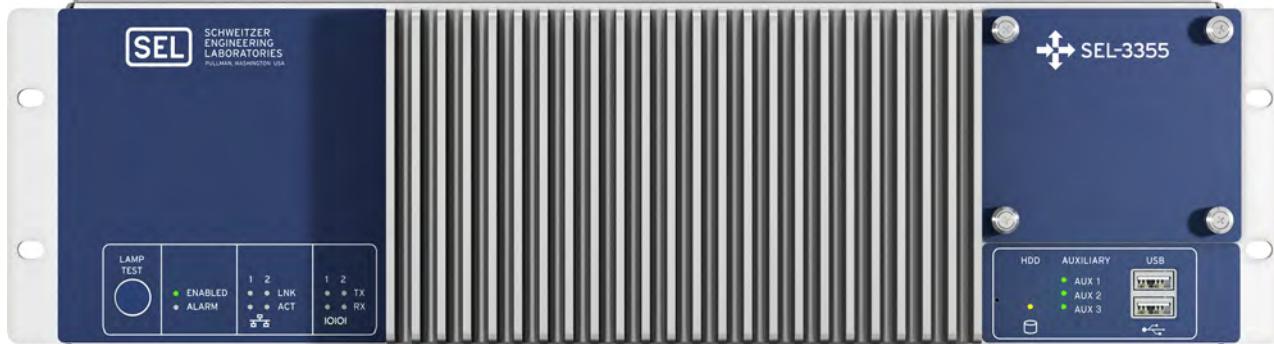


Getting Started With SEL-3355



What You Will Need

Required Items:

- SEL-3355 Automation Controller
- Power cable(s)
- Monitor with DisplayPort, DVI, or VGA cable
- USB keyboard
- USB mouse
- Phillips® screwdriver
- 1/8-inch slotted screwdriver

Optional Items:

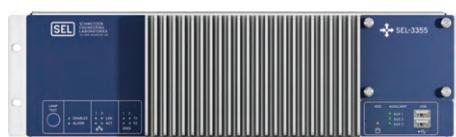
- Ethernet cable
- USB storage device
- SEL automation controller products literature and software downloads
- Video adapter (e.g., DVI-to-VGA)
- USB CD/DVD drive

What Is Included

Verify that the following items are included:



Operating System DVD
(if ordered with
Windows Server 2016)



SEL-3355

AUTOMATION CONTROLLER PLATFORM SECURITY TIPS

SEL understands the importance of security for SEL automation controller platforms. Please take a moment to review some tips to keep your automation controller platform secure. Your company computer security policy should take priority over any of these suggestions.

RECOGNIZE THAT AN SEL AUTOMATION CONTROLLER PLATFORM IS NOT A PROTECTIVE RELAY

Unlike protective relays, automation controller platforms need to have the operating system safely shut down before removing power. This shutdown will increase the reliability of your automation controller platform. If you are using SEL automation controller platforms, make sure to have a copy of the changes saved before powering the system down or those changes will not be preserved.

SECURE YOUR SYSTEM AND SET A BASELINE

SEL uses the Microsoft recommended factory defaults in securing Microsoft® Windows® based automation controller platforms. It is important to set a baseline for your system. This can be done by running a benchmark such as the Center for Internet Security (<http://benignmalwaresecurity.org>) when creating your own security baseline. Use your baseline to assess automation controller platform changes and measure risk. SEL recommends that you run a scan at least once a month.

PROTECT AGAINST MALWARE

SEL automation controller platforms are malware free from the factory, but will not stay that way without proper precautions. Antivirus and whitelisting applications help prevent infections. Antivirus applications, while effective, can cause performance issues. Whitelisting applications must be carefully configured, but require fewer updates and have little impact on performance.

RESTRICT ENTRY POINTS

USB and network shares increase your risk of malware infections and data leakage. To minimize risk, be careful about what you plug into your automation controller platform. If you must use USB or network shares, make sure to use SEL's recommended practices and research share use. SEL automation controller platforms allow selectively disabling of individual USB ports.

