

MOTORMAX™

LOW-VOLTAGE MOTOR MANAGEMENT AND PROTECTION SYSTEM



A NEW LOOK AT MOTOR MANAGEMENT

Even as the complexities of motor management have continued to evolve, there are two goals that remain the same: process continuity and personnel safety. At SEL, we have developed a solution that provides a single, system-wide view of your motors; that gathers timely, ordered, and actionable data from these devices; and that gives you and your operators more in-depth knowledge of plant-wide operations in order to drive these goals. This solution is **MOTORMAX**.

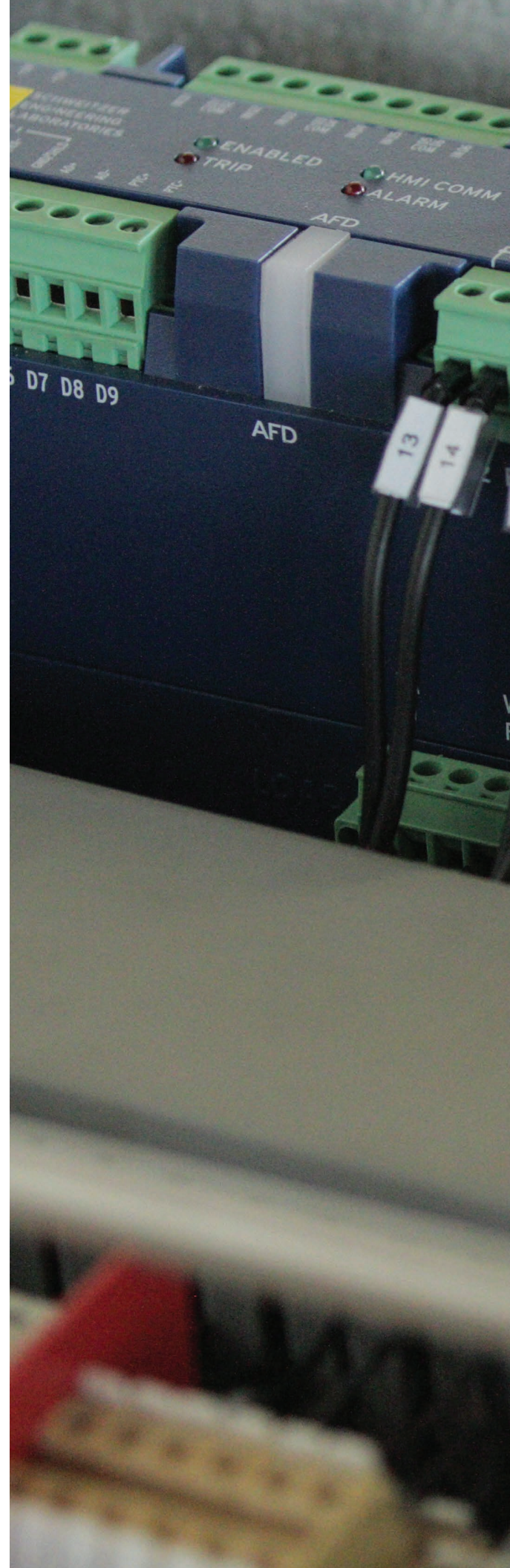
MOTORMAX is a smart, centralized motor control system that gives you the information to make informed decisions about your processes. It actually replicates the front panel of each motor relay in a single view at the control center, which means that when an issue arises, you can figure out the cause from your desk rather than sending operators into dangerous areas without knowing the problem first. This also allows them to bring the right tools they need to efficiently address the problem and minimize the amount of time spent in front of hazardous equipment or arc-flash zones.

With **MOTORMAX**, personnel have the ability to see and respond to any events from a safe environment because it equips each motor with warnings, alarms, and status indication signals that alert at the earliest possible instance. This solution also comes with our exceptional arc-flash detection technology, which mitigates these events in under 16 milliseconds.

In addition, because **MOTORMAX** unifies all of your motors with similar settings, parts, I/O, and data mapping, the whole process of purchasing, integrating, and operating this new system is simplified, and all parts have been pretested and verified to our high-quality standards.

