Optimize Overcurrent Protection, Integration, and Automation

Apply the SEL-351 Relay to enhance service quality of lines and equipment.

Develop SELOGIC control equations using ACSELERATOR QuickSet Software.

Features and Benefits

■ **Overcurrent Protection**
Protect lines and equipment using a sensitive and secure mix of phase, negative-sequence, and ground overcurrent elements. Use directional control elements in looped systems. Provide high-speed operation, even with severe CT saturation, using SEL Adaptive Overcurrent Element.

■ **Control Logic and Integration**
Program remote, local, and latch control switches, as well as the front-panel display, using SELOGIC® control equations.

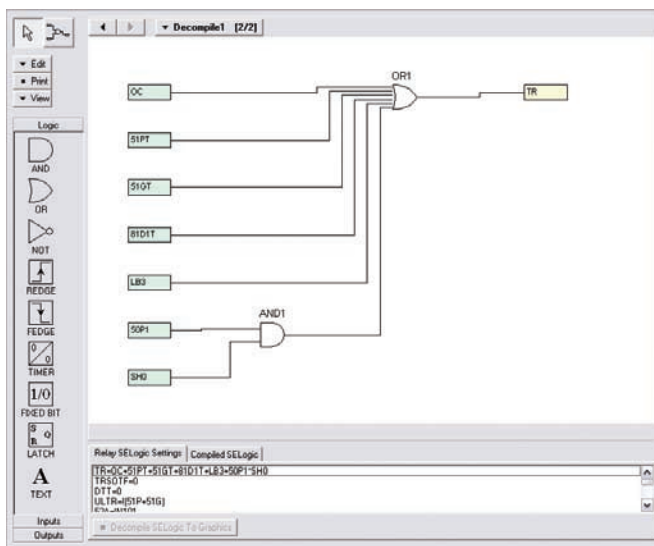■ **Relay and Logic Settings Software**
Use ACSELERATOR® QuickSet™ SEL-5030 Software to reduce engineering costs for relay settings and logic programming. Use graphical tools included with ACSELERATOR to develop SELOGIC control equations.

■ **Accurate Metering and Monitoring**
Use built-in, high-accuracy metering functions to eliminate expensive, separately mounted metering devices. Improve maintenance scheduling using circuit breaker contact wear and substation battery voltage monitors.
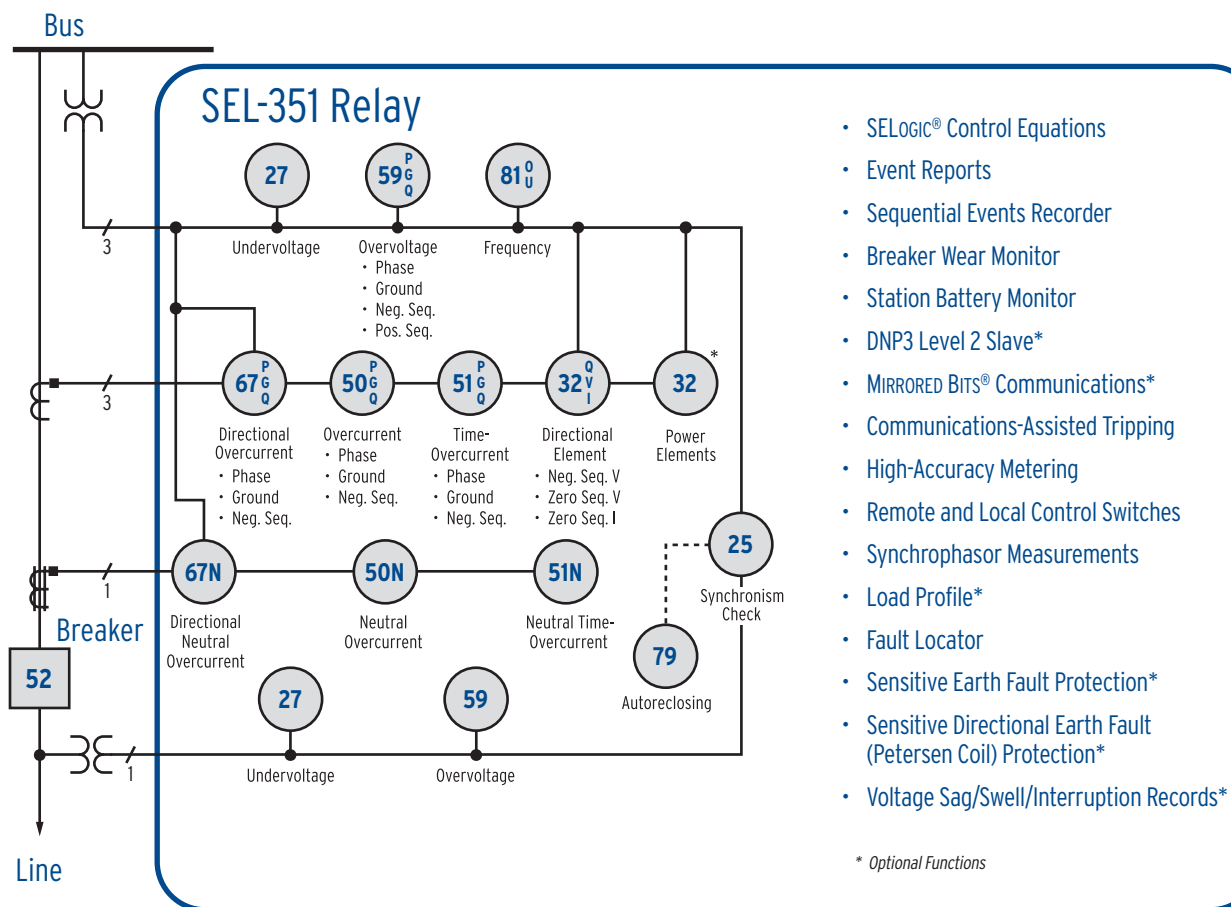
■ **Sequential Events Report**
Analyze Sequential Events Recorder (SER) and oscillographic event reports for rapid commissioning, testing, and post-fault diagnostics.

