

# Non-display Industrial Computers

Catalog Numbers 6177R-M4AXP, 6177R-M4PXP, 6177R-M4SXP, 6177R-R4PXP, 6177R-R4SXP, 6177R-R4LXP, 6177R-M4AS3RD, 6177R-R4AS3RD, 6177R-M3PXP, 6177R-M3PXPDC, 6177R-M3AS3



## Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.



**WARNING:** Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.



**ATTENTION:** Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.

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### IMPORTANT

Identifies information that is critical for successful application and understanding of the product.

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Labels may also be on or inside the equipment to provide specific precautions.



**SHOCK HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.



**BURN HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.



**ARC FLASH HAZARD:** Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

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This manual contains new and updated information. Changes throughout this revision are marked by change bars, as shown to the right of this paragraph.

### New and Updated Information

This table contains the changes made to this revision.

Topic	Page
Expanded Abbreviations table	10
Updated 'Chapter Objectives' section	11, 25, 39, 43, 61
Added link to Rockwell Automation Product Compatibility and Download Center (PCDC) website	11, 71
Removed 'Multilingual User-interface CD Pack' section	12
Reduced what compact discs (CDs) are shipped with computer in 'Parts List' section	13
Removed 'Accessories and Replacement Parts' section	23
Moved existing information into 'Installation Precautions' section	26
Added information in 'Installation Guidelines' section	27
Updated information in 'Mounting Clearance Requirements' section	27
Moved existing installation and mounting information into 'Install the Computer' section	29
Revised and added information in 'Install the Computer' subsections	30
Moved existing AC and DC power information into 'Connect Power' section	35
Added information in 'Connect AC Power' section	35
Added information in 'Functional Ground Screw' section	37
Added information in 'Connect to a Network' section	37
Added information in 'Start the Computer' section	40
Replaced 'reset' with 'restart' in 'Restart the Computer' section	41
Updated and added information in 'Shut Down the Computer' section	42
Updated link to Rockwell Automation Computers and Operators Interface website	43, 67
Moved existing cover removal information into 'Remove the Cover' section	46
Moved existing cover reinstall information into 'Reinstall the Cover' section	47
Added 'Drive Precautions' section	48
Moved existing HDD replace information into 'Replace or Install a Drive' section	48
Moved existing add-in card install information into 'Install Add-in Cards' section	53
Revised and added information in 'Replace or Add Memory Modules' section	58
Added 'Hardware Monitoring' section	61
Added information in 'Troubleshooting' section	62
Added information in 'Diagnostic Utility' section	64
Added 'Clear the CMOS' section	65
Changed title and added Specifications column to Table 1	67
Added Turkey RoHS statement in Certifications table	69
Revised information in 'Upgrade the BIOS from a CD Drive' section	71
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**Notes:**

## Preface Objectives

This preface covers the following topics:

- [Purpose of This Manual](#)
- [Additional Resources](#)
- [Abbreviations](#)

## Purpose of This Manual

This manual is a user guide for non-display industrial computers. It provides procedures to the following:

- Install the computer.
- Make computer connections.
- Operate the computer.
- Troubleshoot the computer.

## Additional Resources

These documents contain additional information to related products from Rockwell Automation.

Resource	Description
Industrial Non-display Computers Installation Instructions, publication <a href="#">6177R-IN001</a>	Provides information on mounting the non-display computers inside a machine or in a rack.
Cloning Utility for Rockwell Automation Industrial Computers Technical Data, publication <a href="#">6000-TD002</a>	Provides information on how to create and restore a back-up image of your computer's hard disk drive.
Industrial Automation Wiring and Grounding Guidelines, publication <a href="#">1770-4.1</a>	Provides general guidelines for installing a Rockwell Automation® industrial system.

You can view or download publications at <http://www.rockwellautomation.com/literature>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

## Abbreviations

This publication can use the following abbreviations.

Abbr	Meaning
ACPI	Advanced configuration (and) power interface
AHCI	Advanced host controller interface
AMI	American Megatrends, Inc.
AMT	Active management technology
BIOS	Basic input/output system
CF	CompactFlash
CPU	Central processing unit
CMOS	Complementary metal oxide semiconductor
COM	Communication (serial port interface)
CRC	Cyclic redundancy clock
DDR	Double data rate (RAM)
DIMM	Dual in-line memory module
DVI	Digital video interface
DVMT	Dynamic video memory technology
ECC	Error correcting code
EEA	European Environment Agency
EMC	Electromagnetic compatibility
EOS	Embedded operating system
ESD	Electrostatic discharge
EWf	Enhanced write filter
FAT	File allocation table
HDD	Hard disk drive
HORM	Hibernate once, resume many
IDE	Integrated device electronics
IEC	International Engineering Consortium
IGD	Intel graphics driver
KVM	Keyboard video mouse
LAN	Local area network
NEMA	National Electrical Manufacturers Association
ODD	Optical disk drive

Abbr	Meaning
PCB	Printed circuit board
PCDC	Product Compatibility and Download Center
PCH	Platform control hub
PCI	Peripheral component interconnect
PCIe	Peripheral component interconnect express
PEG	PCI express graphics
PELV	Protective extra-low voltage
PERR	PCI parity error
POST	Power on self test
PSU	Power supply unit
PXE	Pre-boot execution environment
RAID	Redundant array (of) independent disks
RAM	Random access memory
RIUP	Remove or insert under power
RMS	Root-mean-square
RTC	Real-time clock
SAS	Serial attached SCSI
SATA	Serial advanced technology attachment
SCSI	Small computer system interface
SELV	Safety extra-low voltage
SERR	PCI signal error
SPD	Serial presence detect
SSD	Solid-state drive
TFT	Thin film transistor
UEFI	Universal extensible firmware interface
USB	Universal serial bus
UPS	Uninterruptible power source
VBAT	Voltage (battery)
VDDR	Voltage (DDR RAM)
VGA	Video graphics array

## Features

### Chapter Objectives

This chapter provides information on the following topics:

- [Computer Overview](#)
- [Operating Systems](#)
- [Computer Options](#)
- [Before You Begin](#)
- [Parts List](#)
- [Hardware Features](#)

### Computer Overview

Non-display industrial computers run operations from small visual interface and maintenance applications to large control and information applications. Combine an industrial display with the 650R (catalog number 6177R-M3), 750R (catalog number 6177R-M4), or 1450R (catalog number 6177R-R4) computer to complete your system.

These computers are available with standard, performance, and advanced features. They come standard with a selection of I/O ports for peripheral connections and expansion slots.

### Operating Systems

The following Microsoft-licensed operating systems are available:

- Windows Server 2003 R2, Service Pack 2
- Windows XP Professional, Service Pack 3

No operating system updates have been applied to the factory image beyond the service packs.

The I386 source directory for Microsoft Windows is on the system drive of your computer off the root directory, C:\I386. This allows for easy removal and addition of Windows components.

Computers with HDDs include a recovery partition with the original factory image. Refer to the Cloning Utility for Rockwell Automation Industrial Computers Technical Data, publication [6000-TD002](#), for instructions.

To obtain a copy of a factory system image, contact your local technical support center or access the Rockwell Automation Product Compatibility and Download Center (PCDC) at <http://www.rockwellautomation.com/support/pcdc.page>.

## Computer Options

This table summarizes the options available for non-display industrial computers. A comparative summary of features for the computers is in Appendix A, [Specifications on page 67](#).

Cat. No.	Model	Form Factor	Package	Windows OS
6177R-R4PXP	1450R	4U rack mount	Performance	XP Professional SP3
6177R-R4LXP			Legacy	
6177R-R4SXP			Standard	
6177R-R4AS3RD			Server	Server 2003 SP2 <sup>(1)</sup>
6177R-M3PXP	650R	—	Performance	XP Professional SP3
6177R-M3PXPDC				
6177R-M3AS3		M3 Machine mount	Advanced	Server 2003 SP2
6177R-M4AXP	750R	M4 Machine mount		XP Professional SP3
6177R-M4PXP			Performance	
6177R-M4SXP			Standard	
6177R-M4AS3RD			Server	Server 2003 SP2 <sup>(1)</sup>

(1) RAID-enabled.

## Before You Begin

Before unpacking the computer, inspect the shipping carton for damage. If damage is visible, immediately contact the shipper and request assistance. Otherwise, proceed with unpacking.

Keep the original packing material in case you need to return the computer for repair or transport it to another location. Use both inner and outer packing cartons to provide adequate protection for a computer returned for service.

## Parts List

The computers ship with the following items.

Item	Description
Hardware	<ul style="list-style-type: none"> <li>• Power cord for AC power models</li> <li>• Mounting hardware               <ul style="list-style-type: none"> <li>– Rack handles for 1450R computers</li> <li>– Mounting brackets for 650R computers</li> <li>– Mounting brackets for 750R computers</li> <li>– Mounting fasteners</li> </ul> </li> <li>• Keys for door lock for 1450R computers</li> <li>• Assembly screw bag</li> <li>• Industrial Computer System Cloning Utility CD (red)</li> <li>• CD with CD/DVD burning software<sup>(1)</sup></li> </ul>
Documents	<ul style="list-style-type: none"> <li>• Non-display Industrial Computers Installation Instructions, publication <a href="#">6177R-IN001</a></li> <li>• Shipped Compact Discs (CDs) Update Release Note, publication <a href="#">6000-RN009</a></li> <li>• China RoHS hazardous material table insert</li> <li>• Production test report</li> </ul>

(1) Shipped only with Performance models; see the table in [Computer Options on page 12](#) for more information.

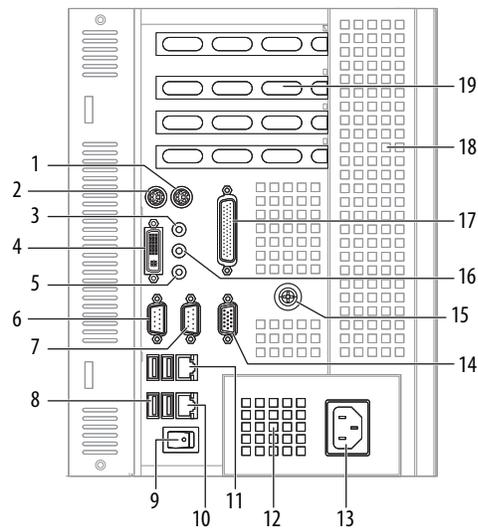
## Hardware Features

The illustrations in this section show the hardware features of each computer:

- Exterior views
  - Front panel
  - Rear panel
  - Side panel (650R)
- Status indicators
- System boards
  - Motherboard
  - Front panel board
  - HDD adapter boards
  - PCI expansion board
  - RAID controller board on systems with the Windows 2003 Server

## 650R Computer

Figure 1 - Side Panel

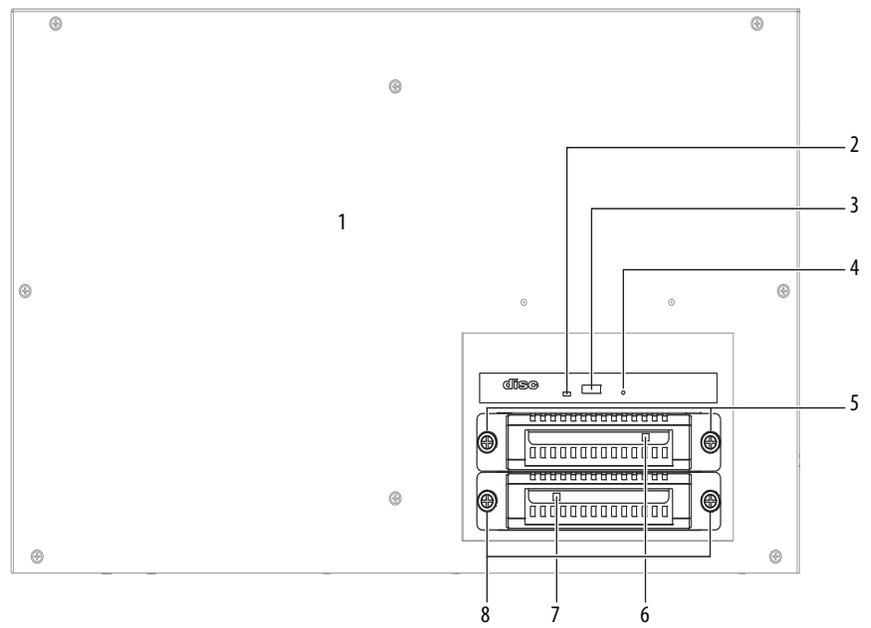


Item	Component
1	PS/2 mouse port
2	PS/2 keyboard port
3	Microphone-in jack
4	DVI-I port <sup>(1)</sup>
5	Line-in jack
6	COM 1
7	COM 2
8	USB ports, 4
9	Power switch
10	LAN port 2

Item	Component
11	LAN port 1
12	PSU fan
13	Power input, AC
14	HD-15 (VGA) port
15	Functional ground screw
16	Line-out jack
17	Parallel port
18	Ventilation slots
19	Expansion slot covers, 4

(1) Use a DVI to HD-15 adapter connector to connect to the analog interface. This connector is not included with the computer's shipped contents.

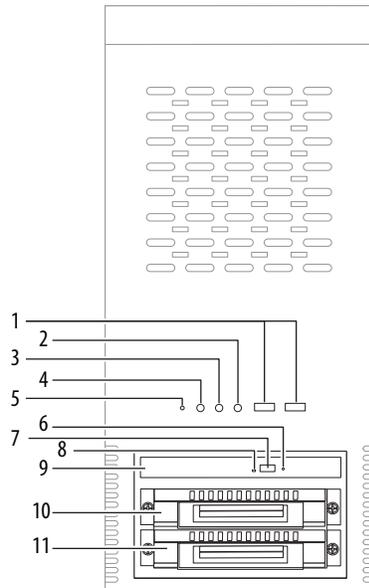
**Figure 2 - Rear Panel**



Item	Component
1	Rear cover
2	ODD activity indicator
3	ODD eject button
4	ODD mechanical eject hole
5	HDD 2 bay captive thumbscrews
6	HDD 2 bay
7	HDD 1 bay
8	HDD 1 bay captive thumbscrews

## 750R Computer

Figure 3 - Front Panel

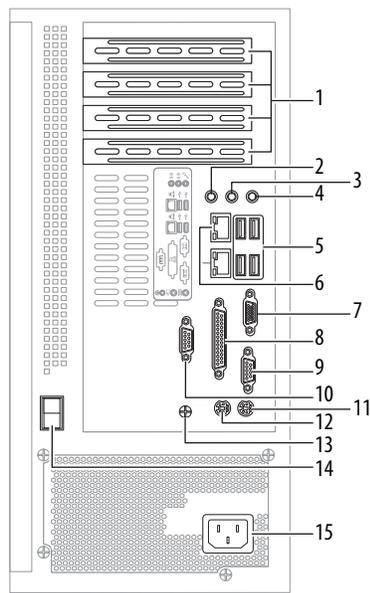


Item	Icon	Component
1		Front USB ports
2		System health status indicator
3		Disk drive access status indicator
4		Power status indicator
5		Reset button
6		ODD mechanical eject hole
7		ODD eject button
8		ODD access indicator
9		ODD
10		HDD bay <sup>(1)</sup>
		HDD <sup>(2)</sup>
11		HDD <sup>(2)</sup>

(1) HDD bay shipped empty for optional, second HDD.

(2) Computers with the Windows Server 2003 operating system ship with two HDDs installed that are configured for RAID 1 operation.

