



SEL-3360 Automation Controller

Improve Reliability, Availability, and Serviceability With a Rugged, Compact Industrial Automation Controller



The SEL-3360 Automation Controller 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 automation controller 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 automation controller 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 automation controller 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.

Functional Overview

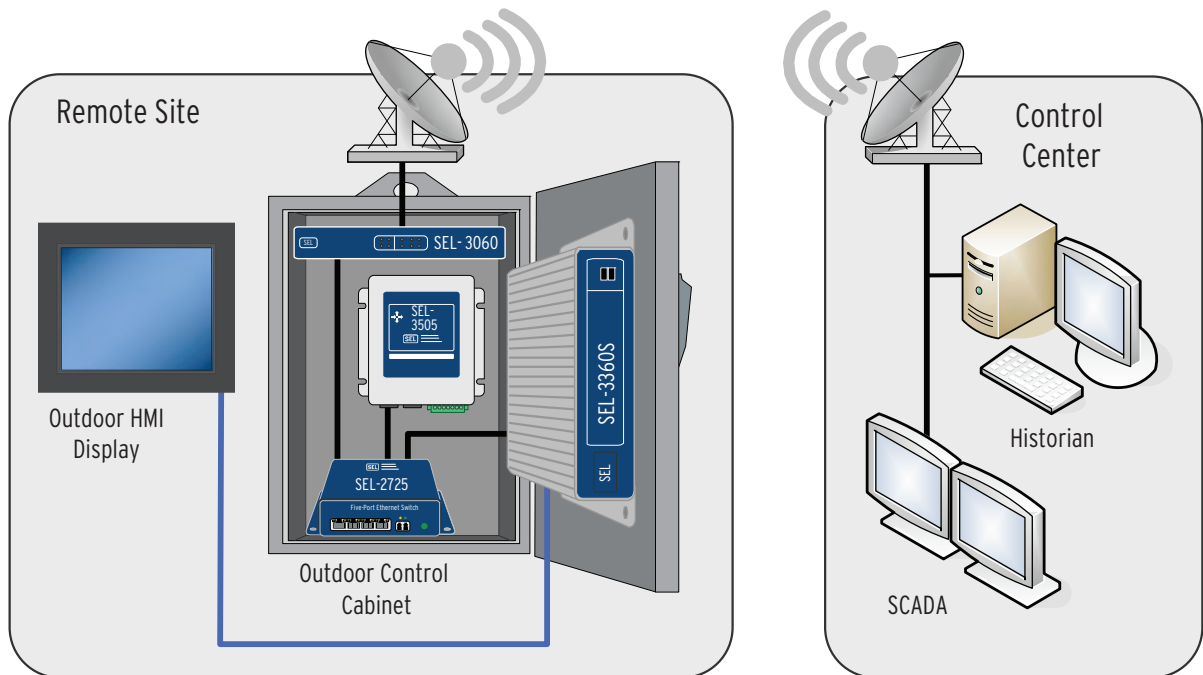


Figure 1 SEL-3360 in Monitoring and Control Applications

Watchdog Functionality

An embedded controller provides an extra level of automation controller system reliability. One function of the embedded controller is to reboot the automation controller 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 automation controller 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

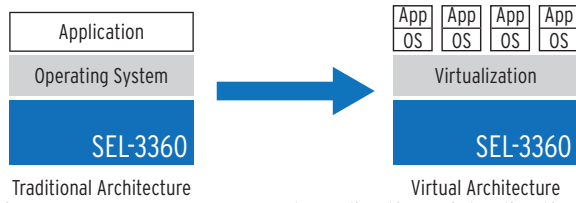


Figure 2 SEL-3360 OS and Application Virtualization Platform

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 automation controller 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.

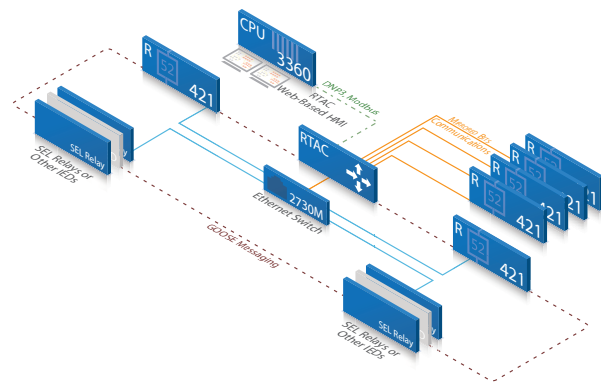


Figure 3 High-Speed Control With SEL MIRRORRED BITS and IEC 61850 GOOSE Communications

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.

