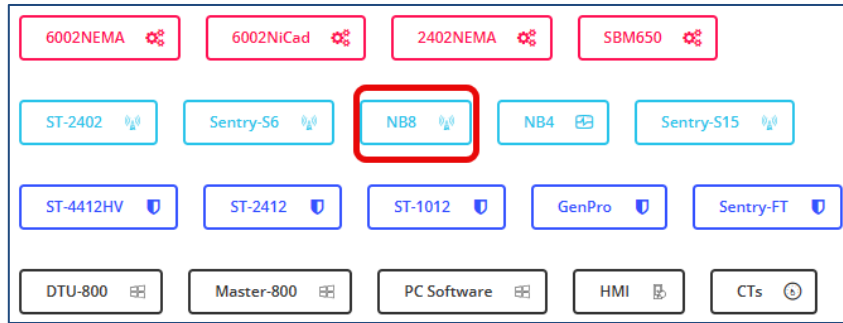# Sentry-NB8

All-in-One Battery Health Monitor

For Critical Backup Power Systems

- ✓ **Telecom Cell Sites**
- ✓ **Broadband Headend**
- ✓ **Substation 48V Systems with 6V or 12V Blocks**
- ✓ **Solar Powered Radio Stations/Cell Sites**

6002NEMA ⚙	6002NiCad ⚙	2402NEMA ⚙	SBM650 ⚙
ST-2402	Sentry-S6	NB8	NB4	Sentry-S15
ST-4412HV	ST-2412	ST-1012	GenPro	Sentry-FT
DTU-800	Master-800	PC Software	HMI	CTs

www.batterydaq.com

ORDER ONLINE

ISO 9001 CERTIFIED

UL CERTIFIED

MADE IN THE U.S.A WITH PRIDE

Telecom **Broadband Headend** **Cell Site** **Substation Support System**

Key Features

- **Precise IR Measurement:** Internal resistance/conductance is accurately measured for each battery using advanced DC methods. Users can select to display data as internal resistance or conductance.
- **SOH Evaluation:** Battery deterioration and failure are evaluated using internal resistance and ongoing charging/discharging data.
- **SOC and Runtime Calculation:** Our proprietary method calculates state-of-charge percentage and estimates remaining runtime during power outages.
- **Equalization/Voltage Balancing**: Two-stage auto-balancing ensures all batteries remain in optimal charging condition. This function can be disabled if needed.
- **Thermal Runaway Prevention**: Intelligent detection provides early alerts for thermal risk, preventing thermal runaway. The alarm output can be connected to the rectifier/charger to mitigate excessive charging.
- **Compact Design:** Solid all-in-one design allows for convenient installation inside or outside the battery cabinet.
- **Easy Installation:** Simplified premade harness facilitates efficient installation. Plug-and-play functionality enables large-scale implementation.
- **Remote Data/Alarm Access:** Firewall-friendly communication and simplified management allow access to data and alarms from anywhere via the internet or private network.
- **Support for Site Management Systems:** Fully supports third-party SCADA or site management systems with Modbus-TCP and hyperlink integration for real-time data.

Introduction

The **Sentry-NB8** is an industrial grade battery health monitor specifically designed for 48V (or 24V) systems accommodating one or two strings up to 8 blocks each. This compact unit combines superior data quality and streamlined installation flexibility, ideal for large-scale remote cabinets and stations in telecommunications, broadband, and substations.

Functions

Sentry-NB8 is engineered to automate the recommended measurements outlined in IEEE standards for VRLA batteries, ensuring **Safe Operation, Efficient Battery Maintenance, and Optimal Battery Service Life**.

1) Continously monitors Voltage, Current, Ambient and Battery Temperatures to ensure batteries are in the correct float charging condition.

String Voltage	54.26 V	String High	54.28 V	String Low	54.25 V
Remaining	346 min	Current	1.1 A	CT1/CT2	1.1/0.0 A
Total Runtime	346 min	Ambient	26.0°C	Ambient High	26.0°C
SOH(Health)	72.1%	SOC(Charge)	100.0%	ThermalRisk(Max)	0 (0)
Discharge Counter	0	Deep Discharge	0	Full Discharge	0

Batt#	Voltage(V)	IR(mohm)
#1	13.603	11.52
#2	13.553	12.11
#3	13.565	22.38
#4	13.551	11.03
#5	13.539	17.21
#6	13.710	12.58
#7	13.495	18.08
#8	13.523	14.52

