

## Industrial Computers and Thin Clients for Hazardous Locations, Series J

Catalog Numbers 6181X-000NWNNDNB-3xNNNNxG-xxx(x), 6181X-000NWNNDNB-3xxxxxxG-xxx(x), 6181X-121PPMXDNB-3xNNNNxG-xxx(x), and 6181X-121PPMXDNB-3xxxxxxG-xxx(x)

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Read this document and the documents that are 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.

### Installation Precautions

Read and follow these precautions before you install your industrial computer or thin client for hazardous locations.

### 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-121 integrated display industrial computers and 6181X-121 integrated display thin clients 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 Location Information on page 2](#). 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/United Kingdom Regulations

These industrial computers and thin clients meet the European Union Directive requirements when installed within the European Union or EEA regions and has the CE marking. Additionally, these industrial computers and thin clients meet the United Kingdom regulation requirements when installed within the United Kingdom and has the UKCA marking. Copies of the declarations of conformity are available at [rok.auto/certifications](http://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
LAN	Shielded or unshielded
USB	Shielded

Cable Type	Required Attribute
Serial RS-232	Shielded
DVI	Shielded

Cable Type	Required Attribute
DisplayPort	Shielded
DC Power	Unshielded

## Outdoor Installation – Integrated Display Models

If your integrated display model (Cat. No. 6181X-121PPMXDNB-3xxxxxG-xxx(x)) will be used outdoors, consider the following to maximize the field life of the front bezel and integrated display:

- Select the proper enclosure
- Vertical and horizontal position

Ultraviolet (UV) and infrared radiation can reduce the field life of any electronic device. While the materials used in the 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 your product from direct exposure to UV radiation, and greatly increase its field life.

**IMPORTANT** The Rockwell Automation approved sun shield, Cat. No. 6189X-SUNSHIELD, must be used if your integrated display model is exposed to direct sunlight.

If you install a sun shield that closes over your integrated display, the temperature between the sun shield and the integrated display cannot exceed the maximum temperature of the integrated display, which is 55 °C (131 °F). Adequately ventilate all sun shields to help prevent excess heat rise on the integrated display.

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 your integrated display model on the south (north in the southern hemisphere) or west side of the cabinet. Proper placement reduces the heat rise due to solar loading during the hottest part of the day.





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

## Hazardous Location Information

This equipment is suitable for these location categories.

**IMPORTANT** All 6181X Series J industrial computers and thin clients for hazardous locations can only be used in non-hazardous locations in any Eurasian Conformity region.

**Table 1 - Location Categories for Hazardous Locations**

Integrated Display			Non-display		
Region	Rating	Temperature Range	Region	Rating	Temperature Range
United States	Class I Division 2, Groups A, B, C, D T4 Class II Division 2, Groups F, G T6 Class III Division 1 T6	$-20\text{ }^{\circ}\text{C} \leq T_a \leq 55\text{ }^{\circ}\text{C}$ $(-4\text{ }^{\circ}\text{F} \leq T_a \leq 131\text{ }^{\circ}\text{F})$ (display side)  $-20\text{ }^{\circ}\text{C} \leq T_a \leq 70\text{ }^{\circ}\text{C}$ $(-4\text{ }^{\circ}\text{F} \leq T_a \leq 158\text{ }^{\circ}\text{F})$ (backside)	United States	Class I Division 2, Groups A, B, C, D T4	$-20\text{ }^{\circ}\text{C} \leq T_a \leq 70\text{ }^{\circ}\text{C}$ $(-4\text{ }^{\circ}\text{F} \leq T_a \leq 158\text{ }^{\circ}\text{F})$
	Class I Zone 2, IIC, T4 Class II Zone 22, IIB, T70 °C			Class I Zone 2, IIC, T4	
Canada	Class I Division 2, Groups A, B, C, D T4 Class II Division 2, Groups F, G T6 Class III Division 1 T6		Canada	Class I Division 2, Groups A, B, C, D T4	
	Class I Zone 2, IIC, T4 Class II Zone 22, IIB, T70 °C			Class I Zone 2, IIC, T4	
Europe (ATEX)	 II 3 GD, Ex ec IIC T4 Gc IP66, Ex tc IIIC T70 °C Dc IP66, UL 23 ATEX 3066X		Europe (ATEX)	 II 3 G, Ex ec IIC T4 Gc, UL 23 ATEX 3066X	
United Kingdom (UKEX)	 II 3 GD, Ex ec IIC T4 Gc IP66 Ex tc IIIC T70 °C Dc IP66, UL23UKEX2943X		United Kingdom (UKEX)	 II 3 G, Ex ec IIC T4 Gc, UL23UKEX2943X	
Global/IECEx	Ex ec IIC T4 Gc IP66, Ex tc IIIC T70 °C Dc IP66 IECEx UL 23.0060X		Global/IECEx	Ex ec IIC T4 Gc, IECEx UL 23.0060X	
Brazil (INMETRO)	Ex ec IIC T4 Gc IP66, Ex tc IIIC T70 °C Dc IP66 UL-BR 23.1284X		Brazil (INMETRO)	Ex ec IIC T4 Gc UL-BR 23.1284X	
China (CCC)	Ex ec IIC T4 Gc IP66, Ex tc IIIC T70 °C Dc IP66		China (CCC)	Ex ec IIC T4 Gc	

## Conditions for Safe Use Apply in ATEX, UKEX, IECEx, INMETRO, and CCC

**For All Integrated Display Models** (Cat. No. 6181X-121PPMXDNB-3xxxxxG-xxx(x))

- The equipment must 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 a CCC (Ex)/INMETRO/ATEX/UKEX/IECEx Zone 2 (minimum) 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 should be installed in a CCC (Ex)/INMETRO/ATEX/UKEX/IECEx 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 will be provided if 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 models with projective captive (PCAP) touch screens were evaluated for use with a PCIe or PCI add-in card.
- PCIe and PCI add-in cards must be rated Zone 2 CCC (Ex)/ATEX/UKEX/IECEx/INMETRO, T4 (max), 4 W (max), 90 °C (194 °F) (min) surrounding ambient temperature.
- To maintain the IP66 rating of the equipment, mount the integrated display model in an enclosure with an equivalent IP rating.
- To minimize the risk from electrostatic discharge (ESD), only clean the display with a damp cloth.

