

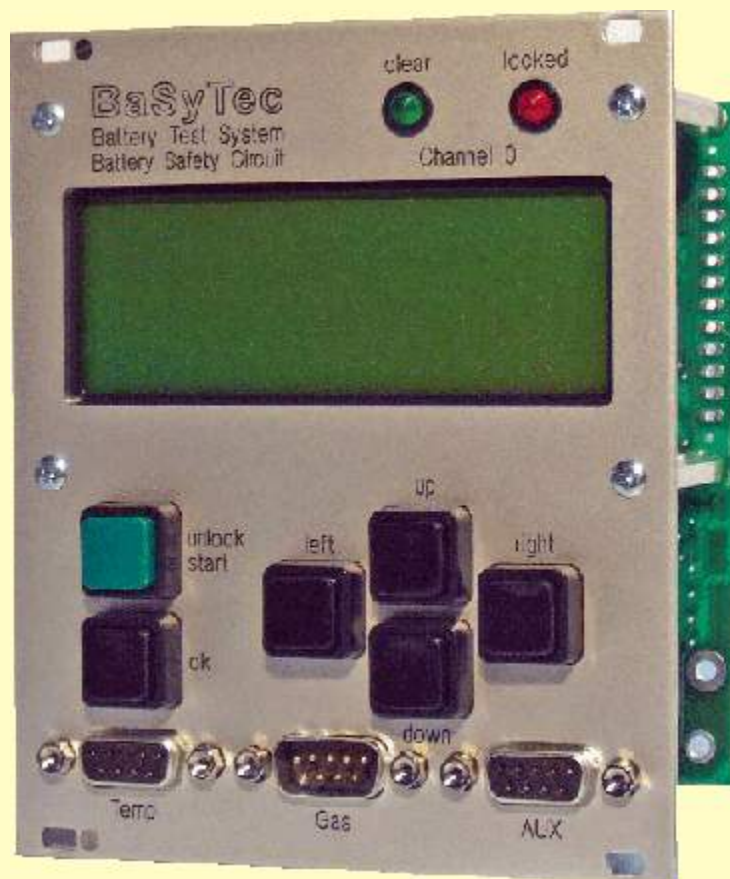
BaSyTec

Battery - System - Technology

- ✓ Research
- ✓ Development
- ✓ Production
- ✓ Quality control

BSD

Battery Safety device



Avoid battery accidents

Make battery testing safer

BaSyTec is one of the leading manufacturers of battery test systems. Several hundred systems are operated today all over the world. Our customers are battery manufacturers, universities, test laboratories, car makers, power tool manufacturers and producers of electronic equipment. The ongoing development is strongly related to our customer needs. BaSyTec offers today the most powerful battery test software and a wide product range. The Battery Safety Device (BSD) is an add-on for our test systems. It operates independently and monitors all relevant battery parameters.

Battery Safety

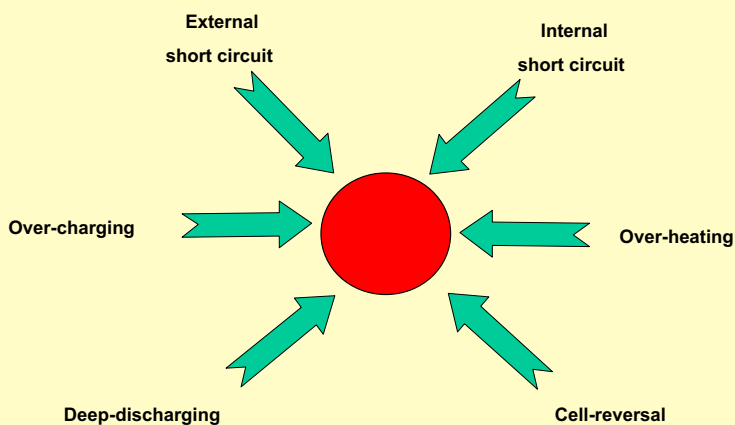
High energy density and high specific power are two of the key targets in battery research and development. However, both parameters result in fast energy release in case of internal or external battery failures. Additionally the thermal energy content of lithium based batteries is a multiple of the stored electrical energy. Exothermal reactions in case of overcharging or in case of short circuits can result in explosion and fire and can destroy a battery test laboratory. The risk increases with larger batteries and should not be underestimated.

BaSyTec test procedures allow to supervise a test by all monitored signals, as current, temperatures and voltages. However this method does not protect from careless mistakes and it is not independent from the control system.

