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User Manual

Allen-Bradley

Integrated Display Industrial Computers

Catalog Numbers 6181F, 6181P









Allen-Bradley • Rockwell Software

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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.

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

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' section	10
Added information in 'Operating Systems' section	12
Added link to Rockwell Automation Product Compatibility and Download Center (PCDC) website	12, 49, 57, 59
Removed 'Multilingual User-interface CD Pack' section	12
Reduced what compact discs (CDs) are shipped with computer in 'Parts List' section	14
Added information to 'Required Tools' section	24
Added steps in 'Mount the Display Computer in a Panel' section	25
Added a step in 'Mount the Non-display Computer to a Wall' section	26
Added information in 'Connect Power' section	27
Added information in 'Connect AC Power' section	28
Revised and added information in 'Operating Guidelines' section	31
Revised and added information in 'Start the Computer' section	32
Replaced 'reset' with 'restart' in 'Restart the Computer' section	33
Added information in 'Restart the Computer' section	33
Updated link to Rockwell Automation Computers and Operators Interface website	35, 50, 53
Added information in 'Remove the Cover' section	37
Added information in 'Reinstall the Cover' section	38
Added 'Load a Card in the Bottom CF Card Slot' section	41
Added Attention table in 'Drive Precautions' section	42
Added information in 'Replace a Performance and Non-display Computer Drive' section	42
Added information in 'Replace a Standard Computer Drive' section	43
Revised section title from 'Add-in Cards' to 'Install an Add-in Card'	46
Added step 3 in 'Replace the RTC Battery' section	52
Added Tip table in 'Hardware Monitoring' section	55
Added Tip table in 'Troubleshooting' section	56
Added information in 'Troubleshooting Checklists' section	58
Replaced 'Diagnostic Utility' section with 'Load the System Defaults' section	59
Added information in 'Clear the CMOS' section	59
Added introductory paragraph in Appendix A	63
Changed title and added Specifications column to Table 1	63
Added Turkey RoHS statement in Certifications table	66
Added information in 'Driver Software' section	67
Revised information in 'Upgrade the BIOS from an External CD Drive' section	69
Revised information in 'Upgrade the BIOS from an External Floppy Disk Drive' section	71

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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 integrated 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
6181P Integrated Display Computers Installation Instructions, publication 6181P-IN010	Provides procedures on how to install the computer and make connections.
Cloning Utility for Rockwell Automation Industrial Computers Technical Data, publication 6000-TD002	Provides information on how to create and restore a back-up image of your computer's hard disk drive.
EWF and HORM Configuration Utility Technical Data, publication 6000-TD003	Provides information on how to configure Enhanced Write Filter (EFW) and Hibernate Once, Resume Many (HORM) features for computers with the Windows 2009 Embedded Standard operating system.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	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.

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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

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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

Integrated display industrial computers combine a TFT flat-panel display with industrial computing power for performing visual interface, maintenance, and basic information applications. These panel mount devices offer 12-, 15-, and 17-inch displays with a resistive touch-screen option for operator input, and a solid state or hard disk drive. A non-display version is also available.

These computers are available in standard and performance models. Performance models have aluminum or stainless steel bezels, both with a flush design to reduce debris build-up around the display. Aluminum bezels offer application access through a lockable, front-accessible USB 2.0 port. Optional stainless steel bezels are available to fulfill NEMA 4X requirements.

By combining industrially hardened displays and computers in a single machine, these panel mounted computers provide an entire solution in one chassis and catalog number. Because there are no external display cables or separate component mounting requirements, system integration is simplified.

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Operating Systems

The following Microsoft-licensed operating systems are available:

- Windows 7 Professional (32 bit)
- Windows XP Professional, Service Pack 3
- Windows Embedded Standard (WES) 2009

Computers with Windows XP Professional Operating System

- No operating system updates have been applied to the factory image beyond Service Pack 3.
- 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 WES 2009 Operating System

- All operating system updates have been applied as of September 2009.
- Computers include a utility for configuring the Enhanced Write Filter (EWF) and Hibernate Once, Restore Many (HORM) features. Refer to the EWF and HORM Configuration Utility for Rockwell Automation Computers Technical Data, publication 6000-TD003, for instructions.

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.

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Computer Options

This table summarizes the options available for the integrated display industrial computers. A comparative summary of features for the computers is in Appendix A, Specifications on page 61.

Table 1 - Integrated Display Industrial Computers

Cat. No.	Model	Series	Display Size (in.)	Storage	Touchscreen	Package	Windows OS
6181F-2PW7	NDM	E	N/A	SSD	N/A	Performance	7 Professional 32 bit
6181F-2PW7DC[1]							
6181P-2PW7				HDD			
6181P-2PW7DC[1]							
6181P-2PXP							XP Professional SP3
6181P-2PXPDC[1]							
6181F-12TPW7	1200P	E	12.1	SSD	Yes	Performance	7 Professional 32 bit
6181F-12TPW7DC[1]							
6181F-12TPWE							WES 2009
6181F-12TPWEDC[1]							
6181F-12TPXP							XP Professional SP3
6181F-12TPXPDC[1]							
6181F-12TSXP						Standard	
6181F-12TSWE							WES 2009
6181P-12NSXP				HDD	No		XP Professional SP3
6181P-12NPXP						Performance	
6181P-12TPW7					Yes		7 Professional 32 bit
6181P-12TPW7DC[1]							
6181P-12TPXP							XP Professional SP3
6181P-12TPXPDC[1]							
6181P-12TSXP						Standard	
6181F-15TPW7	1500P	E	15	SSD	Yes	Performance	7 Professional 32 bit
6181F-15TPW7DC[1]							
6181F-15TPW7SS[2]							
6181F-15TPWE							WES 2009
6181F-15TPWEDC[1]							
6181F-15TPWESS[2]							
6181F-15TPXP							XP Professional SP3
6181F-15TPXPDC[1]							
6181F-15TPXPSS[2]							
6181F-15TSXP						Standard	
6181F-15TSWE							WES 2009
6181P-15NSXP				HDD	No		XP Professional SP3
6181P-15NPXP						Performance	
6181P-15TPW7					Yes		7 Professional 32 bit
6181P-15TPW7DC[1]							
6181P-15TPW7SS[2]							
6181P-15TPXP							XP Professional SP3
6181P-15TPXPDC[1]							
6181P-15TPXPSS[2]							
6181P-15TSXP						Standard	

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Table 1 - Integrated Display Industrial Computers (continued)

Cat. No.	Model	Series	Display Size (in.)	Storage	Touchscreen	Package	Windows OS
6181F-17TPW7	1700P	E	17	SSD	Yes	Performance	7 Professional 32 bit
6181F-17TPW7DC(1)							
6181F-17TPW7SS(2)							
6181F-17TPWE							WES 2009
6181F-17TPWEDC(1)							
6181F-17TPWESS(2)							
6181F-17TPXP							XP Professional SP3
6181F-17TPXPSS(2)							
6181F-17TPXPDC(1)							
6181F-17TSXP						Standard	
6181F-17TSWE							WES 2009
6181P-17NSXP				HDD	No		XP Professional SP3
6181P-17NPXP						Performance	
6181P-17TPW7					Yes		7 Professional 32 bit
6181P-17TPW7DC(1)							
6181P-17TPW7SS(2)							
6181P-17TPXP							XP Professional SP3
6181P-17TPXPDC(1)							
6181P-17TPXPSS(2)							
6181P-17TSXP						Standard	

(1) Models with a catalog number ending in DC operate from DC power.
(2) Models with a catalog number ending in SS have a stainless steel bezel.

