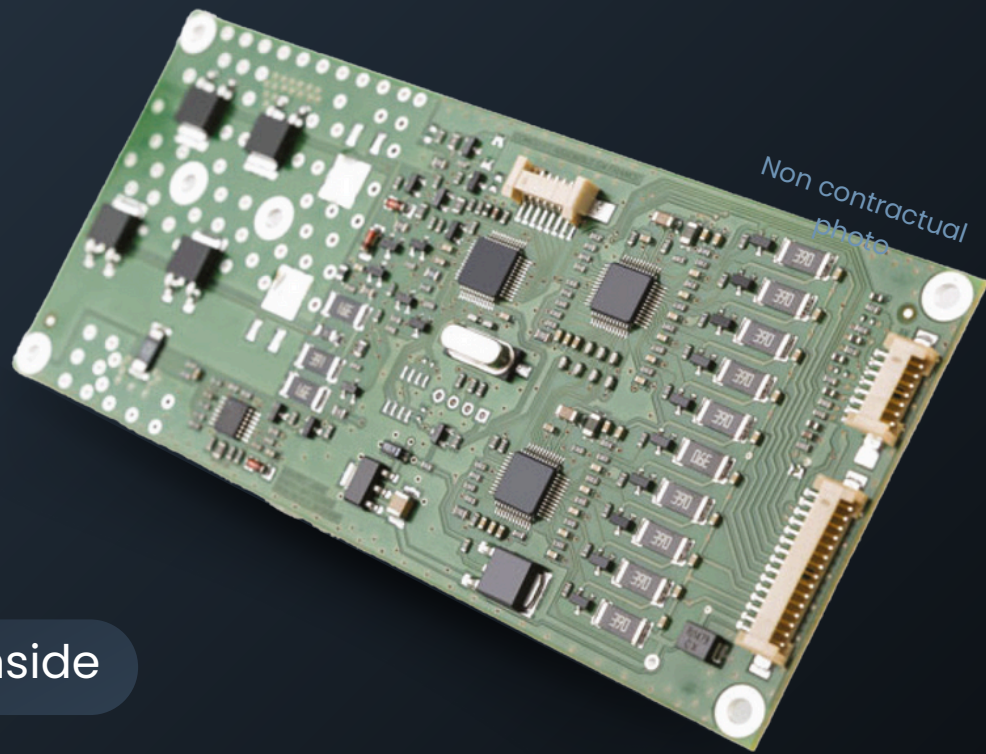
Non contractual photo

40A

CAN BUS

Powerbox Inside

> **eMobility**

> **Energy storage**

ENERGY STORAGE

Technical Description

6-10S

Cells management

*Factory setting

- Management of 6 to 10 lithium cells in series*, compatible with all cell technologies (NMC, LiFe, LiPo...)
- Management of 2 NTC temperature sensors
- Measurements accuracy :
  - Cell voltages: +/- 5 mV
  - Temperatures: +/- 1°C

Protections

- Overcurrent software protection
  - several configurable levels in charge and discharge phases
- Overdischarge, overcharge, overtemperature protection
- Short circuit hardware protection (electronic fuse) :
  - Above 42 A for more than 100 μs

Balancing

- Passive balancing with 100 mA of bypass current

Power Box

- Integrated power box with MOSFET technology:
  - 30 A continuous current in discharge
  - 40 A maximum peak current in discharge
  - 20 A continuous current in charge
- Bidirectional current measurement
- Precharge circuit included on the BMS

Smart functions

- SOC and SOH estimation
- Display of the SOC and SOH on an external LED display (optional)
- Management of a push button or switch to wake up the battery
- Automatic detection of the charger connection with wake up of the BMS
- Advanced self-diagnostic of the board
- Communication by CAN bus 2.0B
- Advanced supervision software
- Black box integrated with defaults history storage and life counters
- BLE communication (optional)

Power supply/consumption

- Supply of the BMS directly on the battery pack
- Very low consumption in deep sleep mode: < 60 μA

- 130 mm x 61 mm x 11 mm

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6-18S BMS PowerSafe

- 750A
- CAN BUS
- Serializable
- External Powerbox
- Equivalent to SIL2 (EN61508)

Non contractual photo

> eMobility

> Automotive

Technical Description
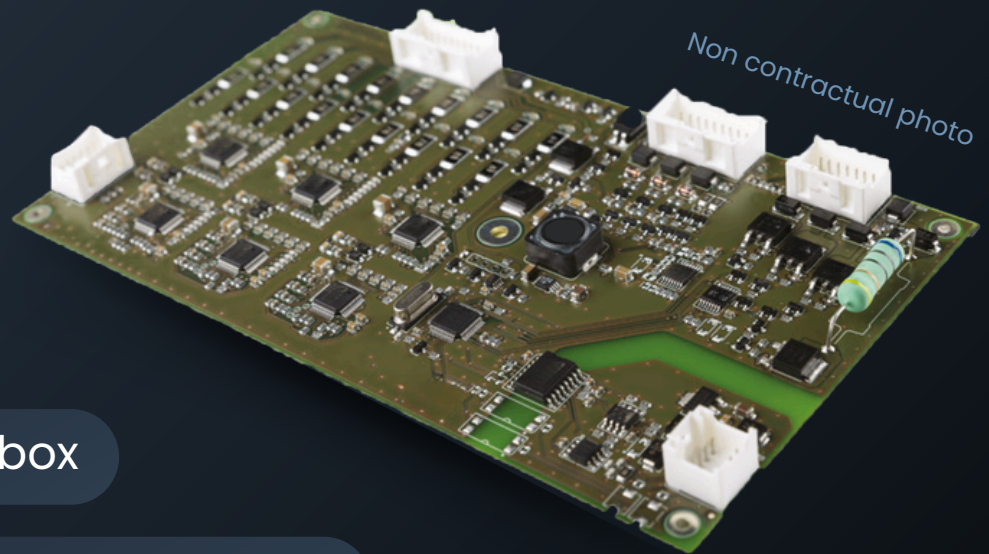
Cells management

* Possibility to connect in series several BMS in order to manage a battery pack with a voltage up to 1000 Volts (depending on precharge management)
* Management of 6 to 18 lithium cells in series* compatible with all cell technologies (NMC, LiFe, LiPo,...),
* Measurements accuracy :
  * Cell voltages: +/- 5 mV
  * Temperatures: +/- 1°C
* Management of 6 NTC temperature sensors.
  * 3 digital measurements used by the software
  * 3 analogic measurements used by the hardware redundancy

