

SEL-3355

COMPUTER

POWERFUL. RUGGED. RELIABLE.



DEPENDABLE COMPUTATION FOR CRITICAL INFRASTRUCTURE

THE SEL-3355 COMPUTER IS DESIGNED AND BUILT IN THE U.S.A. TO HANDLE THE EXTREME.

The SEL-3355 Computer is built for speed, reliability, and security. SEL uses the same high standards to design the SEL-3355 as we do with our well-known, successful line of protective relays. And, we manufacture and test each SEL-3355 in the U.S.A., so we can ensure quality, security, and on-time delivery.

To offer optimal operation in harsh industrial and substation environments, the SEL-3355 includes substation-rated components, such as error-correcting code (ECC) RAM, single-level cell (SLC)

solid-state drives (SSDs), and a state-of-the-art thermal management system. Dual- and quad-core processor options provide fast processing power. Dual wide-range modular power supplies for two supply sources are available to meet high-availability application requirements. A third-generation Intel® Core™ i7 multicore processor with vPro™ technology is embedded into the computer's chipset to help combat malware threats and encrypt sensitive information.

The SEL-3355 is equipped with automated tools that apply Center for Internet Security (CIS) benchmarks to help meet current and future security requirements.

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



RELIABILITY, AVAILABILITY, SERVICEABILITY (RAS)

SEL COMPUTERS ARE SERVER-CLASS COMPUTERS WITH RESPECT TO RELIABILITY, AVAILABILITY, AND SERVICEABILITY.



RELIABILITY

Fans that dissipate heat are one of the most common points of failure in computers. The unique thermal design of SEL computers allows them to dissipate heat quickly and eliminate problems associated with moving parts, such as fans, spinning drives, or vents. The power supplies are fanless and have a high mean time between failures (MTBF). The SEL-3355 Computer is also designed to be easily enhanced or upgraded, even in the field.

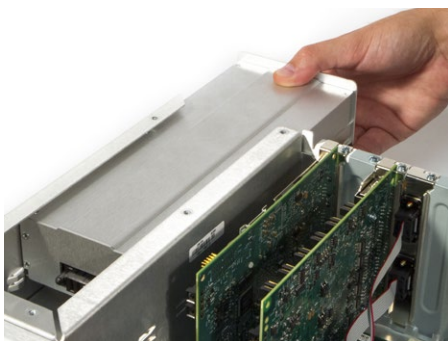
SEL-3355 Computers withstand harsh environments of -40° to $+75^{\circ}\text{C}$ (-40° to $+167^{\circ}\text{F}$) and are built with the highest-quality components available. To ensure the high quality of each unit, SEL subjects every SEL-3355 Computer to thorough environmental stress screening.

Design, quality components, system testing, memory, storage capacity, and the ability to upgrade as needs change make the SEL-3355 Computer the reliable choice for your demanding computing applications.



AVAILABILITY

Design features, such as no moving parts, ECC RAM, and modular components, increase the availability of the SEL-3355. The no-moving-parts design eliminates 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 redundant array of independent disks (RAID) configuration, you can remotely rebuild a failed drive onto a spare. Designed for maximum availability, SEL computers won't break down even if there is a problem.



SERVICEABILITY

With the SEL-3355 Computer's modular design and hot-swappable drives and power supplies, you can replace components in the field while your system is up and running. The modular design also allows memory upgrades to be performed in the field. The SEL-3355 processor features Intel's Active Management Technology, which allows logs to be viewed for evaluation and service even when the unit is powered off. Users can reboot into another OS for diagnostics or to batch install software, and then bring the system back online, all remotely. SEL's SysMon 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.

