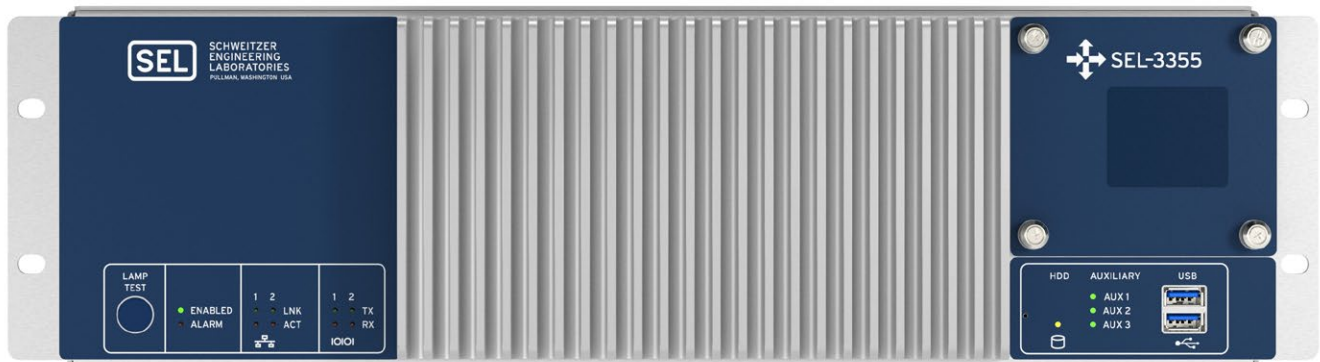


SEL-3355



Rugged, versatile computing platform for utility and industrial applications

- Configurable as a Blueframe™ application platform or an industrial computer running a Microsoft Windows or Linux OS.
- Powerful rack- or panel-mount model with an Intel Xeon quad-core 2.0 GHz or 2.8 GHz processor.
- Durable design with a broad operating temperature range from -40° to $+75^{\circ}\text{C}$ (-40° to $+167^{\circ}\text{F}$).
- High-quality single-level cell (SLC) SSDs and error-correcting code (ECC) memory.
- Worldwide ten-year warranty, local technical support, and no-charge diagnostic and repair services.





Designed and Built in the U.S.A.

Built for speed, reliability, and security, the SEL-3355 computing platform is designed to provide optimal operation in harsh industrial and substation environments. SEL uses the same high standards that we use in our successful line of protective relays. We design, manufacture, and test each computing platform in the U.S.A. so we can ensure quality, security, and on-time delivery.

Additionally, an Intel Xeon quad-core processor with vPro technology provides fast processing power, helps combat malware threats, and encrypts sensitive information.

With its solid-state design, no moving parts, silent operation, and ten-year, no-questions-asked warranty, the SEL-3355 offers the performance, flexibility, and security you need for your most demanding, rugged computing applications.



Reliability, Availability, and Serviceability (RAS)

Reliability

The unique thermal management system of SEL computing platforms allows them to dissipate heat quickly and eliminate problems associated with vents or moving parts, such as fans and spinning drives. The power supplies are fanless and have a high mean time between failures (MTBF).

Built with the highest-quality, substation-rated components, the SEL-3355 can withstand harsh environments of -40° to $+75^{\circ}\text{C}$ (-40° to $+167^{\circ}\text{F}$).

Availability

Design features, such as no moving parts, ECC RAM, and modular components, increase the availability of the SEL-3355 and eliminate problems that are associated with normal wear and tear. ECC memory protects against bit flips to prevent digital logic errors. Dual power supplies ensure continuous power, with the typical configuration of one power supply connected to a battery bank and the other connected to line power. And, with a RAID configuration, you can remotely rebuild a failed drive onto a spare.

Serviceability

The modular design and hot-swappable drives and power supplies of the SEL-3355 allow you to replace components, enhance capabilities, and upgrade memory in the field while your system is up and running. The SEL-3355 processor features Intel Active Management Technology (AMT), which allows you to view logs for evaluation and service even when the unit is powered off. You can remotely reboot into another OS for diagnostics or to batch-install software and then bring the system back online. SEL system monitor (SysMon) software creates runtime event logs within the OS to aid in quick recovery. Additionally, KVM-over-IP capabilities allow a remote expert to help with troubleshooting as needed for upgrades or commissioning.



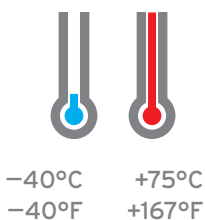
Maximize System Availability

The SEL-3355 is built to exceed the rigorous industry standards required for harsh operating environments, with one of the highest mean time between failures (MTBF) ratings in the industry. ECC memory, an advanced thermal management solution with no moving parts, and SLC SSDs improve your application reliability. These technologies, combined with a fast quad-core Intel Xeon processor and a custom system watchdog, create a powerful, rugged, and reliable computing platform for your most demanding applications.

