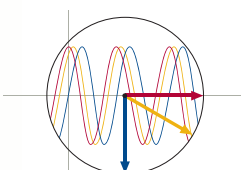# SEL-700GT Intertie Protection Relay

Complete Intertie and Generator Protection

Field-configurable front panel, including display, LEDs, and pushbuttons.

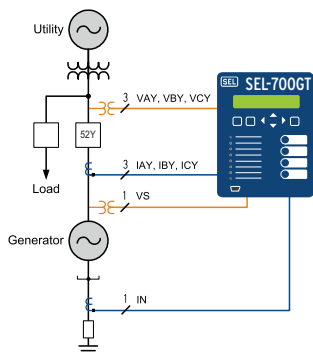*Ethernet, serial, and expanded I/O options.*

Field-upgradable design.

SEL Synchrophasors®

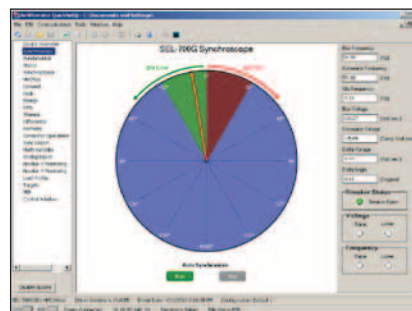## Distributed Generation Intertie

Provides IEEE 1547-compliant protection.

Protects electric grid and distributed generation.

Optional synchronous generator protection.

Integrated Automatic Synchronizer Option

Automatically adjusts generator voltage, speed, and phase angle to match line voltage.

Closes breaker when synchronized.

Substation-Hardened Ethernet

Modbus® TCP, SNTP, DNP3 LAN/WAN, Telnet, FTP, and IEC 61850.

Fiber or copper Ethernet communications port.

Withstands electrostatic air discharge of 15 kV.