**For All Non-display Models** (Cat. No. 6181X-000NWNNDNB-3xxxxxG-xxx(x))

- The equipment can 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 must be installed in a CCC (Ex)/INMETRO/ATEX/UKEX/IECEx Zone 2 (minimum) certified enclosure that provides a degree of protection not less than IP54, and is only accessible by use of a tool.
- Transient protection will be provided if set at a level not exceeding 140% of the peak rated voltage value at the supply terminals to the equipment.
- The non-display models 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 CCC (Ex)/ATEX/UKEX/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)

## Conditions for Safe Use in North American Hazardous Locations

The following statements apply to when a 6181X Series J industrial computer or 6181X Series J thin client 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 United States, 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 18-1J2 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 chassis of your industrial computer or thin client.
- PCIe and PCI add-in cards must be rated Class I, Division 2, T4 (max), 4 W (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 your integrated display model is exposed to direct sunlight.

## Restricted Access Location

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

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

## Installation Requirements

### System Design Requirements: Integrated Display Models

End user access is limited to the front of the industrial computer or thin client, which includes the integrated display and the touch screen.



**WARNING: Risk of death, serious injury, or equipment damage.** If the integrated screen darkens or if the backlight is not functioning properly, the integrated screen can be difficult to read and use of this screen could result in a potentially hazardous outcome. System design must take into account that the integrated screen or LCD touch screen can lose functionality and therefore be unable to maintain or change control of the system. The touch screen cannot be the single point of control of critical functions and is not intended to replace an E-stop. System design must follow all applicable code and good engineering practice. Factors to consider include the following:

- The possibility of an unreadable LCD screen.
- The possibility of an inoperable touch screen.
- Operator error in the control of the system.
- Proper use of E-stops and other safety practices.
- Unexpected communication errors or delays.

You must provide means to achieve a safe state during anomalies and help ensure that the system has adequate redundancy for critical functions. Failure to follow these instructions can result in death, serious injury, or equipment damage.

## DC Power Requirements

- Both integrated display and non-display models have a DC input terminal block for connection to an 18...32V DC power source.
- Operate your industrial computer or thin client in an industrial or control room environment, which uses some form of power isolation from public low-voltage mains.
- Supply your industrial computer or thin client circuit with its own disconnect.
- Use an uninterruptible power source (UPS) to help protect against unexpected power failure or power surges.
- The DC power option supports operation from the safety extra low voltage (SELV) power source.
- Use a SELV isolated and ungrounded power supply as input power to your industrial computer or thin client. 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.
- The power supply is internally protected against reverse polarity.
- Required for EMC compliance: A functional ground connection is required.
- The DC power wires must meet the requirements that are listed in [Table 2](#).

**Table 2 - DC Power Wire Requirements**

Attribute	Requirements
Wire Material	Stranded Copper, Insulation 90 °C (194 °F) minimum
Wire Gauge	To Connect to DC Input Terminal Block: 0.823...2.08 mm <sup>2</sup> (18...14 AWG)
	To Connect to Earth Ground: 1.5 mm <sup>2</sup> (16 AWG) or larger <sup>(1)</sup>
Wire Temperature Rating	76 °C (169 °F) minimum
Torque Values	For DC Input Terminal Block Screws: 1.36 N•m (12 lb•in)
	For Functional Ground Screw: 1.47 N•m (13 lb•in)

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

## Installation Site Requirements

Follow these requirements to make sure that your industrial computer or thin client provides service with excellent reliability.

**Table 3 - Environment Specifications**

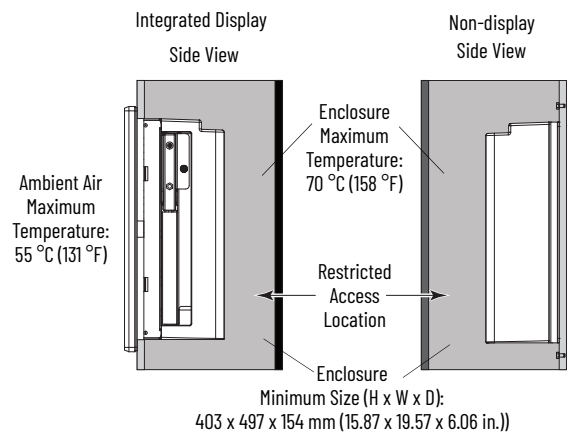
Model Type	Enclosure Ratings	Temperature [°C (°F)]	Relative Humidity	Altitude	Shock	Vibration
Integrated Display	Rated for UL Type1, 4, 4X, 12, 13 and classified by UL in accordance with IEC 60529, IP66 when properly mounted on a flat surface of an equivalent-type enclosure.	Operating: Display Side: -20...+55 (-4...+131) Back Side: -20...+70 (-4...+158)  Non-operating: -30...+80 (-22...+176)	10...90% without condensation	Operating: 2000 m (6561 ft)  Non-operating: 12,000 m (40,000 ft)	Operating: 15 g's (1/2 sine, 11 ms)  Non-operating: 30 g's (1/2 sine, 11 ms)	0.012 in p-p (10...57 Hz); 2 g peak (57...640 Hz)
Non-display	—	Operating: -20...+70 (-4...+158)  Non-operating: -30...+80 (-22...+176)				

- The installation site must have sufficient power.
- In dry environments, static charges can build up easily. Proper grounding of your industrial computer or thin client helps to reduce static discharges, which can cause shock and damage electronic components.
- The enclosure or cover must always remain in place during operation. The cover provides protection against high voltages inside your industrial computer or thin client and inhibits radio frequency (RF) emissions that can interfere with other equipment.
- The minimum required enclosure size (H x W x D) is:  
403 x 497 x 154 mm (15.87 x 19.57 x 6.06 in.).
- Never allow air passages to become obstructed. Allow sufficient space around air inlets and outlets to provide the circulation necessary for cooling.
- The ambient air temperature must not exceed the maximum operating temperature in [Table 3](#) and must avoid condensation. Consider a user-supplied fan, heat exchanger, or air conditioner for heat generated by other devices in the enclosure.



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.

### Enclosure Requirements



**IMPORTANT** Your industrial computer or thin client can operate at a range of extremes. If it continuously operates at its highest rated temperature, then the life span and its components (including the touch screen and LCD panel) is shortened.

- The relative humidity of the ambient air must not exceed the limits that are specified in [Table 3](#) and must avoid condensation.

## Prepare for Installation

### Unpack Your Product

**IMPORTANT** Before you unpack your industrial computer or thin client, inspect the shipping carton for damage. If damage is visible, immediately contact the shipper and request assistance. Otherwise, continue to unpack your industrial computer or thin client.