2) Detects thermal risk at early stage and generates alarm to prevent battery thermal runaway.
3) Measures Internal Ohmic value to detect premature or normal deterioration such as **Dryout** / **Loss of Compression** / **Swelling and Expansion** / **Grid or Strap Corrosion** / **Loss of Active Material** / **Nagative Plate Discharge** / and **Other Capacity Losing Mechanisms**.
4) Provides actionable data and graph via Web and/or PC software for weak battery identification, alarm handling, preventative battery service and battery replacement.
5) Enables efficiently management of a large number of battery banks and sites, whether nationwide or worldwide.
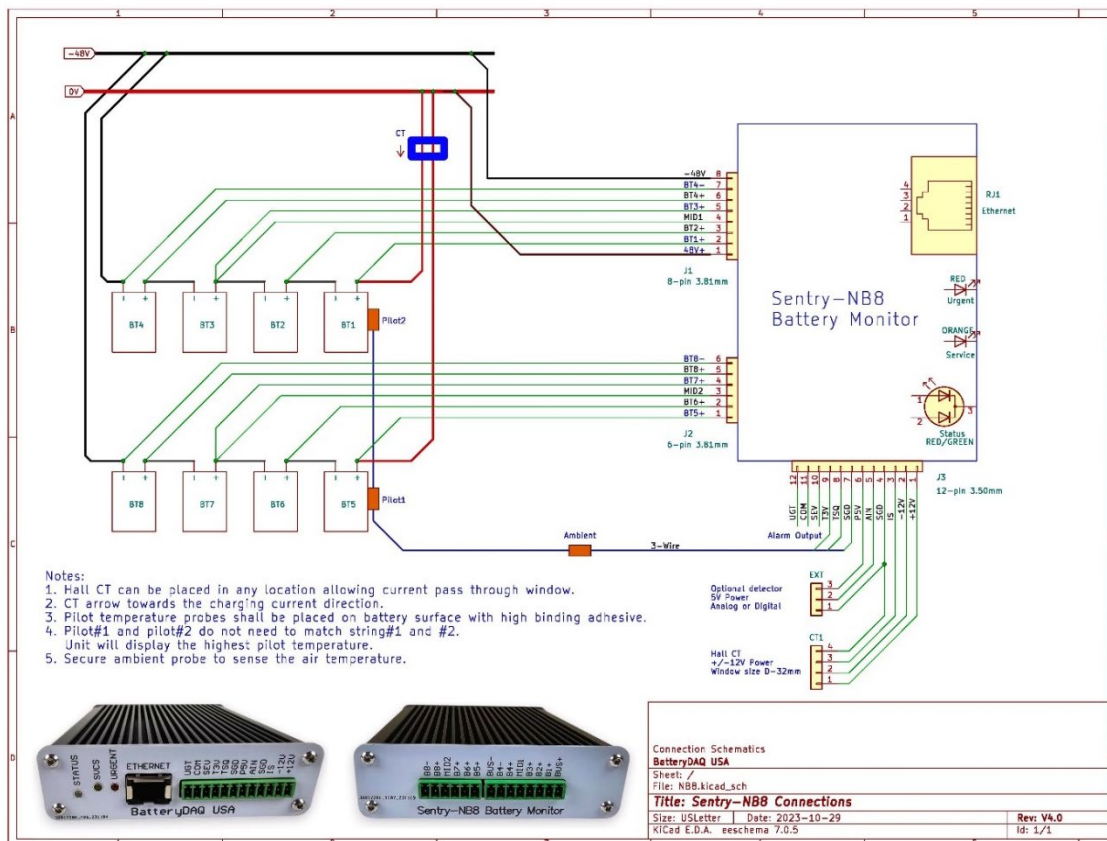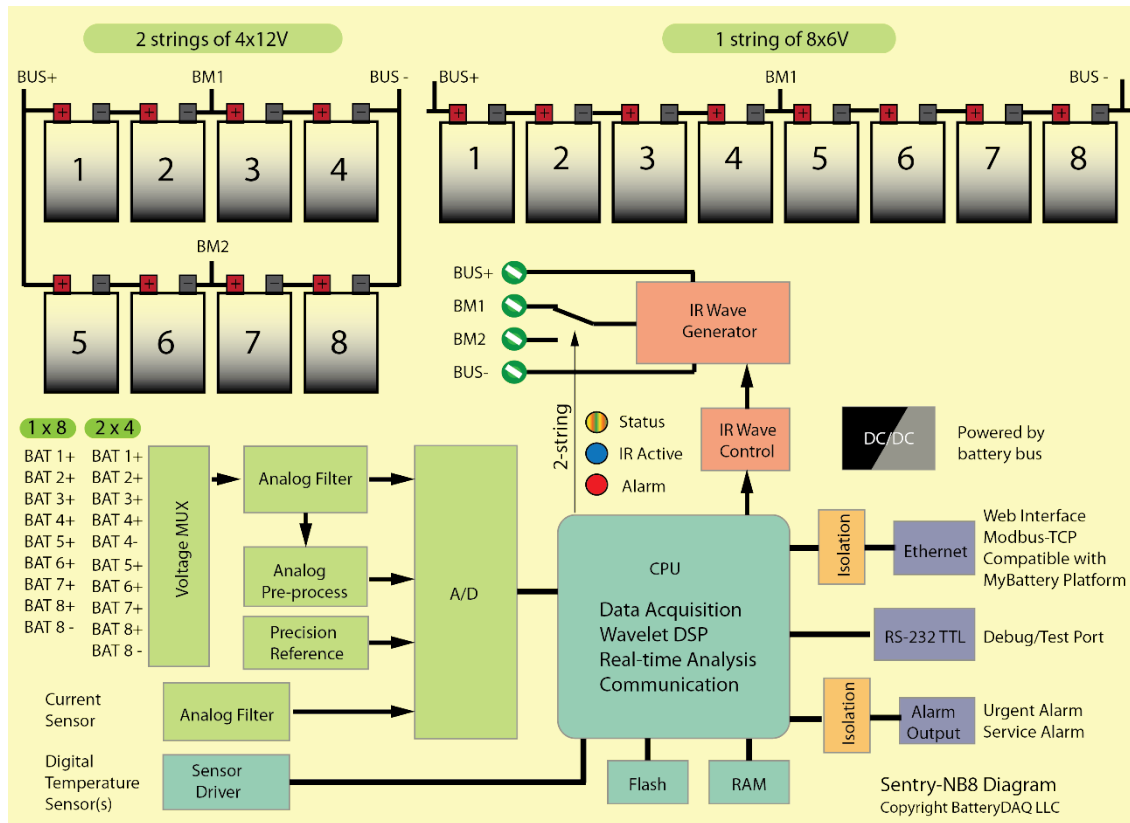
IEEE Standard Reference

