The Multilin™ 850 relay is a member of the Multilin 8 Series protective relay platform and has been designed for the management, protection and control of feeder applications. The Multilin 850 is used to provide primary (main) or backup protection for underground and overhead feeders for utility and industrial power networks.

Designed with advanced communications options and detailed asset monitoring capabilities, the Multilin 850 provides advanced functionality, including high-performance protection, extensive programmable logic and flexible configuration capabilities. With support for industry leading communications protocols and technologies, the 850 provides easy integration into new or existing SCADA or DCS for enhanced situational awareness.

Key Benefits
- Advanced logic and configuration flexibility to provide comprehensive primary or backup protection of overhead or underground cables
- Advanced breaker diagnostics with high-end fault and disturbance recording
- Integrated arc flash detection using light sensors supervised by over current to reduce incident energy and equipment damage
- High-end cyber security such as AAA, Radius, RBAC, and Syslog enabling NERC® CIP requirements
- Draw-out design simplifies testing, commissioning and maintenance, thereby increasing process uptime
- Optional Wi-Fi connectivity minimizes system configuration and provides safe relay programming and diagnostic retrieval
- Relay environmental diagnostic information helps reduce system downtime

Applications
- Wide range of feeder applications for utility, oil & gas, mining & metals, process industry, commercial, and water wastewater
- Comprehensive protection and management of incoming and outgoing feeders
- Fast protection pass enables use for load shedding schemes
- Advanced communications and flexlogic for reliable automatic bus transfer schemes
- High speed fault detection for arc flash mitigation

Innovative Technology & Design
- Advanced feeder protection, control and diagnostics capability
- Patented environmental monitoring and diagnostics
- Advanced, flexible and embedded communications: IEC® 61850 Ed2, IEC 62439/PRP, Modbus® RTU & TCP/IP, DNP3.0, IEC 60870-5-104
- Single setup and configuration across the platform
- Field swappable power supply
- Enhanced relay draw-out construction
- Elimination of electrolytic capacitors

Exceptional Quality & Reliability
- IPC A-610-E Class 3 manufacturing standards
- Highest reliability standards for electronics testing
- 100% Environmental Stress Screening and full functional testing
- Rated for IP54 (front) applications
- Standard Harsh Conformal Coating

Uncompromising Service & Support
- Covered under GE’s 10 year warranty plan
- Designed, tested and assembled by GE

GE Grid Solutions

Multilin 850
Innovative Feeder Protection System for Industrial and Utility Feeder Applications

Innovative Feeder Protection System for Industrial and Utility Feeder Applications

The Multilin™ 850 relay is a member of the Multilin 8 Series protective relay platform and has been designed for the management, protection and control of feeder applications. The Multilin 850 is used to provide primary (main) or backup protection for underground and overhead feeders for utility and industrial power networks.

Designed with advanced communications options and detailed asset monitoring capabilities, the Multilin 850 provides advanced functionality, including high-performance protection, extensive programmable logic and flexible configuration capabilities. With support for industry leading communications protocols and technologies, the 850 provides easy integration into new or existing SCADA or DCS for enhanced situational awareness.

Key Benefits
- Advanced logic and configuration flexibility to provide comprehensive primary or backup protection of overhead or underground cables
- Advanced breaker diagnostics with high-end fault and disturbance recording
- Integrated arc flash detection using light sensors supervised by over current to reduce incident energy and equipment damage
- High-end cyber security such as AAA, Radius, RBAC, and Syslog enabling NERC® CIP requirements
- Draw-out design simplifies testing, commissioning and maintenance, thereby increasing process uptime
- Optional Wi-Fi connectivity minimizes system configuration and provides safe relay programming and diagnostic retrieval
- Relay environmental diagnostic information helps reduce system downtime

Applications
- Wide range of feeder applications for utility, oil & gas, mining & metals, process industry, commercial, and water wastewater
- Comprehensive protection and management of incoming and outgoing feeders
- Fast protection pass enables use for load shedding schemes
- Advanced communications and flexlogic for reliable automatic bus transfer schemes
- High speed fault detection for arc flash mitigation