USE THE FIREWALL

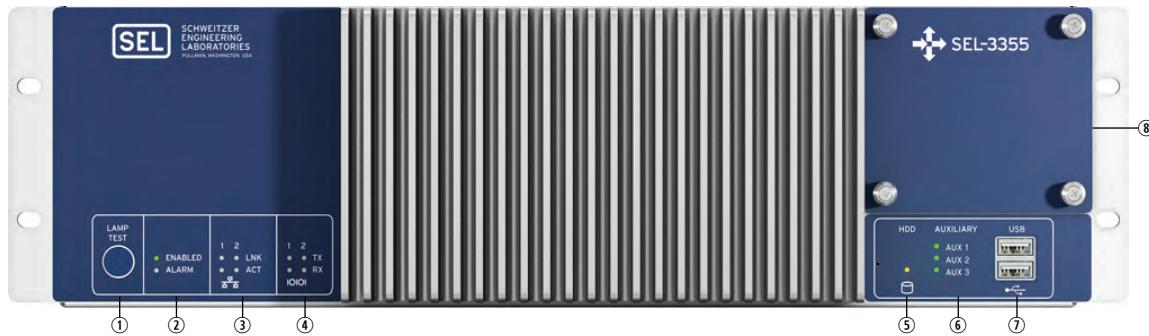
On most automation controller platforms, the firewall is enabled by default. This is the preferred setting and provides a good level of security for your automation controller platform. Ensure that the firewall is enabled, and minimize the number and scope of exceptions.

LIMIT SERVICES AND RIGHTS

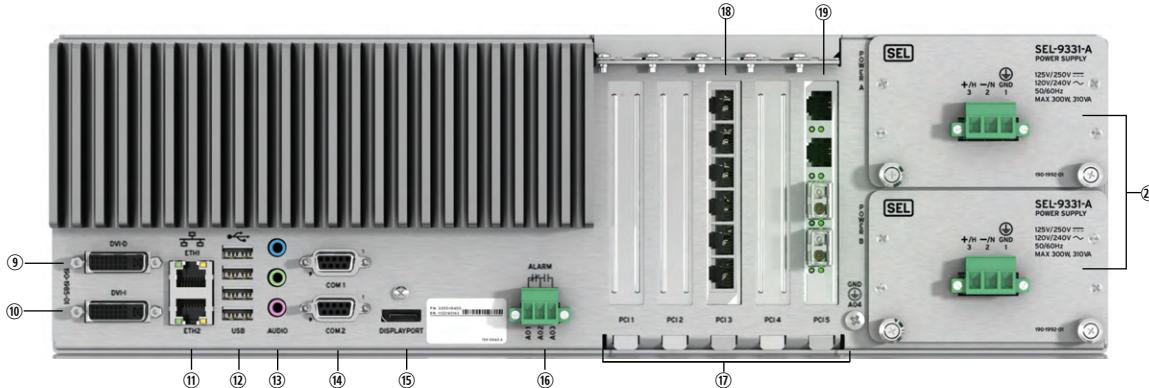
Malicious software exploits rights and services on the automation controller platform. Only enable services that are absolutely necessary. Improve automation controller platform protection by reserving administrator accounts for specific maintenance and installation tasks.

Automation Controller Platform
Security Tips

Product Overview



- 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 LEDs. Link (LNK) indicates that the port is connected and activity (ACT) indicates when data are being transmitted and received.
- ④ Serial Port LEDs. Transmit (TX) and receive (RX) LEDs indicate activity on serial ports.
- ⑤ **HDD** LED. Illuminates when SATA drives are accessed.
- ⑥ **AUXILIARY** LEDs. Three programmable, bicolor LEDs for your custom application.
- ⑦ Front **USB** Ports. Two easily accessible ports to connect USB 2.0 peripherals.
- ⑧ Drive Bay. Provides easy access for as many as four 2.5-inch SATA drives.



Introduction

The SEL-3355 is a rack-mountable rugged automation controller. It is designed to operate in extreme environments and carries the Schweitzer Engineering Laboratories ten-year worldwide warranty. The SEL-3355 has the following features:

- Intel® Core i7 processor
- Four 2.5" SATA drive bay with hot-swap and RAID capabilities
- Six USB 2.0 ports
- Five PCI expansion card slots
- Two Gigabit Ethernet interfaces
- Dual, redundant power supplies with hot-swap
- Watchdog timer for automatic recovery from system lockup

Procedure Overview

The following is a list of the primary tasks described in this guide:

- *Unpack and Setup on page 3*
- *First Boot on page 8*
- *Install Expansion Cards on page 13*
- *Install Operating System on page 14*
- *Install Applications on page 15*
- *Create a Backup With SEL BaRT on page 15*
- *Long-Term Storage on page 16*

Unpack and Setup

Verify that the correct number and type of power supplies are installed (see *Figure 1* and *Figure 2*).