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	• Power cord for AC power models • Mounting clips(1) • Keys for front access cover lock(2) • Assembly screw bag • Industrial Computer System Cloning Utility CD (red) • CD with CD/DVD burning software(3)
Documents	• Integrated Display Industrial Computers Installation Instructions, publication 6181P-IN001 • Shipped Compact Discs (CDs) Update Release Note, publication 6000-RN009 • 6181P and 6181X Industrial Computers Cutout Template, publication 6181P-DS002(1) • China RoHS hazardous material table insert • Production test report

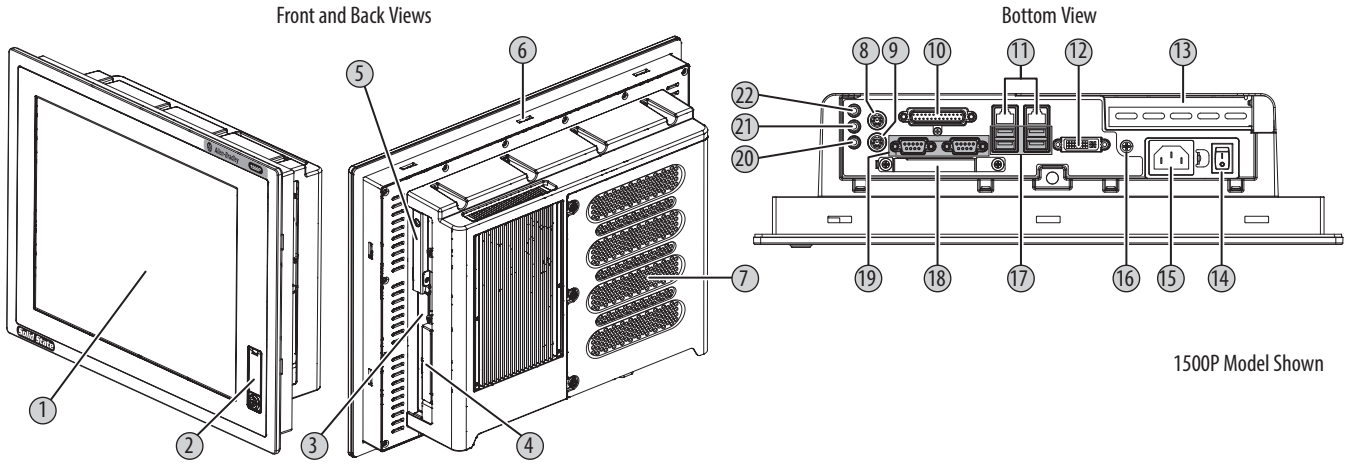
(1) Shipped only with display computers.
(2) Shipped only with computers with aluminum bezels; see the table in Computer Options on page 13 for more information.
(3) Shipped only with computers with the Windows XP Professional operating system.

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Hardware Features

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

Figure 1 - Performance Computers



1500P Model Shown

Item	Component
1	LCD panel(1)
2	Front access cover(2)
3	Optical disc drive
4	CompactFlash Type II card slot
5	HDD or SSD bay
6	Mounting slots
7	Rear cover
8	PS/2 mouse port

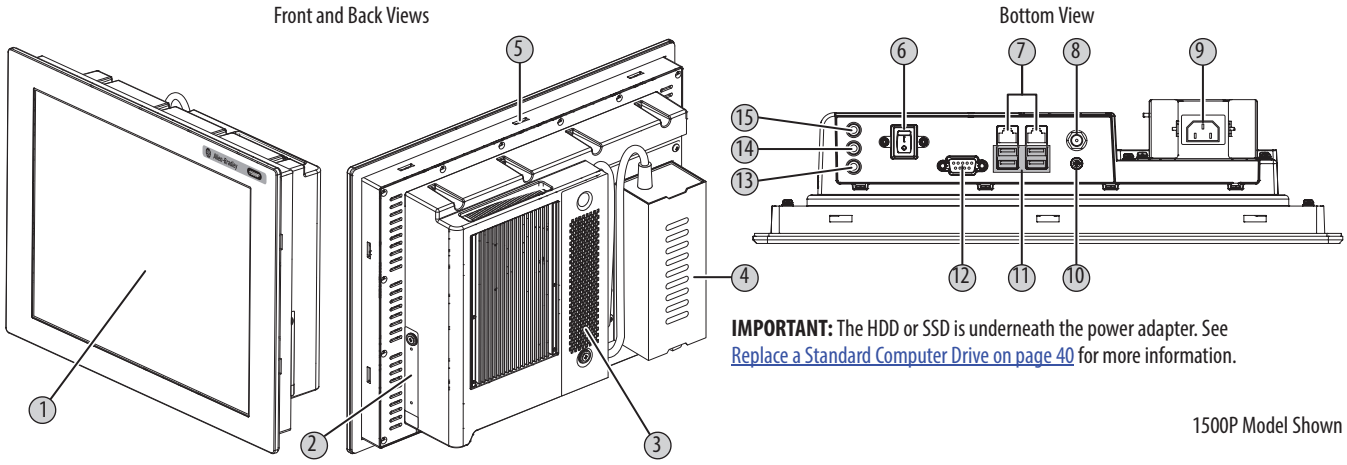
Item	Component
9	PS/2 keyboard port
10	Parallel port
11	Ethernet ports (RJ45), 2
12	DVI-I port
13	PCI riser slot cover(3)
14	Power switch
15	Power input, AC or DC(4) (5)

Item	Component
16	Functional ground screw
17	USB ports, 4
18	CompactFlash Type II card slot
19	Serial COM ports, 2
20	Microphone-in jack
21	Audio line-out jack
22	Audio line-in jack

(1) With or without optional touch screen.
(2) Protects the front USB port. This option not available on models with stainless steel bezel.
(3) 1500P and 1700P models have one PCI riser slot; 1200P and non-display models have two PCI riser slots.
(4) Model dependent.
(5) The DC power input has a pre-installed ground bus strip.