Innovative Technology & Design
- Advanced feeder protection, control and diagnostics capability
- Patented environmental monitoring and diagnostics
- Advanced, flexible and embedded communications: IEC® 61850 Ed2, IEC 62439/PRP, Modbus® RTU & TCP/IP, DNP3.0, IEC 60870-5-104
- Single setup and configuration across the platform
- Field swappable power supply
- Enhanced relay draw-out construction
- Elimination of electrolytic capacitors

Exceptional Quality & Reliability
- IPC A-610-E Class 3 manufacturing standards
- Highest reliability standards for electronics testing
- 100% Environmental Stress Screening and full functional testing
- Rated for IP54 (front) applications
- Standard Harsh Conformal Coating

Uncompromising Service & Support
- Covered under GE’s 10 year warranty plan
- Designed, tested and assembled by GE

GE Grid Solutions
Multilin 8 Series Platform Overview

From oil pumping and refining facilities, to open pit or underground mining and processing operations, to large or small utilities, customers demand solutions that ensure maximum process uptime, minimum operational and maintenance efforts, and have the durability to withstand harsh environmental conditions.

The Multilin 8 Series is GE’s next-generation protection and control relay platform provides comprehensive protection and asset monitoring for critical feeders, motors, generators, and transformers.

Multilin 8 Series Platform - Application Example
The Multilin 8 Series is designed to solve the challenges that customers face in running their day-to-day operations including maximizing system and process uptime, simplifying system integration and maintenance, and extending the life of critical assets. Utilizing advanced design practices (IPC A-610 standards), superior technology, and state-of-the-art test and manufacturing facilities (every device endures 100% Environmental Stress Screening), GE is raising the bar on system performance and reliability.

With advanced communications the Multilin 8 Series integrates easily and seamlessly into new or existing DCS/SCADA system, along with other Multilin protection devices, providing a comprehensive solution for the end-to-end electrical system within the operations.
Exceptional Quality & Reliability

Industry-leading quality, reliability and design processes are at the core of GE’s next generation protective relay platform. With significant investments in state-of-the-art type test facilities that simulate a complete range of operating environments and designed to the IPC A-610 Class 3 standard, adhering to the highest reliability standards and ensuring rugged performance, each device completes one hundred percent Electrical Stress Screening prior to shipping from GE’s facility.

The Multilin 8 Series Protection Relays are manufactured in an ISO® 9001:2008 certified manufacturing facility.

Pioneering Technology & Design

The Multilin 850 is part of the 8 Series platform that provides comprehensive, high performance protection and control for critical assets in Industrial and utility environment.

For main-tie-main configurations, the Multilin 850 delivers a more economical and reliable solution, enabling customers to reduce hardware requirements and simplify device integration, including safe and secure Wi-Fi communications for system configuration and diagnostics.

Utilizing decades of experience, GE has implemented ease-of-use features, such as single screen set-ups delivering faster feeder configuration, configurable scheme logic that eliminates the need for complex end-user programming, driving quicker setup times, decreased implementation costs and reduced points of failure.

The Multilin 8 Series products have an integrated protection integrity engine that utilizes customized algorithms, providing advanced diagnostics to ensure asset protection is not compromised.

Maintaining and safeguarding the electrical supply of an operation is critical to ensuring maximum process availability and performance.

The 8 Series incorporates the latest cyber security features, including password complexity, RADIUS authentication, role-based access control (RBAC), customers to comply with NERC CIP and NISTIR 7628 requirements.

Understanding that customers need protection and control devices that must reliably operate in extremely harsh and challenging environments, GE delivers the Multilin 850 with harsh conformal coating on all printed circuit boards and a patented environmental awareness module that provides real-time detection of environmental factors that affect product life, as part of its standard offering, delivering higher reliability and extended relay life.

Uncompromised Service and Support

In addition to the superior technology and innovative design advancements that enable delivery of uncompromised performance and reliability, the Multilin 8 Series is also backed by GE’s 10 year warranty plan.

