

Industrial Computers for Hazardous Locations

Series H

Catalog Numbers 6181X-12A2SW71DC, 6181X-00N2SW71DC, 6181X-12A2SWX1DC, 6181X-00N2SWX1DC, 6181X-12P2SWX1DC

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Summary of Changes

This publication contains new and updated information as indicated in this table.

Topic	Page
Added ABNT NR ratings to Important table in Environment and Enclosure Information subsection.	3
Added ratings information sentence that references Hazardous Location section.	3
Updated Product Certifications URL to rok.auto/certifications .	3, 31
Reduced maximum distance for I/O cables from 30 ft to 3 ft, and added Ethernet cable exception.	3
Added paragraph about available Rockwell Automation® sun shield in the Outdoor Installation section.	4
Added Important table about Rockwell Automation sun shield in the Outdoor Installation section.	4
Added Cat. No. 6181X-12P2SWX1DC to Hazardous Locations table.	5
Revised rating numbers and added INMETRO information in the Hazardous Locations table.	5
Added Important table above the Hazardous Locations table.	5
Converted table footnotes to the new The Following Conditions for Safe Use Apply in ATEX, IECEx, and INMETRO section.	6
Added 'Conditions for Safe Use in North American Hazardous Locations' subsection title.	7
Revised content to address sun shield usage in Important table in Hot Surfaces section.	7
Added Cat. No. 6181X-12P2SWX1DC and footnote to the first table in the Computer Options section.	7
Revised description to 6189X-PCIRISER to the second table in the Computer Options section.	8
Added Cat. No. 6189X-SUNSHIELD to the second table in the Computer Options section.	8
Added footnote to the second table in the Computer Options section.	8
Added DC wiring table to Installation Guidelines section.	9
Added Cat. No. 6181X-12P2SWX1DC to the table in the Panel Cutout Dimensions section.	14
Added Cat. No. 6181X-12P2SWX1DC to the table in the Mount the Integrated Display Computer in a Panel section.	15
Added second sentence to introductory paragraph in Hardware Features section.	17
Added cross-references to new DC wiring table in steps 3 and 4, and Important table in step 4.	18
Revised Important table to specify add-in card evaluation and use.	24
Added picture of factory-installed riser card and available riser card accessory.	24
Expanded step 3 to include slot cover screw information for further use.	24
Expanded step 6 to include separate install instructions for PCIe and PCI add-in cards.	24
Added sentence about memory modules with heatsinks to Important table in Replace or Add Memory Modules section.	26
Added second sentence to Important table in the Replace or Add Memory Modules subsection.	26
Added picture of memory modules with heatsinks to step 3 in the Replace or Add Memory Modules section.	26
Added step 5 to the Replace or Add Memory Modules section.	27
Updated website and URL to return a computer for clock battery replacement.	27
Added 6181X-12P2SWX1DC column to all specification tables and any corresponding specifications.	28...31
Added UAE RoHS row to table in Certifications section.	31
Added EAC row to table in Certifications section.	31

Installation Precautions

Read and follow these precautions before you install 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 32 and ABNT NBR IEC/CISPR 32. Without appropriate precautions, there can be potential difficulties with electromagnetic compatibility in other environments due to conducted and radiated disturbance.

The equipment must be panel mounted or open-type, and installed in a tool-only accessible enclosure that is suitable for the environment.

All 6181X-12 integrated display computers are shipped with a gasketed bezel to meet specified ratings when mounted in a panel or enclosure with an equivalent rating. For more information about these ratings, see [Hazardous Locations on page 5](#).

In addition to this publication, see the following:

- Publication [1770-4.1](#), Industrial Automation Wiring and Grounding Guidelines, for more installation requirements
- ABNT NBR IEC 60529, NEMA 250, UL 50, and IEC 60529, as applicable to your region, for explanations of the degrees of protection that are 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 marking. A copy of the declaration of the conformity is available at rok.auto/certifications.



ATTENTION: To comply with EN 55024 and EN 55032, the following applies to cable usage:

- USB cables must be less than 3 m (9.84 ft) long
- All I/O cables, except for Ethernet cables, must be used indoors
- All I/O cables, except for Ethernet cables, cannot exit the building at any point and cannot directly connect to cables outside the building

To comply with EN 55024 and EN 55032, use the following for cable types.

Cable Type	Required Attribute	Cable Type	Required Attribute
LAN	Shielded or unshielded	DVI	Shielded
USB	Shielded	DP	Shielded
Serial RS-232	Shielded	DC power	Unshielded

Outdoor Installation

When you use a 6181X integrated display computer outdoors, consider the following to maximize the field life of the front bezel and display:

- Select the proper enclosure
- Computer orientation

Ultraviolet (UV) and infrared radiation can reduce the field life of any electronic device. While the materials used in the computer bezels provide long field life, that life can be improved by proper installation.

UV radiation from the sun causes all plastics to fade or yellow and become brittle over time. Avoiding long-term exposure to direct sunlight helps protect the front of the computer from direct exposure to UV radiation, and greatly increase its field life.

Rockwell Automation sells a sun shield (Cat. No. 6189X-SUNSHIELD) for the 6181X integrated display computers. If you install a sun shield that closes over the display, the temperature between the sun shield and the display cannot exceed the maximum temperature of the display, which is 55 °C (131 °F). Adequately ventilate all sun shields to help prevent excess heat rise on the computer display.

IMPORTANT	The Rockwell Automation approved sun shield (Cat. No. 6189X-SUNSHIELD) must be used if the computer is exposed to direct sunlight.
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Use stirring fans or active cooling in high altitude and high ambient temperature locations to keep the internal enclosure temperature below 70 °C (158 °F). Use a heater in installations where the ambient temperature is below -20 °C (-4 °F).




If possible, avoid placing the computer on the south (north in the southern hemisphere) or west side of the cabinet. This reduces the heat rise due to solar loading during the hottest part of the day.

Mount the computer vertically to minimize solar loading on the display. Do not mount the computer in a sloped enclosure if it exposes the computer to direct sunlight.

Hazardous Locations

This equipment is suitable for these location categories.

IMPORTANT 6181X computers can only be used in non-hazardous locations in any Eurasian Conformity region.