FEATURES AND BENEFITS

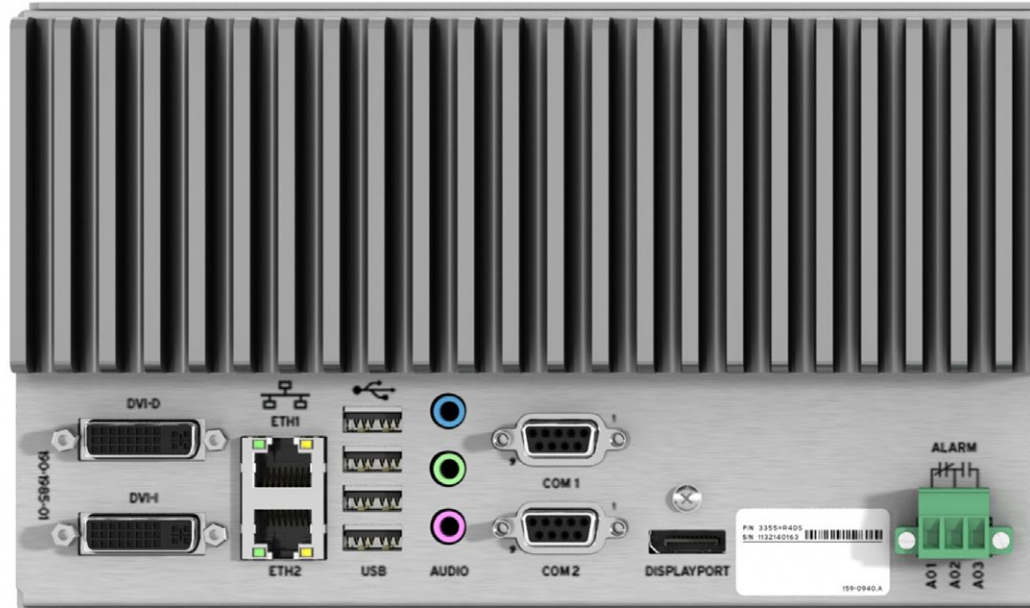
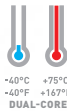
THE SEL-3355 IS BUILT TO EXCEED THE ALREADY PROVEN RELIABILITY OF SEL COMPUTERS WITH AN ANTICIPATED MTBF OF OVER TEN TIMES THAT OF TYPICAL INDUSTRIAL COMPUTERS.

Improve your application reliability with the SEL-3355, which features ECC memory, an advanced thermal management solution with no moving parts (no fans), SLC SSDs, and security-hardened operating system options. These technologies combined with a fast multicore Intel i7 processor and a custom system watchdog create a powerful, rugged, and reliable computing platform for your most demanding applications.

The SEL-3355 Computer's independent, diagnostic watchdog processor is configurable and improves system availability by detecting and alarming when problems occur. The system monitor (SysMon) software also detects system interruptions and monitors CPU load, memory, and disk space.

Standard Features Include

- Intel dual-core i7 CPU
- 4 GB DDR3 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 types of high-definition display interfaces: DVI-I, DVI-D, and DisplayPort
- Two 10/100/1000 Mb copper Ethernet interfaces
- Two front-facing and four rear-facing USB 2.0 ports
- Speaker, line-in, and microphone audio jacks
- Two EIA-232 serial ports
- Programmable Form C alarm contact
- Four PCI Express (PCIe) and one PCI (legacy) expansion slots



OPTIONAL CONFIGURATION FEATURES

CHOOSE OPTIONAL FEATURES TO ENHANCE PERFORMANCE AND AVAILABILITY FOR YOUR CRITICAL PROCESSES.

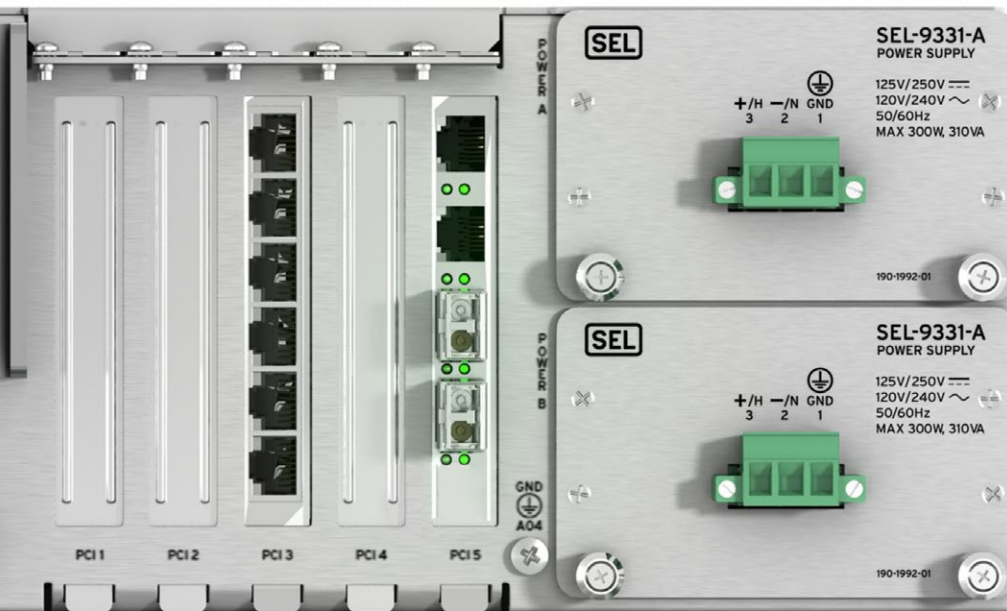
Built on Intel's proven Core i7 processor line, the SEL-3355 has the capacity to deliver the processing power needed in today's high-demand environments. Maximize configuration options to help boost performance and availability of your critical systems. Industrial computers consist of reliable hardware, a reliable OS, and tools to help the user lock down the monitoring and control applications. SEL dependable industrial computers come with a choice, allowing you to decide which OS and configuration options are best for your application.