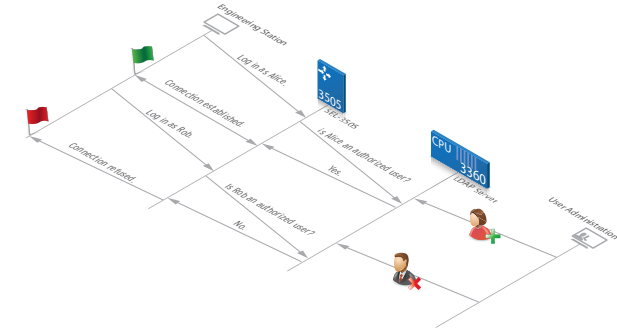


Figure 4 SEL-3360 as Remote Read-Only Domain Controller Performing Central Authentication Using LDAP

Disturbance Recording System for PRC-002-2

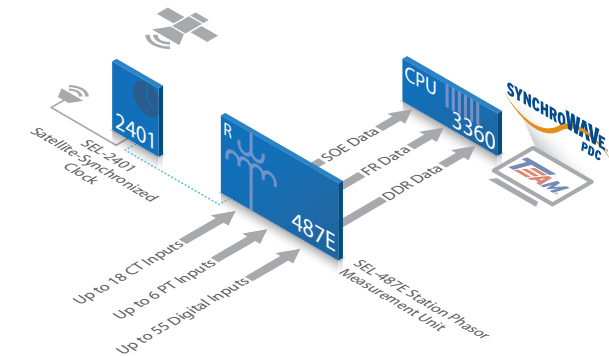


Figure 5 Reliable Hardware for Running Your Disturbance Recording System

Event Collection Applications

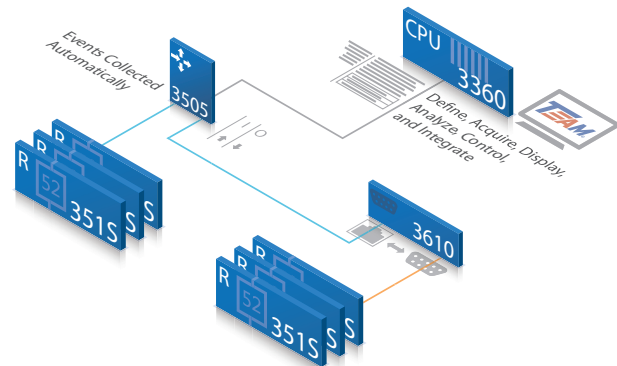
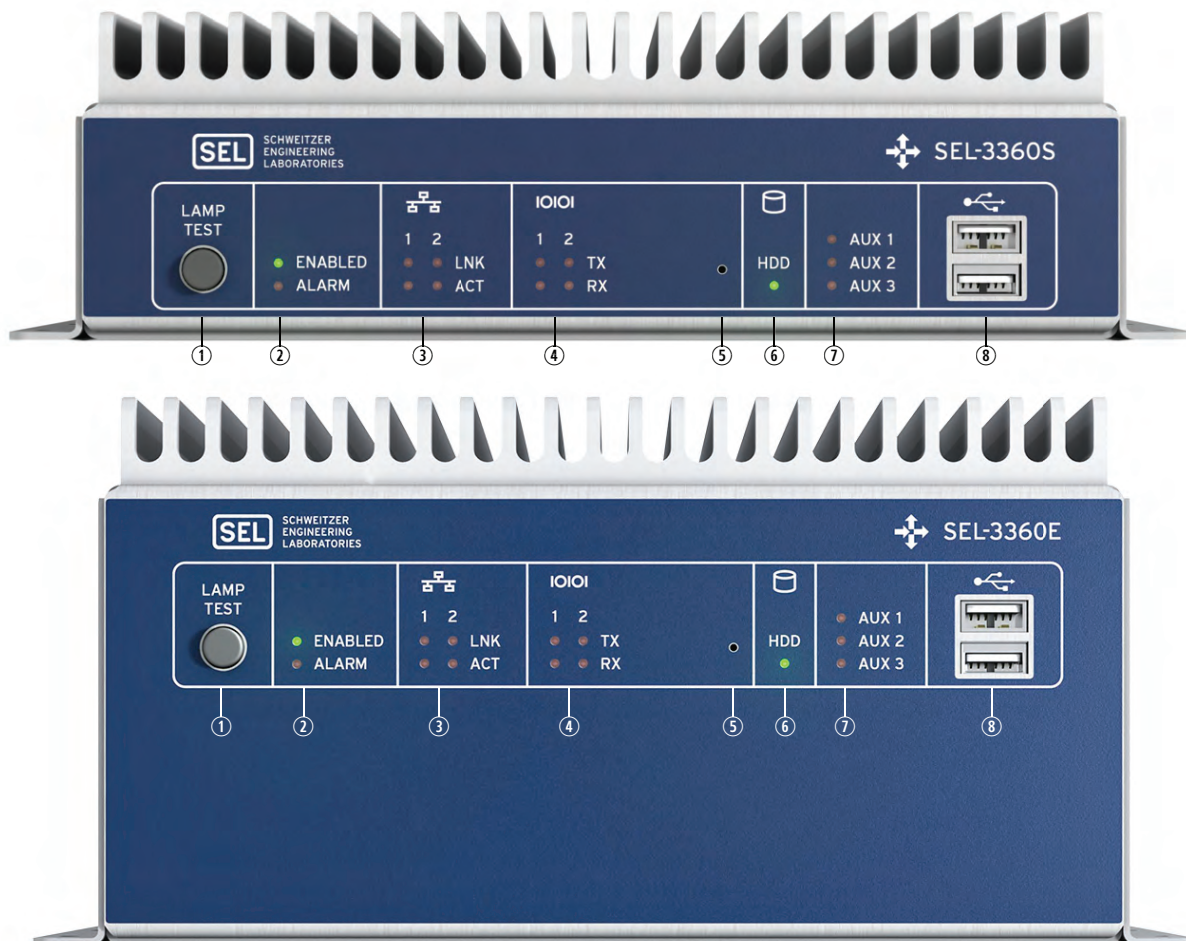


