The SEL-3360 Compact Industrial Computer uses a high-performance x86-64 architecture processor to support modern operating systems like Microsoft Windows and Linux. The extremely rugged SEL hardware of the SEL-3360 enables you to use your choice of computer operating system and software in very harsh environments not suitable for general purpose computers.

Integrate the SEL-3360 in computing applications that demand high performance, reliability, and low maintenance in extreme, harsh environments. The SEL-3360 offers a mean time between failure (MTBF) of at least ten times that of typical industrial computers by eliminating all moving parts, including rotating hard drives and fans; using high-quality solid-state drives; and by using error-correcting memory technology. By eliminating vent holes, the SEL-3360 significantly reduces dust buildup and foreign contaminants. Power the SEL-3360 from 12 Vdc power sources with voltage ranging from 10.0–16.6 Vdc, enabling simple integration with common power sources and battery-powered systems with high float-charge levels. You can install software from SEL and third-party software vendors to customize the SEL-3360 for your specific applications. Every SEL-3360 comes with the unprecedented ten-year, worldwide SEL warranty.

Key Features and Benefits

The SEL-3360 provides a rugged, easy-to-use computing platform for substation, industrial, or other harsh environments.

➤ **x86-64 Architecture.** The SEL-3360 uses the latest Intel Core i7 microprocessor architecture to deliver very high performance and broad operating system and software compatibility. Multiple processor cores and Intel Hyper-Threading Technology enable you to run multiple time-critical applications simultaneously.

➤ **Operating System Choices.** The SEL-3360 may be purchased as hardware only, or with a variety of modern Microsoft Windows operating systems to provide extreme flexibility and functionality along with enhanced security features.
**Form Factor.** The SEL-3360 provides a compact wall-mount chassis, designed for substation and industrial control applications. The system includes rear-panel I/O connectors for network, peripherals, storage, video, audio, alarm, and serial I/O—all with protection against electrical shock and surge.

**Power Supply.** The SEL-3360S can be powered from any 12 Vdc source, such as the robust, reliable SEL-9331 power supply module. The SEL-3360E has an integral power supply that can be powered from low- and high-voltage ac and dc power sources.

**Mass Storage.** The SEL-3360 supports two 2.5-inch SATA drives, which are hot-swappable and accessible after removing the right side panel. High-performance, industrial-rated solid-state drives (SSD) are available as ordering options.

**RAID.** The integrated SATA controller supports Redundant Array of Independent Disks (RAID) configurations to maximize data availability and improve storage volume performance.

**Display Interfaces.** DVI, DisplayPort, VGA, or HDMI video connections enable you to connect one or two simultaneous, independent, high-definition displays.

**Audio Interface.** Analog HD audio inputs and outputs enable connection to amplified speakers, microphone, and audio sources for clear audible user feedback, audio capture and analysis, and voice recognition. Digital audio can be streamed through the digital display interfaces for simple integration and high-definition surround-sound.

**USB Connectivity.** The SEL-3360 has four rear-panel and two front-panel USB ports for connection to a local keyboard, mouse, and any USB peripherals. Each port is individually current limited, protecting the system from external short circuits, and enabling high-power devices such as USB hard drives to be powered from any USB port.

**PCIe Expansion.** The SEL-3360E supports as many as two standard PCIe form factor expansion cards, enabling you to customize the system I/O to meet your application needs. Choose from a selection of SEL PCIe expansion cards, or install your own custom third-party expansion card.

**Ethernet.** Two 10/100/1000 Mbps Ethernet connections on the rear panel support high-speed network connectivity and enable connections to independent networks, or redundant paired network connections. Network interface cards such as the SEL-3390E4 quad-gigabit Ethernet card can be added to the SEL-3360E for additional network connectivity.

**Serial I/O.** Two standard EIA-232 serial ports enable connection to nearby electronic devices such as automation controllers, communication radios, and modems. As many as two SEL-3390S8 serial expansion cards can be added to the SEL-3360E for applications that require many serial I/O connections and IRIG time synchronization and distribution.

