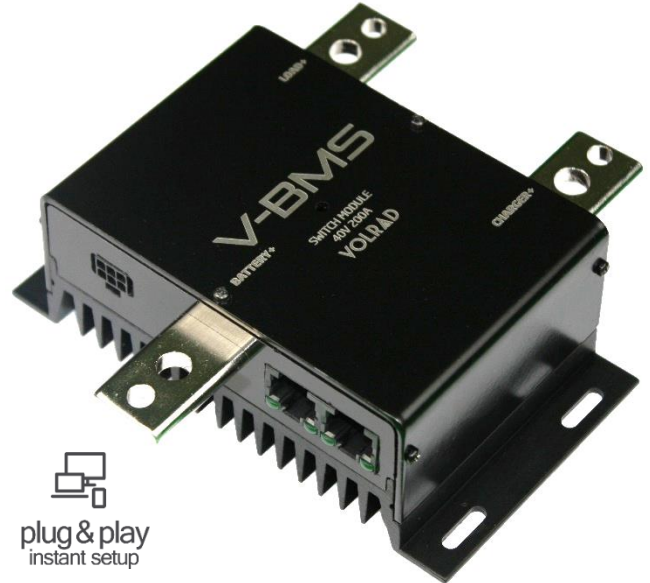


### Product Description

V-BMS Switch module monitors battery current with built-in shunt resistor and controls connection to the charger & load over 2 separate paths via internal MOSFET's. It also serves as a master module for the battery management system; sharing & gathering data to/from slave modules and evaluating warnings & alarms.

Switch module has fully programmable CAN Bus port with custom baud rate/period/field control & information messages. This allows user to communicate to any device and control chargers without using an intermediate protocol converter.

Switch module is fully plug & play. It comprises a configurable Modbus port for monitoring & controlling the system. All module configuration can be managed using cross-platform V-BMS software.



### Typical Applications

- Industrial / Robotic Applications
- Telecom Solutions
- Energy Storage Systems
- Uninterruptable Power Supplies
- E-Bike / E-Scooter
- Electric Heavy Duty Equipment

### Features & Benefits

- Supports up to 50 slave modules & 16 parallel strings
- Fully Plug & Play;
  - ✓ Detects & addresses modules on boot;
  - ✓ Gathers cell & sensor information
  - ✓ Calculates number of series cells & parallel strings,
  - ✓ Configures all modules on each boot
  - ✓ Detects string shunts & automatically switches to string shunts if available
- ✓ Separate positive disconnect paths for charge & load connection with dedicated pre-charge circuits

### Flexibility

- Fully programmable separate charge & load switches with separate pre-charge circuits.
- Short circuit detection at all times
- Fully programmable CAN Bus messages with charger control functions
- Configurable Modbus slave port for monitoring & configuration
- Fully programmable warning & alarm levels for;
  - ✓ Over-charge current
  - ✓ Over-discharge current
- Configurable beeper for warnings & alarms