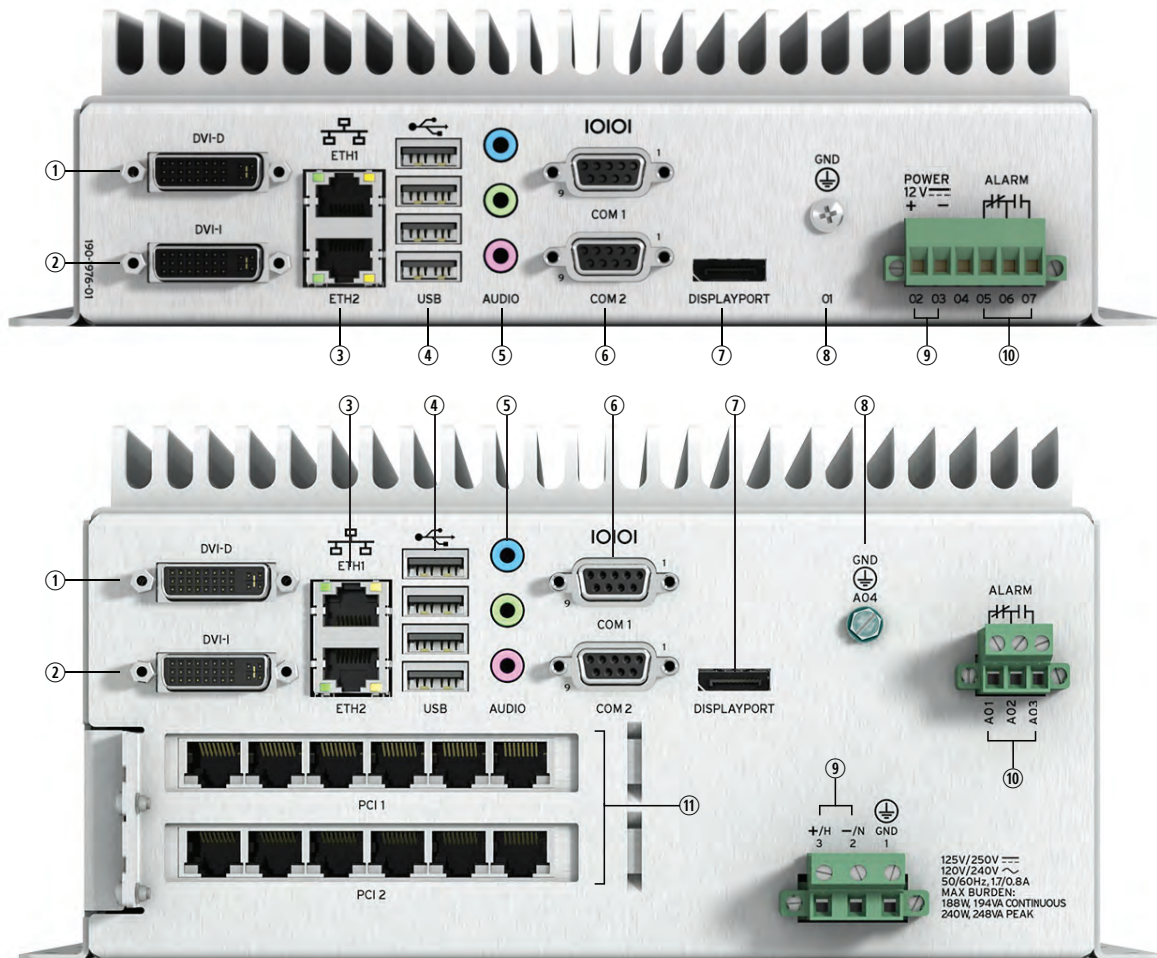
Figure 6 IED Event Collection With Optional ACCELERATOR TEAM SEL-5045 Software

Diagrams and Dimensions



- 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.

Figure 7 Front-Panel Diagram



- 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).
- ⑥ **COM1 and COM2.** Standard EIA-232 serial ports with configurable +5 Vdc power on Pin 1.
- 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

