

Battery Enterprise Monitoring System

► Main Features

<ul style="list-style-type: none"> • Fully embedded TCP/IP and Web server • RS485 ports for communication to other sensors to detect Battery voltage , resistance , current and temperature or measure ripple voltage and current (optional) • Monitor parameters during charging & discharging environments <ul style="list-style-type: none"> - Block voltages, String voltages in Realtime - String currents in Realtime - Manually or automatically test internal resistances (~15 days at maximum) • Built in 2 ports dry contact sensor and 4 ports Relay output • Touch screen color display , LED and Buzzer • User login for better security • Battery backed up time of real-time clock and network time synchronization for an accurate system date and time. • SD card logging features for data and event alarm with timestamp • Send alarm details to certain users by emails (optional) • Send alarm details to certain users by LINE messages (optional)
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<ul style="list-style-type: none"> • A standalone product without any external hardware and software dependencies. • Micro code firmware update over Ethernet. • Internal resistance testing to indicate state of health (SOH) of battery • State of charge (SOC) estimation from Watt-Hour charging /discharging counting method • Suitable for Lead Acid or Ni-Cd • Estimate remaining time when battery backup • Optional sensors: <ul style="list-style-type: none"> - Float current sensor - Leakage current sensor - Pilot temperature sensor - Electrolyte level sensor - Hydrogen gas detector

► Benefits

<ul style="list-style-type: none"> • Access to Battery Monitoring System from any PCs on the same network • No Client application required
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<ul style="list-style-type: none"> • Improve reliability • Reduce man hours • Automated-alarm features

► LCU Specifications

Measurement Inputs	
• Network Interface	10/100 Mb Ethernet RJ-45 Compliant with IEEE-802.3-2002
• Power Supply	Voltage 48 VDC
• Inputs port	2 sets of 0-5V dry contact input
• Output port	4 sets of Relays contact
• Sensors port	- RS485 communication to Data Gathering Unit (DGU)

• LCD Display	4.3" 480x272 color LCD-TFT With capacitive touch screen
• Status Indicators	Green LED for Power/network connectivity Buzzer: keypad and Alarm notification
• Protocols	HTTP Server, Modbus TCP/IP SNTP (Simple network time protocol) MQTT Client, HTTP Rest (optional)
• Storage	SD Card

Sensors

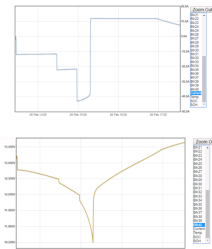
Data Gathering Unit (DGU) RI



- Up to 24 Blocks of Voltage, Resistance / module
- 1 channel Current sensor (Charge / Discharge)
- 1 channel Current sensor (Float or Ground Leakage)
- 1 channel Temperature sensor (Ambient or Pilot)
- 1 channel Temperature sensor (Pilot)
- Expandable up to 16 modules
- Optinal: Ripple voltage, Ripple current

• Nominal Voltage	2V model: 1.2V / 2V 12V model: 4V / 6V / 8V / 12V
• Voltage	Range: 0-3V (2V), 0-18V (12V) Accuracy: 0.1% Resolution: 0.001V
• Current	Range: ±300A - 1000A Accuracy: 0.2% + sensor error Resolution: 0.1A
• Temperature	Range: 0-80°C Accuracy: ±1°C@25°C Resolution: 0.1°C
• Resistance	Range: 10 mΩ (2V), 37.5 mΩ (12V) Accuracy: ±2% Resolution: 0.001 mΩ (2V), 0.005 mΩ (12V)

Local Control Unit (LCU)



- Hardware**
- Touchscreen Display
 - Alarm LED Status
 - Dry Contact
 - Alarm Outputs

Data Logging

- LCU
 - Data log Up to 2 Million Records
 - Event log Up to 2 Million Records
 - Alarm sound
- BMS Server
 - SQL Express (Maximum Capacity 10GB)
 - Data log ~5 Million records on estimate
 - Event log ~5 Million records on estimate
 - SQL Server Enterprise Edition (Maximum Capacity 524 PB)
 - 2 Billion Records
 - 2 Billion Records

*Recording Interval are customizable (up to every 5 sec.)

Current sensor (Charge / Discharge current)

- Current Sensor**
- Closed loop hall effect
 - Maximum current 1000A
 - Linearity ± 0.1%
 - Accuracy ± 0.7%

Software Features

Software Features	Software Features
<ul style="list-style-type: none"> • Features 	<ul style="list-style-type: none"> • Environment
- View on web browser: Chrome recommended	- Operating System: Windows 7, 8, 10, Server
- Chart Integrated Design	- Web Server: Internet Information Service
- Realtime Monitoring: Voltage, Current, Temperature, Internal Resistance (optional)	- Database Engine: SQL Server
- Historical Display: Voltage, Current, Temperature, Internal Resistance (optional)	- Frame work: .Net 4.0
- Report generating service (PDF, Excel)	
- Email / LINE Notification (optional)	
- User classification: Admin, Viewer	

System Layout

