Product brochure

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.

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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.

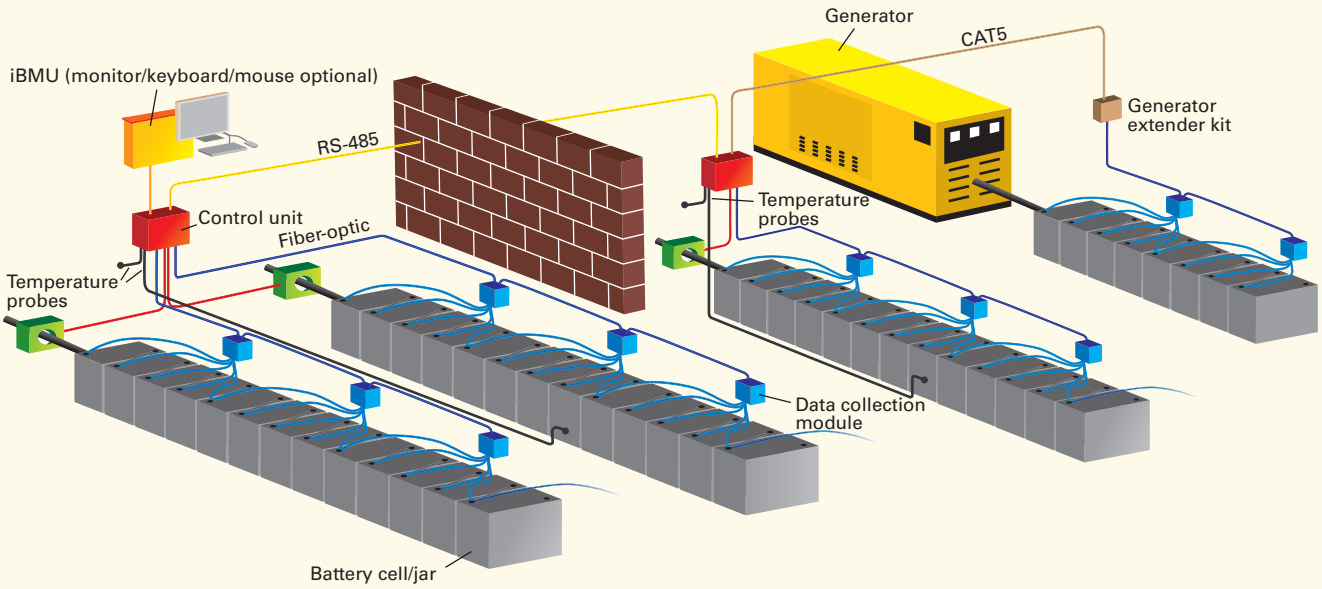
Cellwatch prevents unplanned outages by:

- 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



Cellwatch battery monitoring

Cellwatch consists of six basic components:

- Data collection module (DCM)
- Battery monitoring unit (iBMU)
- Control unit (CU)
- Temperature probes (TP)
- Current transducers (CT)
- Extender kit to monitor generator batteries

The DCM is connected directly to the battery cells or jars and gathers the information on battery health. The control unit provides the interface between the DCM and the iBMU. This serves as an aggregation point and provides dry contact alarms for the system. The iBMU is a data center grade server running the Cellwatch application software and provides the graphical user interface remote communications and analysis tools for the administrator.

The iBMU can integrate with the BMS or NMS, simplifying battery management.

Cellwatch can be used to monitor all mission critical batteries in your data center. Cellwatch monitors UPS, switchgear, communications equipment and generator batteries on the same system.

