SEL-2414

Transformer Automation Controller (TAC)

Voltage and thermal regulation in a single device

- Reduce energy losses, and maintain voltages within acceptable limits.
- Optimize transformer performance for changing load conditions, power flow direction, seasonal variations, and network demands.
- Prevent transformer overloading by controlling transformers operating in parallel.
- Extend the lifespan of your transformer by using IEEE or IEC thermal modeling and cooling stage control.

Key Features

Load Tap Changer (LTC) Control

Control 32 LTC positions using block, auto, and manual modes from local or remote access. Program three dynamically adjustable set-point values, set triggered tap-changing delays, and automatically adjust for line-drop compensation and reverse power flow.

LTC Control for Transformer Paralleling

Deploy a network of SEL-2414 TAC devices for your transformer parallelling schemes by using preconfigured Ethernet communications settings to streamline setup. Control methods include leader/follower and current angle with intertap delay.

Cooling Bank Control

Automate fan and/or oil pump bank alternation and exercising to balance wear and prevent mechanical seizure. Adapt to operating conditions in real time by using responsive calculated hotspot temperatures to control cooling banks.

Transformer Temperature and Through-Fault Monitoring

Make informed maintenance decisions using daily loss-of-life and total loss-of-life modeling. Calculate transformer loss of life using the IEEE or IEC thermal model for various winding configurations. Use through-fault monitoring to track events that cause mechanical and thermal stress to transformers.

Seamless System Integration

Select hardware options to fit your application, as well as orderable power supplies, I/O cards, and communications ports. Integrate with SCADA and other distributed control systems by using a wide range of supported protocols.

Rich Data Capture and Display

Inform decisions with data from triggered oscillography, LTC event records, thermal records, and custom records, with the option to display statistics on the color touchscreen. Capture Sequential Events Recorder (SER) time-stamped data, and store SER reports.

Modernization and Retrofit Solutions

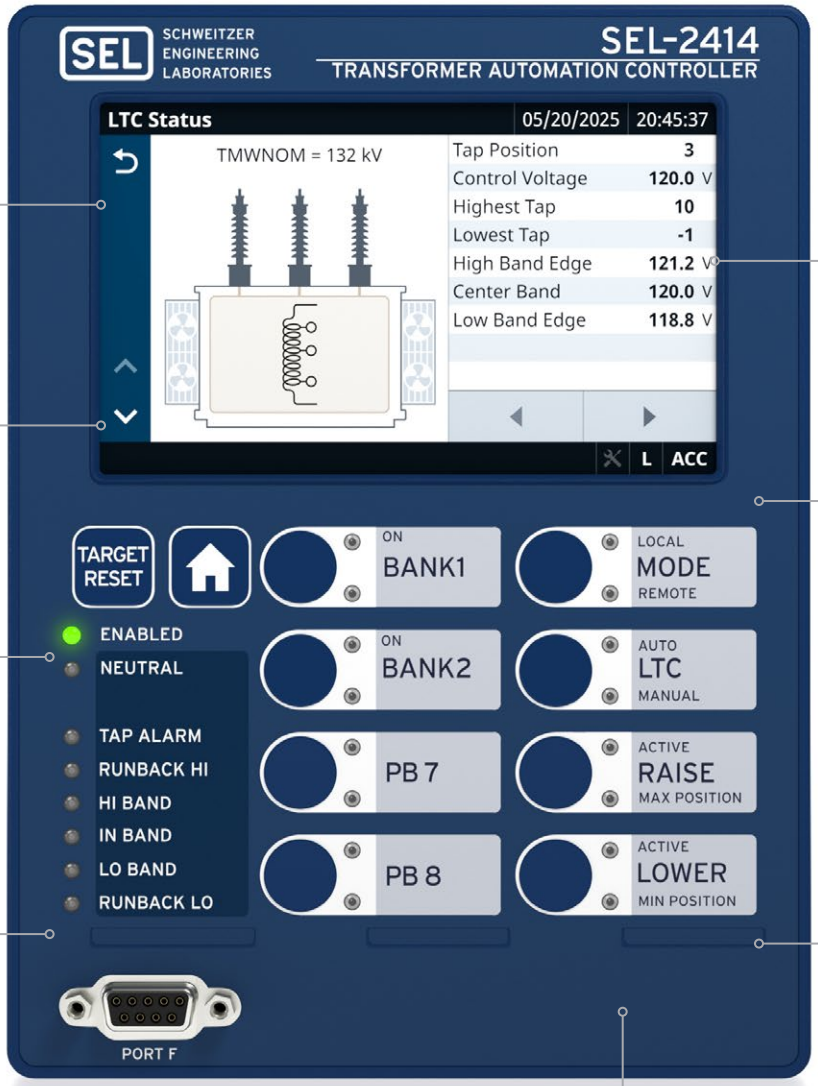
Specify the SEL-2414 for new transformer installations, and deploy a robust, single-device solution for transformer voltage and thermal regulation. Replace older LTC controllers with the SEL-2414 TAC by using adapter plates or SEL direct-replacement assemblies.

