ECS

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

The **LiPro1-1 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 Lipro1-1 V2 has two separate safety loops for deep discharge and overcharge protection, so that the load and charge termination can be controlled separately.
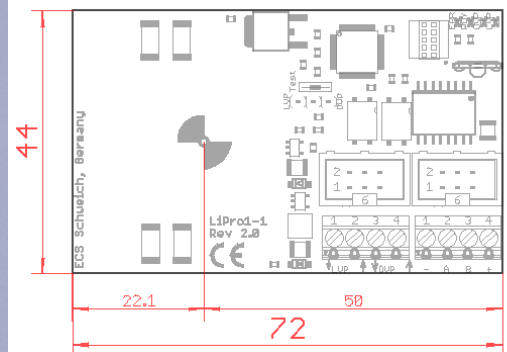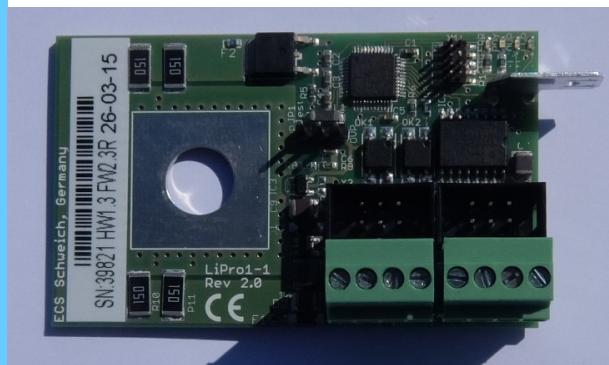
Features:

- ♦ 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 1000 mA
- ♦ Balancer voltage 3,65 V
- ♦ Deep discharge protection (LVP) delayed at 2,8 V (LiFeYPo4)
- ♦ Deep discharge protection (LVP) delayed at 2,7 V (LiFePo4)
- ♦ Delay to avoid early response at high inrush or cold cells
- ♦ Overcharge protection (OVP) at 3,9 V (LiFeYPo4 Version)
  Overcharge protection (OVP) at 3,7 V (LiFePo4 Version)
- ♦ 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**
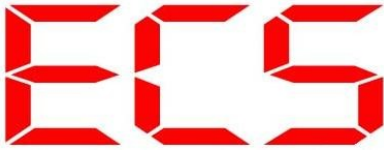
*ECS
…weil es uns Spaß macht, das Unmögliche zu tun.*

Mechanical data:

♦	Dimension:	72 mm x 44 mm 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 - 1000 mA
♦	Temperature protection	80 °C (+- 5 °C)

Environmental Data

♦	Ambient temperature	-20 °C to +45 °C
♦	Storage temperature	-20 °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	1000 mA
♦	Max. switch voltage	80 V
♦	On resistance	0.5 Ohm
♦	Max. leakage current	< 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