The SEL-3355 computing platform has an independent, diagnostic watchdog processor that is configurable and improves system availability by detecting when problems occur and sending an alarm. SysMon software also detects system interruptions and monitors the CPU load, memory, and disk space.

Standard Features

- Intel Xeon E3-1505L 2.0 GHz quad-core CPU
- 4 GB DDR4 ECC RAM
- Front-facing 2.5" SATA drive bay for up to four 2.5" SATA drives
- One load-sharing, high-voltage, hot-swappable ac/dc power supply
- Three independent digital display interfaces: two DVI-D and one DisplayPort
- Two 10/100/1000 Mb copper Ethernet interfaces
- Two front-facing and four rear-facing USB 3.1 ports
- Speaker, line-in, and microphone audio jacks
- Two EIA-232 serial ports
- Programmable Form C alarm contact
- Four PCIe and one legacy PCI expansion slots





Optional Configuration Features

Built on the proven Intel Xeon processor line, the SEL-3355 has the capacity to deliver the processing power needed in today's high-demand environments. Configuration options can help boost the performance and availability of your critical systems. When ordering an SEL computing platform, you can select the OS and other options that are best for your specific application. The available PCI and PCIe expansion slots let you tailor the SEL-3355 to custom applications.

Optional Features

- Intel Xeon E3-1505M 2.8 GHz quad-core CPU
- 4–64 GB DDR4 ECC PC4-17000 (2,133 MHz)
- Industrial-grade SLC SSDs in 32, 64, 128, and 256 GB capacities; industrial-grade pseudo-SLC (pSLC) SSDs in 120, 240, and 480 GB capacities; and industrial 3D triple-level cell (TLC) SSDs in 240, 480, 960, and 1,920 GB capacities; (8 TB maximum storage)
- Second load-sharing, high-voltage, hot-swappable ac/dc power supply
- SEL-3390S8 six-port serial expansion card (up to four)*
- SEL-3390E4 four-port Ethernet expansion card (up to two)
- SEL-3390T BNC IRIG-B precise-time and two-port Ethernet expansion card
- Microsoft Windows 10 IoT Enterprise LTSC or Windows Server
- Conformal coating



REDUNDANT
POWER SUPPLIES



SLC SSD
STORAGE



CONFORMAL
COATING

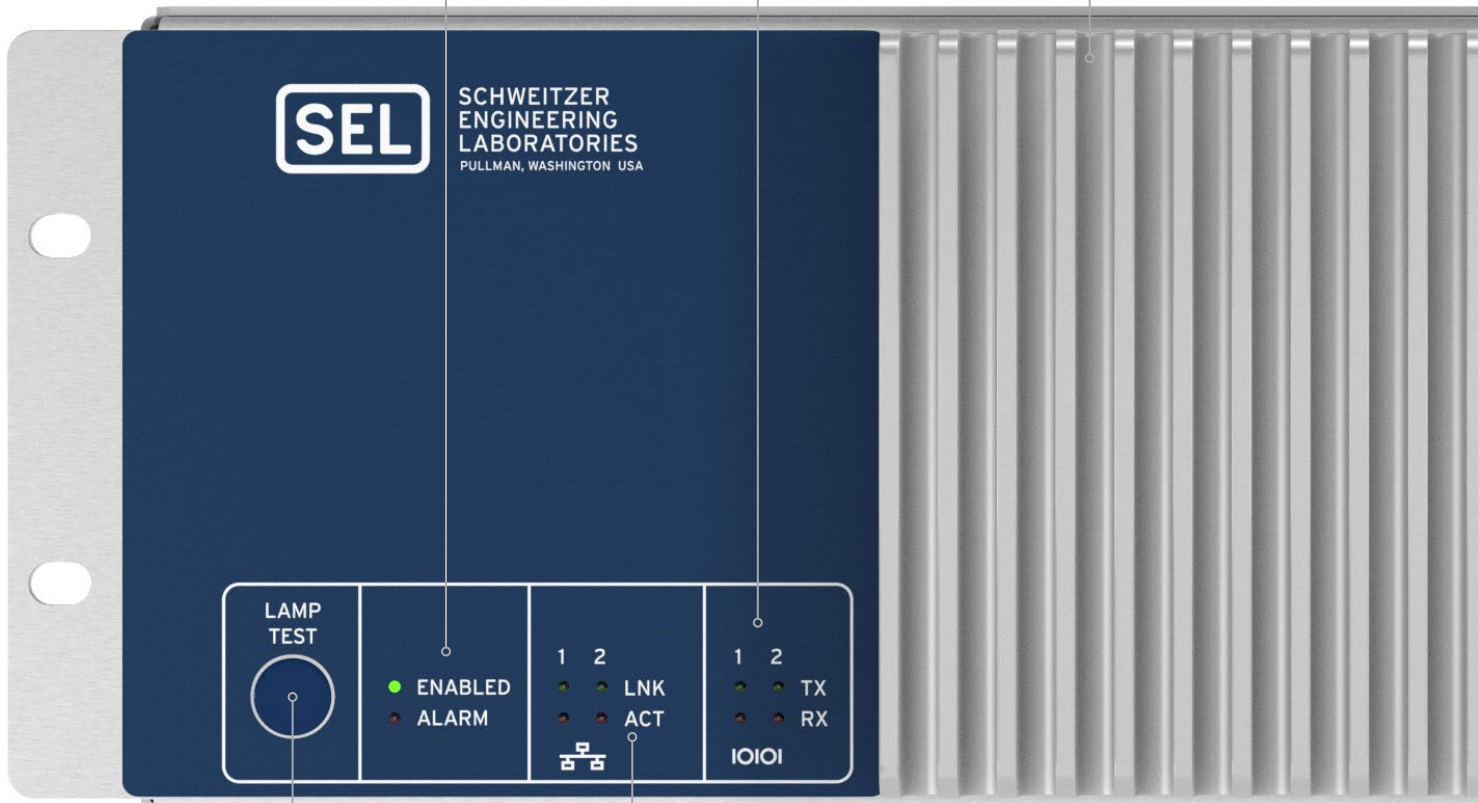
*Up to 26 total serial ports are possible when adding four serial PCIe expansion cards (24 ports).

