Battery Monitoring System for Lithium Batteries BMSL

Operation of the monitoring system BMSL is suitable for applications where is required monitoring of battery operation. The utilization of the battery monitoring system will bring to the user information about an upcoming battery failure, prevents back-up system failure due to the poor condition of the batteries and destruction of the entire battery set due to failure of one cell.

Field of application:

- Stationary batteries
- Batteries in the UPS and telecommunications power supplies, energetic industry
- Gas industry, railways

Features:

- Complex modular monitoring system of battery status
- Processor control unit
- Possibility to monitor up to 4 independent battery sets
- Max. number of monitored cells for one set are together 250
- Distributed measurement of cells
- Individual voltage balancing of cell
- Connection of the external graphic display
- Fully programmable measuring process
- Galvanic isolation of measuring
- Simple connection of measuring modules
- User friendly interface
- The ability to view data in the monitoring software application for PC
- The possibility of clamping to DIN rail and subsequent embedding into a 19 "rack or possibility to be wall mounted

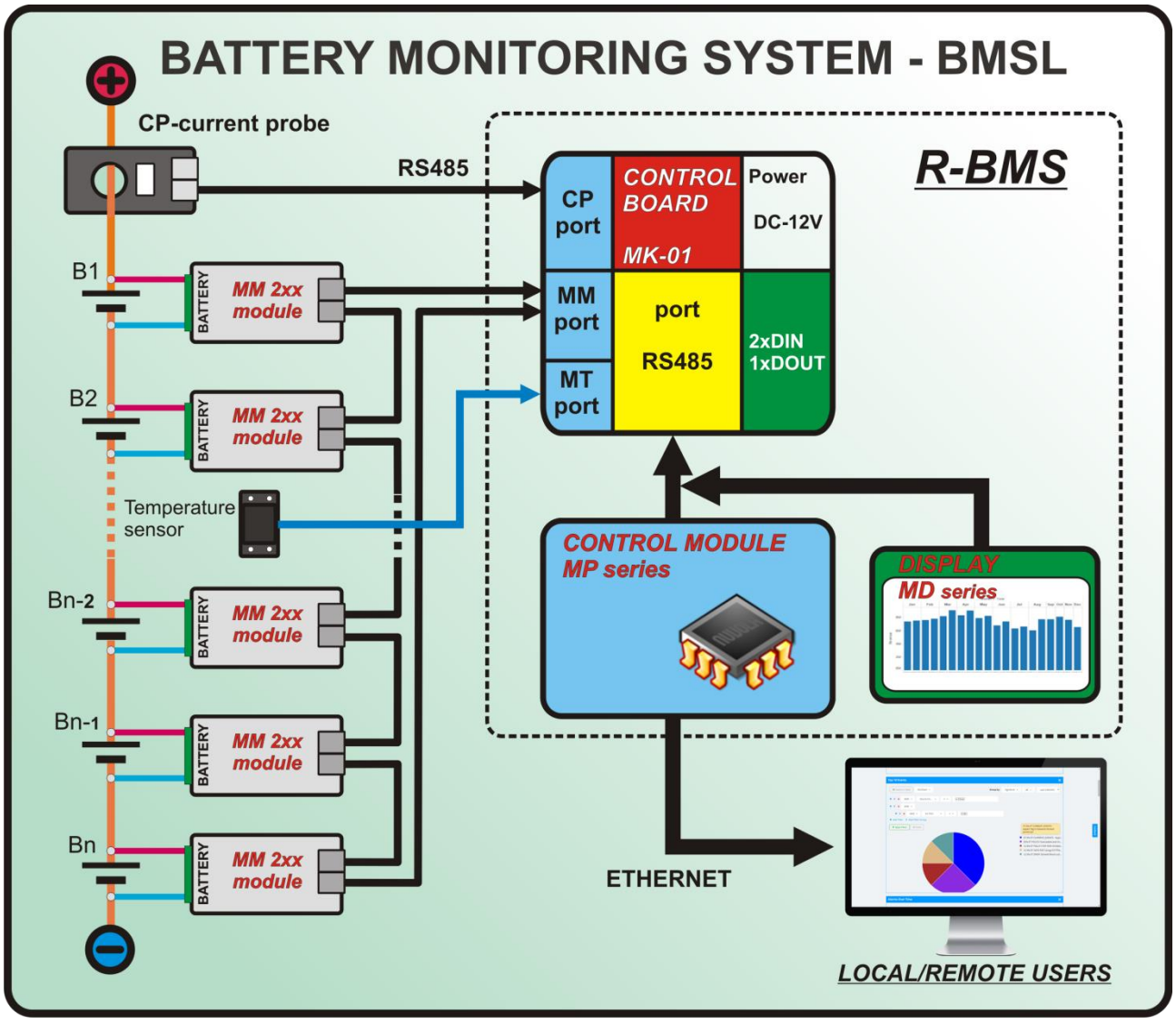
BMSL monitoring system monitors and signals in the real time states of accumulator batteries, for example deep battery discharge, eventually discharging of single cells of the battery set, cell voltage unbalance, excessive discharging or charging currents of the battery set, battery temperature variation from the stated value and other parameters. Overrun of every mentioned parameter can destroy of the battery set, so it is needed to have immediate information about battery status.