**System Monitoring and Watchdog.** An embedded controller works in unison with the SEL SysMon software to provide an extra level of computer system reliability, and detect failures in the application software or operating system. The system logs any abnormal conditions, enables the system alarm to alert operators of a problem, and if necessary, can reboot the system to return to a good operation state.

**Alarm Contact Output.** SEL SysMon software controls the alarm contact output to signal in case of system health problems or malfunctions. The Form C contact supports both normally open and normally closed alarm operation.

**Remote Management.** The SEL-3360 supports remote access over Ethernet by using Windows Remote Desktop or Intel vPro Active Management Technology (AMT), enabling full access to the system video, keyboard, mouse, and storage.
Watchdog Functionality
An embedded controller provides an extra level of computer system reliability. One function of the embedded controller is to reboot the computer if there is an operating system problem or a problem with specific software services running on the operating system.

SEL System Monitor
SEL System Monitor software monitors system performance and component health. Alerts for alarm conditions are issued on configurable thresholds. Example thresholds include CPU usage, free disk space, and available system memory.

Ethernet
Ethernet connections allow the SEL-3360 to connect to two separate, high-speed Ethernet networks via built-in Gigabit Ethernet. Aggregate ports for increased performance or redundancy or separate local area networks (LANs) for control, data, or engineering access. Additional copper or fiber-optic Ethernet ports can be added to the SEL-3360E by installing PCI Express expansion cards such as the SEL-3390E4. For information on those cards, please refer to the appropriate expansion card instruction manual.

Time
The COM1 serial port accepts IRIG-B time-code input for precise time input from a GPS clock or other source.

EIA-232 Serial Ports
The SEL-3360 computing platform has two built-in EIA-232 DB-9 ports, which can provide +5 V power to run external transceivers, modems, and other serial-connected accessories. Additional serial ports can be added to the SEL-3360E by installing PCI Express expansion cards such as the SEL-3390S8. For information on those cards, please refer to the appropriate expansion card instruction manual.

Alarm Output
An alarm contact output on the rear panel can be used to signal internal errors and operating system malfunctions.

Programmable LEDs
Program three front-panel bicolor LEDs for use with your custom applications.

Out-of-Band Management
Intel vPro Active Management Technology (AMT) provides out-of-band management for security, configuration, and monitoring.
Application Examples

Virtualization for HMI and Other Applications

Create your own virtualization appliance by leveraging Intel Virtualization Technology (VT-x) to allow one hardware platform to function as multiple “virtual” platforms. Isolate your computing activity onto separate virtual machines to maintain productivity and realize improved manageability and reduced downtime. For example, run a virtualized OS specifically for your HMI or other essential but noncritical applications. Should your HMI require that the system be rebooted, simply restart the virtual machine and avoid an outage for your other critical processes. Similarly, multiple SEL-3360 computing platforms may be virtualized and entire operating systems transparently migrated from one physical SEL-3360 to another for hardware upgrades, security or software updates, or testing purposes.

Control System Applications

Use the SEL-3360 for process control applications, including as a human-machine interface (HMI) or for protocol conversion and high-speed control when working with other SEL products and solutions.

Security Applications

Improve security with a single sign-on, enabled through using the SEL-3360 as a local Lightweight Directory Access Protocol (LDAP) server. Centrally manage user accounts and group memberships with Microsoft Active Directory or with your choice of back-end database support.

Event Collection Applications

Figure 3  High-Speed Control With SEL MIRRORED BITS and IEC 61850 GOOSE Communications

Figure 4  SEL-3360 as Remote Read-Only Domain Controller Performing Central Authentication Using LDAP

Figure 5  Reliable Hardware for Running Your Disturbance Recording System

Figure 6  IED Event Collection With Optional acSELERATOR Team SEL-5045 Software
Diagrams and Dimensions