* Factory setting

Protections

* Hardware redundancy for voltage and temperature measurements in order to reach a high level of safety (SIL2 of EN61508 standard)
* Overcharge and undercharge, tunable by software
* Overtemperature and undertemperature, tunable by software
* Overcurrent : 2 levels in discharge, 1 level in discharge tunable by software
* Short circuit hardware protection (resettable electronic fuse)

Balancing

* Passive balancing with a 150 mA bypass current per cell (on the BMS)

Power Box

* Bidirectional measurement of the battery current with a hall effect sensor
* Charge and discharge management
* Power box management up to 750 A :
  * Command of an external 12V electromechanical contactor**
  * Command of a precharge circuit (included on the board or external)
  * Possibility to control two additionnal 12V contactors**

** No need for an external 12V supply

Smart functions

* SOC and SOH calculation
* Advanced self-diagnostic of the board
* Communication by CAN bus 2.0B (opto-isolated)
  * Motor controller management by CAN bus
  * Charger management by CAN bus
* Advanced supervision software
* Black box integrated with defaults history storage and life counters
* Possibility to reprogram the firmware by CAN Bus

Power supply/consumption

* Supply of the BMS directly on the battery pack
* Low consumption in standby mode: < 500 µA

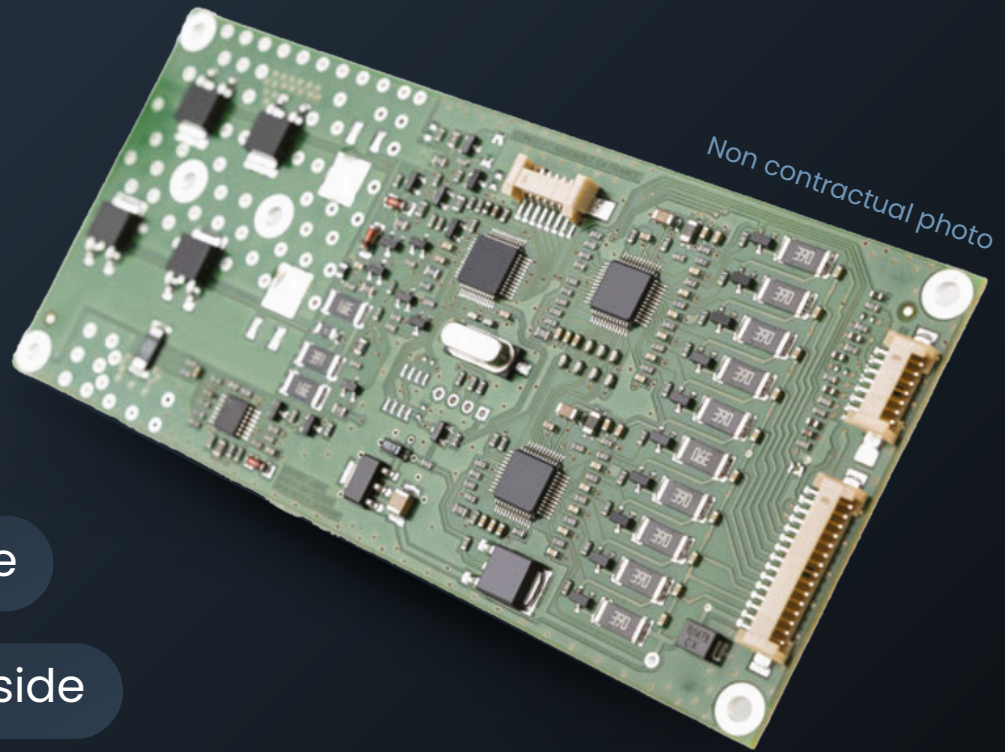## Mechanical format

* 113 mm x 180 mm x 12 mm
* Can be potted to be used in harsh environment

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6S BMS PowerSafe

Non contractual photo

55A

CAN BUS

Parallelizable

Powerbox Inside

eMobility

Energy storage

Technical Description

Cells management

* Factory setting

- Management of 6 lithium cells in series*, compatible with all cell technologies (NMC, LiFe, LiPo…)
- Management of 2 NTC temperature sensors
- Measurements accuracy :
  - Cell voltages: +/- 5 mV
  - Temperatures: +/- 1°C

Protections

- Over-current software protection :
  - several configurable levels during charge and discharge phases
- Overdischarge, overcharge, overtemperature protection
- Short circuit hardware protection (electronic fuse) :
  - Above 56 A for more than 100 μs

Balancing

- Passive balancing with 100 mA of bypass current

Power Box

- Integrated power box with MOSFET technology:
  - 45 A continuous current in discharge
  - 55 A maximum peak current in discharge
  - 20 A continuous current in charge
- Bidirectional current measurement
- Precharge circuit included on the BMS

Smart functions

- SOC and SOH estimation
- Management of a push button or switch to wake up the battery
- Automatic detection of the charger connection with wake up of the BMS
- Advanced self-diagnostic of the board
- Communication by CAN bus 2.0B
- Advanced supervision software
- Black box integrated with defaults history storage and life counters
- Possibility to connect up to 10 packs in parallel