Computer Model	Cat. Nos.	Region	Rating	Temperature Range
Non-display	6181X-00N2SW71DC, 6181X-00N2SWX1DC	United States	Class I Division 2, Groups A, B, C, D T4	-20 °C ≤ T _a ≤ 70 °C (-4 °F ≤ T _a ≤ 158 °F)
			Class I Zone 2, IIC, T4	
		Canada	Class I Division 2, Groups A, B, C, D T4	
			Class I Zone 2, IIC, T4	
		Europe (ATEX)	 II 3 G, Ex ec IIC T4 Gc, DEMKO 19 ATEX 2274 X	
Global/IECEx	Ex ec IIC T4 Gc, IECEx UL 19.0091 X			
		INMETRO	Ex ec IIC T4 Gc, UL-BR 19.1305 X	
Display (12 in.)	6181X-12P2SWX1DC	United States	Class I Division 2, Groups A, B, C, D T4	-20 °C ≤ T _a ≤ 55 °C (-4 °F ≤ T _a ≤ 131 °F) (display side)
			Class II Division 2, Groups F, G T6	
			Class III Division 1 T6	-20 °C ≤ T _a ≤ 70 °C (-4 °F ≤ T _a ≤ 158 °F) (backside)
		Canada	Class I Zone 2, IIC, T4	
			Class II Zone 22, IIIB, T70 °C	
		Europe (ATEX)	Class I Division 2, Groups A, B, C, D T4	
Class II Division 2, Groups F, G T6				
	Class III Division 1 T6			
	Class I Zone 2, IIC, T4			
	Class II Zone 22, IIIB, T70 °C			
	Europe (ATEX)	 II 3 GD, Ex ec IIC T4 Gc IP66, Ex tc IIIC T70 °C Dc IP66, DEMKO 19 ATEX 2274 X		
	Global/IECEx	Ex ec IIC T4 Gc IP66, Ex tc IIIC T70 °C Dc IP66, IECEx UL 19.0091 X		
		INMETRO	Ex ec IIC T4 Gc IP66, Ex tc IIIC T70 °C Dc IP66, UL-BR 19.1305 X	
Display (12 in.)	6181X-12A2SW71DC, 6181X-12A2SWX1DC	United States	Class I Division 2, Groups A, B, C, D T4	-20 °C ≤ T _a ≤ 55 °C (-4 °F ≤ T _a ≤ 131 °F) (display side)
			Class I Zone 2, IIC, T4	
		Canada	Class I Division 2, Groups A, B, C, D T4	
			Class I Zone 2, IIC, T4	
Europe (ATEX)	 II 3 GD, Ex nA nC IIC T4 Gc IP66, Ex tc IIIC T135 °C Dc IP66, DEMKO 17 ATEX 1851 X			
Global/IECEx	Ex nA nC IIC T4 Gc IP66, Ex tc IIIC T135 °C Dc IP66, IECEx UL 17.0024 X			

The Following Conditions for Safe Use Apply in ATEX, IECEx, and INMETRO

For all non-display models (Cat. Nos. 6181X-00N2SW71DC and 6181X-00N2SWX1DC).

- The equipment shall only be used in an area of not more than Pollution Degree 2, as defined in EN/IEC 60664-1, as applicable to your region.
- The equipment shall be installed in an INMETRO/ATEX/IEC certified enclosure that provides a degree of protection not less than IP54, and is only accessible by use of a tool.
- Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage value at the supply terminals to the equipment.
- The non-display computers were evaluated for use with a PCI Express (PCIe) or PCI add-in card.
- PCIe and PCI add-in cards must be rated Zone 2 ATEX/IECEx/INMETRO, T4 (maximum), 4 W (maximum), 90 °C (194 °F) (minimum) surrounding ambient temperature.
- The internal enclosure ambient temperature range is -20...+70 °C (-4...+158 °F).

For all integrated display models (Cat. Nos. 6181X-12A2SW71DC, 6181X-12A2SWX1DC, and 6181X-12P2SWX1DC).

- The equipment shall only be used in an area of not more than Pollution Degree 2, as defined in EN/IEC 60664-1, as applicable to your region.
- For EPL Gc, the equipment shall be installed in an INMETRO/ATEX/IEC certified enclosure that provides a degree of protection not less than IP54, and is only accessible by use of a tool.
- For EPL Dc, the equipment shall be installed in an INMETRO/ATEX/IEC Zone 22 (minimum) certified enclosure that provides a degree of protection not less than IP64, and is only accessible by use of a tool.
- Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage value at the supply terminals to the equipment.
- The ambient temperature (external to enclosure) range is -20...+55 °C (-4...+131 °F), and that of the internal enclosure ambient temperature is -20...+70 °C (-4...+158 °F).
- The integrated display computers with a resistive touch screen (Cat. Nos. 6181X-12A2SW71DC and 6181X-12A2SWX1DC) were evaluated for use with a PCI Express (PCIe) add-in card.
- The integrated display computer with a PCAP touch screen (Cat. No. 6181X-12P2SWX1DC) was evaluated for use with a PCIe or PCI add-in card.
- PCIe and PCI add-in cards must be rated Zone 2 ATEX/IECEx/INMETRO, T4 (max), 4 W (max), 90 °C (194 °F) (min) surrounding ambient temperature.
- To maintain the IP66 rating of the equipment, it shall be mounted in an enclosure with an equivalent IP rating.
- To minimize risk from electrostatic discharge, only clean the display with a damp cloth.

Conditions for Safe Use in North American Hazardous Locations

The following statements apply to when the computer is used in a North American hazardous location.



WARNING: Explosion Hazard

- Do not connect or disconnect the device or any connected peripheral equipment unless power has been switched off and the area is known to be non-hazardous.
- Peripheral equipment must be suitable for the location where it is used.
- In the U.S., all wiring must be in accordance with Class I, Division 2 wiring methods of Article 501 of the National Electrical Code, and in accordance with the authority having jurisdiction.
- In Canada, all wiring must be in accordance with Section 18-112 of the Canadian Electrical Code, and in accordance with the authority having jurisdiction.
- In final applications, properly connect these devices to ground by using the ground terminal screw on the computer chassis.
- PCIe and PCI add-in cards must be rated Class I, Division 2, T4 (max), 4W (max), 90 °C (194 °F) (min) surrounding ambient temperature.

Hot Surfaces

IMPORTANT

The Rockwell Automation approved sun shield (Cat. No. 6189X-SUNSHIELD) must be used if the computer is exposed to direct sunlight.

Restricted Access Location

Verify that restricted access locations for the equipment meet these conditions:

- Access is gained only by service personnel or by users who have been instructed on the reasons for restrictions to a location and about any precautions to be taken.
- Access is by using a tool, a lock and key, or other means of security controlled by the authority responsible for the location.

Computer Options

This table summarizes the options that are available for industrial computers for hazardous locations. A comparative summary of features for the computers is in [Technical Specifications on page 28](#).

Cat. No.	Model	Series	Display Size	Touch Screen	Windows OS
6181X-00N2SW71DC	NDM	H	—		7 Professional 64-bit SP1
6181X-12A2SW71DC	1200P		12.1 in.	Resistive	
6181X-00N2SWX1DC	NDM	H	—		10 IoT Enterprise 64-bit
6181X-12A2SWX1DC	1200P		12.1 in.	Resistive	
6181X-12P2SWX1DC				PCAP ⁽¹⁾	

(1) PCAP touch screen supports multi-touch operation.

This table shows what accessories are available for industrial computers for hazardous locations.