Making Electric Power Safer, More Reliable, and More Economical®

Functional Overview

SEL-351 Relay

Bus

Breaker

52

Line

- 27 — Undervoltage
- 59 P G Q — Overvoltage
  - Phase
  - Ground
  - Neg. Seq.
  - Pos. Seq.
- 81 O U — Frequency
- 67 P G Q — Directional Overcurrent
  - Phase
  - Ground
  - Neg. Seq.
- 50 P G Q — Overcurrent
  - Phase
  - Ground
  - Neg. Seq.
- 51 P G Q — Time-Overcurrent
  - Phase
  - Ground
  - Neg. Seq.
- 32 Q V I — Directional Element
  - Neg. Seq. V
  - Zero Seq. V
  - Zero Seq. I
- 32 — Power Elements *
- 67N — Directional Neutral Overcurrent
- 50N — Neutral Overcurrent
- 51N — Neutral Time-Overcurrent
- 25 — Synchronism Check
- 79 — Autoreclosing
- 27 — Undervoltage
- 59 — Overvoltage

- SELOGIC® Control Equations
- Event Reports
- Sequential Events Recorder
- Breaker Wear Monitor
- Station Battery Monitor
- DNP3 Level 2 Slave*
- MIRRORED BITS® Communications*
- Communications-Assisted Tripping
- High-Accuracy Metering
- Remote and Local Control Switches
- Synchrophasor Measurements
- Load Profile*
- Fault Locator
- Sensitive Earth Fault Protection*
- Sensitive Directional Earth Fault (Petersen Coil) Protection*
- Voltage Sag/Swell/Interruption Records*

* Optional Functions*

Maintain Sensitive Protection for a Wide Range of Ground Fault Currents

Quickly and selectively trip the faulted feeder on multiple feeder bus configurations to improve system reliability.

Sense faults on compensated systems with as much as 10,000 ohms using the wattmetric element.

Sense faults on compensated systems with as much as 100,000 ohms using the patented incremental conductance element.
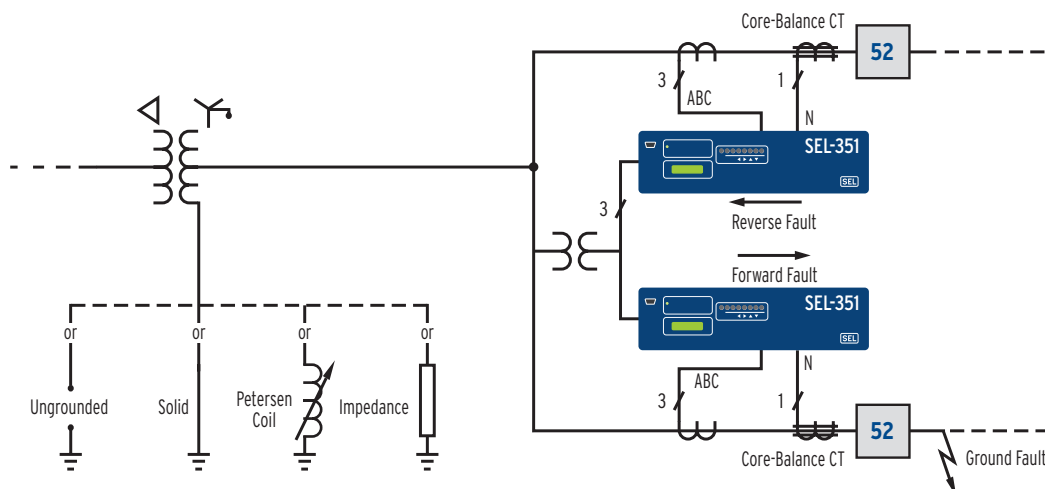
SEL-351 Best Choice Ground Directional Element™ System

Speed SEL-351 Applications With ᴀᴄSELᴇʀᴀᴛᴏʀ QuickSet Software

Shorten the time required to program the SEL-351-5, -6, -7 Relay by using ᴀᴄSELᴇʀᴀᴛᴏʀ QuickSet Software. Use the event viewer features to speed up delivery of post-fault analysis reports.

