

# SEL-3505/3505-3

Real-Time Automation Controllers (RTACs)



Economical, multifunctional, compact real-time automation control

- RTAC versatility facilitates easy event collection, protocol conversion, and secure communications.
- Built-in client and server protocols allow the RTAC to communicate with, monitor, and control virtually every device in your system.
- Exe-GUARD<sup>®</sup> technology provides a whitelist antivirus solution, eliminating the need for end-user patch updates.
- IEEE 1613 compliance means the RTAC reliably operates in the presence of vibration, electrical surges, fast transients, and extreme temperatures.





## Simple Solutions to Complex Problems

Making the transition to complete system automation requires controllers that are flexible enough to integrate with your existing devices, durable enough to meet the most rigorous demands, and powerful enough to deliver the highest performance possible. The SEL-3505 and SEL-3505-3 RTACs reduce costs and increase productivity in your system without compromising reliability.

These compact automation controllers can communicate with remote intelligent electronic devices (IEDs) and enable wide-area control and monitoring schemes. This allows you to find and correct problems remotely, saving time and money. The RTAC also acts as a data concentrator in your distribution automation applications by seamlessly communicating with and incorporating your new and legacy devices. In addition, the integrated I/O in the SEL-3505-3 provides even more opportunities for expansion in other applications, such as industrial process control and retrofit control for remote apparatus.

The ability to operate effectively in difficult, remote environments combined with the compact size make the SEL-3505 the ideal solution for reliable and efficient automation.



### Complete System Control

Through several advanced built-in client and server protocols, the RTAC acts as a single access point to communicate with, monitor, and control practically any device in your system. This means you only need to address the RTAC in order to interface with your apparatus, rather than managing separate connections to every device. With the RTAC, you can exchange data through DNP3, Modbus, IEC 61850 GOOSE, IEC 60870-5-101/104, LG 8979, CP 2179, SES-92, IEEE C37.118 for synchrophasors, SEL Fast Messaging, and MIRRORING BITS® communications. The RTAC also allows you to execute time-deterministic output logic for automation, perform math and logic functions, and convert data between protocols. These advanced communications and control abilities from the RTAC will improve the performance and reliability of your system.



### **Versatile, Comprehensive Operation**

The RTAC makes it easy to keep all your devices operating as a cohesive system. By having the RTAC filter and process all IED information, you can get immediate notification of any issues through alarms, Sequence of Events (SOE) logs, and/or email messages. The optional integrated modem expands your communications for SCADA and engineering access. This allows you to access IEDs in remote locations and gather data or configure your device settings, all without leaving the office or control center. With the ability to process SCADA communications, synchrophasors, time synchronization, and custom logic, the RTAC gives you a truly versatile and integrated system.