**Figure 7  Front-Panel Diagram**

1. **LAMP TEST** Button. Press and hold to test front-panel LEDs. Can be programmed to be an on/off or reset button.
2. **ENABLED** and **ALARM** LEDs provide operational status. A green **ENABLED** LED indicates normal operation. The **ALARM** LED illuminates red when a nonoptimal system condition exists.
3. **ETHERNET** Status Indicators. Link (LNK) indicates that the port is connected, and activity (ACT) indicates when data are being transmitted and received.
4. **SERIAL** Status Indicators. Transmit (TX) and receive (RX) LEDs indicate activity on serial ports.
5. **PINHOLE** button. Provide reset and power functions, and requires a push-pin to prevent accidental use.
6. **HDD** Activity Indicator. Illuminates when SATA drives are accessed.
7. **AUXILIARY** Status Indicators. Three programmable, bicolor LEDs for your custom application.
8. **USB** Ports. Two easily accessible ports to connect USB 2.0 peripherals.
1. **DVI-D**: Connect digital monitors by using native DVI or an HDMI adapter.
2. **DVI-I**: Connect either digital or analog monitors by using native DVI, an HDMI adapter, or a VGA adapter.
3. **ETH1** and **ETH2**: Onboard independent Gigabit Ethernet interfaces.
4. **USB** Ports: Connect as many as four USB 2.0 peripherals at the rear panel.
5. **AUDIO** Ports: Line Input (blue), Line Output (green), and Microphone Input (pink).
7. **DISPLAYPORT**: Connect new digital monitors supporting the DisplayPort interface.
8. **GROUND** Terminal Screw: The earth ground connection for the SEL-3360.
9. **POWER** Input Terminals: The rated input voltage is clearly marked on the chassis near the terminals.
10. **ALARM**: The Form C alarm contact output enables both normally closed and normally open wiring connections.
11. **PCI** Expansion Slots: Install SEL or third-party PCI Express expansion cards for additional network, serial, or other application-specific I/O.

**Figure 8** Rear-Panel Diagram
Figure 9 SEL-3360S Dimensions Diagram

CHASSIS WITH
STANDARD HEATSINK

CHASSIS WITH
CONDUCTION-COOLED HEATSINK

Figure 10 SEL-3360E Dimensions Diagram

CHASSIS WITH
STANDARD HEATSINK

CHASSIS WITH
CONDUCTION-COOLED HEATSINK
Specifications

Compliance

Designed and manufactured under an ISO 9001 certified quality management system

47 CFR 15B, Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

UL Recognized to U.S. and Canadian safety standards (File E220228; NRAQ2, NRAQ8)

CE Mark

General

Supported Operating Systems

Microsoft Windows 7
Microsoft Windows 8/8.1
Microsoft Windows Server 2008 R2
Microsoft Windows Server 2012 R2*
Microsoft Windows Server 2016*
CentOS Linux 6
CentOS Linux 7
Red Hat Enterprise Linux 6
Red Hat Enterprise Linux 7
VMware ESXi 5.x

* Orderable as a factory-installed option.

CPU

Intel Core i7-3555LE Dual-Core Processor
Speed: 2.5 GHz base, 3.2 GHz turbo
Cache: 2 x 256 KB L2, 4 MB L3

Intel Core i7-3612QE Quad-Core Processor (SEL-3360S Only)
Speed: 2.1 GHz base, 3.1 GHz turbo
Cache: 4 x 256 KB L2, 6 MB L3

RAM

4, 8, or 16 GB DDR3 ECC PC3-10600 (1333 MHz)

Chipset

Intel QM77 Express Chipset

Mass Storage

Internal Drive Bay: Supports 2.5 inch SATA drives
two industrial-grade drives
one consumer-grade drives
SATA II 3.0 Gb/s
RAID level 0, 1
Hot-Swap Support

Optional SATA Drives: Industrial-Grade SLC SSD
30–250 GB
10-year warranty
Industrial-Grade iMLC SSD
120–480 GB
5-year warranty
Consumer-Grade MLC SSD
240–1920 GB
3-year warranty

