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.

Flexibility and Simplified Interlocking

The Multilin 850 provides a set of user friendly features and pre-configured scheme logic to simplify device setup and configuration. Installation, relay setup, monitoring, maintenance and troubleshooting processes have all been optimized to simplify and reduce operational effort and time. At the same time, a number of customizable protection and control features are available to support advanced or non-typical applications.

One of the key design targets of the 850 relay was compatibility with the Multilin 750 relay. For users familiar with GE's existing SR platform, setting up the 850 has been simplified and made easier. Both platforms use the same settings formats and menus organization. The basic features, system setup and protection elements are very similar except that the 850 has more advanced features. For customers who want to upgrade an existing Multilin 750 relay, a 750 to 850 setting file conversion tool is provided through the 850 Setup Software.

For advanced applications, the Multilin 850 relay is equipped with a FlexLogic™ tool that is capable of reducing or removing external wires and allows custom logic solutions. To provide maximum flexibility, Flexlogic allows manipulation of the contact inputs, contact outputs, internal relay functions digital and analog points with Boolean operators, timers, latches and other tools available within the Flexlogic engine. Logic equations can be set in 850 relay using the EnerVista 850 Setup Software program. The FlexLogic tool consists of 1024 lines giving the user ability to meet the needs of their unique application(s).

SettingName	SettingValue	Original SettingName	Original SettingValue
Setpoints			
Device			
System			
Current Sensing			
Current Sensing 1			
Phase CT Primary	200 A	Phase CT Primary	200 A
Ground CT Primary	3000 A	Ground CT Primary	3000 A
Current Sensing 2			
Sens. Ground CT Primary	50 A	Sensitive Ground CT Primary	50 A
Voltage Sensing			
Voltage Sensing 1			
Phase VT Connection	Delta	Bus VT Connection Type	Delta
Phase VT Secondary	120.0 V	Bus Nominal VT Secondary Voltage	120.0 V
Phase VT Ratio	35.00	BUS VT Ratio	35.0 : 1
Aux. VT Connection	Vab VT	Line VT Connection	Vab
Aux. VT Secondary	120.0 V	Line Nominal VT Secondary Voltage	120.0 V
Aux. VT Ratio	35.00	Line VT Ratio	35.0 : 1
Power System			
Breakers			
FlexCurves			
Protection			
Group 1			
Current			
Phase TOC 1			
Function	Trip	Phase Time Overcurrent 1 Function	Trip
Input	Phasor		
Pickup	0.900 x CT	Phase Time Overcurrent 1 Pickup(Setpoints)	0.90 x CT
Curve	Flex Curve A	Phase Time Overcurrent 1 Curve	FlexCurve A
TDM	100.00	Phase Time Overcurrent 1 Multiplier	100.00
Reset	Instantaneous	Phase Time Overcurrent 1 Reset	Instantaneous
Direction	Disabled	Phase Time Overcurrent 1 Direction	Disabled
Voltage Restraint	Disabled	Phase Time Overcurrent 1 Voltage Restraint	Disabled
Block	Off		
Relays	Disabled		

Figure 1.
Settings file conversion tool from 750 to 850, simplifying device and system upgrades.

The Multilin 850 relay supports up to 6 settings groups allowing the user to change protection settings depending on the power system configuration and conditions. The active setting group in the 850 is settable from either the value set via a FlexLogic operand in the 850 (present practice) or a SelectActiveSG command from a 61850 Client. For both, the 850 and IEC 61850, the default active setting group is "1"

Due to availability of the powerful logic engine Flexlogic, multiple I/O points and communications, the 850 relay reduces the amount of external wiring traditionally required for a number of applications. This includes transfer schemes, interlocking, trip transfer and more. As the IEC 61850 protocol is becoming widely used to exchange digital points between Intelligent devices - latency to exchange these points is better than hard wired connections and health of IEC 61850 I/Os is continuously monitored.