Cat. No.	Description
6189X-MCLPS	Replacement mounting clips (10)
6189X-8GDDR3	8 GB DDR3 RAM memory for extended temperature
6189X-16GDDR3	16 GB DDR3 RAM memory for extended temperature
6189V-CFSSD8GB	CompactFlash card, 8 GB single-level cell (SLC) solid-state drive (SSD)
6189V-CFSSD16GB	CompactFlash card, 16 GB SLC SSD
6189X-128GBSSD	128 GB multi-level cell (MLC) SSD
6189X-256GBSSD	256 GB MLC SSD
6189X-PCIRISER	PCIe x1 to PCI x16 riser card ⁽¹⁾
6189X-SUNSHIELD	Sun shield

(1) This card can only be used in Cat. Nos. 6181X-00N2SW71DC, 6181X-00N2SWX1DC, and 6181X-12P2SWX1DC.

You can view a current list of accessories and replacement parts at <https://ab.rockwellautomation.com/Computers/Hazardous-Location-Display-Computers#selection>.

Operating Systems

The following Microsoft®-licensed operating systems are available:

- Windows® 7 Professional (64 bit), SP1
- Windows 10 Internet of Things (IoT) Enterprise (64 bit)

These solid-state drives are customized to accommodate their unique properties as follows:

- No paging file
- System restore is disabled by default

To obtain a copy of a factory system image, access the Rockwell Automation Product Compatibility and Download Center (PCDC) at <https://compatibility.rockwellautomation.com/Pages/home.aspx>.

Before You Begin

Before you unpack the computer, inspect the shipping carton for damage. If damage is visible, immediately contact the shipper and request assistance. Otherwise, continue to unpack.

Keep the original packing material in case you must 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 that is returned for service.

Parts List

The computers ship with these items.

Item	Description
Hardware	<ul style="list-style-type: none"> Screws with grommets to mount non-display computers Clips to mount integrated display computers
Documents	<ul style="list-style-type: none"> This publication 6181P and 6181X Industrial Computers Cutout Template, publication 6181P-DS002⁽¹⁾ Production test report

(1) Shipped only with integrated display computers.

Installation Guidelines

Follow these guidelines to make sure that your computer provides service with excellent reliability:

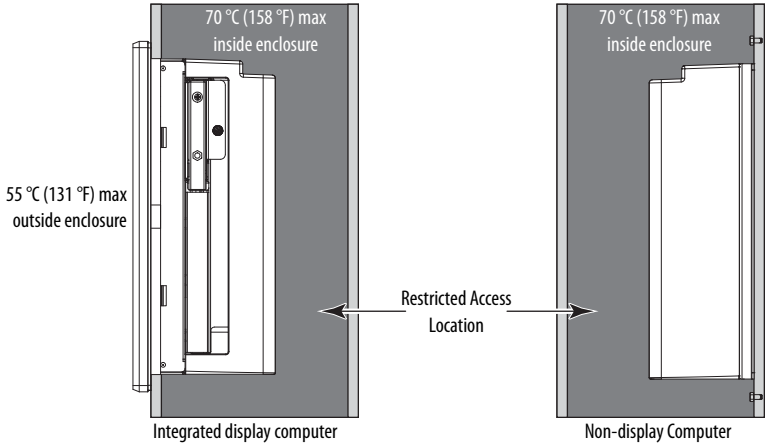
- The installation site must have sufficient power.
- Verify that the DC power wires meet these requirements.

Attribute	Requirement
Wire material	Stranded copper, insulation 90 °C (194 °F) min
Wire gauge <ul style="list-style-type: none"> To connect to DC input terminal block To connect to earth ground 	<ul style="list-style-type: none"> 0.823...2.08 mm² (18...14 AWG) 1.5 mm² (16 AWG) or larger⁽¹⁾
Wire temperature rating, min	76 °C (169 °F)
Torque values <ul style="list-style-type: none"> For DC input terminal block screws For functional ground screw 	<ul style="list-style-type: none"> 1.36 N•m (12 lb•in) 1.47 N•m (13 lb•in)

(1) Use a ground wire with an insulation color allowed by local inspection authority.

- 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 11](#) for further information. Never allow air passages to become obstructed.

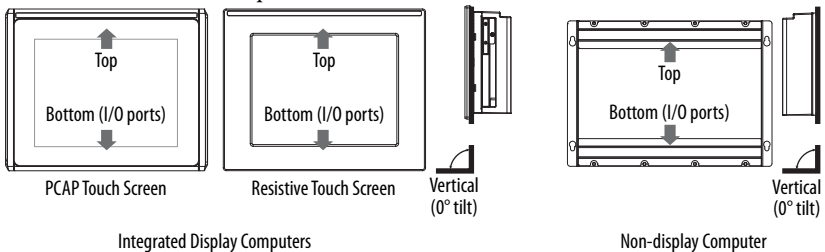
- The ambient air temperature must not exceed the maximum operating temperature in [Environmental Specifications on page 30](#). Consider a user-supplied fan, heat exchanger, or air conditioner for heat that is generated by other devices in the enclosure.



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

IMPORTANT The computer can operate at a range of extremes. If you continuously operate the computer at its highest rated temperature, then the life span of any electronic device is shortened, which includes the touch screen and LCD panel.

- The relative humidity of the ambient air must not exceed limits in [Environmental Specifications on page 30](#) and must avoid condensation.
- The enclosure or cover must always remain in place 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 from vertical.



Mounting Clearance Requirements

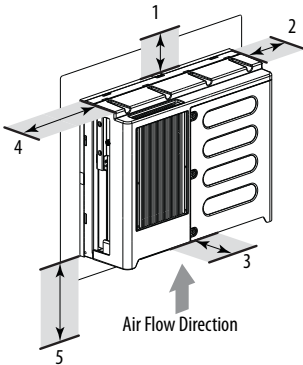
IMPORTANT

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

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

The minimum required enclosure size (HxWxD) is 403 x 497 x 154 mm (15.87 x 19.57 x 6.06 in.).