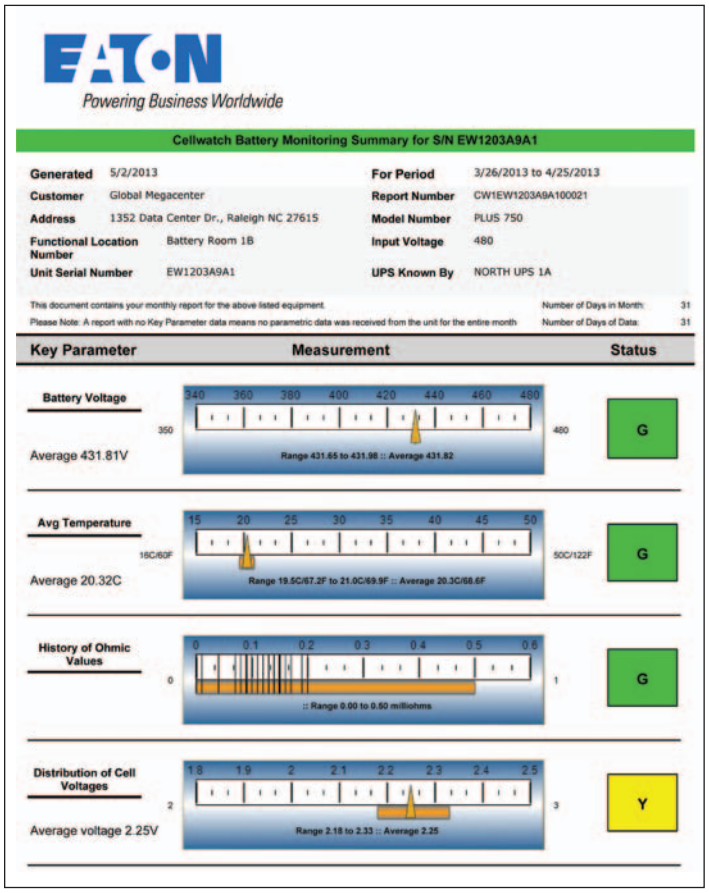
Fast installation—immediate results

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.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Cellwatch Battery Monitoring Summary for S/N EW1203A9A1

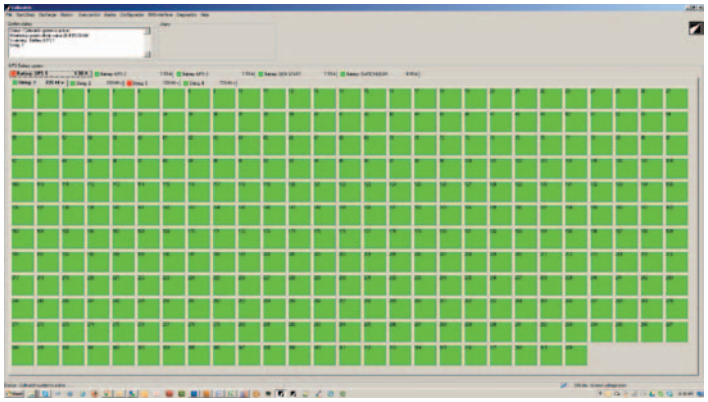
Generated	5/2/2013	For Period	3/26/2013 to 4/25/2013
Customer	Global Megacenter	Report Number	CW1EW1203A9A100021
Address	1352 Data Center Dr., Raleigh NC 27615	Model Number	PLUS 750
Functional Location Number	Battery Room 1B	Input Voltage	480
Unit Serial Number	EW1203A9A1	UPS Known By	NORTH UPS 1A

This document contains your monthly report for the above listed equipment. Number of Days in Month: 31
Please Note: A report with no Key Parameter data means no parametric data was received from the unit for the entire month. Number of Days of Data: 31

Key Parameter	Measurement	Status
Battery Voltage	Average 431.81V	G
Avg Temperature	Average 20.32C	G
History of Ohmic Values		G
Distribution of Cell Voltages	Average voltage 2.25V	Y

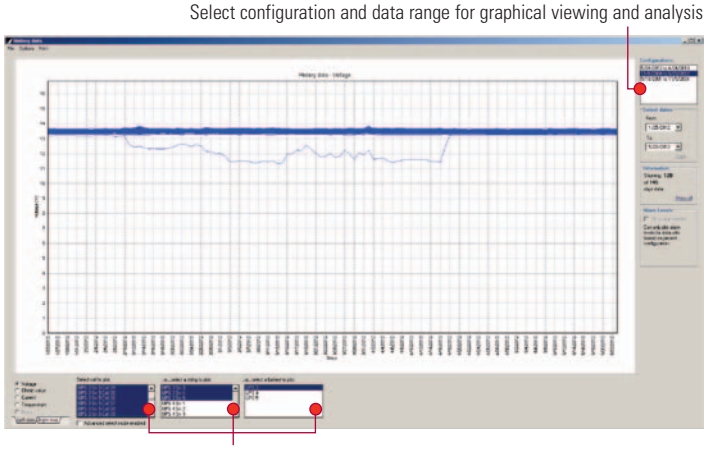
Battery status at a glance

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.