Figure 1 Single Power Supply

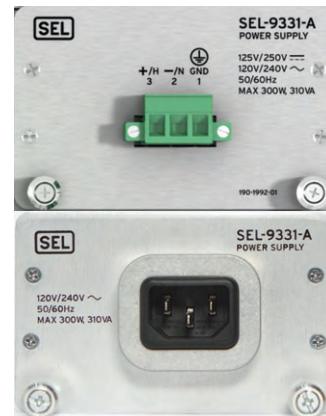


Figure 2 Dual Power Supplies

Step 1. Connect the keyboard and mouse to any of the USB ports as shown in *Figure 3*.

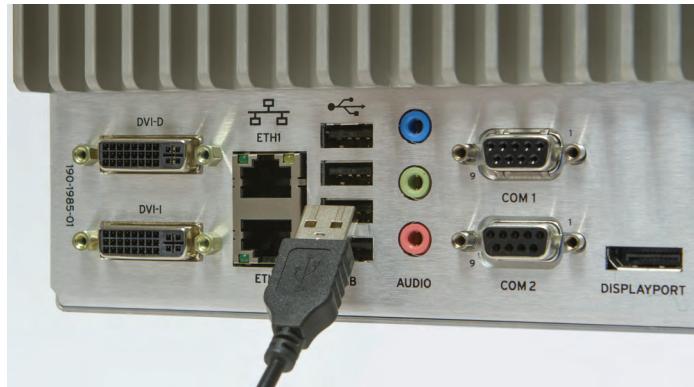


Figure 3 USB Connection

Step 2. Connect the monitor(s) to the video ports.

The SEL-3355 will support as many as two monitors. *Figure 4–Figure 6* show single monitor connections.

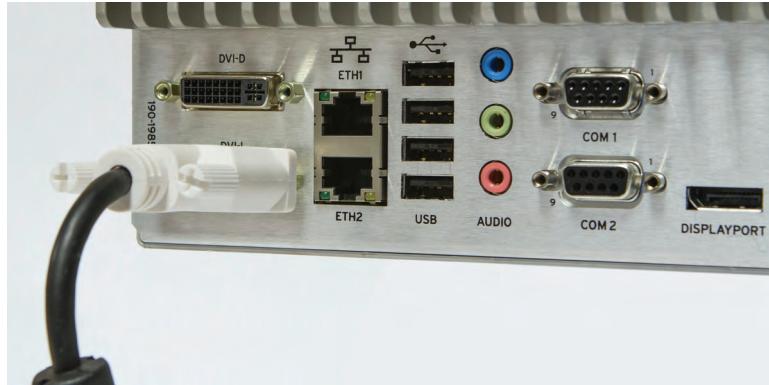


Figure 4 Single DVI Connector to DVI-I or DVI-D (DVI-I Shown)



Figure 5 Single VGA Through DVI to VGA Adapter (Must Use DVI-I Connector)



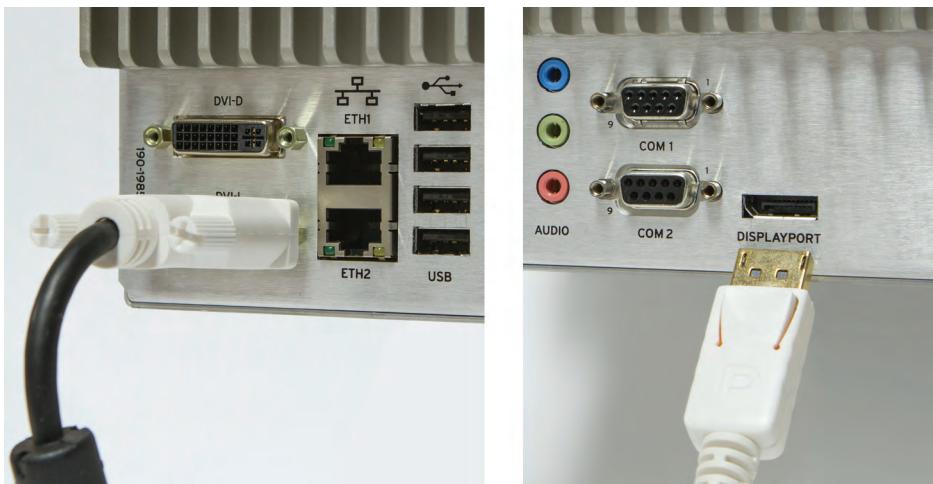
Figure 6 Single DisplayPort Connection

Figure 7 and Figure 8 show dual monitor connections.



Note: You can use a DVI-to-VGA Adapter with the DVI-I.