At all levels, from the single motor view all the way to a system-wide view, **MOTORMAX** gives you a new way to approach motor management and reduces the costs associated with integrating new technologies. This is the smart motor control solution that brings efficiency, simplicity, and safety to your low-voltage motor management systems, all in one cost-effective package.

MOTORMAX also allows for seamless integration with the SEL **POWERMAX** power management system for a fully-integrated solution from a single source. **MOTORMAX** integrates low-voltage motor control into an overall plant control system.





SEL-849

MOTOR MANAGEMENT RELAY

RESET

A1

15

16

17

VC
F7

VN
F10

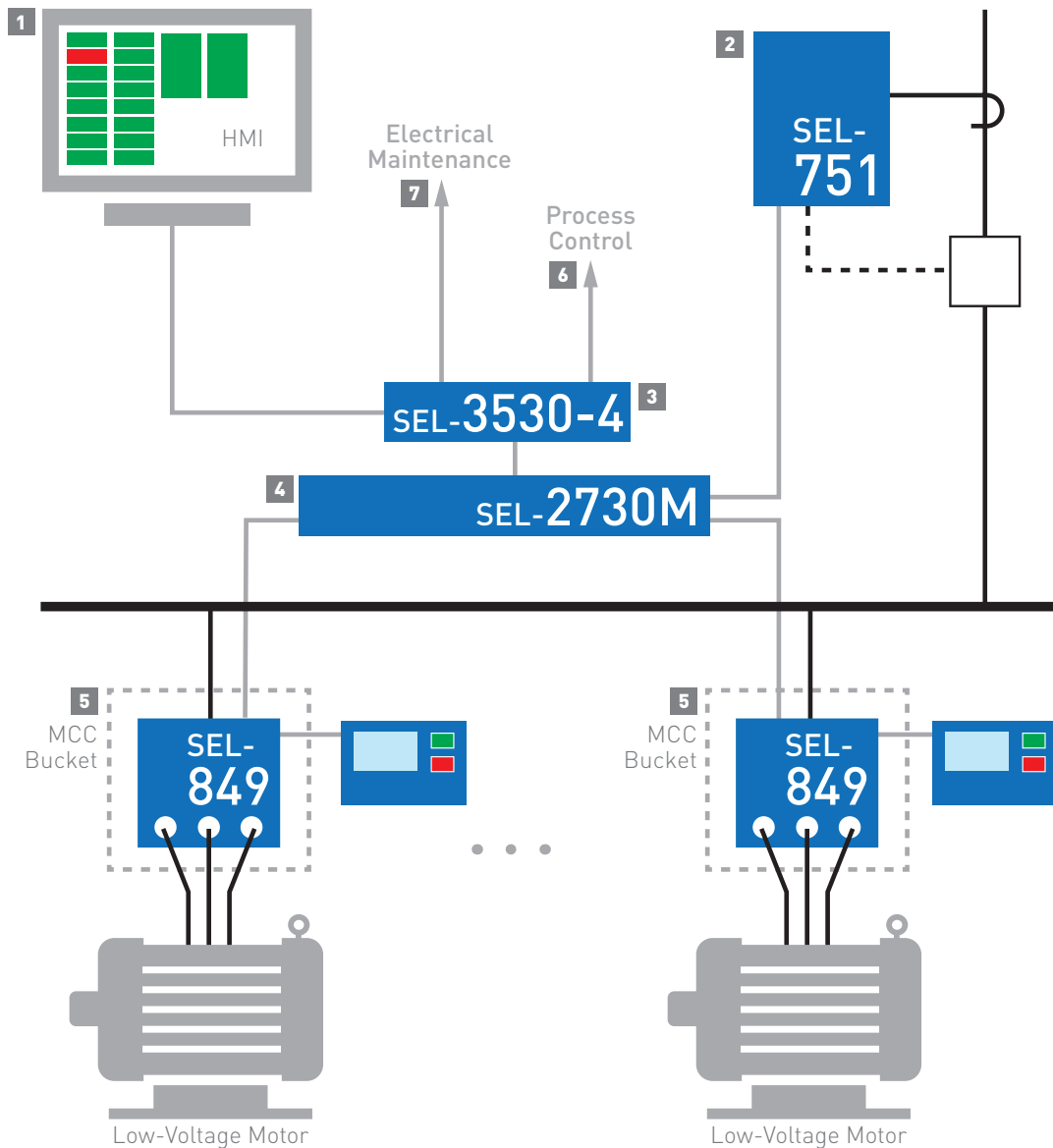
PORT2A

PORT2B

BASIC MOTORMAX ARCHITECTURE

MOTORMAX is a combination of motor protection, network management, and real-time automation control. Along with the SEL-849, MOTORMAX uses features from other key devices, such as the communications abilities in SEL RTACs and managed

