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Cellwatch System Overview

Cellwatch is a state-of-the-art modular battery monitoring system designed specifically for large (three-phase) UPS. It utilizes the latest fiber optic technology to provide rapid, noise-free transmission of information on battery health. Cellwatch continuously monitors the entire battery system; including string and cell level voltage, ohmic value, current and temperature throughout the charge, discharge, and float periods.

Cellwatch provides immediate warnings of battery deterioration and imminent failures. Cellwatch identifies any individual battery that exhibits problems—providing a proactive approach to ensuring UPS reliability. In addition, Cellwatch allows battery replacement to be based on the battery's actual condition, not simply on how long it has been in use, helping avoid premature and unnecessary replacement.

The Cellwatch system has 3 core components. The majority of the system is comprised of Data Collection Modules (DCMs). The DCMs are optically linked to Control Units (CUs) or Thermal Runaway Controllers that are connected via RS485 to the integrated Battery Monitoring Unit (iBMU), a rack or wall-mounted appliance, running proprietary Cellwatch software on a Windows operating system.

The concepts behind the Cellwatch system are flexibility, scalability, with ease of installation, use and operation. It can be installed on new or old batteries. The modular design allows Cellwatch to fit applications of any size and configuration, including monitoring several separate battery systems simultaneously (UPS, switchgear, generator). Cellwatch is listed to UL, CE, CSA and TUV safety standards.

Battery parameters that can be monitored on a per cell basis include:

- On Float Voltage
- Ohmic Value (OV)
- Jar Temperature
- Thermal Runaway

On a battery system it can report on:

- Total Float Voltage
- Float Voltage
- Ripple Voltage
- String Current
- Ambient Temperature
- Pilot Temperature

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CELLWATCH COMMUNICATION

The iBMU is set up to automatically search for and obtain a TCP/IP address from a local network DHCP sever. If no network DHCP server is available (i.e. when the network is not connected) the iBMU will automatically use 192.168.0.128 as a default address.

WEB SERVER

Cellwatch comes with an integral HTTP web server (secure or open capability). This is turned on from the Cellwatch software screen and allows anyone on the user's network to view summarized results from the system. For this to operate, Cellwatch must be connected to a Local Area Network and correctly configured by the network administrator for the monitoring system to be viewed across the Internet.

MODBUS TCP/IP INTERFACE

The Cellwatch software, running on the iBMU, can communicate with a Modbus device using TCP/IP protocols over a network. The iBMU must be connected to the same network as the MODBUS device.

SNMP INTERFACE

The Cellwatch software, running on the iBMU, can communicate with via SNMP Agent and provide SNMP connectivity.

REMOTE DESKTOP

The iBMU can be connected to remotely over Windows Remote Desktop, additionally through PCAnywhere on legacy systems.

CELLWATCH COMPONENTS DESCRIPTIONS

Integrated Battery Monitoring Units (iBMU)	Wall mountable (see figure 1) or rack mountable (2U x 19" x 15" server module) with Cellwatch software and communication software. LAN and USB port for modem included. Modbus TCP/IP and integrated web browser are standard. RS232 to RS485 data connector.
Control Unit (CU)	Converts RS485 signals to optical signals for DCMs. Handles inputs from the current transducers (CT) and temperature transducers (TT). Houses (4) volt-free alarm contacts to allow connection for additional alarm capabilities.
Thermal Runaway Controller (TRC)	Performs functions of CU above as well as monitors four strings for a thermal event. The TRC detects, warns and prevents thermal runaway. The TRC can isolate 1 to 4 strings from the UPS in the event of a thermal condition, as per IFC 608.3 requirements.
Data Collection Modules	Small solid-state component that connects to (4) cells to be monitored. Connects to the CU via fiber optic, providing a safe (no voltage) connection with noise immunity. Power to the DCM is supplied from the batteries it is monitoring. Measures voltage and ohmic value (internal resistance) of its host cell. Each channel can be 2, 4, 6 or 12 volts.
DCM Accessory Kits	Items needed to install 10 DCMs; fiber optic cable, rubber boots, cable ties, tie mounts, swabs, and ring tabs.
Current Transducer (CT)	Measures string current for discharge and recharge, 35' standard length.
Temperature Transducers (TT)	Measures pilot cell and ambient battery room temperatures, 35' standard length.

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Cellwatch Kits

M Kit	**Cellwatch "M" or Main h Kit for initial battery rack or cabinet with XXX (12 to 256) monitoring points.** Contains an iBMU, CU, DCMs, DCM accessory kits, CT, TT, cable and fiber.
CS Kit	**Cellwatch "CS" or "Control String" Kit with XXX (12-256) monitoring points.** Contains: CU, DCMs, DCM accessory kits, CT, TT, cable and fiber.
S Kit	**Cellwatch "S" or "String" Kit XXX (12-256) monitoring points.** Contains: DCMs, DCM accessory kits, CT, TT, cable and fiber.