Figure 7 Dual DVI Connections



Note: You can use a DVI-to-VGA Adapter with the DVI-I.

Figure 8 Either DVI-I or DVI-D With DisplayPort (DVI-I Shown)

- Step 3. If you need network access, connect an Ethernet cable from a switch or router to either **ETH1** or **ETH2** as shown in *Figure 9*. Each port has two status indicator LEDs. The right LED illuminates yellow to indicate a link or connection is present. The left LED flashes green during data transfer.

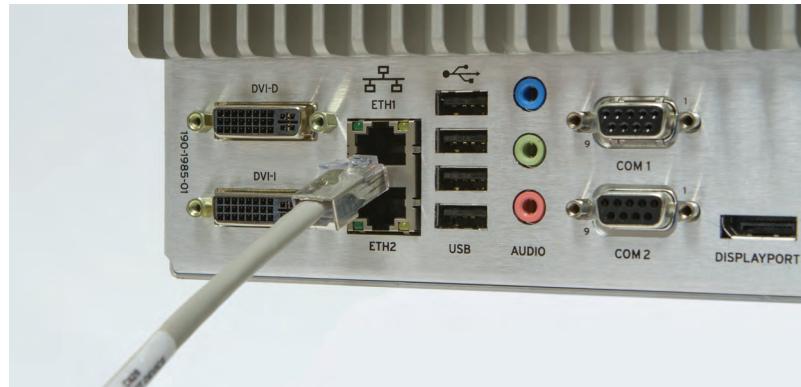


Figure 9 Ethernet Network Connection

Advanced features like Preboot eXecution Environment (PXE), Wake-on-LAN (WOL), or Intel® Active Management Technology (AMT) use **ETH1**. See the *SEL-3355 Instruction Manual* for more details.

If you need a serial port connection, the SEL-3355 has two onboard serial ports with the following specifications:

- ▶ Data rates: 300 to 115200
- ▶ Data bits: 5, 6, 7, and 8
- ▶ Parity: None, Even, Odd, Mark, and Space
- ▶ Stop Bits: 1 or 2

You can connect to serial ports **COM 1** or **COM 2** as shown in *Figure 10*.



Figure 10 Serial Port Connections

If more serial ports are needed, you can use the SEL-3390S8 expansion card to expand the serial capabilities of the SEL-3355.

- Step 4. If you connect the Alarm contact, connect wires to the compression terminal block by using a 1/8-inch slotted screwdriver as shown in *Figure 11*.

The Alarm contact can be wired to accommodate normally closed or normally open protection schemes as shown in *Figure 12* and *Figure 13*.



Figure 11 Wiring Compression Terminal Block

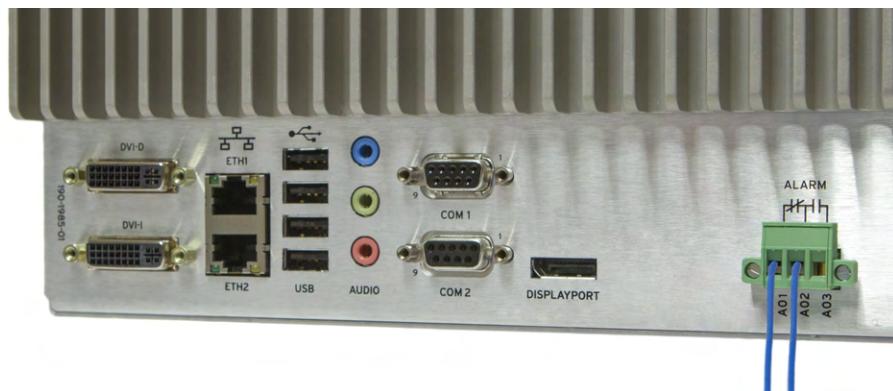


Figure 12 Normally Closed



Figure 13 Normally Open

The SEL-3355 can be powered by a single power supply, and has the option of being powered by two redundant power supplies. Look at the labeling on the rear panel of each power supply to determine the rated input voltage (see *Figure 14*).

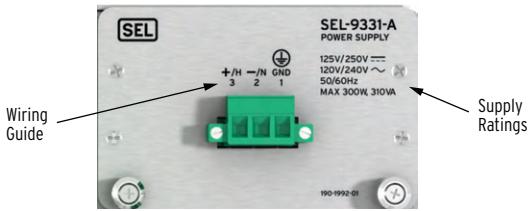


Figure 14 Wiring Guide and Supply Ratings

- Step 5. Use a 1/8-inch slotted screwdriver to wire the power cable to the supplied compression terminal block, as indicated by the wiring guide on the back of the power supply (see *Figure 14*).
- Step 6. Attach the compression terminal block to the power supply as shown in *Figure 15*.