By means of a process called **Equalization** (or **Balancing**), battery monitoring system BMSL regulates the voltage of each cell. This process serves to calibrate the cell and results optimal capacity and improved lifespan.

The whole system consists of the control unit (MP) and the appropriate number of measurement modules (MM) of the same structural design, current probes (CP), and related number of connecting conductors and conductors of voltage sensors.

The system can be powered directly from the battery. Therefore, it is not necessary to provide the power supply from back-up distribution mains, what enable to situate the battery-monitoring system directly into accumulators´ installation or storage room. Another option is to power the system by an external source.

BMSL system block scheme



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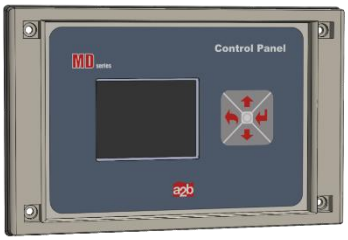
Components of BMSL system

Display Module MD		
Dimension w x h x d	170 x 110 x 30 mm	
Power supply	from control module	
Power consumption	max. 3 W	
Communication	RS485	
Display	graphic, colour, 240x320	
Cover	front IP 65, back IP20	
Mounting	panel	

Control Module MP		
Dimension w x h x d	120 x 115 x 22,5 mm	
Power supply	from measured battery	
Power consumption	max. 5 W	
Communication	2xRS485, MODBUS RTU WEB, SNMP, MODBUS TCP	
Dig input / output	4 x relay 4 x dig. input	
Number of battery string	max. 4	
Mounting	DIN rail	

String Control Module MK / 1 per string		
Dimension w x h x d	120 x 115 x 22,5 mm	
Power supply	from control module	
Power consumption	max. 2 W	
Communication	RS485	
Dig input / output	1 x relay 2 x dig. input	
Number of cell per string	max. 250	
Number of temp . sensor	max. 4 / string	
Number of current probe	1 / string	
Mounting	DIN rail	

Measure Module MM201/203			
Dimension w x h x d	MM201 MM203	40 x 10 x 60 mm 40 x 10 x 70 mm	
Power supply	from measured battery		
Power consumption	< 50 mW		
Balancing current	MM201 MM203	max. 1.5 A max. 3 A	
Nominal voltage	3.2 V		
Voltage Range / resolution	0-4.5V / 5mV		
Temp. measure range / resolution	-25 to 75 °C / ± 2 °C		

Current Probe CP200/400/800 (IP - option)		
Dimension w x h x d	100 x 51 x 27 mm	
Power supply	from control module	
Power consumption	< 0.5 W	
Communication	RS485	
Nominal current range / resolution	± 200 A / 400 A / 800 A / 0.1 A	

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Temperature Sensor MT01-5/10 - option		
Dimension w x h x d	35 x 35 x 20 mm	
Power supply	from measure module	
Power consumption	< 0.1 W	
Temp. measure range	-25 to 75 °C (depends on type)	

Main features of the battery monitoring system BMSL

Monitoring

- Total voltage of each battery set
- Voltage of a particular cell of battery set
- Voltage balance on a particular cell of battery set
- Min / max cell voltage
- Max. charging and discharging currents of batteries
- Current balance of battery sets
- Cell temperature
- Battery ambient temperature
- Number of satisfactory / unsatisfactory cells
- Option: configuring control of mutual parameters among battery sets
- Option: monitoring of battery sets with a varying number of cells

Communication with a user:

- Alarm report
  - visually (LED)
  - alarm relay dry contacts
- Communication via serial interface RS485 – protocol MODBUS RTU
- Communication via standard net protocols – protocols MODBUS TCP, SNMP, WEB interface

Control:

- Locally by using display.
- Locally / remotely via Ethernet interface – WEB interface or MODBUS TCP

Software:

- Support of OS MS Windows XP, Windows 7 / 8 / 10

Operating temperature range:

- -25 °C to 55 °C

Protection:

- IP20
- If the location of the monitoring is in a room with open batteries, it is necessary to place the control unit and measurement modules into cabinets with IP54 and to use a CPxxxIP current probe.