Ethernet switches. Together these devices deliver high-performance motor protection as well as high-speed reporting of motor status, alarms, and operating conditions at the HMI.



1 The HMI provides timely, clear, and actionable information for operations, both on the system level and on the relay level.

2 The SEL-751 Feeder Protection Relay protects the incoming feeder. It also coordinates protection with the motor relays during arc-flash conditions.

3 The Real-Time Automation Controller (RTAC) hosts system logic, organizes data, and serves data to the HMI.

4 A managed network switch prioritizes and secures network traffic.

5 SEL-849 Motor Management Relays (and optional remote displays) deliver patented thermal protection and integrated arc-flash protection for low-voltage motors used in high-value processes.

6 PLC replacement and full metering and control.

7 Ready-built for integration to a POWERMAX control system.

DESIGNED FOR HIGH-DENSITY APPLICATIONS

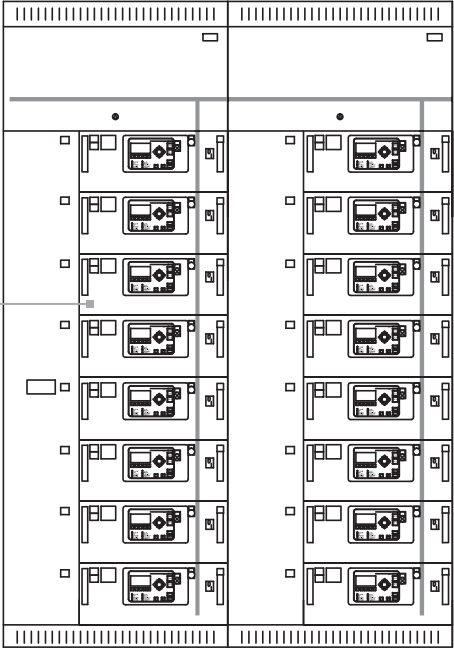
With its ease of installation, design flexibility, and blend of several important features from different devices, **MOTORMAX** is the ideal solution for a variety of motor control center buckets and drawer configurations. The processing power and logic built into this solution can replace traditional programmable logic controllers (PLCs) and associated wiring and panels.

The compact size of the SEL-849 and the SEL-3421 Motor Relay HMI make them ideal for high-density installations.

REDUCE TOTAL COST OF OWNERSHIP

MOTORMAX reduces cost of ownership from the very beginning of the process. SEL delivers **MOTORMAX** with all relay, network, and automation control settings preconfigured and tested to customer specifications. Every system is delivered with a complete test report, bill of materials, cabling, and labels to simplify on-site installation. By delivering a fully-tested, preconfigured system, SEL reduces the risk of new technology adoption.

As with all SEL relays, the SEL hardware within the **MOTORMAX** solution is designed and tested to meet the most demanding requirements and comes with SEL's ten-year, worldwide warranty so that you can rely on its performance and durability no matter what.





SCHWEITZER
ENGINEERING
LABORATORIES

ONE LINE

INCOMER A

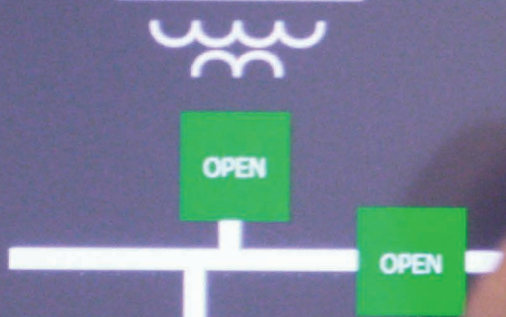
IA (A)	0.0
IB (A)	0.0
IC (A)	0.0
P (kW)	0.0
Q (kVAR)	0.0
PF	1.00