### Use ᴀᴄSELᴇʀᴀᴛᴏʀ QuickSet Software to apply relay settings:

- Develop settings offline.
- View and change settings for enabled elements only.
- Automatically check interrelated settings.
- Automatically highlight out-of-range settings.
- Transfer settings files by using PC communications link with the SEL-351-5, -6, -7 Relay.

### Use ᴀᴄSELᴇʀᴀᴛᴏʀ QuickSet Software to program SELᴏɢɪᴄ control equations:

- Develop programmable logic offline.
- Develop SELᴏɢɪᴄ control equations using graphical and/or text editors.
- Automatically create SELᴏɢɪᴄ control equation text strings from drag-and-drop graphical logic elements.
- Automatically generate graphical logic elements from SELᴏɢɪᴄ control equation text strings.
- Develop and test SELᴏɢɪᴄ control equations using the ᴀᴄSELᴇʀᴀᴛᴏʀ QuickSet built-in logic simulator.

Use ᴀᴄSELᴇʀᴀᴛᴏʀ QuickSet Software to analyze fault records and relay element response:

- Convert relay event reports to oscillography with time-coordinated element assertion and phasor/sequence element diagrams.
- Quickly analyze fault records and relay element response using the event viewer.
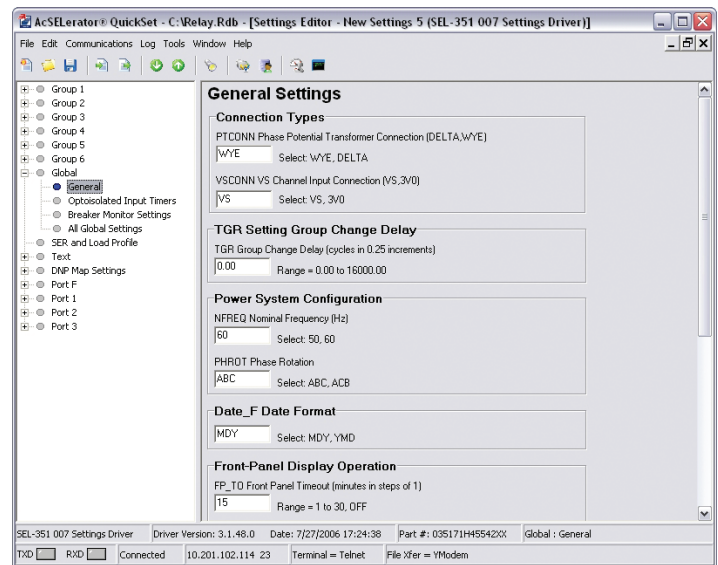
*Use graphical interface to quickly and intuitively set relay.*
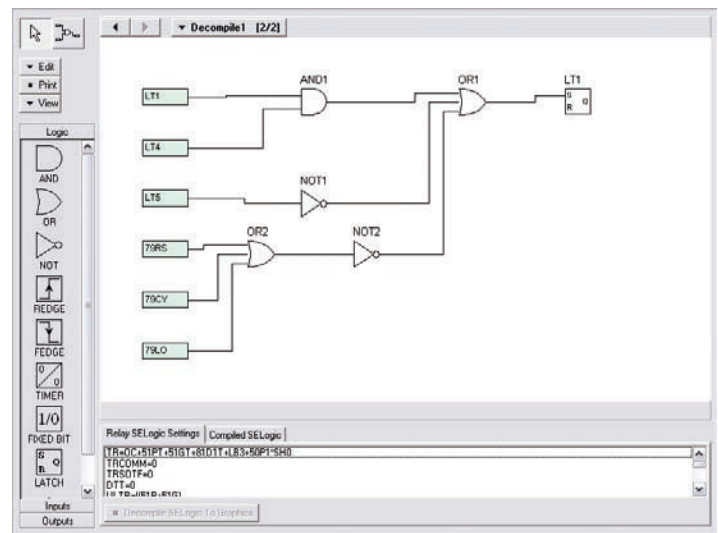
Graphically create SELᴏɢɪᴄ control equations.

