Multilin™ 350
FEEDER PROTECTION SYSTEM

Intuitive and Innovative Feeder Protection

KEY BENEFITS

- Easy to use and intuitive overcurrent protection and control for feeder applications.
- Effortless draw-out construction eliminates requirement for test switches and reduces downtime
- Environmental monitoring system to alarm on destructive operating conditions and plan preventative maintenance
- Easy to use interface and set up in one simple step
- Accelerated Life Cycle Tested to ensure reliability of relay operation under abnormal conditions
- Advanced power system diagnostics to increase reliability through fault and disturbance recording capabilities

- Flexible communications with multiple ports & protocols to allow seamless integration into new and existing infrastructure
- Arc flash mitigation via zone inter-tripping, flex curves, and multiple settings group
- Powerful Security Audit Trail tool to increase security and minimize system risks by tracking setting changes
- Application flexibility with the use of programmable logic elements

APPLICATIONS

- Industrial feeders with enhanced breaker monitoring diagnostics, etc.
- Distribution utility down stream breaker protection

- Medium voltage Utility feeders with advanced control features Cold Load Pickup, auto reclose, multiple settings group, etc

FEATURES

Protection and Control

- Phase, neutral and ground TOC and IOC
- Undervoltage, overvoltage, frequency
- Neutral/ground directional
- Negative sequence Overcurrent
- ANSI, IAC, IEC, flex curves
- Cable Thermal Model Protection
- Breaker Failure
- Cold Load Pick Up
- Four-shot auto-reclose
- 8 digital inputs, 7 contact outputs
- Two setting groups

Metering & Monitoring

- Event Recorder: 256 events
- Oscillography with 32 samples per cycle
- IRIG-B clock synchronization
- Relay health diagnostics
- Security audit trail
- Metering - current, voltage, power, frequency

User Interface

- 4 line display for easy viewing of key data
- 10 LED indicators for quick diagnostics
- Front USB and rear RS485 serial communications
- Multiple Communication Protocols:
  IEC 61850
  IEC 61850 GOOSE,
  MODBUS TCP/IP, MODBUS RTU,
  DNP 3.0, IEC 60870-5-104, IEC 60870-5-103

EnerVista™ Software

- EnerVista Software- an industry-leading suite of software tools that simplifies every aspect of working with Multilin devices.
- Quick & easy configuration requiring minimal settings for most feeder applications.

Digital Energy

Overview

The 350 relay is a member of the 3 Series family of Multilin relays. This protective device is used to perform primary circuit protection on medium voltage feeders and down stream protection for distribution utilities.

The basic protection function of this relay includes multiple phase, ground, and neutral time and instantaneous overcurrent elements for coordination with upstream and downstream devices. Additionally, the device provides essential feeder breaker control features such as cold load pick up blocking, breaker failure, and auto reclose.

The robust 350 streamlines user work flow processes and simplifies engineering tasks such as configuration, wiring, testing, commissioning, and maintenance. This cost-effective relay also offers enhanced features such as diagnostics, preventative maintenance, arc flash mitigation and security.

Easy to Use

Drawout Construction

The 350 offers a complete drawout feature eliminating the need for rewiring after testing has been concluded. The withdrawable feature also eliminates the need to open the switch gear door and disconnect communication cables, eg. Ethernet fiber, copper, RJ45, etc prior to removing the relay from the chasis

Effortless Retrofit

The small and compact 350 enables multiple relays to be mounted side by side on medium voltage panels. It also allows easy retrofit into existing S1 and S2 cutouts with adapter plates.

Easy to Configure

Fast & Simple Configuration

The 350 requires minimal settings for configuring standard feeder protection applications. The entire feeder protection setup can be completed in one easy step.

Advanced Communications

Easy integration into new or existing infrastructure

With several Ethernet and serial port options, and a variety of protocols, the 350 provides advanced and flexible communication selections for new and existing energy management, SCADA, and DCS systems.

Easy to Use and Configure

Easy to Configure- 1 simple step

Easy to Use- Draw out case

Advanced & Flexible Communication Options

Diagnostic Alarms

Enhanced Diagnostics

Preventative Maintenance

The 350 allows users to track relay exposure to extreme environmental conditions by monitoring and alarming at high ambient temperatures. This data allows users to proactively schedule regular maintenance work and schedule upgrade activities. The diagnostics data enables the user to understand degradation of electronics due to extreme conditions.

Cost Effective

Robust Design

The 350 is subjected to Accelerated Life Testing (ALT) to validate accurate relay function under specified normal conditions. The device is further tested for durability through Highly Accelerated Life Testing (HALT) where it undergoes extreme operating conditions. The robust 350 design ensures long term operation.

Reduced Life Cycle Cost

The 350 is designed to reduce total installation and life cycle cost for feeder protection. The draw out construction of the device reduces downtime during maintenance and decreases extra wiring needed for relay testing and commissioning.