---

1. Field Swappable Power Supply
   Extends the usable life of the protection relay and minimizes costly, time consuming replacement and re-configuration

2. Harsh Environment Conformal Coating
   Standard on all printed circuit boards delivering higher reliability and extended relay life

3. No Electrolytic Capacitors
   Increasing quality and reliability for continuous plant operations by removing high failure components (excluding low voltage power supply)

4. IPC A-610 Class 3 Manufacturing
   Drives to the highest level of reliability standards delivering rugged performance

5. Robust Extruded Aluminum Chassis
   Custom-designed extruded aluminum chassis delivering optimal operating performance

6. Draw-Out
   Providing simplified device fleet management
**Multilin 850 Overview**

The Multilin 850 feeder Protection System is a protection device designed for the management, protection and control of incoming and outgoing feeders. The 850 provides comprehensive protection and control for these various feeders.

The 850 relay offers the ideal solution for protecting, monitoring and controlling feeders from disturbances or faults. With a fast protection pass, running every two milliseconds, the 850 relay provides fast response to current, voltage, power, and frequency protection elements. Supporting the latest in industry standard communication protocols, including IEC 62439/PRP and IEC 61850, the Multilin 850 relay easily integrates into new or existing networks.

The 850 is an advanced feeder protection relay that provides high performance protection, extensive programmable logic and flexible configuration capabilities. With protection and control logic, the 850 allows for simplified coordination with upstream and downstream disconnect devices. This advanced protection relay also offers enhanced features, such as diagnostics, preventative maintenance, condition monitoring, security, and advanced communications options.

**Protection & Control**

As part of the 8 Series family, the Multilin 850 provides superior protection and control. The 850 offers comprehensive protection and control solutions for incoming, outgoing bus-tie/bus-coupler feeders. It contains a full range of selectively enabled, self-contained protection and control elements.

- **Phase/Neutral/Ground Time Overcurrent (51P/N/G)**
- **Phase/Neutral/Ground Instantaneous Overcurrent (50P/N/G)**
- **Phase Directional Overcurrent (67P)**
- **Directional Power (32)**
- **Phase/Aux Under Voltage (27P/X)**
- **Phase/Neutral/Aux Over Voltage (59P/N/X)**
- **Over/Under/ROC Frequency (81O/U)**
- **Synchrocheck (25)**
- **Autoreclose (79)**
- **AR Current Supervision And AR Zone Coordination**

The voltage and frequency protection functions detect abnormal system conditions, potentially hazardous to the system. Some of these conditions may consist of over and undervoltage, over and underfrequency, and phase reversal.

**Fast Underfrequency**

The 850 has an 8-stage Fast Underfrequency element that measures frequency by detecting the consecutive voltage zero crossings and measuring the time between them. The measured frequency has the range between 20 to 70 Hz. This is useful for performing fast load shedding when frequency variations from unbalance conditions arise due to:

- Inadequate load forecast or deficient generation capacity programming.
- Busbars, generator group or interconnection feeders trip.
- System splits into islands.

**FlexCurves™**

For applications that require greater flexibility, FlexCurves can be used to define custom curve shapes. These curves can be used to coordinate with other feeders to achieve fault selectivity.

**RTD Protection**

The Multilin 850 supports up to 13 programmable RTD inputs that can be configured for an Alarm or Trip.

The RTDs can be assigned to a group for monitoring ambient temperatures or any other desired temperature. The RTD voting option gives additional reliability to ignore any RTD failures.

**Integrated Arc Flash Protection**

The Multilin 8 Series supports an integrated arc flash module providing constant monitoring of an arc flash condition within the switchgear, motor control control centers, or panelboards. With a 2ms protection pass, the 8 Series is able to detect light and overcurrent using 4 arc sensors connected to the 8 Series relay. In situations where an arc flash/fault does occur, the relay is able to quickly identify the fault and issue a trip command to the associated breaker thereby reducing the total incident energy and minimizing resulting equipment damage.

Self-monitoring and diagnostics of the sensors ensures the health of the sensors as well as the full length fiber cables. LEDs on the front panel display of the 845 can be configured to indicate the health of the sensors and its connections to the relay.

**Analog Inputs, Analog Outputs**

The 850 provides 7 Analog Outputs (dc mA), 4 Analog Inputs (dc mA), 1 RTD input. The configurable analog inputs can be used to measure quantities fed to the relay from standard transducers. Each input can be individually set to measure 4-20 mA, 0-20 mA or 0-1 mA transducer signals.