Keep the original packing material including the inner and outer packing cartons, in case you must return your product for service, lithium battery replacement, or transport to another location.

6181X Series J industrial computers and 6181X Series J thin clients ship with these items:

Model	Items
Integrated Display	<ul style="list-style-type: none"> <li>Mounting clips, quantity of 10</li> <li>Cutout template, publication <a href="#">6181P-DS002</a></li> </ul>
Non-display	<ul style="list-style-type: none"> <li>Screws with grommets, quantity of 4</li> </ul>
All Models	<ul style="list-style-type: none"> <li>Product test report</li> <li>This installation instruction, publication <a href="#">6181X-IN003</a></li> </ul>

### Required Tools

These tools are required to mount and install your industrial computer or thin client:

Model	Required Tools
Integrated Display	<ul style="list-style-type: none"> <li>Cutout tools appropriate for panel material</li> <li>Scissors for cutout template</li> <li>Low-tack masking tape</li> </ul>
Non-display	<ul style="list-style-type: none"> <li>Cutout tools appropriate for wall material</li> <li>Drill, drill bit, and M4 screw tap</li> </ul>
All Models	<ul style="list-style-type: none"> <li>#2 cross-head screwdriver</li> <li>Level, square, and marking tool</li> <li>Torque limiting screwdriver</li> <li>Tape measure</li> <li>Anti-static wriststrap</li> <li>Assorted cables</li> </ul>

### Add Accessories (Optional)



To ease the installation process, add these accessories before you proceed to mount, connect power, and connect peripheral cables to your industrial computer or thin client: CompactFlash (CFast) card, PCI riser card, DDR4 SC-DIMM RAM memory modules, and solid-state drive (SSD). For a complete list of accessories and proper installation, see Accessories for Industrial Computers and Thin Clients for Hazardous Locations, Series J Product Information, publication [6181X-PC003](#).

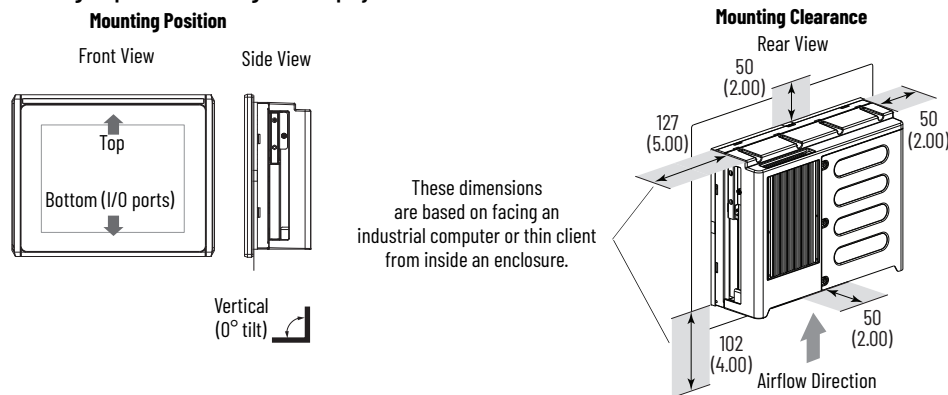
## Mount Your Product

Follow all mounting requirements and mounting steps to secure your integrated display model to a panel or non-display model to a wall.

### Panel Mount – Integrated Display Models

#### Mounting Requirements

Figure 1 – Mounting Requirements: Integrated Display Models – Panel Mount



#### Mounting Position

- When mounted, your integrated display model **cannot** be:
  - tilted from vertical (see [Figure 1](#)).
  - mounted on a horizontal surface.
- Choose an ergonomic height suitable for the end user.

### Mounting Clearance

- Do not operate your integrated display model in an enclosure with minimum clearances (see [Figure 1](#)) unless adequate ventilation or other methods are used to lower the temperature within the enclosure.
- Allow for minimum clearances to accommodate future installation or removal of peripheral components (such as internal hard drives) and peripheral cables.
- Be sure that there is adequate space behind the panel.

### Cutout Requirements

- Remove all electrical power from the panel before making the cutout.
- Cut the supporting panels to specifications before installation.
- Take precautions so debris does not enter components that are already installed in the panel.
- Support panels must be at least 16 gauge for proper sealing against water and dust, and to provide proper support.
  - The supplied mounting hardware accommodates 16...6 gauge or 1.6...6 mm (0.064...0.24 in.) support panel thickness.
- Make sure that the area around the panel cutout is clear.
- The cutout template (provided) must be used to prepare the panel cutout.



You can download and print the cutout template, publication [6181P-DS002](#), from [rok.auto/literature](http://rok.auto/literature).

- For planning purposes only: The approximate dimensions [mm] in.)] for the panel cutout (H x W) is: 254 x 324 (10 x 12.76)

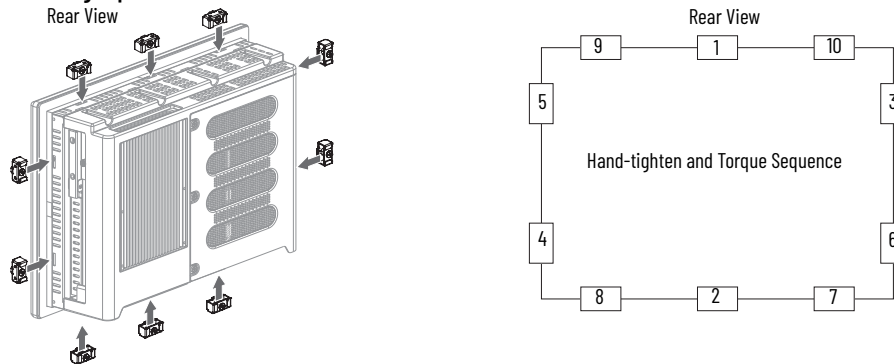
### Step A: Create the Panel Cutout

Follow these steps to create the panel cutout.

1. Remove all electrical power from the panel.
2. Use a scissors to cut the cutout template (provided) to your specific integrated display model indicated on the cutout template itself.
3. Affix the prepared cutout template against the panel at the preferred height and squarely positioned.
4. Use cutting tools appropriate for the panel material, cut an opening in the panel by using the appropriate panel cutout dimensions.
5. Remove the cutout template and the cut panel material.
6. Clean the area of material debris.