Industry-Leading Quality, Reliability, and Service

−40°C +85°C

10 years WORLDWIDE WARRANTY

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

Functional Overview

SEL-700GT Intertie Protection Relay

Utility

VAY, VBY, VCY

52 Y

IAY, IBY, ICY

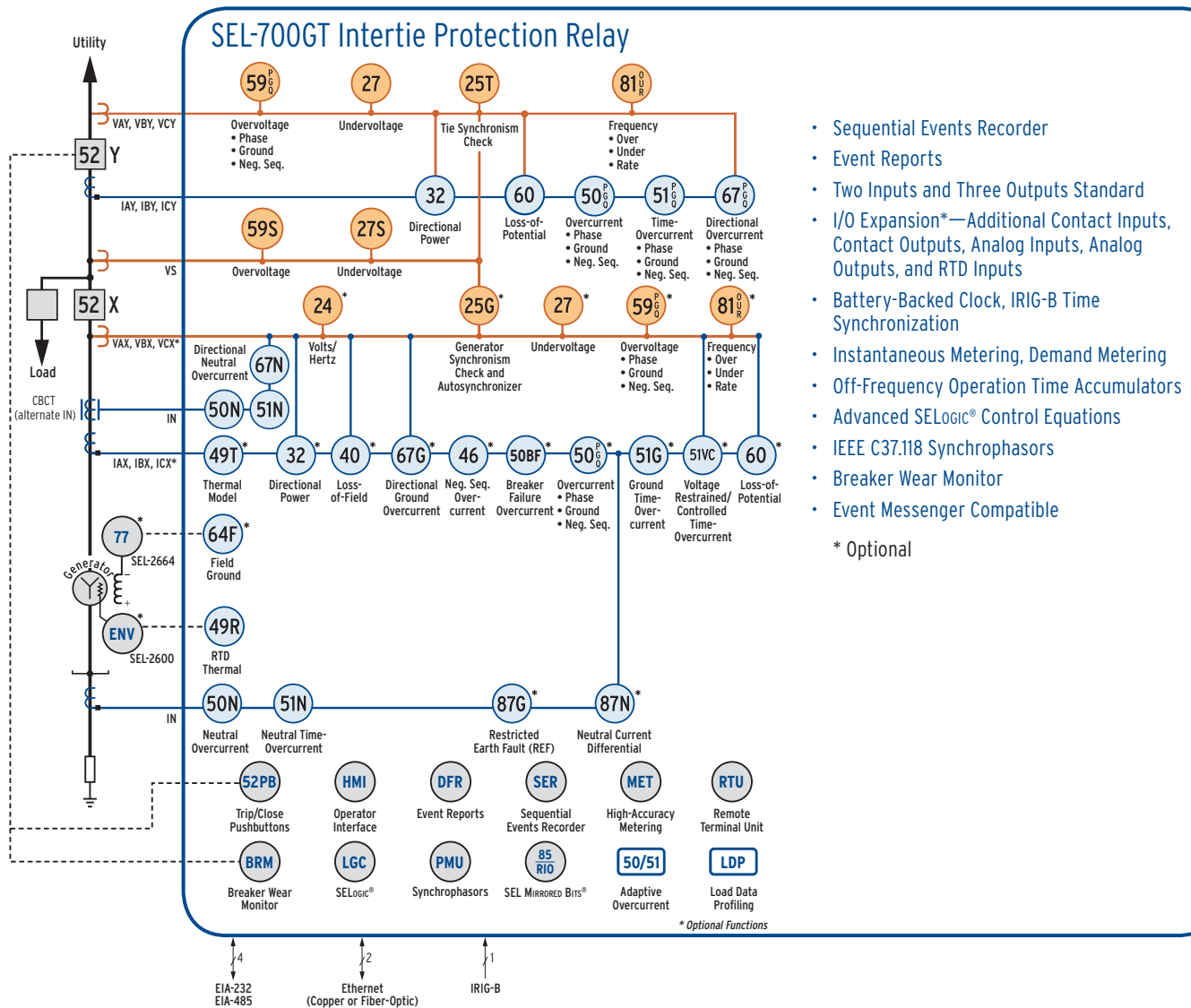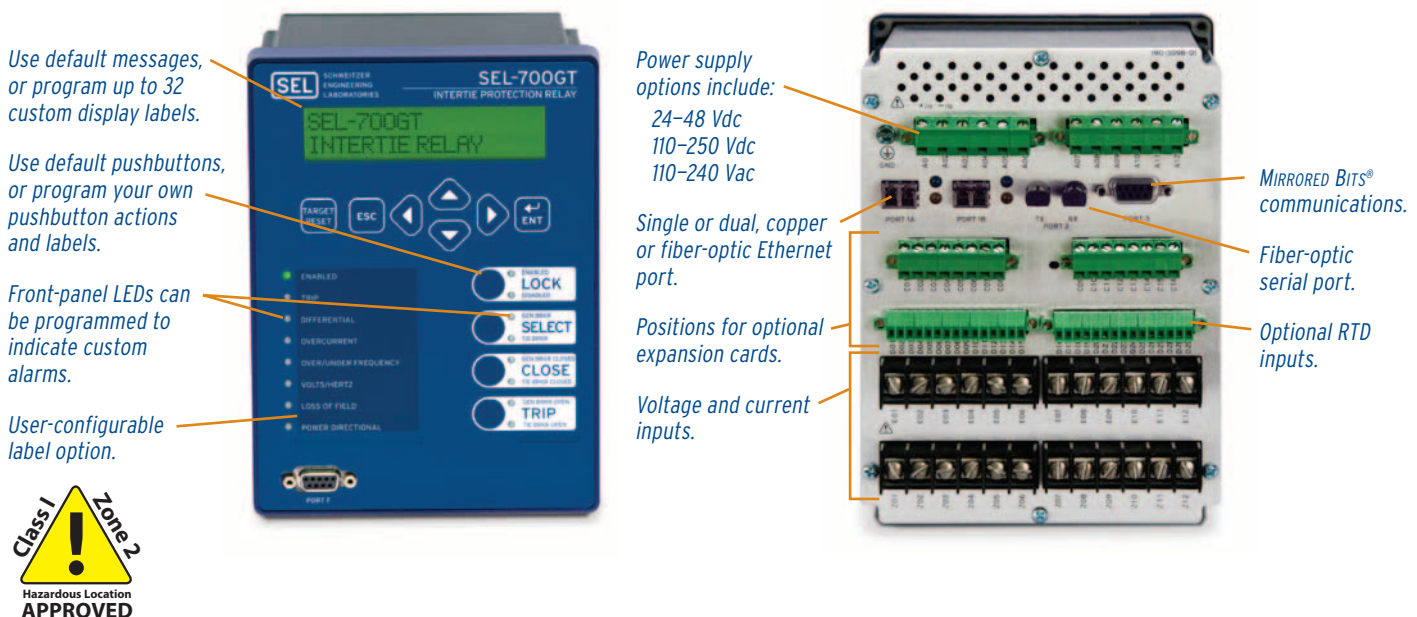**59** P G Q — Overvoltage • Phase • Ground • Neg. Seq.

