

PEACE OF MIND 24 / 7 / 365



CELLGUARD **SYSTEM-GEN-3 TELCO**

BATTERY MONITORING SOLUTION

WITH PATENTED WIRELESS COMMUNICATIONS ARCHITECTURE

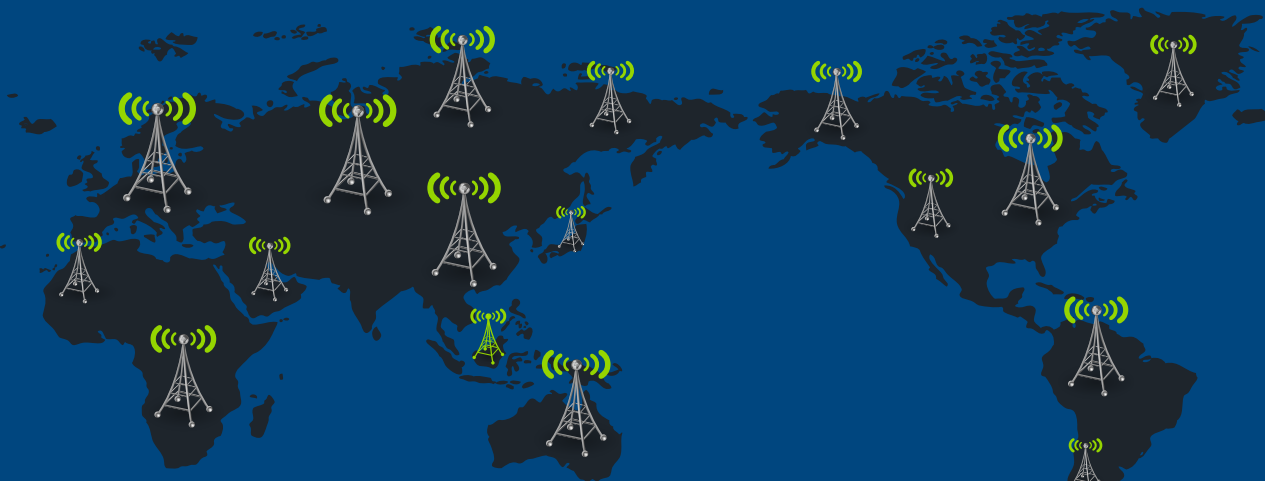
Uptime is a requirement in today's connected world. Power systems rely on batteries to provide critical back up energy. Deploying a Midtronics battery monitoring solution ensures your batteries will perform as expected.

Midtronics **CELLGUARD™ SYSTEM-GEN-3 TELCO** combines wireless communication with patented, field-proven battery conductance analysis technology. **CELLGUARD™ SYSTEM-GEN-3 TELCO** lowers total cost of ownership while providing the most thorough and easy to access stationary battery health diagnostics.

MIDTRONICS

 Stationary Power

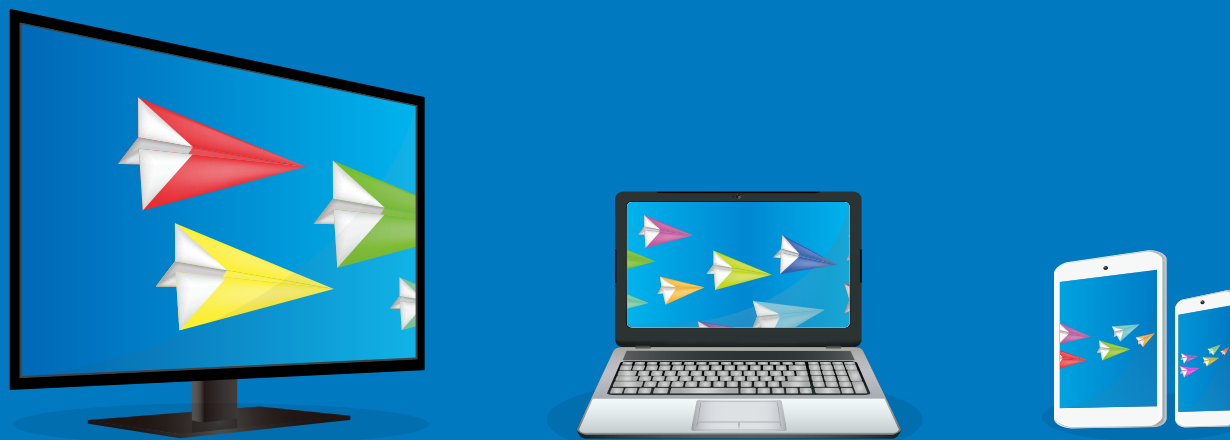
UPTIME IS A REQUIREMENT IN TODAY'S CONNECTED WORLD.