Minimum Clearances (display model shown)



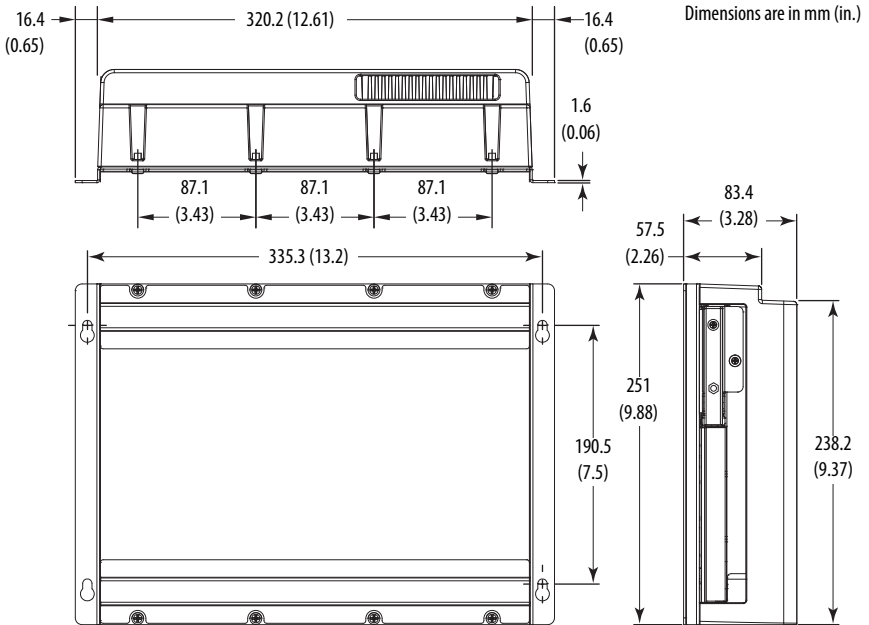
Item	Description	Value
1	Top	50 mm (2 in.)
2	Right (for airflow)	50 mm (2 in.)
3	Rear	50 mm (2 in.)
4	Left (for airflow and drive access)	127 mm (5 in.)
5	Bottom (for I/O port access and ventilation)	102 mm (4 in.)

Right and left are based on facing a computer from inside an enclosure.

Computer Dimensions

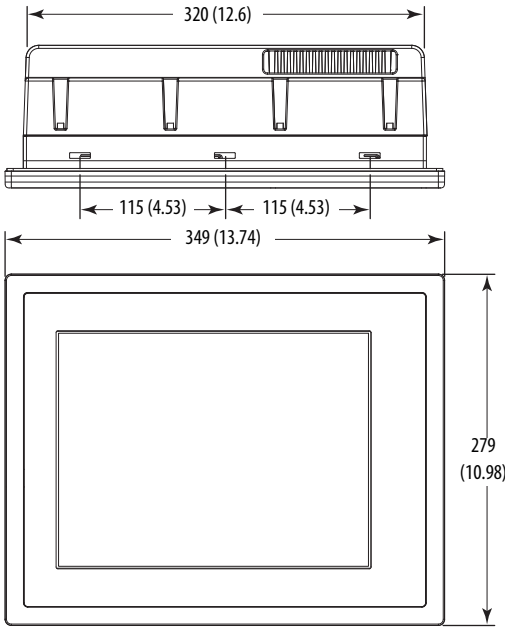
Review computer dimensions to estimate the clearance necessary for computer installation.

Non-display Computers

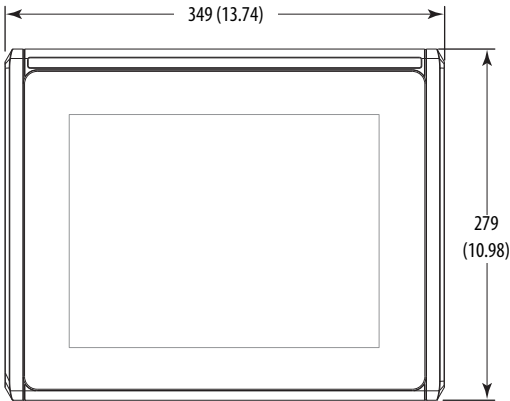
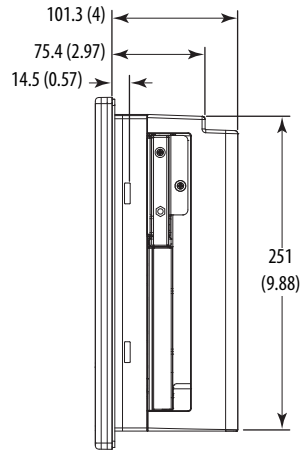


Integrated Display Computers

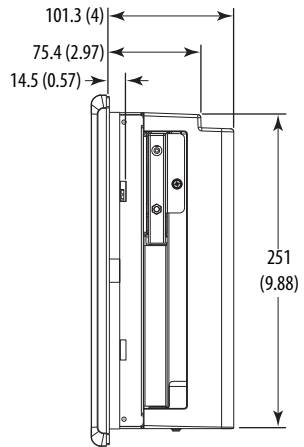
Dimensions are in mm (in.)



Resistive Touch Screen



PCAP Touch Screen



Tools for Computer Installation

These tools are required for computer installation:

- #2 cross-head screwdriver
- Panel cut out tools (for panel mounting)
- Drill motor, drill bit, and M4 screw tap (for wall mounting)
- Anti-static wriststrap

Install the Computer

The computers support these mounting options:

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

Panel Mounting Guidelines

Observe these guidelines when you install the computer in a panel:

- Remove all electrical power from the panel before making the cutout.
- Verify that there is adequate space behind the panel. For specific information, see [Mounting Clearance Requirements on page 11](#).
- Cut supporting panels to specifications before installation. Take precautions so metal cuttings do not enter components that are already installed in the panel.

Supporting panels must be at least 16 gauge for proper sealing against water and dust, and to provide proper support. The supplied mounting hardware accommodates panel thickness between 16...6 gauge or 1.6...6 mm (0.064...0.24 in.). Make sure that 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 Cut Out Dimensions

The 6181P and 6181X Industrial Computers Cut Out Template, publication [6181P-DS002](#), is shipped with all 6181X integrated display computers.

The integrated display computers must be mounted to meet these panel cut out dimensions.

Cat. Nos.	Cut Out Dimensions (H x W), Approx
6181X-12A2SW71DC, 6181X-12A2SWX1DC, 6181X-12P2SWX1DC	254 x 324 mm (10 x 12.76 in.)

Mount the Integrated Display Computer in a Panel

Use the supplied clips to secure the integrated display computer to the panel.

Cat. Nos.	Clips (qty.)
6181X-12A2SW71DC, 6181X-12A2SWX1DC, 6181X-12P2SWX1DC	10

Cat. No.	Description
6189X-MCLPS	Replacement mounting clips (10)

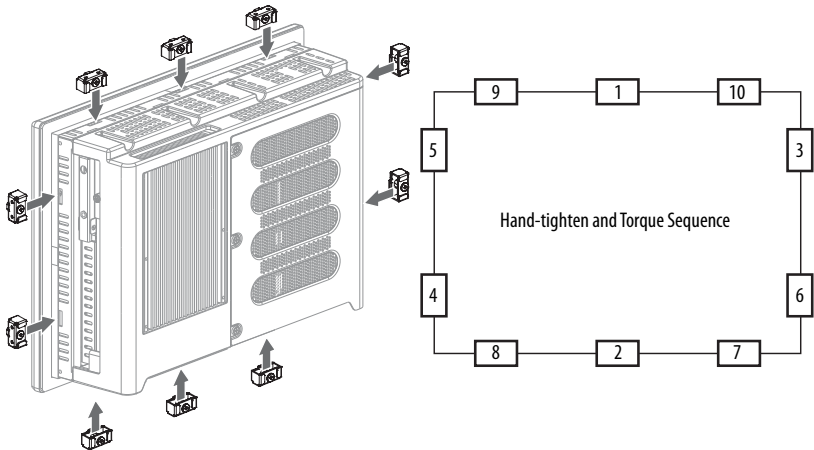
Follow these steps to mount the integrated display computer in a panel.