Multiple Options

Several option for protection & communications are provided to match basic to high end application requirements.

Protection

The 350 feeder protection system offers protection, control and monitoring in one integrated, economical and compact package.

Timed Overcurrent (Phase, Ground, Neutral)

The 350 has three-phase TOC elements which enables coordination with upstream and downstream protection devices such as fuses, overload relays, etc to maximize fault selectivity and minimize interruptions and downtime.

Multiple time current curves are available including IAC, IEC, ANSI and IEEE curves. Additional user programmable flex curves can be used to customize and meet specific coordination requirements. The TOC has both linear and instantaneous reset timing function to coordinate with electro-mechanical relays

Instantaneous Overcurrent (Phase, Ground, Neutral)

The instantaneous element provides fast clearance of high magnitude faults to prevent damage to the power infrastructure and the equipment connected to it.

Neutral Overcurrent

The neutral signal is derived as the residual sum of the three phase CTs eliminating the need for an additional ground sensor.

Sensitive Ground Overcurrent

Sensitive ground protection feature detects ground faults on high impedance grounded systems in order to limit damage to conductors and equipment. Special low ratio CT's are used for this purpose to detect low magnitude ground faults.

Over/Under Voltage Protection

Overvoltage / Undervoltage protection features can cause a trip or generate an alarm when the voltage exceeds a specified voltage setting for a specified time.

Frequency Protection

The 350 offers overfrequency and underfrequency elements to improve network (grid) stability using voltage or frequency based load shedding techniques.

It also provides back up protection when protecting feeders and other frequency sensitive power equipment.

Arc Flash Mitigation

The 350 relay is equipped with multiple setting groups and two user definable inverse curves -FlexCurves A and B for fast and reliable arc-flash mitigation and breaker operation. In the event of an arc-

Protection Features
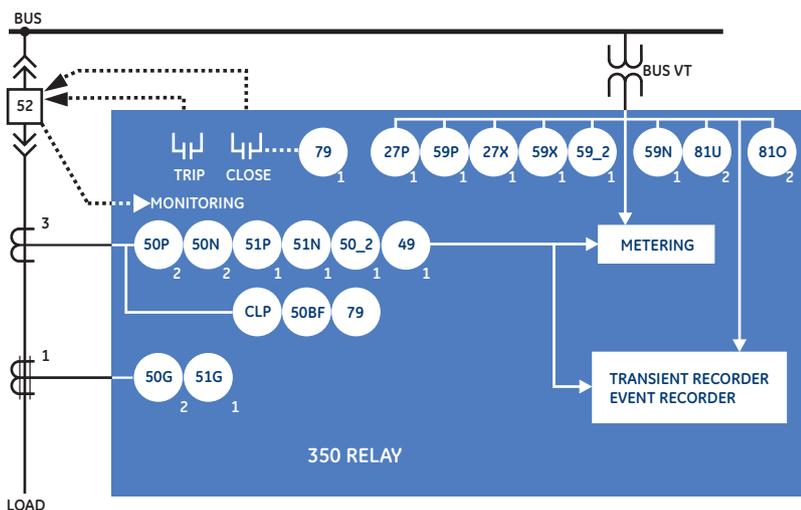
ANSI Device Numbers & Functions

Device Number	Function
27P	Phase Undervoltage
27X	Auxiliary Undervoltage
49	Thermal Model
50P	Phase Instantaneous Overcurrent
50N	Neutral Instantaneous Overcurrent
50G	Ground/Sensitive Ground Instantaneous Overcurrent
50BF	Breaker Failure
50_2	Negative Sequence Overcurrent
51P	Phase Timed Overcurrent
51G	Ground Timed Overcurrent
51N	Neutral Timed Overcurrent
59P	Phase Overvoltage
59X	Auxiliary Overvoltage
59N	Neutral Overvoltage
59_2	Negative Sequence Overvoltage
67G	Ground Directional Overcurrent
67N	Neutral Directional Overcurrent
79	Autoreclose
81U	Underfrequency
81O	Overfrequency
CLP	Cold Load Pickup

Latched Lockout available as a standard feature

Logic Designer

Sixteen logic elements available for applications such as manual control, interlocking, and peer to peer tripping.

flash, the relay can be set to communicate to any upstream or downstream devices via IEC 61850 GOOSE messaging.

Cable Thermal Model

The cable thermal modelelement protects feeder cables against overheating due to excessive load. It estimates the temperature rise of current carrying conductors based on the amount of current flow (I2R) and alarms when temperature rise exceeds a threshold value. This protection feature is essential to ensure the longevity of electrical feeders; particularly important to prevent premature cable failures, expensive repair costs and system down time.

Neutral/Ground Directional Overcurrent

The directional ground overcurrent isolates faulted feeders in ring bus or parallel feeder arrangements. It also allows detection of back feed of fault current from feeders with motors.