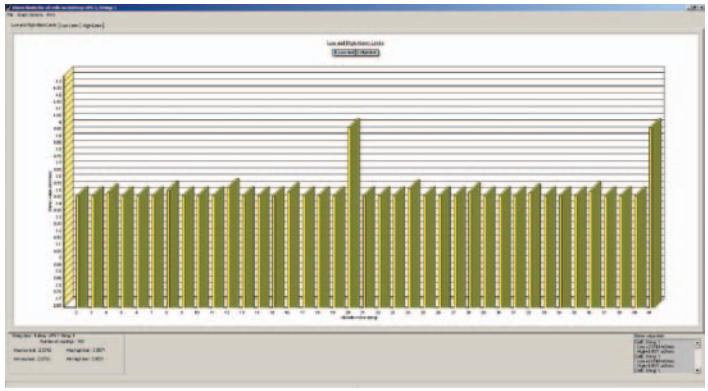
Multi-year history

You can view all history data for all battery configurations available in Cellwatch. Graphing functions provide quick views of a battery's performance over its entire life cycle, and allow you to quickly select, isolate and zoom in for easy evaluation of a combination of cells/strings or batteries.



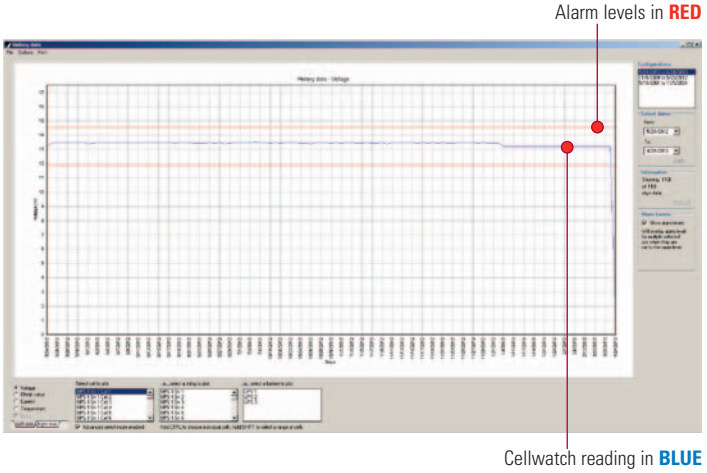
Ohmic alarm levels

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.



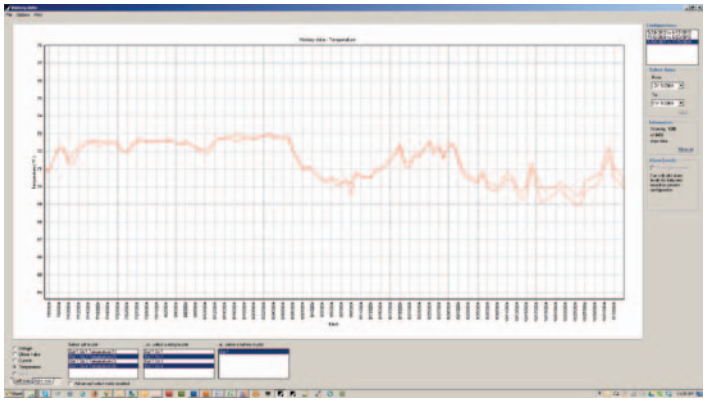
Alarm level display

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 now visualize how the cell is trending over time compared to the alarm levels configured for that jar. Easily view an entire string's performance in just a few seconds.



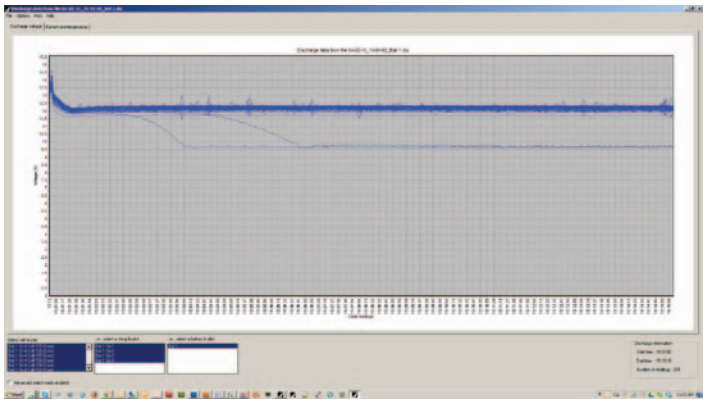
Battery pilot and battery ambient temperature over time

Cellwatch provides data on temperature of the batteries. If they are too hot, battery life is compromised. If they are too cold, then performance is compromised.