### **Custom Logic**

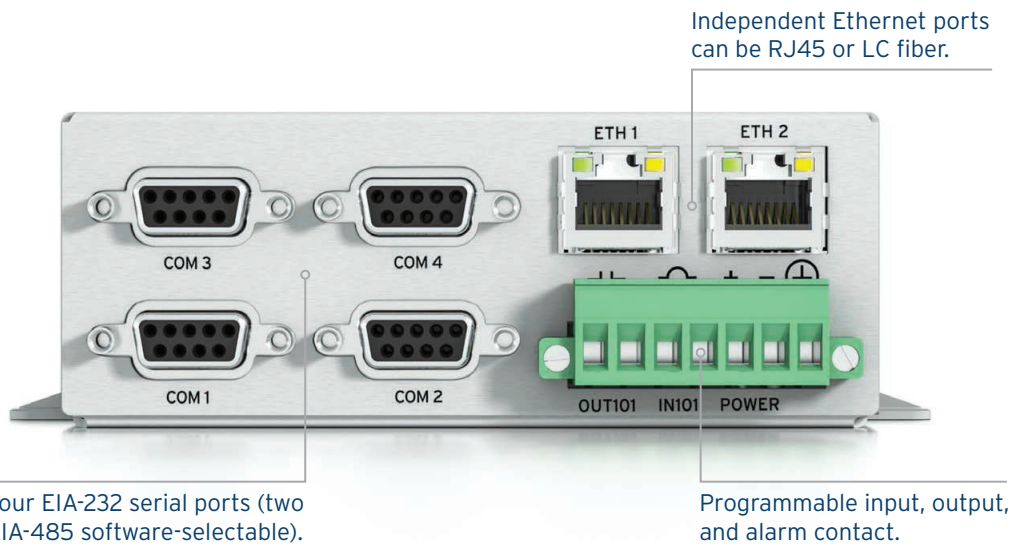
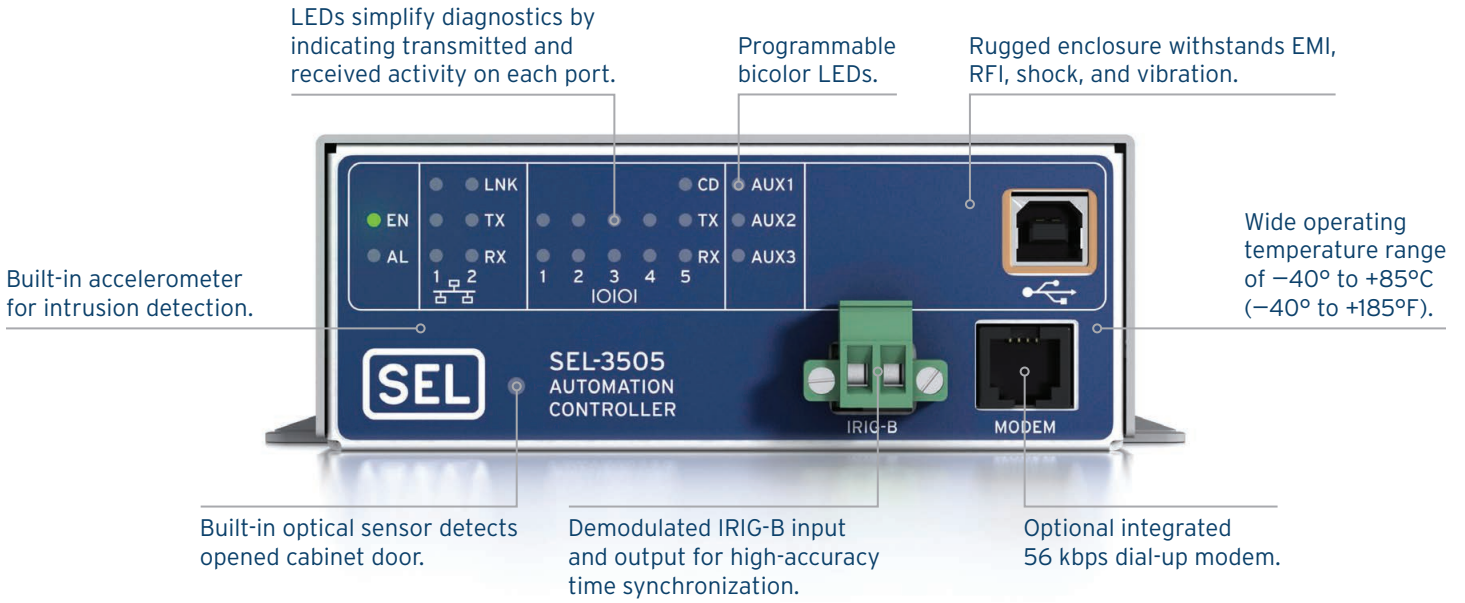
Create your own solutions in the embedded IEC 61131 logic engine, which comes standard with every RTAC. This gives you the freedom to write programs that are tailored to fit your system's unique requirements. In addition, the RTAC provides unparalleled control flexibility with the option to build your own custom user logic and the ability to easily access all of your system information, including diagnostics, contact I/O, protocol data, and communications statistics.