The 850 can also be set to issue trip or alarm commands based on signal thresholds. The configurable analog outputs can be used to provide standard transducer signals to local monitoring equipment. The analog outputs can be configured to provide outputs based on measured analog values, or calculated quantities.

An optional general purpose transducer input allows a user-defined quantity to be monitored and used as part of the protection as defined by FlexLogic™.
Advanced Automation

The Multilin 850 incorporates advanced automation capabilities that exceed what is found in most feeder protection relay. This reduces the need for additional programmable controllers or discrete control relays including programmable logic, communication, and SCADA devices. Advanced automation also enables seamless integration of the 850 into other protection or process systems (SCADA or DCS).

FlexLogic™

FlexLogic is the powerful programming logic engine that provides the ability to create customized protection and control schemes, minimizing the need and associated costs of auxiliary components and wiring. Using FlexLogic, the 850 can be programmed to provide the required tripping logic along with custom scheme logic for feeder control interlocking schemes with adjacent protections (for example, preventing sympathetic tripping of healthy feeders), and dynamic setting group changes.

Monitoring & Diagnostics

The Multilin 850 includes high accuracy metering and recording for all AC signals. Voltage, current, and power metering are built into the relay as a standard feature. Current and voltage parameters are available as total RMS magnitude, and as fundamental frequency magnitude and angle.

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 set points.

Environmental Monitoring

The 850 implements a patented environmental monitoring system that measures and provides operating condition information. 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, 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 and transient voltage. 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.
The Multilin 850 offers high accuracy power quality monitoring for fault and system disturbance analysis. The Multilin 8 Series delivers unmatched power system analytics through the following advanced features and monitoring and recording tools:

- Harmonics measurement up to 25th harmonic for both currents and voltages including THD.
- The length of the transient recorder record ranges from 31 cycles to 1549 cycles, depending on the user specified configuration. This gives the user ability to capture long disturbance records which is critical for some applications.
- 32 digital points and 16 analog values, assigned by the user, can be captured in the COMTRADE format by the transient recorder.
- Comprehensive data logger provides the recording of 16 analog values selected from any analog values calculated by the relay. Capture rates range from 16 ms, 20ms, 1 second, 30 seconds, 1 minute, 30 minutes, or 1 hour rate. This data capture flexibility allows the operator to measure power factor or reactive power flow (for example), for several hours or even days, enabling detailed analysis and corrective action to be taken, if required.
- Detailed Fault Report allows the user to identify the fault location, fault type and element(s) that triggered the 850 to trip. It carries other useful information, such as pre-fault and fault phasors, relay name and model, firmware revision and other details. The 850 stores fault reports for the last 16 events. 1024 Event Recorder chronologically lists all triggered elements with an accurate time stamp over a long period of time. The 850 stores the last 1024 events locally in the relay.
Communications

The 850 provides advanced communications technologies for remote data and engineering access, making it easy and flexible to use and integrate into new and existing infrastructures. Direct support for fiber optic Ethernet provides high-bandwidth communications, allowing for low-latency controls and high-speed file transfers of relay fault and event record information. The 850 also supports two independent IP addresses, providing high flexibility for the most challenging of communication networks.

Providing several Ethernet and serial port options and supporting a wide range of industry standard protocols, the 850 enables easy, direct integration into DCS and SCADA systems. The 850 supports the following protocols:

- IEC 61850, IEC 62439 / PRP
- DNP 3.0 serial, DNP 3.0 TCP/IP, IEC 60870-5-103, IEC 60870-5-104
- Modbus RTU, Modbus TCP/IP

The 850 has two interfaces as USB front port and Wi-Fi for ease of access to the relay.

Wi-Fi Connectivity:

- Simplify set-up and configuration
- Simplify diagnostic retrieval
- Eliminate personnel in front of switchgear
- WPA-2 security

Cyber Security

The 850 cyber security enables the device to deliver full cyber security features that help operators to comply with NERC CIP guidelines and regulations.