001

INCOMER B

IA (A)	0.0
IB (A)	0.0
IC (A)	0.0
P (kW)	0.0
Q (kVAR)	0.0
PF	1.00

002



BUS A

TIE B/A

IA (A)	0.0
IB (A)	0.0
IC (A)	0.0
P (kW)	0.0
Q (kVAR)	0.0
PF	1.00

007



VIEW YOUR LOW-VOLTAGE MOTOR PROTECTION AS A SYSTEM, AND SEE THE BIGGER PICTURE

The MOTORMAX solution changes your perspective of typical motor management. Through a simple yet powerful human-machine interface (HMI), you can securely manage MCC lineups with dozens or even hundreds of motors, all from a remote location. You can also examine any individual motor relay from your remote location in order to quickly spot trouble conditions, gather relevant data, and develop necessary corrective actions based on actual events and trends.

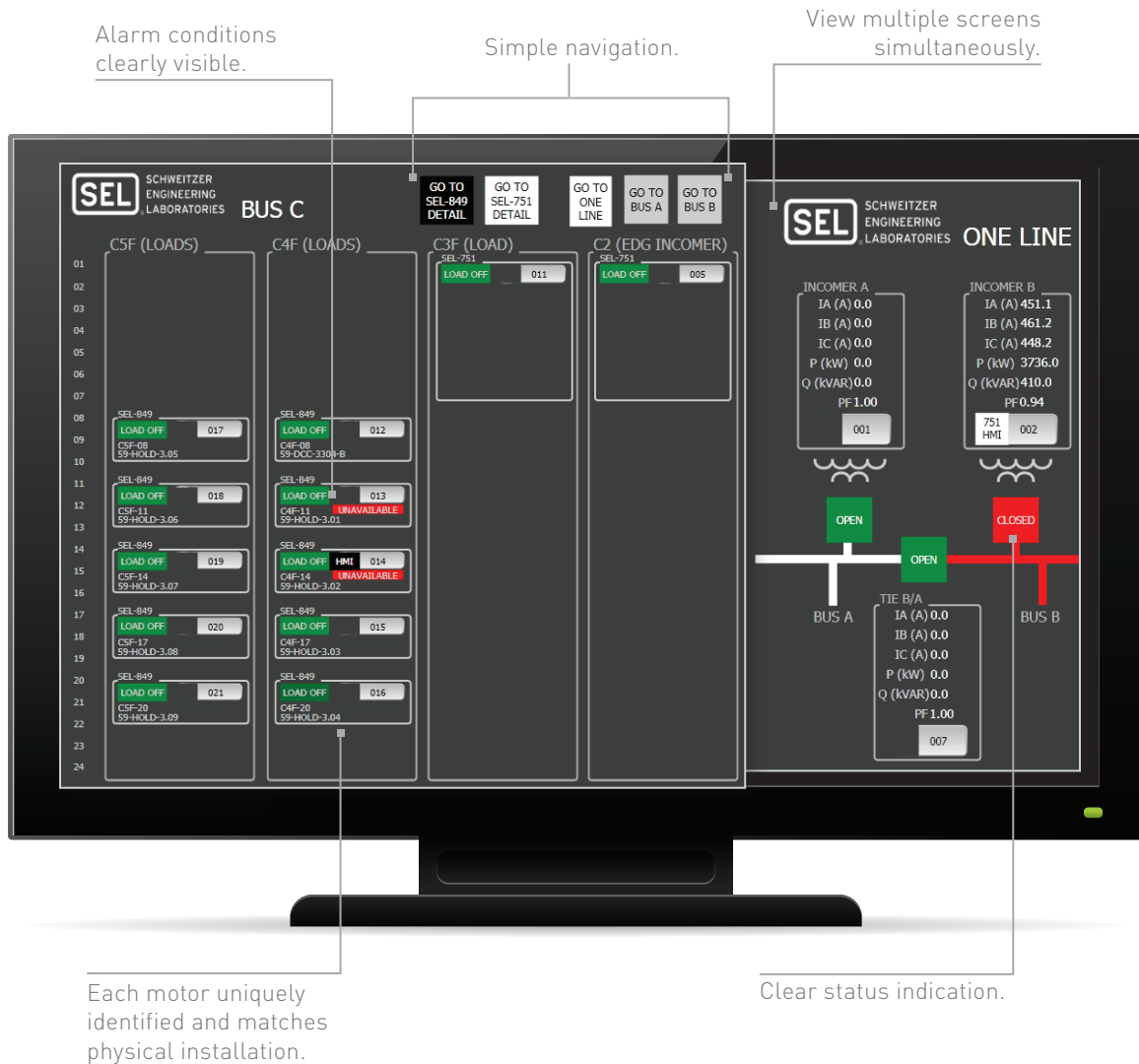
The ability to see more of your system at once means you have access to more detailed information about your operations at all times. With just one glance, you can identify different motor operating conditions, such as stopped, starting, running, warn, alarm, offline, and more, for your entire system. Then, with the ability to capture running alarm conditions and motor trends, you can send maintenance crews to resolve motor issues before the process is interrupted.

