

PowerChain Management Solutions

Eaton Cellwatch Battery Monitoring System



Powering Business Worldwide



Cellwatch Battery Monitoring System



Cellwatch Battery Monitoring System

Businesses that rely on technology for their day-to-day operations cannot afford to risk even a split second of downtime, let alone an extended outage. To keep information technology, telecommunications, factory floor and call center operations running smoothly, businesses have to take a close look at their power infrastructure to identify vulnerabilities and take action to prevent costly downtime.

Central to an effective power infrastructure are UPSs. By ensuring that consistent, quality power is fueling critical systems, UPSs provide a first line of defense against unexpected downtime and load loss, and offer various levels of redundancy, communications and interoperability with other power equipment. Despite advances in UPS technology, however, 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 start and synchronize 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 innovative battery monitoring system for large-scale technology 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 overall system reliability

Unlike other battery monitoring systems, Cellwatch has been specifically designed to monitor the ohmic value of all jars in the battery every day. By avoiding random sampling of jars, which can miss a failing cell,

Cellwatch dramatically increases the likelihood of identifying a potential problem before it becomes a crisis. Cellwatch's unique design uses a very light test load, combined with superior electrical noise filtering techniques, enabling timely battery replacement or other preventive action. Cellwatch is a critical part of ensuring availability and saving money by:

- Providing a window to the battery with continuous, accurate monitoring and alarm notification
- Offering clear information in the form of graphs for forensic analysis
- Reducing manpower demands and increase safety during maintenance
- Extending the life of the batteries through efficient and rapid preventative maintenance

Cellwatch consists of three basic components: the data collection module (DCM), the battery monitoring unit (iBMU) and the control unit. It also offers an optional generator extender kit. 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. The iBMU is a PC running the Cellwatch application software and provides the graphical reporting on the status of the battery system. The iBMU can integrate with the BMS or NMS, simplifying battery management. The generator extender kit enables the generator start batteries to be monitored.

Cellwatch is the only system that can monitor different jar voltages with the same system. Each DCM is capable of monitoring two-, four-, six-, eight- and 12-volt jars. This capability enables Cellwatch to provide a total solution, leaving no critical batteries in the power system unmonitored.

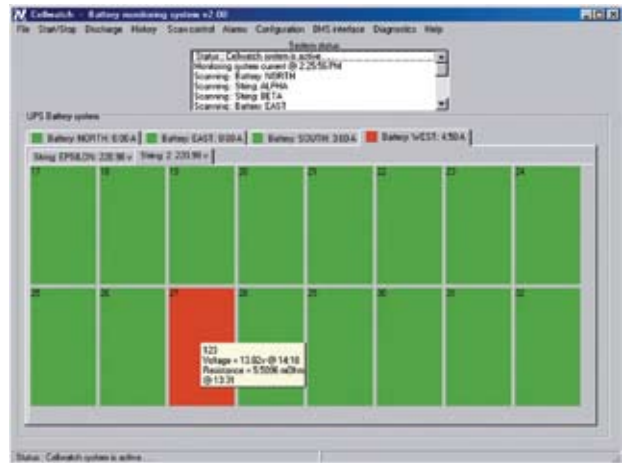
Cellwatch is ideal for applications and industries that require long battery runtimes, and where any downtime can cascade into a very costly scenario, including:

- Telecommunications
- Tier 1 and Tier 2 data centers
- Manufacturing



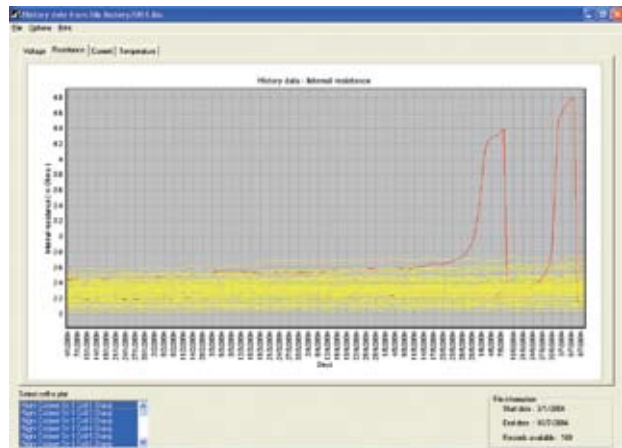
Battery status at a glance

Cellwatch gives you a simple view of the battery with clear indications of a good or bad cell or jar, including the cells on your generator batteries.



