



BMS Power Control 1.x

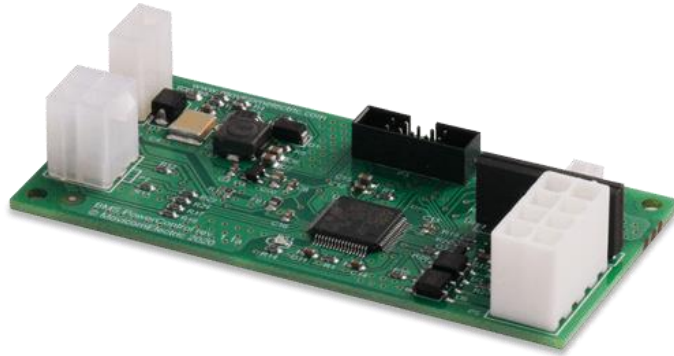
CONNECTION AND CONFIGURATION MANUAL

Revision 1 (16-February-2021)

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1 General information



The BMS Power Control 1.x is used to power the battery system based on the BMS Main 2.x.

1.1 Features

- Turn on/off the battery system if the power button is pressed.
- Measure the battery voltage and temperature and turn off the battery if the voltage or temperature is out of range.
- Turn off the battery with a delay to shut down the battery load correctly.

1.2 Principle of operation

If the BMS Power Control 1.x is powered, it goes into sleep mode. In sleep mode, consumption is minimal.

When the power button is pressed the device goes into active mode. In active mode, the battery voltage and temperature are measured. If the voltage and temperature are in range, the device closes its solid-state relay which switches on the battery voltage to a DC/DC converter. After starting the DC/DC converter, the device continues to measure the battery voltage and temperature.

If the conditions for starting the DC/DC converter are not met (the voltage and temperature are out of range), the device goes into sleep mode.

If any of the following conditions is met:

- the power button is released;
- the battery voltage is out of range;
- the battery temperature is out of range,

the device sends a shutdown request to the BMS Main. When the BMS Main acknowledges the shutting down the device opens its solid-state relay and goes into sleep mode. The device will do the same actions if the BMS Main does not send the shutdown acknowledgement for 30 seconds (the delay can be configured).

If the BMS Main 2.x works with the BMS Power Control 1.x its discharging algorithm is changed.

2.3.1. "Discharging ON" state

The discharging relay is closed in this state.

If the BMS Power Control 1.x sends the shutdown request the BMS Main 2.x goes to the "Cancelling discharging" state.

2.3.2. "Canceling discharging" state

The discharging relay is closed as before.

After the delay set in the BMS Main 2.x settings the transition to the "Discharging OFF" state is done.

2.3.3. "Discharging OFF" state

The discharging relay is opened in this state and the BMS Main 2.x sends the shutdown acknowledgement to the BMS Power Control 1.x. When the BMS Power Control 1.x receives the acknowledgement, it turns off the DC/DC converter.