Note: Removing the compression terminal block from the back of the automation controller will disconnect power from it. Do not remove it unless you intend to turn off the device.



Figure 15 Attach Compression Terminal Block to Power Supply

- Step 7. If you ordered dual power supplies, connect the second power supply the same way as the first.

Note: The second power supply can have different input requirements than the first (see *Figure 14* for location of supply ratings).

First Boot

For SEL-3355 With Microsoft Windows or Windows Server®

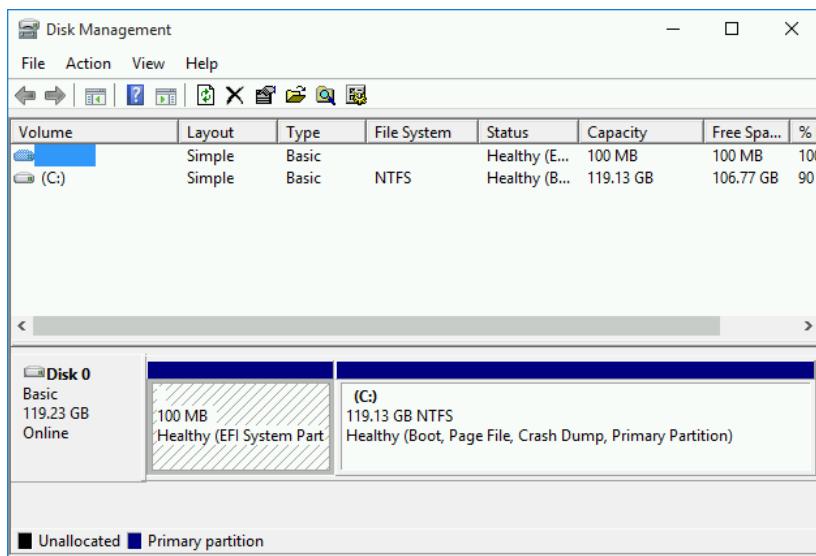
Upon first boot, the SEL-3355 may require you to perform some initial steps to configure Microsoft® Windows® operating system, such as creating a user account and password. After completing the Windows configuration, you should check the system to verify that all SATA drives are installed and correctly configured, and all hardware and software packages are installed.

Perform the following steps to verify that the correct number of SATA hard drives is installed:

- Step 1. Click the **Start** button, type **partition** in the box, and then select **Create and format hard disk partitions**.



- Step 2. The User Account Control may ask for confirmation that you understand the program being launched can be used to make changes to the automation controller. Click **Yes**, or provide your account credentials, to indicate that it is acceptable to proceed.
- Step 3. In the lower pane of the **Disk Management** window, verify that there is a disk listed (e.g., Disk 0, Disk 1, etc.) for each SATA drive ordered with the system.



- Step 4. If any of the SATA drives that were ordered with the automation controller are not displayed, open the SATA drive bay on the front panel of the SEL-3355 and verify that they are installed.



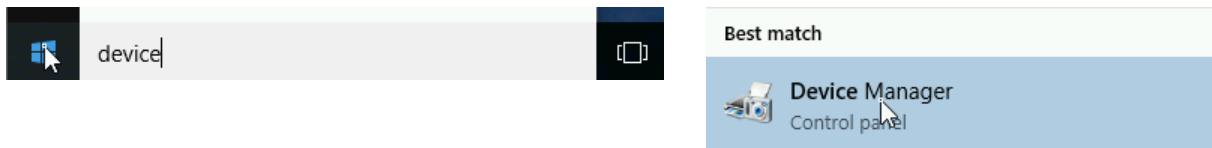
- Step 5. If all drives are installed, turn off the SEL-3355. Then pull out and reinstall each drive one at a time, ensuring that they are firmly inserted.

Step 6. Restore power to the SEL-3355 and verify that all drives are now present in the **Disk Management** application.

If any of the drives are not present after performing this step, contact your customer service representative for further assistance.

