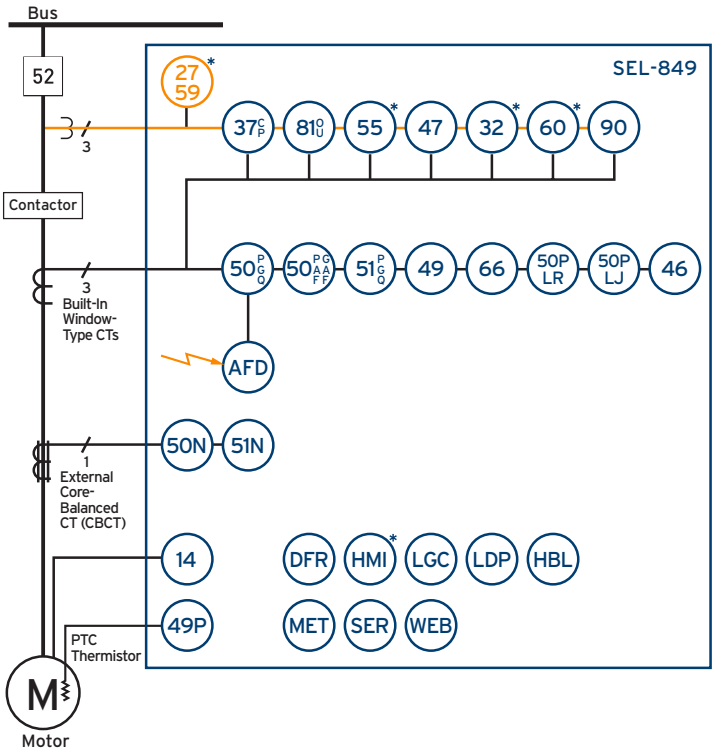
SEL-849

Motor Management Relay

One relay for safety and process continuity

- Improve safety at each motor control center (MCC) with secure, fast arc-flash detection.
- Use the enhanced thermal model for more precise motor thermal protection and better productivity.
- Gather critical motor behavior data and issue safe, remote control signals over Ethernet or serial communications to save operator time.
- Integrate into Ethernet-based control networks with EtherNet/IP, Modbus TCP, DNP3, or IEC 61850 Edition 1.

Functional Overview



ANSI Numbers/Acronyms and Functions	
14	Speed Switch
27	Undervoltage*
32	Directional Power*
37C	Undercurrent
37P	Underpower*
46	Current Unbalance
47	Phase Reversal
49	Thermal Model
49P	PTC Overtemperature
50G AF	Arc-Flash Residual Overcurrent
50N	Neutral Overcurrent
50P AF	Arc-Flash Phase Overcurrent
50 (P,G,Q)	Overcurrent (Phase, Ground, Neg. Seq.)
50P LJ	Load Jam
50P LR	Locked Rotor
51N	Neutral Time Overcurrent
51 (P,G,Q)	Time Overcurrent (Phase, Residual, Neg. Seq.)
55	Power Factor*
59	Phase Overvoltage*
60	Loss-of-Potential*
66	Starts-Per-Hour
81 (O,U)	Over-/Underfrequency*
90	Load Control

Additional Functions	
AFD	Arc-Flash Detector
CC	Conformal Coating*
DFR	Event Reports—Motor Starts, Motor Operating Statistics, Sequential Events Recorder
HBL	Harmonic Blocking
HMI	Operator Interface*
LDP	Load Data Profiling
LGC	SELOGIC® Control Equations
MET	Metering—RMS Voltage and Current, Frequency, Power, Power Factor, Energy, Maximum/Minimum, Thermal, Thermal Capacity Used
SER	Sequential Events Recorder
VFD	Variable-Frequency Drive Support
WEB	Web Server

*Optional Feature

Key Features

Multiple Applications

The SEL-849 Motor Management Relay supports a variety of applications, including pumping applications for water, chemicals, and petroleum as well as air-based applications involving fans, blowers, air handlers, and compressors. It also supports chiller applications using compressors and air-conditioning; bulk material applications involving conveyors, crushers, screeners, feeders, augers, and bucket elevators; and more.