27 — Undervoltage

25T — Tie Synchronism Check

81 O U R — Frequency • Over • Under • Rate

32 — Directional Power

60 — Loss-of-Potential

50 P G Q — Overcurrent • Phase • Ground • Neg. Seq.

51 P G Q — Time-Overcurrent • Phase • Ground • Neg. Seq.

67 P G Q — Directional Overcurrent • Phase • Ground • Neg. Seq.

59S — Overvoltage

27S — Undervoltage

VS

VAX, VBX, VCX*

52 X

Load

24* — Volts/Hertz

25G* — Generator Synchronism Check and Autosynchronizer

27* — Undervoltage

59* P G Q — Overvoltage • Phase • Ground • Neg. Seq.

81* O U R — Frequency • Over • Under • Rate

CBCT (alternate IN)

67N — Directional Neutral Overcurrent

50N **51N**

IN

IAX, IBX, ICX*

49T* — Thermal Model

32 — Directional Power

40 — Loss-of-Field

67G* — Directional Ground Overcurrent

46 — Neg. Seq. Over-current

50BF* — Breaker Failure Overcurrent

50* P G Q — Overcurrent • Phase • Ground • Neg. Seq.

51G* — Ground Time-Over-current

51VC* — Voltage Restrained/Controlled Time-Overcurrent

60 — Loss-of-Potential

77* SEL-2664

64F* — Field Ground

Generator

ENV* SEL-2600

49R* — RTD Thermal

IN

50N — Neutral Overcurrent

51N — Neutral Time-Overcurrent

87G* — Restricted Earth Fault (REF)

87N* — Neutral Current Differential

52PB — Trip/Close Pushbuttons

HMI — Operator Interface

DFR — Event Reports

SER — Sequential Events Recorder

MET — High-Accuracy Metering

RTU — Remote Terminal Unit

BRM — Breaker Wear Monitor

LGC — SELogic®

PMU — Synchrophasors

85 RIO — SEL Mirrored Bits®

50/51 — Adaptive Overcurrent

LDP — Load Data Profiling

* Optional Functions

4 — EIA-232 EIA-485

2 — Ethernet (Copper or Fiber-Optic)

1 — IRIG-B

- Sequential Events Recorder
- Event Reports
- Two Inputs and Three Outputs Standard
- I/O Expansion*—Additional Contact Inputs, Contact Outputs, Analog Inputs, Analog Outputs, and RTD Inputs
- Battery-Backed Clock, IRIG-B Time Synchronization
- Instantaneous Metering, Demand Metering
- Off-Frequency Operation Time Accumulators
- Advanced SELogic® Control Equations
- IEEE C37.118 Synchrophasors
- Breaker Wear Monitor
- Event Messenger Compatible

* Optional

Feature Overview

Use default messages, or program up to 32 custom display labels.

Use default pushbuttons, or program your own pushbutton actions and labels.

Front-panel LEDs can be programmed to indicate custom alarms.

User-configurable label option.

