

# CELLGUARD GEN-3 BATTERY MONITORING SYSTEM



CELLGUARD  SYSTEM



GRID SOLUTIONS

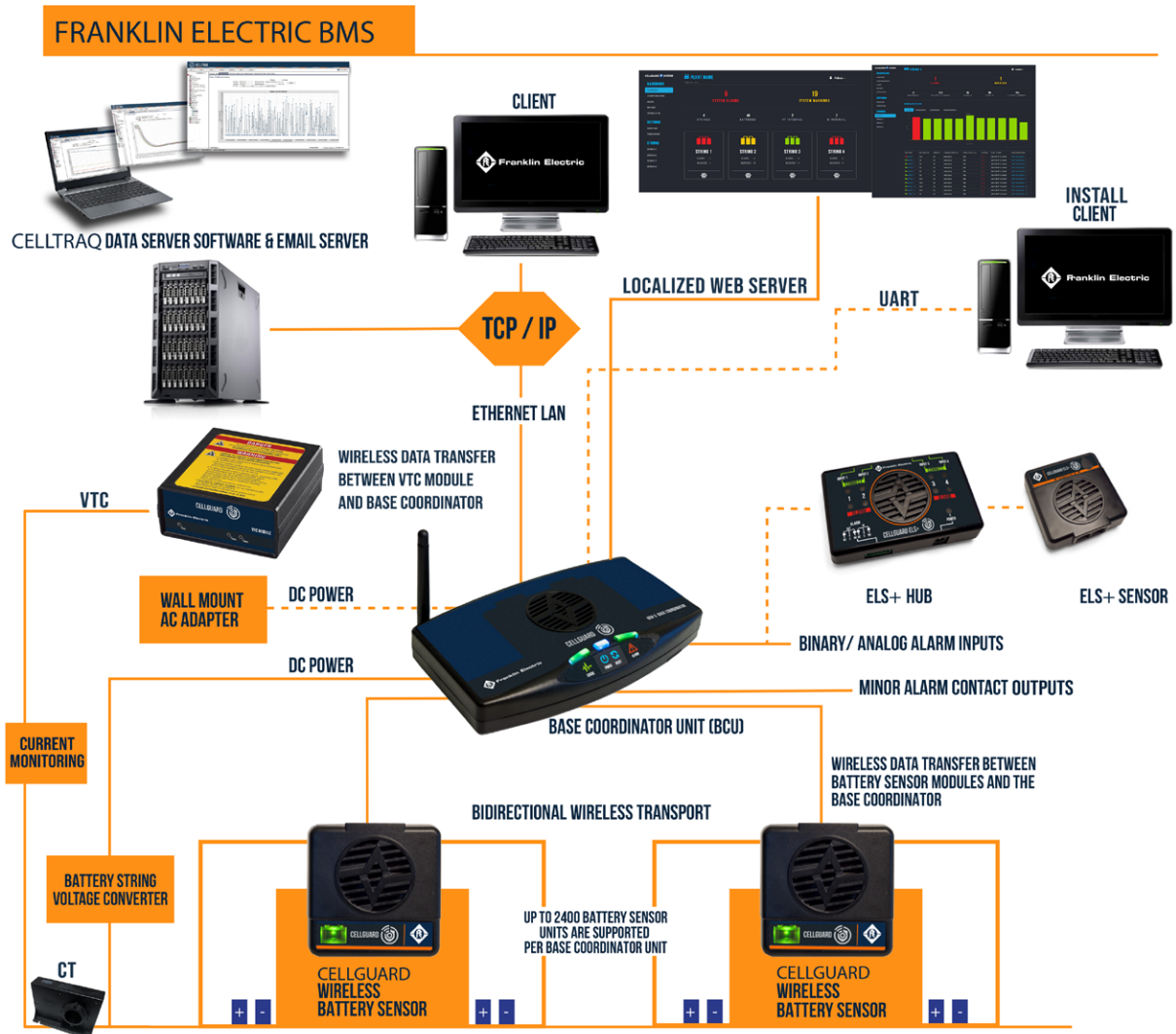
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# CELLGUARD GEN-3 BATTERY MONITORING SYSTEM

## SYSTEM ARCHITECTURE



# CELLGUARD GEN-3 BATTERY MONITORING SYSTEM

## BASE COORDINATOR UNIT (BCU)



### FEATURES

Supports up to 10 strings with 240 batteries per string
Network communications
Modbus over TCP/IP
DNP3 Communications
Embedded Internal Web Server
Field upgradable software
WiFi/cellular enabled
Two ambient temperature sensors
String voltage capture (Sum of Batteries)
Discharge data collection and reporting
Remote network configuration
Field hardware commissioning
External Alarm Dry Contacts – Utilized with ELS System
Capture String & Battery data, report it to Celltraq at scheduled frequency