Compact Design for MCCs

The compact form factor easily installs in small MCC drawers and buckets. Built-in CTs save room and reduce the installation time.

Easy-to-Use Web Interface

The web interface makes it easy for electricians and technicians to configure and monitor the SEL-849.

Easy Integration With Control Systems

Several communications protocol options allow you to use the SEL-849 with old and new control systems. These protocols include IEC 61850 Edition 1, EtherNet/IP, the IEC 62439 Parallel Redundancy Protocol (PRP), DNP3, Modbus TCP/IP, Modbus RTU, Telnet, FTP, and the Simple Network Time Protocol (SNTP).

Optional HMI Modules

Install SEL-849 relays in MCC buckets, then connect them to display modules outside the MCC for secure and safe access to relay status and control functions. Choose the HMI module that meets your needs: the SEL-3421 Motor Relay HMI (With LCD) or the SEL-3422 Motor Relay HMI (Without LCD).

Rugged Hardware You Can Rely On

All SEL relays are designed to operate in harsh environments where other relays may fail. The SEL-849 operates in extreme conditions, with an operating temperature of −40° to +85°C (−40° to +185°F), and is designed and tested to exceed applicable standards, including vibration, electromagnetic compatibility, and adverse environmental conditions. In addition, the SEL-849 and SEL-3422 are ATEX and Underwriters Laboratories (UL) Class I, Division 2-certified for use in hazardous and potentially explosive environments.

Arc-Flash Hazard Protection

MCCs typically have large fault-current potential, resulting in increased arc-flash hazards. The SEL-849 arc-flash detection capability significantly reduces the total arc-flash energy.

Easier Testing, Commissioning, and Maintenance

The SEL-3421 HMI with an LCD allows you to perform key maintenance and operational tasks without plugging in a computer. The ability to view and set the IP and router address directly from the HMI screen makes relay installation easier. The HMI navigation keys can be programmed as pushbuttons to perform functions, such as triggering reports or resetting values, making commissioning, maintenance, and day-to-day operation easier.

Optional Conformal Coating

An optional conformal coating protects circuit boards in harsh environments that expose the relay to contaminants, such as chemical vapors, salt, or moisture.

Product Overview

EIA-232 or EIA-485 provides quick and easy engineering access.

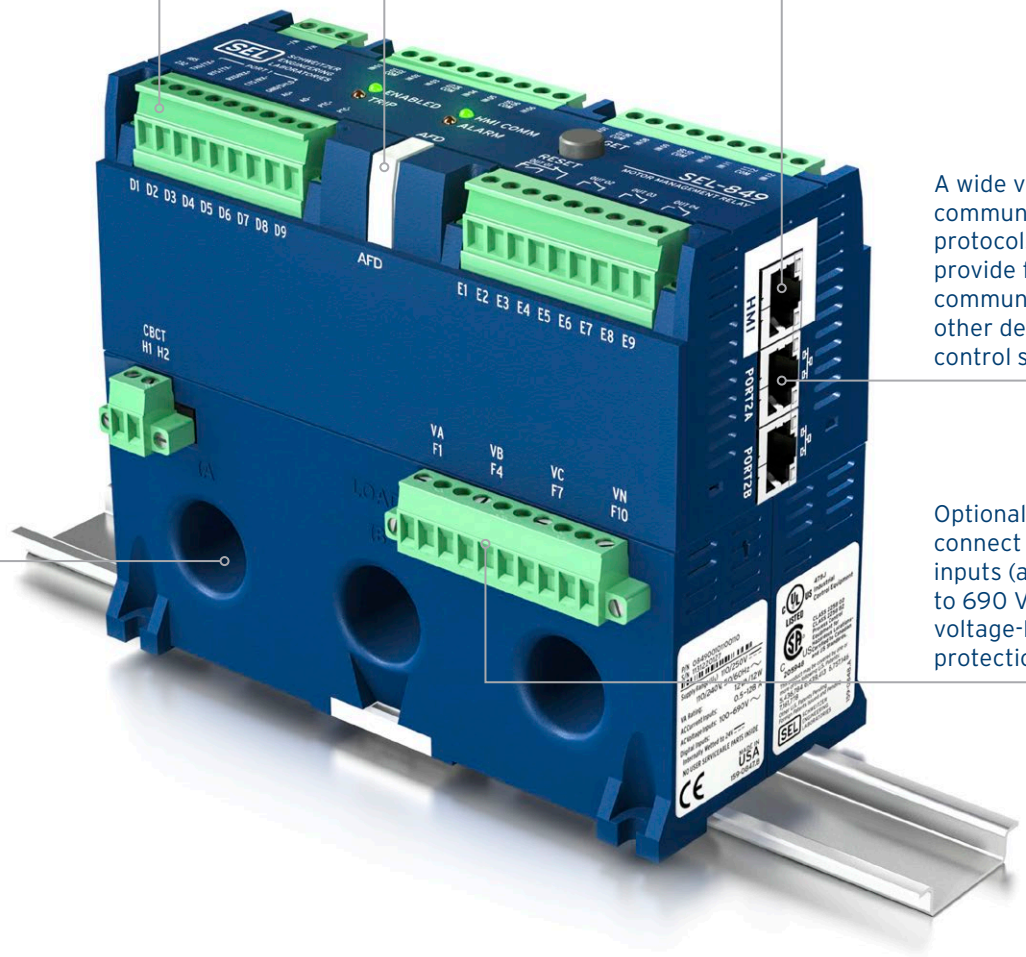
Optical sensor supports high-speed, secure arc-flash detection.