Control

Cold Load Pick Up

Cold Load Pick up allows automatic or manual blocking or raising of trip settings for a period after the breaker has been closed. This feature adapts the pick up of overcurrent elements to override the higher overload currents resulting from re-energization of feeder after a long period of time.

Breaker Failure

The Breaker Failure function is used to determine when a trip command sent to a breaker has not been executed within a selectable time delay. In the event of a breaker failure, the 350 will issue an additional signal to trip the breakers connected to the same busbar or signal the trip of upstream breakers.

Autoreclose

Reclose can be initiated externally or from an overcurrent protection. Up to four reclose operations are available, each with a programmable dead time. For each reclose shot, the relay can be programmed to block any overcurrent element.

Automation and Integration

Inputs & Outputs

The 350 features the following inputs and outputs for monitoring and control of typical feeder applications:

- 8 contact Inputs with programmable thresholds
- 2 Form A output relays for breaker trip and close with coil monitoring
- 5 Form C output relays

IEC 61850 GOOSE

The 350 supports IEC 61850 Logical Nodes which allows for digital communications to DCS, SCADA and higher level control systems.

In addition, the 350 also supports IEC 61850 GOOSE communication, providing a means of sharing digital point state information between 350's or other IEC 61850 compliant IED's.

- Eliminates the need for hardwiring contact inputs to contact outputs via communication messaging.
- Transmits information from one relay to the next in as fast as 8 ms.
- Enables sequence coordination with upstream and downstream devices.
- When Breaker Open operation malfunctions, GOOSE messaging sends a signal to the upstream breaker to trip and clear the fault.

Logic Elements

The 350 relay has sixteen Logic Elements available for the user to build simple logic using the state of any programmed contact, virtual, remote input or the output operand of a protection or control element.

The logic provides for assigning up to three triggering inputs in an "AND/OR" gate for the logic element operation and up to three blocking inputs in an "AND/OR" gate for defining the block signal. Pickup and dropout timers are available for delaying the logic element operation and reset respectively.

Virtual Inputs

Virtual inputs allow communication devices the ability to write digital commands to the 350 relay. These commands could be open/close the breaker, changing setting groups, or blocking protection elements.

Multiple Settings Group

Two separate settings groups are stored in nonvolatile memory, with only one group active at a given time. Switching between setting groups 1 and 2 can be done by means of a setting, a communication command or contact input activation.

The two settings groups allow users to store seasonal settings- such as for summer and winter or alternate profiles such as settings during maintenance operations.

Monitoring & Diagnostics

Event Recording

Events consist of a broad range of change of state occurrences, including pickups, trips, contact operations, alarms and self test status. The 350 relay stores up to 256 events time tagged to the nearest millisecond. This provides the information required to determine sequence of events which facilitates diagnosis of relay operation. Event types are individually maskable in order to avoid the generation of undesired events, and includes the metered values at the moment of the event.

Oscillography/ Transient Fault Recorder

The 350 captures current and voltage waveforms and digital channels at 32 samples per cycle. Multiple records can be stored in the relay at any given time with a maximum length of 192 cycles Oscillography is triggered either by internal signals or an external contact.

Trip/Close Coil Monitoring

The 350 can be used to monitor the integrity of both the breaker trip and closing coils and circuits. The supervision inputs monitor both the battery voltage level, while the outputs monitor the continuity of the trip and/or closing circuits, by applying a small current through the circuits.

Basic Metering

Metered values include:
- Current: Ia, Ib, Ic, In, Ig, Isg
- Phase-to-phase and phase-to-ground voltages for bus and line: Van, Vbn, Vcn, Vab, Vbc, Vca
- Active power (3-Phase)
- Reactive power (3-Phase)
- Frequency

Advanced Device Health Diagnostics

The 350 performs comprehensive device health diagnostic tests during startup and continuously at runtime to test its own major functions and critical hardware. These diagnostic tests monitor for conditions that could impact system reliability. Device status is communicated via SCADA communications and the front panel display. This continuous monitoring and early detection of possible issues helps improve system availability by employing predictive maintenance.

IRIG-B

IRIG-B is a standard time code format that allows time stamping of events to be synchronized among connected devices within 1 millisecond. An IRIG-B input is provided in the 350 to allow time synchronization using a GPS clock over a wide area. The 350 IRIG-B supports both AM and DC time synchronization with an auto detect feature that removes the requirement for manual selection.