Overview

The 5-inch color display with a resolution of 800 × 480 pixels offers direct navigation via a capacitive touchscreen.

Adjust settings using the onscreen keyboard.

Alert onsite staff to device conditions by using programmable LEDs.



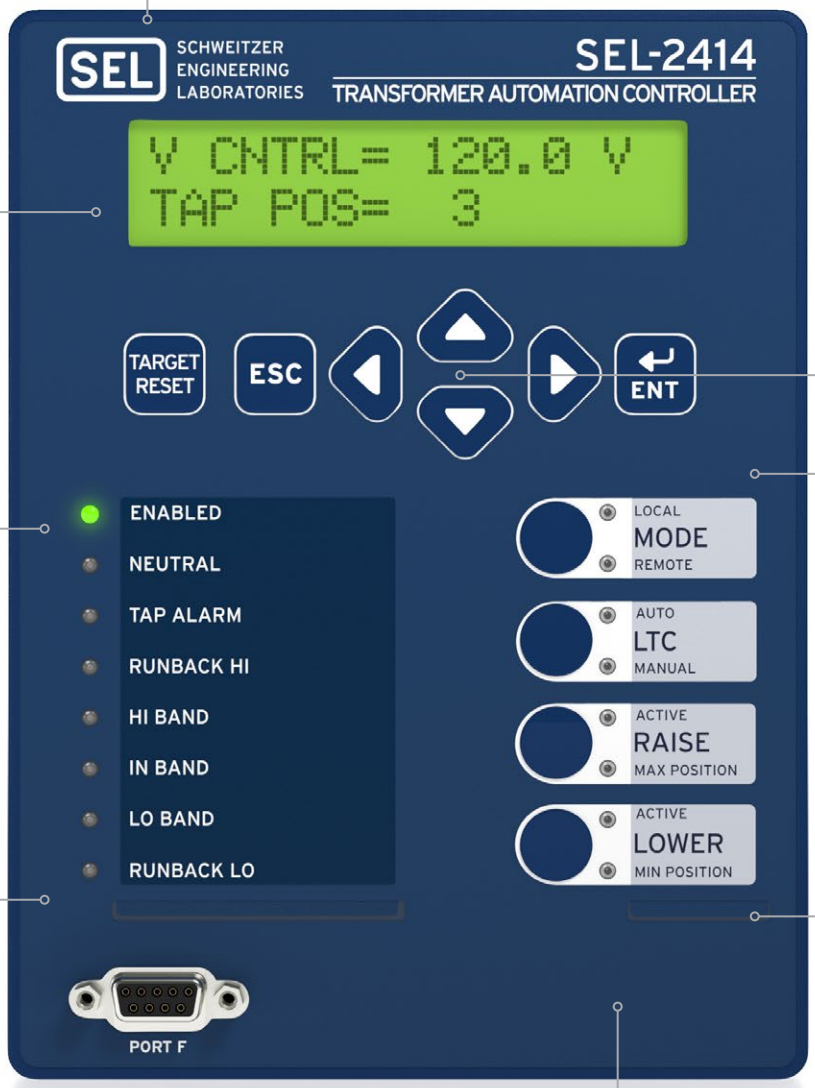
Display alarms, SER data, loss-of-life status, and LTC status are visible on the touchscreen.

Execute commands by using programmable pushbuttons.

Install in harsh environments. The color touchscreen has an operating temperature of −20° to 70°C (−4° to +158°F) and includes a global, ten-year warranty.

Optional surface-mount chassis is available.

Customize display messages or use the default messages to support control and diagnostics viewing.



Navigate the onscreen menus by using simple directional pushbuttons.

Alert personnel of controller status and conditions by using programmable pushbuttons and LEDs.