Power supply/consumption

- Supply of the BMS directly on the battery pack
- Very low consumption in sleep mode: < 60 μA
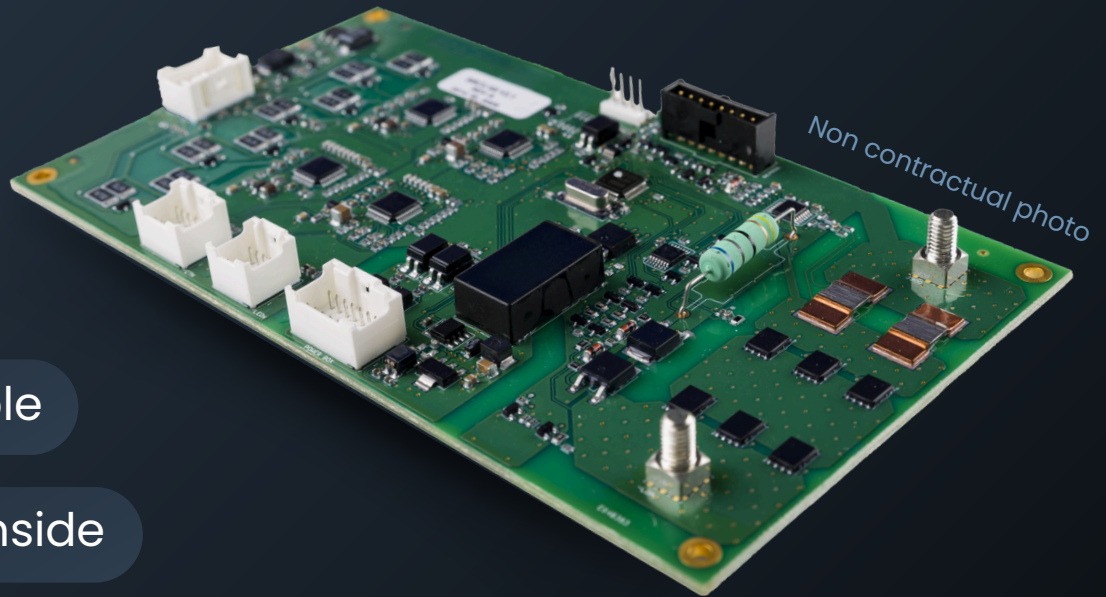
Mechanical format

- 130 mm x 61 mm x 11 mm

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7-8S CAN   BMS PowerSafe

40A

CAN BUS

Parallelizable

Powerbox Inside

Equivalent to SIL2 (EN61508)

Non contractual photo

eMobility

Energy storage

ENERGY STORAGE

Technical Description

Cells management

* Factory setting

- Management of 7 or 8 lithium cells in series*, compatible with all cell technologies (NMC, LiFe, LiPo...)
- Management of 4 NTC temperature sensors :
  - Cell voltages: +/- 5 mV
  - Temperatures: +/- 1°C
- Management of 6 NTC temperature sensors.
  - 3 digital measurements used by the software
  - 3 analogic measurements used by the hardware redundancy

Protections

- Hardware redundancy for voltage and temperature measurements in order to reach a high level of safety (SIL2 of EN61508 standard)
- Overcharge and undercharge, tunable by software
- Overtemperature and undertemperature, tunable by software
- Overcurrent : 2 levels in discharge, 1 level in discharge tunable by software
- Short circuit hardware protection (resettable electronic fuse)
  - Above 41 A for more than 100 μs

Balancing

- Passive balancing with a 150 mA bypass current per cell (on the BMS)

Power Box

- Integrated power box with MOSFET technology :
  - 40 A continuous current in charge/discharge
  - 45 A maximum peak current in charge/discharge
- Bidirectional measurement of the battery current
- Precharge circuit included on the BMS
- No heatsink required
- Integrated 12V isolated power supply to power an external controller

Smart functions

- SOC and SOH calculation
- Advanced self-diagnostic of the board
- Communication by CAN bus 2.0B (opto-isolated)
- Possibility to manage the motor controller and the charger
- Advanced supervision software
- Black box integrated with defaults history storage and life counters
- Possibility to connect two packs in parallel

Power supply/consumption
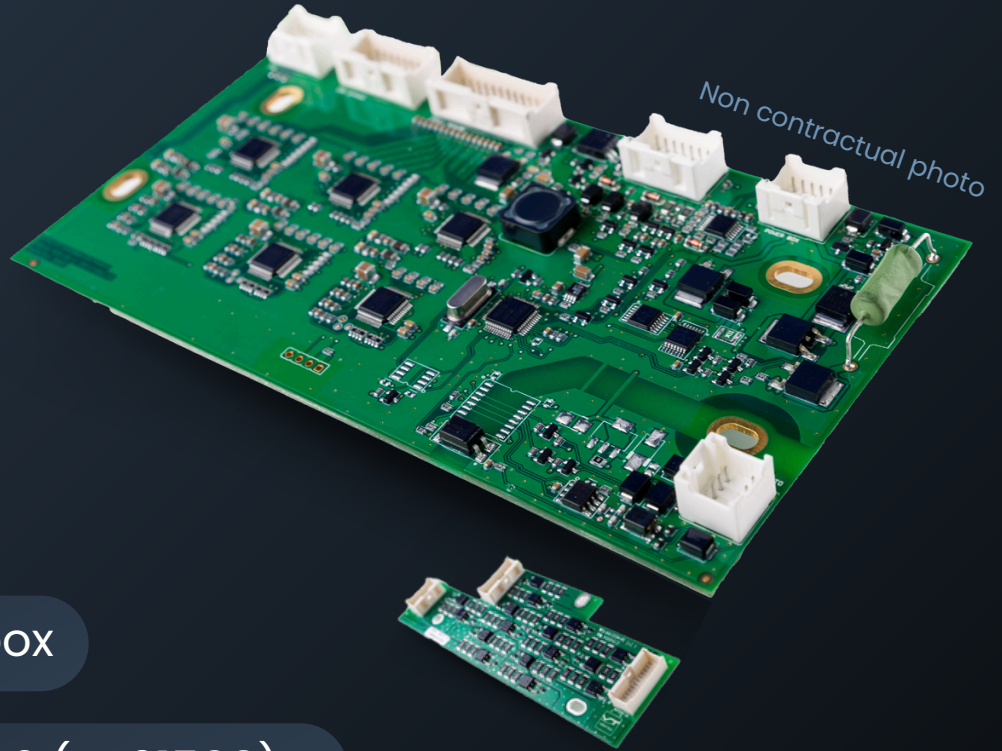
- Supply of the BMS directly on the battery pack
- Low consumption in sleep mode: < 500 μA

Mechanical format

- 100 mm x 180 mm x 12 mm
- Can be potted to be used in harsh environment

8-16S BMS PowerSafe

Non contractual photo

750A

CAN BUS

Parallelizable

External Powerbox

Equivalent to SIL2 (EN61508)