**Figure 4 - Rear Panel**

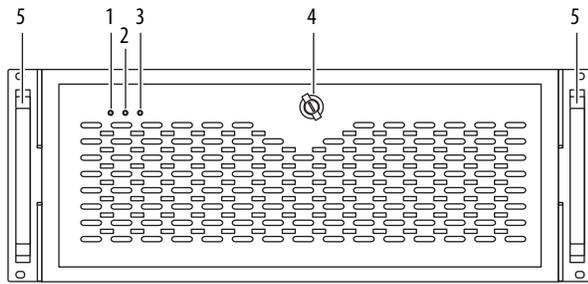


Item	Icon	Component
1		PCI expansion slot covers, 4
2		Line-in jack (light blue)
3		Line-out jack (lime)
4		Microphone-in jack (pink)
5		USB ports, 4
6		Gigabit LAN ports, 2
7		External VGA port (blue)
8		Parallel port (burgundy)

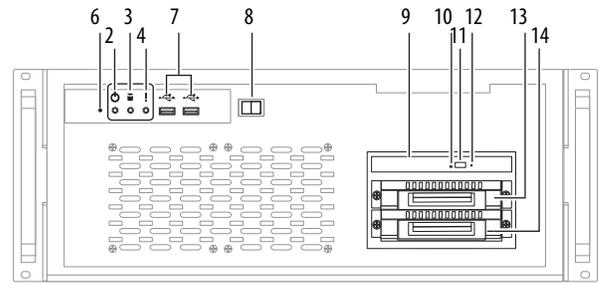
Item	Icon	Component
9		Serial COM2 port (aqua)
10		Serial COM1 port (light blue)
11		PS/2 keyboard port (purple)
12		PS/2 mouse port (green)
13		Functional ground screw
14		Power switch
15		Power input, AC

# 1450R Computer

Figure 5 - Front Panel



With Door Closed



With Door Open

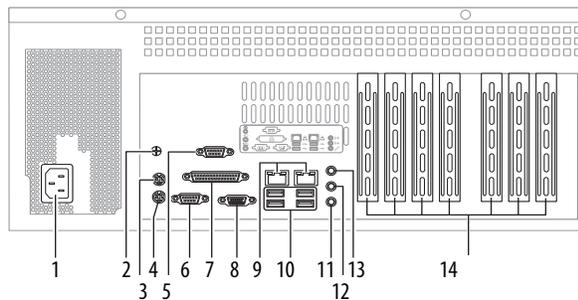
Item	Icon	Component
1		Power status indicator
2		Disk drive access status indicator
3		System health status indicator
4		Door lock
5		Rack handle

Item	Icon	Component
6		Reset button
7		USB ports, 2
8		Power switch
9		ODD
10		ODD access status indicator

Item	Icon	Component
11		ODD eject button
12		ODD mechanical eject hole
13		HDD bay <sup>(1)</sup> HDD <sup>(2)</sup>
14		HDD <sup>(2)</sup>

- (1) Second HDD is optional for computers with operating systems other than Windows Server 2003.
- (2) Computers with the Windows Server 2003 operating system ship with two HDDs, both configured for RAID 1 operation.

Figure 6 - Rear Panel



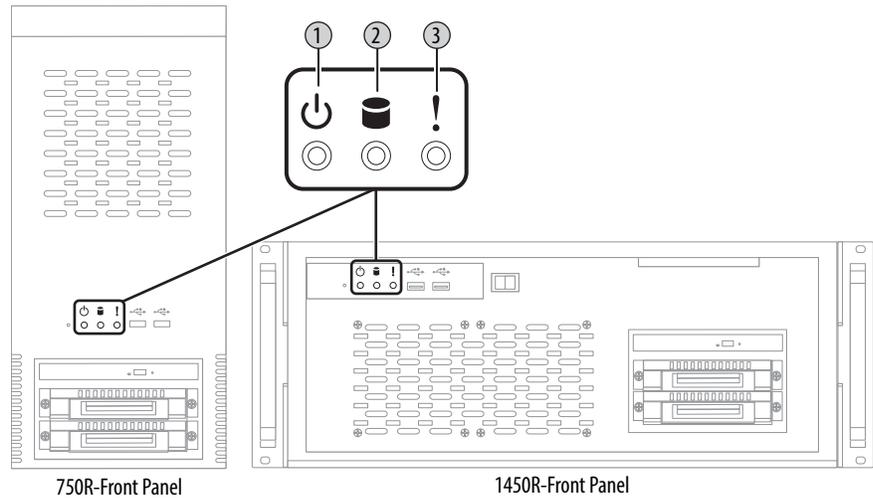
Item	Icon	Component
1		Power input, AC
2		Functional ground screw
3		PS/2 mouse port (green)
4		PS/2 keyboard port (purple)
5		Serial COM1 port (light blue)
6		Serial COM2 port (aqua)
7		Parallel port (burgundy)

Item	Icon	Component
8		External VGA port (blue)
9		Gigabit LAN ports
10		Rear USB ports
11		Microphone-in jack (pink)
12		Line-out jack (lime)
13		Line-in jack (light blue)
14		PCI expansion slot covers, 7

## Status Indicators

There are three status indicators on the front panel of the 750R and 1450R computers. These indicators aid in issue diagnosis by providing status information of different system components.

The 650R computer does not have status indicators.

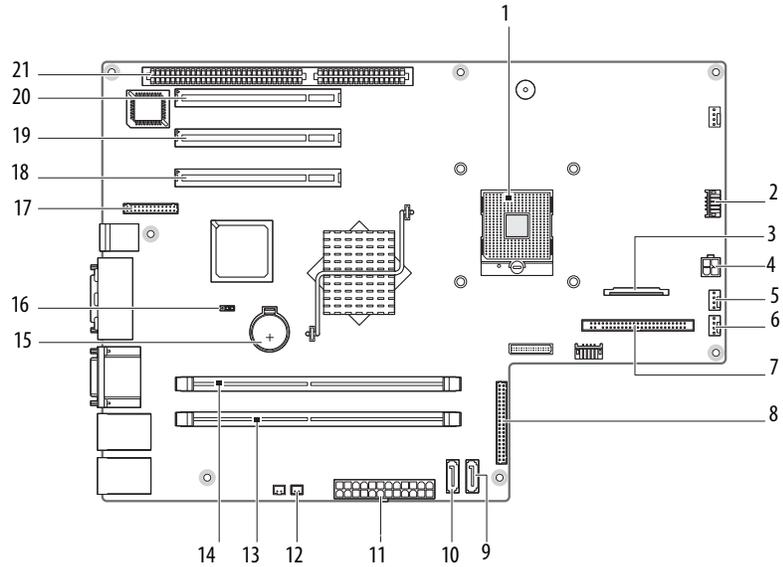


Item	Icon	Indicator	Status	Description
1		Power status	Green	The computer is operating.
			Flashing orange	The computer is in Standby mode.
			Off	The computer is off.
2		Disk drive access status	Flashing red	HDD or ODD activity.
			Off	No HDD or ODD activity.
3		System health status	Red	The computer's temperature threshold has been exceeded.
			Off	System health is normal.

## System Boards

The illustrations in this section show the system board layouts for the computers. The 750R and 1450R computers share the same set of system boards except for the PCI expansion board, which is available only on 1450R computers.

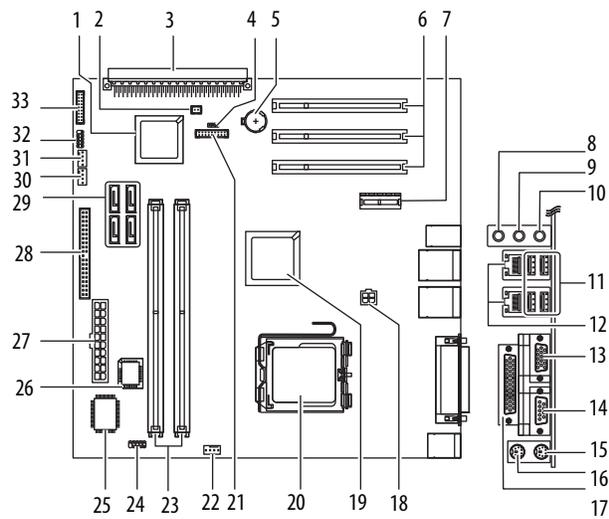
**Figure 7 - 650R Motherboard**



Item	Component
1	LGA775 processor socket
2	Reserved for USB port connector
3	FDD cable connector
4	ATX12V power connector
5	Heat sink fan connector
6	System fan connector
7	ODD cable connector
8	Keypad cable connector
9	SATA 2 cable connector
10	SATA 1 cable connector
11	ATX power connector

Item	Component
12	Power switch cable connector
13	DIMM 1 slot
14	DIMM 2 slot
15	RTC battery socket
16	Clear CMOS jumper
17	Parallel port cable connector
18	PCI 3 expansion slot
19	PCI 2 expansion slot
20	PCI 1 expansion slot
21	ISA expansion slot

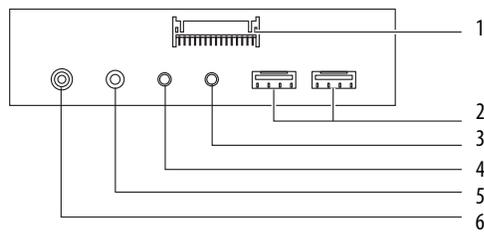
**Figure 8 - 750R/1450R Motherboard**



Item	Component
1	Intel ICH6 chipset (south bridge)
2	Power switch cable connector
3	PCI expansion board connector
4	Clear CMOS jumper
5	RTC battery
6	PCI expansion slots
7	PCI-Express expansion slot
8	Line-in jack
9	Line-out jack
10	Microphone-in jack
11	Rear USB ports
12	Gigabit LAN ports
13	External VGA port
14	Serial port (COM2)
15	PS/2 keyboard port
16	PS/2 mouse port
17	Parallel port

Item	Component
18	ATX12V power connector
19	Intel 915GV chipset (north bridge)
20	LGA775 processor socket
21	Diagnostic card connector
22	Heatsink fan connector
23	DDR-II DIMM slots
24	COM1 cable connector
25	Super I/O controller
26	BIOS EPROM chip
27	System board power connector
28	ODD cable connector
29	SATA cable connectors
30	System fan 2 connector
31	System fan 1 connector
32	Internal USB connector
33	Front panel board cable connector

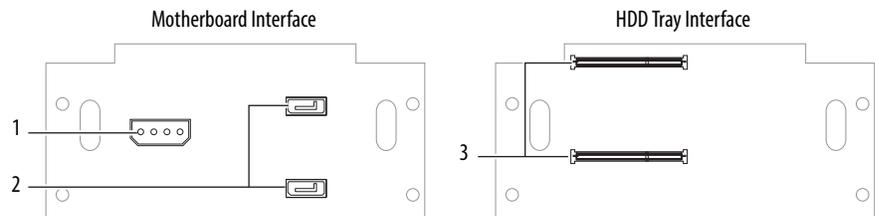
**Figure 9 - Front Panel Board**



Item	Component
1	Front panel board cable connector
2	USB ports
3	System health indicator

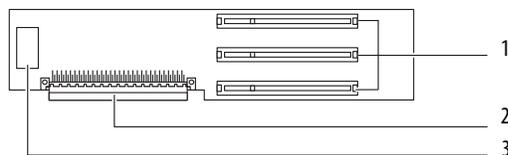
Item	Component
4	Disk drive access indicator
5	Power status indicator
6	Reset button

**Figure 10 - HDD Adapter Board**



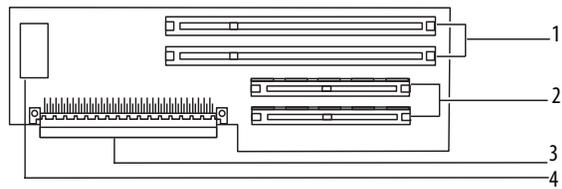
Item	Component
1	Legacy power connector
2	SATA cable connectors
3	Serial data interface connectors

**Figure 11 - PCI Expansion Board (1450R, catalog number 6177R-R4)**



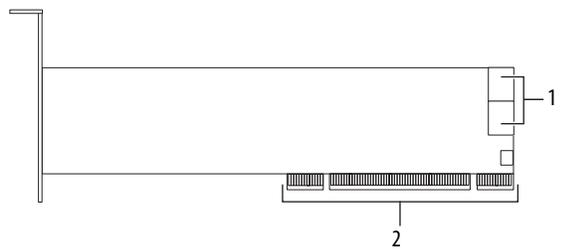
Item	Component
1	PCI expansion slots
2	Motherboard connector
3	PCI expansion board power connector

**Figure 12 - ISA Expansion Board (1450R, catalog number 6177R-R4LXP) Legacy Product Only**



Item	Component
1	ISA expansion slots
2	PCI expansion slots
3	Motherboard connector
4	PCI expansion board power connector

**Figure 13 - RAID Controller Board (catalog number 6177R-M4AS3RD or 6177R-R4AS3RD)**



Item	Component
1	SATA cable connectors
2	PCI slot connector

**Notes:**

## Installation

### Chapter Objectives

This chapter provides information on the following topics:

- [Installation Precautions](#)
- [Installation Guidelines](#)
- [Mounting Clearance Requirements](#)
- [Mounting Hardware](#)
- [Computer Dimensions](#)
- [Required Tools](#)
- [Install the Computer](#)
- [Connect Peripherals](#)
- [Connect Power](#)
- [Functional Ground Screw](#)
- [Connect to a Network](#)

Review each mounting type and computer dimensions before installing.

## Installation Precautions

Read and follow these precautions before installing the computer.

### Environment and Enclosure Information



**ATTENTION:** This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC 60664-1), at altitudes up to 2000 m (6561 ft) without derating.

This equipment is considered Group 1, Class A industrial equipment according to IEC/CISPR 11. Without appropriate precautions, there can be potential difficulties ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbance.

This equipment is supplied as open type equipment. The interior of the enclosure must be accessible only by the use of a tool. UL Listed equipment need not be mounted inside another enclosure. Subsequent sections of this publication can contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

In addition to this publication, see the following:

- Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#), for additional installation requirements
- NEMA Standards 250 and IEC 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure

### European Union Compliance

This computer meets the European Union Directive requirements when installed within the European Union or EEA regions and have the CE mark. A copy of the declaration of the conformity is available at <http://www.rockwellautomation.com/certification>.



**ATTENTION:** This computer is intended to operate in an industrial or control room environment, which uses some form of power isolation from the public low-voltage mains. Some computer configurations cannot comply with the EN 61000-3-2 Harmonic Emissions standard as specified by the EMC Directive of the European Union. Obtain permission from the local power authority before connecting any computer configuration that draws more than 75 W of AC power directly from the public mains.

To comply with EN 55024, the Ethernet port LAN cable must be only used indoors. All other I/O cables must be less than 3 m (9.84 ft) and only used indoors.

## Installation Guidelines

Follow these guidelines to make sure your computer provides safe and reliable service:

- The installation site must have sufficient power.



**ATTENTION:** To maintain an electrically safe installation, AC powered computers must be plugged into a grounded outlet.

- In dry environments, static charges can build up easily. Proper grounding of the computer helps to reduce static discharges, which can cause shock and damage electronic components.
- The enclosure must allow sufficient space around air inlets and outlets to provide the circulation necessary for cooling. See [Mounting Clearance Requirements on page 27](#) for further information. Never allow air passages to become obstructed.
- The ambient air temperature must not exceed the maximum operating temperature specified in [Table 3 on page 68](#). Consider a user-supplied fan, heat exchanger, or air conditioner for heat generated by other devices in the enclosure.

**TIP** Hot air rises. The temperature at the top of the enclosure is often higher than the temperature in other parts of the enclosure, especially if air is not circulating.