High-Accuracy Metering

Use High-Accuracy Metering in Place of Panel-Mounted Meters

Reduce the installed cost of breaker control panels by avoiding separately mounted metering devices. SEL-351-5, -6, -7 Relay metered quantities include phase voltages and currents (including demand), sequence voltages and currents, power, frequency, and energy along with maximum/minimum logging of selected quantities.
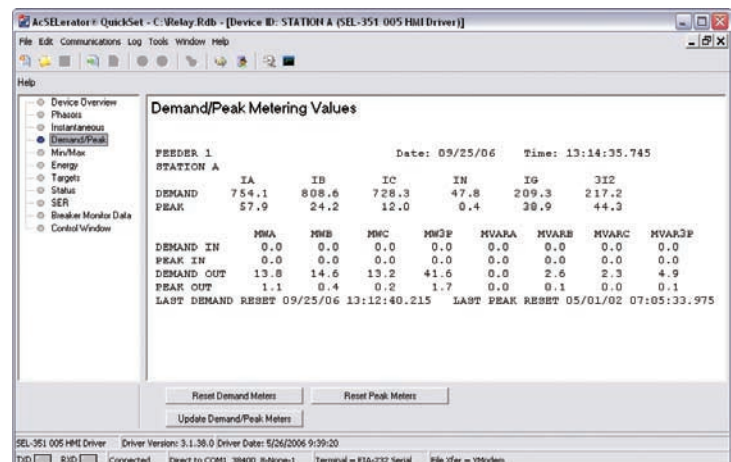
ᴀᴄSELᴇʀᴀᴛᴏʀ QuickSet Software demand/peak metering display.

SEL-351 Directional Overcurrent and Reclosing Relay

SEL-351 Relay Models and Feature Selection

Model	Remote and Local Integration Features	AcSELerator® Support	Load Profile and Mirrored Bits® Communications	Voltage Sag/Swell/ Interruption Reports	Directional Power Elements
SEL-351-5	•	•			
SEL-351-6	•	•	•		
SEL-351-7	•	•	•	•	•

General Specifications

AC Current Inputs

5 A nominal

15 A continuous, 500 A for 1 second, linear to 100 A symmetrical, 1250 A for 1 cycle

Burden   0.27 VA @ 5 A; 2.51 VA @ 15 A

1 A nominal

3 A continuous, 100 A for 1 second, linear to 20 A symmetrical, 250 A for 1 cycle

Burden   0.13 VA @ 1 A; 1.31 VA @ 3 A

Sensitive Earth Fault

0.2 A nominal channel IN current input: 15 A continuous, 500 A for 1 second, linear to 5.5 A symmetrical, 1250 A for 1 cycle

Burden   0.002 VA @ 0.2 A; 1.28 VA @ 15 A

0.05 A nominal channel IN current input: 1.5 A continuous, 20 A for 1 second, linear to 1.5 A symmetrical, 100 A for 1 cycle

Burden   0.0004 VA @ 0.05 A; 0.36 VA @ 1.5 A

AC Voltage Inputs

300 V_{L-N} or V_{L-L} continuous, 600 Vac for 10 seconds (wye or delta)

Burden   0.03 VA @ 67 V; 0.06 VA @ 120 V; 0.8 VA @ 300 V

Frequency and Rotation

60/50 Hz system frequency and ABC/ACB phase rotation are user-settable. Frequency tracking range: 40.1–65 Hz (VA required for frequency tracking.)

Power Supply Ratings

24/48 V supply	18–60 Vdc; <25 W
48/125 V supply	38–200 Vdc, or 85–140 Vac; <25 W
125/250 V supply	85–350 Vdc, or 85–264 Vac; <25 W

Optoisolated Input Ratings (6 total for standard model, 14 total with optional I/O board)

24, 48, 110, 125, 220, or 250 Vdc, level-sensitive (specify voltage at time of order)

Output Contact Ratings (8 total for standard model, 20 total with optional I/O board)

30 A make per IEEE C37.90-1989 paragraph 6.7.2

6 A continuous at 70°C; 4 A continuous at 85°C

330 Vdc MOV for differential surge protection

Operating Temperature

−40° to +85°C (−40° to +185°F)

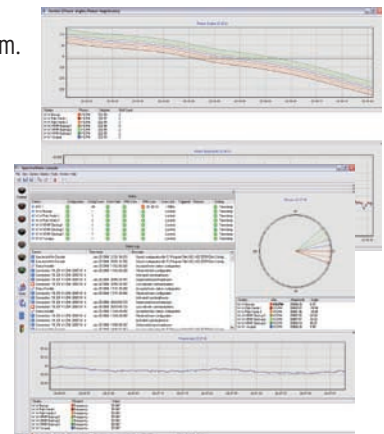## Wide-Area Measurements

Synchrophasor Measurements

View absolute phase angles from across the power system.

High-Accuracy Timing

Use precise timestamping to improve analysis of wide-area events.

SYNCHROWAVE.

SYNCHROWAVE® Software concentrates and displays data from across the power system.