



SEL-351R Recloser Control Guideform Specification

The microprocessor-based recloser control shall provide a combination of functions including protection, monitoring, control, fault locating, and automation. Recloser control self-checking functions shall be included. Specific operational and functional requirements are as follows.

Autoreclosing Control. The recloser control shall incorporate a four-shot control. It shall include four independently set open time intervals, an independently set reset time from reclose cycle, and an independently set reset time from lockout.

Coordination With Downstream Reclosers. The recloser control shall include 38 standard recloser time-overcurrent curves and sequence coordination logic for secure and dependable operation.

Phase Fault Overcurrent Protection. The recloser control shall incorporate phase and negative-sequence overcurrent elements for detection of phase faults. For added security, the recloser control shall provide directional elements, load-encroachment logic, and torque-control capability (internal and external).

Ground Fault Overcurrent Protection. The recloser control shall incorporate residual ground and neutral ground overcurrent elements for detection of ground faults. For added security, the recloser control shall provide directional elements and torque-control capability (internal and external).

Phase Under- and Overvoltage Elements. The recloser control shall incorporate undervoltage and overvoltage elements for creating protection and control schemes, including but not limited to the following: voltage checks (e.g., hot bus/dead line) for reclosing; blown transformer high-side fuse- detection logic; control schemes for capacitor banks.

Sequence Voltage Elements. The recloser control shall incorporate positive-, negative-, and zero-sequence voltage elements that can be logically configured for either under- or overvoltage applications.

Under- and Overfrequency Protection. The recloser control shall incorporate four levels of under-/overfrequency elements for detection of power system frequency disturbances. Each setting level shall use an independently set timer for load- shedding or generator-tripping schemes.

Synchronism Check. The recloser control shall include two synchronism-check elements with separate maximum angle settings (e.g., one for autoreclosing and one for manual closing). The synchronism-check function shall compensate for close time and constant phase-angle differences between the two voltage sources used for synchronism check (phase-angle differences settable in 30-degree increments).

IED Communications. The recloser control shall include the capability for communication of internal logic values to a remote relay or recloser control via serial communications. These values shall be available for use in control logic.

Secure Communications. The recloser shall include an optional accessory for converting an EIA-232 serial port to encrypted and authenticated IEEE 802.11b wireless communication. Software shall be provided with this accessory for access to the wireless port using a personal computer (PC) or personal data assistant (PDA).

Operator Controls. The recloser control shall include 10 operator controls on the recloser control front panel; these functions shall also be accessible in the recloser control control logic. The operator control panel shall include pushbuttons and LEDs with programmable functions and indications.

Event Reporting and Sequential Events Recorder (SER). The recloser control shall be capable of automatically recording disturbance events of 15 or 30 cycles with settable prefault duration and user-defined triggering. Events shall be stored in nonvolatile memory. The recloser control shall include an SER that stores the latest 512 entries.

Status and Trip Target LEDs. The recloser control shall include 16 status and trip target LEDs.

Overload and Unbalance Alarms. The recloser control shall include user-settable demand current thresholds for phase, negative-sequence, neutral, and residual demand measurements.

Recloser Wear Monitor. The recloser control shall include a recloser wear monitor with user-definable wear curves, operation counter, and accumulated interrupted currents by phase.

Battery Monitor. The recloser control shall measure and report the battery level. Two user-selectable threshold parameters shall be provided for alarm and control purposes.

Fault Locator. The recloser control shall include a fault-locating algorithm to provide an accurate estimate of fault location without communications channels, special instrument transformers, or prefault information.



Automation. The recloser control shall include 16 local control elements, 16 remote control logic points, 16 latching logic points, and 16 display messages in conjunction with a local display panel included in the recloser control. The recloser control shall have the capability to display custom messages.

Recloser Control Logic. The recloser control shall include programmable-logic functions for a wide range of user-configurable protection, monitoring, and control schemes.

Communication. The recloser control shall include three independent EIA-232 serial ports and one optional EIA-485 serial port for external communications. There shall be an option for DNP3 Level 2 protocol with bit-mapping.

IRIG-B. The recloser control shall include an interface port for a demodulated IRIG-B time synchronization input signal.

PC Software. The recloser control shall include compatibility with a PC software program for use in programming control settings and logic functions, and retrieving event data. The PC software shall be included, but not required to use the recloser control.