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



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

3. Cut an opening in the panel by using the appropriate panel cutout dimensions.
4. Make sure that the sealing gasket is properly positioned on the computer.
This gasket forms a compression-type seal. Do not use sealing compounds.
5. Place the computer in the panel cutout.
6. Slide the clips into the holes on the top, bottom, and sides of the computer.
7. Hand-tighten the clips around the bezel by following this tightening sequence.



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

- Repeat this process at least three times until the clips are properly torqued, making sure that the gasket is compressed uniformly against the panel.



ATTENTION: Tighten the clips to the specified torque to provide a proper seal and to help prevent damage to the computer. 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 on a Wall

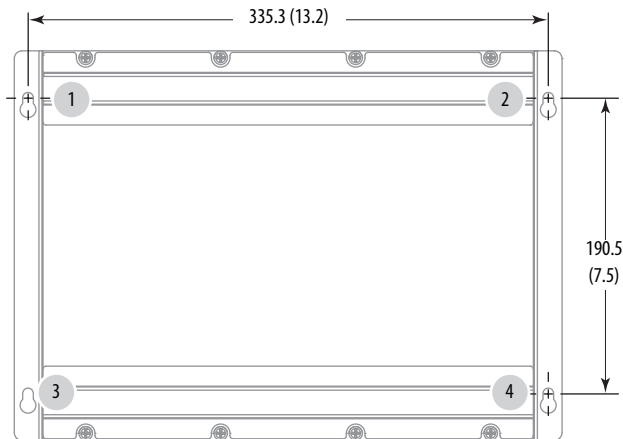
Use the four supplied screws to secure the non-display computer to a metal wall, such as a steel panel in an enclosure or equipment room.

IMPORTANT Do not mount the non-display computer on a horizontal surface.

Follow these steps to mount a non-display computer.

- Verify that the power is disconnected.
- After you decide where to mount the computer, drill holes in the wall to accommodate the four supplied M4 panhead screws.

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

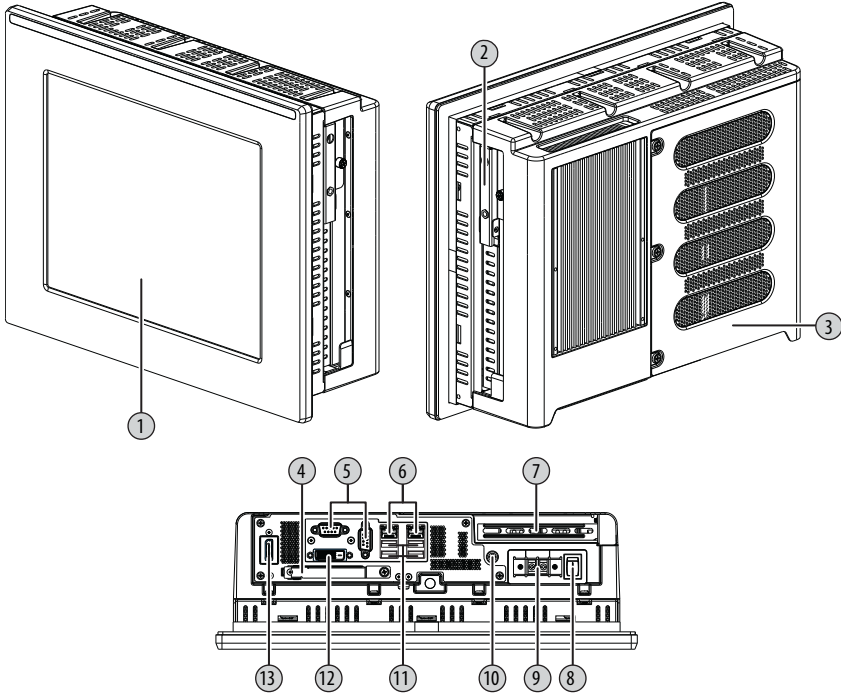


- Attach two of the supplied screws with grommets to positions **1** and **2**.
- Mount the computer to the wall.
- Attach the remaining two supplied screws with grommets to positions **3** and **4**.
- Tighten to a torque that is appropriate for the screw and wall material.

The recommended torque in steel is 1.13...1.36 N•m (10...12 lb•in).

Hardware Features

This section shows the hardware features of the industrial computers for hazardous locations. An integrated display computer with a resistive touch screen is shown for illustrative purposes.



Item	Component
1	LCD panel (only on display models)
2	128 GB MLC SSD
3	Rear cover
4	CompactFlash (CF) Type II card slot ⁽¹⁾
5	Serial COM ports (RS-232), 2
6	1 Gb LAN ports (RJ45), 2
7	PCIe riser slot cover

Item	Component
8	Power switch
9	DC input terminal block
10	Functional ground screw
11	4 USB 3.0 ports ⁽¹⁾
12	DVI-D port
13	DisplayPort

(1) The USB ports and the bottom CF card slot are hot swappable but only in non-hazardous locations. For more information about proper use of these ports, refer to [Outdoor Installation on page 4](#).

Connect Power

Display and non-display computers have a DC input terminal block for connection to an 18...32V DC power source.



ATTENTION: When you connect power to the computer for the first time, these 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.

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 help 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.

The DC power option supports operation from safety extra low voltage (SELV) power source.

The power supply is internally protected against reverse polarity.



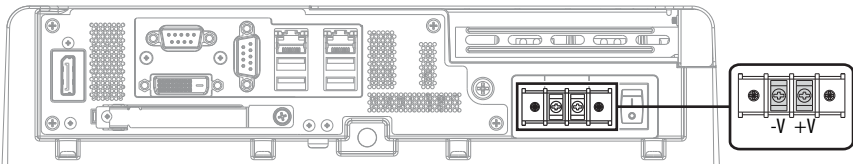
ATTENTION: Use a SELV isolated and ungrounded power supply as input power to the computer. This power source provides protection so that under normal and single fault conditions, the voltage between the conductors and Functional Earth/Protective Earth does not exceed a safe value.

IMPORTANT

A functional ground connection is required for EMC compliance.

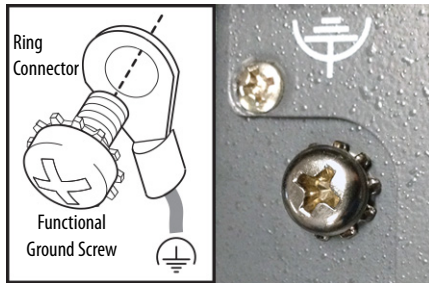
Follow these steps to connect the computer to a DC power source.