TRC Kits

If the Thermal Runaway Controller is optioned, the "Main" and "Control String" kits ship with a TRC in place of the CU. Closed cabinet applications require a TRC. Open applications require a TRC and the DCM 5T (for jar temperature monitoring).

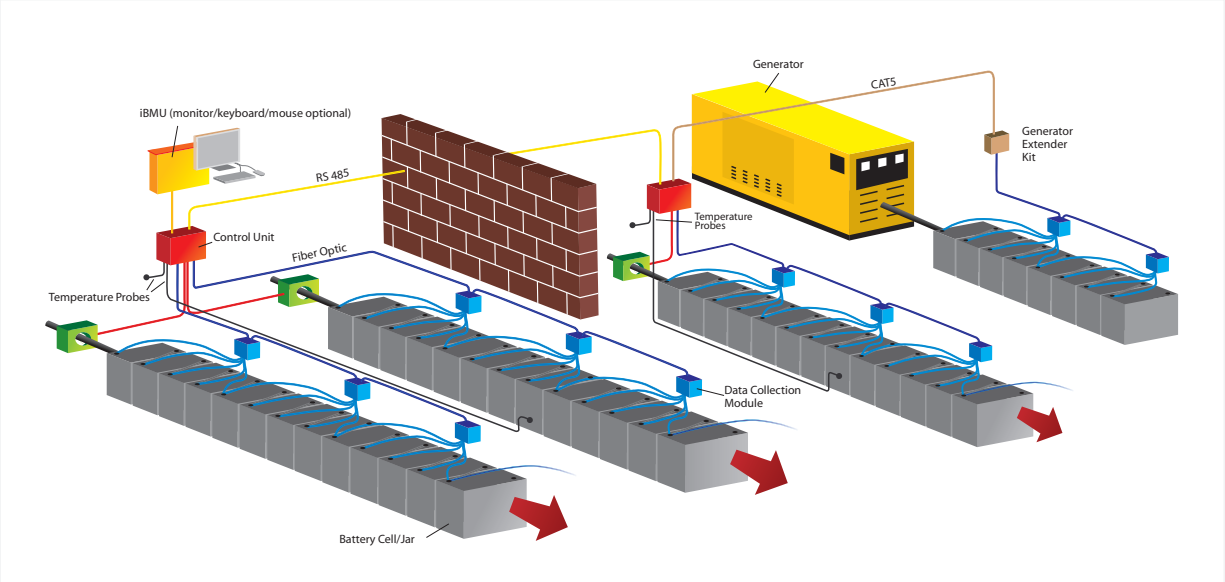

Figure 1 *The diagram in figure 1 shows a basic layout of the Cellwatch system. Each DCM can read voltage or ohmic value data from four channels (cells, jars or monoblocs). There is a CT and TT per string. Strings terminate into the CU or TRC. The CU/TRC are connected to the iBMU via RS485. Cellwatch can also monitor the generator batteries and any other auxiliary batteries in the facility using the same components on the same system. Cellwatch can monitor 2V-16V; VLA, VRLA or NiCad batteries.*