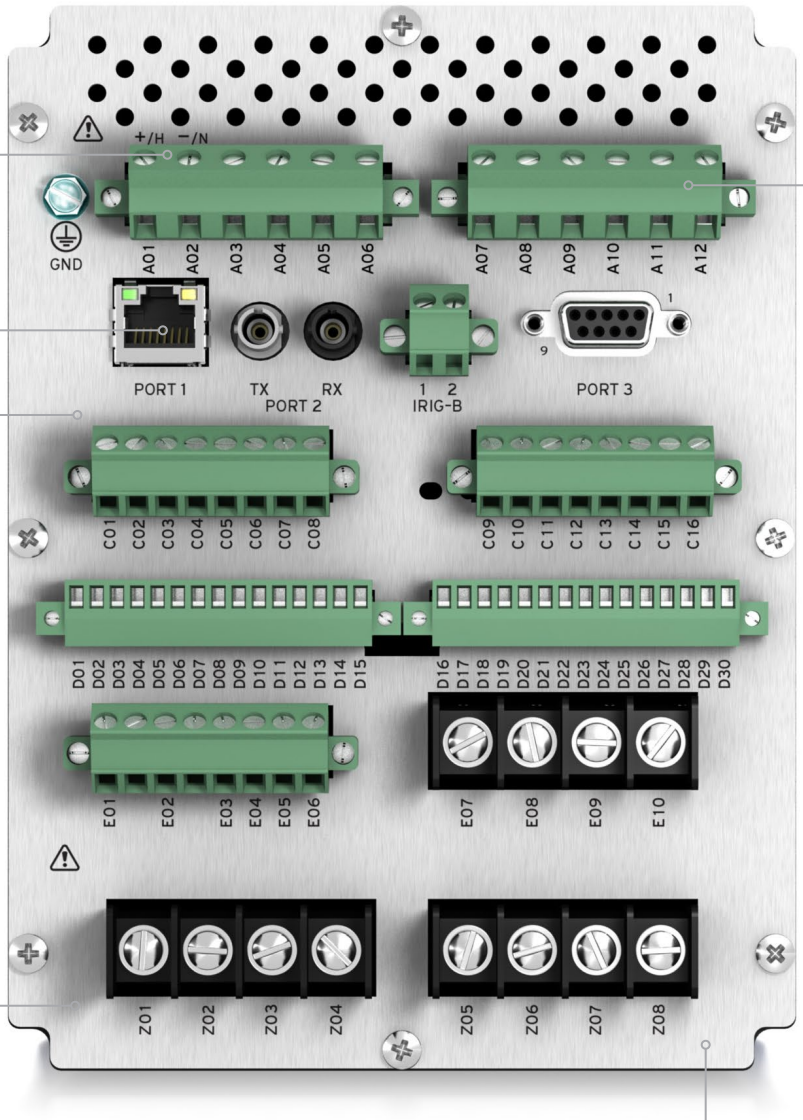
Execute commands by using programmable pushbuttons.

Install in the most extreme environments. The device has an operating temperature of −40° to +85°C (−40° to +185°F).

Select from a range of power supply options, including a 24/48 Vdc option and a 110/250 Vdc, 110/230 Vac option.

Accelerate firmware downloads and support transformer paralleling via the Ethernet port.

Configure I/O to fit your installation by using four available slots and a range of orderable I/O cards.



Standard I/O includes three digital outputs and two digital inputs.

Trust the SEL-2414 for proven quality and reliability, as it meets the same IEC standards as SEL protective relays.

Upgrade and Retrofit Options

Field Upgrades

Deploy the TAC as a dual-use device for thermal and voltage regulation or as a single-use device for thermal regulation only. Upgrade an existing SEL-2414 unit to an LTC controller by using a simple firmware upgrade kit.*