500mA external bypass

> eMobility

> Energy storage

ENERGY STORAGE

Technical Description   8-16S

Cells management

* Factory setting

- Management of 8 to 16 lithium cells in series*, compatible with all cell technologies (NMC, LiFe, LiPo…)
- Management of 4 NTC temperature sensors :
  - Cell voltages: +/- 5 mV
  - Temperatures: +/- 1°C
- Management of 6 NTC temperature sensors :
  - 3 digital measurements used by the software
  - 3 analog measurements used by the hardware redundancy

Protections

- Hardware redundancy for voltage and temperature measurements in order to reach a high level of safety (SIL2 of EN61508 standard)
- Overcharge and undercharge, tunable by software
- Overtemperature and undertemperature, tunable by software
- Overcurrent : 2 levels in discharge, 1 level in discharge tunable by software
- Short circuit hardware protection (resettable electronic fuse)

Balancing

- Passive balancing with a 500 mA bypass current per cell (with an external bypass board)

Power Box

- Requires an external power box (contactors, hall effect current sensor)
- Bidirectional measurement of the battery current by an external hall effect sensor
- Charge and discharge management
- External power box management up to 750 A :
  - Management of an external electromechanical contactor
  - Precharge circuit (included on the board)

Smart functions

- SOC and SOH calculation
- Advanced self-diagnostic of the board
- Communication by CAN bus 2.0B (can be opto-isolated)
- Possibility to manage the motor controller and the charger
- Black box integrated with defaults history storage and life counters
- Possibility to connect up to 10 packs in parallel
- Hot swap capability
- Possibility to reprogram the firmware of the BMS by CAN Bus

Power supply/consumption

- Supply of the BMS directly on the battery pack
- Low consumption in sleep mode: < 500 µA

Mechanical format

- 90mm x 172mm x 12mm (BMS) 65mm x 170mm x 12mm (500mA Bypass)
- Can be potted to be used in harsh environment

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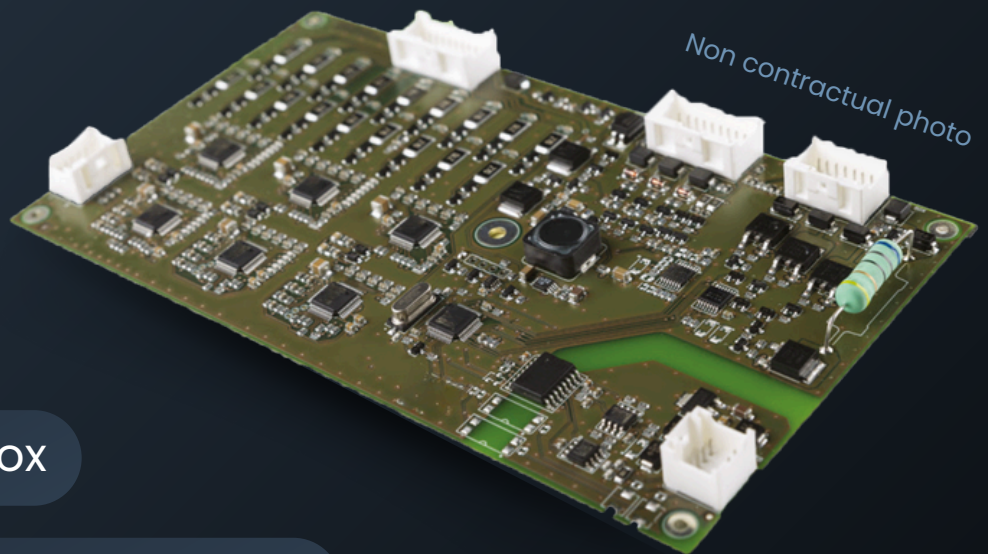
8-18S BMS PowerSafe

- 750A
- CAN BUS
- Parallelizable
- External Powerbox
- Equivalent to SIL2 (EN61508)

Non contractual photo

> eMobility

> Automotive

Technical Description

Cells management

* Factory setting

- Possibility to connect in series several BMS in order to manage a battery pack with a voltage up to 1000 Volts
- Management of 8 to 18 lithium cells in series* compatible with all cell technologies (NMC, LiFe, LiPo,...), +/- 5 mV of accuracy.
- Management of 6 NTC temperature sensors :
  - 3 digital measurements used by the software
  - 3 analogic measures used by the hardware redundancy

Protections

- Hardware redundancy for voltage and temperature measurements in order to reach a high level of safety (SIL2 of EN61508 standard)
- Overcharge and undercharge, tunable by software
- Overtemperature and undertemperature, tunable by software
- Overcurrent : 2 levels in discharge, 1 level in discharge tunable by software
- Short circuit hardware protection (resettable electronic fuse)

Balancing

- Passive balancing with a 150 mA bypass current per cell (on the BMS)

Power Box

** Requires an external 12V power supply

- Bidirectional measurement of the battery current with a hall effect sensor
- Charge and discharge management
- Power box management up to 750 A :
  - Command of an external electromechanical contactor
  - Command of a precharge circuit (included on the board)
  - Possibility to control two additionnal contactors **

Smart functions

- SOC and SOH calculation
- Advanced self-diagnostic of the board
- Communication by CAN bus 2.0B (opto-isolated)
  - Motor controller management by CAN bus
  - Charger management by CAN bus
- Advenced supervision software

Power supply/consumption

- Supply of the BMS directly on the battery pack
- Low consumption in standby mode: < 500 µA