Video

Intel HD Graphics 4000 Controller

Dual Independent Displays
From 2 of the 3 Outputs:
DVI-I (digital + VGA) maximum resolution 1920 x 1200 @ 32 bpp
DVI-D (digital only) maximum resolution 1920 x 1200 @ 32 bpp
DisplayPort 1.1 maximum resolution 1920 x 1200 @ 32 bpp
Cable length <10 m

Audio

TSI (IDT) 92HD91 HD Audio Codec

3 Analog 3.5 mm TRS Jacks:
Line input
Line/headphone output
Microphone input
Cable length <2 m

Intel Display Audio

Digital Audio Outputs: DVI-I, DVI-D, DisplayPort

USB

4 Rear-Panel Ports, 2 Front-Panel Ports
USB 2.0 Compliant
800 mA Current Limit
Cable length <10 m

Expansion Cards (SEL-3360E Only)

2 Half-Length, Full-Height
PCI Expansion Card
PCI 1: PCIe x1 (Revision 2.0)
PCI 2: PCIe x4 (Revision 2.0)

Ethernet

2 Rear-Panel, 1 Gb Copper RJ45 Ports
ETH1: Intel 82579LM, 10/100/1000 Mbps
ETH2: Intel 82574L, 10/100/1000 Mbps

Optional SEL-3390E4 PCIe x4 Expansion Card (SEL-3360E Only):
As many as four additional 10/100/1000 Mbps ports, copper or LC fiber SFP

Serial Ports

Standard Ports: 2 EIA-232 ports, DB-9 connectors
300 to 115200 bps
(Meets EIA/TIA-562 Specifications)

Optional SEL-3390S8 PCIe x1 Expansion Cards (SEL-3360E Only):
As many as 12 additional EIA-232/EIA-422/EIA-485 ports, RJ45 connectors
300 to 921600 bps

Time-Code Input

Main Board (Input Only)

Connector: COM1 DB-9 serial port
Time Code: Demodulated IRIG-B TTL compatible

SEL-3390S8 Expansion Card (Input/Output) (SEL-3360E Only)
Connector: RJ45 serial port
Time Code: Demodulated IRIG-B TTL compatible

Note: Output generated from either IRIG-B input or SEL-3360 clock.