Power System Troubleshooting

Analyze power system disturbances with transient fault recorder and event records
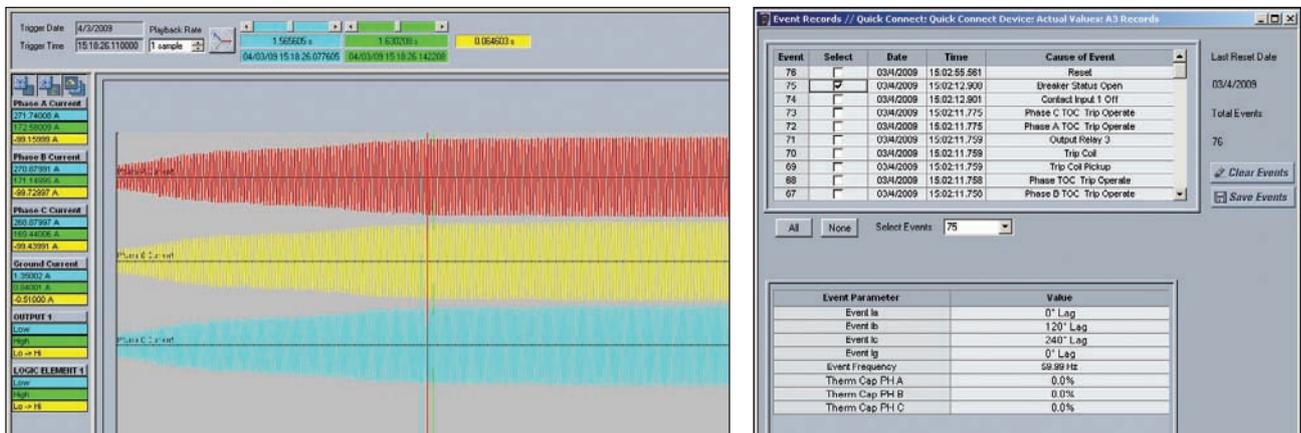
Temperature Monitoring

The 350 continually monitors ambient temperature around the relay and alarms when the device is exposed to extreme temperatures and undesirable conditions such as air-conditioning unit or station heater failures.

The EnerVista Viewpoint maintenance tool allows users to review and analyze the time period a 350 relay is exposed to certain temperature ranges.

Security

Security Audit Trail

The Security Audit Trail feature provides complete traceability of relay setting changes at any given time and is NERC CIP compliant. The 350 maintains a history of the last 10 changes made to the 350 configuration, including modifications to settings and firmware upgrades. Security Setting Reports include the following information:

- If Password was required to change settings
- MAC address of user making setting changes
- Listing of modified changes
- Method of setting changes - Keypad, Front serial port, Ethernet, etc.

Password Control

With the implementation of the Password Security feature in the 350 relay, extra measures have been taken to ensure unauthorized changes are not made to the relay. When password security is enabled, changing of setpoints or issuing of commands will require passwords to be entered. Separate passwords are supported for remote and local operators, and separate access levels support changing of setpoints or sending commands.

Advanced Communications

The 350 incorporates the latest communication technologies making it the easiest and the most flexible feeder protection relay for use and integration into new and existing infrastructures. The 350 relay provides the user with one front USB and one rear RS485 communication port. Also available with the 350 is a rear communication port with Ethernet Fiber and Copper. Through the use of these ports, continuous monitoring and control from a remote computer, SCADA system or PLC is possible.

The 350 supports popular industry standard protocols enabling easy, direct integration into electrical SCADA and HMI systems. The protocols supported by the 350 include:

- IEC 61850
- IEC 61850 GOOSE
- DNP 3.0
- Modbus RTU

Trace any setting changes with security audit trail

- Modbus TCP/IP
- IEC 60870-5-103
- IEC 60870-5-104

These protocols make it easy to connect to a Utility or Industrial automation system, eliminating the need for external protocol converter devices.

EnerVista™ Software

The EnerVista™ suite is an industry leading set of software programs that simplifies every aspect of using the 350 relay. The EnerVista suite provides all the tools to monitor the status of the protected asset, maintain the relay, and integrate the information measured into DCS or SCADA monitoring systems. Convenient COMTRADE and sequence of event viewers are an integral part of the 350 set up software and are included to ensure proper protection and system operation.

Simplified Feeder Setup

The 350 Feeder Protection System includes a simplified setup process. This simplified feeder setup consists of minimal settings and can be accessed through the relay front panel or via the EnerVista Setup software. Once the information is entered, the simplified setup will generate a settings file, provide documentation indicating which settings are enabled, and an explanation of the parameters entered.

Viewpoint Monitoring

Viewpoint Monitoring is a simple to use and full featured monitoring and data recording software package for small systems. Viewpoint monitoring provides a complete HMI package with the following functionality:

- Plug and play device monitoring
- System single line monitoring and control
- Annunciator alarm screens

- Trending reports
- Automatic event retrieval
- Automatic waveform retrieval

Display

A 4 line liquid crystal display (LCD) allows visibility under varied lighting conditions. When the keypad and display are not being used, the metering summary page is displayed to show critical metered values.

LEDs

The 350 relay has ten LED's that provide status indication for various conditions of the relay and the system. The LED indications are color coded to indicate the type of event.

Feeder protection settings in one easy step

Fast and accurate configuration in one simple screen.