Mechanical format

- 100 mm x 180 mm x 12 mm
- Can be potted to be used in harsh environment

BMS
⚡Safe
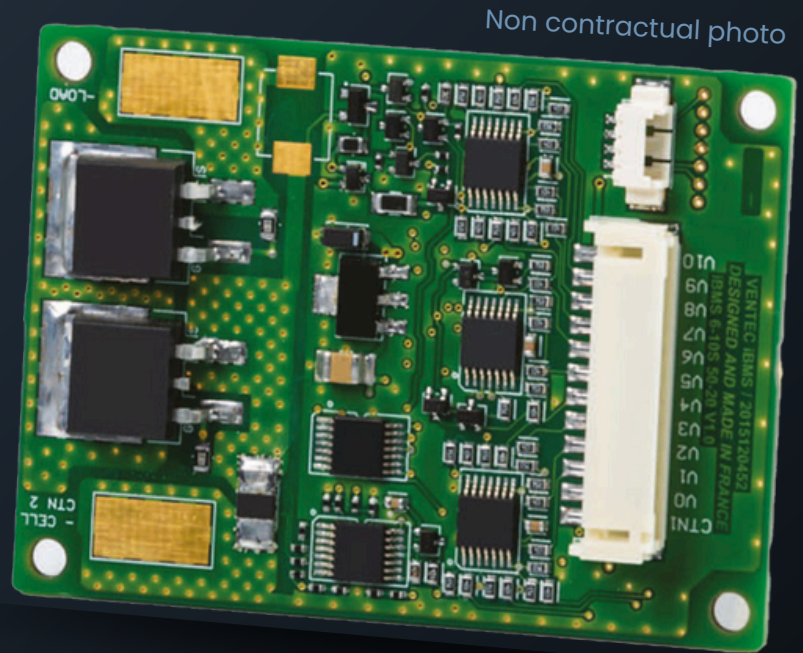THE BMS COMPANY

10S BMS PowerSafe

Non contractual photo

30A

I2C

Powerbox Inside

▶ eMobility

Technical Description

10S

Cells management

- Management of 10 lithium cells in series, compatible with all cell technologies (NMC, LiFe, LiPo...)
- Management of 1 NTC temperature sensor
- Measurements accuracy:
  - Cell voltages: +/- 40 mV
  - Temperatures: +/- 1ºC

Protections

- Overdischarge, overcharge, overtemperature protection
- Over-current software protection :
  - several configurable levels during charge and discharge phases
- Short circuit hardware protection (electronic fuse in discharge) :
  - Above 40 A for more than 100 µs

Balancing

- Passive balancing with 35mA of bypass current

Power Box

- Integrated power box with MOSFET technology :
  - 15 A continuous current in discharge
  - 30 A maximum peak current in discharge
  - 9 A continuous current in charge
- Bidirectional current measurement with +/- 5 % of accuracy
- Charge and discharge control
- Precharge circuit included on the BMS

Smart functions

* Requires external opto-isolation

- Automatic detection of the charger connection with wake up of the BMS
- External communication via I2C serial link*
- Auto diagnostics of the BMS

Power supply/consumption

- Supply of the BMS directly on the battery pack
- Very low consumption in sleep mode : < 30 µA

Mechanical format

- 65 mm x 48 mm x 17 mm
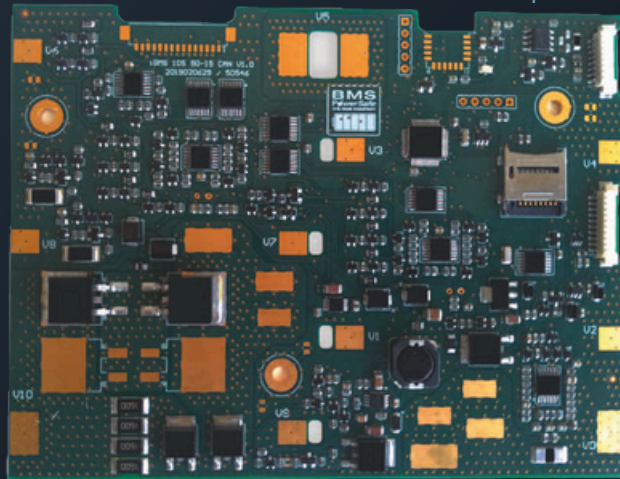- Can be potted to be used in harsh environment

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10S CAN BMS PowerSafe

Non contractual photo

30A

CAN BUS

Powerbox Inside

▶ **eMobility**

Technical Description

10S CAN

Cells management

- Management of 10 lithium cells in series, compatible with all cell technologies (NMC, LiFe, LiPo...)
- Management of 1 NTC temperature sensor
- Measurements accuracy:
  - Cell voltages: +/- 40 mV
  - Temperatures: +/- 1°C

Protections

- Overdischarge, overcharge, overtemperature protection
- Over-current software protection :
  - several configurable levels during charge and discharge phases
- Short circuit hardware protection (electronic fuse) :
  - Above 40 A for more than 100 μs

Balancing

- Passive balancing with 35mA of bypass current

Power Box

- Integrated power box with MOSFET technology :
  - 15 A continuous current in discharge
  - 30 A maximum peak current in discharge
  - 17 A continuous current in charge
- Bidirectional current measurement with +/- 5 % of accuracy
- Precharge circuit included on the BMS

Smart functions

- SOC and SOH estimation
- Management of a switch to wake up the battery
- Automatic detection of the charger connection with wake up of the BMS
- Advanced self-diagnostic of the board
- Communication by CAN bus 2.0B
- Advanced supervision software
- Black box integrated with defaults history storage, life counters and timestamp
- BLE : Bluetooth Low Energy / RFID (optional)
- Data saving on SD Card

Power supply/consumption

- Supply of the BMS directly on the battery pack
- Very low consumption in sleep mode : < 60 μA