Ohmic value history

A rapid rise in the cell or jar's ohmic value indicates cell failure. Ohmic value of failing cells can rise to twice its normal value within days. At this point your battery may be compromised and immediate action is required.

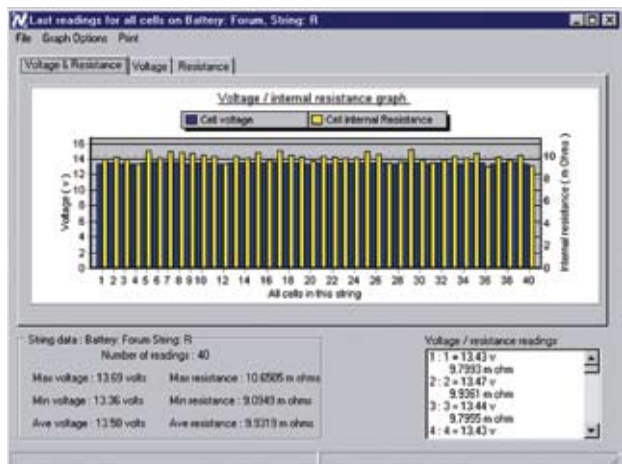


At-a-glance battery status

Cellwatch provides graphical representation of status at a system, battery and cell level. This gives you an unprecedented view into the daily health of your batteries.

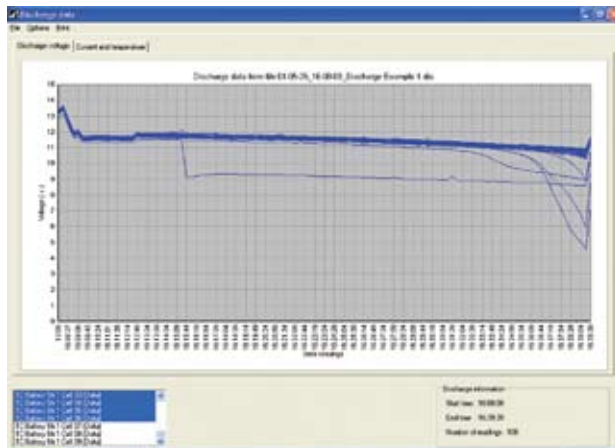
Ohmic values and inter-cell resistance across strings

This graph makes it easy for you to compare a string of cells or jars within the battery. If the reading is higher than the others there is a problem.



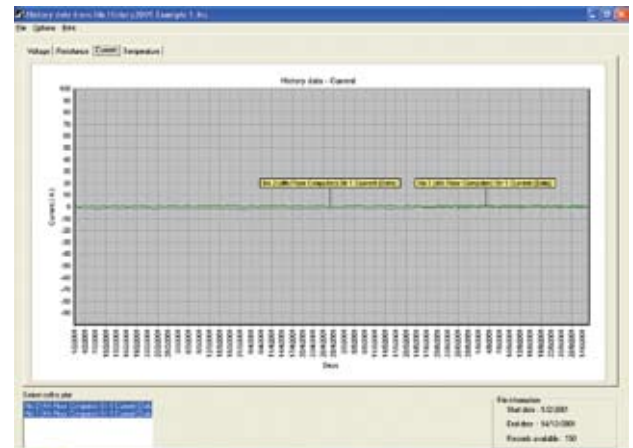
Cell voltage performance on load

Cellwatch automatically monitors discharges and can track over 1900 readings a minute. This capability provides the data for a very detailed map of individual cell or jar performance on load.



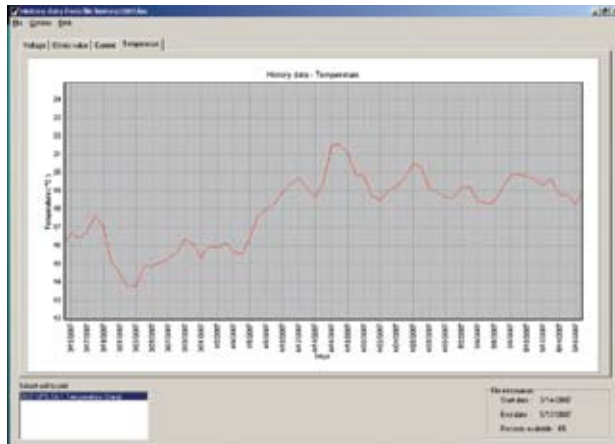
Battery current over time

Cellwatch shows you how much current the batteries are taking during normal float charge. An increase in current could indicate a problem.



