SEL-2411
Programmable Automation Controller

Complete control and monitoring system

- Rugged design withstands vibration, electrical surges, fast transients, and extreme temperatures for reliable operation in harsh environments.
- Multiple I/O options provide the flexibility to fit many applications.
- Complete front-panel configuration functions make commissioning easy.
- Mounting kits and adapters provide numerous installation options.
Key Features

High Reliability, Rugged Design, and Low Price
Apply the SEL-2411 Programmable Automation Controller (PAC) in harsh physical and electrical environments. The SEL-2411 withstands vibration, electrical surges, fast transients, and extreme temperatures and meets stringent industry standards. Compared to other programmable logic controller (PLC) and remote terminal unit (RTU) alternatives, the SEL-2411 offers superior specification compliance, higher reliability, a lower price, and a worldwide ten-year warranty.

Flexible I/O
To meet your system requirements, select from flexible I/O options that include digital or analog outputs and digital, analog, RTD, ac current, and ac voltage inputs.

Comprehensive Logic Programming
Program the SEL-2411 with powerful logic, math, timer, counter, and edge-trigger functions. Using the acSELerator QuickSet® SEL-5030 Software graphical logic editor, you can implement SELogic® control equations or standard logic gates.

acSELerator QuickSet Designer® Templates
Create settings templates to hide settings that do not need to change for common applications. The SEL-2411 retains a copy of the template in its internal memory.

Sequential Events Recorder (SER)
Store up to 512 SER reports of digital input transitions, time-tagged to the nearest millisecond. You can collect the SER data with a communications processor or Real-Time Automation Controller (RTAC) for performing system analysis on a computer.

Simple Commissioning
Access complete configuration functions on the front panel while displaying settings, measurements, and calculated values. Or, you can use QuickSet to quickly and easily configure, commission, and manage the SEL-2411.

Mounting Options
Easily mount the controller in a variety of locations using our complete line of mounting kits and adapters. You can choose from rack-mount, surface-mount, wall-mount, indoor, and outdoor configurations.

Applications

Generating and Industrial Plant Monitoring, Control, and Reporting
Implement automatic control or data acquisition using high-speed, deterministic logic. With the SEL-2411, you can:

• Sense pressures, temperatures, fluid levels, or other process values with dc analog inputs.
• Report input to SCADA or a distributed control system (DCS).
• Include inputs as set points, feedback, or other variables in local automatic control equations.
• Measure ac currents and voltages.
• Calculate three-phase watts and VARs for reporting and control logic.
• Implement underfrequency load-shedding, voltage control, or VAR control.
• Back up electrical protection.
• Record waveform profiles.

Plant monitoring and reporting example.
Electrical Substation SCADA, Report Retrieval, and Engineering Access

When compared with a traditional RTU, SEL communications processors, embedded computers, relays, remote I/O modules, and the SEL-2411 offer higher reliability, lower costs, and more functions. A typical RTU provides only remote I/O for SCADA, while an SEL solution provides:

- Digital and analog I/O to SEL communications processors.
- High-speed automatic control loops with SELLogic control equations using combinational logic, analog comparison, edge-trigger, and timer functions.
- Protection and control settings, allowing you to retrieve and file power system reports, time-tag changes to the nearest millisecond, and directly access devices for engineering maintenance.

RTU With Local Control

Deploy the SEL-2411 as an RTU with local control and monitoring.

- Provide remote control and monitoring to a SCADA system over IEC 61850, Modbus®, or DNP3 protocols.
- Save training, spare parts, and maintenance costs with SEL-2411 PACs instead of PLCs or dedicated controllers.
- Use the built-in HMI and pushbuttons to provide local control and display.

Match Your Applications With SELEcT™ I/O Cards

<table>
<thead>
<tr>
<th>Card Description</th>
<th>Card Designation</th>
<th>Max. Cards/SEL-2411</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 Analog Inputs</td>
<td>8 AI</td>
<td>4</td>
</tr>
<tr>
<td>4 Analog Inputs/4 Analog Outputs</td>
<td>4 AI/4 AO</td>
<td>1</td>
</tr>
<tr>
<td>8 Digital Inputs</td>
<td>8 DI</td>
<td>4</td>
</tr>
<tr>
<td>8 Digital Outputs (Form A or Form B)</td>
<td>8 DO</td>
<td>4</td>
</tr>
<tr>
<td>4 Digital Inputs/4 Digital Outputs</td>
<td>4 DI/4 DO</td>
<td>4</td>
</tr>
<tr>
<td>4 Digital Inputs/3 Digital Outputs (2 Form C and 1 Form B)</td>
<td>4 DI/3 DO</td>
<td>4</td>
</tr>
<tr>
<td>10 RTD Inputs (only in Slot D)</td>
<td>10 RTD</td>
<td>1</td>
</tr>
<tr>
<td>10 RTD/TC Inputs (only in Slot D)</td>
<td>10 RTD/TC</td>
<td>1</td>
</tr>
<tr>
<td>4 AC Current Inputs (only in Slot Z)</td>
<td>4 ACI</td>
<td>1</td>
</tr>
<tr>
<td>3-Phase AC Voltage Inputs (only in Slot E)</td>
<td>3 AVI</td>
<td>1</td>
</tr>
<tr>
<td>3 AC Current/3-Phase AC Voltage Input (only in Slot E)</td>
<td>3 ACI/3 AVI</td>
<td>1</td>
</tr>
<tr>
<td>EIA-232 or EIA-485 Port (only in Slot C)</td>
<td>EIA-232/-485</td>
<td>1</td>
</tr>
</tbody>
</table>