With the available PCI and PCIe expansion slots, you can tailor the SEL-3355 for your custom applications.

Optional Features Include:

- Intel Core i7 quad-core CPU
- 4, 8, or 12 GB additional DDR3 ECC RAM (for a total of 16 GB)
- Industrial-grade SSDs in 30, 60, 120, and 250 GB capacities (for a total of four SSDs and a maximum of 1 TB of 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)
- Windows® 7 (x64)
-OR-
- Windows Server® 2008 R2 (x64)

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



DURABLE AND DEPENDABLE HARDWARE

FRONT VIEW





Four-bay, hot-swappable SSDs

HDD activity LED

Programmable auxiliary LEDs

USB 2.0 ports

DIMENSIONS

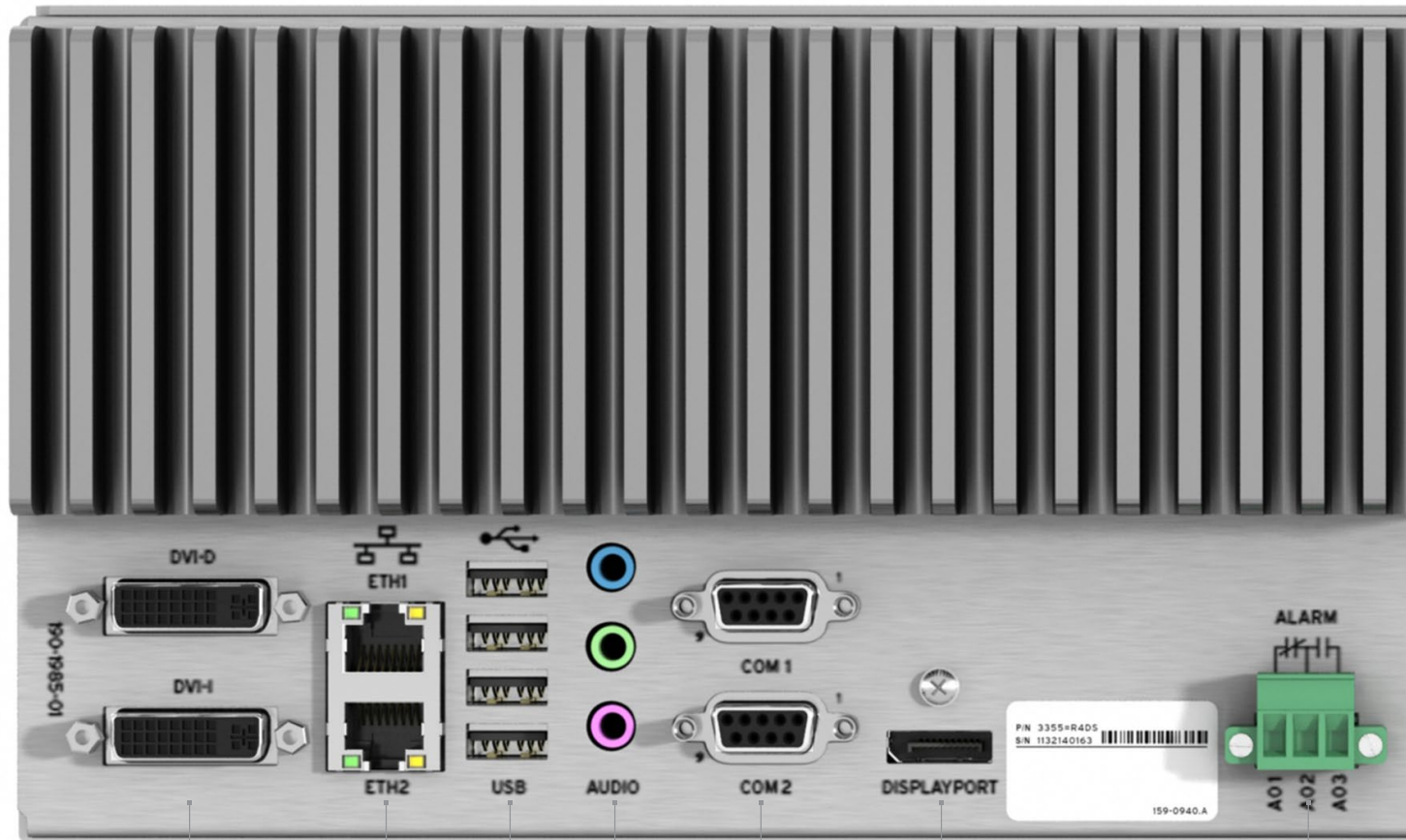
3 rack units (3U)

