

**NEW:**

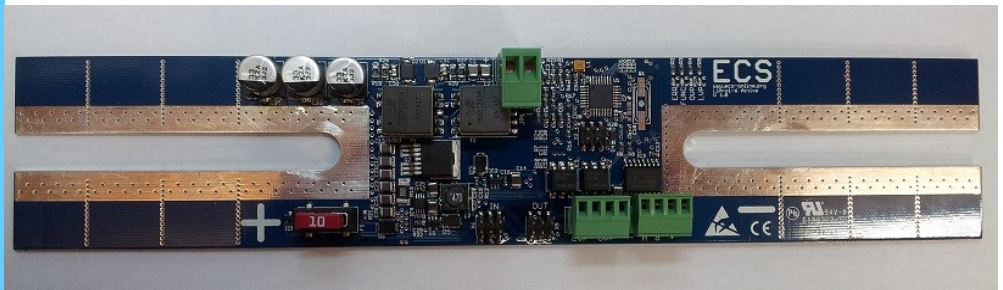
PRODUCT INFORMATION

## LIPRO 1-6 ACTIVE

Battery Management System (BMS) for LiFeYPO4 and LiFePO4 Cells

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

The **LiPro1-3 Active** by ECS is used to monitor the charge and dis-charge 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 has two separate safety loops for deep discharge and over-charge protection, so that the load and charge termination can be controlled separately.



### Features:

- ◆ **New:** Greater effectiveness through active charge transfer! Active charge exchange, excess energy of a cell is transferred to the other cells and not converted into heat, as in conventional systems.
- ◆ Effective capacity increase by charge transfer. Total capacity is no longer based on the worst cell. The total capacity corresponds to the average capacity of the individual cells now.\*1
- ◆ **New:** Switching outputs now with electronic relays. Switching current up to 1A.
- ◆ **New:** Support for **LTO (Titanat)** cells
- ◆ 2 separate safety loops against deep discharge or overcharge
- ◆ Microprocessor controlled
- ◆ Easily expandable, one LiPro1-3 per cell
- ◆ Mounting directly on each positive battery terminal
- ◆ Balancer current 4A to 8A
- ◆ Balancer voltage 3,65 V (Default, adjustable)
- ◆ Deep discharge protection (LVP) delayed at 2,8 V (default, adjustable)
- ◆ Deep discharge protection (LVP) non delayed at 2,6 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 (default, adjustable)
- ◆ Maximum tolerance of limits better than 1%
- ◆ Board is lacquered to protect against environmental influences
- ◆ RS485 interface with the open Modbus protocol
- ◆ Read all data possible
- ◆ Thresholds programmable
- ◆ Up to 254 devices on bus

\*1) For this Function is a greenView or greenController as Master controller necessary, greenView will be available in Q4/2015.

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## Battery Management System (BMS) for LiFeYPO4 and LiFePO4 Cells

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### Mechanical data:

- ◆ Dimensions
  - Length: 150 / 190 / 230 / 270 mm (separable)
  - Width: 53 mm
  - High: 26 mm
  - Mounting slot: 9mm
  - For M8 battery terminals,  
or M12, M14 with adapter screws.
  - Distance of battery terminals: 106 - 250 mm
- ◆ Wight
- ◆ Cable size
- ◆ Protection class
  - 77 gr.
  - OVP/LVP/BUS: 0,1 mm<sup>2</sup> to 1,5mm<sup>2</sup>
  - Charge Transfer: 0,5 mm<sup>2</sup> to 2,5mm<sup>2</sup>
  - IP00, Board is lacquered to protect  
against environmental influences

### Electrical data:

- ◆ Operating voltage range 1 V to 5 V
- ◆ Overcharge protection (OVP disconnect) 3,90 V (Default, adjustable via interface)
- ◆ Overcharge protection (OVP reconnect) 3,50 V (Default, adjustable via interface)
- ◆ Deep discharge protection (LVP disconnect delayed) 2,80 V (Default, adjustable via interface)
- ◆ Deep discharge protection (LVP disconnect non delayed) 2,60 V (Default, adjustable via interface)
- ◆ Deep discharge protection (LVP reconnect) 3,20 V (Default, adjustable via interface)
- ◆ Balancer voltage 3,65 V (Default, adjustable via interface)
- ◆ LVP Alarm (red LED) 2,60 V (Default, adjustable via interface)
- ◆ OVP Alarm (red LED) 4,00 V (Default, adjustable via interface)
- ◆ Maximum tolerance of voltages < 1 %
- ◆ Balancer current 4-8A (depends on U<sub>cell</sub> and U<sub>batt</sub>, see user manual)
- ◆ Battery voltage (for charge transfer) 12 V - 63 V ( eg. 4 - 16 LiFeYPO4 cells)
- ◆ Efficiency DC/DC converter 77 - 82 % (depends on U<sub>cell</sub> and U<sub>batt</sub>)
- ◆ Temperature protection 80 °C (+- 5 °C)

### Environment data

- ◆ Ambient temperature - 20 °C to + 45 °C
- ◆ Storage temperature - 20 °C to + 85 °C

### Switching outputs

- ◆ Functions
  - 1 x Safety loop LVP
  - 1 x Safety loop OVP
- ◆ Contact type and design
  - NC (normally closed), optocoupler with  
with mosfet output (AC or DC)
- ◆ Max. switch current 1A
- ◆ Max. switch voltage 60 V
- ◆ On - Resistance < 0,5 Ohm

### RS 485 BUS

- ◆ Open Modbus protocol
- ◆ Up to 254 devices on bus
- ◆ Galvanically isolated
- ◆ Large number of parameters (eg. cell voltage, cell temperature, min and max values, actual balancer current, ...)