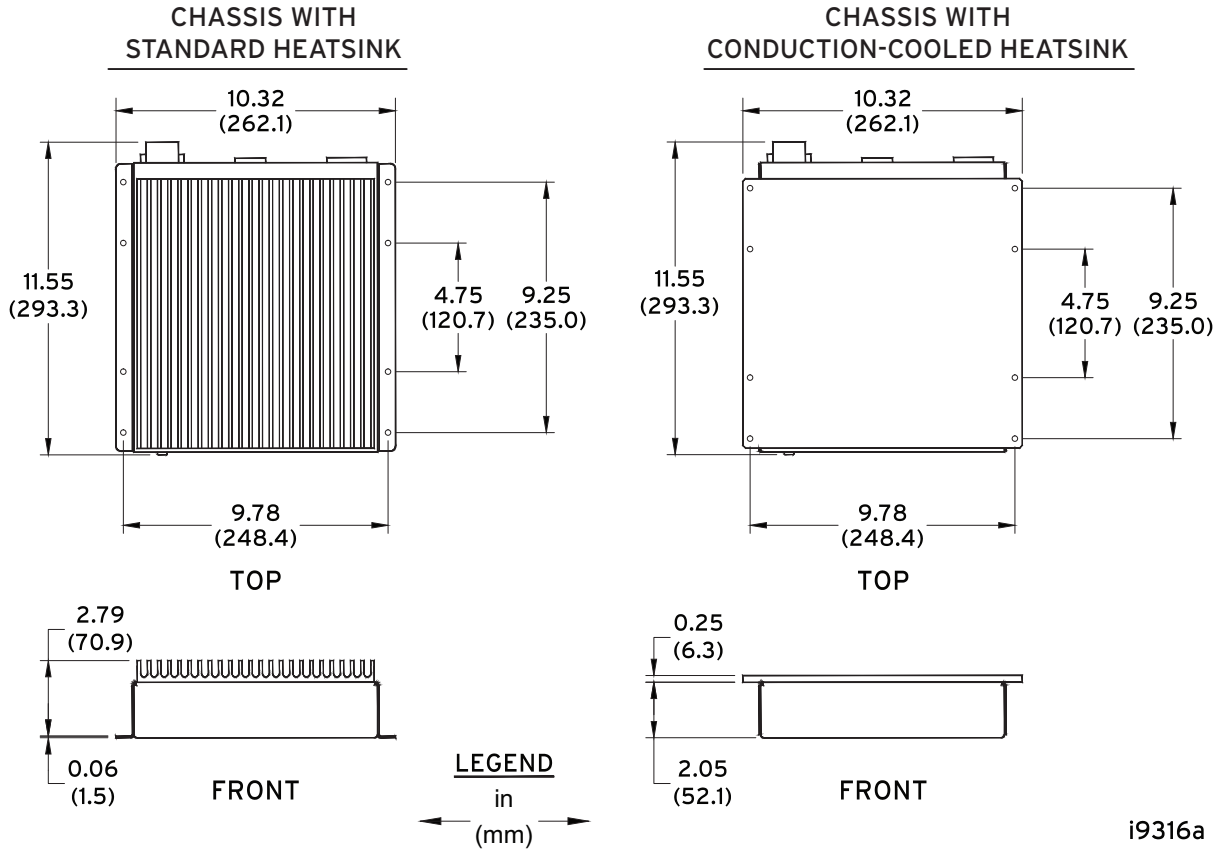


Figure 9 SEL-3360S Dimensions Diagram

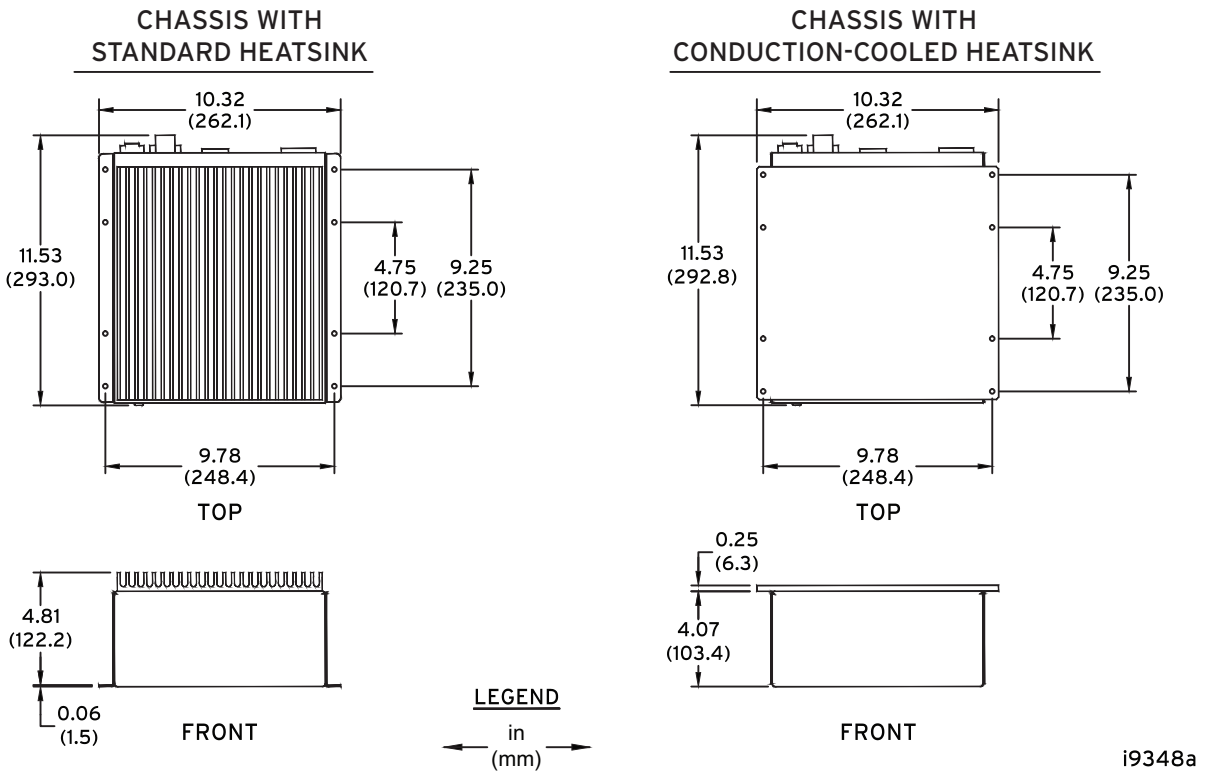


Figure 10 SEL-3360E Dimensions Diagram

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

UKCA Mark

General

Supported Operating Systems

Microsoft Windows 7
 Microsoft Windows 8/8.1
 Microsoft Windows 10*
 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 (Contact SEL for hardware and version compatibility)
 * 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: DVI-I (digital + VGA) maximum resolution 1920 x 1200 @ 32 bpp
 From 2 of the 3 Outputs: 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 Slots:
 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 RJ45 copper

ETH2: Intel 82574L, 10/100/1000 Mbps RJ45 copper

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. BR-2330A 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 SupplySee *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-9331160 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:	15.5 A peak, 48 ms duration Measured per IEC 60255-1, Section 6.10. Quiescent current level derived from 40 W input.
Insulation:	3600 Vdc
Isolated From Chassis Ground:	Yes

SEL-9331160 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:	16.6 A peak, 4 ms duration, 240 Vac 12.8 A peak, 9 ms duration, 250 Vdc Measured per IEC 60255-1, Section 6.10. Quiescent current level derived from 75 W input.
