



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)



Allen-Bradley

by ROCKWELL AUTOMATION

Important User Information

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

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

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

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

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

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

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



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



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

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

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



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



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



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

The following icon may appear in the text of this document.



Identifies information that is useful and can help to make a process easier to do or easier to understand.

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Notes:

About This Publication

This manual provides procedures for suitably trained personnel to install, connect, operate, maintain, and troubleshoot 6181X Series J industrial computers or thin clients for hazardous locations.

Download Firmware and Other Files

Download firmware and access product release notes from the Product Compatibility and Download Center at rok.auto/pcdc.

Terminology

This publication contains several acronyms. See [Table 1](#) for the meaning of these acronyms.

Table 1 - Acronyms

Acronym	Meaning
BIOS	Basic Input/Output System
CMOS	Complementary Metal-oxide Semiconductor
ESD	Electrostatic Discharge
HW	Hardware
IoT	Internet of Things
OS	Operating System
PCAP	Projected Capacitive
PCB	Printed Circuit Board
POST	Power On Self Test
PTT	Platform Trust Technology
RoT	Root of Trust (RoT)
SSD	Solid-state Drive
TFT	thin-film-transistor
TPM	Trusted [®] Platform Module
UEFI	universal extensible firmware interface

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation. You can view or download publications at rok.auto/literature.

Resource	Description
Industrial Computers for Hazardous Locations Technical Specification, publication 6300-TD001	Provides technical specifications for 6181X Series J integrated display and non-display industrial computers, for hazardous locations.
Accessories for Industrial Computers for Hazardous Locations 6181X Series J Product Information, publication 6181X-PC002	Provides installation instructions for internal and external accessories for industrial computers and thin clients for hazardous locations, 6181X Series J.
Industrial Computers and Thin Clients for Hazardous Locations Series J Installation Instructions, publication 6181X-IN003	Provides installation instructions to mount and connect a 6181X Series J industrial computer or thin client for hazardous locations.
6181P and 6181X Integrated Display Industrial Computers Cutout Template – Standard, publication 6181P-DS002	Provides the cutout template to prepare the site to mount an integrated display model industrial computer or thin client for hazardous locations.
Restriction of Hazardous Substances (RoHS), publication PEC-TD003	Provides the Restriction of Hazardous Substances (RoHS) information and table.
EtherNet/IP Network Devices User Manual, ENET-UM006	Describes how to configure and use EtherNet/IP devices to communicate on the EtherNet/IP network.
Ethernet Reference Manual, ENET-RM002	Describes basic Ethernet concepts, infrastructure components, and infrastructure features.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation [®] industrial system.
Product Compatibility and Download Center (PCDC) website, rok.auto/pcdc	Provides product-related downloads including firmware, release notes, associated software, drivers, tools and utilities for your industrial computer or thin client.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.

Notes:

Overview

6181X Series industrial computers and thin clients for hazardous locations are a necessity for maintaining productivity in hazardous location work environments. Both integrated display and non-display models are ThinManager® ready and built with the capacity to withstand extreme and harsh temperatures.



Other features include:

- 11th Generation Intel® Dual Core™ i3-1115GRE, 2.2 GHz, Tiger Lake processor
- Microsoft® Windows® 10 IoT Enterprise 2021 LTSC (64 bit)
- ThinManager® ready
- Hazardous location certifications (IECEX, cUL Class 1 Division 2 and Class 1 Zone 2, ATEX, UKEx, CCC Ex, and INMETRO)
- IECEx, ATEX Category 3 (for gas and dust), and UL listed for Class I Division 2 hazardous locations ratings
- Trusted® Platform Module (TPM) enabled UEFI (HW, FW, or No TPM options) and Secure Boot functionality
- Available with 256 GB, 512 GB, or 1 TB solid state drives (SSDs) or 64 GB CFAST card
- Available with 16 GB, 32 GB, or 64 GB DRAM memory
- Various I/O Ports to include: COM ports (2 quantity), USB 3 ports (4 quantity), 1 GB Ethernet Ports (2 quantity), DisplayPort (1 quantity), DVI port (1 quantity), and a 24V DC input power terminal block
- Environment specifications of -20...+70 °C (-4...158 °F) operating temperature inside enclosure, 2 G vibration, and 15 G/30 G shock rating