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Figure 2 - Standard Computers



IMPORTANT: The HDD or SSD is underneath the power adapter. See Replace a Standard Computer Drive on page 40 for more information.

1500P Model Shown

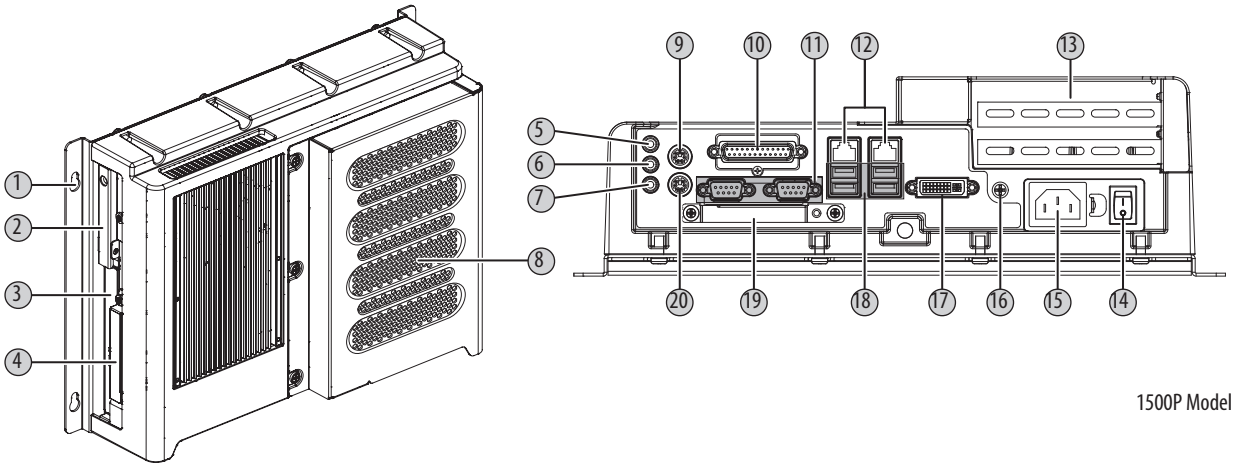
Item	Component
1	LCD panel(1)
2	CompactFlash Type II card slot
3	Rear cover
4	Power adapter
5	Mounting slots

Item	Component
6	Power switch
7	Ethernet ports (RJ45), 2
8	Power input, DC(2)
9	Power input, AC
10	Functional ground screw

Item	Component
11	USB ports, 4
12	Serial COM port
13	Microphone-in jack
14	Audio line-out jack
15	Audio line-in jack

(1) With or without optional touch screen.
(2) Use supplied adapter only.

Figure 3 - Non-display Computers



1500P Model Shown

Item	Component
1	Mounting hole, 4
2	HDD or SSD
3	Optical disc drive
4	CompactFlash Type II card slot
5	Audio line-in jack
6	Audio line-out jack
7	Microphone-in jack

Item	Component
8	Rear cover
9	PS/2 mouse port
10	Parallel port
11	Serial COM ports, 2
12	Ethernet ports (RJ45), 2
13	PCI riser slot cover, 2
14	Power switch

Item	Component
15	Power input, AC or DC(1) (2)
16	Functional ground screw
17	DVI-I port
18	USB ports, 4
19	CompactFlash Type II card slot
20	PS/2 keyboard port

(1) Model dependent.
(2) The DC power input has a pre-installed ground bus strip.

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Installation

Chapter Objectives

This chapter provides information on the following topics:

- Installation Precautions
- Installation Guidelines
- Mounting Clearance Requirements
- 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.

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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 an open type equipment. The interior of the enclosure must be accessible only by the use of a tool. UL Listed equipment does not need to be mounted inside another enclosure.

In addition to this publication, see the following:

- Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1, for additional installation requirements
- NEMA Standard 250 and IEC 60529, as applicable, for explanations of the degrees of protection provided by enclosures

European Union Directive

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/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.

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Installation Guidelines

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

- The installation site must have sufficient power.

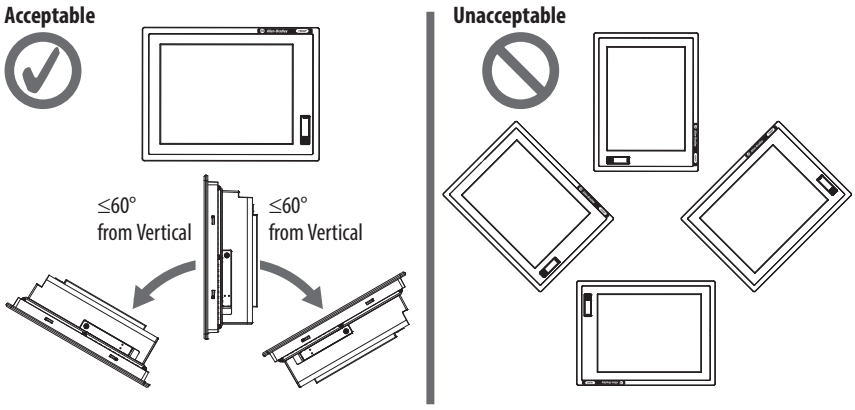
ATTENTION: To maintain an electrically safe installation, AC powered computers must be plugged into a grounded outlet.

- 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 20 for further information. Never allow air passages to become obstructed.
- The ambient air temperature must not exceed the maximum operating temperature as specified in Table 5 on page 63. 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 5 on page 63 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.
- When mounted, the computer cannot be tilted more than 60° from vertical.



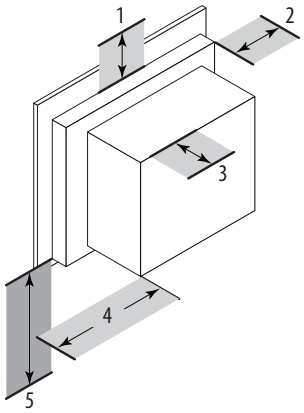
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Mounting Clearance Requirements

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.