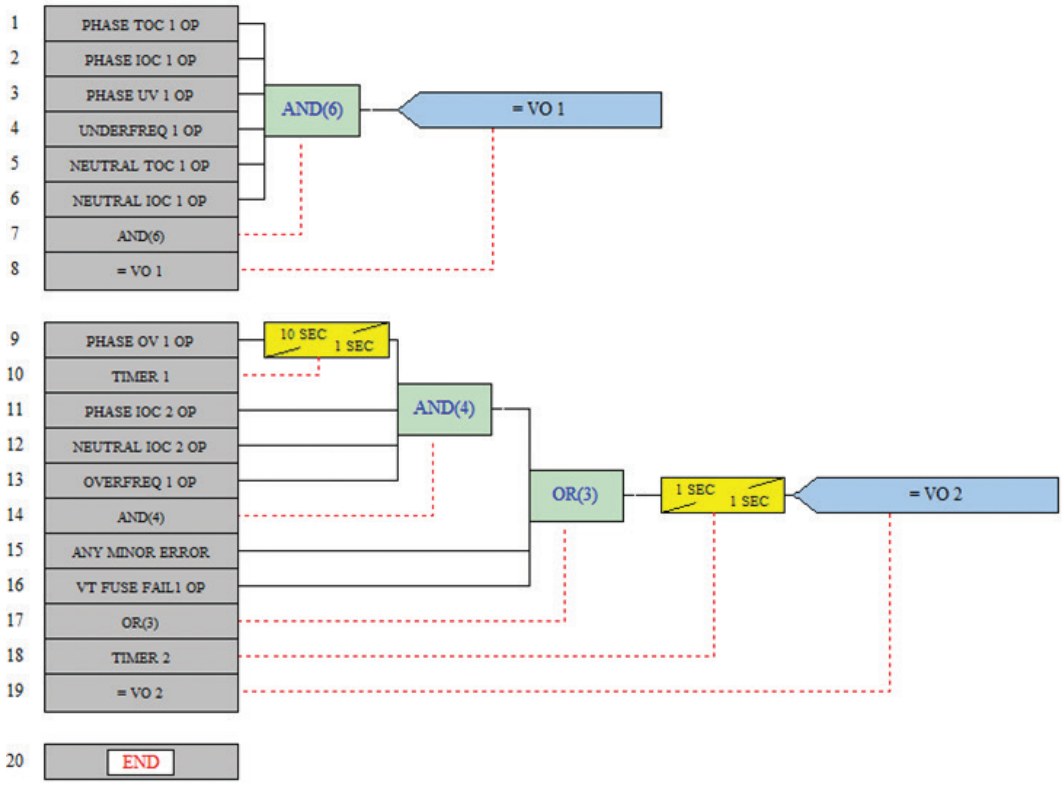

Figure 2.
Flexlogic is a powerful tool that provides the flexibility required to meet unique application requirements.

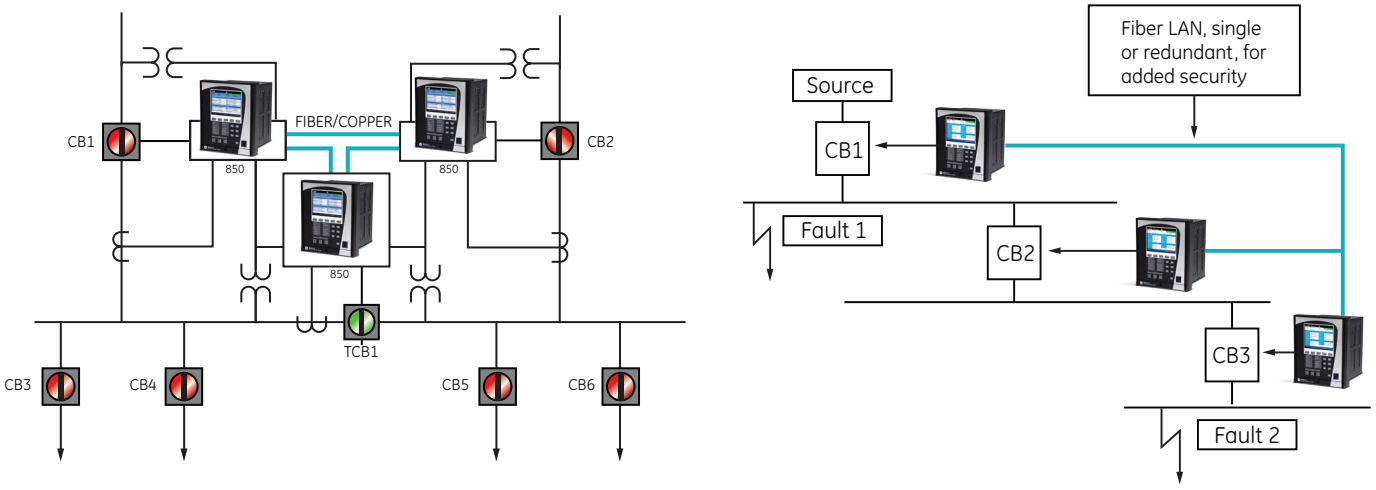

Figure 3.
Bus Transfer Scheme and zone selective interlocking Simplified with IEC 61850 GOOSE .