Dependency on network continuity is only going to increase in the future. For consumers, business owners and institutions, the network is a constant running lifeline.

BUSINESSES CANNOT AFFORD AN OUTAGE

Many factors can stress power system integrity, from natural disasters to human error. When power is lost, mission critical back-up systems must perform. Without the proper surveillance of mission critical system status, there is a risk of catastrophic loss for healthcare organizations, financial institutions or any key service providers. Furthermore, customer satisfaction can be compromised resulting in far reaching financial impact.



SYSTEM INTEGRITY IS A MUST

Telecom service providers have designed the traditional wire-line telecom and wireless network systems for high service availability, and that reliability depends on the availability of power from the battery plant.

The deployment of **CELLGUARD SYSTEM-GEN-3 TELCO** supports that reliability through efficient and effective assessment of battery performance and condition.

CELLGUARD SYSTEM-GEN-3 TELCO combines patented wireless communication with field-proven battery conductance analysis technology to provide proactive battery health monitoring. Further, it lowers total cost of ownership by identifying early stage battery degradation, eliminating emergency battery replacement and reducing energy expense.

BASE COORDINATOR UNIT (BCU)



BACK

FRONT

SINGLE BATTERY SENSOR MODULE



APPLICATION COMPATIBILITY

- Telecommunications systems (24, 36 and 48 Volt nominal systems)
- Any DC systems with filtered AC electrical ripple

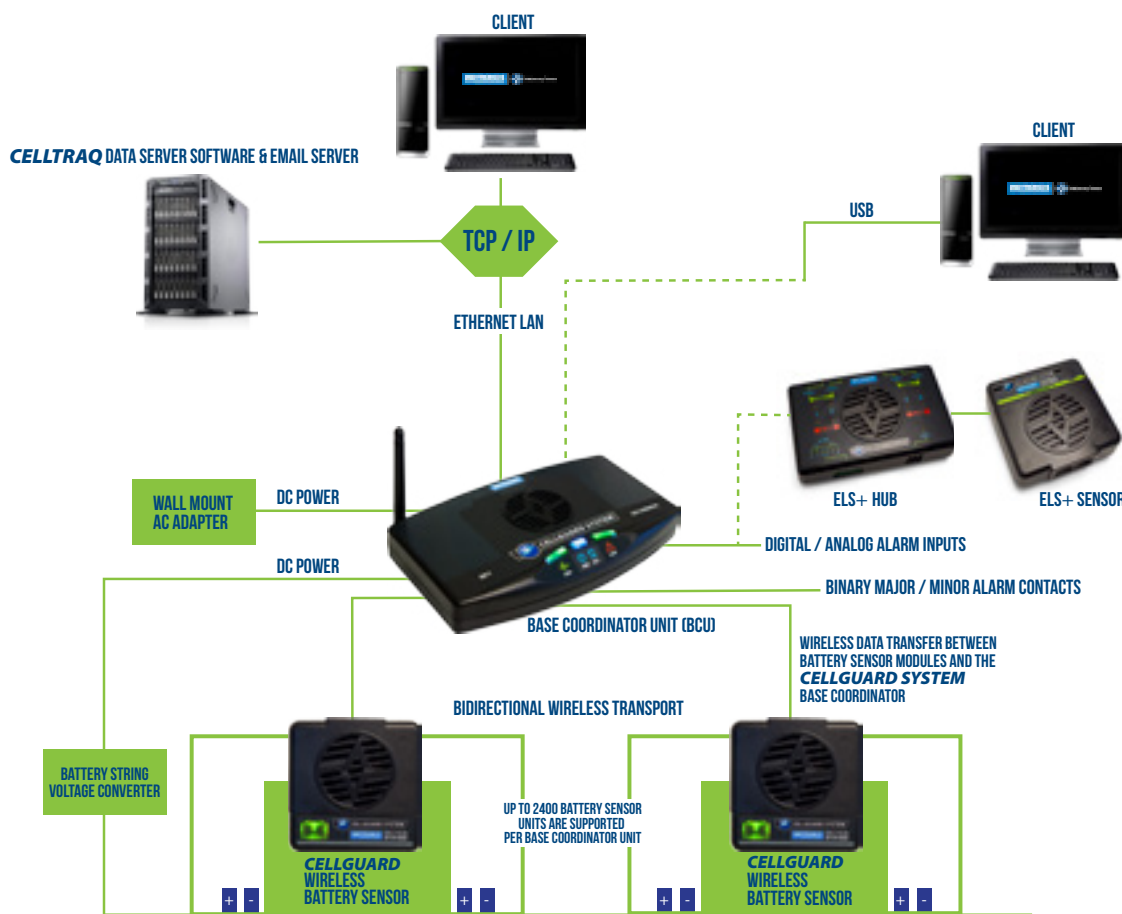
BASE COORDINATOR UNIT (BCU)