Figure 4 - Minimum Clearances



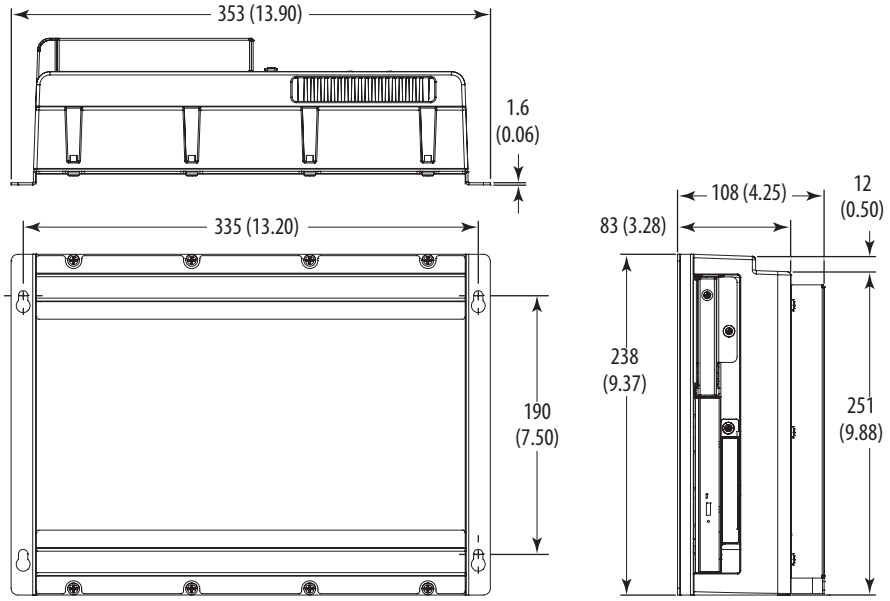
Item	Description	Value
1	Top	50 mm (2 in.)
2	Left (for airflow)	50 mm (2 in.)
3	Rear	50 mm (2 in.)
4	Right (for airflow and drive access)	127 mm (5 in.)
5	Bottom (for I/O port access and ventilation)	102 mm (4 in.)

Right and left are based on facing the front of the computer.

Computer Dimensions

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

Figure 5 - Non-display Computer



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Figure 6 - 1200P Integrated Display Computer – Performance

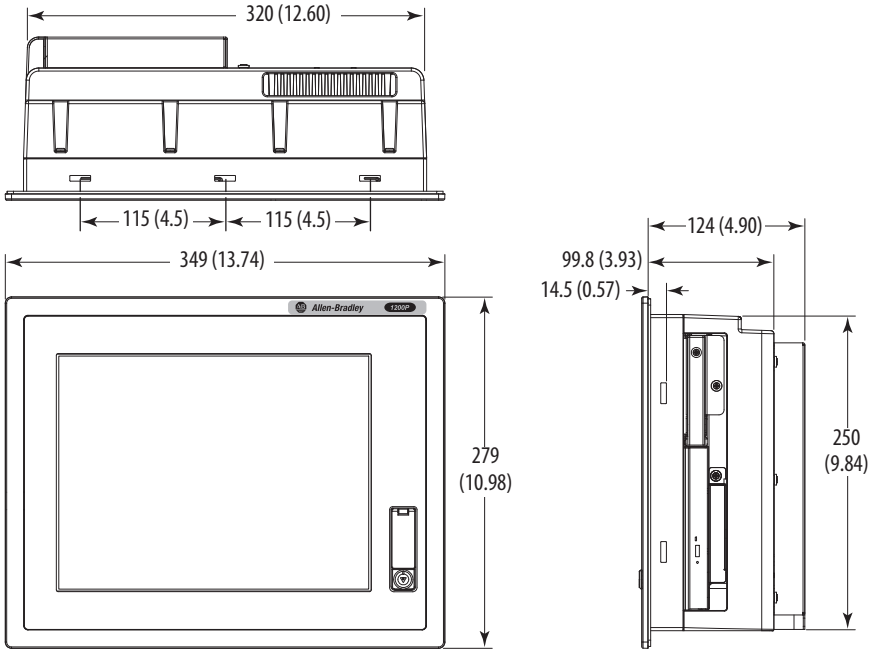
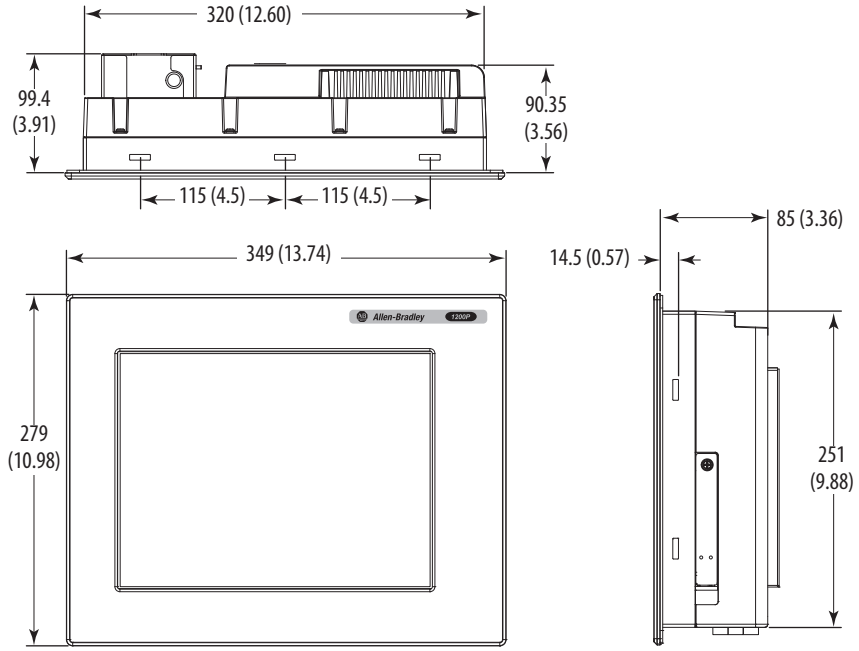


Figure 7 - 1200P Integrated Display Computer – Standard



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Figure 8 - 1500P Integrated Display Computer – Performance