Real-Time Clock/Calendar

Battery Type: IEC No. BR2335 Lithium
Battery Life: 10 years with power
2 years without power
BIOS
Phoenix SecureCore Tiano UEFI
Trusted Platform Module
Integrated TPM 1.2
Intel Active Management Technology
Intel AMT v8.1, accessible through ETH1
Power Supply
See Table 1 for additional burden information.
No power supply (SEL-3360S only)
Voltage Rating: 12 Vdc
Voltage Range: 10–16.6 Vdc
Typical Burden: 25 W
Max Burden: 144 W (cold startup)
Peak Inrush: 15 A
Negative input power terminal is internally tied to chassis ground.
SEL-9331 160 W LV Power Supply
Voltage Rating: 48 Vdc
Voltage Range: 38–58 Vdc
Maximum Constant Burden: 149 W
Maximum Peak Burden: 225 W
DC Ripple: <15% rated voltage
Peak Inrush: 20 A
Insulation: 3600 Vdc
Isolated From Chassis Ground: Yes
SEL-9331 160 W HV Power Supply
Voltage Ratings: 125/250 Vdc
120/220/240 Vac; 50/60 Hz
DC Range: 100–300 Vdc
Maximum DC Dropout: 88 Vdc
AC Range: 85–264 Vac
Frequency Range: 45–65 Hz
Maximum Constant Burden: 155 W, 160 VA
Maximum Peak Burden: 240 W, 248 VA
DC Ripple: <15% rated voltage
Peak Inrush: 20 A
Insulation: 3600 Vdc
Power Factor: >0.9 (at full load)
Isolated From Chassis Ground: Yes
Recommended External Overcurrent Protection
Breaker Type: Standard
Breaker Rating: 20 A at 250 Vdc
Current Breaking Capacity: 10 kA
Grounded Neutral Systems: Devices in series with the HOT or energized conductor
DC and Isolated Systems: Device in serial with both conductors
Distance from Equipment: Less than 2 m
Fuse Ratings
12 Vdc Input Power Fuse F1:
Rating: 15 A, 250 Vac/60 Vdc fast acting
60 Vdc/50 A break rating
LV Power Supply Fuse:
Rating: 15 A
Maximum Rated Voltage: 500 Vdc, 500 Vac
Breaking Capacity: 20 kA at 500 Vdc
Type: Time-lag T
HV Power Supply Fuse:
Rating: 5 A
Maximum Rated Voltage: 250 Vdc, 277 Vac
Breaking Capacity: 1500 A at 277 Vac
Type: Time-lag T
Heater Fuses F2, F3: 5 A, 125 V slow blow
125 Vdc/50 A break rating
Fuses are not serviceable.
Alarm Output Contact
Per IEC 255-0-20:1974, using the simplified method of assessment
Output Type: Relay, Form C, break-before-make
Power Supply Burden: <1 W maximum
Mechanical Life: 2000000 operations
Operational Voltage: 250 Vac/Vdc
Make: 30 A at 250 Vdc
Carry: 6 A continuous at 70°C
1 s Rating: 50 A
MOV Protection: 270 Vac/360 Vdc, 75 J
Insulation Voltage: 300 Vac/Vdc
Pickup Time: <8 ms
Dropout Time: <8 ms
Breaking Capacity (10000 operations):
24 V 0.75 A L/R = 40 ms
48 V 0.50 A L/R = 40 ms
125 V 0.30 A L/R = 40 ms
250 V 0.20 A L/R = 40 ms
Cyclic Capacity (2.5 cycles/second):
24 V 0.75 A L/R = 40 ms
48 V 0.50 A L/R = 40 ms
125 V 0.30 A L/R = 40 ms
250 V 0.20 A L/R = 40 ms
Terminal Ratings
Compression Screw Terminal
Power Wiring
Insulation: 300 V min.
Size: 12–14 AWG, length <2 m
Alarm Wiring
Insulation: 300 V min.
Size: 12–18 AWG
Tightening Torque
Minimum: 0.6 Nm (5 in-lb)
Maximum: 0.8 Nm (7 in-lb)
Crimp Ferrule Recommended
Mounting Ear Tightening Torque
Minimum: 0.18 Nm (1.6 in-lb)
Maximum: 0.25 Nm (2.2 in-lb)

Grounding Screw
Grounding Wire
Insulation: 300 V min.
Size: 12 AWG, length <3 m

Tightening Torque
Minimum: 0.9 Nm (8 in-lb)
Maximum: 1.4 Nm (12 in-lb)

Ring Terminal Recommended

Serial Port
Tightening Torque
Minimum: 0.6 Nm (5 in-lb)
Maximum: 0.8 Nm (7 in-lb)

Video Port
Tightening Torque
Minimum: 0.6 Nm (5 in-lb)
Maximum: 0.8 Nm (7 in-lb)

Temperature Range
Operating
SEL-3360S With i7-3555LE CPU: –40° to +75°C (–40° to +167°F)
SEL-3360S With i7-3612QE CPU: –40° to +60°C (–40° to +140°F)
SEL-3360E With i7-3555LE CPU: –40° to +60°C (–40° to +140°F)

Note: Not applicable to UL applications.

Storage
–40° to +85°C (–40° to +185°F)

Relative Humidity
5% to 95% noncondensing

Maximum Altitude
5000 m

Atmospheric Pressure
80–110 kPa

Overvoltage Category
Category II

Insulation Class
1

Pollution Degree
2

RoHS Compliance
Compliant with European Union’s RoHS directive

Weight
4.1 kg (9 lb) maximum (SEL-3360S)
6.8 kg (15 lb) maximum (SEL-3360E)

Product Standards

Communications
IEC 61850-3:2013
Equipment in Utility Substations:
IEEE 1613-2009
Severity Level: Class 1

Industrial Environment:
IEC 61000-6-2:2005
IEC 61000-6-4:2006

Electrical Equipment for Measurement, Control, and Laboratory Use:
IEC 61010-1:2010
UL 61010-1:2016,
C22.2 No. 61010-1-12
IEC 61010-2-101:2013

Measuring Relays and Protection Equipment:
IEC 60255-26:2013
IEC 60255-27:2013

Type Tests

Note: To ensure good EMI and EMC performance, type tests were performed using shielded Ethernet and serial cables with the shell grounded at both ends of the cable, and the USB, video, and audio cables with ferrite chokes. Double-shielded cables are recommended for best EMI and EMC performance.