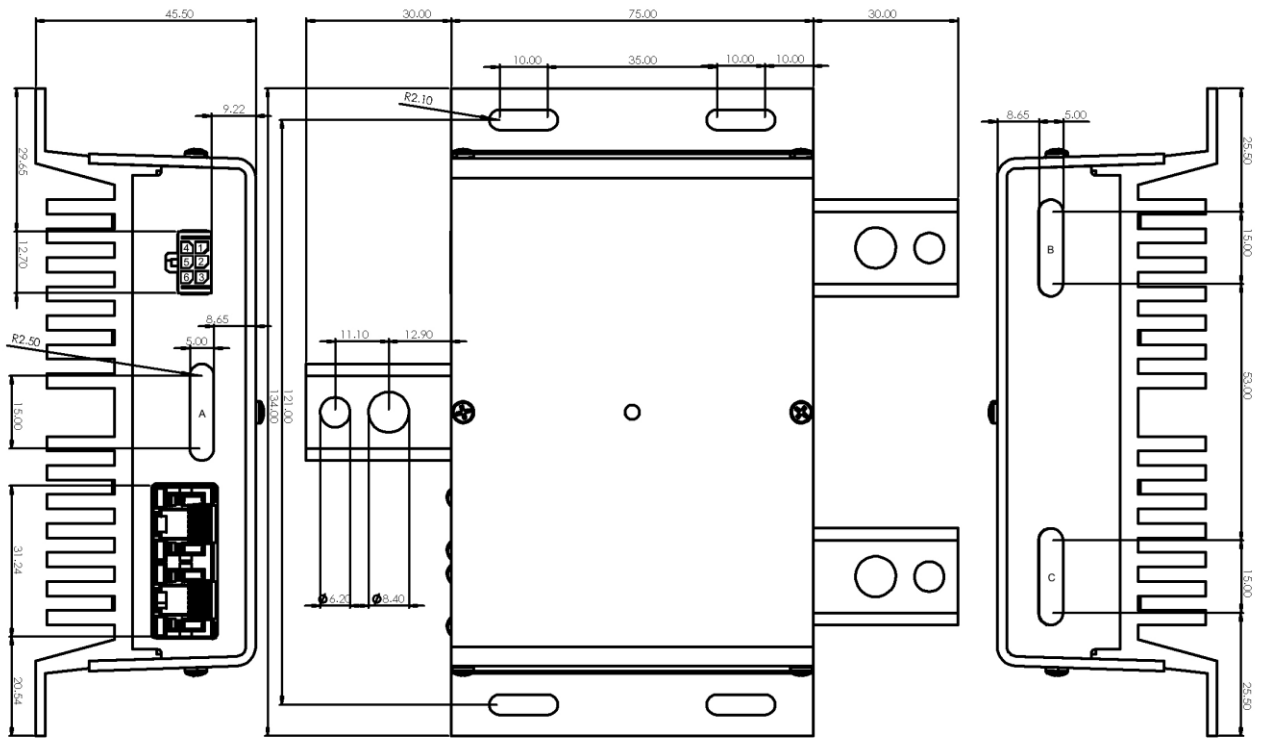
## Electrical Characteristics

Parameter	Comments	Min.	Typ.	Max.	Unit
<b>General</b>					
Supply Voltage	Model 40V200	9	-	40	V
	Model 60V150	12	-	60	
	Model 80V120	18	-	80	
	Model 100V100	24	-	100	
Battery Voltage	Model 40V200	0	-	40	V
	Model 60V150	0	-	60	
	Model 80V120	0	-	80	
	Model 100V100	0	-	100	
Continuous Battery Current	Model 40V200	-200	-	200	A
	Model 60V150	-150	-	150	
	Model 80V120	-120	-	120	
	Model 100V100	-100	-	100	
Peak Battery Current	Model 40V200	-300	-	300	A
	Model 60V150	-220	-	200	
	Model 80V120	-180	-	180	
	Model 100V100	-150	-	150	
Current Measurement Resolution				12	bits
Current Measurement Error		-1	-	+1	%
<b>Power Control</b>					
Charge port precharge time	With possibly additional Vds time	1	-	30	Seconds
Charge port hiccup Time		1	-	30	Seconds
Load port precharge time	With possibly additional Vds time	1		30	Seconds
Load port hiccup time		1	-	30	Seconds
Precharge current				10	A
<b>Communication</b>					
MODBus baudrate		9600	-	115200	Bps
CANBus baudrate		125	-	1000	Kbit/sec
Number of CANBus messages		-	-	8	-
<b>Operating Conditions</b>					
Sleep Mode Power Consumption		-	100	-	mW
Operational Power Consumption	No output activated	-		2	W
Operational Temperature Range		-40	-	+50	°C
Humidity Level		0	-	95	%Rh
Altitude				6000	m
Weight	Including Case			650	gr

## Module Features

Functional Features
• Battery current measurement using internal shunt
• Uni-directionally switched CHARGE & LOAD port (allows regenerative currents to LOAD port, slow discharge over CHARGE port)
• Automatic module addressing, serial cell / parallel string detection (up to 50 modules / up to 16 parallel strings)
• Automatic module detection, hard power control for slave modules
• Fully programmable CANBus baudrate (125/250/500/1000 kbit/sec)
• Up to 4 information/control message with programmable period, length and 16 bit fields
• Charger Start/Stop/Pause/Resume messages with programmable length and 16 bit fields
• Available CANBus fields; Battery voltage, Battery Current, Max. Charging Voltage, Max. Charging Current, Charging Current Percentage, Minimum Cell Voltage, Maximum Cell Voltage, Minimum Cell Temperature, Maximum Cell Temperature
• Selectable scale / programmable offset for battery/charging voltage, battery/charging current, percentage fields
• Charger Detection over CANBus
• Configurable MODBus port; 9600/19200/38400/57600/115200 bps, 8 data bits, 2 Stop bits or Odd/Even Parity with 1 Stop bit
• Supported MODBus commands; Read Input Registers, Read Holding Registers, Write Single/Multiple Registers
• Password protection for Holding (Configuration) Registers
• Fully configurable over MODBus slave port
• Periodic data sharing/gathering to/from slave modules, warning & alarm control, balancing control
• Port control with single function button
Safety Features
• Programmable load current warning & alarm levels
• Programmable charge current warning & alarm levels
• Module high temperature protection
• Communication timeout/error protection
• ALARM output for critical errors

**Mechanical Information**



All Dimensions are in millimeters (mm)

**Module Connections**

Battery & CANBus Connector			
<b>Connector Type</b>		Micro-Fit 3.0 43045 series 6 pin male	
<b>Mating Connector</b>		Micro-Fit 3.0 43025 series, 2 row, 6 pin female or equivalent	
Battery & Sensor Pinout			
1	CANH	4	CANL
2	Toggle Power Switch IN- / GND	5	Toggle Power Switch IN+
3	GND	6	Battery IN+
Communication Ports			
<b>Connector Type</b>		2 x RJ-45	
<b>Recommended Connection Cable</b>		CAT5e, CAT6, CAT6a, terminate unused port	
<b>Indicators</b>		1 x Error LED, 1 x Communication LED	
Power Bus			
<b>Connector Type</b>		20mm x 5mm Busbar, M6 & M8 Stud Hole	
<b>A</b>	BATTERY +		
<b>B</b>	LOAD +		
<b>C</b>	CHARGER +		