

# Battery Enterprise Monitoring System

## ► Main Features

• Fully embedded TCP/IP and Web server
• RS485 ports for communication to other sensors to detect battery voltage, resistance/impedance, current and temperature or measure ripple voltage and current (optional)
• Monitor parameters during charging & discharging environments
- Block voltages, Block temps, String voltages in Realtime
- String currents in Realtime
- Manually or automatically test internal resistances /impedance (~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 (optional)

• A standalone product without any external hardware and software dependencies.
• Micro code firmware update over Ethernet.
• Internal resistance/impedance 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:
- Float current sensor
- Leakage current sensor
- Pilot temperature sensor
- Hydrogen gas detector
- Electrolyte level sensor
- Inter connection resistance

## ► Benefits

• Access to Battery Monitoring System from any PCs on the same network
• No Client application required

• Improve reliability
• Reduce man hours
• Automated-alarm features

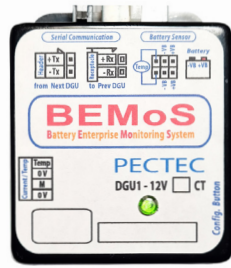
## ► LCU Specifications

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) IEC61850 (optional) MQTT Client, HTTP Rest (optional)
• Storage	SD Card

► Sensors

• Data Gathering Unit (DGU1-12V)

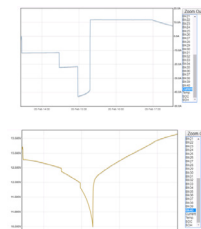


• <b>Model</b>	- DGU1-12V : Battery Voltage, Impedance/Resistance and Temperature - DGU1-12VCT : Battery Voltage, Impedance/Resistance, Temperature, Room Temperature and String Current
• <b>Nominal Voltage</b>	12 V.
• <b>Voltage</b>	Range: 1-18 V. Accuracy: 0.1% Resolution: 0.001V.
• <b>Temperature</b>	Range: 0-80°C Accuracy: ±1°C@25°C Resolution: 0.1°C
• <b>Impedance/Resistance</b>	Range: 40 mΩ Accuracy: ±2% Resolution: 0.005 mΩ
• <b>Communication</b>	Opto-isolated serial communication at each DGU (connect to LCU via 485 converter module)

• <b>Expandable up to 256 modules</b>	
• <b>LED</b>	Green (Normal), Red (Fault) Blinking (received and send data)
• <b>Supply (+VB, -VB)</b>	Voltage: 5-18 Vdc. Normal Current: < 10 mA. (average)
• <b>Room Temperature*</b>	Range: 0-80°C Accuracy: ±1°C Resolution: 0.1°C
• <b>Current*</b>	Range: ±300A. - 1000A. Accuracy: 0.5% + sensor error Resolution: 0.1A.
• <b>Ripple voltage, Ripple current (Optional)</b>	

(\*) for model DGU1-12VCT

• Local Control Unit (LCU)



<b>Hardware</b>
• Touchscreen Display
• Alarm LED Status
• Dry Contact
Alarm Outputs

<b>Data Logging</b>	
• <b>LCU</b>	
- Data log	Up to 2 Million Records
- Event log	Up to 2 Million Records
- Alarm sound	
• <b>BMS Server</b>	
- 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 $\pm 0.1\%$
• Accuracy $\pm 0.7\%$

## ► Software Features

Software Features
• Features
- View on web browser: Chrome recommended
- Chart Integrated Design
- Realtime Monitoring: Voltage, Current, Temperature, Internal Resistance/Impedance
- Historical Display: Voltage, Current, Temperature, Internal Resistance/Impedance
- Report generating service (PDF, Excel)
- Email / LINE Notification
- User classification: Admin, Viewer

Software Features	
• Environment	
- Operating System	Windows 7, 8, 10, Server
- Web Server	Internet Information Service
- Database Engine	SQL Server
- Frame work	.Net 4.0