AAA Server Support (Radius/LDAP)

Enables integration with centrally managed authentication and accounting of all user activities and uses modern industry best practices and standards that meet and exceed NERC CIP requirements for authentication and password management.

Role Based Access Control (RBAC)

Efficiently administrate users and roles within UR devices. The new and advanced access functions allow users to configure up to five roles for up to eight configurable users with independent passwords. The standard “Remote Authentication Dial In User Service” (Radius) is used for authentication.

Event Recorder (Syslog for SEM)

Capture all cyber security related events within a SOE element (login, logout, invalid password attempts, remote/local access, user in session, settings change, FW update, etc), and then serve and classify data by security level using standard Syslog data format. This will enable integration with established SEM (Security Event Management) systems.

Software & Configuration

The EnerVista™ suite is an industry-leading set of software programs that simplifies every aspect of using the Multilin 850. EnerVista provides all the tools to monitor the status of the protected asset, maintain the device and integrate the information measured by the Multilin 8 Series, into SCADA or DCS process control systems. The ability to easily view sequence of events is an integral part of the setup software, as postmortem event analysis is critical to proper system management.

EnerVista Launchpad

EnerVista Launchpad is a powerful software package that provides users with all of the setup and support tools needed for configuring and maintaining Multilin products. The setup tools within Launchpad allow for the configuration of devices in real-time, by communicating via serial,
Application Challenge: Modern Feeder Protection

Challenge:
Utilities and industrial facilities depend on reliable and secure electricity services to keep their operations running. Regardless of the type of source, a fully integrated protection & control scheme is critical to maintaining uninterrupted power to the entire facility.

Solution:
The Multilin 8 Series offers the ideal solution for protecting, monitoring and controlling electrical cables and overhead lines from disturbances or faults. With a fast protection pass, running every 2 msec, the 8 Series provides unmatched overcurrent, overvoltage, undervoltage, and frequency protection. Supporting the latest in industry standard communication protocols, including IEC 62439/PRP and IEC 61850, the Multilin 8 Series easily integrates into new or existing networks.

Simplified Setup and On-Going Maintenance
The robust 850 streamlines user workflow processes and simplifies engineering tasks, such as configuration, wiring, testing, commissioning, and maintenance. Building on the history of simplified setup and configuration, the 850 Feeder Protection Relay has implemented simplified setup screens to minimize relay setup time. In addition, for local programming, the 850 comes with a fully functional GCP, which allows users to locally monitor the asset.

Ease-of-Use
Continuing its legacy in providing easy-to-use protective relay solutions, the 850 is designed to minimize product and system configurability requirements, for quicker physical installations, easier and simplified setup and configuration.

1. Easy to Use - Draw-out case
2. Easy to Configure - 1 simple step
3. Detailed Diagnostics
Full Color Graphical HMI Front Display

A large, full color Graphic Control Panel (GCP) ensures clear representation of critical status and measurements. When the keypad and display are not being used, the GCP will automatically revert to screen saver mode, which will turn off the display until one of the local pushbuttons is pushed.

The GCP can be used to view device and system status, alarms and event logs, and metering information. The GCP and navigation keys simplify relay configuration and setup, allowing users to make setting changes directly through the front panel.

LED Indicators for Quick Status Indication

The front panel includes user configurable LED’s. Each LED can be completely configured and named based on the application and user requirements. The color of each indicator conveys its importance.

- G = Green: General Condition
- A = Amber: Alert Condition
- R = Red: Serious Alarm or Important Status

The 850 front panel provides 14 LED indicators and 3 LED pushbutton indicators. 10 LED’s are user-programmable, while “In service” and “Pickup” LED’s are non-programmable. “Trip” and “Alarm” LED’s are not color programmable but can be assigned with selected operands.