Notes: Unless otherwise specified, all digital outputs are Form A. RTD/TC card option only available in vertical chassis.
Front-panel EIA-232 serial port provides easy operator access.

Optional vertical chassis features a large LCD with four additional pushbutton LEDs and seven total programmable LEDs.

2 × 16 character LCD provides navigation, control, data, and diagnostics via default messages or customizable display messages.

Programmable front-panel LEDs with user-configurable labels alert operators to conditions.

Programmable operator pushbuttons with user-configurable labels allow front-panel customization.

Simple front-panel navigation provides operator access to settings and operational data.
Four available slots for SELECT I/O cards expand application options.

Optional fiber-optic serial port provides quick and easy access.

Wide variety of protocols and media options allow communication with other devices and control systems.

Four ac current input option.

Ten RTD input card option increases I/O.

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

Three ac current/3-phase ac voltage input option.
QuickSet Software makes it easy to program, monitor, and test the SEL-2411 and streamline settings and commissioning. With QuickSet, you can:

- Create and manage device settings.
- Develop settings offline with an intelligent settings editor that allows only valid settings.
- Create SELogic control equations with a drag-and-drop expression builder or a text editor.
- Implement logic using standard gates with the graphical logic editor.
- Create Quickset Designer templates and store them in onboard memory for use with common applications.

- Organize settings with the device database manager.
- Load and retrieve settings using a simple PC communications link.
- Verify settings and analyze events.
- Test logic settings with the built-in logic simulator.
- Analyze system events with the integrated waveform analysis tool.
- Monitor analog data, device I/O, and logic point status during testing via the HMI.

Streamline settings development and commissioning with QuickSet.
## General Specifications

| **Power Supply Range** | 24–48 Vdc option: 18–60 Vdc  
|------------------------|----------------------------------------------------------|
| **Power Consumption**  | &lt;40 VA (ac)  
&lt;15 W (dc) |
| **Operating Temperature** | IEC performance rating: −40° to +85°C (−40° to +185°F)  
Class I, Zone 2 rating: −40° to +70°C (−40° to +158°F) |
| **Dimensions** | Height: 144 mm (5.67 in)  
Width: 192 mm (7.56 in)  
Depth: 147.4 mm (5.8 in) |
| **Plug-In Cards** | Card slots: 4 SELECT I/O Cards |
| **Serial Communications Ports** | Two EIA-232 ports  
Optional third EIA-232/EIA-485 port uses one SELECT I/O card position.  
Connectors: 9-pin female  
Data rate: 300 to 38,400 bps  
Protocols: SEL Fast Meter, SEL Fast SER, SEL MIRRORED BITS communications, ASCII, and Modbus RTU  
Optional protocol: DNP3 Level 2 Outstation |
| **Single or Dual Ethernet Ports** | 10/100BASE-T Wired Port  
Connector: Shielded RJ-45 female for Category 5 STP cable  
Protocols: Telnet, FTP, Modbus TCP, PRP  
Optional protocols: DNP3 LAN/WAN, IEC 61850 |
| **Optional Fiber-Optic Serial Communications Port** | Connectors: Two ST™ connectors for 62.5 mm multimode fiber  
Data rate: 300 to 38,400 bps  
Protocols: SEL Fast Meter, SEL Fast SER, SEL MIRRORED BITS communications, ASCII, and Modbus RTU  
Optional protocol: DNP3 Level 2 Outstation  
Compatibility: Equivalent to built-in SEL-2812MR Fiber-Optic Transceiver  
| **Programmable Automation Logic** | Logic variables: 64  
Math variables: 64  
Timers: 64  
Counters: 32  
Local logic points: 32  
Remote control points: 32  
Remote analog points: 128  
Latching points: 32  
Logic loop execution: 4.2 ms for 60 Hz ac, 5.0 ms for 50 Hz ac  
Analog math execution: 100 ms |