### Step B: Secure to the Panel

Figure 2 - Mounting Clip Attachment



1. Make sure that the sealing gasket is properly positioned on your industrial computer or thin client.

**IMPORTANT** Do not use a sealing compound on the gasket. By design, the gasket forms a compression-type seal.

2. Place your industrial computer or thin client in the panel cutout.
3. Slide the mounting clips (provided) into the holes on the top, bottom, and sides of your industrial computer or thin client as shown in [Figure 2](#).
4. Hand-tighten the clips around the bezel in the sequence shown in [Figure 2](#).
5. Repeat step 4 at least three more times until the mounting clips are hand-tight and the gasket is compressed uniformly against the panel.
6. Use a torque limiting screwdriver to tighten the mounting clips to a torque of 1.35 N•m (12 lb•in) according to the sequence shown in [Figure 2](#).
7. Repeat step 6 at least three more times until the mounting clips are properly torqued and be sure that the gasket is compressed uniformly against the panel.



**ATTENTION:** Do not overtighten the mounting clips. Overtightening causes damage to the gasket. Tighten the mounting clips to the specified torque to provide a proper seal to help prevent water or chemical damage to your industrial computer or thin client. Rockwell Automation assumes no responsibility for water or chemical damage to your industrial computer or thin client and any other equipment within the enclosure because of improper installation.

## Wall Mount – Non-display Models

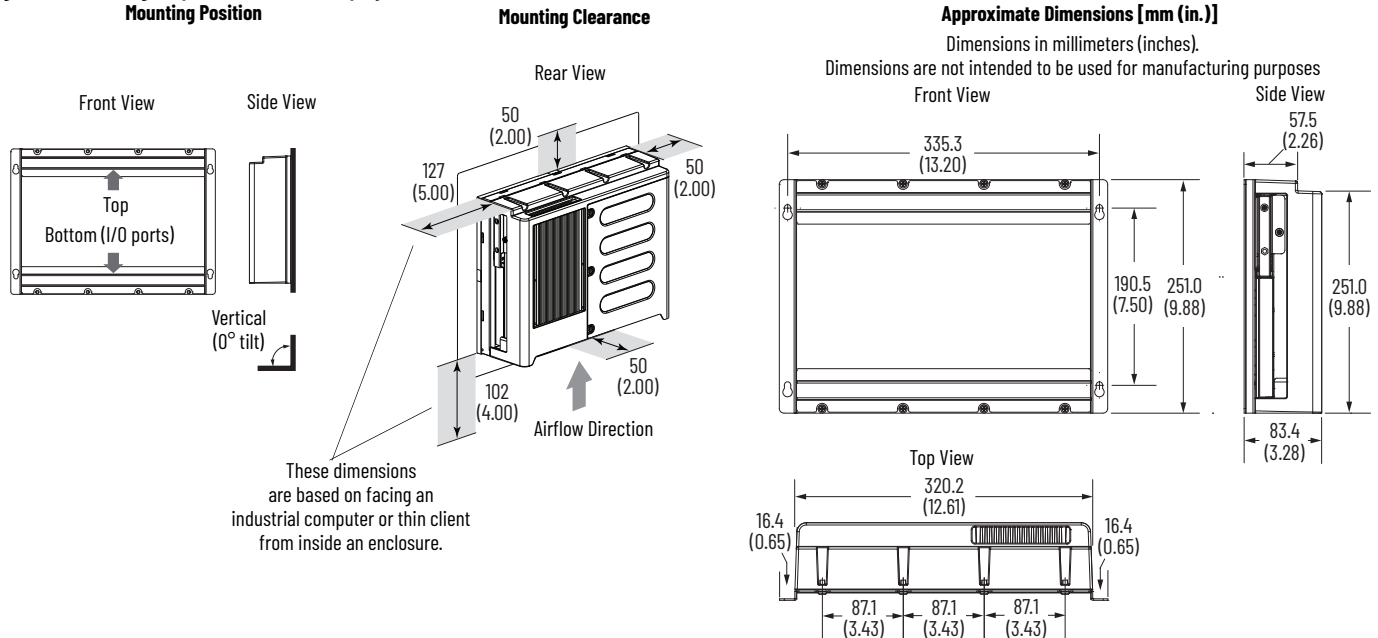
Your non-display model can be mounted vertically at a 0° tilt directly to a wall, such as a steel panel in an enclosure or equipment room.



A book mount bracket, Cat. No. 6181V-B00KBRKT, can be purchased separately if a book mount installation is preferred. For book mount installation, complete the steps in the Accessories for Industrial Computers and Thin Clients for Hazardous Locations, Series J Product Information, publication [6181X-PC002](#).

### Mounting Requirements

Figure 3 - Mounting Requirements: Non-display Models – Wall Mount



### Mounting Position

- When mounted, your non-display model cannot be:
  - tilted from vertical.
  - mounted on a horizontal surface.
- Choose an ergonomic height suitable for the end user.

### Mounting Clearance

- Allow for minimum clearances and space behind the cutout in the wall to accommodate adequate airflow, future installation, or removal of peripheral components (such as internal hard drives) and peripheral cables.

### Cutout Requirements

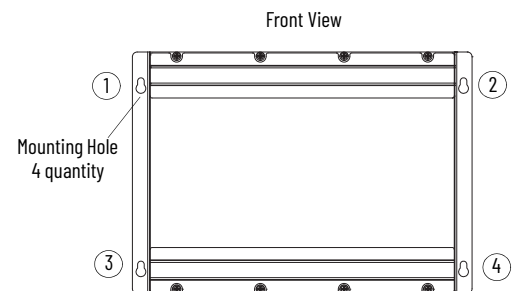
- Remove all electrical power from the panel before making the cutout.
- Take precautions to protect the components that are already installed in the panel so debris does not enter when cutting the panel material.
- Make sure that the area around the panel cutout is clear.
- See the approximate dimensions in [Figure 3](#) to plan the position of your non-display industrial computer or thin client.

### Step A: Secure to the Wall

- Lift your non-display model in the desired position the wall.
- Check that your non-display model is level and square.
- Mark the locations of the four mounting holes of your non-display model.
- Verify that the marked locations are level and square.
- Set your non-display model aside.
- Drill a hole at each marked location to accommodate four M4 panhead screws (supplied).
- Align your non-display model with the four mounting holes that are created in step 4.
- Attach the four M4 panhead supplied screws with grommets according to the sequence shown at right.
- Tighten the M4 panhead screws with grommets in the same sequence to a torque that is appropriate for the screw and wall material.