User-programmable LED’s can be turned on by a selection of FlexLogic operands representing protection, control or monitoring elements. Each LED can be configured to be self-reset or latched and labeled based on the application and user requirements. User-programmable LED’s can be selected to be either Red, Green or Orange to give the distinctive indication of selected operations.
Front View

Menu path display indicating location within menu structure
Soft menu navigation keys
LED status indicators
User-programmable pushbuttons
Graphic Control Panel (GCP)
Soft key navigation menu
Navigation keys
Front USB port
Self-captive screw on draw-out handle

Rear View

Grounding screw
Power supply
RTDs
Digital I/O, DCMA, Arc Flash sensors
Standard serial and RJ45 Ethernet module
Advanced communications module (fiber optic port)
CT, VT inputs

Dimensions & Mounting

7.15”
9.90”
8.42”
1.55”
7.55”
8.84”
Technical Application Example 1: Industrial Auto Transfer Schemes

Challenge
Bus or source transfer solutions are often necessary for industrial facilities to ensure power reliability and process continuity. Being able to rapidly transfer sources was often accomplished through a complex combination of discrete and auxiliary relays, timers, and/or programmable logic controllers, all wired together. The usage of these independent devices required a precise sequencing of interlocks, timing, and functions to ensure no momentary loss of power could potentially damage critical equipment or loads. In addition, the large number of physical I/O required made these schemes expensive to design and implement and difficult to test.

Solution
The Multilin 850 offers seamless automated bus transfer scheme solutions, maximizing system availability and process uptime. Using a minimal amount of programming, the 850 eliminates the need for any discrete devices and device inter-wiring by integrating all the functions directly into the intelligent device. With advanced communications including embedded support for IEC 61850 peer-to-peer communications, inter-relay wiring and physical I/O can be eliminated. The 850 provides a reliable, automatic bus transfer solution that is easy to design, configure, and maintain.

Technical Application Example 2: Zone Selective Interlocking

Challenge
A Fault in an industrial or utility system is a catastrophic event that causes severe damage to equipment and often results in extended system and process downtime. These events require a solution that can quickly and reliably detect and issue a coordinated trip command to clear the fault as fast as possible, reducing total incident energy, equipment damage and system downtime.

Solution
With embedded support for IEC 61850, the 850 provides high-speed data exchange between relays for fast reaction to system issues. As a coordinated system, interlocked protection can be enabled, to provide the necessary bus protection. Fast clearance can be achieved for a fault that occurs at any feeder or bus location by quickly exchanging signals to discriminate the fault location.
Technical Application Example 3: Intelligent Auto-Reclose

Challenge:
A majority of faults that occur on overhead lines are transient in nature, meaning that the fault does not recur when the line is re-energized after tripping. However, in the event the fault is present after the 1st reclose attempt, there is a good possibility that next reclose attempts will be successful and power supply to the customer will be restored. Therefore, in order to maintain system availability and security, utility operators need an intelligent auto-reclose solution that allows them to automatically attempt to re-energize a line multiple times, depending on the system conditions and user requirements. Today’s environment requires integrated solutions into digital relays.

In modern feeder topology, substation relay auto-reclose functions should maintain coordination with downstream reclosures installed along the feeder.

Solution:
For customers wanting a reliable and customized auto-reclose scheme, a device with integrated logic capabilities is necessary. The 850 offers comprehensive protection and auto-reclose functions integrated in one box.

Up to four auto-reclose operations are possible, each with a programmable dead time. For each reclose shot, the relay can be programmed to block IOC elements, and to adjust the curve characteristics of any TOC element. The number of shots can be reduced by high currents. Maximum rate per hour reclose shots would prevent breaker drive and insulation overstressing.

Technical Application Example 4: Adaptive Protection

Challenge:
To effectively manage an electrical system, operators need the ability and flexibility to change power output on a seasonally or even hourly basis due to scheduled maintenance, seasonal load changes and transfers, scheduled switching, transformer inrush or motor starting currents. These changes could have an adverse effect on the reliability of the system and connected loads and requires a protection device that can adapt to ensure secure and dependable protection.

One such application where dynamic setting group change ability is ideal, is with a parallel feeder application where two lines are in service and carry a portion of the required load. If there is an unplanned outage with one of the feeder lines, such that all loads are now supplied by one feeder, key protection settings would need to be adjusted to ensure proper coordination with downstream devices and deliver secure reliable service.

