



Eaton Cellwatch battery monitoring system

Prevent costly downtime

Businesses that rely on technology for their day-to-day operations cannot afford to risk even a split second of downtime.

Despite advances in UPS technology, one truth remains the same: when the power fails, the UPS needs to draw its power from banks of lead acid batteries to feed the critical load until it is able to switch to standby generators. It is well understood that batteries are the most vulnerable part of any UPS and that battery failure is a leading cause of power-related downtime. The more customers know about their batteries, and the more detailed and current that information is, the better their chances of heading off disaster.

Eaton® Cellwatch is an automated battery monitoring system for large-scale installations where power and system availability are critical to successful business operations. Cellwatch is a powerful tool in mitigating and preventing costly downtime due to unexpected battery failure.

Daily battery monitoring increases system reliability

Cellwatch is designed to protect you daily. Cellwatch delivers prompt notification of your vulnerability—giving you peace of mind, ensuring business continuity and safeguarding company assets. Cellwatch often detects failures months before a battery would become an operating risk.

Cellwatch prevents unplanned outages by:

- Allowing you to quickly identify and isolate battery issues well before a failure occurs
- Providing an unprecedented view into the daily health and current status of your batteries with easy-to-use data

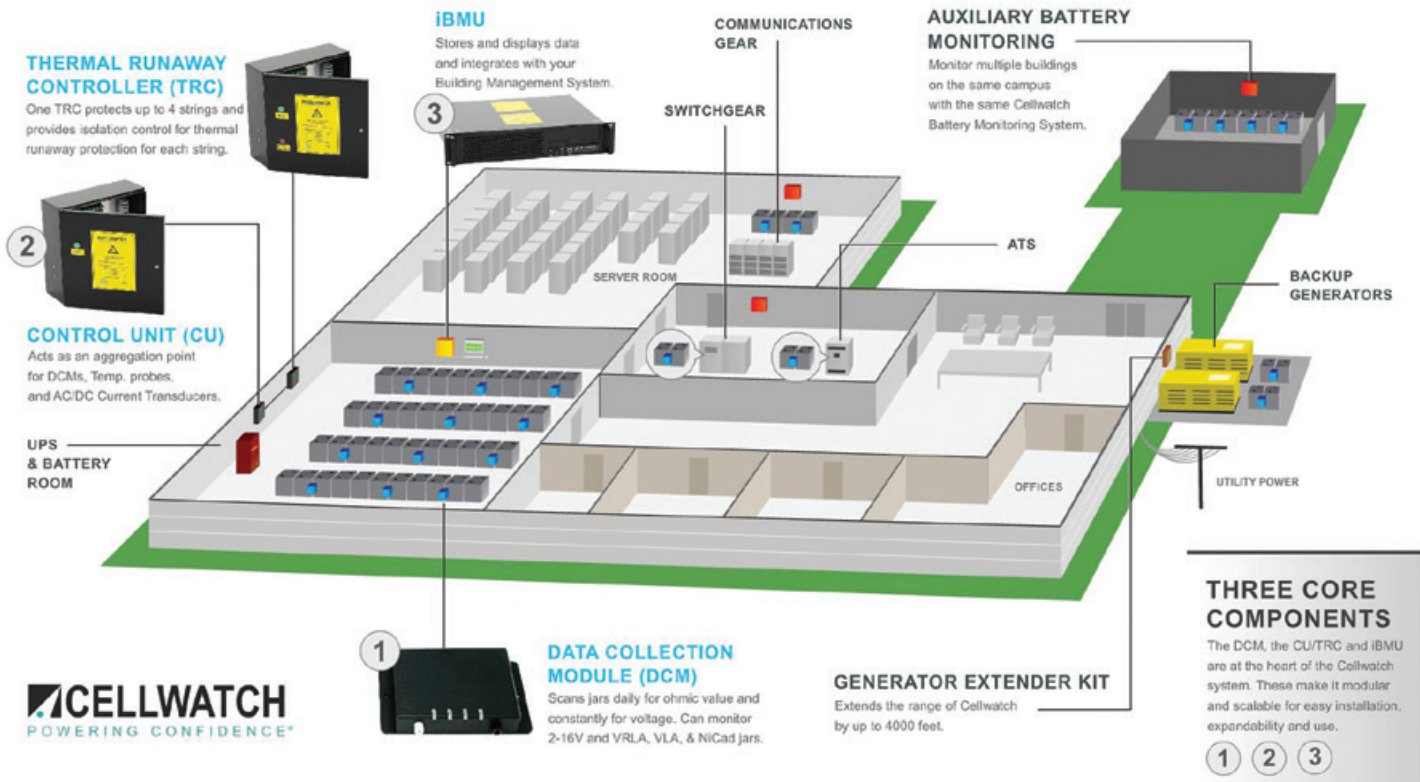
Cellwatch saves you money by:

- Reducing preventive maintenance costs along with increasing safety
- Extending the life of the batteries by knowing exactly when a battery needs to be replaced
- Fewer truck rolls required with electronic surveillance and alerting

- 75 percent of unplanned UPS outages can be attributed to a battery failure (including generator start batteries)
- Up to 5 percent of all lead acid batteries fail during their warranty period
- A string of batteries is only as good as its weakest cell
- VRLA batteries typically fail in one to two weeks, but can fail in as little as two days
- Quarterly battery maintenance means that you don't know the true status of your batteries 98 percent of the time
- Daily battery monitoring is the only way to ensure that the UPS will support the load



Powering Business Worldwide



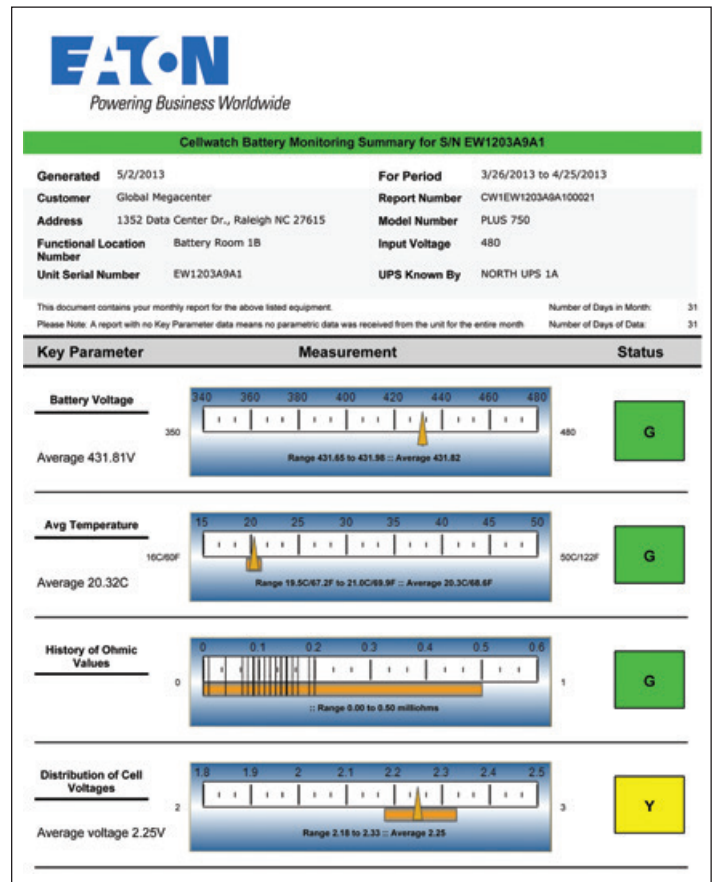
Fast installation—immediate results

Cellwatch's unique design uses an extremely light test load, combined with superior electrical noise filtering for the highest performance across the widest range of batteries in the industry. Cellwatch is the most versatile system on the market today. Each DCM is capable of monitoring 2–16V jars. This capability enables Cellwatch to provide a total solution, addressing all critical batteries in the power network.