1. Turn off the main power switch or breaker.
2. Verify that the DC power wires meet the requirements in the table in [Installation Guidelines on page 9](#).
3. Secure the DC power wires to the terminal block by tightening the terminal block screws to the torque value listed in the table in [Installation Guidelines on page 9](#).



- Secure the ground wire to the functional ground screw by using a ring connector.

Tighten the functional ground screw to the computer at the torque value listed in the table in [Installation Guidelines on page 9](#).

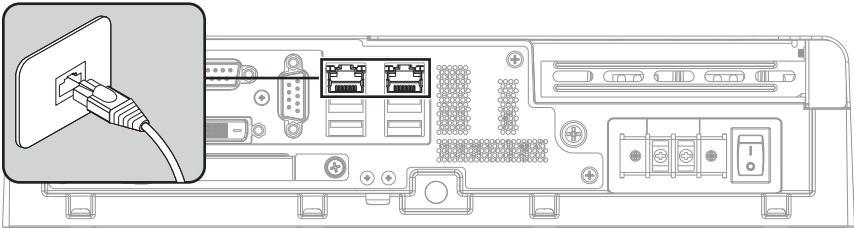


IMPORTANT When using the functional ground screw, connect the computer to earth ground by using the wire gauge listed in the table in [Installation Guidelines on page 9](#).

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

Connect to a Network

The computers have two 1 Gb LAN ports. The computers connect to an Ethernet network by using CAT5 or better twisted-pair Ethernet cable with RJ45 connectors.



WARNING: When you connect a LAN cable, verify that the cable is fully inserted in the LAN port and the latch is engaged. Failure to do so could result in an electric arc that can cause an explosion in a hazardous location.

IMPORTANT

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

In industrial environments, proper cable routing and power conditioning are required for Ethernet communication. Rockwell Automation recommends that you route all Ethernet cable through dedicated metal conduits. For improved performance reliability, install ferrite bead filters at the cable ends.

Accessories and Replacement Parts

You can view a current list of accessories and replacement parts at <https://ab.rockwellautomation.com/Computers/Hazardous-Location-Display-Computers#selection>.

Review the specifications of a new component before you install it to verify that 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 you remove components.

Failure to disconnect power can result in severe electric 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 you work on the computer as detailed in [Voltage Precautions on page 20](#).
 - Observe proper packaging and grounding techniques to help prevent damage.
-

Follow these precautions:

- 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 anti-static wriststrap that is 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 contact with pins, leads, or circuitry.
- Always hold components with a printed circuit board (PCB) by its edges and place it with the assembly side down.
- To minimize risk from electrostatic discharge, only clean displays with a damp cloth.

Preconfiguration

IMPORTANT

When you install hardware or you perform 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 to configure the computer hardware.

Follow these steps before you remove the cover or replace a hardware component.

1. Shut down the computer and all peripherals that are connected to it.
2. To avoid exposure to high energy levels, disconnect all cables from power outlets. If necessary, label each cable to expedite reassembly.
3. To avoid exposure to a shock hazard from ring voltages, disconnect telecommunication cables.

Post-configuration

Follow these steps after you install or remove a hardware component.

1. Make sure that 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 [22](#).
5. Reconnect all external cables and power to the computer.
6. Press the power switch to start the computer.

Tools for Component Replacement

The following tools are required for component replacement:

- #2 cross-head screwdriver
- Anti-static wriststrap

Remove the Cover

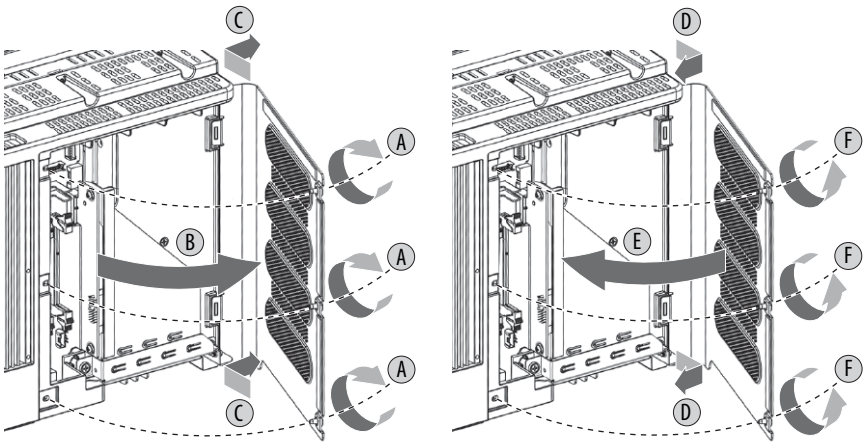
To install, replace, or upgrade internal computer components, you must first remove the cover. Follow these steps to remove the rear cover.

1. Follow the steps for [Preconfiguration on page 21](#).
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 you have installed, replaced, or upgraded internal computer components, reinstall the cover as detailed in [Reinstall the Cover on page 22](#).

Reinstall the Cover

Follow these steps to reinstall the rear cover.

1. Follow steps 1...3 for [Post-configuration on page 21](#).
2. Reattach the rear cover to the chassis (D).
3. Close the cover (E).
4. Tighten the three screws to secure the rear cover (F).
5. Follow steps 5 and 6 for [Post-configuration on page 21](#).



Load a CompactFlash Card

The computers have one location to load a CompactFlash (CF) Type II card, which is the slot on the I/O port panel below the serial ports. This slot is functionally hot-swappable but only in a non-hazardous location. It is meant to be a data slot but it is bootable.



WARNING: Do not connect or disconnect components unless power has been switched off and the area is known to be non-hazardous.

See [Hardware Features on page 17](#) for the CF card slot location.



WARNING: Use only catalog numbers 6189V-CFSSD8GB and 6189V-CFSSD16GB CF cards in 6181X computers for hazardous locations.

Substitution of components can impair suitability for hazardous locations.

Follow these steps to load a CF card in the bottom CF card slot.



WARNING: The CF card slot on the bottom side of all computer models is hot-swappable but only in a non-hazardous location. You can insert or remove a card from this slot while the computer is powered on.

When the computer is used in a hazardous location, do not insert or remove a card in the bottom CF card slot unless power has been switched off.

1. Loosen the screw that secures the CF card slot cover (A).
2. Open the CF card slot cover (B).
If necessary, remove an inserted card by pushing the button on the hinge side.
3. Insert the new CF card into the slot until it is firmly seated (C).



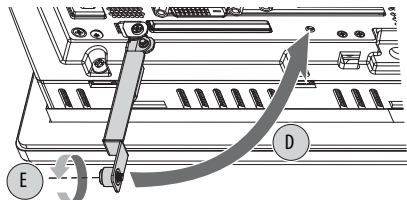
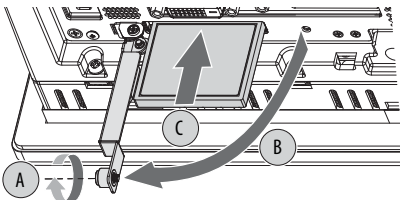
ATTENTION: When properly seated, more than 80% of the CF card easily inserts into the slot before you encounter resistance. If you encounter resistance sooner, then remove the card, rotate it 180°, and reinsert.