**IMPORTANT** The computer can operate at a range of extremes. However, the life span of any electronic device is shortened if you continuously operate the computer at its highest rated temperature.

- The humidity of the ambient air must not exceed limits specified in [Table 3 on page 68](#) and must avoid condensation.
- The enclosure or cover must remain in place at all times during operation. The cover provides protection against high voltages inside the computer and inhibits radio-frequency emissions that can interfere with other equipment.

## Mounting Clearance Requirements

When selecting an installation site for the computers, allow a minimum of 76 mm (3 in.) clearance at the front and rear of the computer for adequate ventilation and cable connections.

**IMPORTANT** Because of self-heating, do not operate the computer in an enclosure with the minimum clearances unless adequate ventilation or other cooling methods are used to lower the temperature within the enclosure.

Allow enough clearance to easily install or remove peripheral components, such as internal drives.

## Mounting Hardware

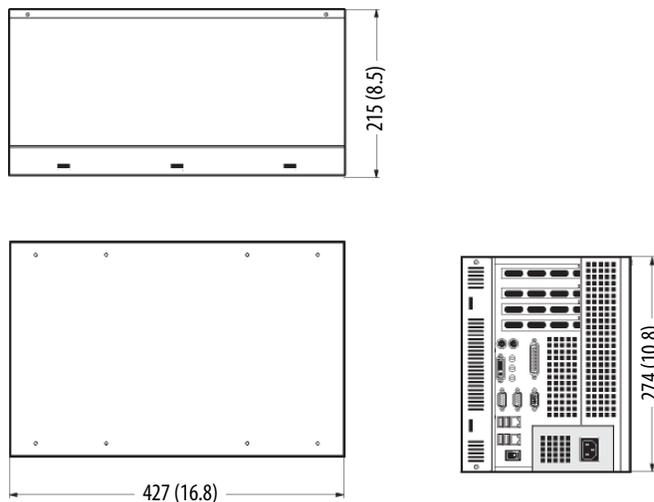
The table lists the hardware required for each type of installation.

Description	Cat. No.	Mounting Type	Supplied with computer?	Applies to	Cat. No.
Mounting brackets (2)	N/A	Machine or wall	Yes	650R	6177R-M3PXP 6177R-M3PXPDC 6177R-M3AS3
				750R	6177R-M4AXP 6177R-M4PXP 6177R-M4SXP 6177R-M4AS3RD
Rack handles (2)	N/A	Rack	Yes	1450R	6177R-R4PXP 6177R-R4SXP 6177R-R4LXP 6177R-R4AS3RD

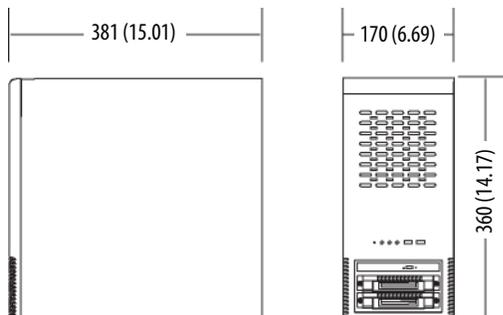
## Computer Dimensions

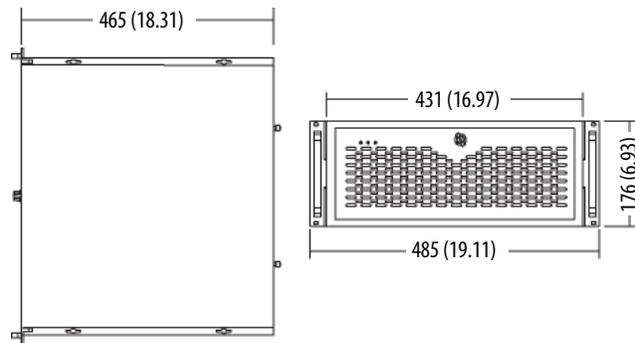
Review computer dimensions to estimate the clearance necessary for computer installation. Dimensions are given in mm (in.).

**Figure 14 - 650R Computers (catalog number 6177R-M3)**



**Figure 15 - 750R Computers (catalog number 6177R-M4)**



**Figure 16 - 1450R Computers (catalog number 6177R-R4)**

## Required Tools

These tools are required for computer installation:

- #2 cross-head screwdriver
- Slot-head screwdriver
- Drill motor and drill bit
- Antistatic wrist strap

## Install the Computer

The computers support the following mounting options:

- Machine or wall mount (for 650R and 750R models)
- Rack mount (for 1450R models)

## Mount the 650R Computer

You can mount the 650R computer on any flat surface, such as a shelf inside a machine or against a wall, by using mounting brackets. Holes are provided on one side of the computer for side mounting installation.

**TIP** For ease of installation, use two or more people to install the computer.

Follow these steps to mount the 650R computer.

1. Verify that the mounting location provides adequate space for cables and air flow.

See [Mounting Clearance Requirements on page 27](#) for recommended allowances.

2. Decide where you will locate the mounting brackets (the bottom side for an upright installation or the side for a wall installation).

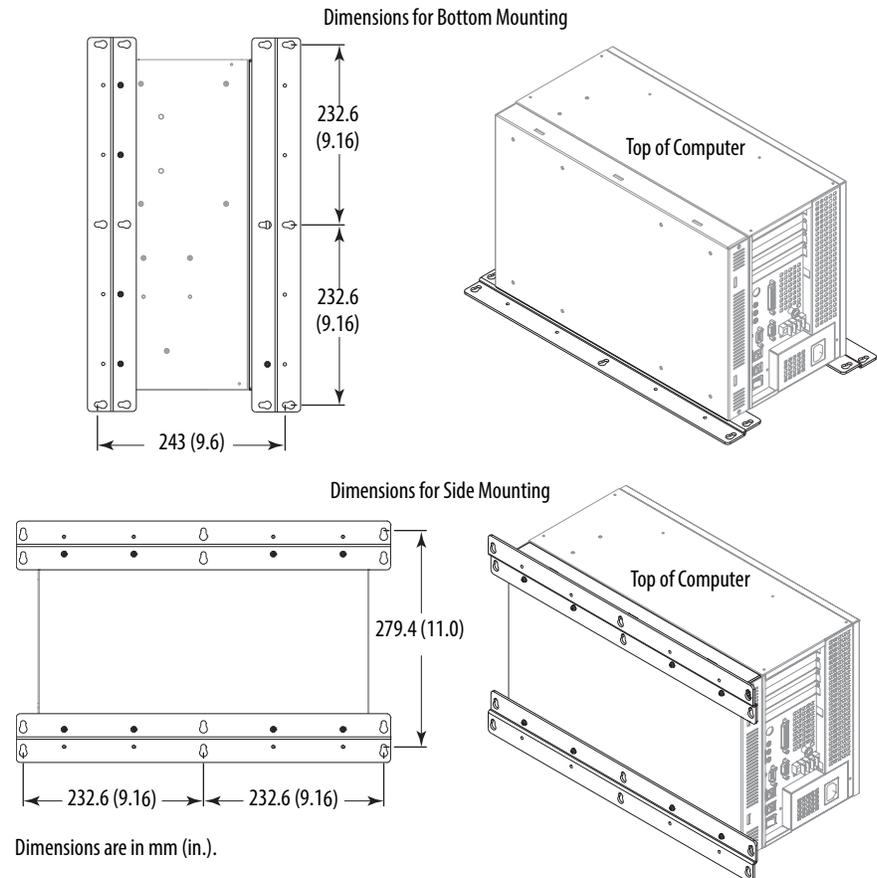
3. Attach each mounting bracket to the computer with four screws.

Torque the screws to 1.3 N•m (12.1 lb•in).

4. Depending on your application, drill holes in the wall or shelf to accommodate screws sized M5 or larger.

5. Fasten the computer to the wall or shelf with M5 or larger screws.

**Figure 17 - Mounting Dimensions for 650R Computer**



## Mount the 750R Computer

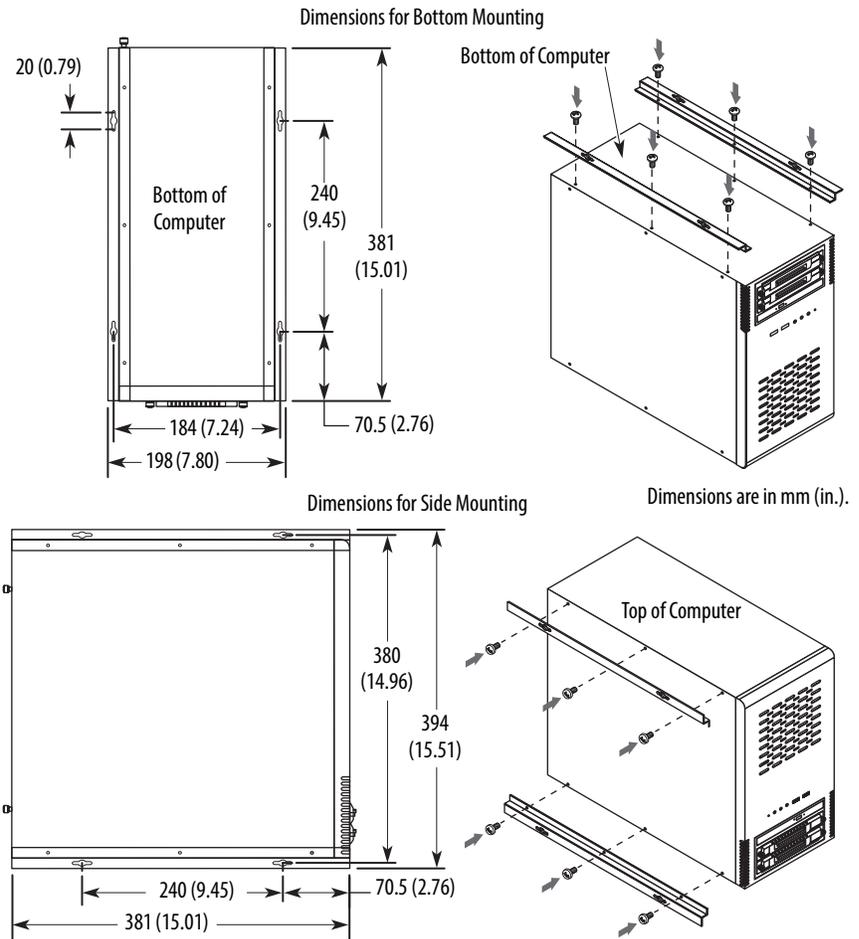
You can mount the 750R computer on any flat surface, such as a shelf inside a machine or against a wall, by using mounting brackets. Holes are provided on both sides of the 750R computer for side mounting installation.

**TIP** For ease of installation, use two or more people to install the computer.

Follow these steps to mount the 750R computer.

1. Verify that the mounting location provides adequate space for cables and air flow.  
See [Mounting Clearance Requirements on page 27](#) for recommended allowances.
2. Decide where you will locate the mounting brackets (the bottom side for an upright installation or the side for a wall installation).
3. Attach each mounting bracket to the computer with four screws.  
Torque the screws to 1.3 N•m (12.1 lb•in).
4. Depending on your application, drill holes in the wall or shelf to accommodate screws sized M6...M8.
5. Fasten the computer to the wall or shelf with M6...M8 mounting screws.

**Figure 18 - Mounting Dimensions for 750R Computer**



### Mount the 1450R Computer in a Rack Cabinet

You can install the 1450R computer in a rack cabinet that conforms to EIA standards for equipment with 483 mm (19 in.) wide panels. The rack cabinet must accommodate the computer's 4U height and depth, and also provide rear clearance for cables and air flow. A rack cabinet with a depth of 610 mm (24 in.) is sufficient.

The computer must be supported by rack slides or fastened to a shelf. The four flanges of the computer are intended to only secure the computer horizontally to the front mounting rails of the rack cabinet.

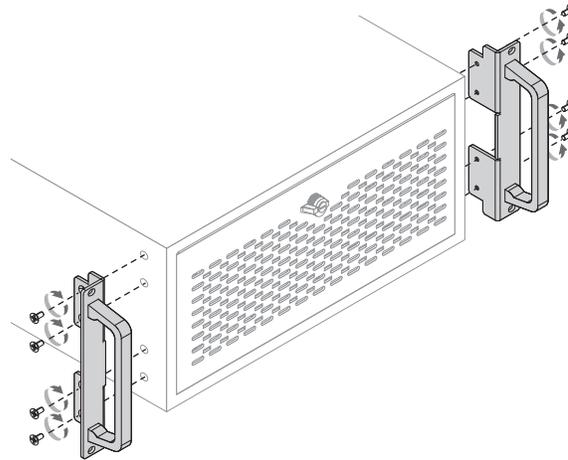
**TIP** For ease of installation, use two or more people to install the computer.

Follow these steps to mount the 1450R computer.

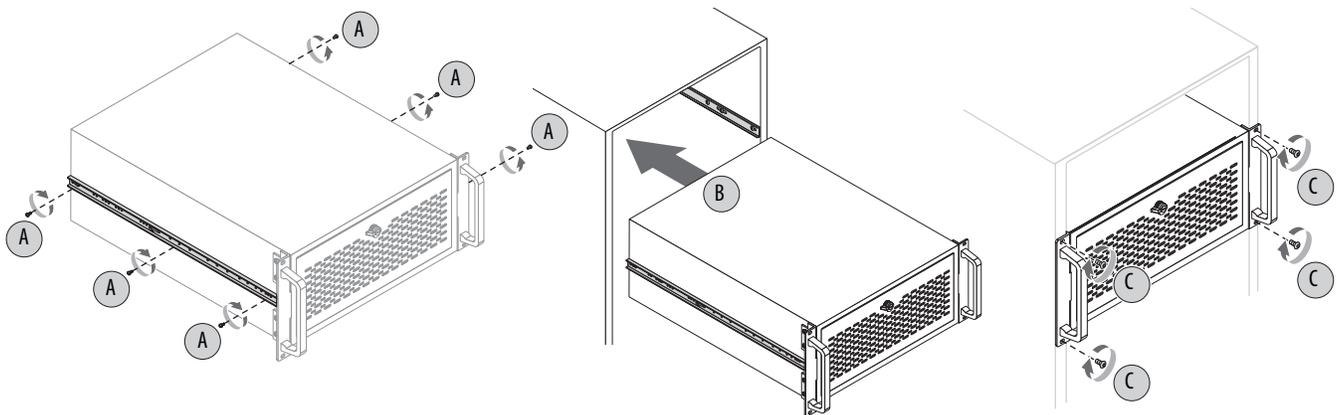
1. Verify that the mounting location provides adequate space for cables and air flow.

See [Mounting Clearance Requirements on page 27](#) for recommended allowances.

2. Attach the supplied rack handles to the computer.



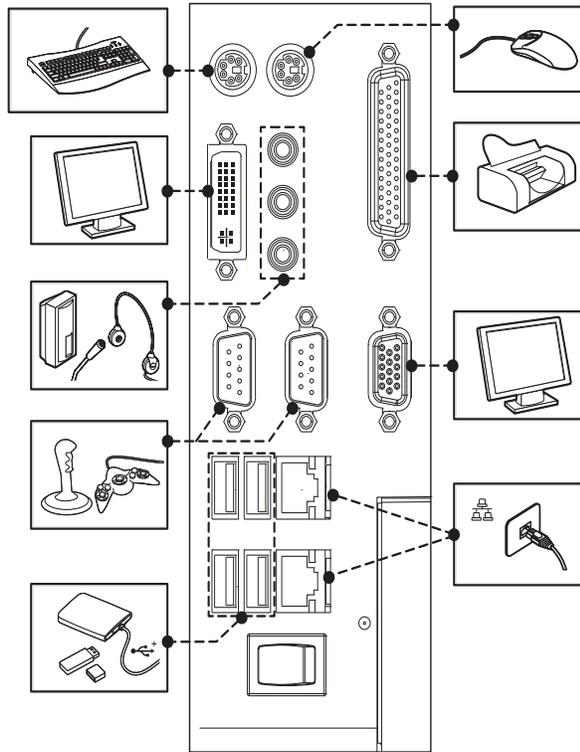
3. Install the rack slides inside the rack cabinet.
4. Attach the rack slides to the computer (A).
5. Align the rack slides to the corresponding slides inside the cabinet.
6. From the front of the rack cabinet, insert the computer in the cabinet (B).
7. Fasten a rack-mounting flange to each side of the chassis with the slotted screws provided.
8. Horizontally secure the computer to the front mounting rails of the rack cabinet (C).