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

Operating specifications	
Operating temperature	0–50°C (32–122°F)
Storage temperature	10–80°C (50–176°F)
Power supply	Manually switchable 110 Vac or 230 Vac
Power supply range	80–135 Vac and 160–270 Vac
Power supply frequency	50–60 Hz
Power supply rating	Max. 5 VA (15 mA quiescent current)
Communications	
RS-485 interface	Input and output with optional jumper for termination
Max. range	2000 ft (609.6m) total bus length
Fiber-optic range	150 ft (45.7m) CU to DCM, DCM to DCM
Max. CUs per RS-485 bus	31
Alarm outputs	
Output relays	4 relays, single contact, volts free
Contact rating	30 Vdc @ 5A max.
Electrical isolation	1500 Vac
Service life	50 million operations, typical
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 (+1°C=33.8°F, -1°C=30.2°F)
Range	2–80°C (35.6–176°F)
Mounting	0.31 in. (7.9 mm)
Current sensor	Solid state, ferrite core clamp
Resolution	0.5A (optional 1.25A)
Useful range	±25–1000A (optional 50–2500A)
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	Pebble gray

Battery Monitoring Unit (iBMU)

Computer characteristics	
Operating system	Microsoft® Windows® 7 embedded
Software	Cellwatch applications Modbus® TCP/IP
Hard drive	8 GB solid state
Operating temperature	0–40°C (32–104°F)
Physical characteristics	
Dimensions (H x W x D)	3.50 (2U) x 19.00 x 12.00 in. (88.9 x 482.6 x 304.8 mm)
Enclosure material	Steel with powder coating
Color	Black
Mounting	19.00 in. (482.6 mm) rack with optional wall-mount kit

Data Collection Module EX

Voltage measuring characteristics	
Voltage measuring range	0–60V
Resolution	15 mV
Accuracy	2V nominal source ±1.0% 6V nominal source ±0.5% 12V nominal source ±0.25%
Protection	
Transient suppression	Up to 600V, 1 kW at 100uS pulses non repetitive
Short circuit	7A max. with in line fuses fitted (DCM 2=5A max.)
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	0.25–25.90m ohms (DCM 2) 0.050m ohms min. (EX DCM)
Resolution	6.3 µOhms
Max. DCMs per control unit	254
Fiber-optic loop	
Fiber-optic range	Max. 150 ft (45.7m)
Input cable lengths	Max. 16 ft 6 in. (5.0m)
Max. variation between cables on one unit	6 ft 6 in. (2.0m)
Temperatures	
Operating temperature	0–50°C (32–122°F)
Storage temperature	0–80°C (32–176°F)
Power supply nominal	4 x 2V cells up to 4 x 12V or 3 x 16V jars
Power supply voltage	Min. 5 Vdc, max. 60 Vdc (DCM 2=Min. 7 Vdc)
Operating current	
Quiescent current	10 mA (DCM 2=25 mA)
During ohmic test	Additional 0.0027A/hr
Physical characteristics	
EX DCM Dimensions (H x W x D)	3.30 x 5.00 x 0.90 in. (83.8 x 127.0 x 22.9 mm)
DCM 2 Dimensions (H x W x D)	2.53 x 4.63 x 1.84 in. (64.3 x 117.6 x 46.7 mm)
Mounting pads	2.00 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 (32–122°F)
Storage temperature	0–80°C (32–176°F)
Communications	Proprietary over CAT5 cable
Max. range	4000 ft (1219.2m)
Fiber-optic range	150 ft (45.7m) remote to DCM, DCM to remote
Dimensions (H x W x D)	
Remote	2.63 x 4.50 x 1.00 in. (66.8 x 114.3 x 25.4 mm)
Master	2.44 x 4.00 x 1.19 in. (62.0 x 101.6 x 30.2 mm)

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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Learn how the Eaton Cellwatch battery monitoring system can help you at **Eaton.com/Cellwatch**.