



Battery Monitoring System for Lead-acid Batteries BMS

Operation of the monitoring system BMS is suitable for applications, which require monitoring of no-failure operation of batteries. Utilization of the battery monitoring system will offer the user information about an upcoming battery failure, prevent back-up system failures caused by poor battery condition and prevent destruction of an 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
- Option: monitoring of up to 4 independent battery sets
- Max. number of monitored cells / blocks for a single set is 250, dependent on nominal cell voltage
- Distributed measurement of cells / blocks
- Option: connect to an external graphic display
- Fully programmable measuring process
- Galvanic isolation of measuring
- Communication via RS485, simple connection of measuring modules also for longer distances
- User friendly interface
- Ability to view data in the monitoring software application for PC
- Option: clamping to DIN rail and subsequent embedding into a 19 " rack or possibility to be wall mounted



BMS monitoring system monitors and signals in the real time states of accumulator batteries, for example deep battery discharge, eventually discharging of single cells / blocks of the battery set, cells / blocks 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.

Battery monitoring system is fully autonomy working. Error entries as well informative one are stored in the internal memory of the control system what enables to the user also additionally analyse the conditions during the use of batteries.

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), temperature sensors (MT) and related number of connecting condanalyzuctors 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.



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Features of the battery monitoring system

Detects imminent battery failures

Typical battery problems like sulfation, corrosion, gassing, dry-out, thermal runaway are detectable given proper monitoring. Changes in voltage and temperature trend indicate onset of such issues.



Prevents thermal runaways

By means of an embedded dry contact output, the BMS system is capable of tripping the battery breaker in the event of a thermal runaway. Automatic stringwise battery disconnection is possible, given the presence of a relay, through tripping the battery breaker when user defined parameters are met.

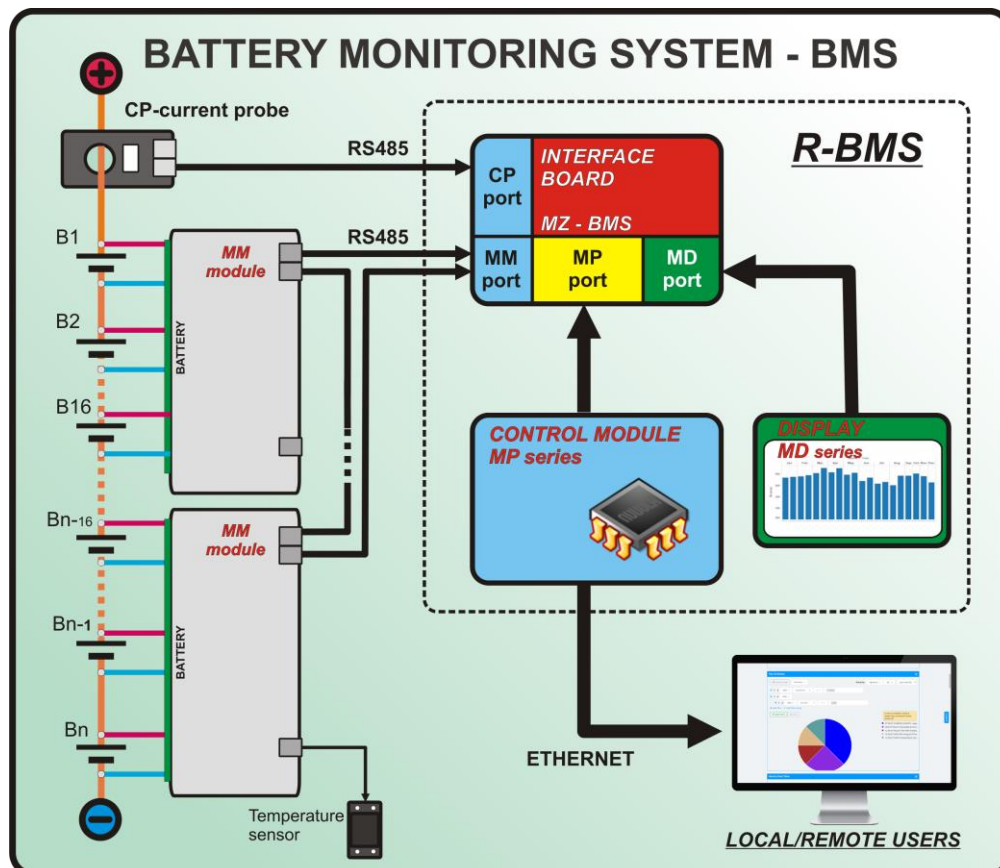
Identifies upcoming required battery replacement

By monitoring voltage trends, BMS allows the user to detect weak or damaged batteries in early stages of deterioration. Timely replacement of bad batteries is vital to improving the lifespan of the battery system as a whole.

Simpler maintenance

BMS improves the service quality by providing remote monitoring through Internet, VPN, or any network, that allows for the downloading of real time data and battery history. It is now possible to test batteries without going through the trouble of disconnecting them from the system. Maintenance and testing take place under real operating conditions and require no downtime!






BMS system block scheme





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Components of BMS 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 54, back IP20	
Mounting	on a 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	
Number of cells per string	max. 250	
Number of temp. sensors	max. 4 / string	
Number of current probes	1 / string	
Cover	IP20	
Mounting	DIN rail	
Measure Module MM06		
Dimension w x h x d	120 x 105 x 35 mm	
Power supply	from measured battery	
Power consumption	< 0.5 W	
Communication	RS485, galvanically isolated	
Nominal voltage / number of cells	2V/16cell 4V/8cell 6V/8cell 12V/4cell	
Temp. measure range / resolution	-25 to 100 °C / ±1 °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	
Temperature Sensor MT01-5/10		
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)	



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Main features of the battery monitoring system

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
- 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

User communication:

- 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 / 8,1 / 10

Operating temperature range:

- -25 °C to 55 °C

Protection:

- IP20
- If the location of the monitoring system 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.