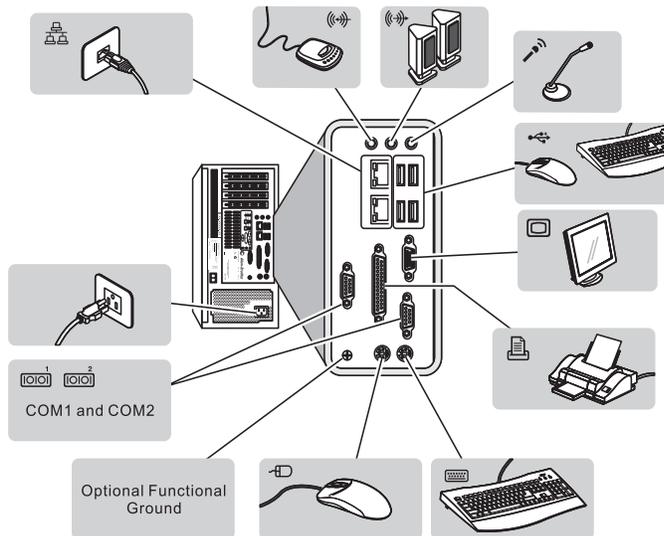
## Connect Peripherals

The following illustrations show the I/O port panel of the computers. Peripheral components compatible to each port are inside the callout figures.

**Figure 19 - 650R Computer Peripherals**



**Figure 20 - 750R and 1450R Computer Peripherals**



**TIP** There are two USB ports on the computer's front panel. Use these ports to connect various USB devices to the computer, such as an external drive.

## Connect Power

The computer connects to either a 100...240V AC or 18...32V DC power source, depending on the model.



**ATTENTION:** When connecting power to the computer for the first time, the following actions occur:

- The default BIOS setting automatically starts the computer after it is plugged into a power source.
- You must read and accept an End User Setup procedure for computers with a Windows operating system (requires an external display).

Do not disconnect power from the system until after the Windows Setup procedure is completed. Disconnecting power during this procedure can result in a corrupted system image.

Operate the computer in an industrial or control room environment, which uses some form of power isolation from the public low-voltage mains.



**ATTENTION:** Supply the computer circuit with its own disconnect. Use an uninterruptible power source (UPS) to protect against unexpected power failure or power surges.

Always shut down the Windows operating system before disconnecting power to the computer to minimize performance degradation and operating system failures.

## Connect AC Power

A grounded, 3-prong IEC60320-C13 power cord provides power to the computer. The power supply input accepts 100...240V AC and is autoranging.

Follow these steps to connect the computer to an AC power source.

1. Connect the power cord to the AC power input. See [Hardware Features](#) starting on [page 13](#) for where the power inputs are on each computer model.
2. Connect the AC power cord to a power source.



**SHOCK HAZARD:** Connect the AC power cord to a power source with an earth ground. Failure to follow this warning can result in electrical shock.

3. Apply 100...240V AC power to the computer.

## Connect DC Power

The 650R computer, catalog number 6177R-M3PXPDC, is available with a DC power option using a three-screw terminal block (+24VDC, 24RTN, GND).

DC power models support operation from either a SELV or PELV power source. A pre-installed ground bus strip lets you connect the DC common and functional ground terminals together. This is to support some cases of SELV where grounding at the computer is required by the end user.

The power supply is internally protected against reverse polarity.



**ATTENTION:** Use a Class 2/SELV isolated and ungrounded power supply as input power to the computer. This power source provides protection so that under normal and single fault conditions, the voltage between the conductors and Functional Earth/Protective Earth does not exceed a safe value.

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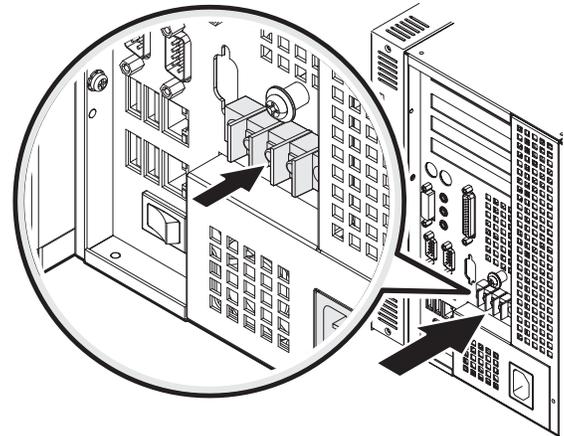
Follow these steps to connect the computer to a DC power source.

1. Turn off the main power switch or breaker.
2. Verify that the DC wires meet these requirements:
  - Material: Stranded copper
  - Wire gauge: 0.325...0.823 mm<sup>2</sup> (22...18 AWG)

3. Secure the DC power wires to the correct terminal-block screws, and the DC ground wire to the GND terminal screw.

Torque the terminal screws to 0.687 N•m (6.1 lb•in).

4. Apply 18...32V DC power to the computer.



## Functional Ground Screw

The pre-installed functional ground screw is not required for safety or regulatory compliance. However, if a supplemental ground is desired, use the functional ground screw on the rear panel of the 750R and 1450R computers, or the side panel of the 650R computer. See [Hardware Features on page 13](#) for where the functional ground screw is on the computer.

If using the functional ground screw, connect the computer to earth ground by using a 1.5 mm<sup>2</sup> (16 AWG) or larger external wire. Use a ground wire with green insulation and a yellow stripe for easy identification.

## Connect to a Network

The computers connect to an Ethernet network by using CAT5 or CAT5e twisted-pair Ethernet cabling with RJ45 connectors. See [Hardware Features](#) starting on [page 13](#) for where the LAN ports are on each computer model.

---

**IMPORTANT** To prevent performance degradation of Ethernet communication, do not subject the computer or cables to extreme radiation or conducted high-frequency noise.

Proper cable routing and power conditioning is required for reliable Ethernet communication in industrial environments. We recommend that you route all Ethernet cabling through dedicated metal conduits. Installing ferrite bead filters at the cable ends can also improve reliability.

---

**Notes:**

## Operation

### Chapter Objectives

This chapter provides information on the following topics:

- [Operating Guidelines](#)
- [Start the Computer](#)
- [Restart the Computer](#)
- [Shut Down the Computer](#)

### Operating Guidelines

Follow these operating guidelines for your computer:

- If you are using an external display, turn on the display first.
- Do not operate the computer with the covers removed. Removing the covers disrupts air flow and results in overheating.



**SHOCK HAZARD:** All covers are required to maintain EMI shield.

---

- Always use the proper power down procedures as required by your operating system, such as the Shut Down command in the Microsoft Windows operating system.
- After shutting down the computer, do not apply power again until shutdown is complete.

For computers with a HDD, the HDD must come to a complete stop, which can take up to 30 seconds after shutdown is initiated.

## Start the Computer

Follow these steps to start the computer.

---

**IMPORTANT** The following steps apply to when you must manually start the computer. See [Connect Power on page 35](#) for when power is applied to the computer for the first time.

---

1. Make sure any connected components with separate power supplies (such as an external display) are turned on first.
2. Make sure all necessary peripheral devices are connected to the corresponding I/O ports on the computer.
3. **AC powered models:** See [Connect AC Power on page 35](#) for how to install the AC power cord into the AC power input on the computer.  
**DC powered models:** See [Connect DC Power on page 35](#) for how to install DC power to the DC power input on the computer.
4. **AC powered models:** Plug the AC power cord into a power source or wall outlet.

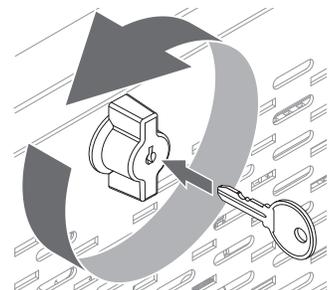


**SHOCK HAZARD:** Connect the AC power cord to a power source with an earth ground to prevent electrical shock. Failure to do so can result in electrical shock.

---

**DC powered models:** Apply 18...32V DC power to the computer.

5. If you have a 1450R computer and the front door is locked, complete the following steps:
  - a. Unlock the front door with the provided key.
  - b. Open the door to access the power switch.
6. Press the computer's power switch.  
See [Hardware Features](#) starting on [page 13](#) for power switch location.



The computer performs certain actions every time it is started or reset. See [Restart the Computer on page 41](#) for what is done.

If your system does not start or you notice other anomalies, refer to [Troubleshooting Procedure](#) on page [63](#).

## Restart the Computer

Use any of the following methods to restart your computer:

- From the Start menu, choose Restart.
- Press CTRL+ALT+DEL on an attached keyboard.
- Press the reset button.

During a restart, the computer does the following:

- Clears the RAM.
- Starts the POST.
- Initializes peripheral devices such as drives and printers.
- Loads the operating system.

Use an external display to view the progress of the POST, the initialization of accessory devices, and the start-up dialogs for the operating system that is installed.

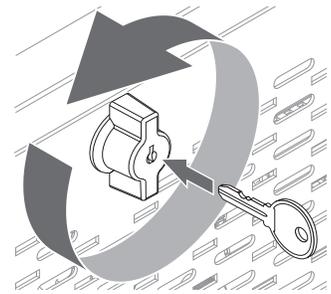
### Restart the Computer with the Reset Button

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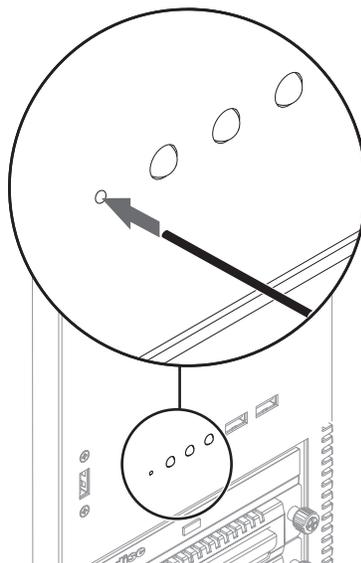
**IMPORTANT** Press the reset button only if the system locks up or some other anomaly occurs.

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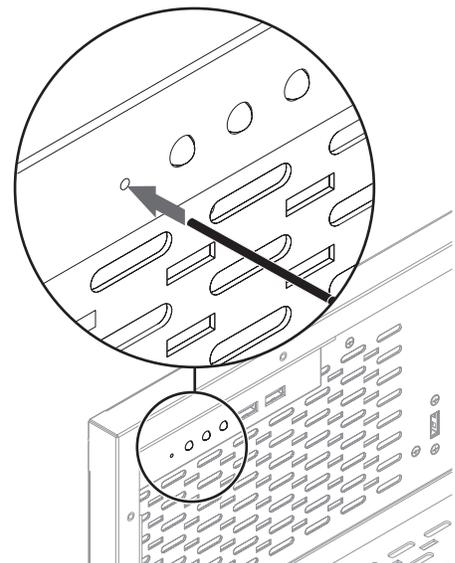
1. If you have a 1450R computer and the front door is locked, complete the following steps:
  - a. Unlock the front door with the provided key.
  - b. Open the door to access the reset button.
2. Lightly press the tip of a stylus or any other pointed device to the computer's reset button.



Resetting the 750R Computer



Resetting the 1450R Computer



## Shut Down the Computer

Use either of the following methods to shut down the computer.

Method	Actions
Windows OS	With an attached mouse, keyboard, and display, do one of the following. <ul style="list-style-type: none"><li>• Press CTRL+ALT+DEL and click Shut Down.</li><li>• From the Start menu, click or choose Shut Down from the pull-down menu.</li></ul>
Power switch	Press the power switch to shut down the computer. See <a href="#">Hardware Features</a> starting on <a href="#">page 13</a> for power switch location.

After shutting down the computer, do not apply power again until shutdown is complete. For computers with a HDD, the HDD must come to a complete stop, which can take up to 30 seconds after shutdown is initiated.

---

## Component Replacement

### Chapter Objectives

This chapter provides information on the following topics:

- [Accessories and Replacement Parts](#)
- [Voltage Precautions](#)
- [Electrostatic Discharge Precautions](#)
- [Pre-configuration](#)
- [Post-configuration](#)
- [Required Tools](#)
- [Remove the Cover](#)
- [Reinstall the Cover](#)
- [Drive Precautions](#)
- [Replace or Install a Drive](#)
- [Install an Add-in Card](#)
- [Replace or Add Memory Modules](#)
- [Replace the RTC Battery](#)

### Accessories and Replacement Parts

You can view a list of accessories and replacement parts at the following Rockwell Automation website: <http://ab.rockwellautomation.com/Computers>.

Review the specifications of a new component before installing it to make sure it is compatible with the computer. Record the model and serial number, and any other pertinent information of new components for future reference.

---

**IMPORTANT** We recommend that you use only Allen-Bradley approved accessories and replacement parts.

---

### Voltage Precautions

The computers contain line voltages. Disconnect all power to the computer before you install or remove components.



**SHOCK HAZARD:** Disconnect all power to the computer before removing components.

Failure to disconnect power can result in severe electrical shock to an individual or electrostatic discharge (ESD) damage to the computer and components.

---

## Electrostatic Discharge Precautions



**ATTENTION:** Electrostatic discharge (ESD) can damage static-sensitive devices or microcircuitry.

- Disconnect all power before working on the computer as detailed in [Voltage Precautions on page 43](#).
  - Observe proper packaging and grounding techniques to prevent damage.
- 

Follow the precautions listed below:

- Transport the computer and replacement parts in static-safe containers, such as conductive tubes, bags, or boxes.
- Keep electrostatic-sensitive parts in their containers until they arrive at the designated static-free work area.
- Cover the designated work area with approved static-dissipating material:
  - Use an antistatic wrist strap connected to the work surface.
  - Use properly grounded tools and equipment.
- Keep the designated work area free of nonconductive materials, such as ordinary plastic assembly aids and foam packing.
- Avoid touching pins, leads, or circuitry.
- Always hold components with a printed circuit board (PCB) by its edges and place it with the assembly side down.

## Pre-configuration

---

### IMPORTANT

When installing hardware or performing maintenance procedures that require access to internal components, we recommend that you first back up all computer data to avoid loss.

---



**ATTENTION:** Make sure to read and understand all installation and removal procedures before you begin configuring the computer hardware.

---

Follow these steps before removing the cover or replacing a hardware component.

1. Shut down the computer and all peripherals connected to it.
2. Disconnect all cables from power outlets to avoid exposure to high energy levels.

If necessary, label each cable to expedite reassembly.

3. Disconnect telecommunication cables to avoid exposure to a shock hazard from ringing voltages.

## Post-configuration

Follow these steps after installing or removing a hardware component.

1. Make sure all components are installed according to instructions.
2. Make sure that no tools or loose parts are left inside the computer.
3. Reinstall any expansion boards, peripherals, and system cables that were previously removed.
4. Reinstall the cover according to the instructions on [page 47](#).
5. Reconnect all external cables and power to the computer.
6. Press the computer's power switch to start the computer.