### **Integrated Security**

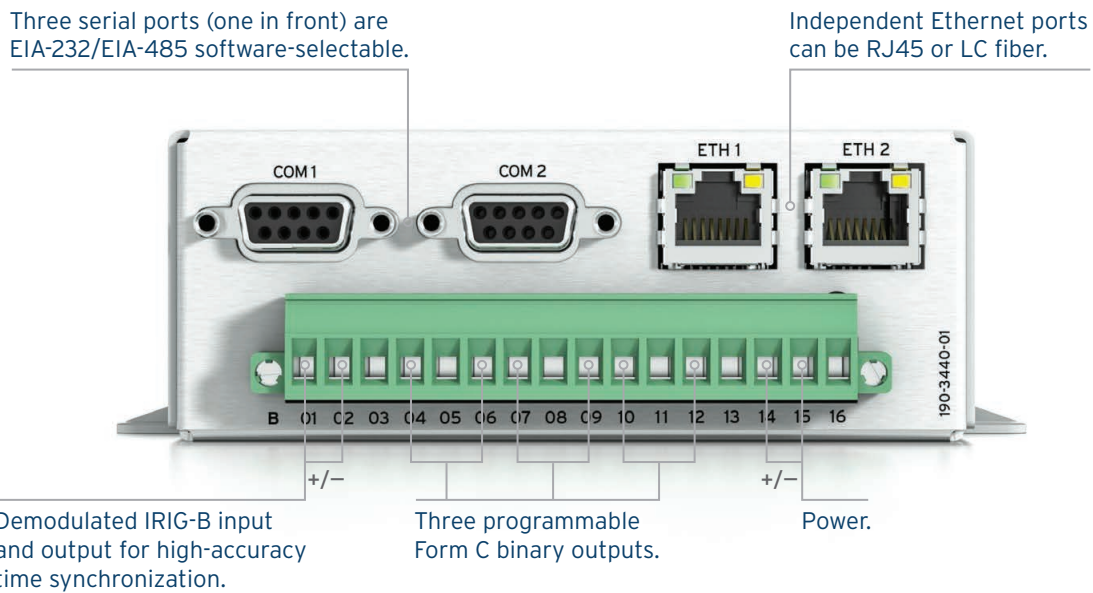
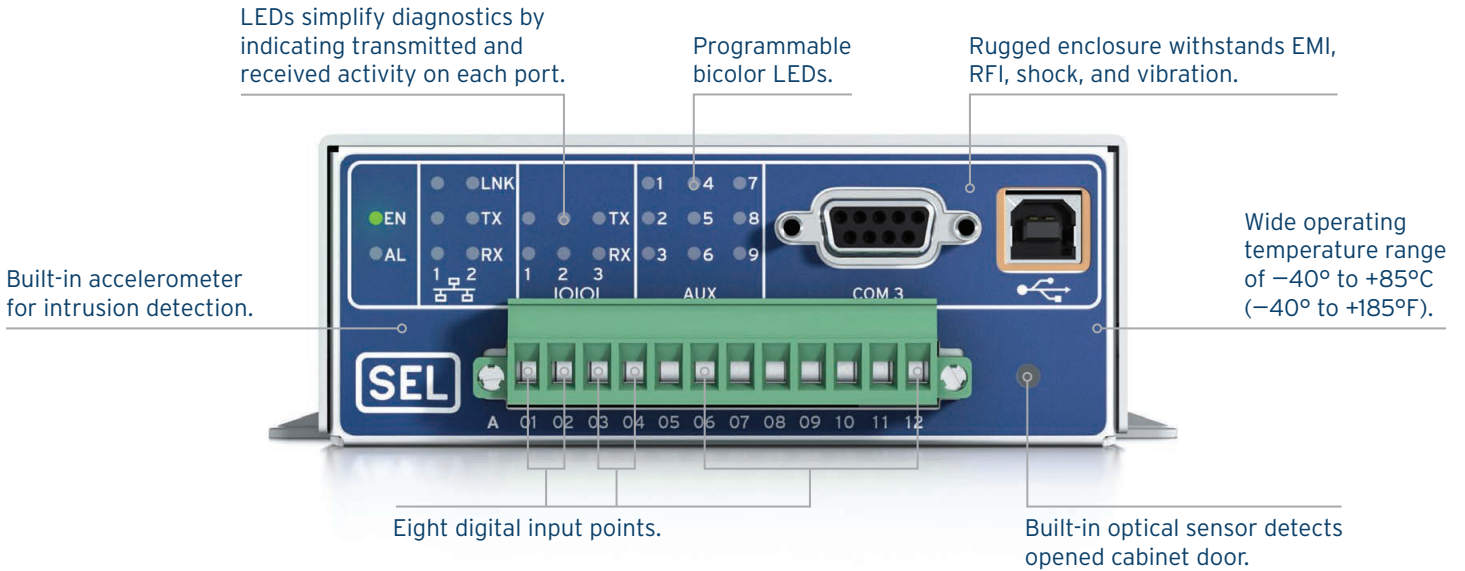
As a secure access point to capacitor bank, recloser, and regulator controllers, the RTAC denies access to unauthorized users and continuously protects the information exchanged. The blend of secure features, such as Lightweight Directory Access Protocol (LDAP) central authentication, exe-GUARD whitelist antivirus technology, secure engineering access, role-based user authentication, HTTPS web connectivity, and access logs, makes managing remote connectivity simple and efficient. The integrated physical security features, like the built-in light sensor and accelerometer, keep you informed about any unauthorized cabinet access so that you can immediately notify operations personnel. With the ability to map security tags into SCADA reports, the RTAC provides industry-leading integration of several security technologies. This combination of protocols, security features, and integration abilities makes the RTAC the most comprehensive, secure, and reliable automation controller for your system.