IEEE-1188, IEEE Recommended Practice for Maintenance, Testing, and Replacement of Valve-Regulated Lead-Acid (VRLA) Batteries for Stationary Applications
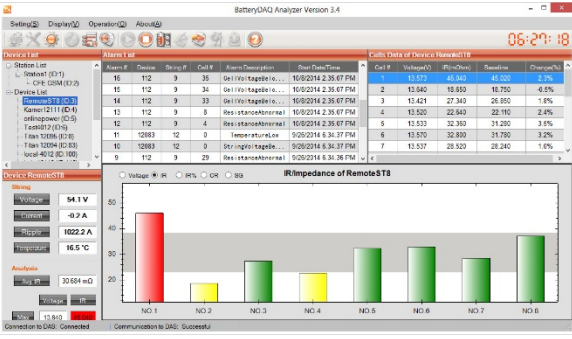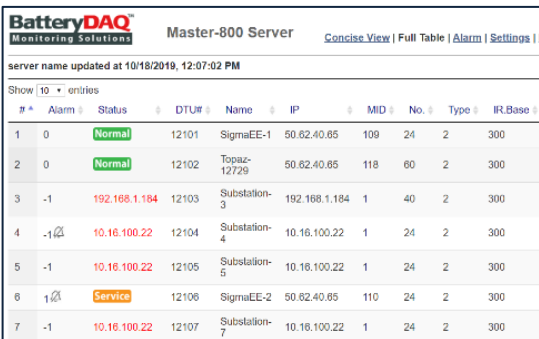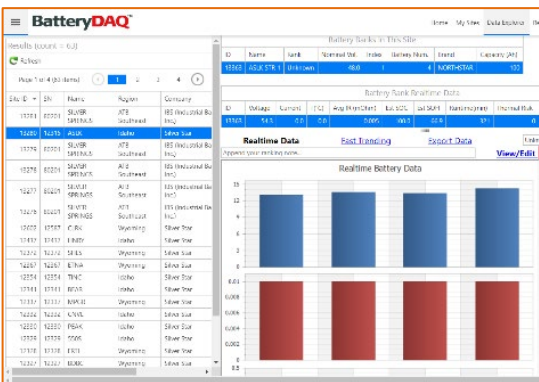
IEEE 1491-2012 IEEE Guide for Selection and Use of Battery Monitoring Equipment in Stationary Applications

System Diagram & Wiring

2 strings of 4x12V

1 string of 8x6V

Sentry-NB8 Diagram
Copyright BatteryDAQ LLC

Notes:
1. Hall CT can be placed in any location allowing current pass through window.
2. CT arrow towards the charging current direction.
3. Pilot temperature probes shall be placed on battery surface with high binding adhesive.
4. Pilot#1 and pilot#2 do not need to match string#1 and #2.
   Unit will display the highest pilot temperature.
5. Secure ambient probe to sense the air temperature.