HMI powered Ethernet port lets you review status and event records externally to improve safety.

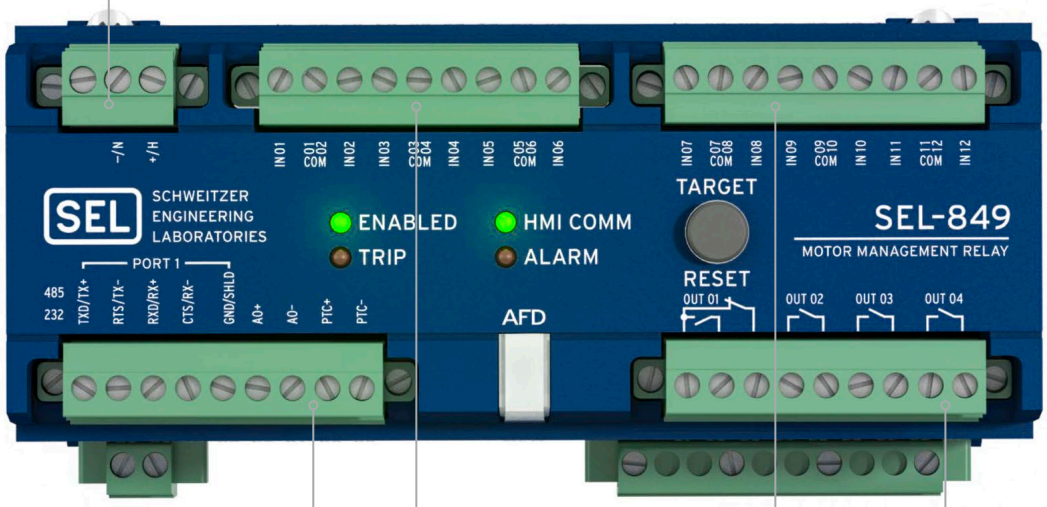
A wide variety of communications protocols and media provide flexibility to communicate with other devices and control systems.

You can use space-saving portals for motor conductors with a full-load ampere (FLA) rating range of 0.5—256 A or external CTs for an FLA rating of up to 6,000 A.

Optional direct-connect voltage inputs (allowing up to 690 Vac) enable voltage-based protection elements.



Power supply options include
110—240 Vac, 125—250 Vdc; or 24—48 Vdc.