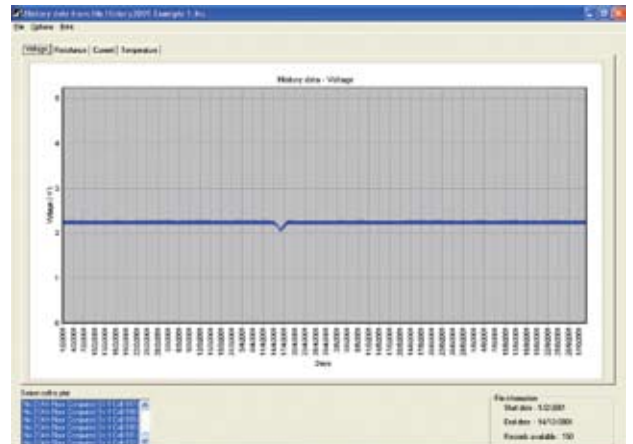
Battery pilot and battery ambient temperature over time

Cellwatch provides data on how hot the batteries are getting. If they are too hot, battery life is compromised. If they are too low, then performance is compromised.



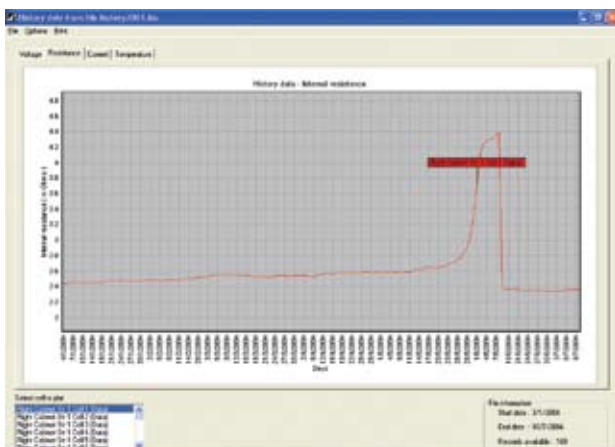
Float voltage over time

This view lets you see how well the UPS charger/rectifier is working.



Individual cell/jar history

Cellwatch plots each individual cell or jar history to give early warning or changes in battery condition and allow you to be proactive in battery maintenance.