Do not force the card into the slot or you can damage the connector pins.

4. Close the CF card slot cover (D).
5. Tighten the CF card slot cover screw (E).

IMPORTANT

For computers in ATEX and IECEx applications, the CF card slot cover screw (step E in the illustration) must be hand-tightened and verified as secure.



Install an Add-in Card

IMPORTANT For hazardous locations, please note the following:

- The integrated display computers with a resistive touch screen were evaluated for use with a PCIe add-in card.
 - The integrated display computer with a PCAP touch screen and non-display computers were evaluated for use with PCIe and PCI add-in cards.
-

Follow these steps to install an add-in card.



IMPORTANT Use an anti-static wriststrap that is connected to the work surface, and properly grounded tools and equipment.

Hold any card by its edges to avoid touching the contacts on the bottom or circuitry on the board.

1. Disconnect power from the computer.
 2. Remove the back cover from the computer as detailed on [page 22](#).
 3. Remove the one screw that secures the slot cover.
Save the screw for the add-in card install.
 4. Remove and store the slot cover.
-



ATTENTION: Do not discard the slot cover. If the add-in card is removed in the future, the slot cover and its screw must be reinstalled to maintain agency access requirements.

5. Hold the add-in card by its edges and remove it from its protective packaging.
6. Install a PCIe or PCI add-in card.

For a PCIe add-in card:

- a. Connect the PCIe add-in board to the corresponding slot on the factory-supplied PCIe riser card.
- b. Verify that the add-in card is properly seated in the riser card.
- c. Use the slot cover screw to secure the add-in card to the slot.

For a PCI add-in card:

- a. Remove the three screws that secure the add-in card tray.



- b. Remove the add-in card tray.
- c. Remove the two screws that connect the factory-supplied PCIe riser card to the add-in card tray.



- d. With the two screws that you removed, connect a PCI riser card (such as Cat. No. P6189X-PCIRISER) to the add-in card tray.
 - e. Replace the add-in card tray, and tighten its three screws.
 - f. Connect the PCI add-in card to the corresponding slot on the PCI riser card.
 - g. Verify that the add-in card is properly seated in the riser card slot.
 - h. Use the slot cover screw to secure the add-in card to the slot.
7. Connect the necessary cables to the add-in card.
See the documentation that came with the card.
 8. Reinstall the computer cover as detailed in [Reinstall the Cover on page 22](#).

Replace or Add Memory Modules

The computers have two dual-channel DDR3 SO-DIMM slots that support up to 16 GB maximum system memory.

IMPORTANT

Both memory slots must be populated with memory modules of the same capacity. All 6181X computers ship with a dual memory module configuration.

All memory module upgrades on [page 7](#) ship with heatsinks. These memory modules replace any existing memory configurations, including modules without heatsinks.

Memory Configuration Guidelines

Follow these guidelines when you replace or add memory to the computers.



WARNING: Unless ordered differently, 6181X computers ship with 8 GB of memory (2 x 4 GB). If upgrading to 16 GB of memory (2 x 8 GB), use only catalog number 6189X-16GDDR3, which is memory specifically for use in hazardous locations. Other memory modules are not acceptable for use in hazardous locations.

To avoid system instability, use the same brand and model number of memory in the two slots.

See <https://ab.rockwellautomation.com/Computers> for qualified replacement parts and accessories.

Replace or Add Memory Modules

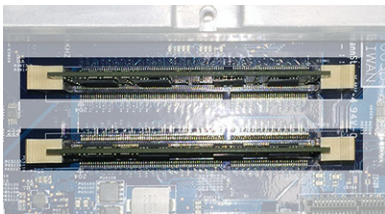
Follow these steps to replace or add memory modules.

IMPORTANT

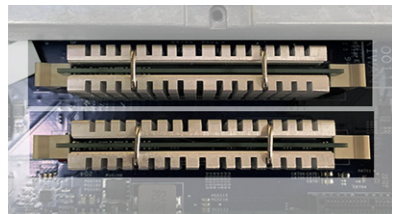
Use an anti-static wriststrap that is connected to the work surface, and properly grounded tools and equipment.

Hold all memory modules by their sides to avoid touching the contacts on the bottom or circuitry on the boards.

1. Follow the steps for [Preconfiguration on page 21](#).
2. Remove the computer cover as detailed in [Remove the Cover on page 22](#).
3. Locate the memory modules that you want to replace.



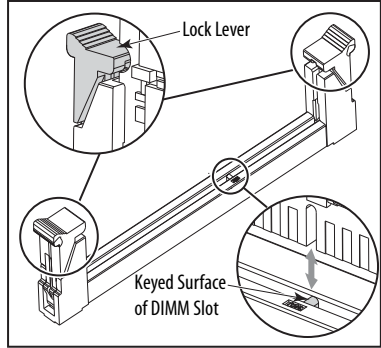
Memory Modules Without Heatsinks



Memory Modules With Heatsinks

4. Remove the existing memory modules.
 - a. Use your thumbs or two fingers to push open the lock levers, which release each memory module from its slot for easy removal. See [step 5](#) on [page 27](#).
 - b. Gently pull out each memory module to remove it from its slot.
 - c. Place each memory module on a static-dissipating work surface or inside an anti-static bag.
5. Install the new memory modules with heatsinks.
 - a. Orient each module so the notch on its bottom edge aligns with the keyed surface of the DIMM slot.

TIP The keyed surface is off center to assist the correct alignment.
 - b. Press each module fully into the slot to engage the lock levers.
6. Reinstall the computer cover as detailed in [Reinstall the Cover on page 22](#).
7. Follow the steps for [Post-configuration on page 21](#).



Real-time Clock (RTC) Battery

This computer contains a lithium battery that you cannot replace. Return the computer to Rockwell Automation for battery replacement.

For return information, contact your local distributor or Rockwell Automation representative, or visit the [Product and Application Support](#) website.



The sealed lithium battery that is contained in this computer could need replacement during the life of the computer.

At the end of its life, collect the battery in this computer separately from any unsorted municipal waste.

Ship or Transport the Computer

If you must ship the computer via common carrier or otherwise transport it to another location for any reason, then 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 any damage to a computer that is shipped or transported while installed in a machine, panel, or rack.