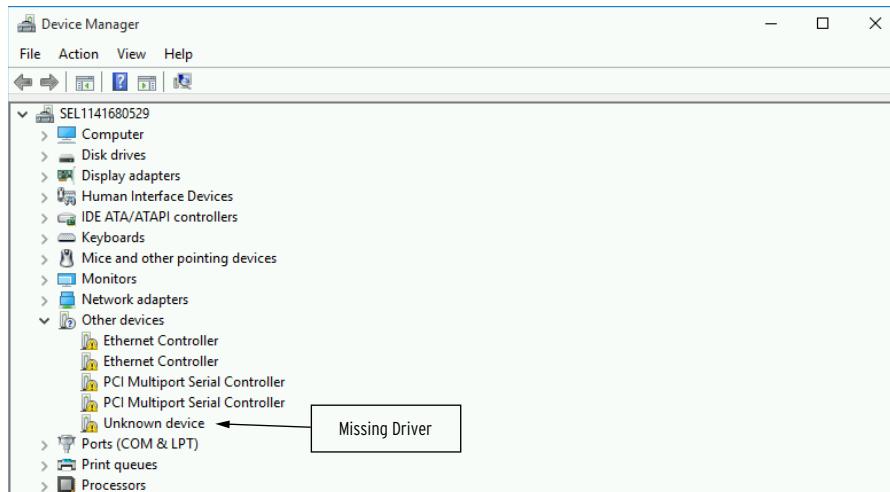
Perform the following steps to verify that all the hardware is correctly installed in the SEL-3355:

Step 1. Click the **Start** button, type **device** in the box, and then select **Device Manager**.



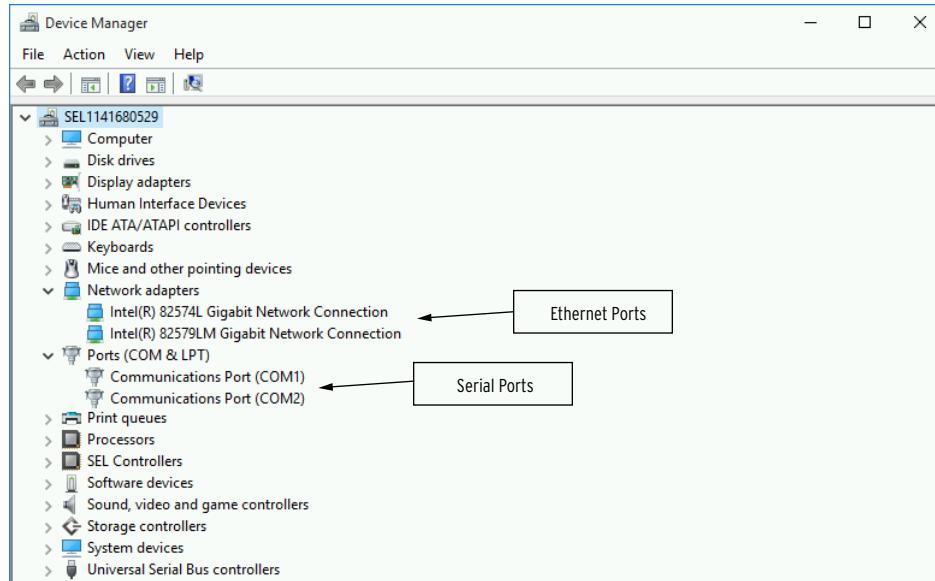
Step 2. The User Account Control may ask for confirmation that you understand the program being launched can be used to make changes to the automation controller. Click **Yes**, or provide your account credentials, to indicate that it is acceptable to proceed.

Step 3. In the **Device Manager** window, verify that there are no missing device drivers by opening **Other devices**, if it is present, and ensuring that there are no **Unknown device** listings. If there are unknown devices listed, then there are device drivers that are not installed. All drivers that are nondefault Microsoft drivers are included on the Literature and Software DVD. For assistance in identifying which driver to install, contact your SEL customer service representative.



Step 4. Click on **Network adapters** and **Ports (COM & LPT)** to verify that the correct number of serial and Ethernet ports are listed.

Note: The number of ports will depend on ordering options.



Perform the following steps to verify that all the software packages ordered with the SEL-3355 have been installed:

- Step 1. Click the **Start** button, type **installed programs** in the box, then select **Show which programs are installed on your automation controller**.



- Step 2. The User Account Control may ask for confirmation that you understand the program being launched can be used to make changes to the automation controller. Click **Yes**, or provide your account credentials, to indicate that it is acceptable to proceed.
- Step 3. Verify that all the software packages ordered with the automation controller are listed.