Solution:
The Multilin 850 offers effective, reliable management of feeders. With dynamic, sensitive settings, the 850 provides secure and dependable protection. With six setting groups the 850 provides the sensitive settings range and groups required to ensure no compromise is made to meet changing system conditions. These setting groups can be enabled automatically or manually to address system needs, ensuring greater system reliability and efficiency.
Retrofit Existing Multilin SR 750 Devices in Minutes

Traditionally, retrofitting or upgrading an existing relay has been a challenging and time consuming task often requiring re-engineering, panel modifications, and re-wiring. The Multilin 8 Series Retrofit Kit provides a quick, 3-step solution to upgrade previously installed Multilin SR 750/760 protection relays, reducing upgrade costs.

With the new 8 Series Retrofit Kit, users are able to install a new 850 Feeder Management System without modifying existing panel or switchgear cutouts, re-wiring, or need for drawing changes and re-engineering time and cost.

With this three-step process, operators are able to upgrade existing SR relays in as fast as 21 minutes, simplifying maintenance procedures and reducing system downtime.

1. **Update Settings File**
   EnerVista 8 Series Setup Software provides automated setting file conversion with graphical report to quickly and easily verify settings and identify any specific settings that may need attention.

2. **Replace Relay**
   Simply remove the 4 existing terminal blocks and then remove the SR chassis from the panel. No need to disconnect any of the field wiring.

3. **Plug & Play Reconnection**
   Insert the new 8 Series Retrofit chassis into the switchgear and simply plug-in the old terminal blocks - there is need to make any cut-out modifications or push and pull cables.

The 8 Series Retrofit Kit comes factory assembled and tested as a complete unit with the 8 Series protection device and includes replacement hardware (terminal blocks and screws) if the existing hardware is significantly aged or damaged.

Explore in Detail

visit us online to explore the SR to 8 Series retrofit kit in detail using our interactive app. www.GEGridSolutions.com/8SeriesRetrofitKit

Multilin 8 Series Retrofit
| Description                                                                 | B500 | E | * | NN | * | H | * | A | * | G | * | * | * | * | * | * | * | N |
|----------------------------------------------------------------------------|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| English Language, High Voltage PS, Graphical Control Panel                  |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Ordering                                                                   | B500 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Base Unit                                                                  | 850  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Language                                                                   | E    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Phase Currents - P1                                                       |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Bank 1/2                                                                  | PS   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Phase Currents - P5                                                       |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Bank 3                                                                     | IN   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Ground Currents - G1                                                      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Ground Currents - G5                                                      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Ground Currents - S1                                                      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Ground Currents - S5                                                      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Ground Currents - D1                                                      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Ground Currents - D5                                                      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Power Supply                                                              | H    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Slot B - LV I/O                                                           | N    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Slot C - LV I/O                                                           | N    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Slot F - HV I/O                                                           | N    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Slot G - HV I/O                                                           | N    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Slot H - HV I/O                                                           | N    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Faceplate                                                                  | G    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Current Protection - Basic                                                | S    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Current Protection - Standard                                             | S    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Voltage Monitoring & Protection - Basic                                    | S    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Voltage Monitoring & Protection - Standard                                 | S    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Control                                                                    | B    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Control                                                                    | B    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Monitoring                                                                 | B    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Monitoring                                                                 | B    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Communications                                                             | S    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Communications                                                             | S    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Connector                                                                  | S    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Connector                                                                  | S    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Wireless                                                                   | N    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Communication                                                              | W    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Security                                                                   | B    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Security                                                                   | B    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

Note: Harsh Environment Coating is a standard feature on all B series units.

*HV I/O, Option A - Max 2 across slots F through H

Arc Flash Detection (Option F) Includes 4 x Arc Flash sensors, each 18 feet long

GFGridSolutions.com

IEC is a registered trademark of Commission Electrotechnique Internationale. IEEE is a registered trademark of the Institute of Electrical and Electronics Engineers, Inc. Modbus is a registered trademark of Schneider Automation. NERC is a registered trademark of North American Electric Reliability Council. NIST is a registered trademark of the National Institute of Standards and Technology. GE, the GE monogram, Multilin, FlexLogic, EnerVista and CyberSentry are trademarks of General Electric Company.

GE reserves the right to make changes to specifications of products described at any time without notice and without obligation to notify any person of such changes.

Copyright 2016, General Electric Company. All Rights Reserved.