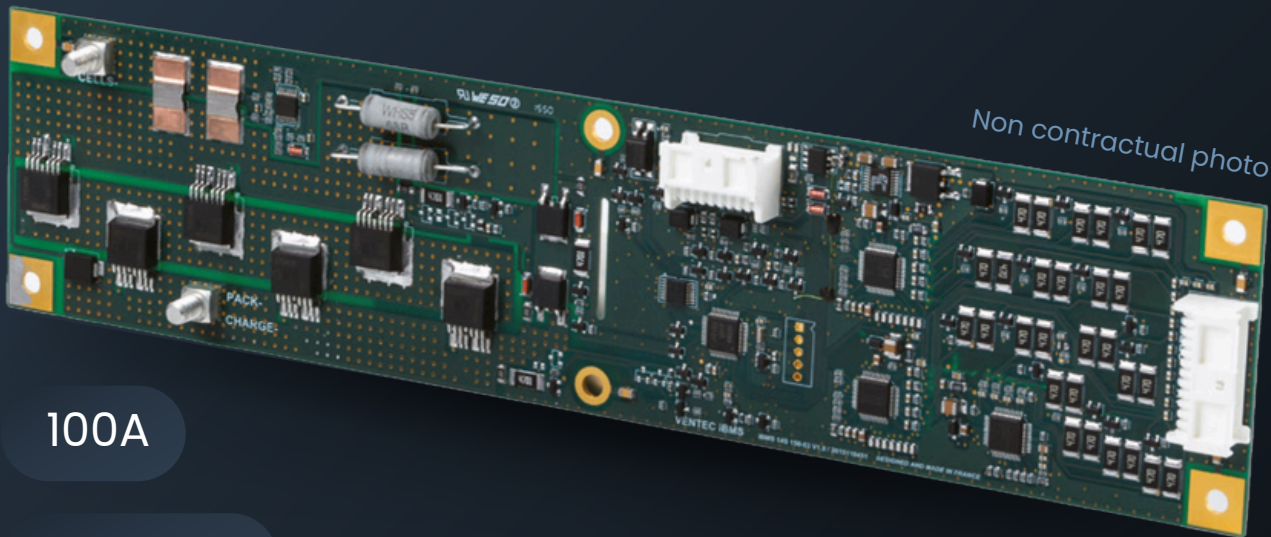## Mechanical format

- 133 mm x 101 mm x 7 mm

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— 14S BMS PowerSafe

Non contractual photo

- 100A
- CAN BUS
- Parallelizable
- Powerbox Inside

▶ eMobility

▶ Energy storage

Technical Description

Cells management

- Management of 14 lithium cells in series, compatible with all cell technologies (NMC, LiFe, LiPo…)
- Management of 3 NTC temperature sensor
- Measurements accuracy:
  - Cell voltages: +/- 5 mV
  - Temperatures: +/- 1°C

Protections

- Overdischarge, overcharge, overtemperature protection
- Over-current software protection :
  - several configurable levels during charge and discharge phases
- Short circuit hardware protection (electronic fuse) :
  - Above 110 A for more than 100 µs

Balancing

- Passive balancing with 150 mA of bypass current

Power Box

- Integrated power box with MOSFET technology :
  - 53 A continuous current in discharge
  - 100 A maximum peak current (500 ms) in discharge
  - 53 A continuous current in charge
- Bidirectional current measurement
- Precharge circuit included on the BMS
- Charge and discharge management

Smart functions

- SOC and SOH estimation
- Possibility to connect 2 external LEDs to have a visual HMI
- Wake up using a switch
- Automatic BMS wake up on detection of the charger connection
- Communication by CAN bus 2.0B
- External communication via CAN bus 2.0B
- Auto diagnostic of the BMS
- Black box integrated with defaults history storage and life counters
- Possibility to connect up to 10 packs in parallel
- Hot swap technology

Power supply/consumption

- Supply of the BMS directly on the battery pack
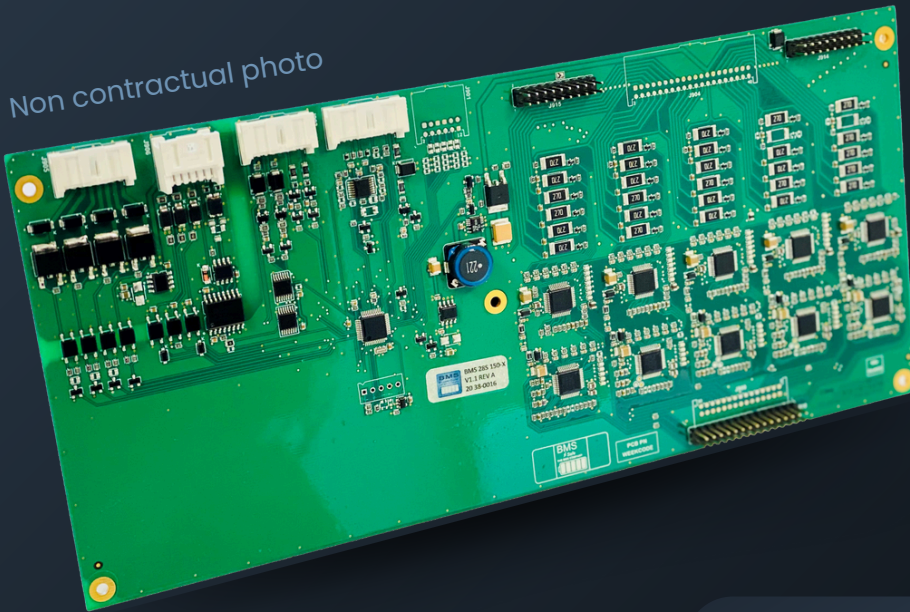- Very low consumption in deep sleep mode : < 50 µA

Mechanical format

- 280 mm x 65 mm x 17 mm

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19-30S BMS PowerSafe

Non contractual photo

750A

CAN BUS

Parallelizable

External Powerbox

Equivalent to SIL2 (EN61508)

▶ **Automotive**

▶ **2 wheels**

Technical Description

Cells management

* Factory setting

- Management of 19 to 30 lithium cells in series* compatible with all cell technologies (NMC, LiFe, LiPo,...)
- Management of up to 15 NTC temperature sensors :
  - 10 digital measurements used by the software
  - 5 analogue measurements used by the hardware redundancy
- Measurements accuracy :
  - Cell voltages: +/- 5 mV
  - 3 analogue measurements used by the hardware redundancy

Protections

- Hardware redundancy for voltage and temperature measurements in order to reach a high level of safety (equivalent to SIL2 of EN61508 standard)
- Overcharge and undercharge, tunable by software
- Overtemperature and undertemperature, tunable by software
- Overcurrent : 2 levels in discharge, 1 level in discharge tunable by software
- Short circuit hardware protection (resettable electronic fuse)

Balancing

- Passive balancing with a 150 mA bypass current per cell (on the BMS)

Power Box

** Requires an external 12V power supply

- Bidirectional measurement of the battery current with a hall effect sensor Requires contactors and hall effect current sensor
- Charge and discharge management
- Power box management up to 750 A :
  - Command of up to 4 external 12V electromechanical contactors**