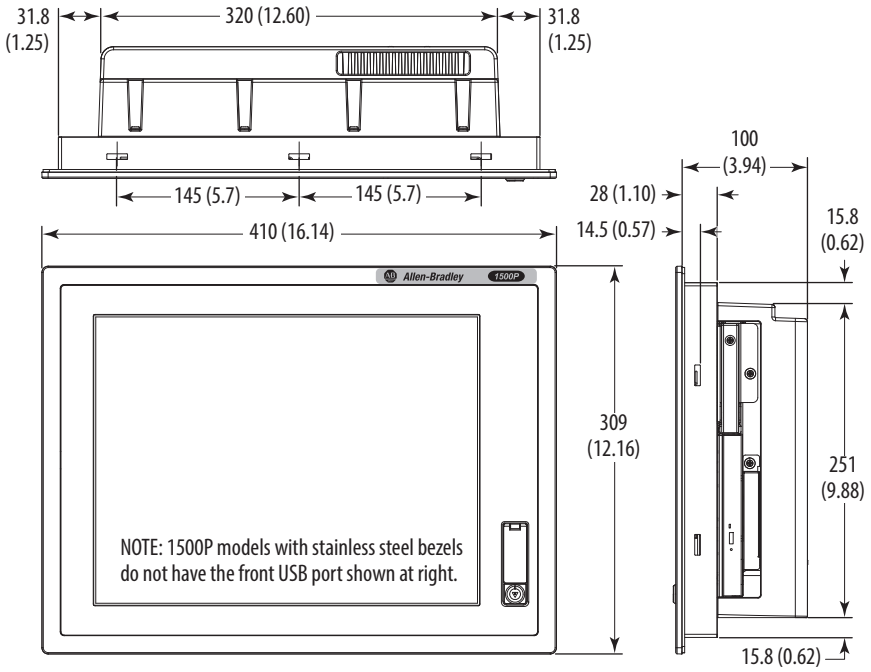
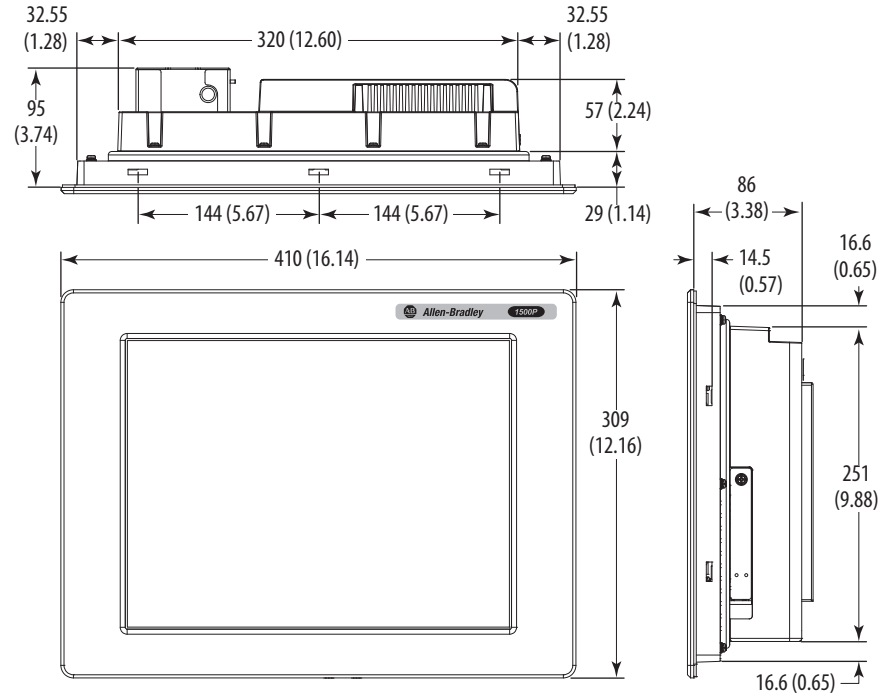


Figure 9 - 1500P Integrated Display Computer – Standard



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Figure 10 - 1700P Integrated Display Computer – Performance

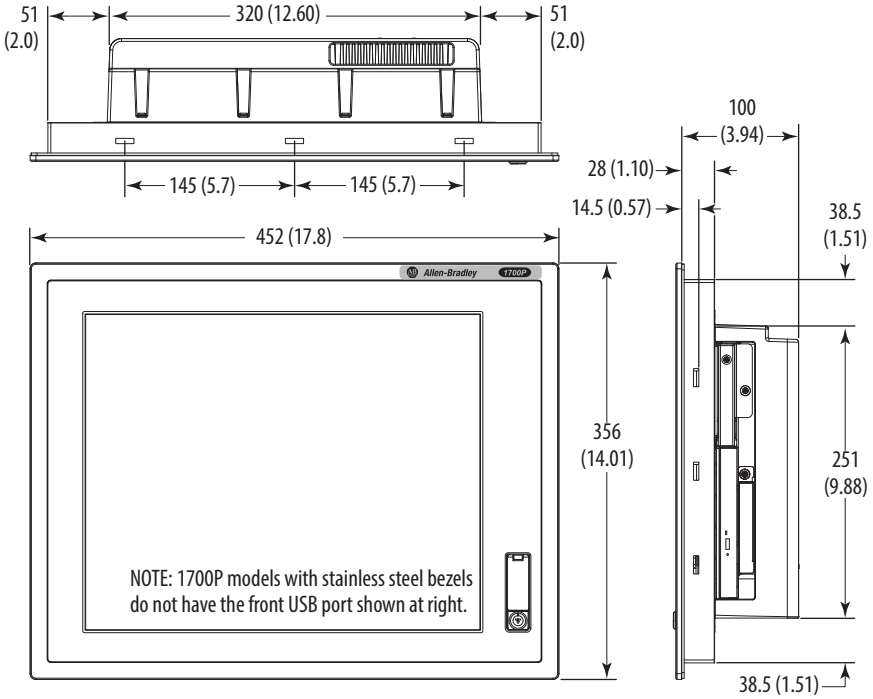
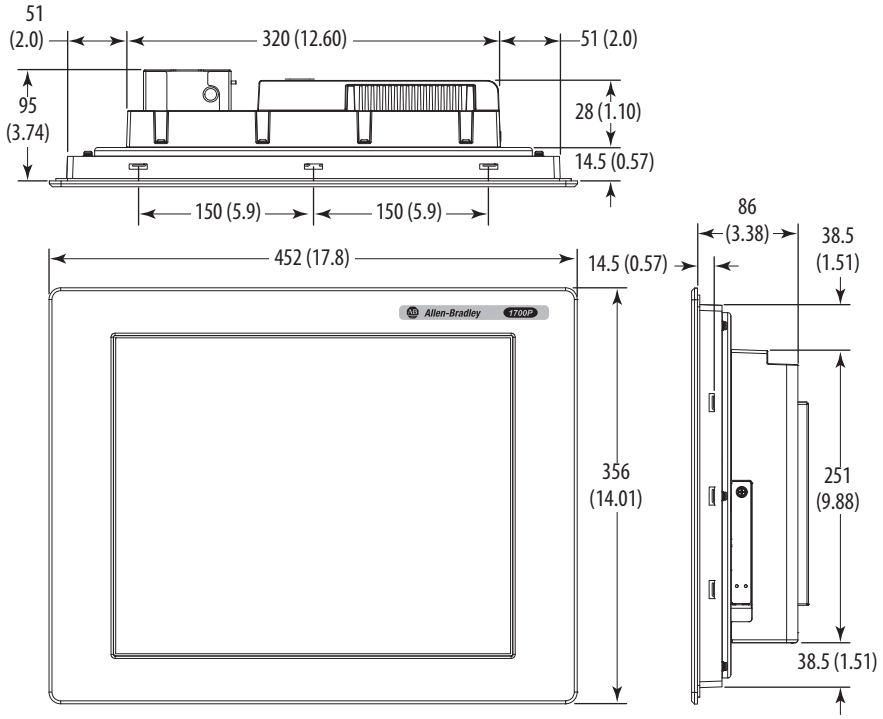


Figure 11 - 1700P Integrated Display Computer – Standard



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Required Tools

These tools are required for computer installation:

- #2 cross-head screwdriver
- Panel cutout tools (for panel mounting)
- Drill motor and drill bit (for wall mounting)
- Antistatic wrist strap

Install the Computer

The computers support the following mounting options:

- Panel mount (display computer models)
- Wall mount (non-display computer models)

Panel Mounting Guidelines

Observe these guidelines when installing the computer in a panel:

- Remove all electrical power from the panel before making the cutout.
- Confirm that there is adequate space behind the panel. For specific information, refer to Mounting Clearance Requirements on page 20.
- Cut supporting panels to specifications before installation. Take precautions so metal cuttings do not enter components already installed in panel.