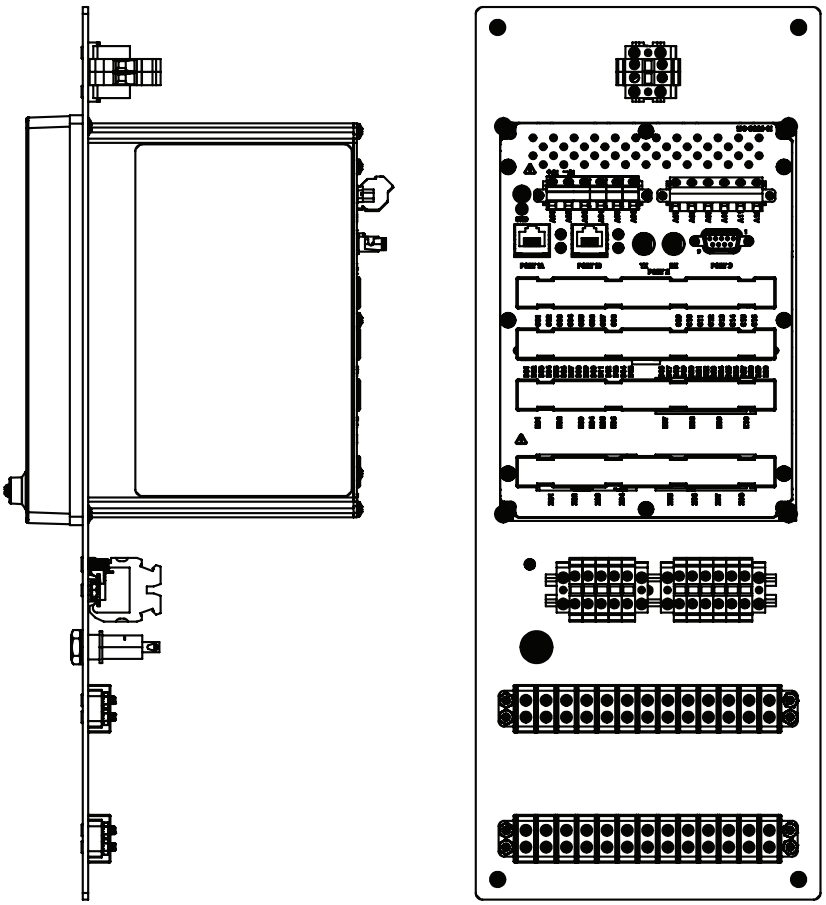
Adapter Plates

Order adapter plates with your SEL-2414 TAC to make it easy to replace older LTC controllers. Plates are manufactured to specific sizes and ship without a wiring harness. Contact your SEL sales representative for available sizes.

Direct-Replacement Assemblies

SEL direct-replacement assemblies closely match the features, form factor, and terminal blocks of specific legacy devices. Contact your SEL sales representative for complete information.

*Requires R500 or later firmware and purchase of an LTC controller license.



An SEL-2414 TAC direct-replacement assembly for a Beckwith M2067B.

Additional Orderable Options

Conformal Coating

Protect equipment installed in extreme environments. The SEL conformal-coating process is certified by an independent laboratory, and the lightweight and flexible coating provides a barrier from high humidity, airborne contaminates, and hazardous chemicals.

Mounting Options

Select from a range of mounting and enclosure options that meet the specifications of your transformer. Contact your SEL sales representative for complete information.

Visit **selinc.com/app/mounting-selector** to see the complete selection of mounting and enclosure kits.

Specifications

General Specifications

Displays	2-line × 16-character LCD 5-inch color touchscreen display, 800 × 480 pixels
AC Current Inputs	0.2 A, 5 A, or 1 A
AC Voltage Inputs	300 Vac
Power Supply	**110/250 Vdc, 110/230 Vac** Input voltage range: 85—275 Vdc, 85—264 Vac **24/48 Vdc** Input voltage range: 19.2—60.0 Vdc
Expansion Cards	Serial communications (EIA-232/EIA-485) 8 analog inputs (AI) 8 digital inputs (DI) 14 DI 8 digital outputs (DO)—electromechanical (8 Form A; 8 Form B; 6 Form A, 2 Form B; or 2 Form A, 6 Form B) 4 DI, 3 DO (2 Form C, 1 Form B)—electromechanical 4 DI, 4 DO—electromechanical 4 DI, 4 DO—high-speed, fast high-current interrupting 4 AI, 4 analog outputs (AO) 4 ac current and 3 ac voltage inputs 3 ac current and 3 ac voltage inputs 4 ac current inputs 3 ac voltage inputs 10 RTD inputs 10 RTD/TC inputs
Protocols	Modbus RTU, Modbus TCP, DNP3, IEC 61850 Edition 2.1, and SEL proprietary protocols
LTC Settings	Operating band voltages: 60 V to 250 V Bandwidth: 1.0% to 10.0% Tap delay, T1: 1 second to 999 seconds Inverse time setting T1: hyperbolic, linear curves Tap delay T2: 3.3 seconds to 999 seconds
Operating Temperature	IEC performance rating −40° to +85°C (−40° to +185°F) Class 1, Zone 2 rating of −40° to +70°C (−40° to +158°F)
Mount	Panel or surface mount
Dimensions	**Vertical Panel Mount** Height: 192 mm (7.56 in), Width: 144 mm (5.67 in), Depth: 147.4 mm (5.8 in) **Vertical Surface Mount** Height: 215.9 mm (8.5 in), Width: 165.1 mm (6.5 in), Depth: 190.5 mm (7.5 in)

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