Smart functions

- SOC and SOH calculation
- Advanced self-diagnostic of the board
- Communication by CAN bus 2.0B (opto-isolated)
  - Motor controller management by CAN bus
  - Charger management by CAN bus
- Advanced supervision software
- Black box integrated with defaults history storage and life counters
- Possibility to connect several packs in parallel using an external EMS (small additional board)

Power supply/consumption

- Supply of the BMS directly on the battery pack
- Low consumption in standby mode: < 500 µA

Mechanical format

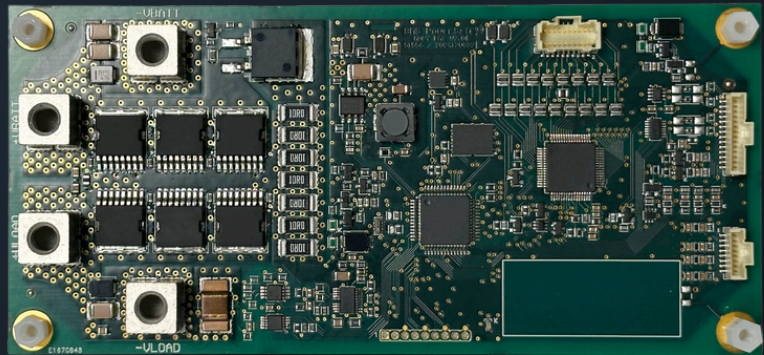- Actual format : 270 mm x 125 mm x 12 mm (possible in 210 mm x 125 mm x 12 mm)

BMS Safe — THE BMS COMPANY

MOBY 8-18S BMS PowerSafe

150A

24-76V

CAN BUS

Parallelizable

Powerbox Inside

ISO26262 - ASIL B

Non contractual photo

> eMobility

> Energy storage

Technical Description

MOBY

Cells management

- Adjustable between 8S and 18S batteries
- Measurement accuracy : +/- 2 mV
- Up to 4 cell temperature sensors
- Measurement accuracy : +/- 1°C
- Compatible with NMC and LFP chemistries
- Passive balancing
- Up to 300 mA per cell

Protections

- Tunable by software
  - Overvoltage
  - Undervoltage
  - Overtemperature
  - Under temperature
  - Overcurrent
- Short-circuit
  - Fixed Hardware setting

Communication

- Through CAN bus up to 1 Mbps
- Possibility to update the firmware via CAN bus
- Diagnostic through UDS
- Possibility to add CAN FD support (not standard feature)

Smart functions

- State Of Charge (SOC)
- State Of Health (SOH)
- Maximum allowed current in charge and discharge
- State Of Energy (SOE)
- Remaining range estimation (for vehicles)
- Black box on the BMS for data logging and errors recording
- BMS auto diagnostic to detect and mitigate failures
- Possibility to connect up to 16 batteries in parallel
- Possibility to wake-up the battery via CAN

Future regulations compliant

- Visual and audio warning in case of detection of thermal runaway
- Data logging

Developed following **ISO 26262** process for an **ASIL B** equivalent level

Overcharge   Over discharge   Overtemperature   Under temperature   Overcurrent

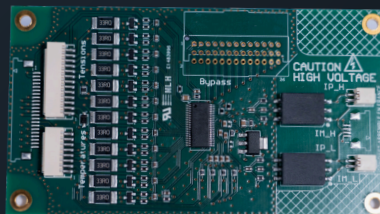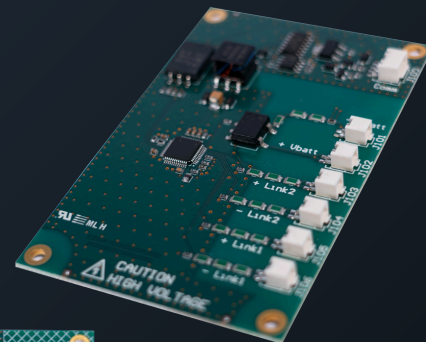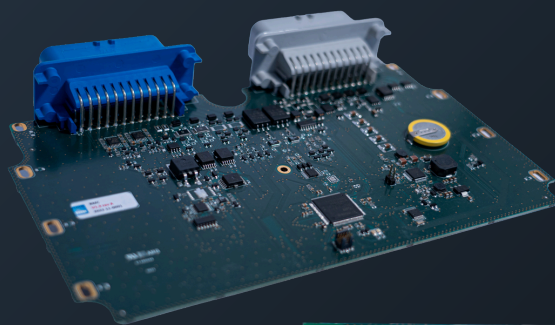BMS Safe
THE BMS COMPANY

HiVO BMS PowerSafe

Non contractual photo

- 750A
- CAN BUS
- Serializable
- External Powerbox
- Developed following ISO 26262 ASIL B

▶ Marine

▶ Automotive

▶ Energy storage
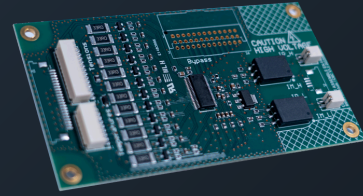
Presentation of the system

HiVO Slave Board

CMC *Cells Management Controller*

Main tasks :

- Supervision from 5 up to 12 Li-ion cells connected in series according to chemistry
- Supervision of 4 NTC
- Balancing (150 mA)

HiVO Master Board

BMC *Battery Management Controller*

Main tasks :

- Up to 20 CMC
- Calculation of SOC
- Calculation of the maximum admissible currents in charge and in discharge according to the state of the battery (SOC, temperature,...)
- Battery pack supervision and alarm generation
- Contactor management (one on the plus pole and one on the minus pole) up to 4 contactors
- 2 CAN buses
- Management of the isolation measurement module between the HV battery and the chassis
- Balancing control
- Possibility to connect up to 7 BMC in parallel thanks to an EMS board
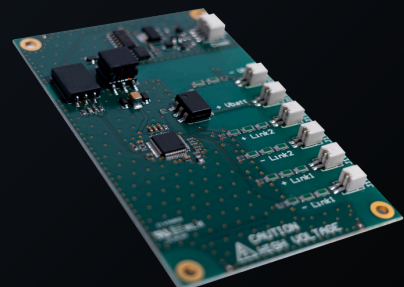- Compatible 12 or 24V (power supply)
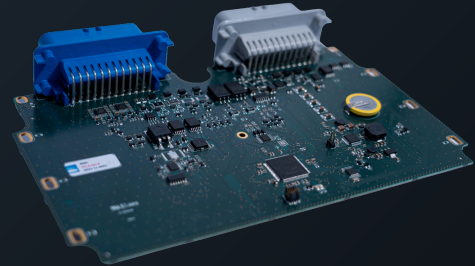
HiVO Isolation Board