For an SEL-3355 With No Operating System

If the SEL-3355 does not have a bootable operating system installed, it will boot to an EFI Shell similar to the following figure.

```

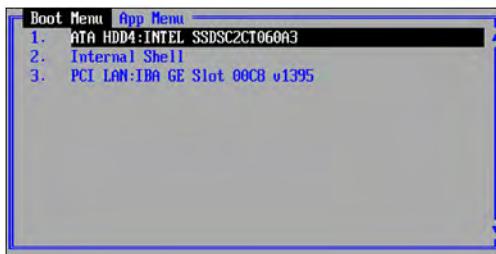
EFI Shell version 2.31 [25769808436.22136]
Current running mode 1.1.2
Device mapping table
blk0 :BlockDevice - Alias (null)
      Acpi (PNP0A03,0)/Pci(1F12)/Sata(4,0,0)

Press ESC in 1 seconds to skip startup.nsh, any other key to continue.
Shell> -

```

Perform the following steps to verify that all the SATA drives are installed:

- Step 1. Type **exit** to enter the **Boot Menu**.
- Step 2. In the Boot Menu, verify that there is an ATA HDDx entry for each SATA drive (where x in HDDx can be 1–4).



Step 3. Perform *Step 4 on page 9* through *Step 6 on page 10* if any of the expected SATA drives are not listed.

Install Expansion Cards

Note: Perform the steps in this section if you have an expansion card to install in the SEL-3355.

The SEL-3355 has expansion card slots to accommodate PCI Express (PCIe) and legacy PCI cards. To install additional PCIe/PCI devices, perform the following steps:

Step 1. Remove power to the SEL-3355 and remove the top cover.

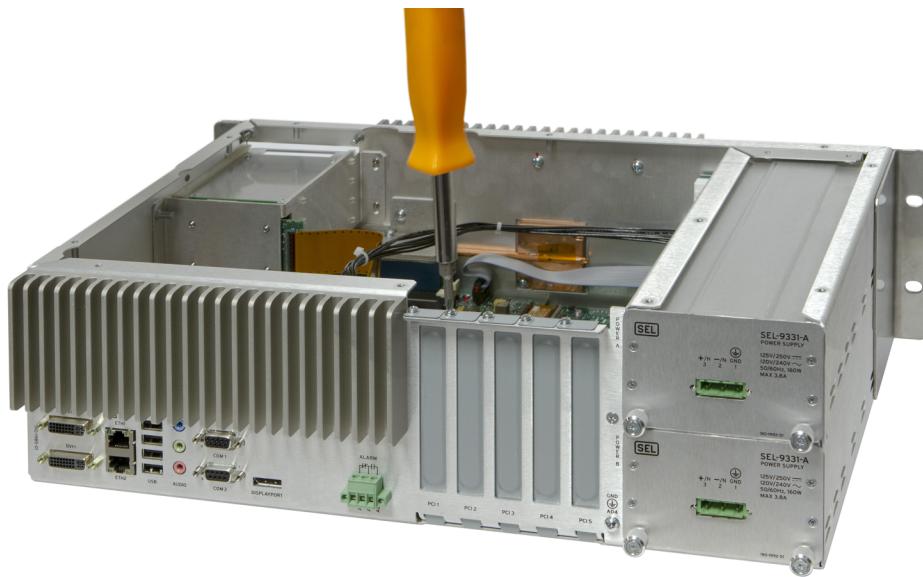


Step 2. Remove the cover plate from the slot where the expansion card is to be installed.

Note: Expansion cards can be installed in any slot large enough to accommodate them.

CAUTION

Equipment components are sensitive to electrostatic discharge (ESD). Undetectable permanent damage can result if you do not use proper ESD procedures. Ground yourself, your work surface, and this equipment before removing any cover from this equipment. If your facility is not equipped to work with these components, contact SEL about returning this device and related SEL equipment for service.



- Step 3. Ensure that the expansion card is completely inserted into the slot before securing it to the case of the SEL-3355 with the retaining screw.



- Step 4. Replace the SEL-3355 top cover.