SEL-3355 Product Overview

Alarm and operational status LED indicators

Serial port Transmit and Receive LEDs

Front heat sink and no fans or moving parts



LED lamp test button

Ethernet port link status and network activity LEDs

Up to four hot-swappable SSDs

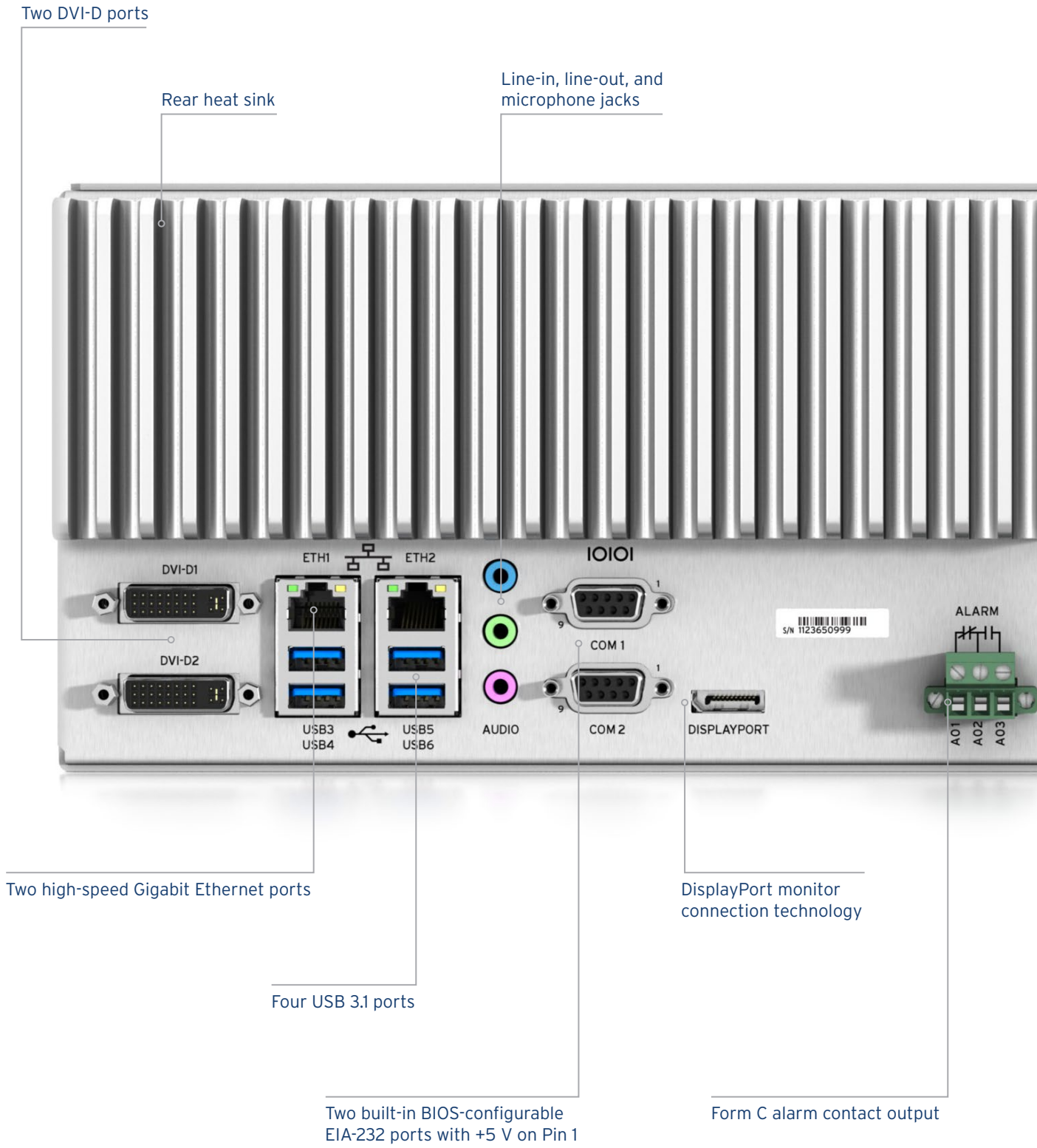
Three programmable bicolor LEDs



Hard disk drive activity LED

Two front-panel USB 3.1 ports

SEL-3355 Product Overview



Two DVI-D ports