Class I Zone 2 Hazardous Location **APPROVED**

Power supply options include:
24–48 Vdc
110–250 Vdc
110–240 Vac

Single or dual, copper or fiber-optic Ethernet port.

Positions for optional expansion cards.

Voltage and current inputs.

Mirrored Bits® communications.

Fiber-optic serial port.

Optional RTD inputs.

Applications

Complete Intertie and Generator Protection

The SEL-700GT provides a complete intertie protection solution for distributed generation. Optional synchronous generator protection and synchronization provide complete generator and intertie protection in one compact and economical package.

The optional SEL-2664 Field Ground Module accurately detects field ground faults whether the generator is operating, stopped, or de-energized.
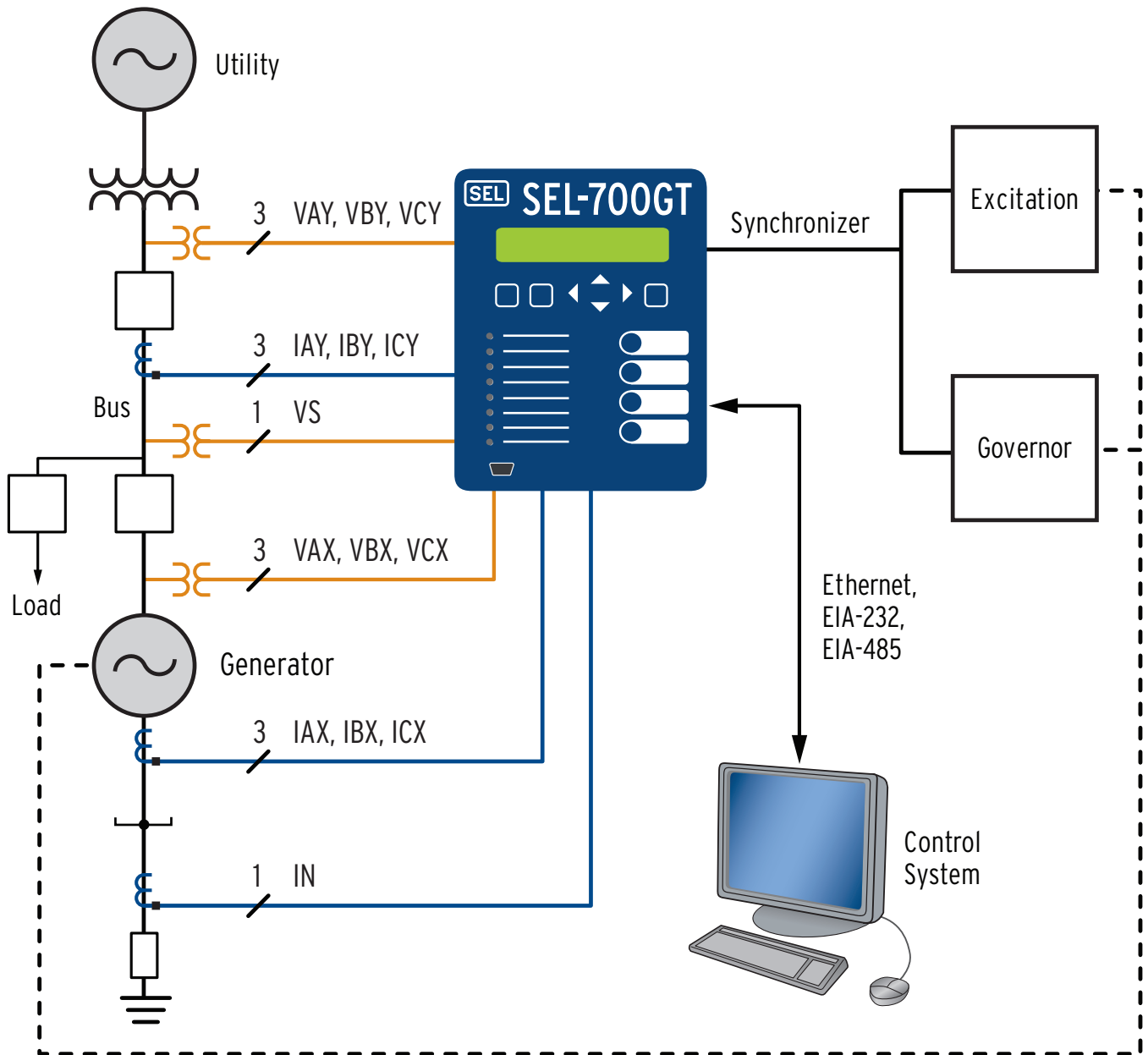