IMC *Isolation Management Controller*

Main tasks :

- High voltage measurement (battery and up to two power circuits)

Technical Description

HiVO

Cells management

- Master/Slave architecture
- Possibility to connect up to 20 CMC in series to manage a battery pack with a voltage up to 1000 Volts
- Possibility to connect up to 7 BMC in parallel thanks to an EMS
- Management of 4 NTC temperature sensors per CMC
- +/- 2 mV of accuracy
- Management from 5 to 12 cells in series per CMC, compatible with all cell technologies (NMC, Na Ion, LFP, LTO...)
  - NMC/Na Ion : From 5S to 12S*
  - LFP : From 6S to 12S*
  - LTO : From 8S to 12S*

Protections

- Overcharge and undercharge, tunable by software
- Overcurrent and over/under temperature, tunable by software
- Designed following ISO26262, equivalent ASIL B

Power Box

- Bidirectional measurement of the battery current with a hall effect sensor
- Charge and discharge management
- Command up to 4 external electromechanical contactors
- Command up to 2 current sensors

Smart functions

- SOC and SOH calculation
- Advanced self-diagnostic of the board
- Communication by CAN bus 2.0B (opto-isolated)
- Calculation of max charge and discharge current allowed.
- Insulation measurement through an external board (bender)
- Black box integrated with faults history storage and life counters
- Possibility to modify the parameters (cells characteristics, alarms thresholds...) using the Supervision software
- Passive balancing with a 150mA bypass current per cell

Spare IO
(function can be customized)

- 2 High Side outputs
- 2 Low Side outputs
- 3 Analog inputs
- 3 Digital inputs
- 1 PWM input

** 18S and other configurations can be developed on request.*

Power supply

- The EMS and BMC are powered with an external 12V/24V power supply
- The IMC is powered from the BMC
- The CMCs are powered from cells
- Low consumption in standby mode (on cells): < 5 µA

Mechanical format

- CMC : 103.5mm x 55.5mm
- BMC : 227,6 mm x 130.4mm
- IMC : 96mm x 64mm

Architecture of the system

HiVO uses the following electrical architecture :
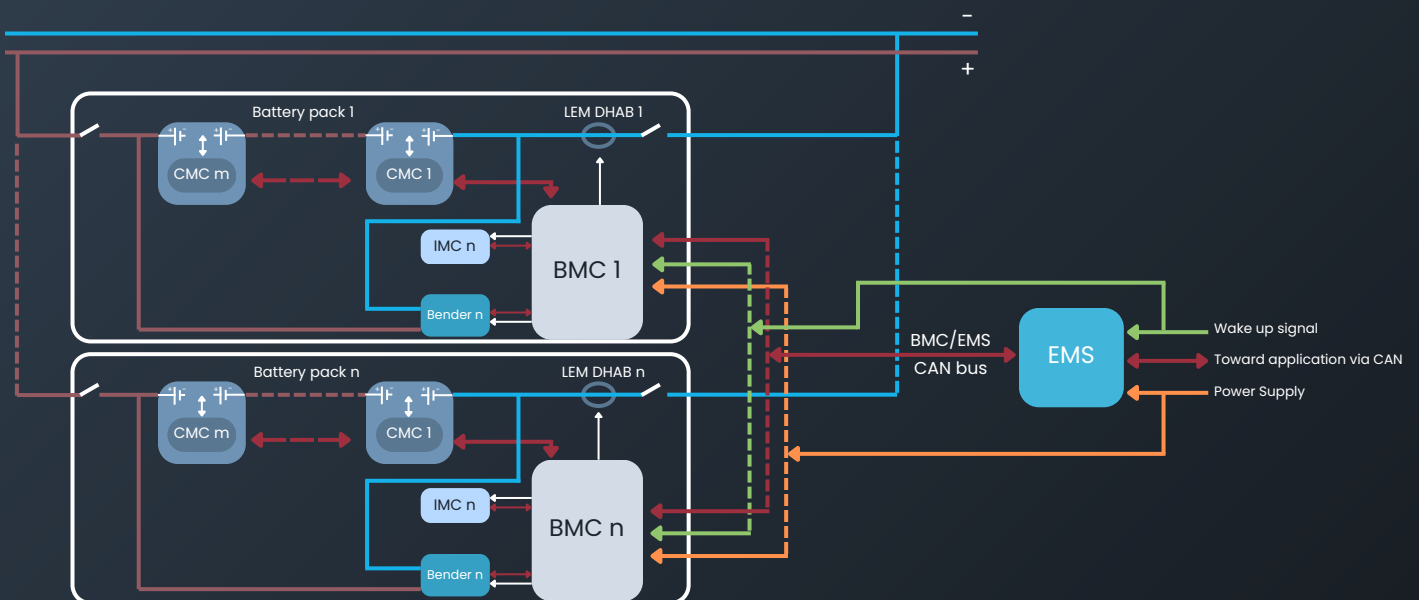
It is based on a master / slave architecture (BMC/CMC) driving a power box (electromechanical contactors, Hall current sensor ...) and an isolation measurement module (IMC).

This system has been developed and validated on heavy electric vehicles.

Low cost BMS

Our priority is to optimise your costs.
Quality will always be paramount.

Functional Safety

ISO 26262, SIL2, ASIL...

High End BMS

The latest technologies embedded.
Fully customisable monitoring software supplied
with each board.

High Voltage BMS

We develop HiVO, the first modular BMS including 3
boards for optimising your HV battery safety.

No compromise between performance and safety

BMS Safe
THE BMS COMPANY

TOP 3
BMS pure
players Europe

TOP 15
BMS pure
players Worldwide

40 M.€
Group Turnover
expected in 2027

They trust us

STARTEC ENERGY

For more than 20 years, the Startec Energy Group and its subsidiaries have supported nearly
300 customer projects in the design and production of all their solutions.

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