Rear heat sink

Line-in, line-out, and microphone jacks

Two high-speed Gigabit Ethernet ports

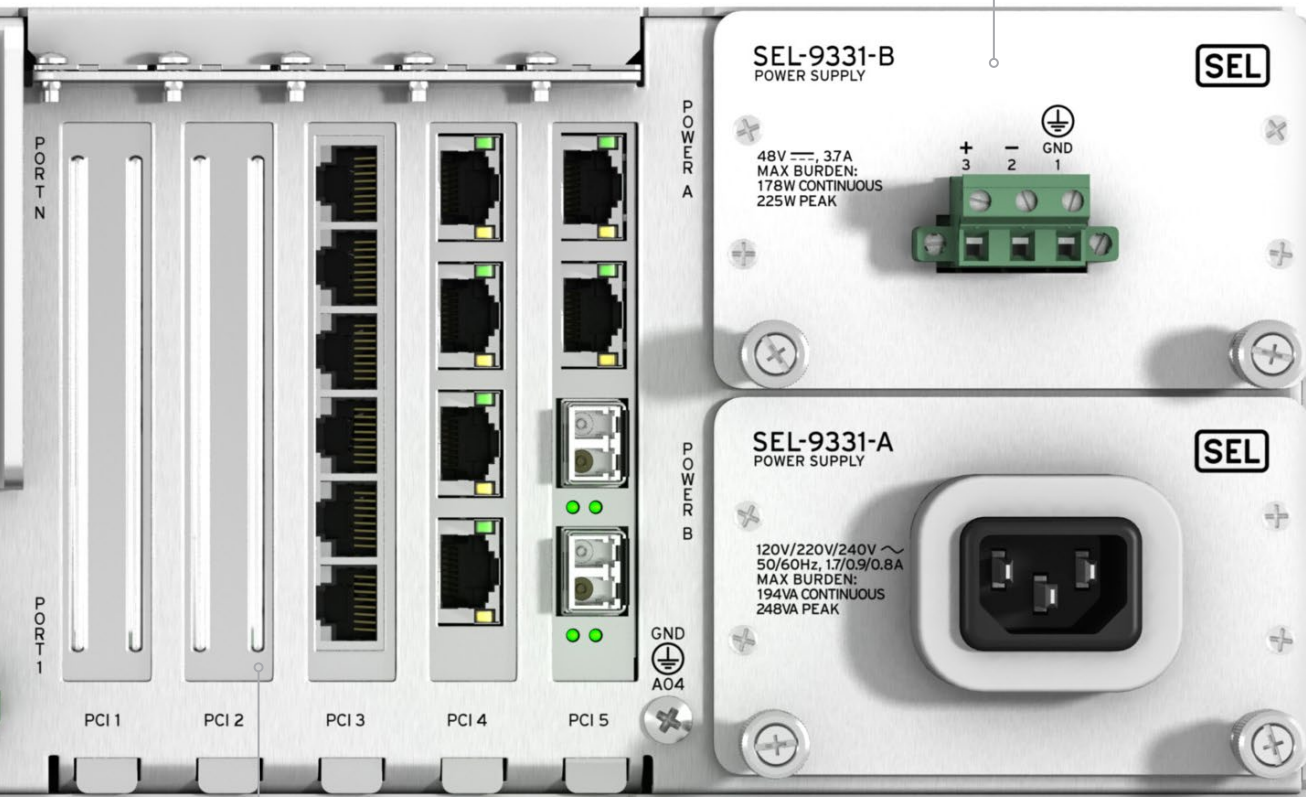
Four USB 3.1 ports

Two built-in BIOS-configurable EIA-232 ports with +5 V on Pin 1

DisplayPort monitor connection technology

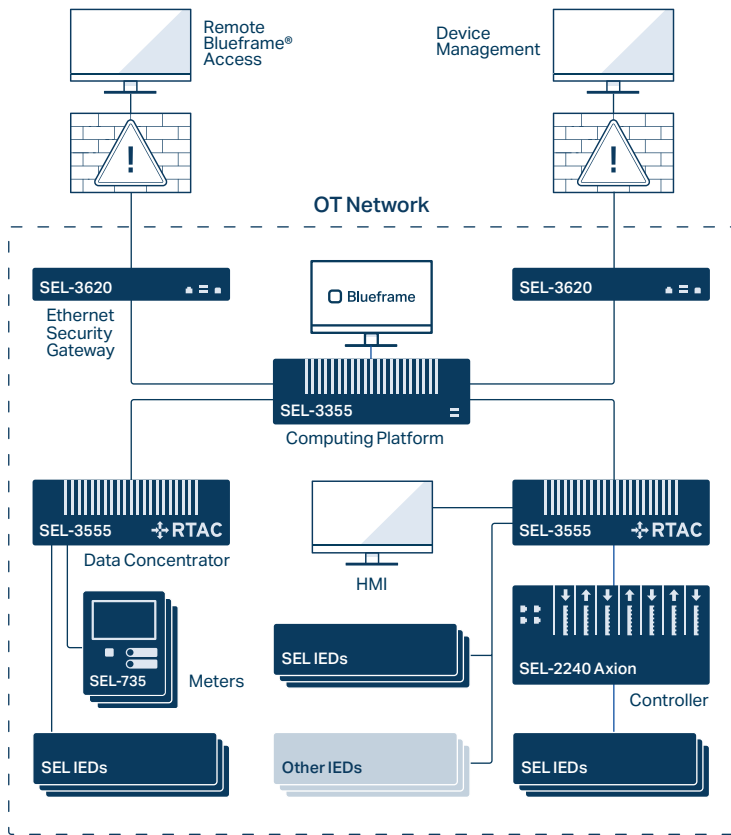
Form C alarm contact output

Dual hot-swappable power supplies



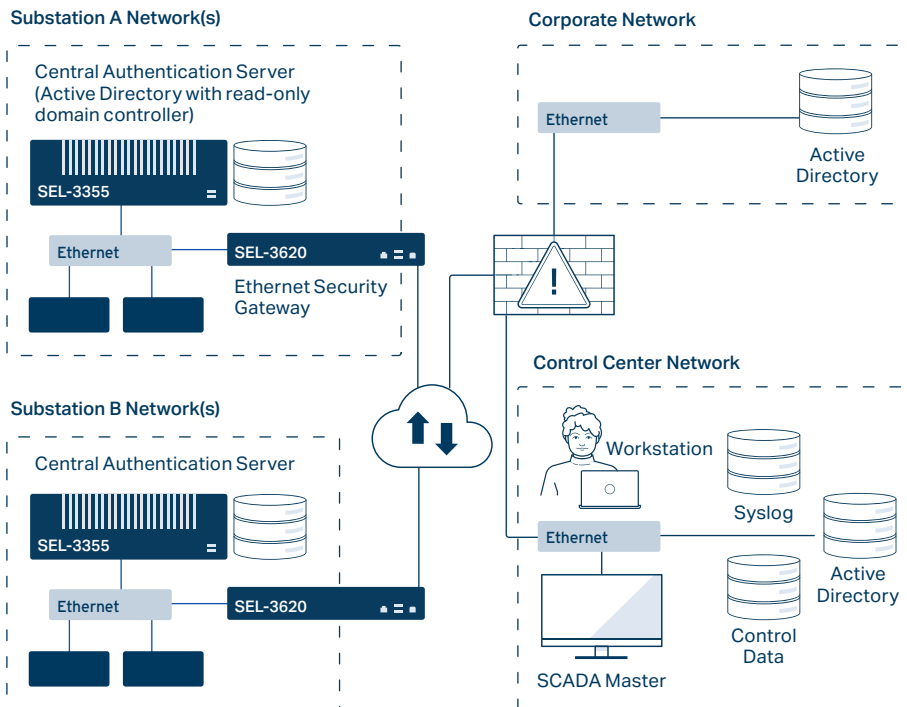
Up to five expansion slots: one legacy PCI, two x1 PCIe, and two x4 PCIe

Applications



Blueframe

Improve your power system operational technology (OT) network management, simplify security patches, and ensure availability using the SEL Blueframe application platform. You can configure SEL computing platforms (SEL-3350, SEL-3355, and SEL-3360) with Blueframe to manage and operate SEL containerized applications, like Data Management and Automation (DMA) applications.



