

BatteryInformer® Purpose and Method of Operation

PURPOSE: ("What it does")

The BatteryInformer is designed to provide a continuous measurement of the state of health (SOH) of in-service lead acid batteries in standby and backup power applications. The device's purpose is to provide real time SOH information to help optimize operational battery reliability and lifecycle management more efficiently and economically than discharge testing. The Smart-500 tracks and reports battery state of health as a battery decays towards its end of life, enabling operations personnel to effectively identify batteries coming to their end of life. The device does not measure absolute capacity via discharge.

A BatteryInformer attached to a new battery when placed in service will 'learn' the ohmic benchmark / baseline characteristics of the new battery and continuously track its ohmic characteristics over its life by testing the battery every 60 seconds. By comparing real time ohmic values (represented as conductance, Mho) to the previously learned reference value (maximum Mho), battery health decay is detected as the battery ages.

The BatteryInformer ohmic testing method is in principle nearly identical to 'periodic ohmic testing' methods utilizing handheld testers that have been widely accepted globally for the past 15 years by IEEE. Periodic ohmic testing was adopted as a 'lower cost' means of evaluating battery health in applications where discharge testing is operationally and financially impractical. However, periodic handheld ohmic testing is challenged by limited data points, expense (truck rolls, technician hours) and accuracy (tool errors, reference value errors, technician errors).

The BatteryInformer is dramatically more accurate as the result of its ability to create a unique baseline for each individual battery as well as its ability to collect data in statistically valid volumes as compared to traditional field handheld ohmic testing. The BatteryInformer also eliminates human and tool errors by affixing semi-permanently to each battery. The device will perform over 3.6 million tests per year providing precise actionable data to assist plant operators to make optimal decisions about battery replacement. The BatteryInformer is designed to proactively warn operators before a battery fails, allowing for replacement before experiencing costly downtime. The device also mitigates proactive and wasteful early battery replacement. The device's remote monitoring capability also allows companies to reduce their carbon emissions by eliminating truck rolls, thus helping them achieve goals related to reducing carbon footprint.



BatteryInformer® Smart-500NC Purpose and Method of Operation

METHOD OF OPERATION: (“How it works”)

The BatteryInformer measures battery conductance ($1/r$, Mho) every 5 minutes using a single DC pulse method. The largest consistent conductance value (maximum Mho) value is stored as the reference value to which subsequent measurements are compared. In addition to current Voltage and Mho value, the BatteryInformer displays calculated State of Health (SOH%) after each test interval. The current battery Voltage, Mho and SOH% scroll on the display continuously. When the measured conductance value drops to 60% of the reference value, the BatteryInformer will indicate end of life (SOH = 0%). This threshold value is chosen to approximate the IEEE guideline for end of life (IEEE EOL = 80% of rated capacity using a discharge test) and is a reasonable value for a typical installation. However, depending upon the design of any particular application this threshold may not be ideal. A higher or lower threshold may be programmed at the factory when ordering the BatteryInformer.

The BatteryInformer activates an on screen “bad battery” icon (a battery with an X through it), a red LED (4 fast flashes every second) and actuates an alarm contact closure (normally open) when SOH=0%. In addition, the BatteryInformer will also provide a ‘warning’ indication consisting of the LED flashing 2x every 4 seconds, and an on screen icon of a “low battery” when SOH is below 25%.