### SPECIFICATIONS

Battery Strings: 1-10
Batteries per String: 1-240
Battery Voltage Test Interval Range: 1 – 24 hrs
Battery Conductance Test Interval Range: 1 – 30 days
Power Input: 9-12VDC @ 800mA
Operating Temperature: 0°C - 65°C
Storage Temperature: -10°C - 80°C
Processor: Quad Core @ 1250MHz
RAM: 1Gb SDRAM @ 400Mhz
Storage: 16GB micro SD card
4 X USB Type A: 2.0
UART: Baud Rate: 57.6Kbps; Data Bits: 8; Parity Bit: None; Stop Bit: 1
Ethernet: RJ45; 10/100Mbps; Auto-Negotiate; 802.3 Compliant
Analog Alarm Input: 0VDC – 10VDC
Binary Alarm Input: 5VDC - 24VDC or Dry Contact
Major/Minor Alarm Output: Close/Open Form C Dry Contacts
Wireless RF Radio Band: 802.15.4 compliant; 2.4 GHz @ 8mW (6.3dBm)
Modbus: Ethernet TCP/IP UDP
Regulatory Compliance: FCC, CE, RoHS, IEEE
Physical Dimensions: L:7.80in, W:4.47in, H:1.44in



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# CELLGUARD GEN-3 BATTERY MONITORING SYSTEM

## WIRELESS BATTERY SENSOR

### FEATURES

One sensor per cell/jar
2V, 6V, 8V, 12V
Sensors capture voltage, temperature, & conductance
Strap Resistance Monitoring (UPS & Utility Applications)
Mesh routing communication
Quick, fully hot swappable sensor and/or wiring harness
Field upgradable firmware
Compatible with VRLA and VLA batteries
Patented conductance technology
Non-Invasive to the battery
Accurate battery state-of-health results
Wireless system, minimizes wiring, installation costs & maintenance



### SPECIFICATIONS

Wireless RF Radio Band: 802.15.4 compliant; 2.4 GHz @ 8mW (6.3dBm)
Wireless RF Range: 0 - 30m
Operating Temperature: 0°C - 65°C
Storage Temperature: -10°C - 80°C
Test Current Draw: 1100 - 4500 mA depending on Battery Float Voltage
Regulatory Compliance: FCC, CE, RoHS, IEEE
Voltage Resolution: 1mV
Conductance Resolution: 1Ω
Physical Dimensions: 2.63in L, 2.64 in W, 1.06 in H

	VOLTAGE		CONDUCTANCE		TEMP @ NEGATIVE POST		RESISTANCE		IDLE CURRENT
PART NUMBER	MEASURED RANGE	ACCURACY	MEAS. RANGE PER CELL	ACCURACY	MEASURED RANGE	ACCURACY	MEASURED RANGE	ACCURACY	MEASURED RANGE
CGS3-02V	1.75 - 2.50 VDC	+/- 20mV	100 - 15,000Ω	+/- 3%	-10°C - +65°C	+/- 2°C	N/A	N/A	70 - 80mA
CGS3-12V	10.50 - 15.0 VDC	+/- 20mV	100 - 4,200Ω	+/- 3%	-10°C - +65°C	+/- 2°C	N/A	N/A	50 - 60mA
CGS3-100-2V	1.75 - 2.50 VDC	+/- 20mV	100 - 15,000Ω	+/- 3%	-10°C - +65°C	+/- 2°C	2 - 1,000 μΩ	+/- 20 μΩ	70 - 80mA
CGS3-6V-12V	6.50 - 14.50VDC	+/- 20mV	4,200 - 8,000Ω	+/- 3%	-10°C - +65°C	+/- 2°C	2 - 1,000 μΩ	+/- 20 μΩ	50 - 60mA



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# CELLGUARD GEN-3 BATTERY MONITORING SYSTEM

## VOLTAGE, TEMPERATURE, CURRENT (VTC) UNIT



### FEATURES

- String current & ripple current monitoring
- String level monitoring module
- Measurements include voltage, current, ripple current
- Field upgradable firmware
- Compatible with battery string configurations commonly found in telecommunications, power utility, and UPS applications between 18-480VDC nominal
- Powered by the battery string, eliminating the need for an external power source

### SPECIFICATIONS

- Wireless RF Radio Band: 802.15.4 compliant; 2.4 GHz @ 8mW (6.3dBm)
- Operating Temperature: 0°C - 65°C
- Storage Temperature: -10°C - 80°C
- Regulatory Compliance: FCC, CE, RoHS, IEEE
- Physical Dimensions: L:4.00in, W:2.50in, H:1.09in
- Wireless RF range: 0 - 30m
- Resolution: 1A

PART NUMBER	VOLTAGE INPUT	ACCURACY	CURRENT RANGE	ACCURACY
CGVTC2-60	20 - 70 VDC	+/- 3%	5 - 200 A	+/- 3% +/- 2A
CGVTC2-300	90 - 300 VDC	+/- 3%	5 - 200 A	+/- 3% +/- 2A
CGVTC2-600	300 - 600 VDC	+/- 3%	5 - 200 A	+/- 3% +/- 2A