  Supporting panels must be at least 14 gauge for proper sealing against water and dust and to provide proper support. The mounting hardware supplied accommodates panel thickness between 1.5...5.5 mm (0.06...0.22 in.).
- Make sure the area around the panel cutout is clear.



ATTENTION: Failure to follow these guidelines can result in personal injury or damage to the panel components.

Panel Cutout Dimensions

Included with the shipped computer is 6181P and 6181X Industrial Computers Cutout Template, publication 6181P-DS002, which is a cutout template for each computer model.

The computers must be mounted to meet the panel cutout dimensions specified below.

Model	Cutout Dimensions (H x W), approx
1200P	254.0 x 324.0 mm (10.0 x 12.76 in.)
1500P	285.0 x 386.6 mm (11.24 x 15.22 in.)
1700P	329.5 x 424.0 mm (12.97 x 16.69 in.)

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Mount the Display Computer in a Panel

Mounting clips secure the display computer to the panel. The number of clips varies by model.

Model	Clips (qty.)
All with aluminum bezel and 1500P with stainless steel bezel	10
1700P with stainless steel bezel	12

Cat. No.	Description
6189V-MCLPS3	Replacement mounting clips (14)

Follow these steps to mount the computer in a panel.

1. Remove power from the panel.
2. Verify that the panel surface around the area to be cut is clean and free of be debris.

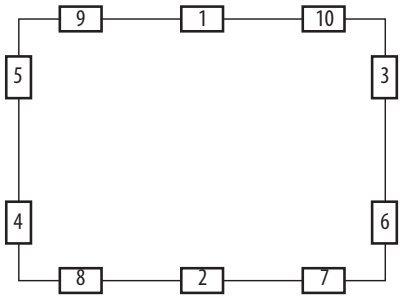
   ATTENTION: Take precautions so metal cuttings do not enter components already installed in panel to avoid personal injury or damage to the panel components.

3. Cut an opening in the panel using the appropriate panel cutout dimensions.
4. Attach cables to the computer before installation if rear access to the computer will be limited after installation. For where to attach cables, see Connect Peripherals on page 27.

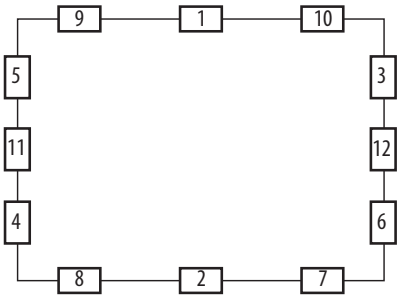
   AC power models: You might need to remove the AC retention clip before installing the computers in a panel cutout. Reattach the clip after installing the computer.
5. Make sure the sealing gasket is properly positioned on the computer.

   This gasket forms a compression-type seal. Do not use sealing compounds.
6. Place the computer in the panel cutout.
7. Slide the mounting clips into the holes on the top, bottom, and sides of the computer.
8. Hand-tighten the mounting clips around the bezel by following the tightening sequence below.

All Display Models with Aluminum Bezel and 1500P Display with Stainless Steel Bezel



1700P Display with Stainless Steel Bezel



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9. Repeat this process at least three times until the clips are hand-tight and the gasket is compressed uniformly against the panel.
10. Tighten the mounting clips to a torque of 1.35 N•m (12 lb•in) by following the torquing sequence on the previous page, making sure to not overtighten.
11. Repeat this process at least three times until the clips are properly torqued, making sure the gasket is compressed uniformly against the panel.

ATTENTION: Tighten the mounting clips to the specified torque to provide a proper seal and prevent damage to the product. Rockwell Automation assumes no responsibility for water or chemical damage to the computer or other equipment within the enclosure because of improper installation.

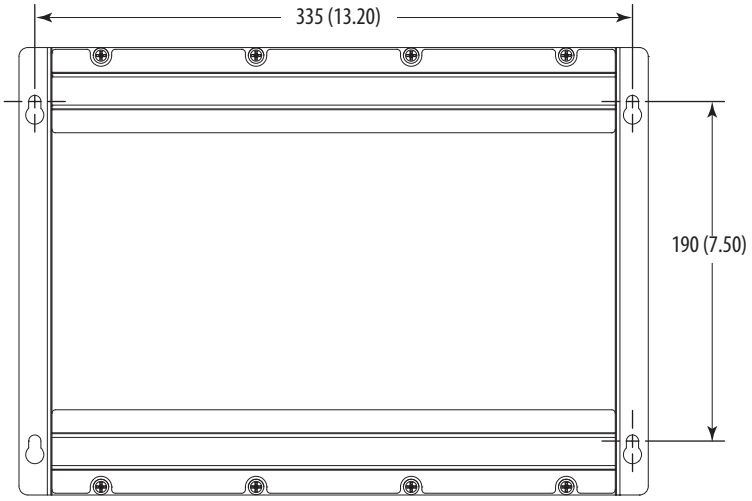
Mount the Non-display Computer to a Wall

Follow these steps to mount a non-display computer.

1. Verify the power is disconnected.
2. Drill holes in the wall to accommodate M5-sized screws.
3. Mount the computer to the wall by using four M5 pan head screws.

   Tighten to a torque that is appropriate for the screw and wall material.

The illustration shows the mounting hole locations with dimensions in mm (in.).