- Modular and scalable design allows for easy installation and expandability
- No calibration required
- Self addressing modules—makes set-up and maintenance simple

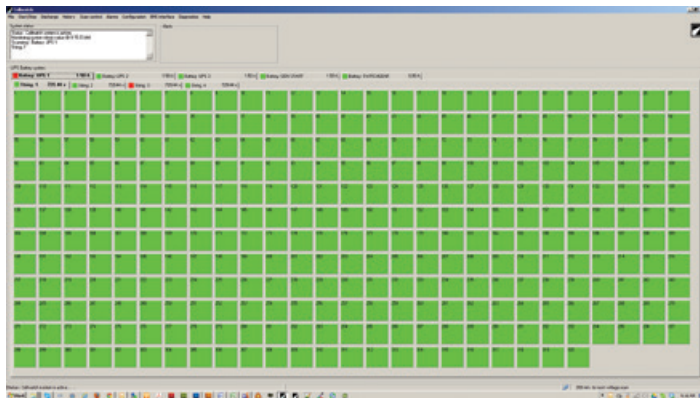
Eaton Cellwatch services

Eaton offers a comprehensive battery monitoring service that works in conjunction with the Cellwatch system. The service has two main components: e-mail notification and periodic reporting. The e-mail notifications provide information about alarms that are happening in the Cellwatch system. This allows for remote notification without needing to access the Cellwatch iBMU to retrieve information. The e-mail notifications can be directed to multiple e-mail addresses if desired, providing assurance that the information is disseminated and corrective action taken. The periodic reporting provides a comprehensive report on the health of the battery being monitored by the Cellwatch system. This report provides information about the alarm activity during the reporting period, the current status of the battery and recommended actions to either address outstanding issues or direction on issues that need to be evaluated further by the customer.



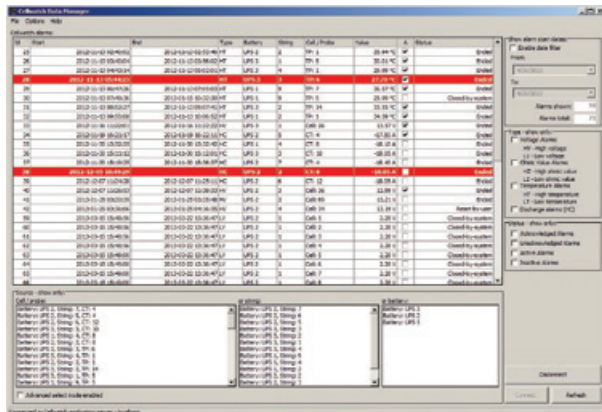
Battery status at a glance

Cellwatch gives you a simple view providing quick battery access with a clear indication of a good or bad cell or jar. Cellwatch also monitors and displays the status of generator, switchgear and communications gear batteries in the same user interface with UPS batteries.



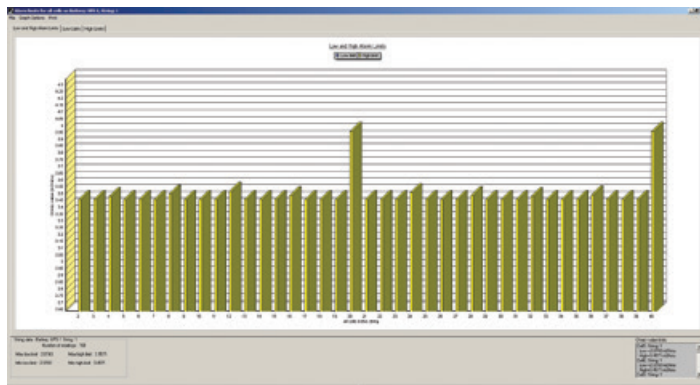
Alarm management and reporting

The Cellwatch Data Manager Application stores all battery alarms from the very first alarm reported and provides controls so you can sort and quickly identify issues, manage alarms, and use the data to create a customized report and plan of action. Filter by string and cell, type, date and status of the alarm. Active alarms are highlighted in red until they end.