# Product Overview—SEL-3505



# Product Overview—SEL-3505-3



## SEL-3505-3 Front

A01 IN101

A03 IN102

A05 NOT USED

A06 IN103

A07 IN104

A08 IN105

A09 IN106

A10 IN107

A11 IN108

A12 COM

## SEL-3505-3 Back

B01 + IRIG-B

B03 NOT USED

B04

B05 OUT101

B06

B07

B08 OUT102

B09

B10

B11 OUT103

B12

B13 NOT USED

B14 + POWER

B15 -

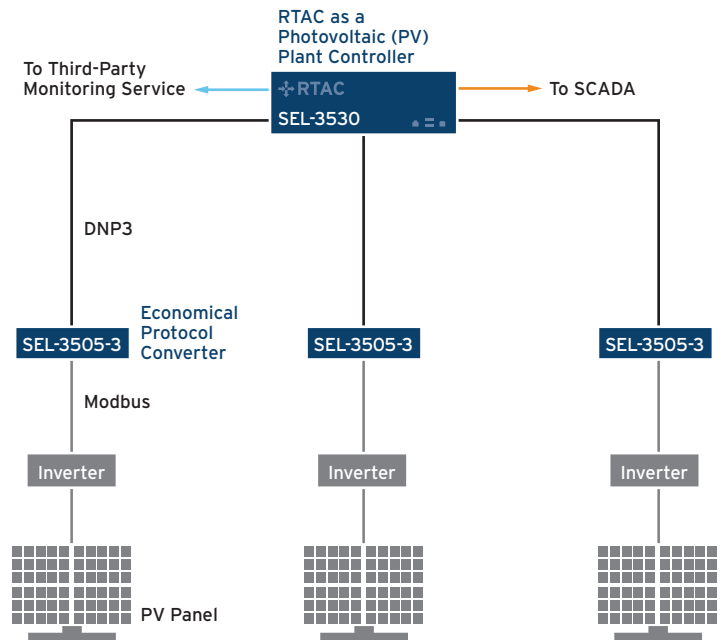
B16 GND

# Applications

## Distributed Generation

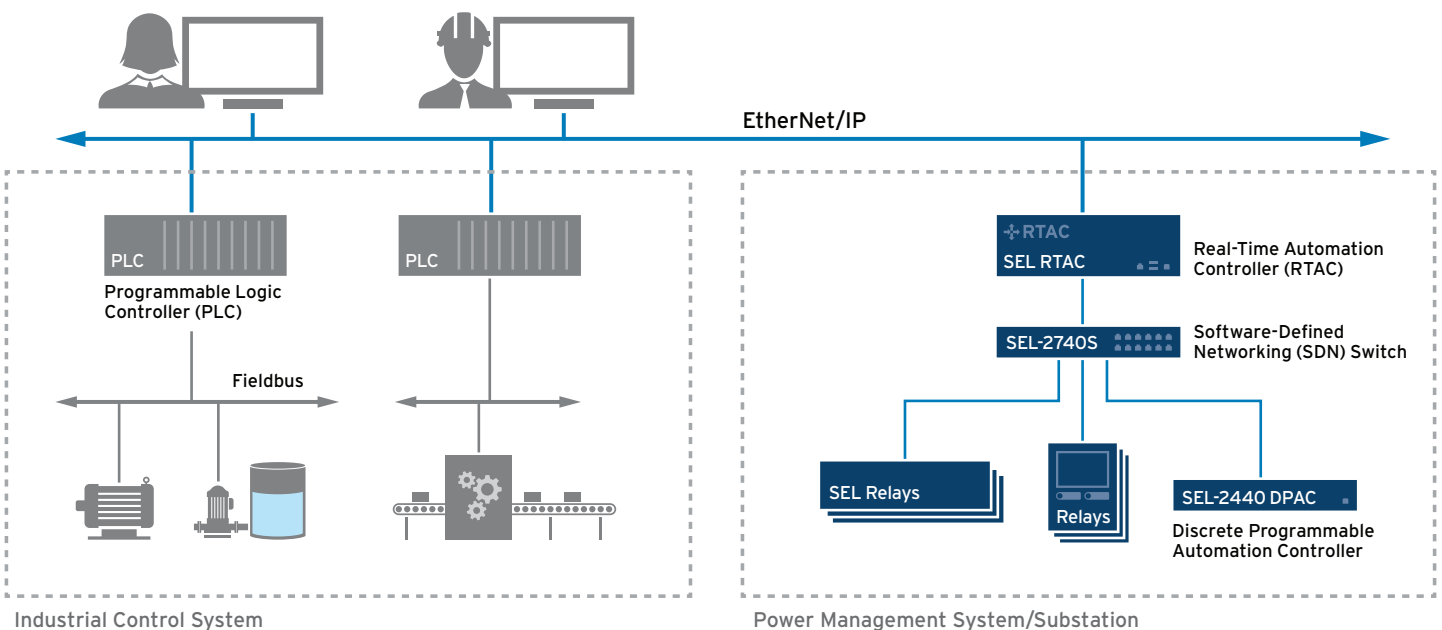
The generation of clean, renewable energy is continually increasing. This represents a challenge for utilities to reliably integrate these interconnections. The RTAC provides a convenient and economical way for your system to reliably integrate renewable energy, reducing the concerns, complexities, and technical challenges associated with interconnecting and controlling your distributed generation.