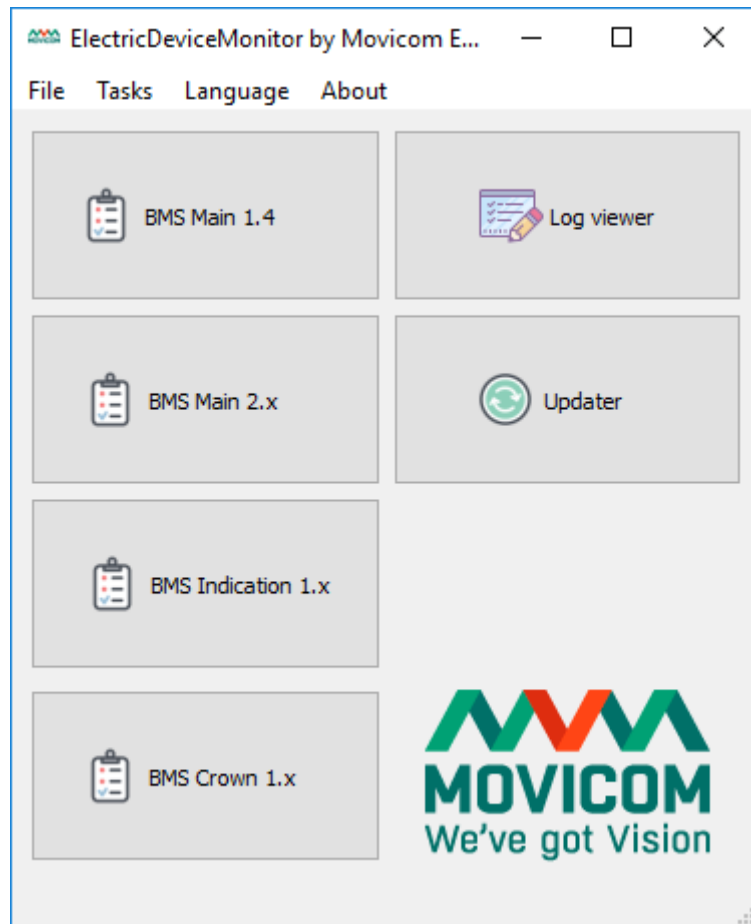
1.3 Specifications

Parameter	Value
Battery voltage, V	10÷95
Maximum current consumption (for the 48V battery), mA:	
• Sleep mode	2
• Active mode	5
Voltage and temperature measurement error, %	5
Dimensions (length × width × height), mm	84 × 40 × 17
Weight, g	19±2
Operating conditions	
Operating temperature range, ° C	-40÷75
Degree of protection from external influences	IP00

2 Configuration procedure

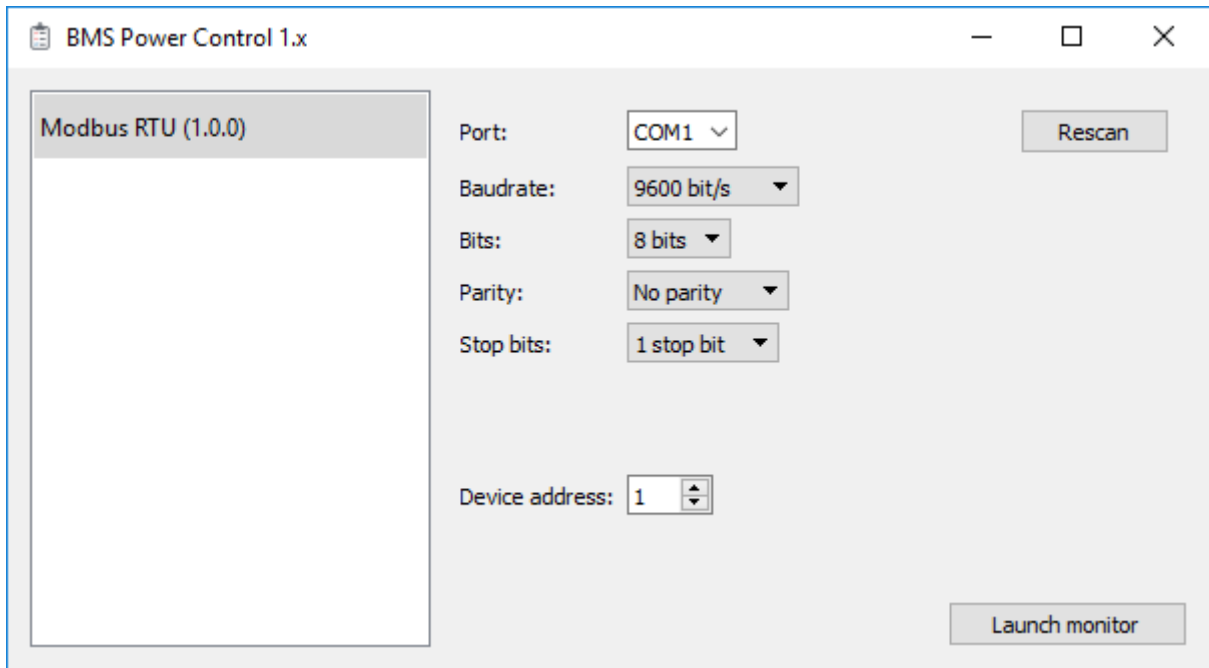
To configure the BMS Power Control do the following steps:

1. Install the ElectricDeviceMonitor software.
2. Connect the USB-RS485 converter to PC.
3. Connect the USB-RS485 converter to the P4 header of the BMS Power Control 1.x.
4. Connect the BMS Power Control 1.x to the battery, press the power button. The device should go into active mode. The DS1 flashes every second in this mode.
5. Launch thr ElectricDeviceMonitor. Select the “BMS Power Control 1.x” monitor.