19 x 5.22 x 11.49 inches (W x H x D)

482.6 x 132.6 x 291.8 mm (W x H x D)

SEL-3355 COMPUTER

BACK VIEW



DVI ports

Gigabit Ethernet ports

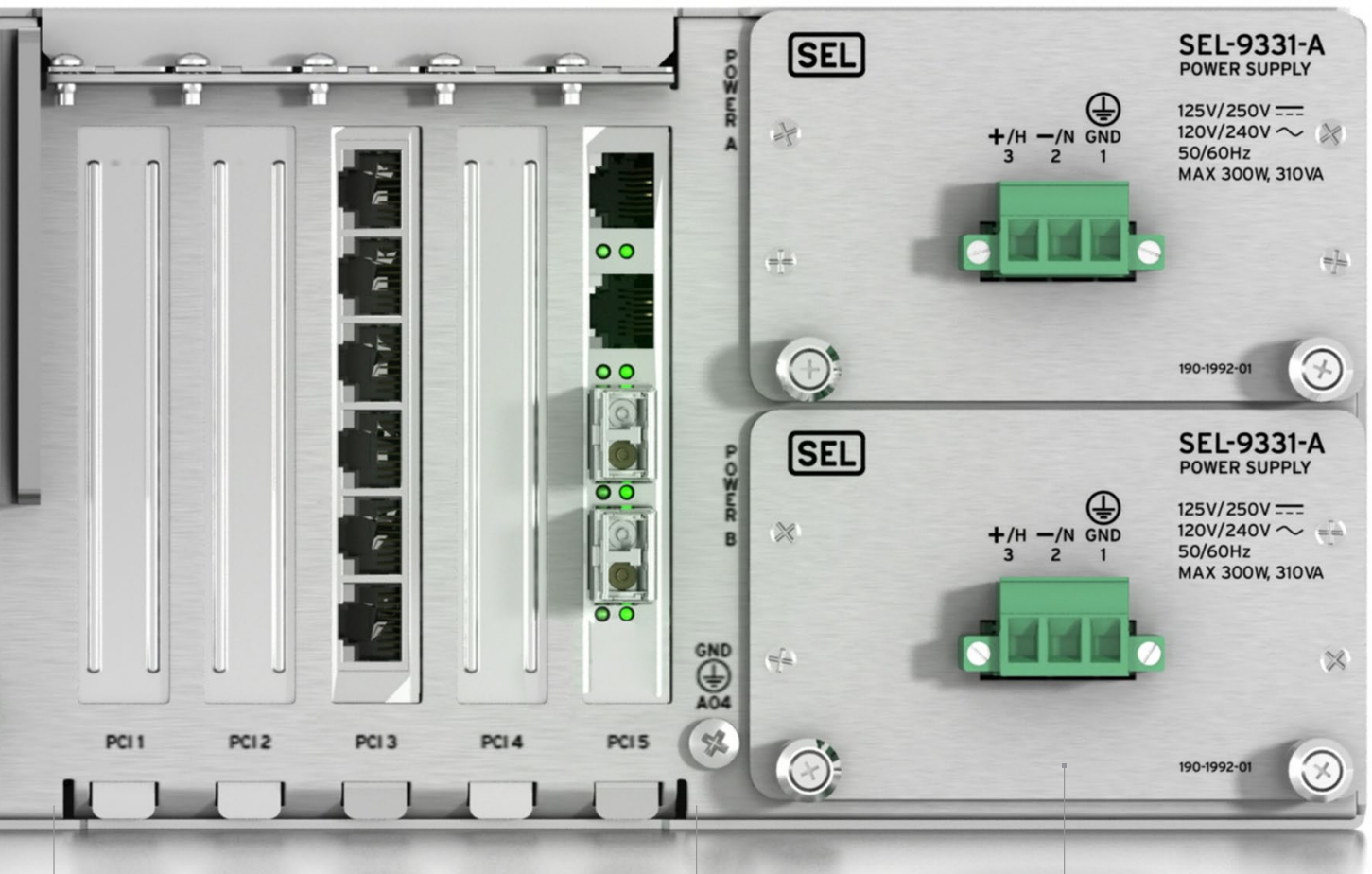
HD audio ports

USB 2.0 ports

DisplayPort

EIA-232 serial ports

Alarm contact output



Four PCI Express and one legacy expansion slots (Use SEL rugged* or third-party PCIe expansion cards for additional networking, serial, time, video, or other application-enabling solutions.)

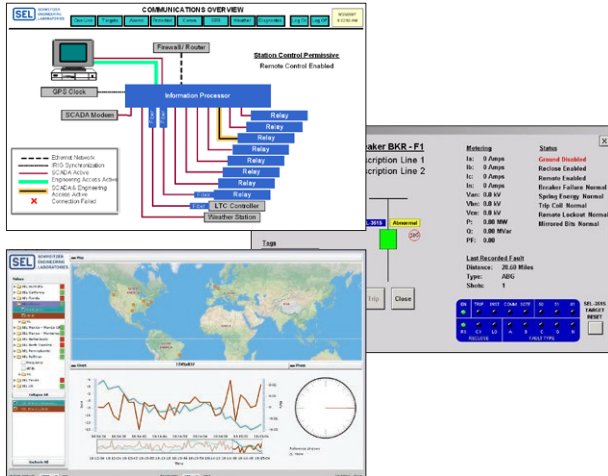
Dual hot-swappable power supplies

*NOTE: Shown with SEL-3390S8 and SEL-3390E4 serial and Ethernet PCIe cards.

APPLICATION EXAMPLES

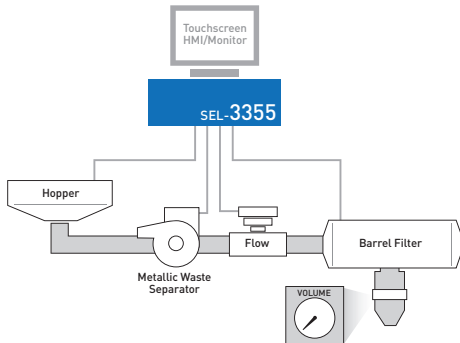
HMI VISUALIZATION, MONITORING, AND CONTROL