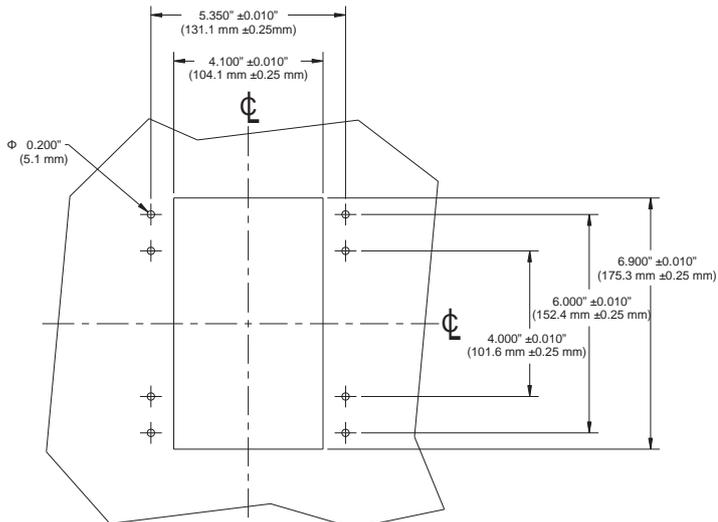*3 Series setup software protection summary for viewing a summary of Protection & Control configuration.*

Typical Wiring Diagram

898728.CDR
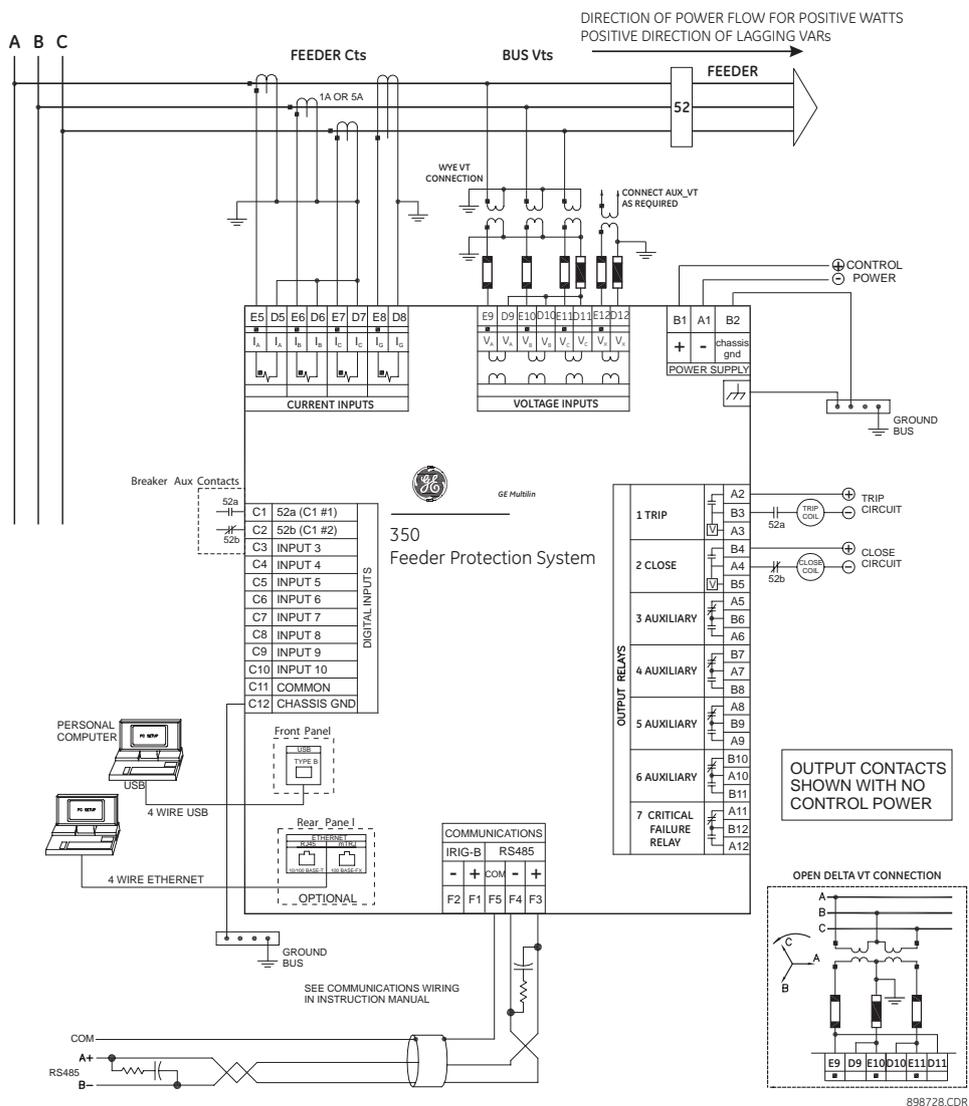
Mounting

User Interface

SETPOINT GROUP 1, 2:
These indicators are continuously on if corresponding group provides settings for protection elements.

