ELECTRONIC CONSTRUCTION SERVICE

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NEW, available from Q1/2015

PRODUCT INFORMATION

LiPro 1-6 ACTIVE

Battery Management System (BMS) for LiFeYPo4 and LiFePo4 Cells

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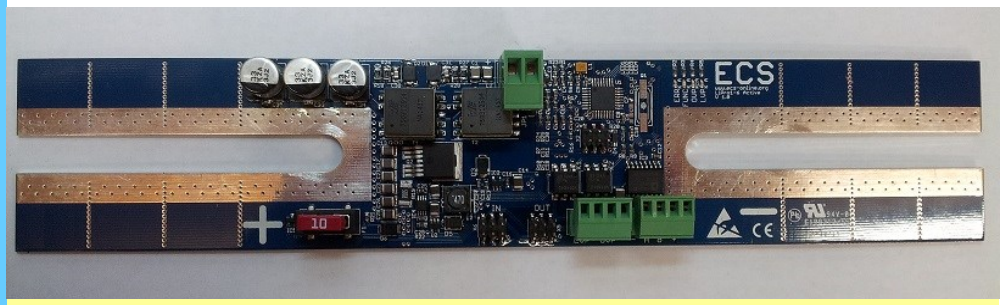
The **LiPro1-3 Active** by ECS is used to monitor the charge and dis-charge of lithium cells so that individual cells in a series-connected battery pack are neither overcharged nor over-discharged. It includes a built-in balancer to balance unequal charged cells. The Lipro1-3 has two separate safety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



Features:

- **New:** Greater range and 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.
- **New:** Switching outputs now with electronic relays. Switching current up to 1A.
- 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 5A 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

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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	77 gr.
♦ Cable size	OVP/LVP/BUS: 0,1 mm² to 1,5mm² Charge Transfer: 0,5 mm² to 2,5mm²
♦ Protection class	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	5-8A (depends on U_{cell} and U_{batt}, see user manual)
♦ Battery voltage (for charge transfer)	12 V - 63 V (4 - 16 LiFeYPo4 Zellen)
♦ Efficiency DC/DC converter	77 - 82 % (depends on U_{cell} and U_{batt})
♦ 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, ...)