Make the SEL-3355 a secure visualization, monitoring, and control point for your substation or plant. Leverage CIS benchmarks settings to meet NERC CIP and other industry security compliance standards.



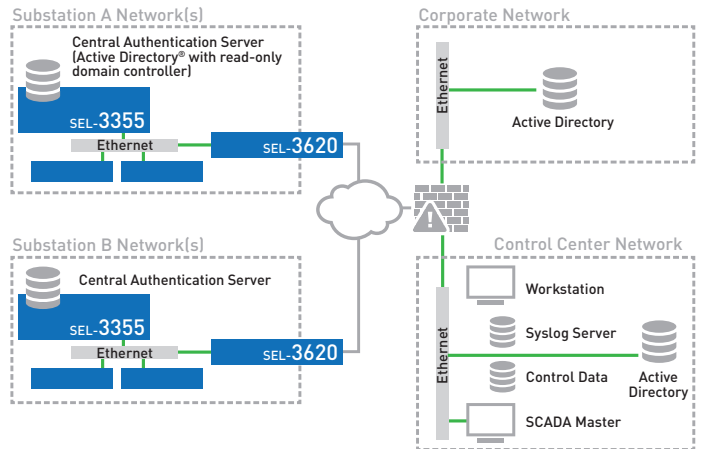
INDUSTRIAL AUTOMATION PLATFORM

Deploy complete automation control and operator station functionality in a single package directly to the plant floor without the concern of environmental conditions. The SEL-3355 is a powerful and reliable computing platform that supports soft programmable logic controllers (PLCs) and operator HMI control engines. Design engineers can leverage virtual technology resources integrated on the SEL-3355 computing system to reduce project costs.