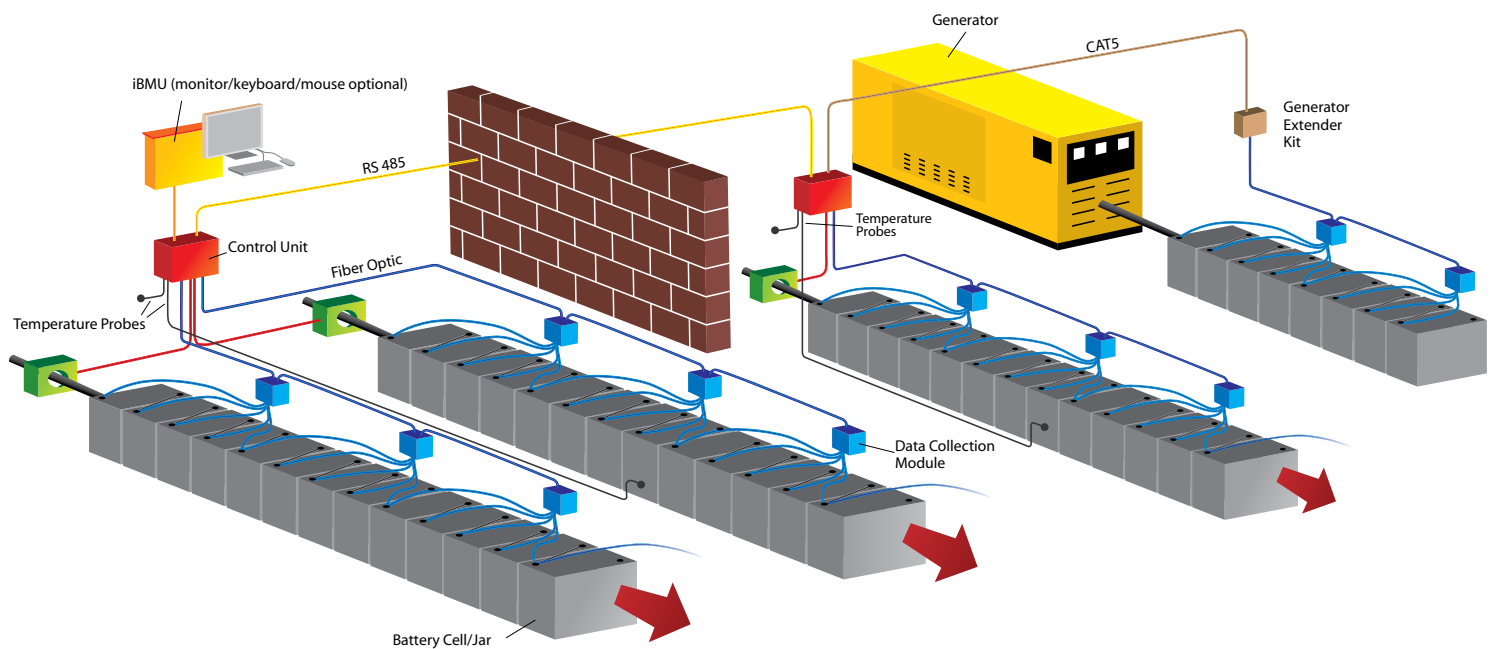




Fast installation—immediate results

Cellwatch's modular format allows for easy installation and expandability. Its layout design minimizes wiring on the battery, increasing reliability and ease-of-installation. Cellwatch uses optical fiber that reduces electrical noise that can negatively impact battery performance.

Cellwatch Battery Monitoring



Specifications

Control Unit

Operating Specifications

Ambient operating temperature	0°C to 50°C/32°F to 122°F
Storage temperature	10°C to 80°C/50°F to 17°F
Power supply	Manually switchable 110 Vac or 230 Vac
Power supply range	80 Vac to 135 Vac 160 Vac to 270 Vac
Power supply frequency	50 Hz to 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 (619m) total bus length
Fiber optic range	150 ft (50m) 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 @ 8A 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
Accuracy	±1°C
Range	2°C to 80°C/35°F to 176°F
Mounting	0.31 in. (8 mm)
Current sensor	Solid state, ferrite core clamp
Sensitivity	1 mV/1A
Resolution	0.5A (optional 1.25A)
Useful range	±25 to 1000A (optional 50 to 2500A)

Physical characteristics

Dimensions (H x W x D)	4.75 x 11.88 x 11.75 in.
Enclosure material	Steel with powder coating
Color	Pebble gray

Battery Monitoring Unit (iBMU)

Computer characteristics

Operating system	Microsoft Windows XP Professional
Software	Cellwatch Applications
Hard drive	60 GB

Physical characteristics

Dimensions (HxWxD)	3.5 (2U) x 19 x 21 in.
Enclosure material	Steel with powder coating
Color	Black
Mounting	19 in. rack with optional wall mount kit

Data Collection Module

Voltage measuring characteristics

Voltage measuring range	0 to 60 volts
Resolution	15 mV
Accuracy	2 volts nominal source ±1.0% 6 volts nominal source ±0.5% 12 volts nominal source ± 0.25%

Protection

Transient suppression pulses non repetitive	Up to 600V, 1 kW at 100uS
Short circuit	5A max with in line fuses fitted
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 to 25.9 mOhms
Resolution	10 uOhms
Temp coefficient of reading	3 uOhms/°C (-5°C to 80°C/23°F to 176°F at nominal 1uOhm)
Max DCMs per control unit	254

Fiber optic loop

Fiber optic range (50m)	Min 6 in. (150 mm) max 150 ft (50m)
Input cable lengths	Min 4 in. (100 mm) max 16 ft 6 in. (5m)
Max variation between cables on one unit	6 ft 6 in. (2m)

Temperatures

Operating temperature	0°C to 35°C/32°F to 95°F
Storage temperature	0°C to 80°C/32°F to 176°F
Power supply nominal	4 x 2V cells up to 4 x 12V jars
Power supply voltage	Min 7 Vdc, max 60 Vdc

Operating current

Quiescent current	15 mA
During ohmic test	Additional 0.0027A/hr

Physical characteristics

Dimensions	2.53 x 4.63 x 1.84 in.
Mounting pads	2 in. 3M Dual Lock
Enclosure material	Flame retardant ABS
Color	Black

Generator Extender Kit

Operating voltage	12 volts
Operating temperature	0°C to 35°C/32°F to 95°F
Storage temperature	0°C to 80°C/32°F to 176°F
Communications	Proprietary over CAT5 c cable
Max range	4000 ft (1219m)
Fiber optic range	150 ft (50m) remote to DCM, DCM to remote

Dimensions (HxWxD)

Remote	2.63 x 4.5 x 1 in. 65 x 110 x 26 mm
Master	2.44 x 4 x 1.19 in. 62 x 122 x 30 mm

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

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Norway: 47.23.03.65.50
Portugal: 55.11.3616.8500
Sweden: 46.8.598.940.00
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