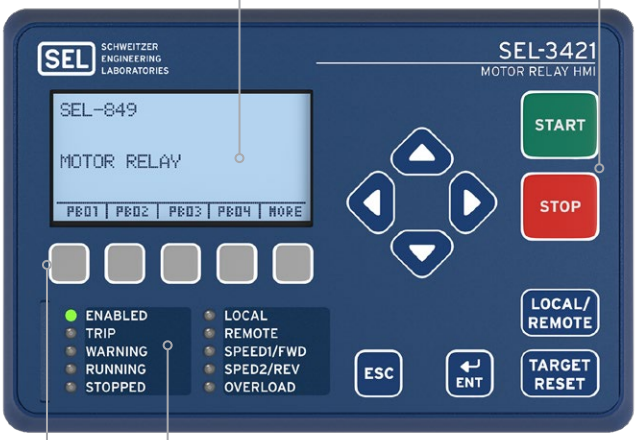
Connectors for the thermistor input and AO let you monitor the equipment temperature and integrate with a distributed control system (DCS).

Connectors for DIs and DOs provide a convenient way to issue control signals and monitor equipment.

Detachable HMI

Large LCD for navigation, relay control, and diagnostics.

Fundamental motor controls.



Two fixed and eight programmable tricolored LEDs.

Context-adjusted navigation keys can be programmed to function as pushbuttons.

Simple HMI for status and control.

Configurable label for programmable LEDs.

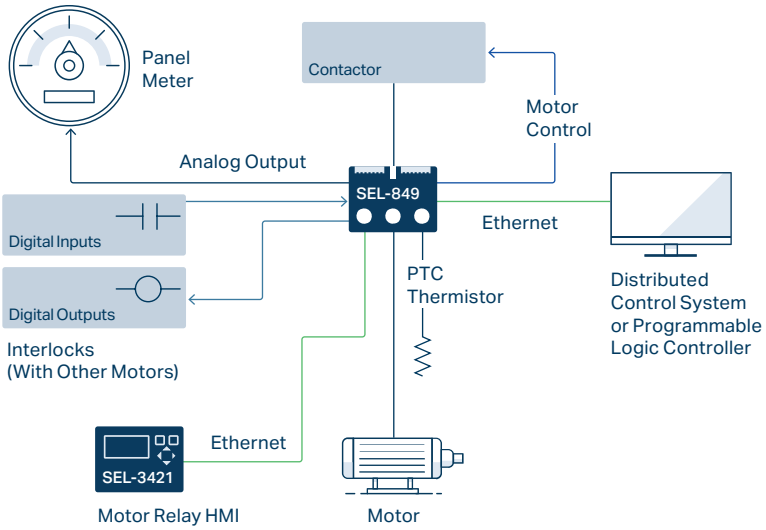
Flexible Integration

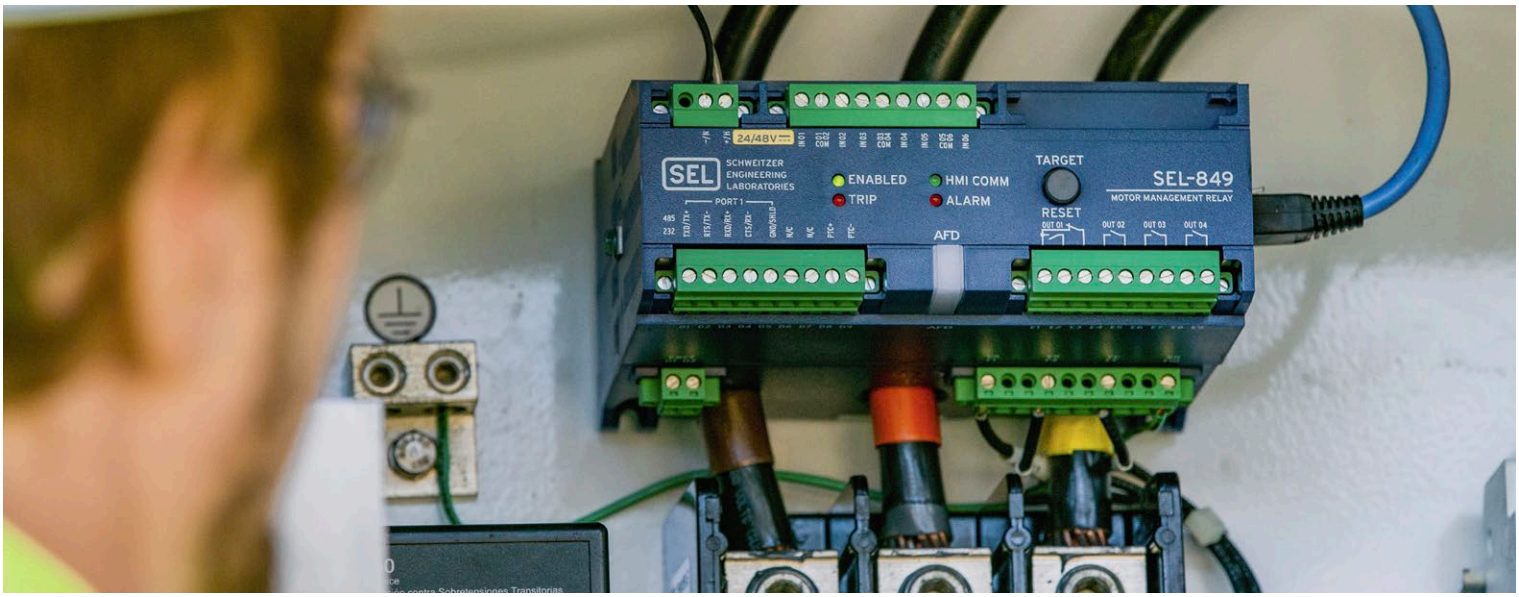
The SEL-849 provides motor performance data for operations, electrical, and reliability personnel.