With the RTAC, you can maintain the power quality you need by using customizable logic to create algorithms that deliver the most effective voltage control and reactive power flow to fit your system's unique requirements. You can install an RTAC at each of your inverters to maximize your system's overall performance while keeping your operations safe. In the event of a fault, the RTAC can send commands to the inverter to trip, or during a season or load change, you can use the logic engine in the RTAC to send commands to the inverter to curtail or ramp generation output. You can gather all of this operational and performance information from the inverters into an RTAC and send this integrated information to the control center for SCADA, control, and monitoring purposes.



## Integrate Power Management With Industrial Control

The RTAC provides a powerful gateway between the substation and the factory using EtherNet/IP. This popular industrial protocol facilitates reliable communication between electronic devices in industrial automation systems. You can use the RTAC EtherNet/IP adapter to exchange critical data for real-time monitoring, process control, and power system integration.



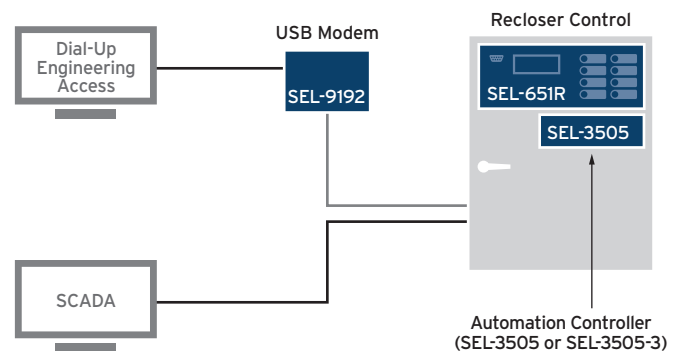


## Industrial Process Control

Automating your industrial processes can increase quality, productivity, and repeatability while maximizing production efficiency. An SEL-3505-3 directly connects to sensors, actuators, or switches to automate your industrial processes. It can also adjust detection levels, material flow control, and mixture levels based on inputs or measurements to ensure that your processes run smoothly and stay within defined limits. From metals and mining to oil and gas, extreme and demanding industrial environments need an automation controller that can provide reliable and deterministic operation. The SEL-3505-3 is the low-cost solution that is capable of handling these difficult environments while producing high-quality results.