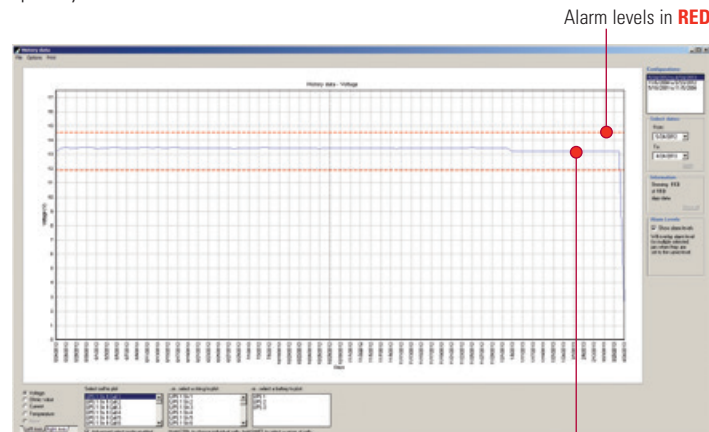
Ohmic alarm levels

Cellwatch automatically sets ohmic alarm levels in minutes for all new strings being monitored, or on a string-by-string basis for aging battery systems. The **auto set** ohmic alarms function ensures proper ohmic alarm setting, improving set-up for batteries with inter-cell and inter-tier links that have varying ohmic measurements. This feature also eliminates the risk for human error and saves a significant amount of time for large battery systems.



Alarm level display

Cellwatch displays alarm levels for individual jars along with their history graph for easy comparison of actual readings and programmed alarm levels. With just a few clicks you can visualize how the cell is trending over time compared to the alarm levels configured for that jar. Graphing functions provide quick views of a battery's performance over its entire life cycle and allow the user to quickly select and zoom in for detailed evaluation.

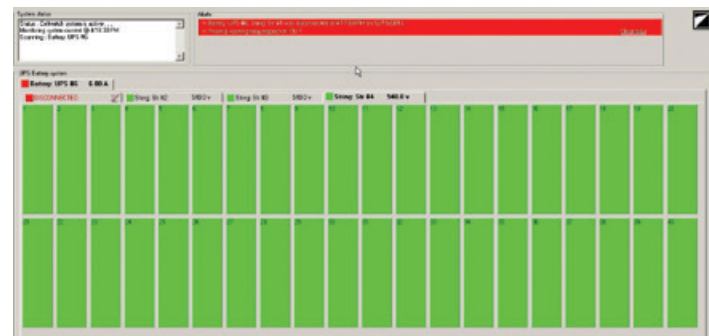


Alarm levels in **RED**

Cellwatch reading in **BLUE**

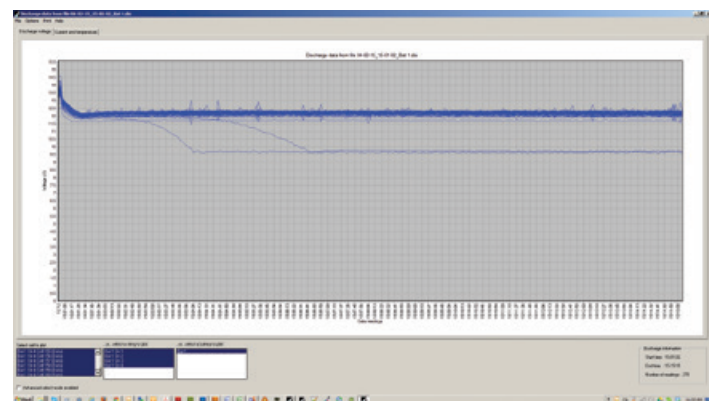
Detect, warn and prevent thermal runaway

Cellwatch instantly detects if thermal runaway conditions are present in cabinet and open rack configurations. When a thermal runaway condition is detected, GUI indicators turn red and a warning alert appears on the screen. Simultaneous with the on-screen warnings, alarm notifications are sent via email or SMS, building management systems are also notified, and lights on the front of the TRC are illuminated. In compliance with IFC 608.3, Cellwatch isolates the string by disconnecting the battery from the charger to prevent thermal runaway. Cellwatch provides temperature data for ambient, pilot cell and for all jars.



Cell voltage performance on load

Cellwatch provides a detailed view of all cells under load so you can verify performance of each individual cell/jar under load.