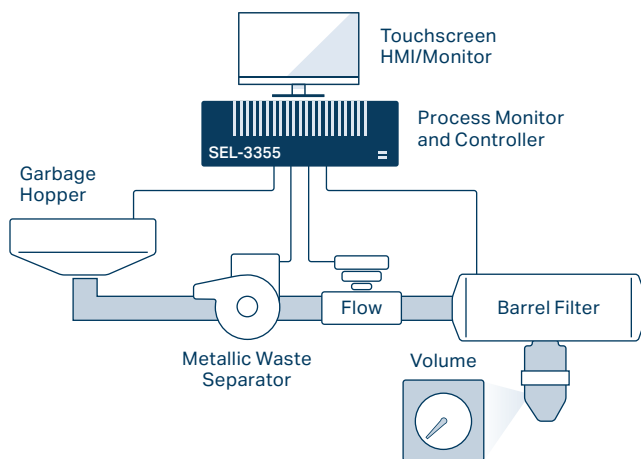
Centralized Authentication Server

Extend centralized authentication to your branch office or substation by logging in with enterprise credentials and using the same account throughout your network. You can set up role-based access controls and employ high-availability roles for always-on service.



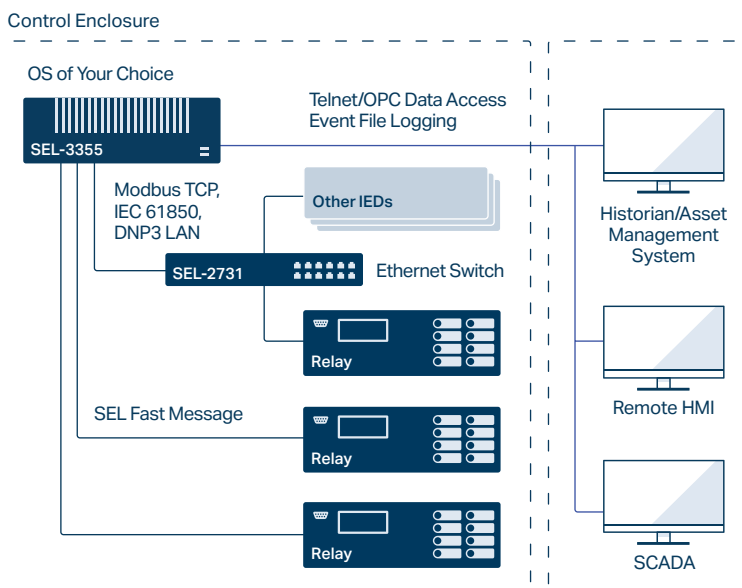
Event Visualization

Incorporate SEL-5601-2 SYNCHROWAVE® Event Software with the SEL-3355 to help protection engineers diagnose protective relay behavior during a power system fault. The software is a powerful yet easy-to-use solution for displaying and analyzing relay event reports and COMTRADE files.



Industrial Process Control Platform

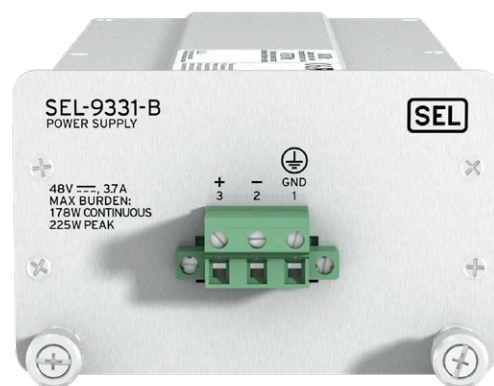
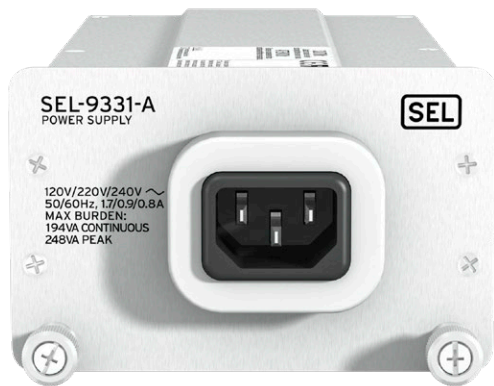
SEL computing platforms are perfect candidates for any industrial control system requiring the power of a rugged, reliable, highly available, embedded computer. SEL computing platforms allow you to implement a control system with your choice of SCADA software. With ample communications ports (serial or Ethernet), the SEL-3355 is also ideal for distributed control systems.