TRIP:
Indicator turns on when relay detects a trip condition. Operates the Trip Relay to open the breaker.

ALARM:
While relay detects an alarm condition, indicator flashes.

PICKUP:
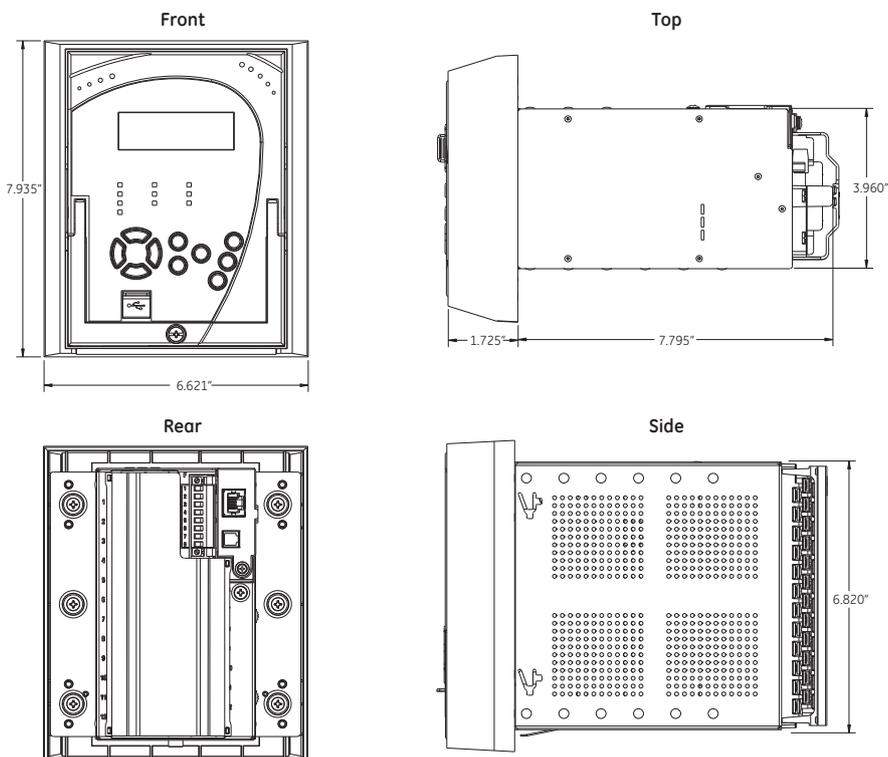Indicator lights steady when any protection feature pickup threshold exceeded.

DISPLAY:
4 line text for easy viewing of key data

LEDs:
10 LED indicators for quick diagnostics

KEYPAD:
Ten button keypad for access to device interrogation and change of settings.

FRONT PORT:
Electrically isolated front USB communication port

Dimensions

Front

Top

Rear

Side

CONTACT INPUTS

Inputs:	8
Selectable thresholds:	17, 33, 84, 166 VDC
Recognition time:	1/2 cycle
Debounce time:	1 to 64 ms, selectable, in steps of 1 ms
Continuous current draw:	2 mA
Type:	opto-isolated inputs
External switch:	wet contact
Maximum input voltage:	300 VDC

PHASE & GROUND CURRENT INPUTS

CT Primary:	1 to 6000 A
Range:	0.02 to 20 × CT
Input type:	1 A or 5 A (must be specified with order)
Nominal frequency:	50/60 Hz
Burden:	<0.1 VA at rated load
Accuracy:	±1% of reading at 1× CT ±3% of reading from 0.2 to 20 × CT ±20% of reading from 0.02 to 0.19 × CT
CT withstand:	1 second at 100 × rated current 2 seconds at 40 × rated current continuous at 3 × rated current

SENSITIVE GROUND CURRENT INPUT

CT Primary:	1 to 600 A
Range:	0.002 to 3 × CT
Input type:	1 A or 5 A (must be specified with order)
Nominal frequency:	50/60 Hz
Burden:	<0.1 VA at rated load
Accuracy:	±1% of reading at 0.1× CT ±3% of reading from 0.02 to 3 × CT ±20% of reading from 0.002 to 0.019 × CT
CT withstand:	1 second at 100 × rated current 2 seconds at 40 × rated current continuous at 3 × rated current

PHASE/AUX VOLTAGE INPUTS

Source VT:	0.12 to 65 kV / 50 to 220 V
VT secondary:	50 to 240 V
VT ratio:	1 to 5000 in steps of 1
Nominal frequency:	50/60 Hz
Accuracy:	±1.0% of reading
Voltage withstand:	260 VAC continuous