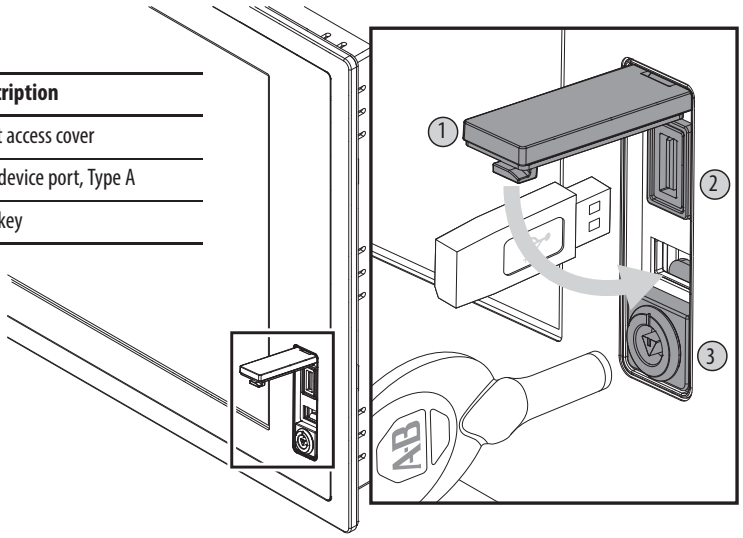
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Connect Peripherals

Connect the required peripherals, such as keyboard and mouse, to the corresponding I/O ports on the computer. Refer to the appropriate illustrations for connector locations in Hardware Features starting on page 13.

Display computer models with aluminum bezels have USB ports located on both the I/O port side panel and the front panel. Use these ports to connect various USB devices to the computer, such as an external drive. The front USB port is enabled or disabled through settings in the BIOS set-up menu.

No.	Description
1	Front access cover
2	USB device port, Type A
3	USB key



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 happen:

- 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.

  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.

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Connect AC Power

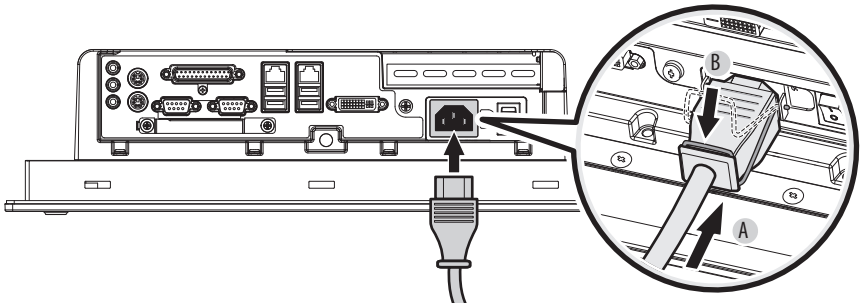
A grounded, 3-prong IEC60320-C13 power cord provides power to the computer. The power supply input accepts 100...240V AC and is autoranging.

TIP If using an alternate IEC60320 cord, make sure the female end of the cord is sized appropriately for the retention clip.

Performance and Non-display Computers

Follow these steps to connect performance and non-display computers to an AC power source.

1. Connect the power cord to the AC power input (A).
2. Secure the power cord in place with the retention clip (B).



3. Connect the AC power cord to a power source.

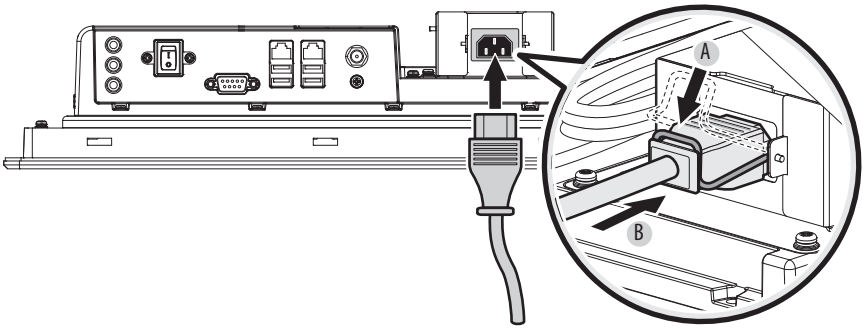
SHOCK HAZARD: Connect the AC power cord to a power source with an earth ground. Failure to follow this warning can result in electrical shock.

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

Standard Computers

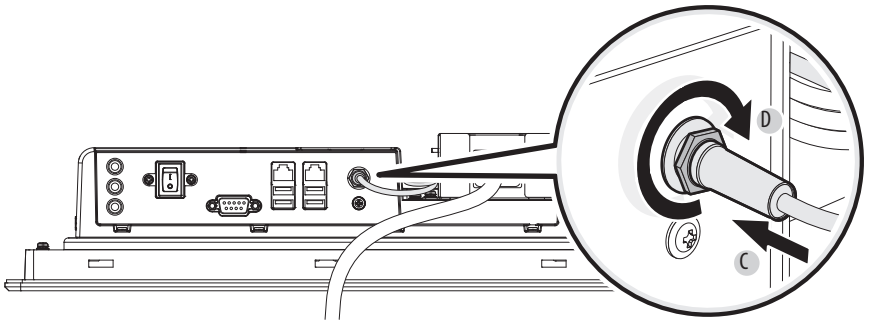
Follow these steps to connect standard computers to an AC power source.

1. Connect the power cord to the AC power input (A).
2. Secure it in place with the retention clip (B).



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3. Connect the DC barrel connector to the power input jack (C).
4. Twist the locking ring clockwise to secure it in place (D).



5. 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.

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

Connect DC Power to Performance and Non-display Computers

Performance and non-display computers with catalog numbers ending in DC have a DC input terminal block for connecting to a 18...32V DC power source.

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.

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

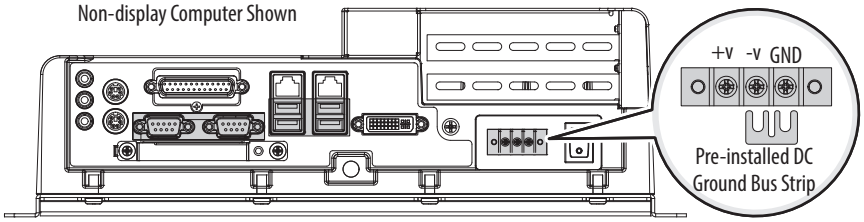
1. Turn off the main power switch or breaker.
2. Verify that the DC power wires meet these requirements:
   - Material: Stranded copper
   - Wire gauge: 0.325...0.823 mm^2 (22...18 AWG)

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

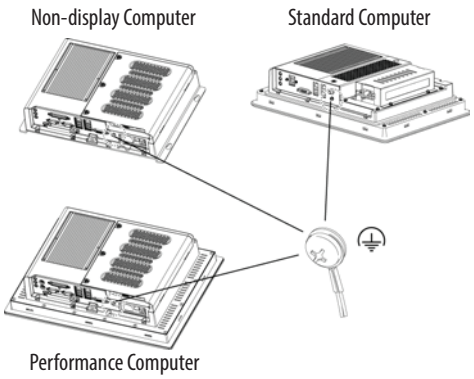
   Torque the terminal screws to 0.687 N•m (6.1 lb•in).