If your non-display model is attached to steel material, the recommended torque of the M4 panhead screws with grommets is 1.13...1.36 N·m (10...12 lb·in).



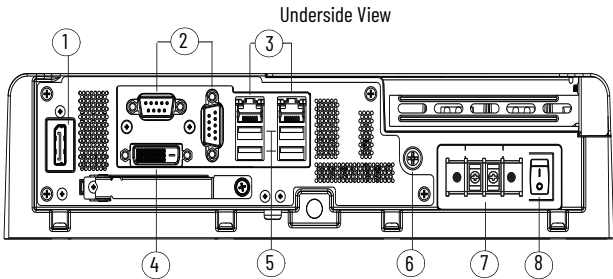


# Connect Your Product

## Connect Peripheral Cables

**IMPORTANT** To comply with EN 55024 and EN 55032, select cables with the required attribute that is listed in [Table 4](#). For detailed requirements, see [European Union Directive/United Kingdom Regulations on page 1](#).

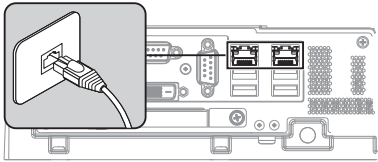
Table 4 - I/O Ports and DC Power



Note No.	Description	Required Attribute
1	DisplayPort <sup>(1)</sup>	Shielded
2	Serial COM ports (RS-232), quantity 2	Shielded
3	1 GB LAN ports (RJ45), quantity 2	Shielded or Unshielded
4	DVI-D port	Shielded
5	USB 3.0 ports, quantity 4 <sup>(2)</sup>	Shielded
6	Ground screw	—
7	DC terminal block	Unshielded
8	Power switch	—

(1) The DisplayPort supports DP V1.4. It supports six monitors in FHD (1920x1080 resolution or 1080p resolution).  
(2) The USB ports are hot swappable but only in non-hazardous locations. For more information about proper use of these ports, see [Outdoor Installation – Integrated Display Models on page 2](#).

1. Attach a CAT5 or better twisted-pair Ethernet cable with RJ45 connectors to the LAN port (Note No. 3 in [Table 4](#)).



**ARC FLASH HAZARD:** When you connect the LAN cable, make sure that:  
(1) the cable is fully inserted in the LAN port and (2) the latch is engaged.  
Failure to verify this connection 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 your industrial computer or thin client and peripheral 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.

2. Attach all other peripheral cables to your industrial computer or thin client. See [Table 4](#) for I/O port locations.



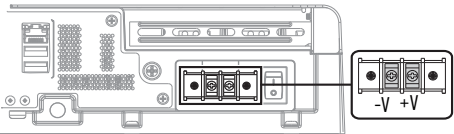
**ARC FLASH HAZARD: Risk of fire or explosion.** USB 3.0 peripheral connections cannot be used in hazardous locations. Only connect a shielded USB 3.0 cable for initial setup and maintenance. Disconnect the shielded USB 3.0 cable once the initial setup or maintenance is complete.

3. Attach the unattached end of the peripheral cables to the appropriate component in your schema.

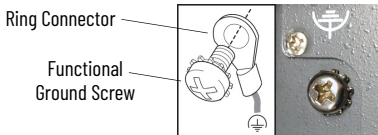
## Connect Power

Follow these steps to connect your industrial computer or thin client to a DC power source.

- Before you proceed, be sure that all requirements have been met in [DC Power Requirements on page 4](#) and [Table 2 on page 4](#).
- Turn off the main power switch or breaker.
- Secure the DC power wires to the terminal block by tightening the terminal block screws to the torque value listed in [Table 2 on page 4](#).



4. Use a ring connector to secure the ground wire to the functional ground screw.



5. Tighten the functional ground screw to your industrial computer or thin client at the torque value listed in the table in [Table 2 on page 4](#).

**IMPORTANT** When using the functional ground screw, connect your industrial computer or thin client to earth ground by using the wire gauge listed in [Table 2 on page 4](#).



## Complete the Installation

1. For integrated display models: If the integrated display will be exposed to direct sunlight, install the sun shield (6189X-SUNSHIELD).  
For proper installation, see Accessories for Industrial Computers and Thin Clients for Hazardous Locations, Series J Product Information, publication [6181X-PC003](#).

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**IMPORTANT**

- 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 the sun shield to help prevent excess heat rise on the integrated display.

---

2. Apply 18...32V DC power to your industrial computer or thin client.  
When power is connected for the first time and power is supplied to the DC terminal block, the default BIOS settings initiate.



The power switch should only be pressed after a shut down is performed.

3. If Microsoft Windows® 10 Internet of Things (IoT) Enterprise 2021 LTSC (64 bit) was factory installed: Read and accept the end user setup procedure.



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**WARNING:** Do not disconnect power from the system until after the Microsoft Windows setup procedure is completed.  
If power is disconnected during the setup procedure your system image can become corrupt.

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## Technical Specifications

### Options Summary

This table summarizes the options that are available for industrial computers and thin clients for hazardous locations, series J.



The code 'x' indicates any alpha/alpha-numeric value.

**6181X - 121 P P M X D N B - 3 B B W21 T G - N 1 S**  
                   a    b    c    d    e    f    g    h    i    j    k    l    m    n    o    p    q    r

a	
Display Size	
Code	Description
000	No display
121	12.1 in. display

b	
Bezel Type	
Code	Description
N	No display
P	PCAP

c	
Mount Type	
Code	Description
P	Panel mount
W	Wall mount

d	
Touch Type	
Code	Description
M	Multi touch PCAP
N	No touch

e	
Resolution	
Code	Description
N	No display
X	4:3 1024 x 768

f	
Power Input	
Code	Description
D	24V DC isolated, no UPS

g	
Fan / Fanless	
Code	Description
N	Fanless

h	
System Configuration	
Code	Description
B	1 x PCIe or 1 x PCI

i	
CPU Class	
Code	Description
3	Intel® Core™ i3

j	
RAM Capacity	
Code	Description
A	16 GB
B	32 GB
C	64 GB

k	
Storage Type, SSD 2.5 in.	
Code	Description
B	256 GB
C	512 GB
D	1 TB
N	None

l	
Operating System (OS)	
Code	Description
NNN	None
W21	Microsoft Windows® 10 IoT Enterprise 2021 LTSC (64 bit)

m	
Trusted® Platform Module (TPM)	
Code	Description
T	TPM (HW TPM Chip)
F	fTPM (FW TPM)
N	No TPM