The application shown includes optional generator protection and synchronism-check voltage input (VS). Ethernet and EIA-485 are optional.

Also available are RTD and field ground module (SEL-2664) inputs (not shown).

SEL-700GT Intertie Protection Relay

Easy to Set and Use

Use acSELerator QuickSet® SEL-5030 Software to Set, Monitor, and Control the SEL-700GT

- Save engineering time while keeping flexibility. Communicate with the SEL-700GT through any ASCII terminal, or use the acSELerator QuickSet graphical user interface.
- Develop settings offline with a menu-driven interface and completely documented help screens. Speed installation by copying existing settings files and modifying application-specific items.
- Simplify the settings procedure with rules-based architecture to automatically check interrelated settings. Out-of-range or conflicting settings are highlighted for correction.
- Use the acSELerator HMI synchroscope to view the real-time synchronization process.
- Initiate the generator synchronization process using an HMI pushbutton.
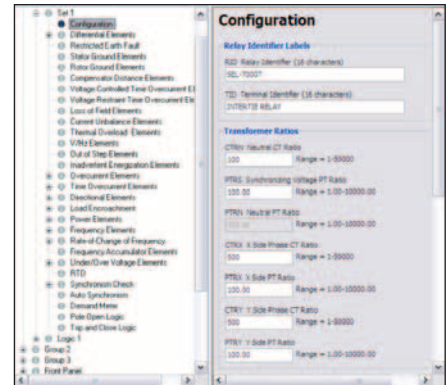
Use acSELerator Software to Retrieve and Display Event Reports Recorded by the SEL-700GT

- Display event report oscillograms. View each report as a plot of magnitude versus time. Select analog and digital points to build a custom display.
- Display phase and symmetrical component phasors. Display the phasor view of electrical data to better understand asymmetrical, three-phase faults. Build a custom plot using per-phase and symmetrical component sequence currents and voltages.
- Retrieve event reports using serial or Ethernet communications links.
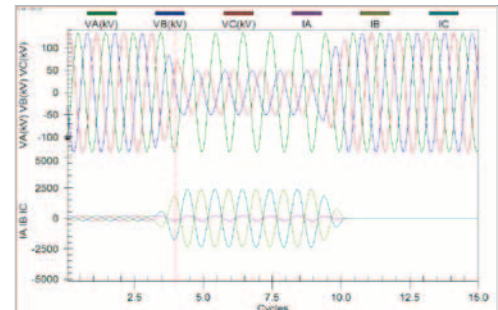
Flexible Communication

Communications Media

- Ethernet 10/100BASE-T
- Ethernet 100BASE-FX
- Single or dual Ethernet ports
- EIA-232 serial
- EIA-485 serial
- Fiber-optic, serial multimode ST®

Communications Protocols

- SEL ASCII
- Mirrored Bits communications
- IEC 61850
- Modbus RTU/TCP
- Simple Network Time Protocol (SNTP)
- DNP3 serial, LAN/WAN
- DeviceNet™
- Telnet
- FTP
- Synchrophasors (IEEE C37.118)

Mounting Options

Retrofit Replacement Kits

Replace existing generator protection with the SEL-700GT and the applicable mounting kit. These kits provide everything needed to replace many existing generator relays with the SEL-700GT.

No cutting or drilling is required when you use the optional mounting kits. Replacement of existing protection is quick and easy!

Central control room.   *Field remote terminal.*   *Engineering access.*