Department	Operations	Electrical	Reliability
Question	How well is the process running?	How much power are the motors using?	Are the motors healthy?
Key Indicators	Operating statistics Motor starts Motor overload, jam, and loss Temperature reports Two-speed motor operation	Voltage and current Power and PF Load profile Event reports Low-voltage starting Energy metering Maximum/minimum metering	Motor start reports Motor operating statistics SER Motor restart after power restoration Motor overload, jam, and loss

Complete Control System Integration

The SEL-849 also provides many of the same functions as a programmable logic controller (PLC). Multiple communications options, a variety of inputs and outputs, and programmable SELOGIC control equations make the SEL-849 a complete automation and protection solution.

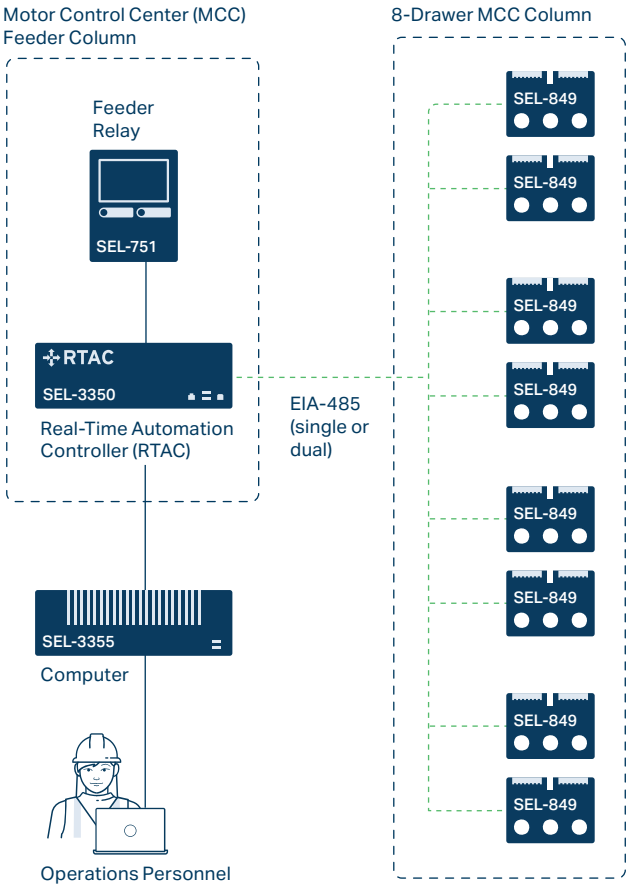




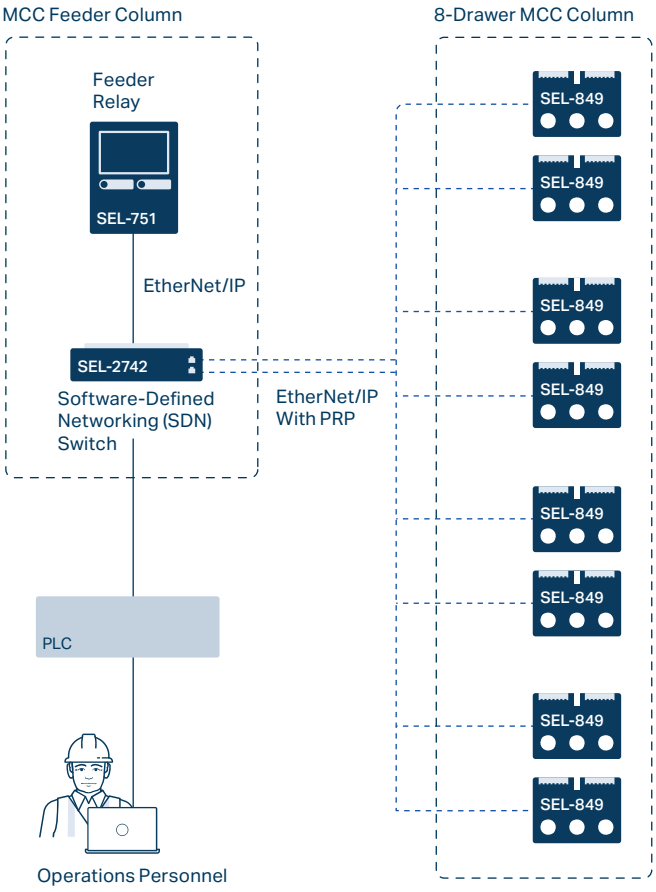
Example Protection and Control System

SEL-849 relays are designed to easily integrate into EIA-485 or Ethernet-based control and monitoring systems. In this example, the MCC drawer system is configured to support EIA-485 communications, which connect the SEL-849 relays and an SEL-3350 Real-Time Automation Controller (RTAC). The RTAC serves as the system controller and DCS/SCADA gateway, converting communications from EIA-485 to Ethernet. The SEL-3355 computing platform serves as the host for the DCS/SCADA software.

The SEL-849 can connect directly to DCS/CADA systems that support EIA-485 or Ethernet communications by using Modbus RTU, EtherNet/IP, PRP, DNP3, Modbus TCP, or IEC 61850 protocols.



