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BTMS - Battery Monitoring System

BTMS is a battery monitoring system for larger UPS systems. Enables:

- cell status monitoring
- equalization of cell load within the string
- switching off strings where an error is detected on at least one cell

Dictionary of terms and abbreviations

BTMS	Batery Monitoring System	Battery monitoring system for larger UPS systems.
battery	-	Lead-acid rechargeable battery stores electricity to operate the UPS during a power outage.
cell	-	Basic battery building. A battery usually consists of several cells connected in series.
string	-	Multiple batteries connected in series.
UPS	Uninterruptible Power Supply	A device that provides battery backup when the electrical power fails or drops to an unacceptable voltage level.
BM-AG	BTMS Aggregator	When several BM-GW's are needed at the Datacenter, aggregate all BM-GW and provide site functionality + Cloud connectivity and alarming.'
BM-GW	BTMS Gateway	Visualization (browser) of batteries and installed systems connected to the GW logically grouped into strings and UPS's in real time and their historical data. Alarming, Cloud connectivity
SCADA	3rd party SCADA	Any SCADA that accesses battery, stringig and/or UPS data via Modbus TCP/IP protocol.
PC web	PC with WEB Browser	Viewing the user interface from BM-AG or BM-GW via any web browser.
BM-MC	BTMS Master Controller	It allows the connection of BM-TH sensors and configurable digital inputs for monitoring additional alarm signals and outputs for alarming or switching off strings where an error occurs.
BM-HMI	BTMS Human-Machine Interface	Local display of the state of the batteries inside the UPS, string and by battery.
CAD	BTMS HMI interface	Communication interface for connecting BM-HMI to BM-CS
BM-LC	BTMS IO Module	Expansion for MC with additional digital inputs and outputs.
BM-TH	BTMS Temperature and Humidity sensor	Ambient temperature and relative humidity sensor.
BM-GS	BTMS Insulation monitoring sensor	String insulation resistance monitoring

BM-SS	BTMS String Master	It monitors the string (string current), aggregates battery data (total string voltage, average SOC, Balance) and enables monitoring of data from BM-CSs.
BM-HS	BTMS Hall Sensor	It measures the string current
BM-CS	BTMS Cell / Battery Sensor	Control of each individual battery / cell. It allows monitoring the status, voltage, internal resistance, temperature of the cell and calculates SOC and SOH.
SOC	State Of Charge	Calculated battery charge; it is calculated from the actual voltage on the battery and by integrating the charge and discharge current.
SOH	State Of Health	Informative battery state calculation that takes into account internal resistance, battery temperature, rise/fall of voltage during charge/discharge and other parameters that affect battery performance.
Balance	Voltage balance within string	Calculation of voltage inequality on the batteries within the string. Battery sensors can actively equalize the voltage between the batteries within the string during the floating charge phase.

System diagram

Wiring diagram