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# CELLGUARD GEN-3 BATTERY MONITORING SYSTEM

## POWER OPTIONS



### WALL PLUG SPECIFICATIONS

Input Voltage Rating: 100 - 240 Vac, 50 - 60 Hz

Input Voltage Range: 90 - 264 Vac

Output Voltage: 9 Vdc

Output Current: 0.8A

No Load Power (stand by): <100mW

Power Efficiency: >80.01%

Temperature Range: 0 to +40° C at full load

ETL: 4002961 conforms to UL STD: 60950 1

EMI standard: FCC part 15 class B

Over voltage and short circuit protected



### TELCO DC-DC CONVERTER SPECIFICATIONS

Input Voltage Range: 42 - 65 Vdc

Output Voltage: 12 Vdc +/-1% Load Regulation

Output Power: 10 Watts Max

Power Consumption: 1.8 Watts Typical

Supply voltage (Vdc): ±15 to ±18

Isolation Voltage: input to output for 1 minute 1500 Vac

Power Efficiency: 86% Typical

Temperature Range: -40 to 85° C

Safety and Protections: Fused String Power Cable assembly

Dimensions: 3.972 in L x .876 in H x 0.6 in W



### UTILITY/UPS DC-DC CONVERTER SPECIFICATIONS

Input Voltage Range: 100-1000 Vdc

Output Voltage: 12 Vdc

Output Power: 15 Watts Max

Power Consumption: 1.8 Watts Typical (when combined with CGBC-250)

Power Efficiency: 77% Typical

Over Voltage Protection: 12 Vdc output model 15 Vdc

Isolation Voltage: input to output for 1 minute 4000 Vac

Operating Temperature: -40 to 70° C

Safety and Protections: Fused String Power Cable assembly

Dimensions: 96.10 x 54.00 x 36.60 [3.783 x 2.126 x 1.441 inch]



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## CURRENT TRANSDUCERS



### CT SPECIFICATIONS

Nominal current (In): $\pm 1000$ A
Current range: 0 to $\pm 1500$ A
Output current (IM): 200 mA
Overall accuracy at 25°C: $\pm 0.5\%$ of In
Supply voltage (Vdc): $\pm 15$ to $\pm 18$
Current consumption: 20 mA + output current
Zero current offset at 25°C: $< \pm 0.2$ mA
di / dt: better than 50A/ $\mu$ s
Solid-Core Closed loop Hall effect current sensor
Primary through hole: 1.57" (40 mm) diameter



### LEM CT SPECIFICATIONS

Nominal current (In): $\pm 500$ A
Current range: 0 to $\pm 1000$ A
Vout Output voltage (Analog): $\pm 4$ V
Supply voltage (Vdc): $\pm 12$ to $\pm 15$ V
Current consumption: 20 mA + output current
Overall accuracy at 25°C: $\pm 0.5\%$ of In
Electrical offset voltage: $I_p = 0$ , $T_A = 25^\circ\text{C}$ mV
Response time: $< 10$ $\mu$ s
di/dt accurately followed: 50 A/ $\mu$ s
Split-Core Open loop Hall effect transducer
Primary through hole: 104 X 40 mm

# CELLGUARD GEN-3 BATTERY MONITORING SYSTEM

## LOCALIZED WEB SERVER



### FEATURES

Localized data storage, data access and management
Review of information & safeguarded historical data
Display battery voltage, conductance and temperature
Display String current data
Display Ambient temperature data
Display strap resistance data (UPS / Utility application)
Instant indication of battery asset conditions
Individual battery discharge data
System-derived notification of battery faults in real time
Measurements are captured, recorded and time-stamped
Automated PDF system reports
Field upgradable firmware



### SPECIFICATIONS

Multi-Browser localized access on Port 3000
8GB Micro SD card data storage
MySQL database
Apache Web Server



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# CELLGUARD GEN-3 BATTERY MONITORING SYSTEM

## CELLTRAQ ENTERPRISE BATTERY ASSET MANAGEMENT



### FEATURES

Server based architecture
Centralized data storage, data access and management
Review of information & safeguarded historical data
Instant indication of battery asset conditions
System-derived notification of battery faults in real time
Suggested corrective actions for technicians
Automated reports delivered via email
Corrective action and audit trail record keeping
Graphical representation of battery system trends
Centralized repository of battery information
Displays and produces formatted reports
Measurements are captured, recorded and time-stamped
SNMP Trap Notification
Automated PDF system reports

### HARDWARE/SOFTWARE MINIMUM REQUIREMENTS

Windows 2012, 2014, 2016, Server O.S., Windows 10 O.S.
SQL 2014, 2016
2 cores CPU with 8GB of Ram and 50GB Memory
.Net Framework 4.0
Java 8 (JRE8)
Apache Tomcat Web Server (Provided by Franklin Electric)
TCP/IP enabled



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