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:	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**Ground Wiring**

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 Equipment in Utility Substations:	IEC 61850-3:2013 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 61010-2-201:2013
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 FCC 15.109:2014 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 61000-4-17:1999+A1:2001+A2:2008 IEC 61000-4-29:2000
Radiated Radio Frequency:	IEC 61000-4-3:2006+A1:2007+A2:2010 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
IEC 60255-1:2009
IEC 61850-3:2013

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.

Damp Heat, Steady: IEC 60068-2-78:2012
Severity Level:
40°C, 240 hours, >93% r.h.
IEC 61850-3:2013

Dry Heat, Operational: IEC 60068-2-2:2007
Severity Level:
SEL-3360S With i7-3355LE 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

Dry Heat, Storage: IEC 60068-2-2:2007
Severity Level: 16 hours at 85°C
IEC 60255-1:2009
IEC 61850-3:2013

Free Fall: IEEE 1613-2009
Severity Level: 100 mm

Vibration: IEC 60255-21-1:1988
Severity Level:
Endurance Class 2
Response Class 2
IEC 60255-21-2:1988
Severity Level:
Shock Withstand, Bump Class 1
Shock Response Class 2
IEC 60255-21-3:1993
Severity Level:
Quake Response Class 2

Safety

Enclosure Protection: IEC 60529:1989+A1:1999
Severity Level: IP30

Dielectric Strength: 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

Impulse: IEC 60255-27:2013
IEEE C37.90-2005
Severity Level:
5 kV common mode, power supply,
contact outputs
1.5 kV Ethernet ports

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

Power Consumption ^a			
Component	Minimum	Typical	Maximum
Base System (Dual-Core CPU, 4 GB RAM, 1 SATA Drive):	15 W	25 W	40 W
Additional Consumption From Optional Components			
SEL-9331 Power Supply (standard on SEL-3360E)	+10 W	+10 W	+10 W
Quad-Core CPU:	+2 W	+5 W	+13 W
2nd RAM Module (included with 8 GB and 16 GB ordering options):	+2 W	+2 W	+3 W
2nd SATA Drive:	+1 W	+2 W	+3 W
SEL-3390E4 Ethernet Card	+6 W	+8 W	+10 W
SEL-3390S8 Serial Card	+4 W	+5 W	+7 W
Chipset Heater ^b			
cold startup (<5°C [41°F]):	N/A	N/A	+90 W
continuous operation (0°C [32°F]):	0 W	+5 W	+10 W
continuous operation (-40°C [-40°F]):	0 W	+20 W	+40 W

^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

Connection	Current Limit
DVI-I and DVI-D	0.2 A, +5 Vdc, 1 W total for both
DisplayPort	0.6 A, +3.3 Vdc, 2 W
COM1 and COM2	0.5 A, +5 Vdc, 2.5 W each
USB Ports	0.8 A, +5 Vdc, 4 W each

Technical Support

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

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