## Required Tools

The following tools are required for component replacement:

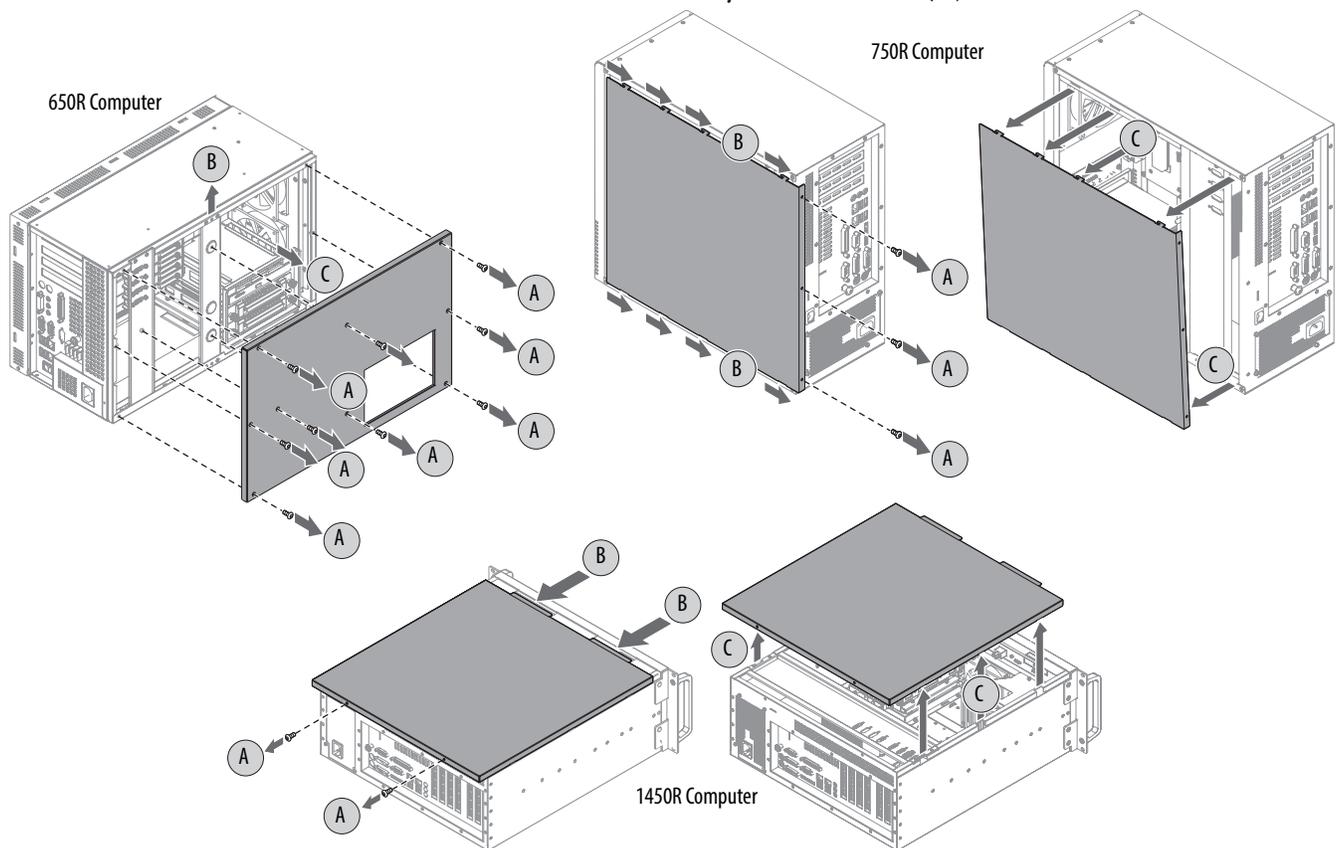
- #2 cross-head screwdriver
- Slot-head screwdriver
- Antistatic wrist strap
- Side cutters (for cutting cable ties, if necessary)

## Remove the Cover

To install, replace, or upgrade internal computer components, you must first remove the cover.

Follow these steps to remove the rear cover for a 650R computer, the side cover for a 750R computer, and the top cover for a 1450R computer.

1. Follow the steps for [Pre-configuration on page 44](#).
2. Unfasten the cover from the computer chassis.
  - 650R computers: Remove the nine screws on the rear cover (A).
  - 750R computers: Remove the three screws on the rear edge of the side cover (A).
  - 1450R computers: Remove the two screws on the rear edge of the top cover (A).
3. Release the cover from the computer chassis.
  - 650R computers: Lift the cover to release it from its locking slot (B).
  - 750R/1450R computers:
    - a. Slide the cover back about 1.5 cm (0.5 in.) to release the hinge tabs (B).
    - b. Tilt the cover up slightly to disengage the hinge tabs from their locking slots.
4. Pull the cover away from the chassis (C).

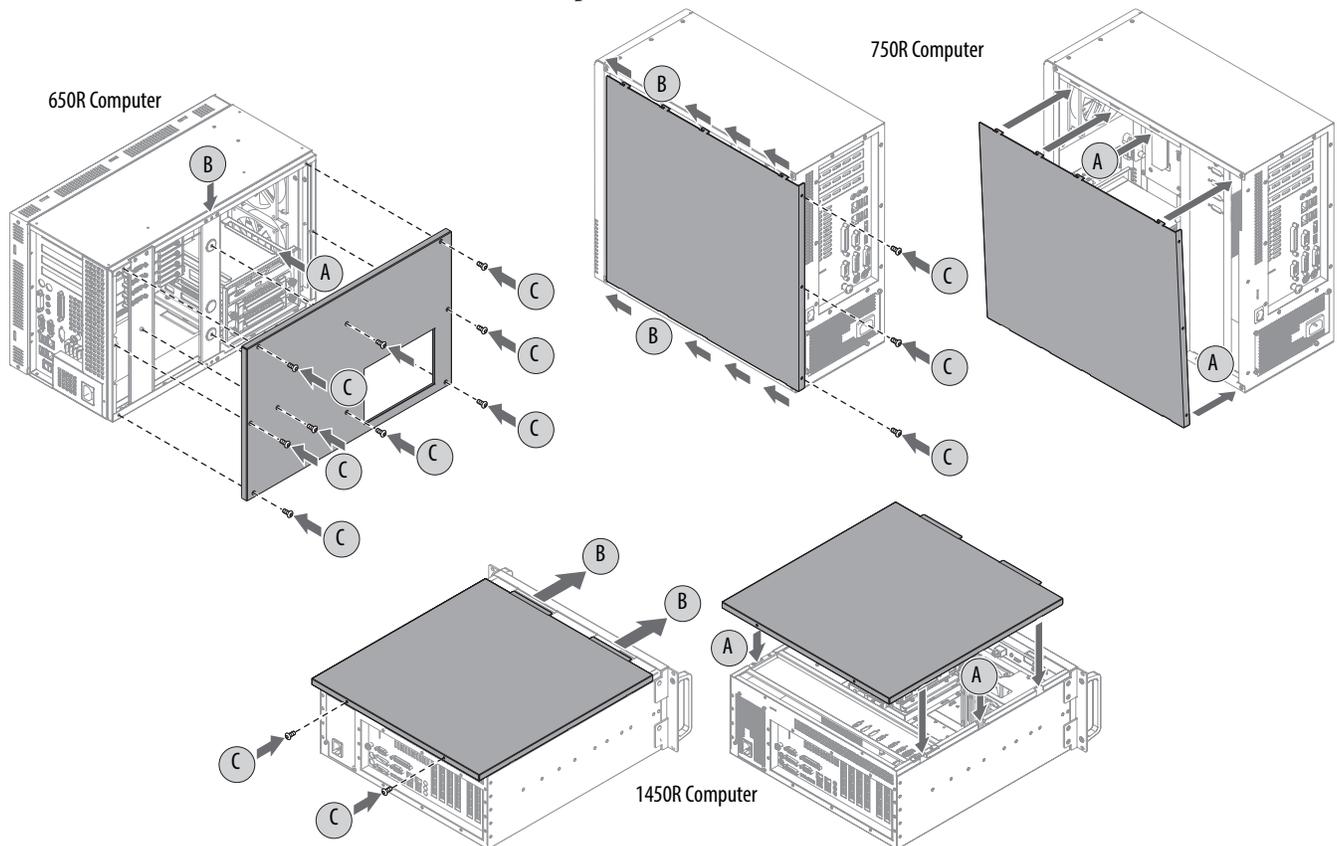


5. After installing, replacing, or upgrading internal computer components, reinstall the cover as detailed in [Reinstall the Cover on page 47](#).

## Reinstall the Cover

Follow these steps to reinstall the rear cover for a 650R computer, the side cover for a 750R computer, and the top cover for a 1450R computer.

1. Make sure the computer is in the upright position.
2. Follow [step 1](#) through [step 3](#) of the [Post-configuration on page 45](#).
3. Reinstall the cover to the computer chassis.
  - 650R computers: Align and slide the cover onto its locking slot (A).
  - 750R/1450R computers:
    - a. Position the cover so its hinge tabs align and engage the locking slots on the chassis (A).  
You can tilt the cover slightly when reinstalling to make sure that all hinge tabs are engaged and locked properly.
    - b. Slide the cover forward to lock the hinge tabs into place (B).
4. Secure the cover to the computer chassis.
  - 650R computers: Reinstall the nine screws on the rear cover (C).
  - 750R computers: Reinstall the three screws on the rear edge of the side cover (C).
  - 1450R computers: Reinstall the two screws on the rear edge of the top cover (C).
5. Torque the screws to 0.6 N•m (5.2 lb•in).



## Drive Precautions

Follow these precautions when working with a drive.

---

**IMPORTANT** Back up or clone your computer before replacing a drive.

---

- Do not touch internal components.
- Always handle the drive by its frame.
- Never remove or install a drive with the power on.
- Store the drive in an antistatic bag when it is not installed.



**SHOCK HAZARD:** Electrostatic discharge (ESD) can damage the computer and components. Read and follow [Electrostatic Discharge Precautions on page 44](#) before removing a drive.

Failure to follow proper safety precautions can result in severe electrical shock to an individual or ESD damage to the computer and its components.

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**ATTENTION:** Mechanical shock can damage a drive. Do not drop or bump the drive.

---

## Replace or Install a Drive

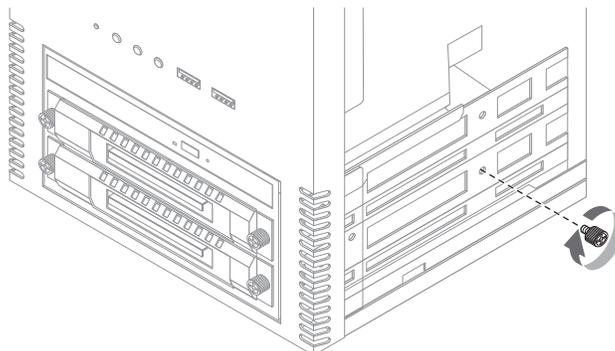
You can replace the existing HDD or install another HDD in the empty drive bay.

All 6177R computers have two drive bays but only server models have two drives that are factory installed.

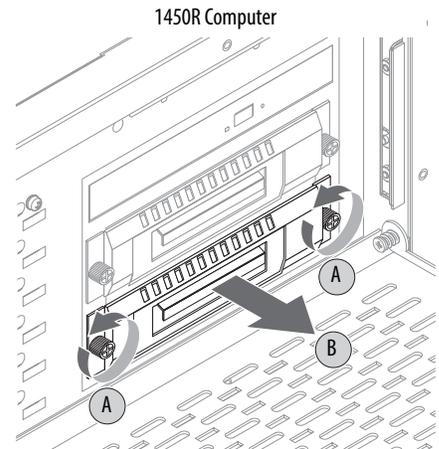
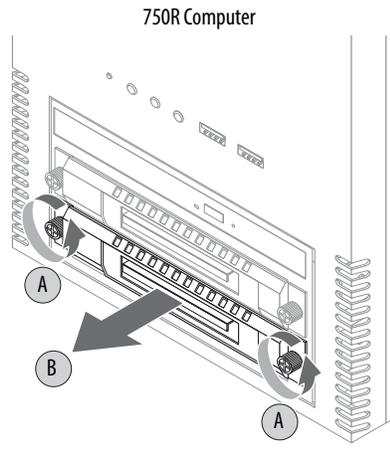
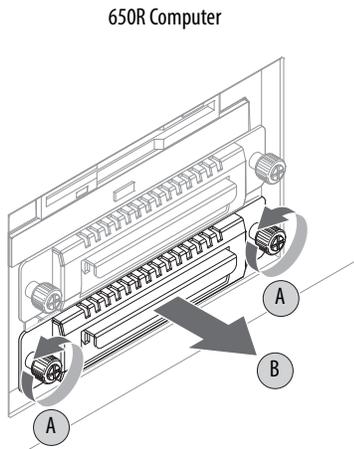
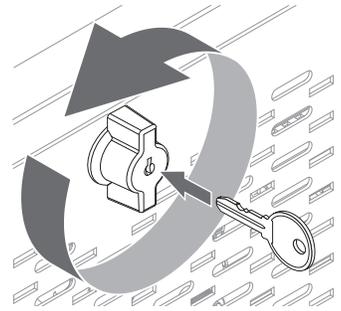
### Replace the Existing HDD

Follow these steps to replace the existing HDD.

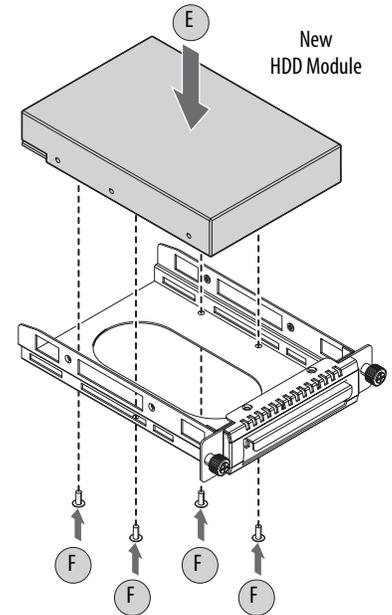
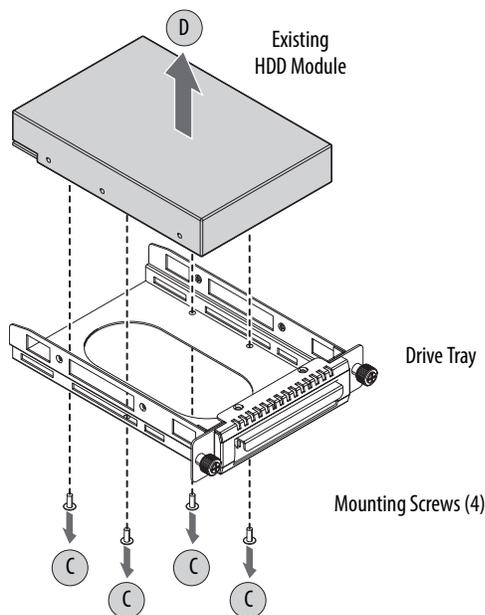
1. Follow the steps for [Pre-configuration on page 44](#).
2. If you have a 750R computer, complete the following steps:
  - a. Remove the side cover according to the steps in [Remove the Cover on page 46](#).
  - b. Remove the screw securing the HDD assembly to its bay.



3. If you have a 1450R computer and the front door is locked, complete the following steps:
  - a. Unlock the front door with the provided key.
  - b. Open the door to access the drive bays.
4. Remove the HDD assembly from its bay.
  - a. Loosen the two captive thumbscrews of the HDD assembly (A).
  - b. Pull the HDD assembly from its bay (B).