RTAC-based motor control solution with EIA-485 communications



PLC-based motor control solution with EtherNet/IP communications

SEL-849 Specifications

General	
Current Inputs	0.5—256 A (built-in relay window CT, no external CT) 1 or 5 A compatible (external CT) 0.010—40.000 mA neutral current (core-balanced CT current input)
AC Voltage Inputs	100—690 Vac rated operating voltage 800 Vac continuous, 1,000 Vac for 10 seconds
Output Contacts	The relay supports Form A and C outputs. Pickup/dropout time: <8 ms for coil energization to contact closure
Optoisolated Control Inputs	Internally wetted (powered) to 24 Vdc or externally wetted to 24/48 Vdc/Vac or 110/125 Vdc/Vac Pickup time: <60 ms for internally/externally wetted Dropout time: <40 ms for internally/externally wetted
Frequency and Phase Rotation	System frequency: 50, 60 Hz Phase rotation: ABC, ACB Frequency tracking: 12.5—72.5 Hz
Communications Protocols	SEL (Fast Meter, Fast Operate, and Fast SER), EtherNet/IP, Modbus TCP/IP, Modbus RTU, DNP3, FTP, Telnet, SNTP, IEC 61850 Edition 1, and PRP for dual-Ethernet models
Power Supply	High-voltage supply: 110—240 Vac, 125—250 Vdc Absolute operating range: 85—264 Vac, 85—275 Vdc Low-voltage supply: 24—48 Vdc Absolute operating range: 19.2—57.6 Vdc
Operating Temperature	SEL-849 Motor Management Relay and SEL-3422 Motor Relay HMI (Without LCD): —40° to +85°C (—40° to +185°F) SEL-3421 Motor Relay HMI (With LCD): —20° to +70°C (—4° to +158°F)
Certifications	To view certifications for the SEL-849, please visit selinc.com/company/certifications.

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