Electromagnetic Compatibility Emissions

Conducted and Radiated Emissions:
CISPR 11:2009+A1:2010
CISPR 22:2008
CISPR 32:2015
IEC 61000-6-4:2006
IEC 61850-3:2013
FCC 15.107:2014
Severity Level: Class A

Harmonic Current:
IEC 61000-3-2:2014
Severity Level: Class A

Voltage Flicker:
IEC 61000-3-3:2013

Electromagnetic Compatibility Immunity

Conducted RF:
IEC 61000-4-6:2013
Severity Level: 10 Vrms

Electrostatic Discharge:
IEC 61000-4-2:2008
IEEE C37.90.3-2001
Severity Level:
2.4, 6, 8 kV contact discharge;
2, 4, 8, 15 kV air discharge

Fast Transient/Burst:
IEC 61000-4-4:2012
Severity Level: Class A
4 kV, 5 kHz on power supply and outputs;
2 kV, 5 kHz on communications lines

Magnetic Field:
IEC 61000-4-8:2009
Severity Level:
1000 A/m for 3 s
100 A/m for 1 m

Power Supply:
IEC 61000-4-11:2004
IEC 61000-4-29:2000

Radiated Radio Frequency:
Severity Level: 10 V/m
IEEE C37.90.2-2004
Severity Level: 20 V/m

Surge Withstand Capability:
IEC 61000-4-18:2006+A1:2010
Severity Level:
Power supply and outputs
2.5 kV peak common mode
1.0 kV peak differential mode
Communications ports
1.0 kV peak common mode
IEEE C37.90.1-2012
Severity Level:
2.5 kV oscillatory
4 kV fast transient
Surge Immunity:  
IEC 61000-4-5:2005  
- 0.5, 1 kV line-to-line  
- 0.5, 1, 2 kV line-to-earth  
- 0.5, 1, 2 kV communications ports  

Environmental  
Change of Temperature:  
IEC 60068-2-14:2009
- Severity Level: 5 cycles, 1°C per minute ramp
- SEL-3360S With i7-3555LE CPU: -40°C to +75°C
- SEL-3360S With i7-3612QE CPU: -40°C to +60°C
- SEL-3360E With i7-3555LE CPU: -40°C to +60°C
- Cold, Operational: IEC 60068-2-1:2007  
  Severity Level: 16 hours at -40°C
- Cold, Storage: IEC 60068-2-1:2007  
  Severity Level: 16 hours at -40°C
- IEC 60255-1:2009
- IEC 61850-3:2013
- Damp Heat, Cyclic: IEC 60068-2-30:2005  
  Severity Level: 12 + 12-hour cycle  
  25° to 55°C, 6 cycles, >93% r.h.
  Severity Level: 40°C, 240 hours, >93% r.h.
  - IEC 61850-3:2013
  Severity Level:  
  SEL-3360S With i7-3555LE CPU: 16 hours at 75°C  
  SEL-3360S With i7-3612QE CPU: 16 hours at 60°C  
  SEL-3360E With i7-3555LE CPU: 16 hours at 60°C  
  IEC 60255-1:2009
  - IEC 61850-3:2013
  Severity Level: 16 hours at 85°C  
  IEC 60255-1:2009
  - IEC 61850-3:2013
- Free Fall: IEEE 1613-2009  
  Severity Level: 100 mm
  Severity Level:  
  Endurance Class 2  
  Response Class 2
  IEC 60255-21-2:1998  
  Severity Level:  
  Shock Withstand, Bump Class 1  
  Shock Response Class 2
  IEC 60255-21-3:1993  
  Severity Level:  
  Quake Response Class 2