n	
Riser Card Type	
Code	Description
G	1 PCIe x 1 installed

o	
Software	
Code	Description
N	No additional software
x	Custom or future software, preloaded

p	
Warranty	
Code	Description
1	Standard
x	Custom or future warranty

q	
Branding	
Code	Description
S	Standard A-B branding

r	
Coating	
Code	Description
empty	No conformal coating

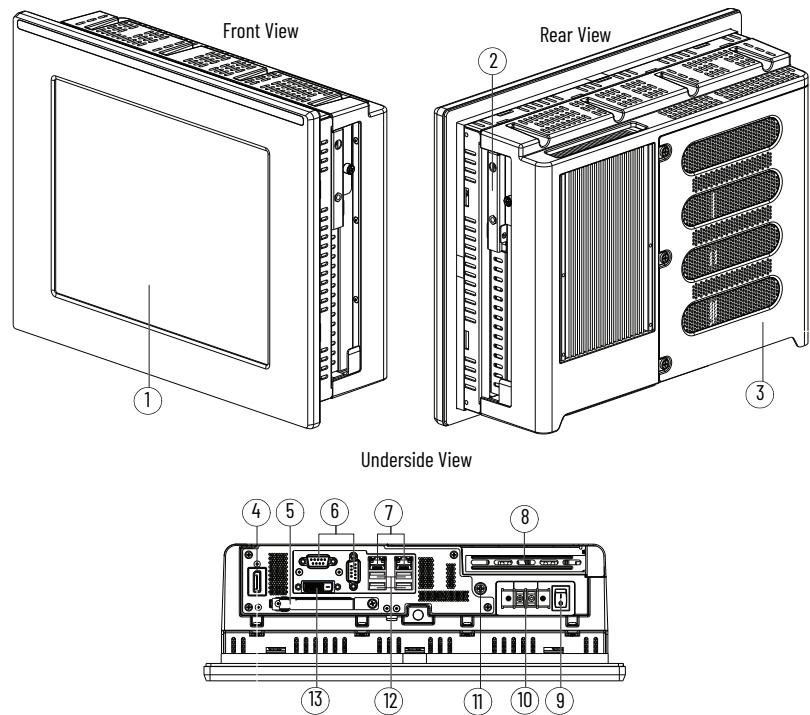
### Initial Preferred Catalog Numbers

Product	Catalog Number	Model	Description
Industrial Computer	6181X-000NWNNDNB-3ABW21FG-N1S	Non-display	Box PC, Intel Core i3 processor, 16 GB RAM, 256 GB solid-state drive (SSD), Firmware Trusted Platform Module (fTPM) DC power, Windows 10 IoT Enterprise 2021 LTSC operating system (OS), without Rockwell Automation software bundle
	6181X-121PPMXDNB-3ABW21FG-N1S	Integrated Display	12.1 inch integrated display panel PC with projective captive (PCAP) multi-touch screen, aluminum bezel, Intel Core i3, 16 GB RAM, 256 GB SSD, fTPM, DC power, Windows 10 IoT Enterprise 2021 LTSC, without Rockwell Automation software bundle
Thin Client	6181X-000NWNNDNB-3ANNNNFG-N1S	Non-display	Box thin client, Intel Core i3 processor, 16 GB RAM, fTPM, DC power, without SSD, without OS, without Rockwell Automation software bundle
	6181X-121PPMXDNB-3ANNNNFG-N1S	Integrated Display	12.1 inch integrated display panel thin client, PCAP multi-touch touch screen, aluminum bezel, Intel Core i3 processor, 16 GB RAM, fTPM, DC power, without SSD, without OS, without Rockwell Automation software bundle

Hardware Features

Although an integrated display model is illustrated, the hardware features are also applicable to non-display models except for Note No. 1.

Table 5 - Hardware Features



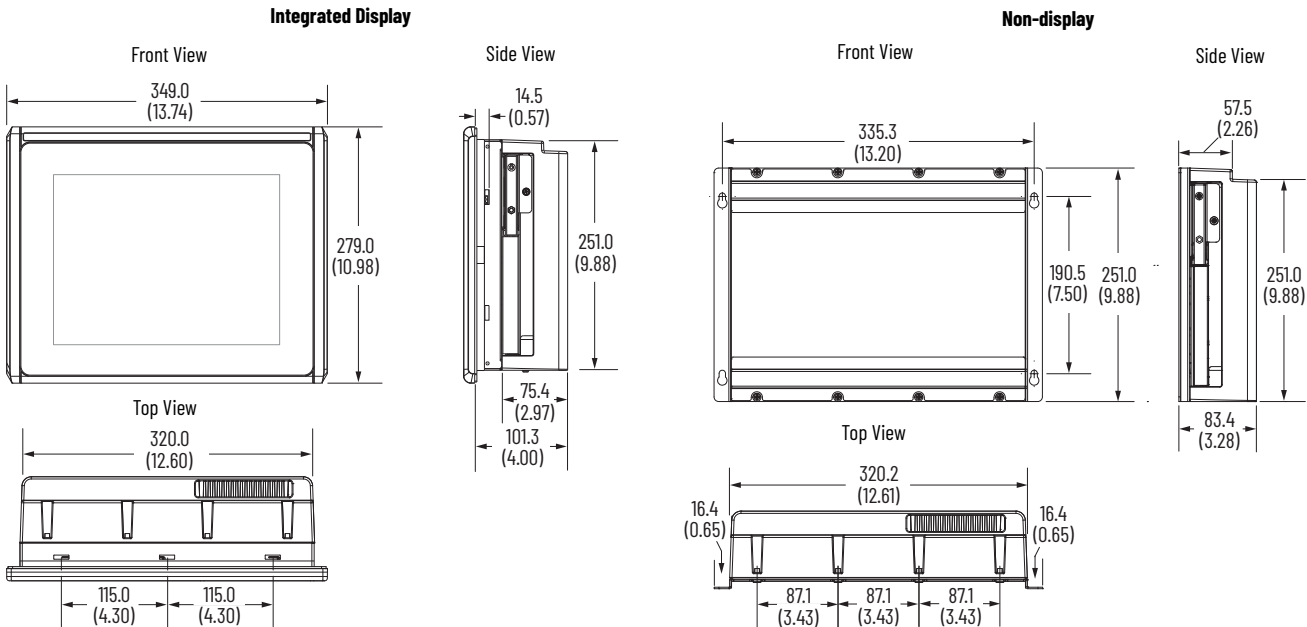
Note No.	Component
1	LCD panel – integrated display models only
2	128 GB Multi-level Cell (MLC), solid-state drive (SSD)
3	Rear cover
4	DisplayPort <sup>(1)</sup>
5	CFast card slot <sup>(2)</sup>
6	Serial COM ports (RS-232), quantity of 2
7	1 GB LAN ports (RJ45), quantity of 2
8	PCIe riser slot cover
9	Power switch
10	DC input terminal block
11	Functional ground screw
12	USB 3.0 ports, quantity of 4 <sup>(1)</sup>
13	DVI-D port

(1) The DisplayPort supports DP V1.4. It supports six monitors in FHD (1920x1080 resolution or 1080p resolution).  
(2) The USB ports and the bottom CFast card slot are hot swappable in non-hazardous locations only. For more information about the proper use of these ports, see [Outdoor Installation – Integrated Display Models on page 2](#).