Information Processor: Data Concentrator and Protocol Converter

Collect and format protective relay data for remote terminal units (RTUs), and send the data directly to SCADA systems using legacy protocols. With the SEL-3355, you can leverage multiple paths for data access. After collecting the data, you can send the data to any client via any supported protocol using your favorite software package.

Accessories



Power Supplies

The SEL-9331 Power Supply is a high-output +12 Vdc power supply designed for SEL computing platforms and is powerful enough to meet the needs of many other applications. Capable of producing 11 A of continuous current from -40° to $+85^{\circ}\text{C}$ and 17 A of maximum current, the SEL-9331 can provide ample power in environments where many supplies cannot.

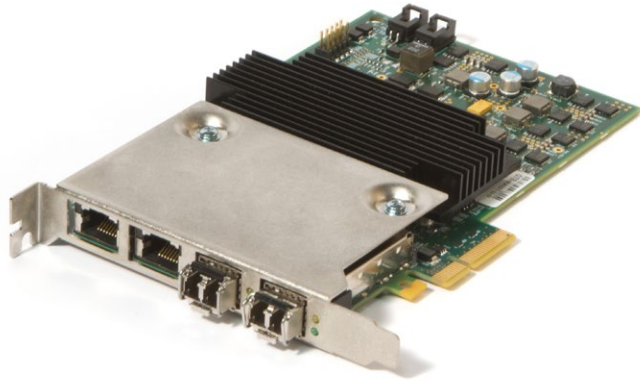
The SEL-3355 integrates one SEL-9331 internally. The supply can be ordered with either three-terminal Euro-style or C14 coupler input connectors.



SSDs and Mounting Sled

SLC SSDs provide the most robust and reliable storage. With no moving parts and the highest write cycle count of any mass solid-state storage media, they provide more uptime and a higher return on investment (ROI). Wide operating temperature ranges ensure that these drives will continue to work in the harshest environments. All SLC drives are covered by the SEL ten-year worldwide warranty. All pSLC and 3D TLC SSDs are covered by a five-year warranty.

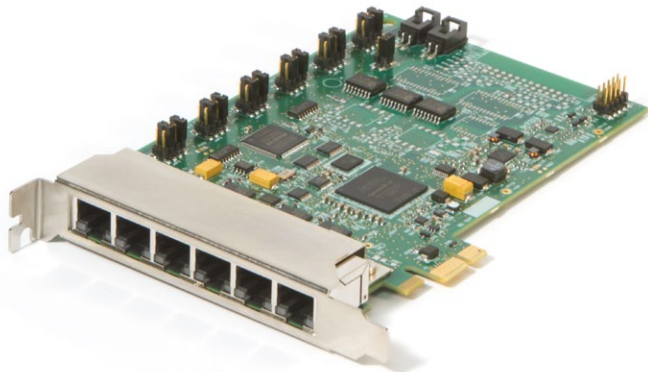
The drives come with mounting sleds already installed for easy insertion into the SEL-3355. You can also purchase spare mounting sleds. The sleds are compatible with 2.5-inch SATA hard-drive mounting holes.



SEL-3390E4 Ethernet Network Adapter Card

The SEL-3390E4 is a 10/100/1000 Mbps PCIe expansion card that is designed, built, and tested for use in harsh industrial and substation environments. The SEL-3390E4 provides a wide operating temperature range and immunity to ESD, shock, and vibration. You can also order it with conformal coating for corrosion immunity. The SEL-3390E4 complies with the PCIe form factor and works with other PCIe-compliant computers and controllers.

Choose one SEL-3390E4 PCIe x4 industrial PCIe Ethernet card for four additional independent Gb ports. You can select all copper, all LC fiber, or a mix of two copper and two fiber ports. The fiber ports use small form-factor pluggable (SFP) modules to support either single-mode or multimode operation at various transmit power levels on a per-port basis.



SEL-3390S8 Serial Adapter Card

The SEL-3390S8 is a PCIe-compliant expansion card that makes use of RJ45 ports instead of DB-9 ports for maximum serial I/O density. You can choose as many as two SEL-3390S8 Cards for an additional twelve EIA-232/485 serial ports. The SEL-3390S8 supports IRIG-B input and output.



SEL-3390T Time and Ethernet Adapter Card

The SEL-3390T is a PCIe expansion card that adds precise time synchronization and distribution functionality to SEL computing platforms, such as the SEL-3355. The SEL-3390T allows these devices to directly synchronize with IRIG-B sources or over Ethernet using the hardware time-stamped Precision Time Protocol (PTP). It provides two Ethernet ports, one BNC input, and one BNC output for IRIG-B so you can source time from IRIG-B and Ethernet devices. The SEL-3390T complies with the PCIe form-factor and can also be installed in other PCIe-compliant computers and controllers.