FORM-A RELAYS

Configuration:	2 (two) electromechanical
Contact material:	silver-alloy
Operate time:	<8 ms
Continuous current:	10 A
Make and carry for 0.2s:	30 A per ANSI C37.90
Break (DC inductive, L/R=40 ms):	24 V / 1 A 48 V / 0.5 A 125 V / 0.3 A 250 V / 0.2 A
Break (DC resistive):	24 V / 10 A 48 V / 6 A 125 V / 0.5 A 250 V / 0.3 A
Break (AC inductive):	720 VA @ 250 VAC Pilot duty A300
Break (AC resistive):	277 VAC / 10 A

FORM-A VOLTAGE MONITOR

Applicable voltage:	20 to 250 VDC
Trickle current:	1 to 2.5 mA

FORM-C RELAYS

Configuration:	5 (five) electromechanical
Contact material:	silver-alloy
Operate time:	<8 ms
Continuous current:	10 A
Make and carry for 0.2s:	30 A per ANSI C37.90
Break (DC inductive, L/R=40 ms):	24 V / 1 A 48 V / 0.5 A 125 V / 0.3 A 250 V / 0.2 A
Break (DC resistive):	24 V / 10 A 48 V / 6 A 125 V / 0.5 A 250 V / 0.3 A
Break (AC inductive):	720 VA @ 250 VAC Pilot duty A300
Break (AC resistive):	277 VAC / 10 A

TRIP / CLOSE SEAL-IN

Relay 1 trip seal-in:	0.00 to 9.99 s in steps of 0.01
Relay 2 close seal-in:	0.00 to 9.99 s in steps of 0.01

HIGH RANGE POWER SUPPLY

Nominal:	120 to 240 VAC 125 to 250 VDC
Range:	60 to 300 VAC (50 and 60 Hz) 84 to 250 VDC
Ride-through time:	35 ms

LOW RANGE POWER SUPPLY

Nominal:	24 to 48 VDC
Range:	20 to 60 VDC

ALL RANGES

Voltage withstand:	2 × highest nominal voltage for 10 ms
Power consumption:	15 W nominal, 20 W maximum 20 VA nominal, 28 VA maximum

SERIAL

RS485 port:	Opto-coupled
Baud rates:	up to 115 kbps
Response time:	1 ms typical
Parity:	None, Odd, Even
Maximum Distance:	1200 m (4000 feet)
Isolation:	2 kV
Protocol:	Modbus RTU, DNP 3.0, IEC 60870-5-103

ETHERNET (COPPER)

Modes:	10/100 MB (auto-detect)
Connector:	RJ-45
Protocol:	Modbus TCP/IP, DNP 3.0, IEC 60870-5-104, IEC 61850 GOOSE

ETHERNET (FIBER)

Fiber type:	100 MB Multi-mode
Wavelength:	1300 nm
Connector:	MTRJ
Transmit power:	-20 dBm
Receiver sensitivity:	-31 dBm
Power budget:	9 dB
Maximum input power:	-11.8 dBm
Typical distance:	2 km (1.25 miles)
Duplex:	half/full
Protocol:	Modbus TCP/IP, DNP 3.0, IEC 60870-5-104, IEC 61850 GOOSE

USB

Standard specification:	Compliant with USB 2.0
Data transfer rate:	115 kbps

CERTIFICATION

CE:	Low voltage directive EN60255-5 / EN60255-27 / EN61010-1 EMC Directive EN60255-26/ EN50263, EN61000-6-2, UL508
North America:	cULus UL1053, C22.2.No 14
ISO:	Manufactured under a registered quality program ISO9001

TYPE TESTS

Dielectric voltage withstand:		2.3KV
Impulse voltage withstand:	EN60255-5	5KV
Damped Oscillatory:	IEC 61000-4-18 IEC 60255-22-1	2.5KV CM, 1KV DM
Electrostatic Discharge:	EN61000-4-2/ IEC 60255-22-2	Level 4
RF immunity:	EN61000-4-3/ IEC 60255-22-3	Level 3
Fast Transient Disturbance:	EN61000-4-4/ IEC 60255-22-4	Class A and B
Surge Immunity:	EN61000-4-5/ IEC 60255-22-5	Level 3 & 4
Conducted RF Immunity:	EN61000-4-6/ IEC 60255-22-6	Level 3
Power Frequency Immunity:	EN61000-4-7/ IEC 60255-22-7	Class A & B
Voltage interruptionand Ripple DC:	IEC 60255-11	15% ripple, 200ms interrupts
Radiated & Conducted: Emissions	CISPR11 /CISPR22/ IEC 60255-25	Class A
Sinusoidal Vibration:	IEC 60255-21-1	Class 1
Shock & Bump:	IEC 60255-21-2	Class 1
Siesmic:	IEC 60255-21-3	Class 2
Power magnetic Immunity:	IEC 61000-4-8	Level 5
Pulse Magnetic Immunity:	IEC 61000-4-9	Level 4
Damped Magnetic Immunity:	IEC 61000-4-10	Level 4
Voltage Dip & interruption:	IEC 61000-4-11	0, 40, 70, 80% dips, 250/ 300 cycle interrupts
Damped Oscillatory:	IEC 61000-4-12	2.5KV CM, 1KV DM
Conducted RF Immunity 0-150khz:	IEC 61000-4-16	Level 4
Voltage Ripple:	IEC 61000-4-17	15% ripple
Ingress Protection:	IEC 60529	IP40 front , IP10 Back
Environmental (Cold):	IEC 60068-2-1	-40C 16 hrs
Environmental (Dry heat):	IEC 60068-2-2	85C 16hrs
Relative Humidity Cyclic:	IEC 60068-2-30	6day variant 2
EFT:	IEEE/ANSI C37.90.1	4KV, 2.5Khz
Damped Oscillatroy:	IEEE/ANSI C37.90.1	2.5KV,1Mhz
RF Immunity:	IEEE/ANSIC37.90.2	20V/m 80-1Ghz
ESD:	IEEE/ANSIC37.90.3	8KV CD/ 15KV AD
Safety:	UL508 UL C22.2-14 UL1053	e83849 NKCR e83849 NKCR7 e83849 NKCR