Technical Specifications

Hardware and Software Specifications

Specification	Attribute	6181X-12A2SW71DC, 6181X-00N2SW71DC, 6181X-12A2SWX1DC, 6181X-00N2SWX1DC	6181X-12P2SWX1DC
Hardware	Processor	Intel® Core™ i3-5010U, 2.1 GHz dual core/3 MB cache/15 W	
	System memory	Dual channel, DDR3 SO-DIMM 2 8 GB (2 x 4 GB) 16 GB (2 x 8 GB)	
	Type		
	Slots		
	Installed		
	Max		
	Solid-state drive	MLC drive on computer side	
	Installed	128 GB	
Max	256 GB ⁽¹⁾		
CompactFlash (CF)	SLC™ drive on computer bottom (bootable, shipped empty) ⁽¹⁾⁽²⁾		
Type II slot			
Expansion slot	1 half-length PCIe ⁽³⁾		
I/O ports	DP port, DVI-D port, 2 serial COM ports, 4 USB 3.0 ports		
Ethernet LAN	2 LAN ports (RJ45), 1 Gb each		
Software	Operating systems	See Computer Options on page 7 .	

(1) See [Computer Options on page 7](#) for available SSD and CompactFlash drives.

(2) The CF card slot on the bottom side of all computer models is hot-swappable but only in a non-hazardous location.

(3) A PCI card is available (Cat. No. 6189X-PCIRISER) that can be used in Cat. Nos. 6181X-00N2SW71DC, 6181X-00N2SWX1DC, and 6181X-12P2SWX1DC.

Display Specifications

Attribute	6181X-12A2SW71DC, 6181X-12A2SWX1DC	6181X-12P2SWX1DC
Display type	Active matrix color TFT	Projected capacitive (PCAP)
Touch screen	Resistive, sunlight readable film	Chemically strengthened glass with matte finish to help reduce glare. Supports 10-point multi-touch operation.
Display size, diagonal	308 mm (12.1 in.)	
Luminance	700 cd/m ² (Nits)	1300 cd/m ² (Nits)
Contrast ratio, typical	800:1	
Native resolution	1024 x 768, 16.2 M colors	
Viewing angle, typical	160°	
Light-emitting diode (LED) backlight lifetime, typical	100,000 hours	

Physical Specifications

Attribute	6181X-12A2SW71DC, 6181X-00N2SW71DC, 6181X-12A2SWX1DC, 6181X-00N2SWX1DC	6181X-12P2SWX1DC
Weight, approx <ul style="list-style-type: none"> • Non-display <ul style="list-style-type: none"> – Only the computer – Computer with packaging • Display <ul style="list-style-type: none"> – Only the computer – Computer with packaging 	<ul style="list-style-type: none"> 6.7 kg (14.8 lb) 9.4 kg (20.7 lb) 9 kg (19.8 lb) 11.6 kg (25.6 lb) 	<ul style="list-style-type: none"> 9.4 kg (20.7 lb) 12.07 kg (26.61 lb)
Dimensions (HxWxD), approx <ul style="list-style-type: none"> • Non-display • Display 	<ul style="list-style-type: none"> 251 x 353 x 83.4 mm (7.5 x 13.20 x 3.28 in.) 279 x 349 x 101.2 mm (10.98 x 13.74 x 3.98 in.) 	
Panel cut out dimensions (HxW) ⁽¹⁾	254.0 x 324.0 mm (10.0 x 12.76 in.)	
Mounting options <ul style="list-style-type: none"> • Non-display models • Display models 	<ul style="list-style-type: none"> Wall Panel 	

(1) Applies only to display models.

Power Specifications

Attribute	6181X-12A2SW71DC, 6181X-00N2SW71DC, 6181X-12A2SWX1DC, 6181X-00N2SWX1DC	6181X-12P2SWX1DC
Input voltage, DC	18...32V DC	
Power consumption, max • Non-display models • Display models	18...32V DC (SELV), 2.22...1.25 A, 40 W 18...32V DC (SELV), 2.78...1.56 A, 50 W	18...32V DC (SELV), 3.32...1.87 A, 60 W
Heat dissipation ⁽¹⁾ • Non-display models • Display models	40 W (136 BTU/h) 50 W (171 BTU/h)	60 W (205 BTU/h)
Peripheral loading • PCIe card, max • USB ports, max per port	4 W 900 mA, 10 W max for all ports (2 A)	4 W —

(1) Add-in cards and peripherals are included in the heat dissipation value.

Environmental Specifications


Attribute	6181X-12A2SW71DC, 6181X-00N2SW71DC, 6181X-12A2SWX1DC, 6181X-00N2SWX1DC	6181X-12P2SWX1DC
Temperature, operating • Non-display models • Display models ⁽¹⁾	-20...+70 °C (-4...+158 °F) -20...+55 °C (-4...+131 °F), display side; -20...+70 °C (-4...+158 °F), back side	
Temperature, nonoperating	-30...+80 °C (-22...+176 °F)	
Relative humidity	10...90% without condensation	
Altitude, operating	2000 m (6561 ft)	
Altitude, nonoperating	12,000 m (40,000 ft)	
Shock, operating ⁽²⁾	15 g (1/2 sine, 11 ms)	
Shock, nonoperating ⁽²⁾	30 g (1/2 sine, 11 ms)	
Vibration, operating ⁽²⁾	0.012 in p-p (10...57 Hz); 2 g peak (57...640 Hz)	
Enclosure ratings • Display models	Rated for UL Type 1, 4, 4X, 12, 13 and classified by UL in accordance with IEC 60529, IP66 when properly mounted on a flat surface of an equivalent-type enclosure.	

(1) See [Installation Guidelines on page 9](#) for more information about temperature guidelines.

(2) Applies to panel-mounted integrated display computers and wall-mounted non-display computers.

Certifications

For the most current information on all certifications for 6181X computers, visit the Rockwell Automation Product Certifications website at rok.auto/certifications.

Attribute	6181X-12A2SW71DC, 6181X-00N2SW71DC, 6181X-12A2SWX1DC, 6181X-00N2SWX1DC, 6181X-12P2SWX1DC
RoHS	Turkey RoHS (EEE Yönetmeliğine Uygundur. In Conformity with the EEE Regulation)
	 UAE RoHS <small>UAE RoHS</small> <small>Emirates Quality Mark</small>
EAC	Не предназначено для применения во взрывоопасных зонах. Только для общепромышленного применения.

Additional Resources

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

Resource	Description
Industrial Computer for Hazardous Locations User Manual, publication 6181X-UM001	Gives an overview of the system and provides procedures to install the computer, set up computer connections, operate the computer, and troubleshoot the computer.
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 <https://www.rockwellautomation.com/global/literature-library/overview.page>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Rockwell Automation Support

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	https://rockwellautomation.custhelp.com/
Local Technical Support Phone Numbers	Locate the phone number for your country.	https://www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	https://www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	https://www.rockwellautomation.com/global/literature-library/overview.page
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	https://www.rockwellautomation.com/global/support/pcdc.page

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete the How Are We Doing? form at https://literature.rockwellautomation.com/idc/groups/literature/documents/du/ra-du002_-en-e.pdf.

Rockwell Automation maintains current product environmental information on its website at <https://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page>.

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