BCS-AM01, BCS-AM02, BCS-AM03, BCS-AM04

Current Module

Measures the current flowing into and out of the battery pack with a temperature-compensated shunt. Four versions cover ranges from ±250 A to ±1825 A.



Key features

Measurement

- Ranges up to ±1825 A
- Accuracy ±0.01 A
- Refresh rate up to 2 kHz
- 24-bit resolution
- Temperature-compensated shunt

Protection

- Hardware overcurrent detection, independent of the MCU
- Thresholds set for both current directions
- Opens the Intelligent Shutdown Circuit (iSDC)
- Reset over CAN

Module

- Supply 9–36 V
- Reinforced isolation, 3750 V RMS
- High-side or low-side installation
- Firmware update over CAN

General description

The BCS-AM is the current module of the Volteek Battery Control System. It measures the current flowing into and out of the pack through a **shunt with temperature compensation**, which keeps the reading accurate across the operating temperature range without external calibration.

The module can be installed on the **high or the low side** of the pack. It connects to busbars or cable lugs through two 7 mm holes, and to the system through one connector that carries power, isolated CAN and the Intelligent Shutdown Circuit.

A **hardware overcurrent circuit**, independent of the microcontroller, opens the iSDC when the current passes a set limit in either direction, so the contactors can open immediately.

Parameters

Parameter	Min.	Typ.	Max.	Unit	Notes
Environment					
Operating temperature	−30		90	°C	
Storage temperature	−30		125	°C	
Supply					
Operating voltage	9	24	36	V	
Current measurement					
Measurement range			±1825	A	Depends on version, see ordering information
Accuracy		±0.01		A	
Resolution		24		bit	
Refresh rate		1000	2000	Hz	
Temperature measurement					
Accuracy		±0.1		°C	Shunt temperature
Refresh rate		10	50	Hz	
Communication					
Protocol	CAN 2.0B				
Data rate	125	500	1000	kbit/s	
Isolation, reinforced		3750		V RMS	UL 1577, 60 s
Common-mode transient immunity		180		kV/µs	

Functions

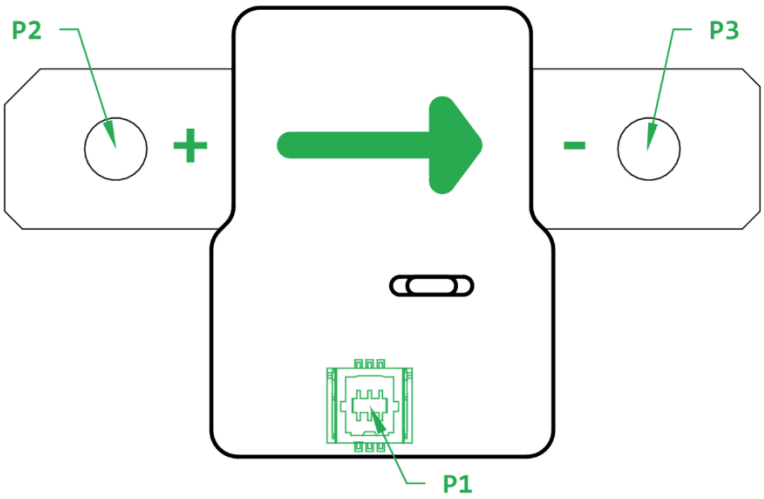
Temperature compensation

The shunt resistance changes with temperature. The module measures the shunt temperature and corrects for it, so the current reading stays stable without external calibration.

Overcurrent protection

A hardware circuit compares the current with configurable thresholds for both directions. When a threshold is passed, it opens the Intelligent Shutdown Circuit, which acts as the interlock of the pack and can open the contactors immediately. The event is reset with a command over CAN. Additional current limits can be set in software to open the contactors.

Connectors



BCS-AM, top view. Current flowing in the direction of the arrow, from P2 to P3, is measured as positive.

List of connectors

Designator	Function	Manufacturer	Board connector	Mating part
Isolated (user) side				
P1	Main communication	Molex	`207760, 6-pin`	`204523-0601`
Battery side				
P2	Source side (+)	–	7 mm hole	Cable lug or busbar
P3	Load side (–)	–	7 mm hole	Cable lug or busbar

P1 is Molex Micro-Lock Plus, 1.25 mm pitch. The list and drawings apply to hardware revision BCS-AM0x.