DIMENSIONS

Size:	Refer to Dimensions Chapter
Weight:	4.1 kg [9.0 lb]

OPERATING ENVIRONMENT

Ambient operating temperature:	–40°C to +60°C [-40°F to +140°F]
Ambient storage / shipping temperature:	–40°C to +85°C [-40°F to +185°F]
Humidity:	Operating up to 95% (non condensing) @ 55C (As per IEC 60068-2-30 Variant 2, 6days)
Pollution degree:	II
Overvoltage category:	III
Ingress Protection:	IP40 Front , IP10 back

Ordering

	350	E	**	**	*	*	*	*	*	**	D	*	Description
Base Unit	350												
Language		E											English
Phase Currents			P1										1A three phase current inputs
			P5										5A three phase current inputs
Ground Currents				G1									1A ground current input
				G5									5A ground current input
				S1									1A sensitive ground current input
				S5									5A sensitive ground current input
Power Supply					L								24 - 48 Vdc
					H								125 - 250 Vdc/120 - 240Vac
Faceplate						S							Standard faceplate (LCD, full menu, actual values and setpoints) with 8 Inputs, 7 Outputs (2 Form A, 5 Form C) --- Only for 350
						E							Standard faceplate (LCD, full menu, actual values and setpoints) with 10 Inputs, 7 Outputs (2 Form A, 5 Form C)
Current Protection							S						Standard Overcurrent Protection - 50P(1), 50G(1), 50N(1), 51P(1), 51G(1), 51N(1)
							E						Extended Overcurrent Protection - 49, 50P(2), 50G(2), 50N(2), 51P(1), 51G(1), 51N(1)
							M						Advanced overcurrent protection - 49, 50P(2), 50G(2), 50N(2), 51P(1), 51G(1), 51N(1), 50_2 (46)
Control								N					No Selection
								C					CLP, 50BF, Autoreclose (79), Lockout (86)
Options									N				No Selection
									D				Directional Neutral Overcurrent Protection 67N(1), 67G(1)
									M				Voltage Metering
									R				Neutral and Ground Directional elements 67N(1), 67G(1) + Voltage Metering
									P				Voltage Protection, Neutral and Ground Directional elements - 27P(1), 27X(1), 59P(1), 59N(1), 59X(1), 59_2(1), 81O(2), 81U(2), 67N(1), 67G(1)
Communications										SN			Standard :Front USB, Rear RS485 : Modbus RTU, DNP3.0, IEC 60870-5-103
										1E			Standard + Ethernet (Copper & Fiber - MTRJ) MODBUS TCP/IP, DNP3.0, IEC 60870-5-104
										2E			Standard + Ethernet (Copper & Fiber - MTRJ) MODBUS TCP/IP, DNP3.0, IEC 60870-5-104, IEC 61850 GOOSE
										3E			Standard + Ethernet (Copper & Fiber - MTRJ) MODBUS TCP/IP, DNP3.0, IEC 60870-5-104, IEC 61850
Case Design											D		Draw-out Design
Harsh Environment												N	None
												H	Harsh Environment Conformal coating

Note: 1) G1/G5 and S1/S5 must match corresponding P1/P5 - there cannot be 5A and 1A mixing

Accessories for the 350

- Multilink Ethernet Switch — ML2400-F-HI-HI-A2-A2-A6-G1
- Viewpoint Maintenance — VPM-1
- Viewpoint Monitoring IEC 61850 — VP-1-61850

Visit www.GEMultilin.com/350 to:

- Download the instruction manual
- Review applications notes and support documents
- Buy a 350 online
- View the 350 brochure