Specifications

Control Unit (CU) / Thermal Runaway Controller (TRC)

Operating specifications	
Operating temperature	0–50°C (32–122°F)
Storage temperature	-10–80°C (15–175°F)
Power supply	110–240 VAC
Power supply frequency	50–60 Hz
Power supply rating	Max. 20 Watts
Communications	
RS-485 interface	With optional jumper for termination
Max. range	2000 ft (619m) total bus length
Fiber optic range	150 ft (50m) CU to DCM, DCM to DCM
Max. CUs / TRCs per RS-485 bus	31
Alarm outputs	
Control Unit	Output relays 5 relays, single contact, volts free
Thermal Runaway Controller	Output relays 10 relays, single contact volts free
Contact rating	30 VDC @ 5A max.
Electrical isolation	1500 VAC
Protection	
Sensing inputs	Short circuit proof
Insulation resistance	600 VDC
Sensing inputs	
Temperature sensor	Solid state probe
Resolution	0.05°C (32.09°F)
Accuracy	±1°C
Range	2–80°C (35–176°F)
Mounting (adhesive pad)	0.31 in (8 mm)
Current sensor	Solid state, ferrite core clamp
Resolution	0.5A
Useful range	±25–1000A
Physical characteristics	
Dimensions (H x W x D)	4.75 x 11.88 x 11.75 in (120.7 x 301.8 x 298.5 mm)
Enclosure material	Steel with powder coating
Color	Black
Battery Monitoring Unit (iBMU)	
Computer characteristics	
Operating system	Microsoft® Windows® 7 embedded
Software	Cellwatch applications Modbus® TCP / IP SNMP v1
Hard drive	30 GB solid state
Operating temperature	0–40°C (32–104°F)
Physical characteristics	
Dimensions (H x W x D)	3.5 (2U) x 19 x 12 in (88.9 x 482.6 x 304.8 mm)
Enclosure material	Steel with powder coating
Color	Black
Mounting	19 in (482.6 mm) rack with optional wall mount kit

Data Collection Module 5

Voltage measuring characteristics	
Voltage measuring range	0–80V
Resolution	2 mV
Accuracy	0.1% ±5 mV
Protection	
Transient suppression	Up to 600W
Short circuit	3A max. with internal fuse
Reverse polarity protection	Any combination in any connection order, for any period of time within the rated voltage
Ohmic value measuring characteristics	
Ohmic value measuring range	0–65m ohms
Resolution	1 µOhms
Max. DCMs per control unit	254
Fiber optic loop	
Fiber optic range	Max. 150 ft (50m)
Input cable lengths	Max. 6 ft (1.828m)
Max. variation between cables on one unit	36 in (0.9144m)
Temperatures	
Operating temperature	0–60°C (32–140°F)
Storage temperature	0–80°C (32–176°F)
Power supply	
Power supply nominal	4 x 1.2V cells up to 4 x 16V jars
Power supply voltage, temperature, ripple	Min. 4 VDC, max. 80 VDC
Power supply voltage for ohmic scan	Min. 4.5–80 VDC
Operating current	
Quiescent current	25 mA
During ohmic test	0.0011A/hr
Sleep mode current	<2 mA
Physical characteristics	
Dimensions (H x W x D)	3.1 x 4.2 x 0.90 in (78.7 x 106.7 x 22.9 mm)
Mounting pads (mounting plates and din rail mounting optional)	2 in (50.8 mm) 3M dual lock
Enclosure material	Flame retardant ABS
Color	Black
Generator Extender Kit	
Operating voltage	12V
Operating temperature	0–50°C (32–120°F)
Storage temperature	0–80°C (32–176°F)
Communications	Proprietary over CAT5 cable
Max. range	4000 ft (1219m)
Fiber optic range	150 ft (50m) remote to DCM, DCM to remote
Dimensions (H x W x D)	
Remote	2.63 x 4.50 x 1 in (65 x 110 x 26 mm)
Master	Integrated into CU and TRC

The control unit and DCM are fully compliant with CE and UL® regulations for safety and EMC. See manual for details.

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