5. Remove the HDD module from its tray.
  - a. Remove the four mounting screws from the bottom of the tray (C).
  - b. Detach the tray from the existing HDD module (D).



6. Install the new HDD module to the tray.

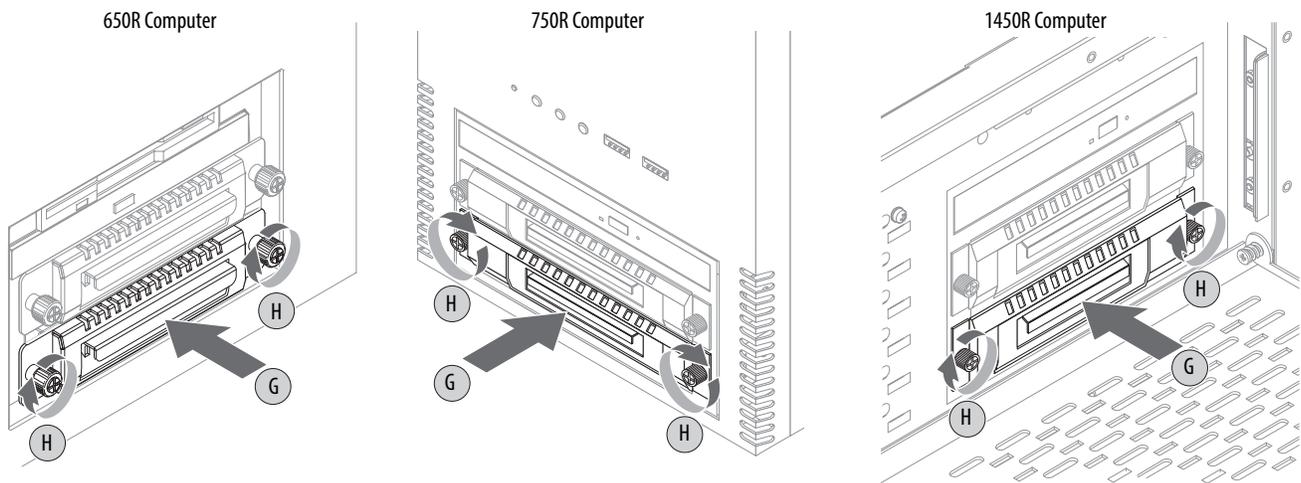


**ATTENTION:** Mechanical shock can damage a drive. Do not drop or bump the drive.

- a. Install the new HDD module with the PCB-side down.
- b. Fasten the drive tray over the HDD module (E).
- c. Secure the drive tray to the module with the four mounting screws (F).  
Torque the screws to 0.59 N•m (5.2 lb•in).

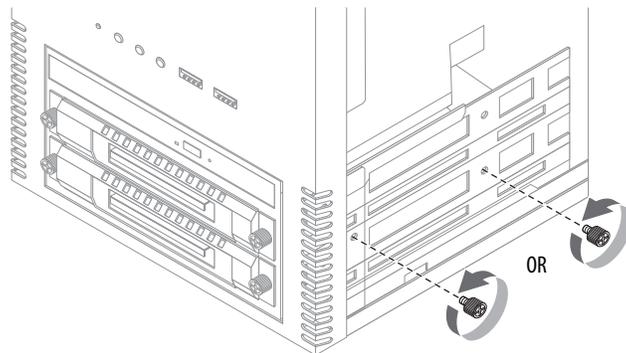
7. Return the HDD assembly into its bay (G).

8. Tighten the two captive thumbscrews of the drive assembly to secure it to the computer (H).



9. If you have a 750R computer, complete the following steps:

- a. You can reinstall the screw securing the HDD assembly to its bay in one of two possible locations.
- b. Reinstall the side cover according to the steps in [Reinstall the Cover on page 47](#).



10. Follow the steps for [Post-configuration on page 45](#).

## Install a Second HDD

You can install another HDD in the secondary (bottom) bay.

**TIP** The 6177R-M3AS3 computer already has two hard disk drives installed.

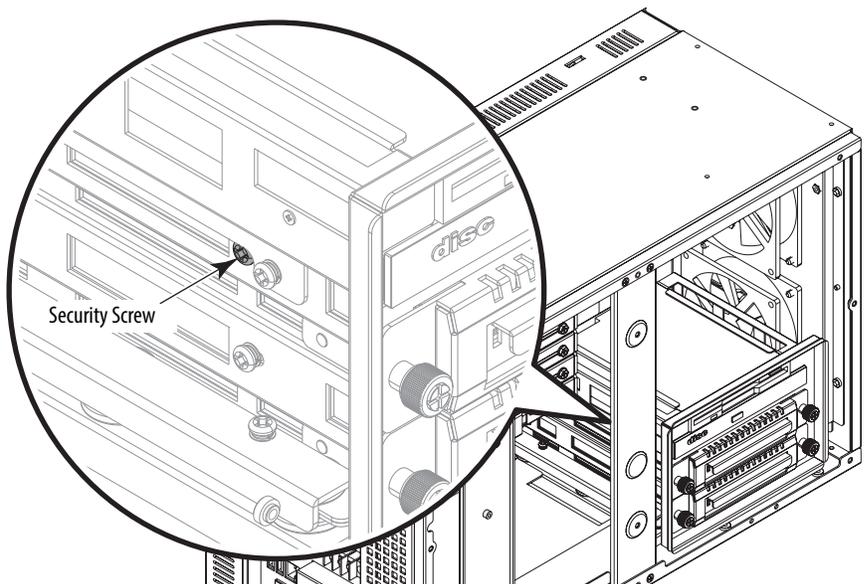
Follow these steps to install a second HDD.

1. Perform [step 1](#) through [step 3](#) in [Replace the Existing HDD on page 48](#).

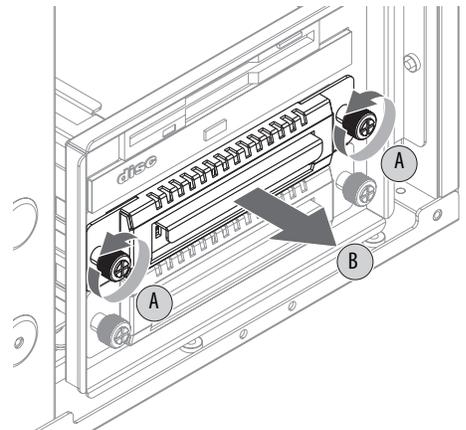
**TIP** Use an antistatic wrist strap connected to the work surface, and properly grounded tools and equipment.

2. Locate and remove the security screw below the ODD; set the screw aside.

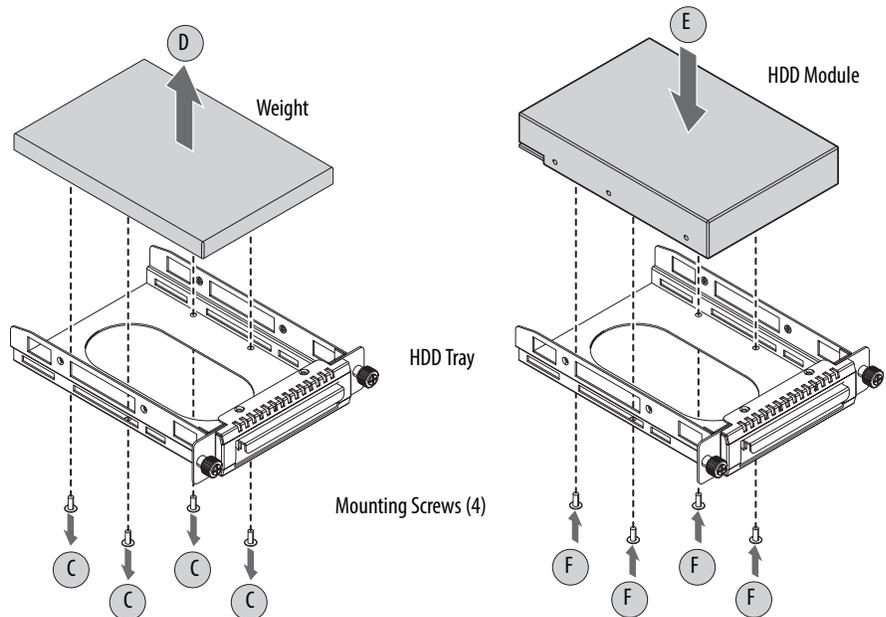
**TIP** Use a magnetized screwdriver to prevent the screw from falling into the chassis.



3. Remove the HDD assembly from the secondary bay.
  - a. Loosen the two captive thumbscrews of the HDD assembly (A).
  - b. Pull the HDD assembly from its bay (B).



4. Remove the weight from the drive tray.
  - a. Remove the four mounting screws from the bottom of the weight (C).
  - b. Detach the tray from the weight (D).



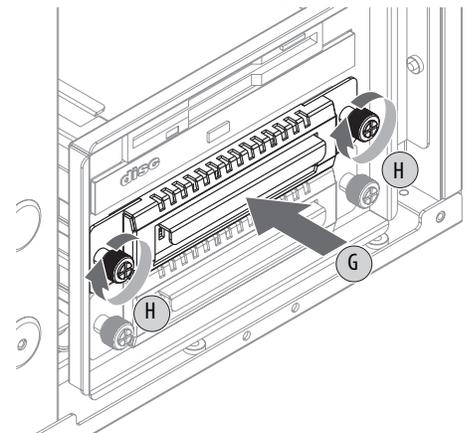
5. Install the new HDD module to the tray.



**ATTENTION:** Mechanical shock can damage a HDD module. Do not drop or bump the HDD module.

- a. Install the new HDD module with the PCB-side down.
- b. Fasten the tray over the HDD module (E).
- c. Secure the tray to the HDD module with the four mounting screws (F).  
Torque the screws to 0.59 N•m (5.2 lb•in).

6. Return the HDD assembly into its bay (G).
7. Tighten the two captive thumbscrews of the HDD assembly to secure it to the computer (H).
8. Reinstall the security screw removed in [step 2](#).
9. Follow the steps for [Post-configuration on page 45](#).

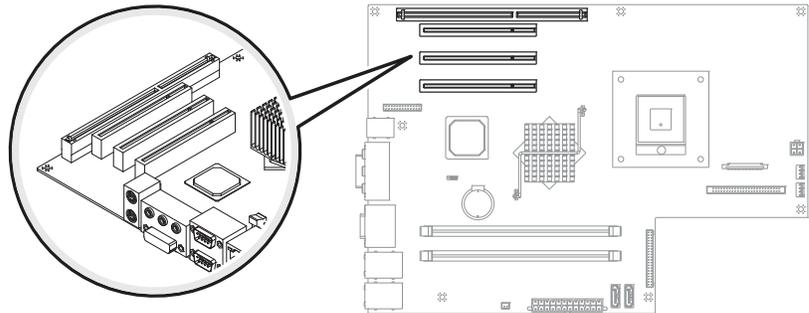


## Install an Add-in Card

### 650R Computers

The motherboard of 650R computers supports the following expansion slots:

- Two full-length PCI slots
- One half-length PCI slot
- One full-length ISA slot



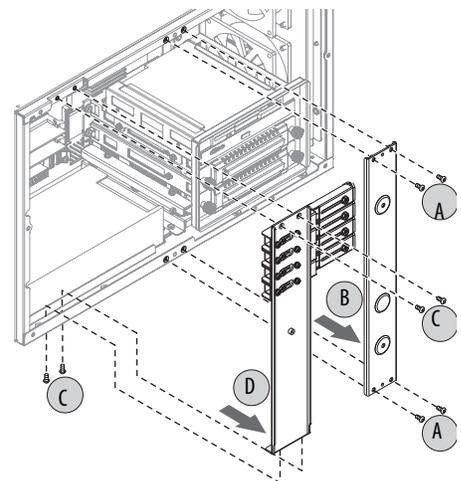
**ATTENTION:** Add-in cards are sensitive to ESD and require careful handling.

- Hold cards only by the edges.
- Do not touch the card connectors, components, or circuits.
- After removing an add-in card, place it on a flat, static-free surface, component side up.
- Do not slide the card over any surface.

**IMPORTANT** Use an antistatic wrist strap connected to the work surface, and properly grounded tools and equipment.

Follow these steps to install an add-in card.

1. Follow the steps for [Pre-configuration on page 44](#).
2. Remove the computer cover as detailed in [Remove the Cover on page 46](#).
3. Remove the four screws securing the chassis center support bar (A) and detach from the chassis (B).
4. Remove the four screws securing expansion hold-down bar (C) and detach from the chassis (D).
5. Locate an empty PCI slot.

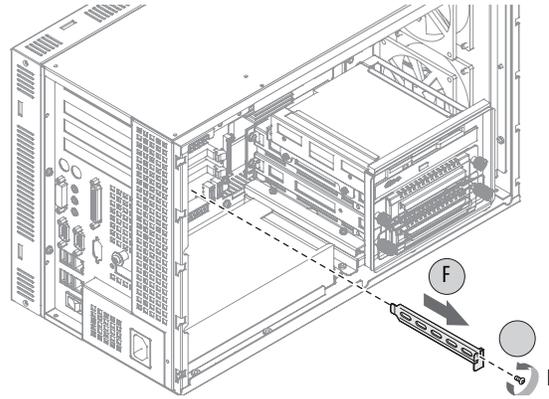


6. Remove the screw securing the slot cover of the selected PCI slot (E).
7. Pull out the slot cover (F) and store it.

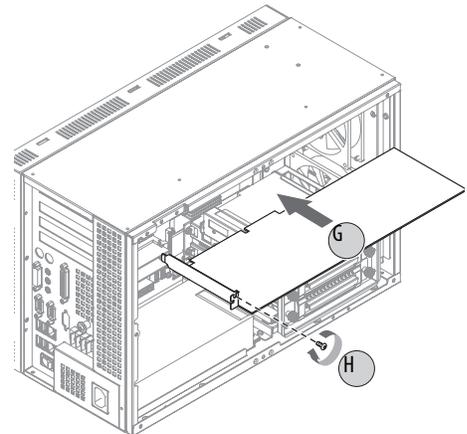
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**IMPORTANT** Do not discard the slot cover. If the add-in card is removed in the future, the slot cover must be reinstated to maintain proper cooling.

---

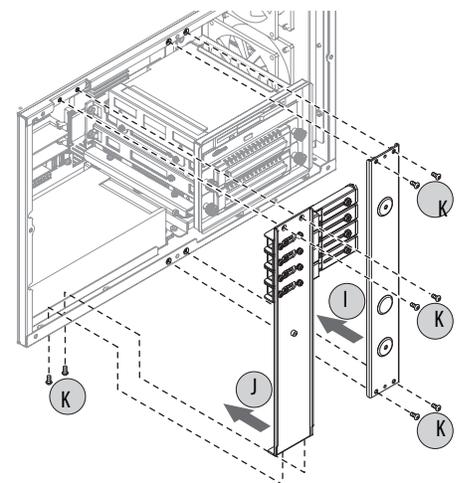


8. Remove the add-in card from its protective packaging.
9. Slide the add-in card into the selected PCI slot (G).  
Press to make sure it is firmly seated.