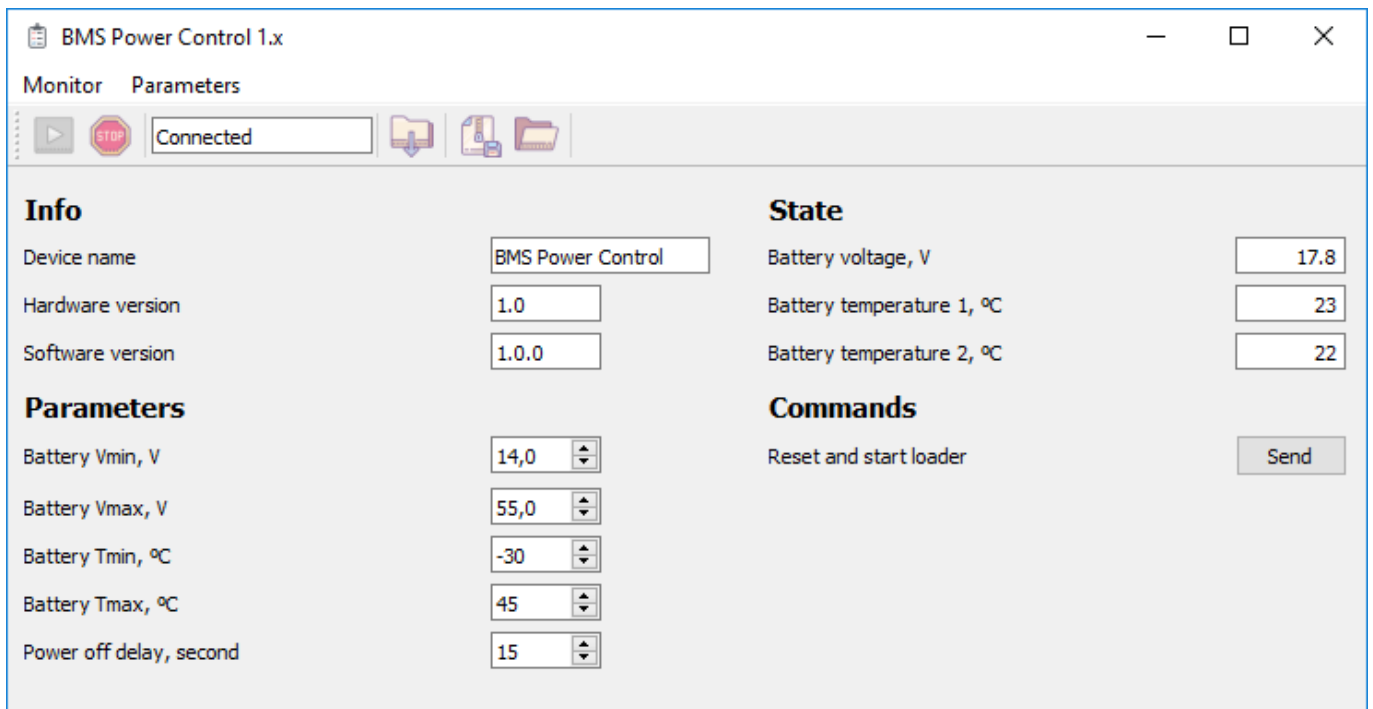


6. In the opened window set the port name and connection parameters – 9600 bps, 8 bit, no parity, 1 stop bit.

7. Set the Device address =1.



8. Click the “Launch monitor” button, a new window with device parameters will open.



The monitor window is divided into the following groups of parameters:

- **Info** – board and firmware versions;
- **State** – current device state;
- **Parameters** – ranges of the battery voltage and temperature;
- **Commands** – commands to the device.

State group contains the following parameters:

- Battery voltage – measured voltage of the battery, V;
- Battery temperature 1 – temperature measured by sensor 1, °C;
- Battery temperature 2 – temperature measured by sensor 2, °C.

Parameters group contains the following items:

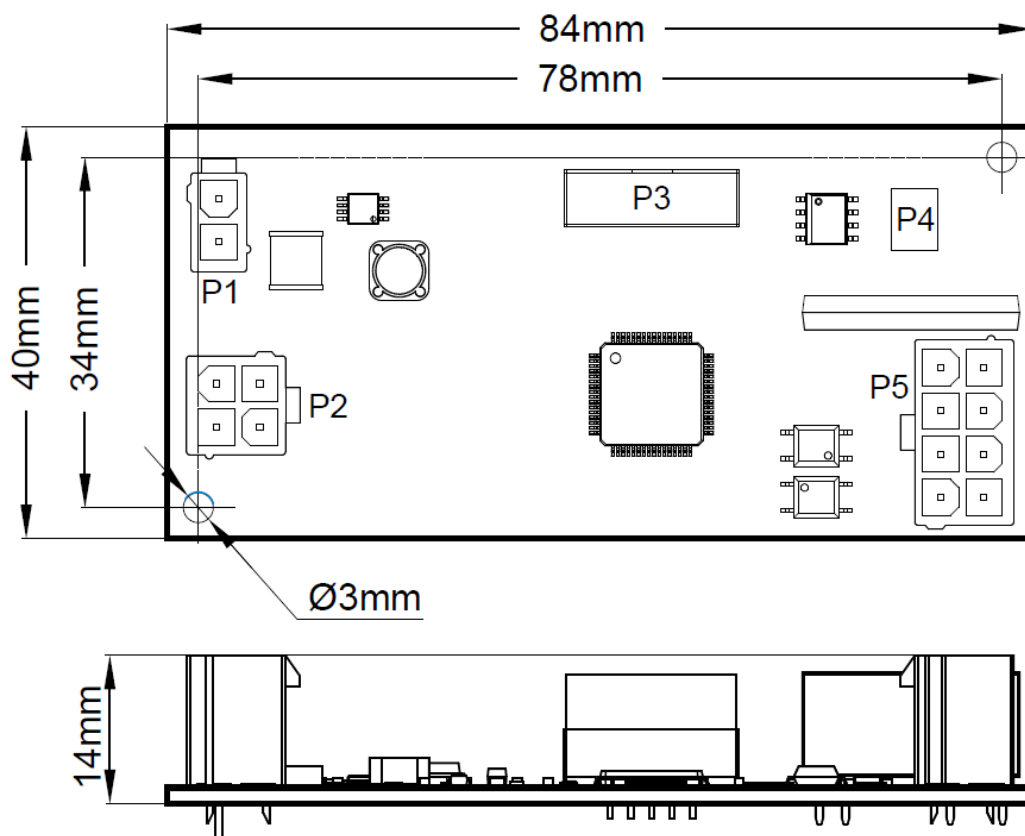
- Battery Vmin – minimum allowable voltage of the battery, V;
- Battery Vmax – maximum allowable voltage of the battery, B;
- Battery Tmin – minimum allowable temperature of the battery, °C;
- Battery Tmax – maximum allowable temperature of the battery, °C;
- Power off delay – time between sending the shutdown request and going to sleep mode (if the shutdown acknowledgement is not received).

Commands group contains the following items:

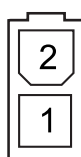
- Reset and start loader – command to start the device bootloader.

3 Connection procedure

The BMS Power Control 1.x has a header to connect the battery (P1), a header to connect to the BMS Main 2.x and the power button (P5), a header to connect temperature sensors (P2) and a header used for configuring the device (P4).

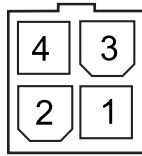


3.1.1 P1 – header to connect battery



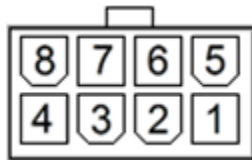
Pin	Name	Description
1	VBAT-	Battery minus
2	VBAT+	Battery plus (10÷95V)

3.1.2 P2 – header to connect temperature sensors



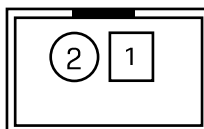
Pin	Name	Description
1	TEMP1	Thermistor 1 (signal)
2	TEMP2	Thermistor 2 (signal)
3	TEMPG1	Thermistor 1 (ground)
4	TEMPG2	Thermistor 2 (ground)

3.1.3 P5 – header for battery system and power button



Pin	Name	Description
1	NO	Normally opened terminal of the solid-state relay
2	BTN	Power button (dry contact; latching switch)
3	PACK	Shutdown acknowledgement line (signal +5V)
4	PDOWN	Shutdown request line (dry contact)
5	COM	Common terminal of the solid-state relay
6	BTNG	Power button (ground)
7	PACKG	Shutdown acknowledgement line (ground)
8	PDOWNG	Shutdown request line (ground)

3.1.4 P4 – header for RS-485



Pin	Name	Description
1	RS-485_A	RS-485 line A
2	RS-485_B	RS-485 line B

4 Contacts

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5 Revision history

Rev. number	Rev. date	Changes
1	16-February-2021	First revision