Connection Schematics
BatteryDAQ USA
Sheet: /
File: NB8.kicad_sch
Title: Sentry-NB8 Connections
Size: USLetter | Date: 2023-10-29 | Rev: V4.0
KiCad E.D.A. eeschema 7.0.5 | Id: 1/1

Centralized Management

Option	Description	Note
Embedded Web Page	Immediate access to battery data/graph with web browser	☑
Battery Analyzer	PC software to manage multiple systems. Email/SMS alarm. Powered by Microsoft® SQL Server® Express database. 	**FREE** Legacy PC software
Master-800 Dashboard	Effectively manage multiple remote systems nationwide or worldwide in private network, without PC software and IT security concerns. Email/SMS alarm. 	**Popular** One Master-800 can manage hundreds of remote sites
MyBattery Platform	Secured cloud/public platform for unlimited (1,000,000+) sites and batteries. Access data worldwide using your smart phone and/or laptop. 	**FREE** Subscription to MyBattery Platform *Cloud function can be disabled by user for sensitive applications.*
SCADA	Modbus-TCP	☑

Specifications

Power Supply	
Power Input	Internal DC/DC converter, 18-60V input; Maximum Consumption: 3W
Current/Temperature Measurement	
Current Sensor	HTA 100-S (or equivalent BatteryDAQ Certified Model) Internal +/-12V power, +/-200A range, D32mm
Accuracy	0.1% + sensor accuracy
Temperature Sensing	Precision digital sensors, daisy chain nodes for ambient, pilot for each string, or individual batteries. Intelligent thermal runaway detection algorithm
Temperature Range	Measurement range: -40 to 105°C Operating range: -40°C to 65°C (-40°F to 149°F)
Accuracy	1 ^{o}C
Voltage Measurement	
Battery Configuration	48V system, 2 strings of 4 x 12V batteries [**Default**] 48V system, 1 string of 8 x 6V 24V system, 2 x 12V or 4 x 6V batteries [Factory Customized] **Caution**: **if your NB8 unit is customized for 24V, do not use it for 48V.**
Bus Voltage	Range: 18 – 60V; Accuracy: 0.1%
Input Range for Each Channel	+/- 18V for 12V batteries
Accuracy	0.1%
Internal Resistance	
Range and Resolution	0 to 30mΩ, 0.01mΩ resolution
Wire Mode	1-wire mode Internal Resistance for each battery block
Communication	
Ethernet	Onboard Ethernet DTU Embedded web pages for real-time data and configuration/calibration Compatible with Master-800 centralized dashboard and MyBattery Platform™
Indication and Output	
LED Indication	Dual-color LEDs for status and alarm
Audio Alarm	Activates beeping for Service Alarm or Urgent alarms
Control Output	Default Normal Close, 0.1A capacity (Optional setting for Normal Open) Can be used to control charger/rectifier ON/OFF for thermal runaway protection
Dimensions	
Unit Dimensions	106mm(W) x 35mm(H) x 120mm(D), 4.2 x 1.4 x 4.7 in.
Mounting	Two strong magnetic cups
Regulatory Approval	
UL Certified E358960-A1	UL 61010-1, 3rd Edition (Electrical Equipment for Measurement, Control, and Laboratory Use)
Flame Rating	Aluminum enclosure, non-flammable

*Specifications subject to change without notice

BatteryDAQ®
Monitoring Solutions

Ordering Information

Part Number	Name	Description
Sentry-NB8	Sentry-NB8 unit	Default for 4 x 12V, 1 or 2 string, up to 200Ah User configurable for 8 x 6V, 1 string
Sentry-NB8-24	Sentry-NB8 unit, 24V	Customized for 24V system. 2 x 12V, 4 x 6V, 1 or 2 strings
TP107-3N2S-5	Temperature Nodes	**Default**, **3** digital temperature nodes, 5FT (Ambient and 2x Pilots)
CT-HTA-100S	Current transducer	Current transducer with 5ft cable, D32mm window
CA-8P-4-1S4-xx	Battery connection harness	**Default** for main string of 4 batteries, 6ft [*Specify O-ring size, default 6mm*.]
CA-6P-6-1S4-xx	Battery connection harness	Harness for 2nd string of 4 batteries, 6ft [*Specify O-ring size, default 6mm*.]
Master-800	Centralized Web Dashboard	Manage multiple remote sites/battery banks

Application Example

A state police department has 300 battery banks on their radio sites.

Voltage	Battery Configuration	Number of Banks	BMS Selection
48V	4 x 12V, 1 or 2 strings	200	200 units of Sentry-NB8
48V	4 x 14V, 3 to 6 strings	50	50 units of Sentry-S6
48V	2 x 24V, 1 string	50	50 units of Sentry-2402

One Master-800 centralized dashboards aggregates data and alarms from all remote BMS units.

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