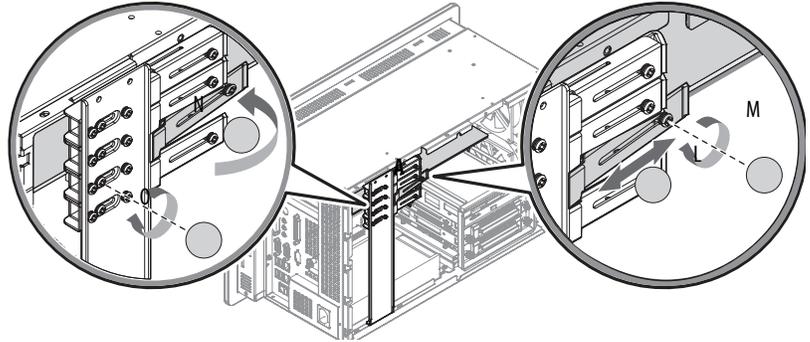


10. Secure the add-in card bracket to the chassis with its screw (H).
11. Connect any necessary cables to the add-in card.
12. Replace the center support and expansion board hold-down bars.

- a. Align the center support (I) and the hold-down bar (J) against the chassis.
- b. Secure each bar with four screws (K).



13. Secure the new add-in board in place.
  - a. Extend the clamp to the desired length (L).
  - b. Tighten the hold-down clamp screw (M).
  - c. Bend the clamp against the add-in card to secure it in place (N).
  - d. Lock the clamp screw on the hold-down bar (O).



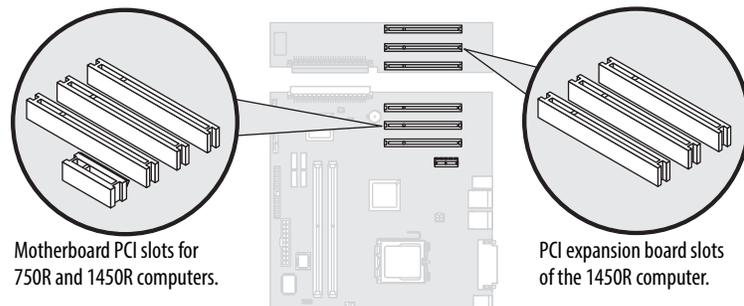
14. Refer to any installation instructions that came with the add-in card to verify that all installation steps are followed.
15. Follow the steps for [Post-configuration on page 45](#).

## 750R/1450R Computers

The motherboard of the 750R and 1450R computers has four PCI slots that support installation of half-length PCI add-in cards:

- Three PCI slots
- One PCI-express slot

In addition to these four PCI slots, the 1450R computer has a slot expansion board that provides another three PCI slots. The 6177R-R4LXP expansion board provides one PCI, one ISA, and one shared PCI/ISA slot.



**ATTENTION:** Add-in cards are sensitive to ESD and require careful handling.

- Hold cards only by the edges.
- Do not touch the card connectors, components, or circuits.
- After removing an add-in card, place it on a flat, static-free surface, component side up.
- Do not slide the card over any surface.

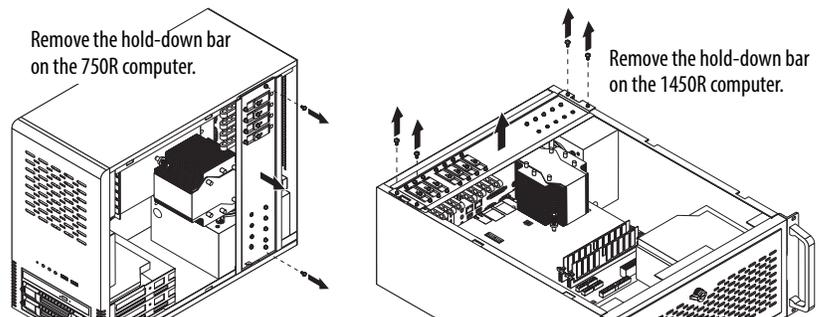
---

**IMPORTANT** Use an antistatic wrist strap connected to the work surface, and properly grounded tools and equipment.

---

Follow these steps to install an add-in card.

1. Follow the steps for [Pre-configuration on page 44](#).
2. Remove the computer cover as detailed in [Remove the Cover on page 46](#).
3. Remove the hold-down bar to access the PCI slots.
  - a. 750R computer: Remove the two screws securing the hold-down bar.
  - 1450R computer: Remove the four screws securing the hold-down bar.
  - b. Detach the hold-down bar from the chassis.



4. Locate an empty PCI slot.
5. Remove the screw securing the slot cover of the selected PCI slot (A).
6. Pull out the slot cover (B) and store it.

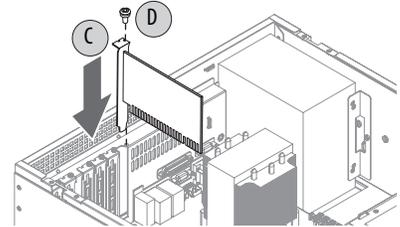
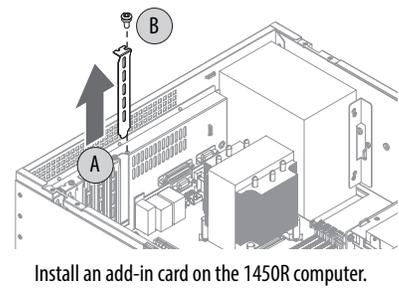
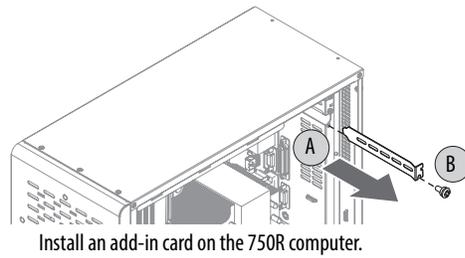
---

**IMPORTANT** Do not discard the slot cover. If the add-in card is removed in the future, the slot cover must be reinstalled to maintain proper cooling.

---

7. Remove the add-in card from its protective packaging.
8. Slide the add-in card into the selected PCI slot (C).  
Press to make sure it is firmly seated.

9. Secure the add-in card bracket to the chassis with its screw (D).

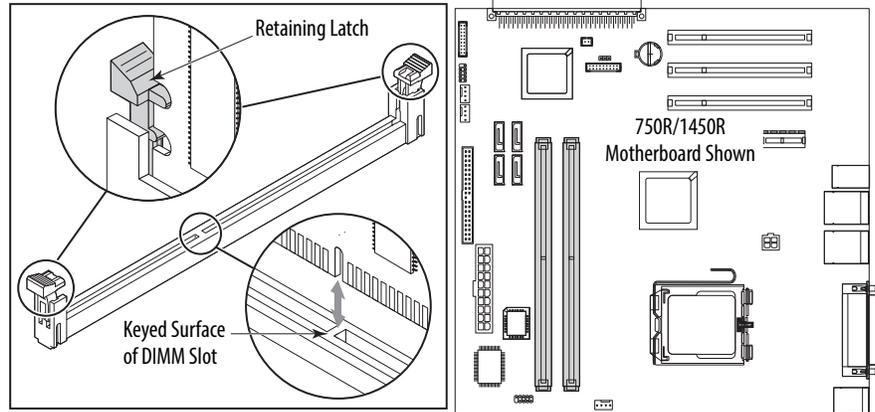


10. Connect any necessary cables to the card.
11. Reattach the hold-down bar to the chassis, then secure it with the screws.
12. To set the hold-down clamp, loosen the center screw and adjust the height of the clamp to secure the add-in card, then tighten the screw.
13. Refer to any installation instructions that came with the add-in card to verify that all installation steps are followed.
14. Follow the steps for [Post-configuration on page 45](#).

## Replace or Add Memory Modules

The motherboard of the 750R and 1450R computers has two DIMM slots that support up to 2 GB maximum system memory. The 650R computer has two DIMM slots that support up to 2 GB per slot and 4 GB maximum system memory.

**Figure 21 - Memory Module Slots and Module Alignment**



### Memory Configuration Guidelines

Follow these guidelines when replacing or adding memory to the computers:

- Use only standard unbuffered memory modules that conform to both PC2-3200 (PC2-5300 for 650R) and SPD compliance industry standards.
- Use only DDR-II type memory modules.
- Use only memory modules with gold-plated contacts.
- Always handle a memory module by its edges.

---

**IMPORTANT** We recommend that you use only Allen-Bradley approved memory modules. Refer to <http://ab.rockwellautomation.com/Computers> for qualified replacement parts and accessories.

---

### Replace or Add a Memory Module

Follow these steps to replace or add a memory module.

---

**IMPORTANT** Use an antistatic wrist strap connected to the work surface, and properly grounded tools and equipment.

---

1. Follow the steps for [Pre-configuration on page 44](#).
2. Remove the computer cover as detailed in [Remove the Cover on page 46](#).

**TIP** To install additional memory, proceed to [step 5](#) of this section.

3. Locate the memory module you want to replace.

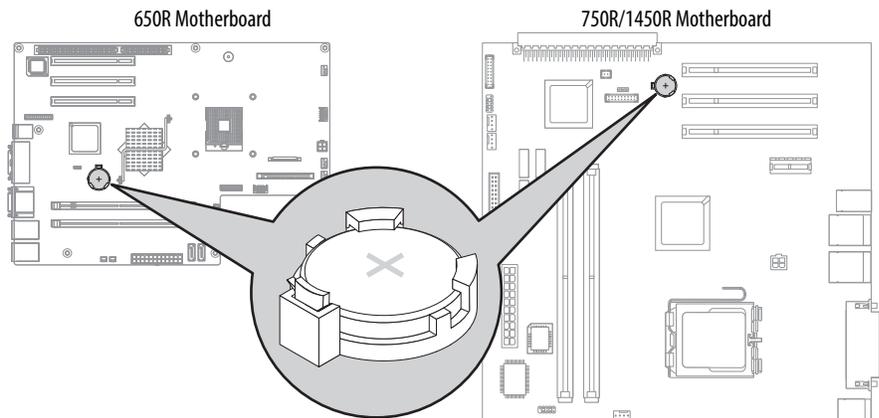
See [System Boards on page 20](#) for memory location on the motherboards.

4. Remove the selected memory module.
  - a. If necessary, use side cutters to cut the cable tie from the retaining latches that hold the selected memory module.
  - b. Completely open the retaining latches to release the memory module from its slot and make it easier to remove. See [Figure 21 on page 58](#).
  - c. Gently pull out the memory module to remove it from its slot.
  - d. Place the memory module on a static-dissipating work surface or inside an antistatic bag.
5. Install the new memory module.
  - a. Hold the memory module by its edges as you remove it from its antistatic bag.
  - b. Orient the module so the notch on its bottom edge aligns with the keyed surface of the DIMM slot. See [Figure 21 on page 58](#).
 

**TIP** The keyed surface is off center to assist the correct alignment.
  - c. Press the module fully into the slot to engage the retaining latches. See [Figure 21 on page 58](#).
6. Reinstall the computer cover as detailed in [Reinstall the Cover on page 47](#).
7. Follow the steps for [Post-configuration on page 45](#).

## Replace the RTC Battery

The computers use nonvolatile memory that require a RTC battery to retain system information when power is removed. The 3V, 200 mAh lithium battery is on the computer's motherboard.



The battery must be replaced during the life of the computer. Battery life depends on the amount of time the computer is on, or on-time.

On-time (hrs/wk)	Estimated Battery Life (yrs)
0	4
40	5.5
80	7

If the computer does not display the correct time and date, replace the battery.



**ATTENTION:** A risk of fire and chemical burn exists if the battery is not handled properly.

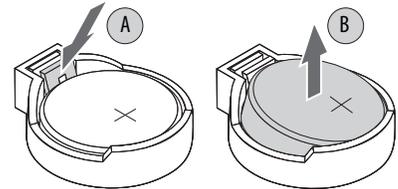
- Do not disassemble, crush, puncture, or short external contacts.
- Do not expose the battery to temperatures higher than 60 °C (140 °F).
- Do not dispose of a used battery in water or fire.

For safety information on handling lithium batteries, see Guidelines for Handling Lithium Batteries, publication [AG-5.4](#).

Follow these steps to replace the RTC battery.

1. Follow the steps for [Pre-configuration on page 44](#).
2. Remove the cover as detailed in [Remove the Cover on page 46](#).
3. If necessary, remove any accessory boards or cables that prevent access to the RTC battery socket.
4. Remove the battery.

- a. To dislodge the battery from its socket, insert a non-conductive tool (such as a small flat-blade plastic screwdriver) between the battery and spring latch (A).



- b. Remove the old battery from its socket (B).

**IMPORTANT** Do not bend the spring latch when replacing the RTC battery. For proper operation, the latch must retain contact with the battery.

5. Insert the new battery with the positive polarity (+ side) facing up, and make sure that it is seated completely.
6. Follow the steps for [Post-configuration on page 45](#).
7. During POST, press F2 on an attached keyboard to enter the BIOS setup and reconfigure settings.

**IMPORTANT** Replacing the battery results in all BIOS settings returning to their default settings. BIOS settings other than default must be reconfigured after replacing the battery.



This computer contains a sealed lithium battery that may need to be replaced during the life of the computer.

At the end of its life, the battery contained in this computer should be collected separately from any unsorted municipal waste.

## System Troubleshooting

### Chapter Objectives

This chapter provides information on the following topics:

- [Hardware Monitoring](#)
- [Troubleshooting](#)
- [Troubleshooting Checklists](#)
- [Diagnostic Utility](#)
- [Load the System Defaults](#)
- [Clear the CMOS](#)
- [Ship or Transport the Computer](#)

### Hardware Monitoring

The built-in hardware monitor of the computer tracks the operating threshold levels of the voltage and temperature sensors.

Follow these steps to determine whether an operating threshold has been reached.

1. Shut down the computer by using the appropriate method for the installed operating system.

See [Shut Down the Computer on page 42](#) for more information.

2. Apply power to the computer.
3. During POST, press F2 to access the BIOS set-up utility.

**TIP** Use the arrow keys on a keyboard to navigate between BIOS menus and menu selections.

4. Select the Hardware Monitor menu from the BIOS-Advanced menu.

Use this menu to determine if there is an issue with internal voltages or component temperatures.

## Troubleshooting

Follow these steps to identify and isolate an issue with the computer's operation.

1. Shut down the computer by using the appropriate method for the installed operating system.  
See [Shut Down the Computer on page 42](#) for more information.
2. Disconnect power to the computer.
3. Disconnect all peripheral devices from the computer.
4. If using a keyboard and mouse, verify that they are properly connected.
5. If using an external display, verify that it is properly connected.
6. Connect power to the computer. During POST, one of three events occurs:
  - The computer completes the start-up process.
  - A nonfatal error occurs and the related error message is displayed.
  - A fatal error occurs and the start-up process terminates.

If	Then
The computer starts	Isolate the issue by connecting peripheral devices one at a time until the issue occurs.
The issue is with a specific software or driver	Reinstall the software or driver.
The issue is not related specifically to software, a driver, or a peripheral device	Refer to the troubleshooting checklists.

**TIP** Some computers emit beeps. These audible alerts only signal that an error is detected. The beeps can apply to nonfatal and fatal errors.

## Troubleshooting Checklists

To manage common issues, use these checklists to test and verify components. If an issue occurs, refer to these checklists before calling technical support.

### Issues during Startup

- Are all connections secure?
- Are the device drivers installed?
- Are the jumpers on any add-in boards correctly positioned?
- If starting from a drive:
  - Is it formatted and set up in the BIOS?
  - Are the drive's data and power cables properly connected? Verify that the computer can start from an external bootable device.
  - Is the drive tray secure? Verify that any captive thumbscrews are not loose or missing.
- Are memory modules properly installed? You can reinstall them to be sure of a good connection.

- Is the BIOS properly configured? You can restore the default BIOS settings by either of the following methods:
  - Load system defaults as detailed in [Load the System Defaults on page 65](#).
  - Use the CMOS jumper to reset the BIOS as detailed in [Clear the CMOS on page 65](#).

