

# Multilin 8 Series – Application Note



GE's Multilin™ 850 Feeder Protection System is part of the Multilin 8 Series platform of protection relays that share common hardware, firmware and PC Setup Software. Other relays in this platform include the Multilin 869 Motor Protection System, Multilin 845 Transformer Protection System, Multilin 889 Generator Protection System, and will include other protection devices in the future.

## Equipment Monitoring

Besides monitoring power system conditions and reporting power quality issues, the Multilin 850 relay provides unique and detailed equipment monitoring and diagnostics as well. This includes features such as, breaker health monitoring and 850's own environmental monitoring using the patented environmental awareness module. This real-time awareness module provides detection of environmental factors that may affect product life, such as, temperature, humidity, transient voltage, and mechanical shock.

### Breaker health monitoring.

The breaker is monitored by the relay not only for detection of breaker failure, but also for the overall “breaker health” which includes:

- breaker close and breaker open times
- Trip circuit monitoring
- spring charging time
- per-phase arcing current
- trip counters

All algorithms provide the user with the flexibility to set up initial breaker trip counter conditions and define the criteria for breaker wear throughout a number of setpoints.

Item Name	Value	Unit
<b>Total Breaker Trips</b>	<b>12</b>	
Trips Since Last Reset	9	
Alarm Counter	4	
Last Trip Time	2512	ms
Avg. of 5 Trip Time	1842	ms
Avg. of Trip Time	1856	ms
Last Close Time	725	ms
Avg. of 5 Close Time	948	ms
Avg. of Close Time	1217	ms
Last PH A Arc Time	0	ms
Avg. of 5 PH A Arc Time	0	ms

At the bottom of the screenshot, there are three buttons: 'BKR1', 'BKR Hlth', and 'Clear'.

**Figure 1.**  
Breaker health status is available on display or via the Multilin 8 Series Setup Software.

### Environmental monitoring.

Reliable and secure operation of the 850 relay and other electronic devices in the vicinity may be affected by environmental factors. The 850 relay has been designed to meet or exceed all required industry standards however, some operating conditions may be beyond those standards and reduce total lifespan of the device.

Typical environmental conditions that may affect electronic device reliability include voltage, current density, temperature, humidity, gas, dust, contamination, mechanical stress, vibration, shock, radiation, and intensity of electrical and magnetic fields. These environmental factors are different from natural weather conditions at particular installation conditions and are beneficial to monitor.

The 850 relay's built-in environmental awareness feature (patent “Systems and methods for predicting maintenance of intelligent electronic devices”) collects the histograms of each operating condition from the point the device is put into service. Monitored environmental conditions include temperature, humidity, transient voltage and mechanical shock. The histogram of each environmental factor may be retrieved from the diagnostic page accessed through a PC running the EnerVista Multilin 8 Series Setup program.

# ENVIRONMENTAL HEALTH REPORT

## PRODUCT INFORMATION

Device Summary	
Device Name	Quick Connect Device
Device Type	850 Feeder Protection System
Order Code	850-EP5NNG6HNNANNGMSFBSENNBN -
Firmware Version	1.10
Serial Number	MJ2T13UNIT18

Generated At: Sep 05, 2013 08:31 AM

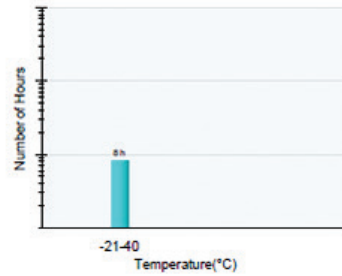


## DEVICE ENVIRONMENT STATISTICS

Summary	
Time In Service	0 Days 8 Hrs 1 Mins 31 Secs
Time Since Last Reset	0 Days 0 Hrs 1 Mins 11 Secs
Minimum Ambient Temperature	20.72°C
Maximum Ambient Temperature	23.07°C
Average Ambient Temperature	22.94°C

Summary	
Minimum Humidity	31.96%
Maximum Humidity	38.41%
Average Humidity	35.06%

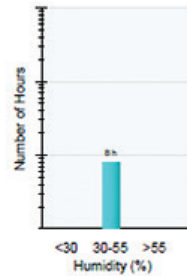
### Ambient Temperature



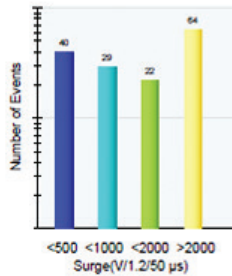
### Ambient / Humidity Combination



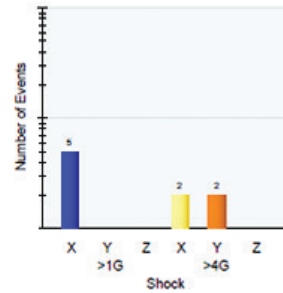
### Humidity



### Surge Detection



### Vibration Sense



8 Series EnerVista  
**SETUP**

Version 1.10

**Figure 2.**  
 Environmental health report is available on front panel display or via Multilin PC Software.