Safety  
- Severity Level: IP30
- IEC 60255-27:2013
- IEEE C37.90-2005  
  Severity Level: 3600 Vdc on power supply  
  2500 Vac on contact output  
  1500 Vac Ethernet ports  
  Type tested for one minute
  IEEE C37.90-2005  
  Severity Level: 5 kV common mode, power supply, contact outputs  
  1.5 kV Ethernet ports
- Dielectric Strength: IEC 60255-27:2013  
  IEEE C37.90-2005  
  Severity Level:  }

Schweitzer Engineering Laboratories, Inc.

SEL-3360 Data Sheet
### Technical Support

We appreciate your interest in SEL products and services. If you have questions or comments, please contact us at:

Schweitzer Engineering Laboratories, Inc.
2350 NE Hopkins Court
Pullman, WA 99163-5603 U.S.A.
Tel: +1.509.338.3838
Fax: +1.509.332.7990
Internet: selinc.com/support
Email: info@selinc.com

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### Table 1  System Power Consumption (at 12 Vdc Input Voltage)

<table>
<thead>
<tr>
<th>Component</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base System (Dual-Core CPU, 4 GB RAM, 1 SATA Drive):</td>
<td>15 W</td>
<td>25 W</td>
<td>40 W</td>
</tr>
</tbody>
</table>

**Additional Consumption From Optional Components**

<table>
<thead>
<tr>
<th>Component</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEL-9331 Power Supply (standard on SEL-3360E)</td>
<td>+10 W</td>
<td>+10 W</td>
<td>+10 W</td>
</tr>
<tr>
<td>Quad-Core CPU:</td>
<td>+2 W</td>
<td>+5 W</td>
<td>+13 W</td>
</tr>
<tr>
<td>2nd RAM Module (included with 8 GB and 16 GB ordering options):</td>
<td>+2 W</td>
<td>+2 W</td>
<td>+3 W</td>
</tr>
<tr>
<td>2nd SATA Drive:</td>
<td>+1 W</td>
<td>+2 W</td>
<td>+3 W</td>
</tr>
<tr>
<td>SEL-3390E4 Ethernet Card</td>
<td>+6 W</td>
<td>+8 W</td>
<td>+10 W</td>
</tr>
<tr>
<td>SEL-3390S8 Serial Card</td>
<td>+4 W</td>
<td>+5 W</td>
<td>+7 W</td>
</tr>
</tbody>
</table>

**Chipset Heater**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>cold startup (&lt;5°C [41°F]):</td>
<td>N/A</td>
<td>N/A</td>
<td>+90 W</td>
</tr>
<tr>
<td>continuous operation (0°C [32°F]):</td>
<td>0 W</td>
<td>+5 W</td>
<td>+10 W</td>
</tr>
<tr>
<td>continuous operation (–40°C [–40°F]):</td>
<td>0 W</td>
<td>+20 W</td>
<td>+40 W</td>
</tr>
</tbody>
</table>

*a Minimum: 0% load on all components; minimum power consumption booted up and idle.
Typical: 25–50% load on all components; good indication of most application loads.
Maximum: 100% load on all components; generally cannot be reached in normal applications.
b Chipset heaters operate at low temperatures to keep the CPU and PCH within specified operating limits.

### Table 2  Peripheral Connection Current Limits

<table>
<thead>
<tr>
<th>Connection</th>
<th>Current Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>DVI-I and DVI-D</td>
<td>0.2 A, +5 Vdc, 1 W total for both</td>
</tr>
<tr>
<td>DisplayPort</td>
<td>0.6 A, +3.3 Vdc, 2 W</td>
</tr>
<tr>
<td>COM1 and COM2</td>
<td>0.5 A, +5 Vdc, 2.5 W each</td>
</tr>
<tr>
<td>USB Ports</td>
<td>0.8 A, +5 Vdc, 4 W each</td>
</tr>
</tbody>
</table>