Connector pinout

P1, Main communication

Isolated

Pin	Name	Description
1	`ISO_VIN`	Power input
2	`ISO_GND`	Ground
3	`CAN_Hi`	CAN high
4	`iSDC_IN`	Intelligent Shutdown Circuit (iSDC) input
5	`CAN_Lo`	CAN low
6	`iSDC_OUT`	Intelligent Shutdown Circuit (iSDC) output

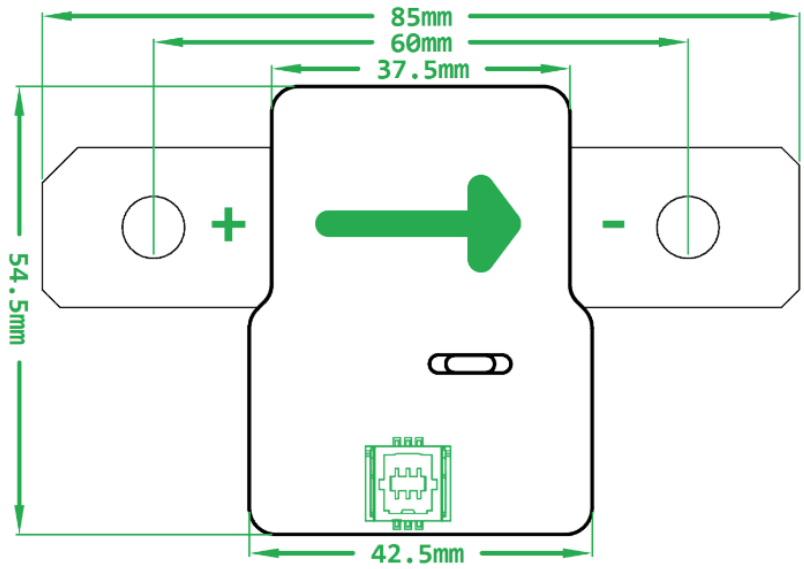
P2 and P3, Current terminals

Battery side

Pin	Name	Description
P2	`SRC_IN`	Source side, current input
P3	`LOAD_OUT`	Load side, current output

P1 connects to connector P3 of the Power Module. The harness swaps pins 4 and 5, so CAN low and the iSDC lines meet the right pins on both modules.

Dimensions



BCS-AM01, dimensions in mm. Length 85 mm, 60 mm between the 7 mm terminal holes, housing 42.5 × 54.5 mm. A 3D model is available on request.

Custom versions

The BCS-AM is supplied as a standard module. We can change it for your application, for example with different connectors or mounting. Contact us at info@volteek.com to discuss the changes.

Ordering information

Part number	Measurement range
BCS-AM01	±250 A
BCS-AM02	±500 A
BCS-AM03	±1000 A
BCS-AM04	±1825 A

Related documents

BCS	Battery Control System, system datasheet
BCS-MM01	Master Module datasheet
BCS-PM01	Power Module datasheet
BCS-CM	Cell Module datasheet

Changelog

Rev.	Date	Description
A	03/2025	Initial release
B	10/2026	New layout, module-specific description, accuracy and refresh rate updated, operating and storage temperature from −30 °C, ordering information for all versions

Disclaimers

Performance

Values are measured under standard test conditions and can differ in other environments and operating conditions. Test the module in your own application.

High voltage

The system can operate at hazardous voltages. Only qualified personnel may install, handle or modify it, following high-voltage safety procedures.

Hardware revisions

Pinouts, connector lists and drawings apply to the current hardware revision and may change in later revisions. Ask us for documentation of earlier revisions.

Electrostatic discharge

The module contains components that are sensitive to electrostatic discharge. Follow ESD precautions to avoid degraded performance or permanent damage.

Measurement accuracy

Measured values can vary. Validate the data and take all sources of error and tolerances into account.

Liability

The manufacturer is not liable for any direct, indirect, incidental or consequential damage arising from the use of, or inability to use, the product.