## Issues after Startup

- If an issue is intermittent, you can have a loose connection. Verify that the following items are secure or properly installed:
  - All connections to the computer including any add-in cards
  - Any captive thumbscrews for the drive assembly
  - The memory modules
- Does your computer have a virus? Run an antivirus software.
- Is the BIOS properly configured? To restore the default BIOS settings, see [Load the System Defaults on page 65](#).
- If there is a flickering display or a locked computer, restart the computer as specified in [Restart the Computer on page 41](#). Although the computers have a regulated and protected power supply, a transient voltage in the power line or peripheral cable can cause errors.
- Is the drive's data cable properly connected? Verify that the computer can start from an external bootable device.
- Is the computer overheating? Refer to the health status indicator on the computer's front panel. The light indicates the computer's temperature threshold has been exceeded.

If the system health status indicator remains lit, verify the following:

- Any fan (if available) is working.
- Any fan filter (if available) is clean.
- Any cooling method (such as heat sink and vents) is not blocked.
- There is proper clearance as detailed in [Mounting Clearance Requirements on page 27](#).
- The ambient temperature is within the operating range specified in [Table 3 on page 68](#).

## Issues Running New Software

- Does the software have a hardware requirement that is not present?
- Are you using an authorized copy of the software? Some software does not work without proper activation.
- Did the software install correctly? Reinstall the software.
- Are you following the software's instructions? Refer to the software vendor's user manual.

### Issues with the Add-in Card

- Is the card installed and configured correctly? Verify the jumper and other configuration settings.
- Are the card cables properly connected?
- Is the add-in card recognized in Device Manager?
- A card issue not listed here? Refer to troubleshooting information supplied by the add-in card manufacturer.

### Issues with the RAID Card

If you experience issues with the RAID card or RAID 1 operation on your Windows 2003 Server computer, contact technical support.

### Issues with an External Display

- Are the display contrast and brightness controls properly adjusted? Refer to the operating system containing the video driver for set-up functions.
- Verify that the selected character color is not the same as the background color.
- Is the display compatible with the selected video mode?
- Is the video cable properly connected?
- Is the video driver properly installed?
- Restart the computer with the external display connected and turned on.
- Is the display functioning properly? Verify display function by operating it with another computer.

## Diagnostic Utility

If you completed the troubleshooting steps and are still having issues, you can use a diagnostic utility to isolate the issue. This utility determines the cause by testing computer components.

Computers shipped before January of 2013 include a system diagnostic (green) CD with this diagnostic utility. If you need a copy of the CD, please contact your local distributor or Rockwell Automation representative, or use the resources on the back cover of this publication.

By using the diagnostic utility, you can perform an initial diagnosis without disconnecting or moving your computer. No software is installed nor does the utility affect any software already installed. Depending on the tests selected, the process can take as little as five minutes or as long as eight hours. After the diagnostic utility is run, you can generate a report for analysis by a technical support representative, expediting any necessary repair process.

## Load the System Defaults

If the computer fails after you make changes in the set-up menus, load the system default settings to correct the error. These default settings have been selected to optimize your computer's performance.

Follow these steps to load the system defaults.

1. Restart the computer as specified in [Restart the Computer on page 41](#).
2. During POST, press F2 to access the BIOS set-up utility.
3. Press F9 to load the default values.
4. Press F10 to save your changes and exit the BIOS set-up utility.

## Clear the CMOS

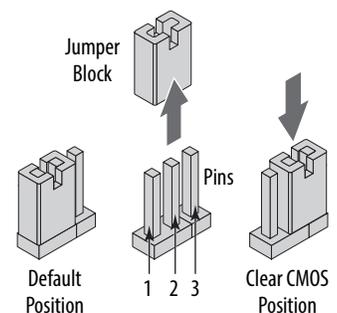
If the system configuration has been corrupted, an incorrect setting has caused error messages to be unreadable, or you cannot access the BIOS set-up utility to load the system defaults, you must clear the system configuration values stored in the CMOS.

Follow these steps to clear the CMOS.

1. Back up all system data and then shut down the computer.
2. Follow the steps for [Pre-configuration on page 44](#).
3. Remove the cover as detailed in [Remove the Cover on page 46](#).
4. Locate the CMOS jumper on the motherboard.

See [Figure 7 on page 20](#) or [Figure 8 on page 21](#) for where the CMOS jumper is on the motherboard.

5. Remove the jumper block from its default position (over pins 1 and 2).
6. Place the jumper block over pins 2 and 3 for 10 seconds.
7. Return the jumper block to its default position.




---

**IMPORTANT** The jumper block must be returned to its default position over pins 1 and 2. The computer does not start if you leave the jumper block over pins 2 and 3.

---

8. Reinstall the cover as detailed in [Reinstall the Cover on page 47](#).
9. Follow the steps for [Post-configuration on page 45](#).

---

**IMPORTANT** When you clear the CMOS, all BIOS settings return to their defaults. BIOS settings other than default must be reconfigured after clearing the CMOS.

---

10. During POST, press F2 to access the BIOS set-up utility and reconfigure settings.

## Ship or Transport the Computer

If you need to ship the computer via common carrier or otherwise transport it to another location for servicing or any other reason, you must first uninstall the computer and place it in its original packing material.



**ATTENTION:** Do not ship or transport the computer when it is installed in a machine, panel, or rack. Doing so can damage the computer. You must uninstall the computer and place it in its original packing material before shipping. Rockwell Automation is not responsible for damage incurred to a computer that is shipped or transported while installed in a machine, panel, or rack.

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## Specifications

The following tables contain specifications for non-display computers. For additional specifications, go to <http://ab.rockwellautomation.com/Computers>.

**Table 1 - Hardware and Software Specifications**

Specifications	Attribute	750R (Cat. No. 6177R-M4)				1450R (Cat. No. 6177R-R4)				650R (Cat. No. 6177R-M3)			
		AXP	PXP	SXP	AS3RD	PXP	LXP	SXP	AS3RD	PXP	PXPDC	AS3	
Hardware	Display	Requires external display											
	Processor <sup>(1)</sup>	Pentium 4		Celeron	Pentium 4	Pentium 4			Celeron	Pentium 4	Core Duo		
	Ethernet LAN	10/100/1000 Mbps (2 ports)											
	Thermal solution	<ul style="list-style-type: none"> <li>1 chassis fan</li> <li>1 heatsink fan</li> </ul>				<ul style="list-style-type: none"> <li>2 chassis fans</li> <li>1 heatsink fan</li> </ul>				<ul style="list-style-type: none"> <li>2 chassis fans</li> </ul>			
	Expansion slots	<ul style="list-style-type: none"> <li>3 PCI</li> <li>1 PCI-express</li> </ul>				<ul style="list-style-type: none"> <li>6 PCI</li> <li>1 PCI-express</li> </ul>	<ul style="list-style-type: none"> <li>4 PCI</li> <li>1 ISA</li> <li>1 shared</li> <li>1 PCI-express</li> </ul>	<ul style="list-style-type: none"> <li>6 PCI</li> <li>1 PCI-express</li> </ul>			<ul style="list-style-type: none"> <li>3 PCI</li> <li>1 ISA</li> </ul>		
	System memory <sup>(2)</sup>	4 GB	2 GB	1 GB	4 GB	2 GB			1 GB	4 GB	2 GB	4 GB	
	Hard disk drive <sup>(3)</sup> Qty. Size (min./each)	1 160 GB			2 160 GB	1 160 GB				2 160 GB	1 160 GB	2 160 GB	
	Optical disc drive	Slim DVD-RW	Slim DVD-ROM/CD-RW		Slim DVD-RW	Slim DVD-ROM/CD-RW	Slim DVD-RW/CD-RW	Slim DVD-ROM/CD-RW	Slim DVD-RW	Slim CD/DVD-RW			
	I/O ports	<ul style="list-style-type: none"> <li>2 front USB</li> <li>4 rear USB</li> <li>2 serial</li> <li>2 GB Ethernet</li> <li>1 parallel</li> <li>1 external VGA</li> <li>1 PS/2 keyboard</li> <li>1 PS/2 mouse</li> </ul>								<ul style="list-style-type: none"> <li>4 rear USB</li> <li>2 serial</li> <li>2 GB Ethernet</li> <li>1 parallel</li> <li>1 external VGA</li> <li>1 DVI</li> <li>1 PS/2 keyboard</li> <li>1 PS/2 mouse</li> </ul>			
	RAID drive <sup>(4)</sup>	No			Yes	No				Yes	No		
Audio jacks	<ul style="list-style-type: none"> <li>1 line-in</li> <li>1 line-out</li> <li>1 mic-in</li> </ul>				<ul style="list-style-type: none"> <li>1 line-in</li> <li>1 line-out</li> <li>1 mic-in</li> </ul>				<ul style="list-style-type: none"> <li>1 line-in</li> <li>1 line-out</li> <li>1 mic-in</li> </ul>				
Software	Operating system	See <a href="#">page 10</a>											

(1) Speeds are 2.66 GHz for Celeron, 3.0 GHz for Pentium 4, and 2.0 GHz for Core Duo processors.

(2) Dual-channel DDR II, 2 DIMM slots, 4 GB maximum memory for 750R and 1450R models. Dual-channel DDR II, 2 DIMM slots, 2 GB/slot and 4.0 GB maximum memory for 650R models.

(3) Drive size is 3.5 inches and SATA.

(4) Configured for RAID 1 operation; see [page 10](#) for operating system version.

**Table 2 - Power Specifications**

Attribute	6177R-M4, 6177R-R4, 6177R-M3
Input voltage, AC	100...240V AC, autoranging
Line frequency, AC	47...63 Hz
Input voltage, DC	18...32V DC
Power consumption, AC 650R 750R, 1450R	144VA (1.4 A @ 100V rms, 0.6 A @ 240V rms) 265VA (2.7 A @ 100V rms, 1.1 A @ 240V rms)
Power consumption, DC 650R	144 W (8 A @ 18V DC, 4.5 A @ 32V DC)
Power dissipation, AC 650R 750R, 1450R	144 W 265 W
Power dissipation, DC 650R	144 W
Power management	ACPI version 1.0b

**Table 3 - Environmental Specifications**

Attribute	6177R-M4, 6177R-R4, 6177R-M3
Dimensions (HxWxD), approx 650R 750R 1450R	274 x 427 x 215 mm (10.79 x 16.81 x 8.46 in.) 360 x 170 x 381 mm (14.17 x 6.69 x 15.01 in.) 176 x 431 x 465 mm (6.93 x 16.97 x 18.31 in.)
Weight, approx. 650R 750R 1450R	12.0 kg (26.50 lb) 13.8 kg (30.36 lb) 14.0 kg (30.80 lb)
Mounting option 650R 750R 1450R	M3 machine mount M4 machine mount 4U rack mount
Temperature, operating 650R 750R and 1450R	0...55 °C (32...131 °F) 0...45 °C (32...113 °F)
Temperature, nonoperating	-20...60 °C (-4...140 °F)
Relative humidity	10...90% noncondensing
Shock, operating	15 g (1/2 sine, 11 ms)
Shock, nonoperating	30 g (1/2 sine, 11 ms)
Vibration	0.003 in p-p, 10...57 Hz, 1.0 g peak, 57...640 Hz

**Table 4 - Certifications**

Attribute <sup>(1)</sup>	6177R-M4, 6177R-R4, 6177R-M3
c-UL-us	UL/c-UL Listed per UL 60950-1 and CSA C22.2 No. 60950-1-03
CE	Marked for all applicable directives: EMC 2004/108/EC LVD 2006/95/EC
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
RoHS	European China Turkey RoHS (EEE Yönetmeliğine Uygundur. In Conformity with the EEE Regulation)

(1) See <http://www.rockwellautomation.com/certification> for declarations of conformity, certificates, and other certification details.

**Notes:**

## Upgrade to a New BIOS

### BIOS Upgrade Procedure

Sometimes a new BIOS is released to enhance the performance of your computer or to correct a defect. In such cases, you can download BIOS upgrades at the Rockwell Automation Product Compatibility and Download Center (PCDC) website at <http://www.rockwellautomation.com/support/pcdc.page#/tab2>. CD and floppy disk drive upgrades are available.

### Upgrade the BIOS from the CD Drive

Follow these steps to upgrade the BIOS in your computer from the CD drive.

1. Attach the following external peripherals to your computer:
  - Display
  - Keyboard
2. Access the Rockwell Automation PCDC website at <http://www.rockwellautomation.com/support/pcdc>
3. Click the Get Downloads tab (A).
4. Click the Find Product Downloads link (B).



5. Use the Product Search criteria to find your specific computer model.
6. Follow the instructions on the PCDC site to find your BIOS.

**TIP** You must be registered with the Rockwell Automation PCDC website to download files.  
You must accept a User Agreement before files can be downloaded.

7. After the download completes, click Open to access the folder where ZIP files were downloaded.



8. Open the downloaded file to locate and extract the ISO (\*.iso) file.
9. Write the ISO file to a blank CD/CD-RW with the included CD Write utility (or one of your choice).
10. With the BIOS upgrade CD in the CD drive, restart the computer.
11. During POST, press F2 to access the BIOS set-up utility.
  - TIP** Use the arrow keys on a keyboard to navigate between BIOS menus and menu selections.
12. Navigate through the BIOS set-up utility to where you can select the CD drive as your boot source.
13. Save your change and exit the BIOS set-up utility.
14. Follow the directions that appear on the display to properly upgrade the BIOS.

## Upgrade the BIOS from an External Floppy Disk Drive

Follow these steps to upgrade the BIOS in your computer from an external floppy disk drive.

1. Attach the following external peripherals to your computer:
  - Display
  - Keyboard
  - Floppy disk drive
2. Follow [step 2](#) through [step 7](#) in [Upgrade the BIOS from the CD Drive](#) starting on [page 71](#) before proceeding to [step 3](#) in this section.
3. Open the downloaded file to locate and extract the executable (\*.exe) file.
4. Run the extracted executable file and then write that file to a floppy disk inserted in the external floppy disk drive.

This creates a BIOS upgrade floppy disk that you can use to start your computer.

5. With the BIOS upgrade disk in the external floppy disk drive, restart the computer.
6. During POST, press F2 to access the BIOS set-up utility.

**TIP** Use the arrow keys on a keyboard to navigate between BIOS menus and menu selections.

7. Navigate through the BIOS set-up utility to where you can select the floppy disk drive as your boot source.
8. Save your change and exit the BIOS set-up utility.
9. Follow the directions that appear on the display to properly upgrade the BIOS.

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**Notes:**



## Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products.

At <http://www.rockwellautomation.com/support> you can find technical and application notes, sample code, and links to software service packs. You can also visit our Support Center at <https://rockwellautomation.custhelp.com/> for software updates, support chats and forums, technical information, FAQs, and to sign up for product notification updates.

In addition, we offer multiple support programs for installation, configuration, and troubleshooting. For more information, contact your local distributor or Rockwell Automation representative, or visit <http://www.rockwellautomation.com/services/online-phone>.

## Installation Assistance

If you experience a problem within the first 24 hours of installation, review the information that is contained in this manual. You can contact Customer Support for initial help in getting your product up and running.

United States or Canada	1.440.646.3434
Outside United States or Canada	Use the <a href="#">Worldwide Locator</a> at <a href="http://www.rockwellautomation.com/rockwellautomation/support/overview.page">http://www.rockwellautomation.com/rockwellautomation/support/overview.page</a> , or contact your local Rockwell Automation representative.

## New Product Satisfaction Return

Rockwell Automation tests all of its products to help ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

United States	Contact your distributor. You must provide a Customer Support case number (call the phone number above to obtain one) to your distributor to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

## Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete this form, publication [RA-DU002](#), available at <http://www.rockwellautomation.com/literature/>.

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