MOTORMAX is also about more than just motor management and protection. It is about safety. The integrated SEL-849 Relay's arc-flash detection greatly improves your work environment safety by reducing the incident energy of arcing faults that can occur in low-voltage MCC buckets.

An integrated motor management and control system also means that you have precise time available throughout the system. When events do occur, having a single time reference is essential. This single time reference allows you to time-align each relay's recorded event reports and efficiently analyze them from a system-wide perspective.

SYSTEM VISUALIZATION

Choose standardized MOTORMAX visualization screens, or work with SEL Engineering Services for screens customized to match your operational practices and standards. The MOTORMAX HMI provides a safe and secure way to gather timely, ordered, and actionable data or to issue informed control around the plant from one location.



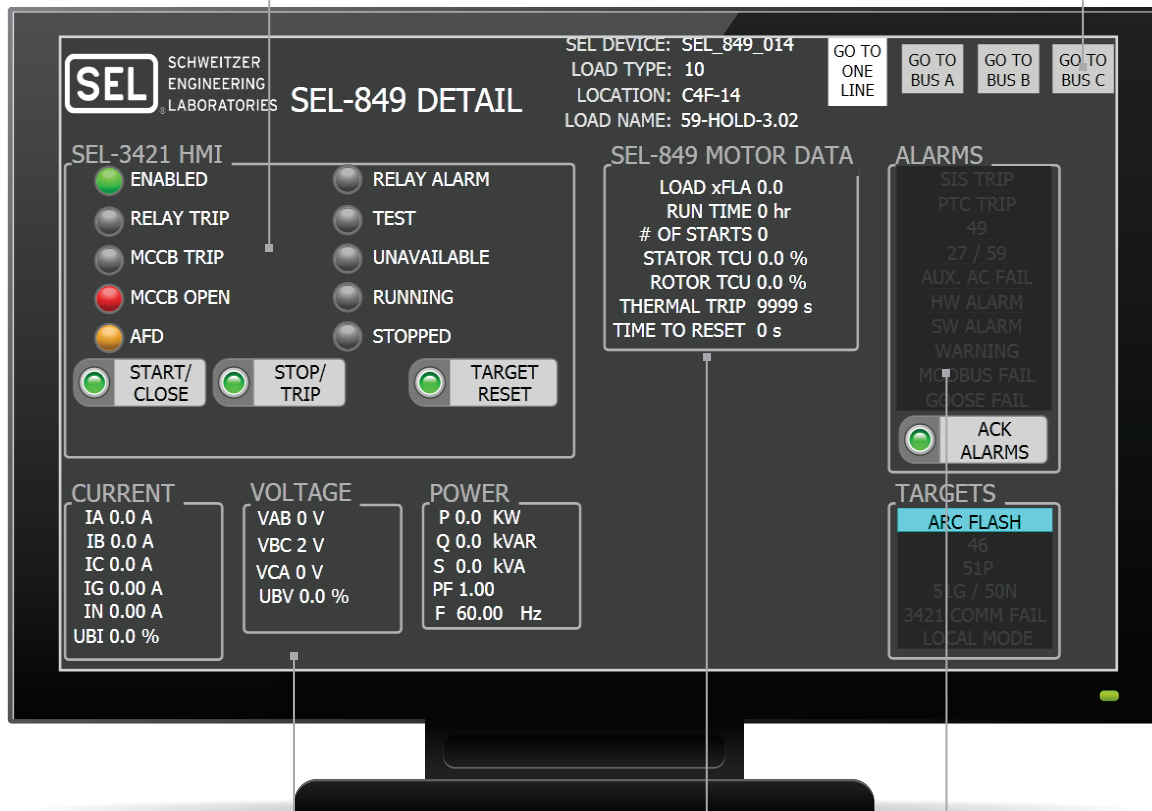
Improve operator efficiency using a single window to summarize the status of an entire bus in each top-level system status window.