Approximate Dimensions

Dimensions in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Figure 4 - Approximate Dimensions [mm (in.)]



Certifications

This equipment meets the following certifications. For the most current information on all certifications, visit the Rockwell Automation Product Certifications website at [rok.auto/certifications](http://rok.auto/certifications).



Certification	RoHS	Turkey RoHS (EEE Yönetmeliğine Uygundur. In Conformity with the EEE Regulation)	
			UAE RoHS Numero 0434B DA ISO 7000
	EAC	не предназначено для применения во взрывоопасных зонах. только для общепромышленного применения.	
	INMETRO		Para manual de instruções em português, use o seguinte link: Computadores industriais para áreas classificadas, publicação <a href="#">6181X-IN003-PT-P</a> .

Figure 5 - China/Taiwan RoHS Disclosure Table

單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛 Lead (Pb)	汞 Mercury (Hg)	鎘 Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr <sup>6+</sup> )	多溴聯苯 Polybrominated d biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
機箱/機板 Enclosure	—	○	○	○	○	○
機械部件 (風扇、散熱器 等) Mech parts (fan, heatsink... etc)	—	○	○	○	○	○
電路板組件 PCBA	—	○	○	○	○	○
電線/連接器 Cables/Connectors	—	○	○	○	○	○
電源設備 Power Supplies	—	○	○	○	○	○
儲存裝置 (硬碟、光碟機 等) Storage (HDD,ODD ,SSD...etc)	—	○	○	○	○	○
備考1: “○” 係指該項限用物質之百分比含量未超出百分比含量基準值。 Note 1: “○” indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.						
備考2: “—” 係指該項限用物質為排除項目。 Note 2: The “—” indicates that the restricted substance corresponds to the exemption.						

Technical Data

Table 6 - Physical Specifications

Model	Approximate Weight [kg (lb)]		Approximate Dimensions H x W x D [mm (in.)]	Mounting Options	Panel Cutout Dimensions H x W [mm (in.)]
	Product Only	Product with Packaging			
Integrated Display	9.40 (20.70)	12.07 (26.61)	279 x 349 x 101.2 (10.98 x 13.74 x 3.98)	Panel	254 x 324 (10.00 x 12.76)
Non-display	6.70 (14.80)	9.40 (20.70)	251 x 353 x 83.4 (7.5 x 13.20 x 3.28)	Wall	—

Table 7 - Power Specifications

Model	Input Voltage DC	Power Consumption, Maximum	Heat Dissipation <sup>(1)</sup>	Peripheral Loading, Maximum	
				PCIe Card	USB Ports
Integrated Display	18...32V DC	18...32V DC (SELV), 3.32...1.87 A, 60 W	60 W (205 BTU/h)	4 W	900 mA, 10 W maximum for all ports (2 A)
Non-display		18...32V DC (SELV), 2.22...1.25 A, 45 W	45 W (154 BTU/h)		

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

Table 8 - High Bright Integrated Display Specification, Cat No. 6181X-121PPMXDNB-3xxxxxxG-xxx(x)

Attribute	Specification
Display Type	active matrix color Thin Film Transistor (TFT)
Touch Screen	projected capacitive (PCAP), 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	1300 cd/m <sup>2</sup> (Nits)
Contrast Ratio, Typical	1000:1
Default Resolution	1024 x 768, 16.2 M colors
View Angle, Typical	176°
Light-emitting Diode (LED) Backlight Lifetime, Typical	100,000 hours

Table 9 - Security Specifications

Model	Catalog Number	Root of Trust (RoT)
Integrated Display	6181X-121PPMXDNB-3xxxxxTG-xxx(x)	HW (Hardware) Trusted® Platform Module (TPM) 2.0
Non-display	6181X-000NWNNDNB-3xxxxxTG-xxx(x)	
Integrated Display	6181X-121PPMXDNB-3xxxxxFG-xxx(x)	FW (firmware) TPM, Intel Platform Trust Technology (PTT), No HW TPM – preferred security configuration
Non-display	6181X-000NWNNDNB-3xxxxxFG-xxx(x)	
Integrated Display	6181X-121PPMXDNB-3xxxxxNG-xxx(x)	No TPM functionality
Non-display	6181X-000NWNNDNB-3xxxxxNG-xxx(x)	

Table 10 - Environment Specifications

Model	Enclosure Ratings	Temperature [°C (°F)]	Relative Humidity	Altitude	Shock <sup>(1)</sup>
Integrated Display	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.	Operating: Display Side: -20...+55 (-4...+131) Back Side: -20...+70 (-4...+158)	10...90% without condensation	Operating: 2000 m (6561 ft)	Operating: 15 g's (1/2 sine, 11 ms)
Non-display	—	Non-operating: -30...+80 (-22...+176) <sup>(2)</sup>		Non-operating: 12,000 m (40,000 ft)	Non-operating: 30 g's (1/2 sine, 11 ms)

(1) Applies to panel-mounted integrated display and wall-mounted non-display industrial computers and thin clients.

(2) See [Installation Guidelines on page 8](#) for more information about temperature guidelines.