- Manages battery sensor test activities
- BCU monitors up to 10 battery strings, with 2400 total batteries, and supports up to 240 batteries per string
- Collects test data and communicates with **CELLTRAQ** server via TCIP/IP
- Captures battery voltage temperature and conductance
- Powered by the battery string voltage converter via battery string power

SINGLE BATTERY SENSOR MODULE

- Battery level monitoring module includes Conductance, Voltage, and Temperature for each mono-block/cell /jar
- Sensors are compatible with VRLA and VLA batteries
- Test circuitry utilizes patented Conductance technology to provide the most accurate, efficient, and non-invasive method possible for monitoring a battery's state of health
- Designed to work within telecommunications applications
- Connects to and is powered from the monitored battery, minimizing wiring, installation costs and maintenance

MIDTRONICS BMS



FEATURES AND BENEFITS

- Provides accurate and reliable indication of battery state of health through monitoring and analysis of battery voltage, temperature, and conductance
- Detects specific battery deterioration and battery string failures, and provides automatic alarms via dry alarm contacts
- Collects and analyzes battery health indicators to provide detailed battery health status reports
- Eliminates the manual time and cost consuming maintenance programs with programmed battery performance testing and reporting through the WEB/Intranet
 - **CELLGUARD SYSTEM-GEN-3 TELCO** provides local application access with real-time testing control and immediate battery health information
- Battery state of health indicators are reported to a remote server with one way outgoing email, without compromising security of the local area network
- Lowers cost of ownership from installation to its product life cycle
 - Wireless sensors reduce time and cost of installation and maintenance
 - **CELLGUARD SYSTEM-GEN-3 TELCO** eliminates the need for dedicated computers to monitor each batter cabinet

VISUAL BATTERY STATE OF HEALTH



BLINKING GREEN:

When the LED indicator is blinking GREEN, this indicates no issues with the battery.



BLINKING YELLOW:

When the LED indicator is blinking YELLOW, this is a warning that the battery readings are out of warning limits.



BLINKING RED:

When the LED indicator is blinking RED, this is an alarm that the battery readings are out of alarm limits.

USER INTERFACE AND REMOTE ACCESSIBILITY



CELLTRAQ

ENTERPRISE BATTERY ASSET MANAGEMENT



CELLTRAQ software is a network based solution that allows quick and easy access to battery system data. The server that hosts the software can be setup to be accessible from anywhere on your network, or on the web. Multi-user access control allows you to customize the views and functionality available to each user. Once connected, users will have access to the most comprehensive battery diagnostic tools available in the industry.