The BaSyTec Battery Safety Device (BSD) is an optional extension of the BaSyTec Battery Test Systems. It will independently monitor all critical parameters of the battery and its ambient and will switch off the battery current by locking the main output relay if any parameter exceeds its safe range.



Fire caused by an overcharged battery



Most Critical operation conditions, resulting in battery degradation or fire

Typical Applications

The BSD is mechanically included into the BaSyTec Battery Test system but operates completely independently, so offering a second backup safety circuit to the main control system of the BaSyTec Battery Test System. It is recommended for:

- All NIMH Batteries with an energy content of more than 500 Wh.
- All Lithium Batteries with an energy content of more than 100 Wh.
- All batteries and cells where safety risks are expected, i.e. Prototypes.

Technical Specification

User Interface	<p>Green light everything ok</p> <p>Red light emergency switch off</p> <p>LCD Display showing actual values, also used for configuration and to show critical parameters which lock the system 20*4 characters, 85*30.5mm, backlight</p> <p>6 Buttons RESET → leave locked state. This button and disconnecting from mains supply are the only possibilities to unlock the BSD ENTER, left, right, up, down → switch between screens and configure the device</p>
Temperature inputs	<p>Count 2 per unit</p> <p>Connector D-SUB 9-pin female</p> <p>Mode 4-wire connection</p> <p>Sensors Pt100 (optional NTC 6k8)</p> <p>Resolution Pt100: 0.05°C</p> <p>Precision: 2°C</p> <p>Sample rate 5Hz</p> <p>Lock delay 400ms to 10s (default 2s)</p>
Analog inputs (Used for Gas sensors like H ₂ , CO or any other sensor outputs)	<p>Count 4 per unit</p> <p>Connector D-SUB 9-pin male</p> <p>Range 0-10V (optional 0-20mA), differential</p> <p>Resolution 16 Bit</p> <p>Precision 1% FS</p> <p>Sample rate 5Hz</p> <p>Lock delay 400ms to 10s (default 2s)</p>
Main voltage	<p>Count 1 per unit</p> <p>Connector internally wired to the sense input of the battery test system</p> <p>Range 0-5V (others optional), unipolar, differential</p> <p>Resolution 16 Bit</p> <p>Precision 1% FS</p> <p>Sample rate 5Hz</p> <p>Lock delay 400ms to 10s (default 2s)</p>
Main current	<p>Count 1 per unit</p> <p>Connector internally wired to the main shunt of the battery test system</p> <p>Range equal to the current range of the test system</p> <p>Resolution 16 Bit</p>

Technical Specification

Single cell voltages (optional)	<p>Count 11 per unit</p> <p>Connector D-SUB 25-pin male</p> <p>Range 0-5V, unipolar, differential, common mode up to 100V</p> <p>Resolution 16 Bit</p> <p>Precision 1% FS</p> <p>Sample rate 5Hz</p> <p>Lock delay 400ms to 10s (default 2s)</p>
External clearance	<p>Count 2 per Unit</p> <p>Connector D-SUB 9-pin female</p> <p>Type TTL-like input with internal 2k2 pullup Must be connected to potential free relais or optocoupler output</p> <p>Range cleared if potential < 0.5V locked if potential > 2.5V 0.5V to 2.5V is not allowed</p> <p>Lock delay 400ms to 10s (default 2s)</p>
External signal out	<p>Count 2 per Unit</p> <p>Connector D-SUB 9-pin female (same one as before)</p> <p>Type Relais output with changeover contacts max. 24V/1A each</p> <p>NO output will be closed if output is enabled</p>
calibration	The units will reach the specified precision without calibration.
Parameter readout (optional)	All measured parameters can be read out and used by the BaSyTec Battery Test System. For reasons of safety it is not possible to set any parameter this way.
Global enable	<p>There is a global enable signal connecting all BSD's in a system. So, if one BSD goes into locked state all others can also lock their outputs.</p> <ul style="list-style-type: none"> • So global parameters (gas sensors, emergency shutdown) need to be wired only to one BSD • It can be configured for each input whether a failure will lock all or only one test channels • Default is that cell voltage, temperature and current inputs do only lock the affected channel • Default is that external clearance and analogue inputs (for gas sensors) will lock all channels

BaSyTec GmbH

Rosenweg 7, 89129 Oellingen, Germany

Tel.: +49-7345/238 500, Fax: +49-7345/238 725, www.basytec.com