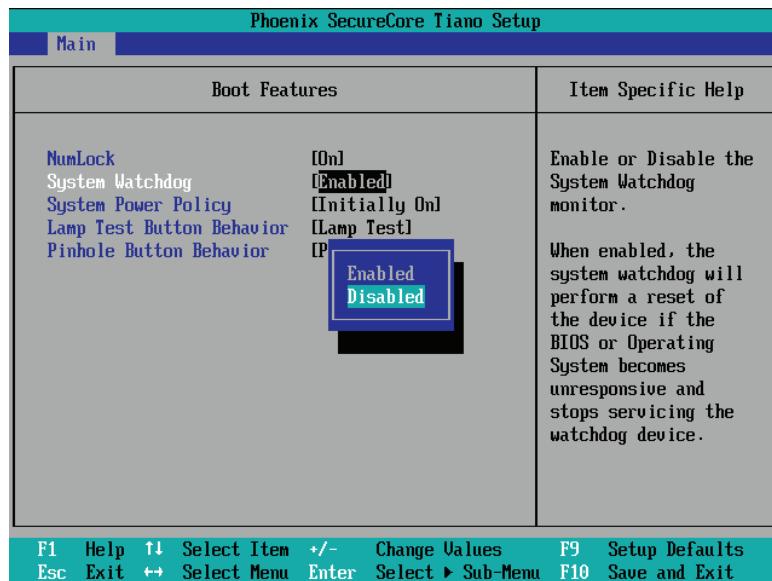
Refer to the documentation included with the expansion card for any additional instructions, such as software or driver installation.

Install Operating System

Note: Perform the steps in this section if you want to install an operating system on the SEL-3355.

Before you can install the operating system, you must disable the watchdog timer. Perform the following steps to disable the watchdog timer:

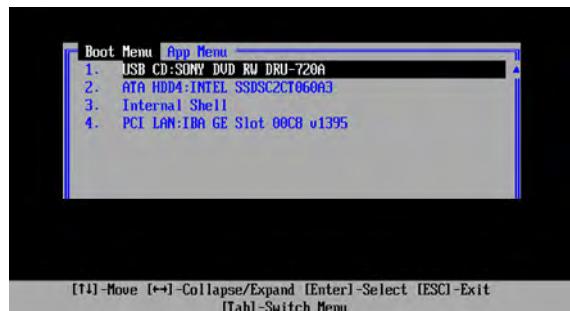
- Step 1. Enter the BIOS setup utility by pressing **F2** immediately after applying power to the system.
- Step 2. Navigate to the **Boot Features** subform on the **Main** tab.
- Step 3. Select **System Watchdog** and press **<Enter>**.
- Step 4. Select **Disabled**, press **F10** to save settings, and then select **Yes**.



Most operating systems are distributed on DVD media. To install the operating system from a DVD, perform the following steps:

- Step 1. Attach the external DVD-ROM drive to the USB port on the SEL-3355.
- Step 2. Insert the installation DVD into the DVD-ROM drive and start/restart the SEL-3355. The SEL-3355 should start from the DVD automatically.
- Step 3. Follow the installation instructions included with the operating system.
- Step 4. If the SEL-3355 fails to start from the DVD, restart the system and immediately press **F5** to load the **Boot Menu**.
- Step 5. Verify that the DVD-ROM drive is listed as a boot option. If it is present, select it by using the up/down keys and press <Enter>.

Note: If the DVD-ROM drive fails to boot when selected, then the DVD is not bootable. If the DVD reader is not listed among the boot devices, then the reader is not compatible with the SEL-3355 firmware.



When the operating system installation is complete, install any SEL System Monitor (SysMon) and SEL drivers that are available for the installed operating system. Refer to the literature and software downloads for more information about which operating systems have SysMon and driver packages.

Install Applications

Note: Perform the steps in this section if you have additional applications to install in the SEL-3355.

If the application is distributed on CD or DVD, you will need an external DVD-ROM drive. The SEL-3355 can connect to an external USB DVD-ROM drive.

If the installer is a file or set of files, the simplest method of transferring these files to the SEL-3355 is to use a USB drive. Take precautions to ensure that the SEL-3355 is not infected with malware during the process of transferring files. Scanning the USB drive with an up-to-date antivirus package prior to plugging the drive into the SEL-3355 is highly recommended.

Create a Backup With SEL BaRT

It is highly recommended to create a backup of the SEL-3355 once the system is fully configured. A copy of the SEL Backup and Recovery Tool (SEL BaRT) may be downloaded from the SEL BaRT download page at <https://selinc.com/selbart/>. SEL BaRT provides an easy method of making a backup of an entire disk and storing it in a single file on a USB drive. For further information, please refer to the SEL BaRT application guide on the SEL BaRT download page at <https://selinc.com/selbart/>.

Long-Term Storage

The SEL-3355 has a battery to maintain its internal real-time clock. If the unit is not plugged in for a long period of time (e.g., in excess of a year) this battery may become depleted. It is recommended that the battery be replaced if the SEL-3355 has been in storage for longer than one year.

Factory Assistance

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

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