Table 11 - Hardware and Software Specifications: Integrated Display and Non-display Models

Attribute	Specification
<b>Hardware</b>	
Processor	Intel Core i3-1115G6RE, 2.2 GHz dual core/6 MB cache/15 W
System Memory	Type
	Dual channel, DDR4 SO-DIMM
	Slots
	quantity of 2
	Installed
Solid-state Drive <sup>(1)</sup>	16 GB (1 x 16 GB) to 64 GB (2 x 32 GB)
	Maximum Memory
	64 GB (2 x 32 GB)
CFast Card Slot	Available Capacities
	see <a href="#">Table 13</a>
	Location
Expansion Slot	see <a href="#">Table 5 on page 11</a>
	Capacity Installed
	256 GB, 512 GB, or 1 TB
I/O Ports	Available Capacities
	see <a href="#">Table 13</a>
	Location
Ethernet LAN	see <a href="#">Table 5 on page 11</a> (bootable, shipped empty)
	Hot-swappable (Y/N)
	only in a non-hazardous location
Real-time clock (RTC) Battery	Expansion Slot
	1 half-length PCIe, 4 W maximum supported
	DisplayPort
	quantity of 1; see <a href="#">Table 12 on page 13</a> for additional information
ThinManager®	DVI-D
	quantity of 1
	Serial COM
	quantity of 2
ThinManager Ready	USB 3.0
	quantity of 4; 10 W maximum supported aggregate for all USB 3.0 ports
	Ethernet LAN
	quantity of 2 LAN ports (RJ45), 1 GB each
Software	Real-time clock (RTC) Battery
	Lithium RTC battery
	<b>IMPORTANT:</b> The lithium battery can only be replaced by Rockwell Automation. Return your product in its original inner and outer packaging to Rockwell Automation for battery replacement. For return information, contact your local distributor or Rockwell Automation representative, or visit the <a href="#">Product and Application Support</a> .
	ThinManager Ready
Operating System (OS)	All models are ThinManager ready
	Factory System Image
	Microsoft Windows 10 Internet of Things (IoT) Enterprise 2021 LTSC (64 bit)
	To obtain a copy, access the Rockwell Automation Product Compatibility and Download Center (PCDC) at <a href="http://rok.auto/pcdc">rok.auto/pcdc</a>

(1) The solid-state drives are customized to accommodate the properties as follows: (a) no paging file and (b) system restore is disabled by default.

Table 12 - DisplayPort Specification

Display Resolution at 60 frames per second (FPS) 10 bit	Resolution Type	Max No. of Monitors Supported (Based on Display 1.4 Bandwidth)
1680x1050	WSXGA (Wide Super-eXtended Graphics Array)	8
1920x1080	1080p	6
2560x1600	WQXGA (Wide Quad Extended Graphics Array)	3
3840x2160	Ultra HD (High Definition), 4K	1
4096x2160	4K x 2K	1

Table 13 - Accessories <sup>(1)</sup>

Accessory	Catalog Number	Description
Book Mount Bracket	6189V-B00KBRKT	Metal bracket for book mount installation of 6181X Series J Non-display Models; includes quantity of 8 mounting screws
DDR4 SO-DIMM RAM	6189X-16GDDR4	1 x 16 GB
	6189X-32GDDR4	2 x 16 GB
	6189X-64GDDR4	2 x 32 GB
CFast Card	6189X-64GCFast	64 GB CFast card
Solid-state Drive (SSD), supports SATA3	6189X-256GBSSD3	256 GB SSD
	6189X-512GBSSD	512 GB SSD
	6189X-1TBSSD	1 TB SSD
Mounting Clips	6189X-MCLPS	Replacement mounting clips, quantity of 10
PCI Riser Card	6189X-PCIRISER	PCI riser card
Sun Shield	6189X-SUNSHIELD	Attachment to protect an integrated display from exposure to direct sunlight, 251 x 343.1 mm (10.12 x 13.50 in.) <b>IMPORTANT:</b> 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 the sun shield to help prevent excess heat rise on the integrated display.

(1) For a complete list of accessories and accessory installation instructions, see Accessories for Industrial Computers and Thin Clients for Hazardous Locations, Series J Product Information, publication [6181X-PC002](#).

## Additional Resources

These documents contain additional information to related products from Rockwell Automation. You can view or download publications at [rok.auto/literature](http://rok.auto/literature).

Resource	Description
Accessories for Industrial Computers and Thin Clients for Hazardous Locations, Series J Product Information, publication <a href="#">6181X-PC002</a>	Provides installation instructions for accessories and internal storage devices for a 6181X Series J industrial computer or thin client for hazardous locations.
Industrial Computers and Thin Clients for Hazardous Locations, Series J User Manual, publication <a href="#">6181X-UM003</a>	Provides an overview of the system, procedures to install, connect, operate, and troubleshoot a 6181X Series J industrial computer or thin client for hazardous locations.
6181P and 6181X Integrated Display Industrial Computers Cutout Template-Standard, publication <a href="#">6181P-DS002</a>	Provides the cutout template to prepare the site to mount an integrated display industrial computer or thin client for hazardous locations.
EtherNet/IP™ Network Devices User Manual, <a href="#">ENET-UM006</a>	Describes how to configure and use EtherNet/IP devices to communicate on the EtherNet/IP network.
Ethernet Reference Manual, <a href="#">ENET-RM002</a>	Describes basic Ethernet concepts, infrastructure components, and infrastructure features.
Industrial Automation Wiring and Grounding Guidelines, publication <a href="#">I770-4.1</a>	Provides general guidelines for installing a Rockwell Automation® industrial system.
Product Certifications website, <a href="http://rok.auto/certifications">rok.auto/certifications</a>	Provides declarations of conformity, certificates, and other certification details.

## Waste Electrical and Electronic Equipment (WEEE)







At the end of life, this equipment should be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental compliance information on its website at [rok.auto/pec](http://rok.auto/pec).

Your comments help us serve your documentation needs better. If you have any suggestions on how to improve our content, complete the form at [rok.auto/docfeedback](http://rok.auto/docfeedback).

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Rockwell Otomasyon Ticaret A.Ş. Kar Plaza İş Merkezi E Blok Kat:6 34752 İçerenköy, İstanbul, Tel: +90 (216) 5698400 EEE Yönetmeliğine Uygundur

Connect with us.    

**rockwellautomation.com** — expanding **human possibility**®

AMERICAS: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444

EUROPE/MIDDLE EAST/AFRICA: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2663 0600, Fax: (32) 2 663 0640

ASIA PACIFIC: Rockwell Automation SEA Pte Ltd, 2 Corporation Road, #04-05, Main Lobby, Corporation Place, Singapore 618494, Tel: (65) 6510 6608, FAX: (65) 6510 6699

UNITED KINGDOM: Rockwell Automation Ltd., Pitfield, Kiln Farm, Milton Keynes, MK11 3DR, United Kingdom, Tel: (44)(1908) 838-800, Fax: (44)(1908) 261-917

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