Identify operating anomalies and take corrective action at the control center, or schedule maintenance operations to restore nominal operating conditions.

Sum power data for each MCC for an informative roll-up of total MCC current, real power, reactive power, and power factor.

Remotely visualize the relay and securely issue start/stop controls.

Navigate back to top-level summary.



Quickly view summarized operating data.

Evaluate motor statistics, power quantities, trends, or other operating data.

Identify alarms or anomalies.

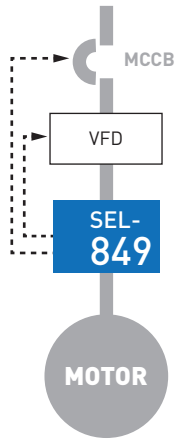
Efficiently navigate from the top-level system status window to the relay detail screen with a single click on the icon for the selected relay.

Issue informed control action from the central console (when remote control is enabled). Gather LED indications. Analyze motor statistics, trends, and operating quantities. Review motor warnings and alarm summaries. Reset LED targets, and start or stop the motor remotely.

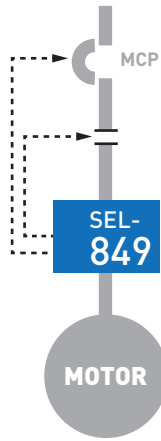
Analyze event data by collecting and viewing sequential events records, oscillography data, event reports, motor start reports, motor start trends, operational alarms, and I/O status. Use collected event data to improve process continuity and safety.

APPLICATION VERSATILITY

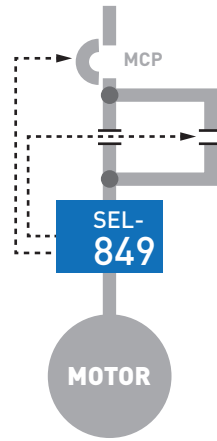
The SEL-849 fits a wide variety of motor protection requirements and control circuits. One relay means one learning curve. A few examples follow:



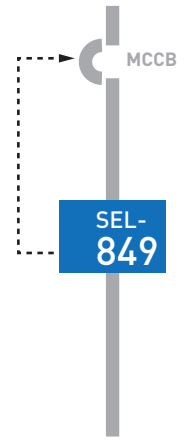
Variable Speed Drive and Soft Start



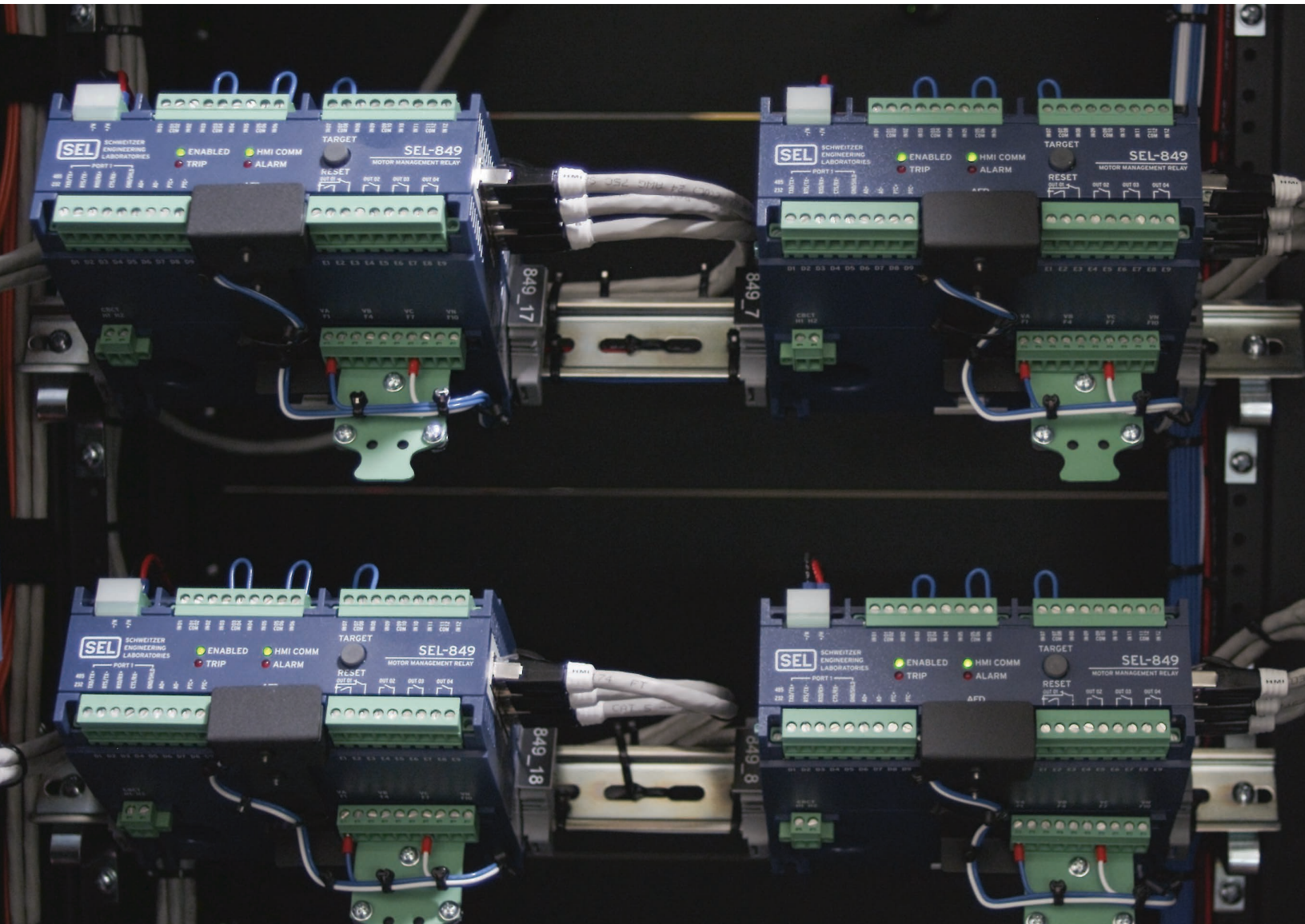
Typical Motor Starter



Two-Speed and Reversing Controls



Feeder Applications

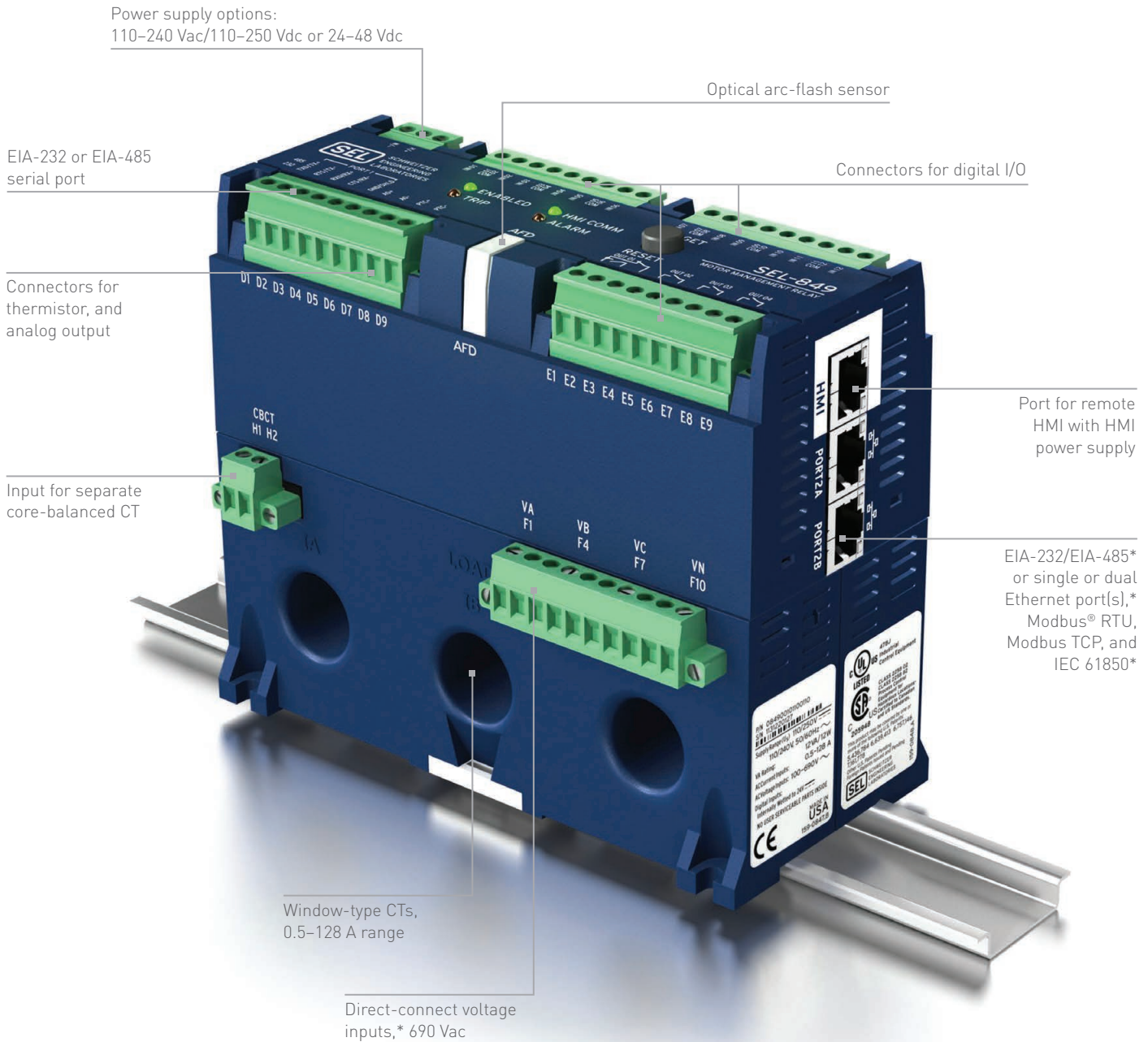
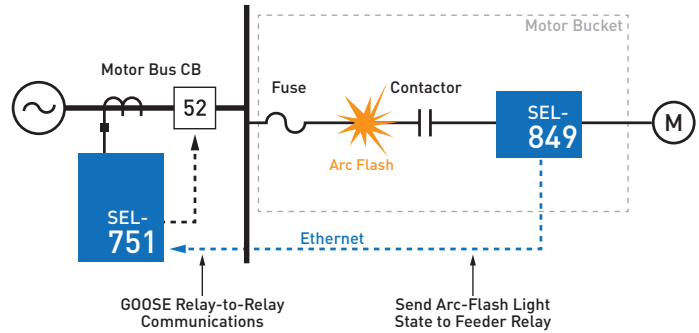


THE FOUNDATION OF MOTORMAX

The SEL-849 Motor Management Relay delivers affordable, advanced motor protection to low-voltage motor control centers. This low-cost relay provides powerful features, such as a patented thermal model, which is capable of simultaneously tracking the real effects of positive, negative, and zero-sequence currents in both the stator and the rotor. The foundation of MOTORMAX is advanced protection in a platform that supports a centralized, smart motor protection and control solution for improved operations.

MOTORMAX uniquely integrates arc-flash detection at no additional cost. Upon detection of an arcing event in the MCC bucket, the SEL-849 shares that information with the overcurrent relay that is protecting the incoming feeder and trips within 16 milliseconds. Overcurrent supervised arc-flash

mitigation reduces incident energy in the affected area, reduces hazardous working conditions for personnel, and reduces equipment damage.





**MAKING ELECTRIC POWER SAFER,
MORE RELIABLE, AND MORE ECONOMICAL**

**SCHWEITZER ENGINEERING
LABORATORIES, INC.**

Tel: +1.509.332.1890

Email: info@selinc.com

Web: www.selinc.com