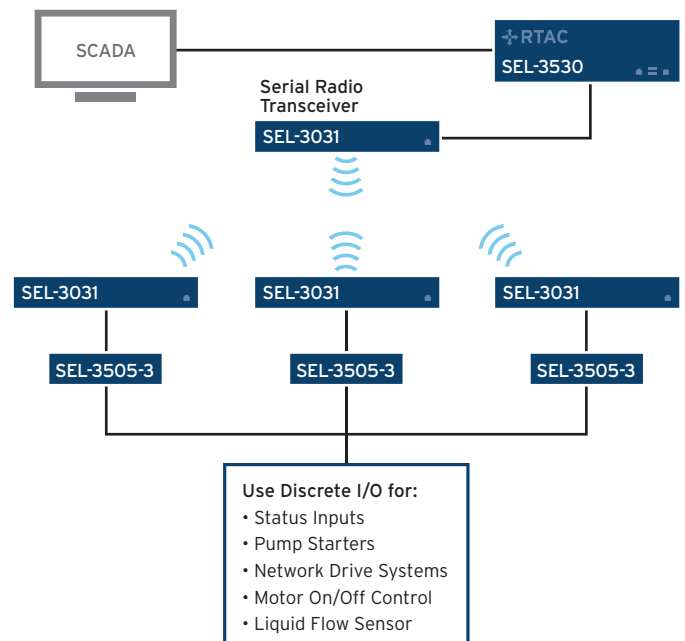
## Remote Engineering Access and SCADA Communications

Enclosure cabinets are part of a power system's remote operations and communications, and the RTAC's compact size is ideal for these small spaces. Placing an RTAC in these cabinets gives you continuous monitoring and intrusion detection with innovative features like the built-in light sensor and accelerometer. You can also collect, measure, and organize data from both serial and Ethernet IEDs through several of the RTAC's standard protocols, such as Modbus, DNP3, and MIRRORING BITS communications. For example, you can use the SEL-3505 with the SEL-651R Advanced Recloser Control for engineering access, settings changes, and data gathering. The RTAC's serial ports, dial-up modem, and high-speed network connection give you several ways to gain secure, remote access. In addition, the digital I/O in the SEL-3505-3 integrates with your legacy recloser controllers and communicates their statuses, which maximizes their capabilities and improves your system's overall performance.



## Retrofit Control for Remote Apparatus

The SEL-3505-3 allows you to remotely control your apparatus from a central location, saving you time and money. The compact RTAC easily fits into cabinets with motor-operated disconnect (MOD) switches that are mounted on pole tops and used for automated sectionalizing. Installing an SEL-3505-3 in a cabinet that has control hardware provides the remote control and monitoring you need for increased efficiency. Also, the SEL-3505-3 is designed to withstand extreme environmental conditions, so you can be assured that it will continue to protect your critical data and operate reliably. The contact outputs on the SEL-3505-3 can be programmed to send alarms or notifications based on logic and digital inputs to convey the status or severity of the situation. In addition, the RTAC can store hundreds of SOE records, allowing you to easily analyze system events and optimize system performance.



# SEL-3505/3505-3 Specifications

General	
Processor	333 MHz
RAM	512 MB
Storage	2 GB
USB Ports	USB Standard-B
Ethernet Ports	2
Serial Ports	SEL-3505: 4 SEL-3505-3: 3
Digital I/O	SEL-3505: 1 digital input/1 digital output SEL-3505-3: 8 digital inputs/3 digital outputs
56 kbps Modem	SEL-3505: Yes (optional) SEL-3505-3: No
Physical Security Features	Ambient light sensor and accelerometer
Power Supply	SEL-3505: Single 12/24 Vdc or 24/48 Vdc SEL-3505-3: Single 12/24 Vdc or 24/48 Vdc
Operating Temperature Range	-40°C to +85°C (-40° to +185°F)
Dimensions	6.93" × 5.54" × 2.25"
Mounting	Surface/DIN rail mount

Protocols
<b>Client</b>
CDC Type II
Courier
CP 2179
DNP3 Serial, DNP3 LAN/WAN
EtherNet/IP—Explicit Message Client*
File Transfer Protocol (FTP)/Secure FTP (SFTP)*
Flex Parse
IEC 60870-5-101/104
IEC 60870-5-103
IEEE C37.118 Synchrophasors
LG 8979
Modbus RTU, Modbus TCP
SEL Protocols
SES-92
Simple Network Management Protocol (SNMP)
<b>Server</b>
CDC Type II
DNP3 Serial, DNP3 LAN/WAN
EtherNet/IP—Implicit Message Adapter*
FTP/SFTP
IEC 60870-5-101/104
IEC 61850 MMS and MMS Server File Services*
IEEE C37.118 Synchrophasors
LG 8979
Modbus RTU, Modbus TCP
SEL Protocols
SES-92
SNMP Agent
<b>Peer-to-Peer</b>
IEC 61850 GOOSE*
Network Global Variable List (NGVL)
SEL MIRRORING BITS Communications

\*Optional feature

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+1.509.332.1890 | info@selinc.com | selinc.com

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