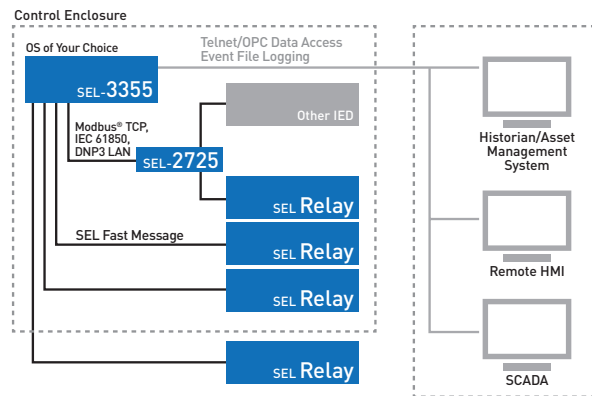
CENTRALIZED AUTHENTICATION SERVER

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



INFORMATION PROCESSOR: DATA CONCENTRATOR/ PROTOCOL CONVERTER

Collect and format protective relay data for remote terminal units (RTUs), and send the data directly to SCADA systems using legacy protocols. Leverage multiple paths for data access. Collect data, and service the data to any client via any supported protocol using your favorite software package.



GENERAL SPECIFICATIONS			
	BASE		OPTIONAL
CPU	Intel Core i7-3555LE Dual-Core		Intel Core i7-3612QE Quad-Core
	Speed	2.5 GHz base, 3.2 GHz turbo	Speed 2.1 GHz base, 3.1 GHz turbo
	Cache	2 x 256 KB L2, 4 MB L3	Cache 4 x 256 KB L2, 6 MB L3
Memory	4 GB DDR3 ECC PC3-10600 (1333 MHz)		8, 12, or 16 GB DDR3 ECC PC3-10600 (1333 MHz)
Platform Control Hub Chipset	Intel QM77 Express Chipset		
Mass Storage	1 internal drive bay No SSDs included		Select 1–4 (30, 60, 120, and 250 GB) SSDs SATA II 3.0 Gb/s RAID level 0, 1, 5, 10 Hot-swappable support
Video	Intel HD Graphics 4000 controller Two independent displays, up to 1920 x 1200 32 bpp Display interfaces DVI-I (digital + VGA) DVI-D (digital only) DisplayPort		
Audio	IDT 92HD91 HD Audio codec 3 Analog 3.5 mm TRS jacks Line input (blue) Line output (green) Microphone input (pink)		
USB	4 rear-panel ports, 2 front-panel ports USB 2.0 compliant 800 mA current limit each		
Expansion Cards	5 half-length, full-height PCI expansion cards Slots 2 PCIe x4 (Revision 2.0) 2 PCIe x1 (Revision 2.0) 1 32-bit 5 V PCI		
Ethernet	2 rear-panel 10/100/1000 Mbps copper RJ45 ports ETH1 Intel 82579, 10/100/1000 Mbps RJ45 copper ETH2 Intel 82574, 10/100/1000 Mbps RJ45 copper		Optional 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 Ports	Standard ports 2 EIA-232 ports, DB-9 connectors 300 to 115200 bps 5 V port power, 500 mA		Optional SEL-3390S8 PCIe x1 expansion cards Up to 24 additional EIA-232/-422/-485 ports, RJ45 connectors 300 to 921600 bps 5 V port power, 500 mA <small>(Meets EIA-/TIA-562 specifications)</small>
Time-Code Input/Output	N/A		SEL-3390S8 expansion card Connector RJ45 serial port Time-code Demodulated IRIG-B TTL-compatible <small>Note: Output generated from either IRIG-B input or SEL-3355 clock.</small>
BIOS	Phoenix SecureCore Tiano™ UEFI		
Trusted Platform Module	Integrated TPM 1.2		
Out-of-Band Management	Intel AMT v8.0		
Power Supply	1 power supply 125/250 Vdc or 120/240 Vac; 50/60 Hz DC range 100–300 Vdc AC range 85–264 Vac Frequency range 45–65 Hz Typical burden 50 W DC ripple <15% Rated Voltage Peak inrush 20 A Max burden 300 W Insulation 3100 Vdc		2 power supplies Same specifications as base
Operating Temperature Range	i7-3555LE CPU	–40° to +75°C (–40° to +167°F)	i7-3612QE CPU –40° to +60°C (–40° to +140°F)
Literature	Instruction Manual and Literature DVD Includes: data sheet, instruction manual, Getting Started Guide, drivers, SEL SysMon, SEL BaRT, third-party licenses, Adobe® Acrobat® Reader® Getting Started Guide (printed copy) Security Tips Flyer (printed copy)		



**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