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CELLWATCH CRITICAL DISTANCES AND SYSTEM LIMITATIONS

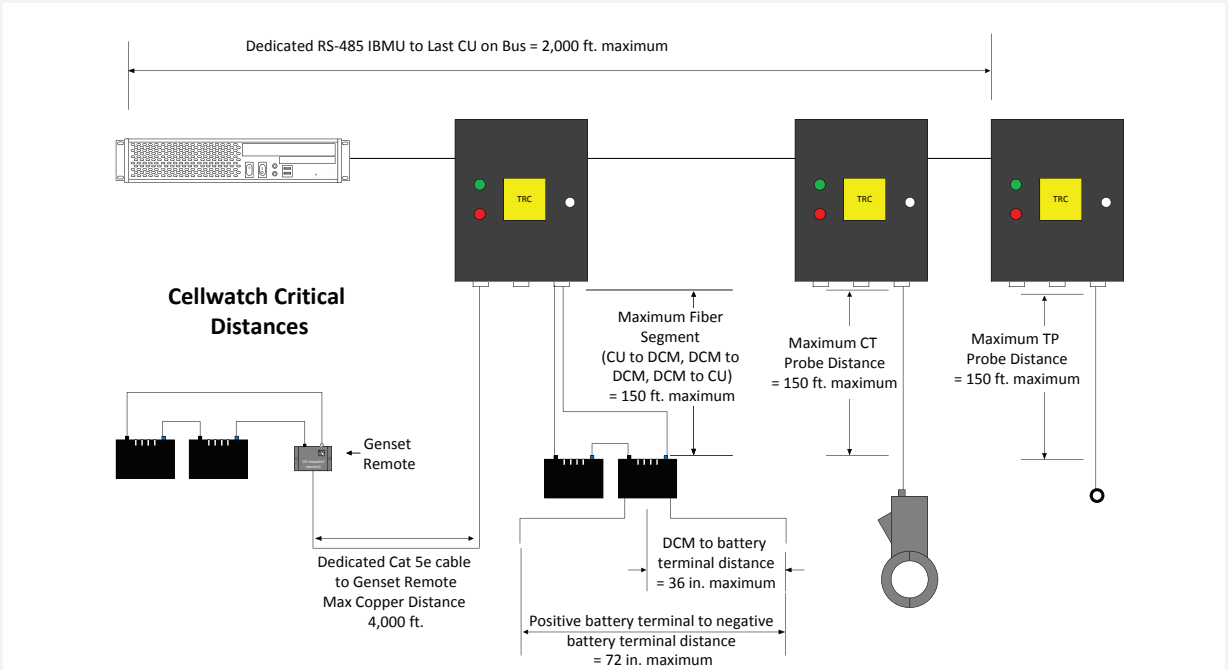

Figure 2 *This diagram shows the critical distances for the Cellwatch system and system limitations for Cellwatch.*

Critical distances:

- IBMU to last CU, in series, 2000’
- CU to string (cabinet/rack) 150’
- DCM span 72”
- CU to Generators 4000’

System limitations:

- 31 CU/TRCs per iBMU
- 254 DCMs per CU/TRC
- 4 strings per CU (inputs for 4 CT, 4 TT, 254 DCMs and 4 alarm triggered volt free contacts)
- Recommended limitation – 1016 channels per iBMU (254 DCMs)

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CUSTOMER SCOPE OF WORK

The customer is responsible for completing this work prior to Cellwatch installation:

1) Any building or demolition work for the mounting of the individual components of the Cellwatch system or the routing of conduit for the cables of the Cellwatch system.

2) The mounting of:

a) The iBMU.

b) The Control Units on that system.

c) Any provisions to mount a keyboard monitor and mouse. (If required – keyboard monitor and mouse not supplied)

d) The power breakers for all power feeds to that system.

(Note: iBMU rating is 600VA (110vac/240vac auto switching), Control Unit rating is 5VA (110vac/240vac manually switched)

3) Conduit work for the Cellwatch system.

a) For UPS supported ac power feed cables from the UPS to the iBMU. (If it is to be wall mounted with wall mount kit – optional item)

b) For UPS supported ac power feed cables from the UPS to all Control Units on that system.

c) For UPS supported ac power feed cables from the UPS to a duplex socket for a monitor. (If applicable –monitor not supplied)

d) For RS485 cables from the iBMU to the first Control Unit.

e) For RS485 cables from the first Control Unit to subsequent Control Units and between all Control Units on that system.

f) For Cat5 cables from Control Units out to any generator sets. (If applicable)

g) For current probe and temperature probe cables and fiber optics from each Control Unit to the relevant battery or battery cabinet(s). (Up to 4 strings per Control Unit)

4) Wire pulling and connection of cables.

a) The UPS supported ac power feed cables from the UPS to the iBMU. (In conduit if wall mounted or from power strip if rack mounted)

b) The UPS supported ac power feed cables from the UPS to all Control Units on that system. (Note: CU has terminal block connections).

c) The Local Area Network cable to the iBMU if required

d) Outside telephone line if required (recommend c) or d) as required but not both)

e) Any “dry contact” alarms required from any of the Control Units

5) Additional items:

a) Any interfacing hardware or software work to enable the Cellwatch system to communicate with a building management system.

b) Any UV relay or additional power source required for implementation of the TRC disconnect.

CONTACT US

WWW.CELLWATCH.COM

UNITED STATES & ASIA PACIFIC
NDSL Inc.
4112 Blue Ridge Road
Suite 210
Raleigh, NC 27612

P: 1-919-790-7877
F: 1-775-535-0139

UNITED KINGDOM
NDSL Ltd
Gloucester House
399 Silbury Boulevard
Milton Keynes
MK9 2AH, England

P: +44 (0)1908 303 730
F: +44 (0)7006 059 864

France: +33 (0)9704 688 83

CHINA
NDSL Shanghai Co. Ltd
No. 805 Block 13
No. 99 Tianzhou Road
Xuhui District, Shanghai
P. R. China

P: +86 21-61138828
F: +86 21-61138838