PRODUCT INFORMATION

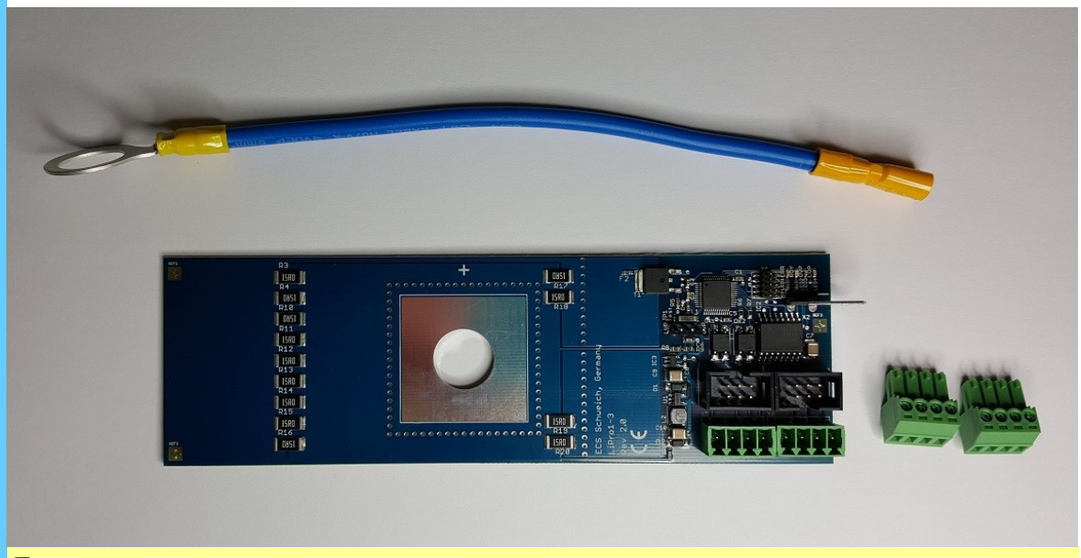
LiPro 1-3 V2

BMS—Battery Management System for e.g. LiFeYPo4, LiFePo4 and LTO Cells

New V2 version

ECS
…weil es uns Spaß macht, das Unmögliche zu tun.

The **LiPro1-3 V2** by ECS is used to monitor the charge and discharge of lithium cells so that individual cells in a series-connected battery pack are neither overcharged nor over-discharged.
It includes a built-in balancer to balance unequal charged cells. The Lipro1-3 V2 has two separate safety loops for deep discharge and overcharge protection, so that the load and charge termination can be controlled separately.



Features:

- 2 separate safety loops against deep discharge or overcharge
- Microprocessor controlled
- Easily expandable, one LiPro1-1 per cell
- Mounting directly on each positive battery terminal
- Balancer current 0 to 3000 mA
- Balancer voltage 3,65 V (default, adjustable)
- Deep discharge protection (LVP) delayed at 2,8 V (default, adjustable)
- Delay to avoid early response at high inrush or cold cells
- Overcharge protection (OVP) at 3,9 V (default, adjustable)
- 4 LEDs to display: Function, error, ovp, lvp
- Temperature protection 80 °C
- Maximum tolerance of limits better than 0,5%
- Board is lacquered to protect against environmental influences

Also available with electrically isolated RS485 interface:

- RS485 interface with the open Modbus protocol
- Read all data possible
- Thresholds programmable
- Up to 32 devices on bus

New in V2 version:

- Stronger Outputs (up to 1A)
- Temperature compensation for set points possible
- Faster wiring, thanks to the optional ribbon cable
- Because of wide input voltage, more cell types possible (e.g. LTO)

ECS
Electronic Construction Service
Isseler Str. 49
54338 Schweich
www.ecs-online.org

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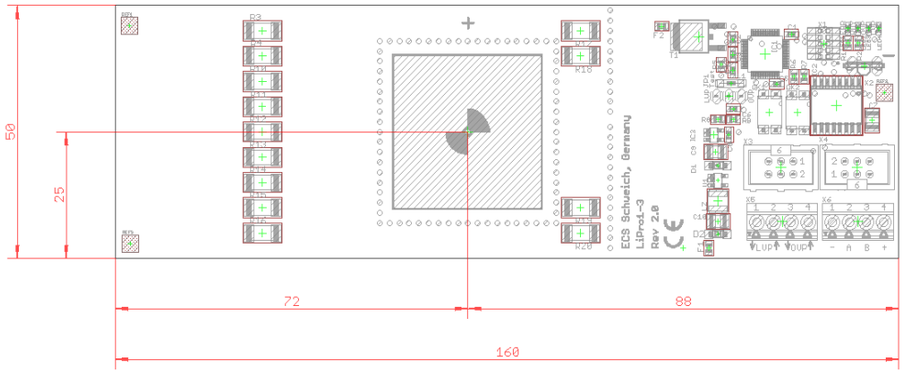

Mechanical data:

♦ Dimension:	72 x 44 x 25 mm , mounting hole M10
♦ Wight	15 gr.
♦ Cable size	AWG 26 - 16 (0,1 mm² - 1,5 mm²)
♦ Protection class	IP00, Board is lacquered to protect against environmental influences

Electrical data:

♦ Operating voltage range	0,80 V to 6 V
♦ Overcharge protection (OVP disconnect)	3,90 V (Default, adjustable)
♦ Overcharge protection (OVP reconnect)	3,50 V (Default, adjustable)
♦ Deep discharge protection (LVP disconnect delayed)	2,80 V (Default, adjustable)
♦ Deep discharge protection (LVP disc. non delayed)	2,60 V (Default, adjustable)
♦ Deep discharge protection (LVP reconnect)	3,20 V (Default, adjustable)
♦ Balancer voltage	3,65 V (Default, adjustable)
♦ LVP Alarm (red LED)	2,60 V (Default, adjustable)
♦ OVP Alarm (red LED)	4,00 V (Default, adjustable)
♦ Maximum tolerance of limits	< 0,5 %
♦ Self consumption	< 20mW
♦ Balancer current	0 mA - 3000 mA
♦ Temperature protection	80 °C (+- 5 °C)

Environmental Data

♦ Ambient temperature	-40 °C to +45 °C
♦ Storage temperature	-40 °C to +100 °C

Outputs

♦ Functions	1 x safety loop LVP 1 x safety loop OVP
♦ Contact type and design	NC (normally closed), optocoupler with MOSFET output
♦ Max. switch current / voltage	1000 mA / 80 V
♦ On resistance, leakage current	0.5 Ohm / < 1,0 µA

RS 485 BUS (optional)

- ♦ Open modbus protocol
- ♦ Up to 147 devices on bus
- ♦ Galvanically isolated
- ♦ Large number of parameters (eg, cell voltage, cell temperature, min and max values, actual balancer current, ...)

Temperature compensation

- ♦ Temperature compensation for all setpoints and reference temperature adjustable.

Safety

- ♦ Watchdog as controller supervisor implemented
- ♦ Safety loop is open in most hardware and software failure cases
- ♦ RS485 bus and switching output's can be used simultaneously to have redundant communication

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