SEL-3355 Specifications

	Base	Optional
CPU	Xeon E3-1505L Quad-Core (25 W) Speed: 2.0 GHz base, 2.8 GHz turbo	Xeon E3-1505M Quad-Core (35 W) Speed: 2.8 GHz base, 3.7 GHz turbo
RAM	4 GB DDR4 ECC	8, 16, 32, or 64 GB DDR4 ECC
Chipset	Intel CM236 Express Chipset	
Mass Storage	1 internal drive bay; no SSDs included	Select 1–4 SLC (32–256 GB), pSLC (120–480 GB), or 3D TLC (240–1,920 GB) SSDs SATA II 3.0 Gb/s; RAID level 0, 1, 5, 10; hot-swap support
Video	Supports up to 3 monitors, 4K maximum resolution DisplayPort 1.2 output with Multi-Stream Transport (MST) 2 DVI-D outputs	
Audio	3 analog 3.5 mm TRS jacks: line input, line output, microphone input Digital audio outputs: DVI-D1, DVI-D2, Intel Display Audio	
USB	4 rear-panel, 2 front-panel ports USB 3.1-compliant; 2,000 mA current limit each	
Expansion Cards	5 half-length, full-height PCI expansion card slots: 2 PCIe x4 (Revision 2.0) 2 PCIe x1 (Revision 2.0) 1 32-bit 5 V PCI	
Ethernet	2 rear-panel copper RJ45 ports ETH 1: Intel WGI219LM, 10/100/1000 Mbps ETH 2: Intel WGI210IT, 10/100/1000 Mbps	SEL-3390E4 PCIe x4 Expansion Cards As many as 8 additional 10/100/1000 Mbps ports, copper or LC fiber SFP. Select from a wide assortment of SEL SFPs.
Serial	2 EIA-232 ports, DB-9 connectors, 300 to 115,200 bps; 5 V port power, 500 mA	SEL-3390S8 PCIe x1 Expansion Cards Up to 24 additional EIA-232/-422/-485 ports, RJ45 connectors, 300 to 921,600 bps; 5 V port power, 500 mA (meets EIA-/TIA-562 specifications)
Operating Systems	None (user-loaded operating system)	SEL OSs: RTAC [†] Blueframe* Supported Third-Party OSs: Microsoft Windows 8 Microsoft Windows 10* Microsoft Windows Server* Red Hat Enterprise Linux (RHEL) CentOS Linux Ubuntu LTS Linux SUSE Linux VMware ESXi

[†]Available via SEL-3533 RTAC Conversion Kit.

*Orderable as a factory-installed option.

	Base	Optional
Chassis	19" rack or panel mount, 3U	
Time-Code Input/Output	IRIG-B input on COM1	<p>SEL-3390S8 Expansion Card RJ45 serial port; demodulated IRIG-B (TTL-compatible); output generated from IRIG-B input or SEL-3355 clock</p> <p>SEL-3390T Expansion Card Synchronize with IRIG-B sources or over Ethernet using hardware time-stamped PTP. Provides one BNC input, one BNC output for IRIG-B, and two Ethernet ports.</p>
BIOS	AMI UEFI	
Trusted Platform Module	Infineon SLB 9670AQ TPM 2.0	
Intel AMT	AMT 11.0	
Power Supply	<p>1 power supply: 125–250 Vdc or 120–240 Vac; 50/60 Hz</p> <p>DC range 100–300 Vdc AC range 85–264 Vac Frequency range 45–65 Hz DC ripple <15% rated voltage Peak inrush 20 A Max. burden 189 W continuous, 240 W peak Insulation 3,600 Vdc</p>	<p>2 power supplies, with the second either the same as the base or selected as the following:</p> <p>48 Vdc, 3.7 A Max. burden 178 W continuous, 225 W peak</p>
Operating Temperature Range	Xeon E3-1505L CPU –40° to +75°C (–40° to +167°F)	Xeon E3-1505M CPU –40° to +60°C (–40° to +140°F)
Storage Temperature Range	–40° to +85°C (–40° to +185°F)	
Other Features	Conformal coating	
Certifications	<p>ISO 9001: Designed, manufactured</p> <p>RoHS</p> <p>CE: CE Mark EMC Directive, Low-Voltage Directive</p> <p>UL, cUL: 61010-1, C22.2 No. 61010-1</p> <p>RCM</p> <p>FCC: 47 CFR 15B, Class A</p> <p>UKCA</p>	

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