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



Functional Ground Screw

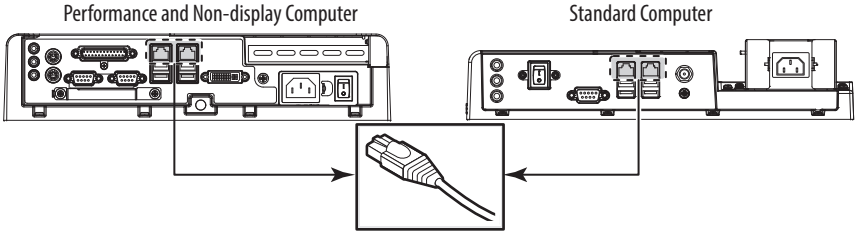
The pre-installed functional ground screw is not required for safety or regulatory compliance. However, if a supplemental ground is desired, use the functional ground screw in the I/O port panel of the computer.



If using the functional ground screw, connect the computer to earth ground by using a 1.5 mm^2 (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.



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.

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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:

- Operator access is limited to the front of the computer, which includes the display and the touchscreen (if available).



ATTENTION: Access to components behind the panel where the computer is installed and the front USB port (if available) is restricted to authorized and properly trained personnel.

- When mounted in an enclosure, keep the enclosure door closed during operation so dust and other airborne contamination do not infiltrate the computer. Open the door only for routine maintenance.
- Do not operate the computer with the covers removed. Removing the covers disrupts air flow and results in overheating.



SHOCK HAZARD: Do not operate the computer with the covers removed. An electrical shock hazard exists. All covers, including the slot 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.

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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 27 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 28 or Standard Computers on page 28 for how to install the AC power cord into the AC power input on the computer.

   DC powered models: See Connect DC Power to Performance and Non-display Computers on page 29 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. Press the computer's power switch.

   See Hardware Features on page 15 for power switch location.

The computer performs certain actions every time it is started or reset. See Restart the Computer on page 33 for what is done.

If your computer does not start or you notice other anomalies, refer to Troubleshooting starting on page 53.

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Restart the Computer

Use either of the following methods to restart your computer:

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

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 the computer 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.

Shut Down the Computer

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

Method	Actions
Windows OS	With an attached keyboard and mouse, do one of the following. • Press CTRL+ALT+DEL and click Shut Down. • From the Start menu, click or choose Shut Down from the pull-down menu.
Power switch	Press the power switch to shut down the computer. See Hardware Features on page 15 for the power switch location. **IMPORTANT:** Access to components behind the panel where the computer is installed is restricted to authorized and properly trained personnel.

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.

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Notes:

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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
- CompactFlash Card
- Drive Precautions
- Replace 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 at 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.

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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 35.
- 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.

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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 38.
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
- Antistatic wrist strap
- Side cutters (for cutting cable ties, if necessary)

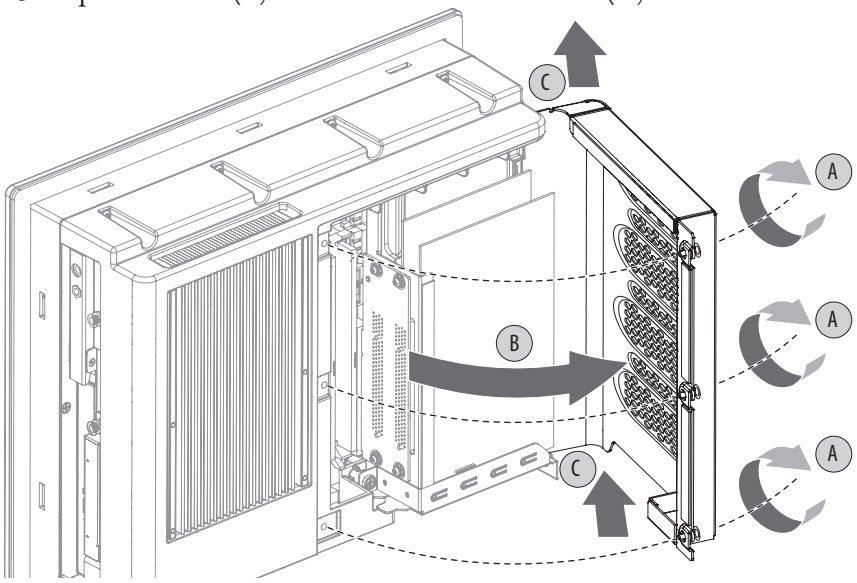
Remove the Cover

To install, replace, or upgrade internal computer components, you must first remove the cover. The procedure for removing the rear cover is different for the computer models.

Performance and Non-display Computers

Follow these steps to remove the rear cover (the performance computer is shown).

1. Follow the steps for Pre-configuration on page 36.
2. Loosen the three screws that secure the rear cover (A).
3. Open the cover (B) and detach it from the chassis (C).



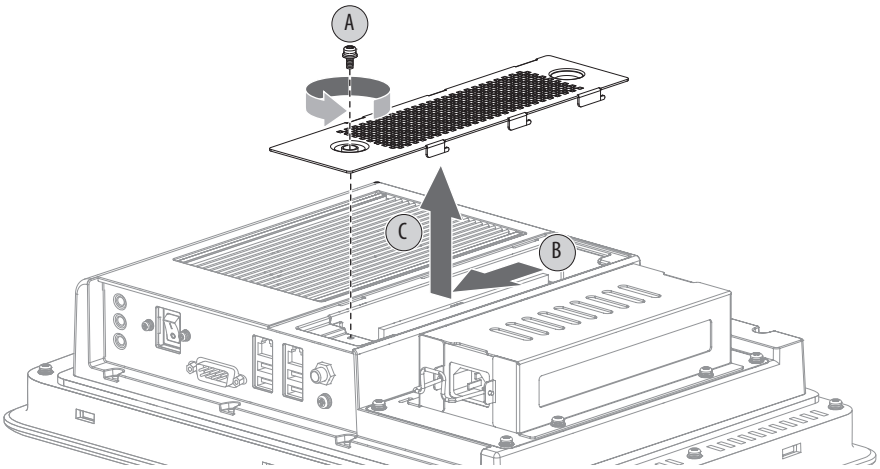
4. After installing, replacing, or upgrading internal computer components, reinstall the cover as detailed in Reinstall the Cover on page 38.

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Standard Computers

Follow these steps to remove the rear cover.

1. Follow the steps for Pre-configuration on page 36.
2. Loosen the one screw that secures the rear cover (A).
3. Slide the cover downward to release the inner tabs from the chassis (B).
4. Detach the rear cover from the chassis (C).



5. After installing, replacing, or upgrading internal computer components, reinstall the cover as detailed in Reinstall the Cover on page 38.

Reinstall the Cover

The procedure for reinstalling the rear cover is different for the computer models.

Performance and Non-display Computers

Follow these steps to reinstall the rear cover (the performance computer is shown).

1. Follow steps 1...3 for Post-configuration on page 37.
2. Reattach the rear cover to the chassis (A).
3. Close the cover (B).

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