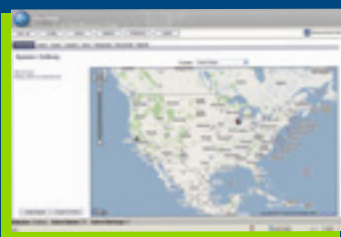


Figure 1. User interface—an organized approach to managing sites/locations



Figure 2. An example of graphical data output

| Ongoing Measurement Report | | | | | |
|----------------------------|-----------|--------------|--------------|---------------|----------|
| Report Date: 01/04/2017 | | Version: 1.0 | | Customer: 100 | |
| Site ID | Site Name | Manufacturer | Model Number | Battery Type | Capacity |
| 01-000001 | 01-000001 | AGC | AGC-1000 | AGC | 1000 |
| 01-000002 | 01-000002 | AGC | AGC-1000 | AGC | 1000 |
| 01-000003 | 01-000003 | AGC | AGC-1000 | AGC | 1000 |
| 01-000004 | 01-000004 | AGC | AGC-1000 | AGC | 1000 |
| 01-000005 | 01-000005 | AGC | AGC-1000 | AGC | 1000 |
| 01-000006 | 01-000006 | AGC | AGC-1000 | AGC | 1000 |
| 01-000007 | 01-000007 | AGC | AGC-1000 | AGC | 1000 |
| 01-000008 | 01-000008 | AGC | AGC-1000 | AGC | 1000 |
| 01-000009 | 01-000009 | AGC | AGC-1000 | AGC | 1000 |
| 01-000010 | 01-000010 | AGC | AGC-1000 | AGC | 1000 |
| 01-000011 | 01-000011 | AGC | AGC-1000 | AGC | 1000 |
| 01-000012 | 01-000012 | AGC | AGC-1000 | AGC | 1000 |
| 01-000013 | 01-000013 | AGC | AGC-1000 | AGC | 1000 |
| 01-000014 | 01-000014 | AGC | AGC-1000 | AGC | 1000 |
| 01-000015 | 01-000015 | AGC | AGC-1000 | AGC | 1000 |

Figure 3. Printed report output

CELLGUARD SYSTEM-GEN-3 TELCO

SPECIFICATIONS

Battery Level Measurements

Conductance:

2V Sensor Range: 100 to 15K Siemens (Mhos)

12V Sensor Range: 100 to 4.2K Siemens (Cell-Mhos)

Test current:

2V Sensor Range: 1.5 AMP RMS @ 2.25 V Typical

12V Sensor Range: .7 AMP RMS @ 13.5 V Typical

Voltage: 2V/12V Battery Accuracy: +/- 20 mv

Temperature (negative post):

Range: 0°C to +65°C

Accuracy: +/- 2°C

Communication Interfaces

Ethernet-TCP/IP @ 100 Mbps

4x USB-A

USB-B virtual comport (57.6 kps)

Alarm Outputs

Major Alarm Output: Form C Binary / Dry Contact

Minor Alarm Output: Form C Binary / Dry Contact

Alarm Inputs

2 Binary Alarm Inputs (Dry Contact)

2 Analog Alarm Inputs (0 to +10 V Range)

Wireless Architecture

Communication between BCU and Sensors is IEEE 802.15.4

Compliant RF transport @ 2.4 GHz

Sensor Transmit Power: 8mW (6.3dBm)

BCU Transmit Power: 8mW (6.3dBm)

Power Requirements

Base Coordinator Unit Module: Powered by battery string voltage converter, or 9V DC wall plug adapter(optional)

Battery String Voltage Converter: Powered from the battery string (CGBC-DC 60)

Sensor Power:

Powered from the monitored mono-block / cell / jar

2V Sensor Voltage: 1.75V to 2.5V

12V sensor Voltage: 10.75V to 15.0V

String / Sensor Configuration:

Max number of strings: 10

Max number of sensors per string: 240

Max number of total sensors: 2400

Protection

Sensor (2 V & 12 V): Test load and power paths are fused

Battery String Voltage Converter: Power leads fuse protected

Environmental

Regulatory Compliance: FCC, CE, RoHS, WEEE compliant

Temperature

Operating Temperature: (0°C to +65°C)

Storage Temperature: (-10°C to +80°C)

Physical Dimensions

Base Coordinator Unit:

7.802 in L, 4.472 in W, 1.443 in H

191.18 mm L, 113.6 mm W, 36.65 mm H

Battery String Voltage Converter:

4.006 in L, 2.5000 in W, 1.094 in H

101.6 mm L, 63.5 mm W, 27.79 mm H

Wireless Battery Sensor:

2.635 in L, 2.646 in W, 1.066 in H

66.92 mm L, 67.21 mm W, 27.08 mm H



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