Integrated display models, designed for panel mounting, feature:

- 12.1 in. thin-film-transistor (TFT) color display with projected capacitive (PCAP) touch screen
- 1300 NIT High-Bright Sunlight Readable LCD (6181X-SUNSHIELD to be installed in applications of direct sunlight)
- Multi-touch screen settings for thick or thin gloves for dry to damp operation

Non-display models are designed for two mounting options, either:

- wall mount design or
- book mount when attached to the 6189V-BOOKBRKT book mount bracket.

Initial Preferred Catalog Numbers



- See [Options Summary on page 67](#) for a complete list of available options.
- Non-preferred catalog numbers will have a minimum quantity order of 6 pieces.

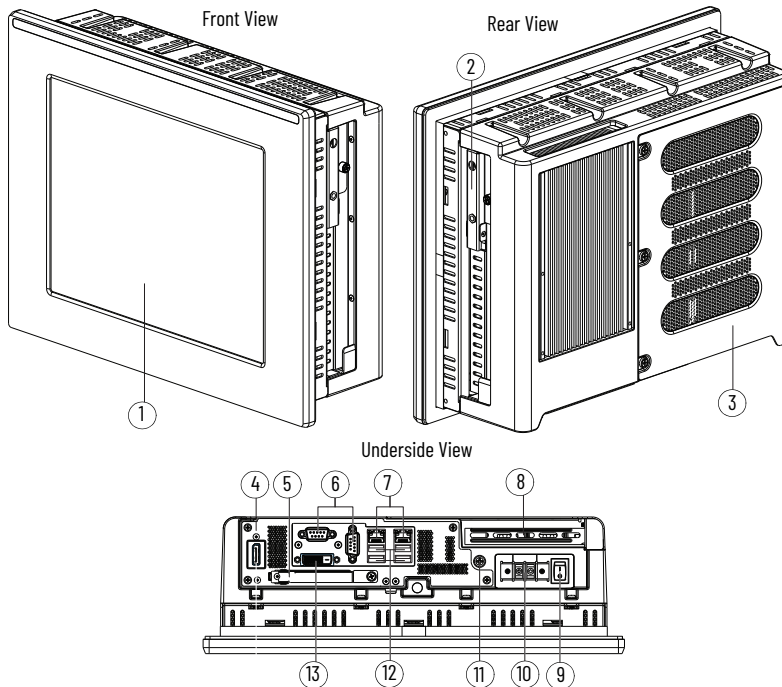
Product	Catalog Number	Model	Description
Industrial Computer	6181X-000NWNNDNB-3ABW21FG-N1S	Non-display	Box PC, Intel Core i3 processor, 16 GB RAM, 256 GB solid-state drive (SSD), Firmware Trusted Platform Module (fTPM) DC power, Windows 10 IoT Enterprise 2021 LTSC operating system (OS), without Rockwell 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-3ANNNFNG-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-3ANNNFNG-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 in [Table 2](#).

Table 2 - Hardware Features



Note No.	Component
1	LCD panel – Integrated Display Model Only
2	Solid-state Drive (SSD)
3	Rear cover
4	DisplayPort™ ⁽¹⁾
5	CFast™ card slot
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 ⁽²⁾
13	DVI-D port

(1) For all models: The DisplayPort supports DP V1.4 and a daisy-chain configuration for up to six monitors in FHD (1920x1080 resolution or 1080p resolution). For thin client models: ThinManager or other thin client software would need to support daisy chaining to be able to take advantage of this multi-monitor functionality.

(2) For non-hazardous locations: The USB 3.0 ports are hot swappable. See [Mounting Requirements on page 23](#) for more information. Only connect a high-quality, shielded USB 3.0 cable with a retention feature.
For hazardous locations: The USB 3.0 ports are not hot swappable.

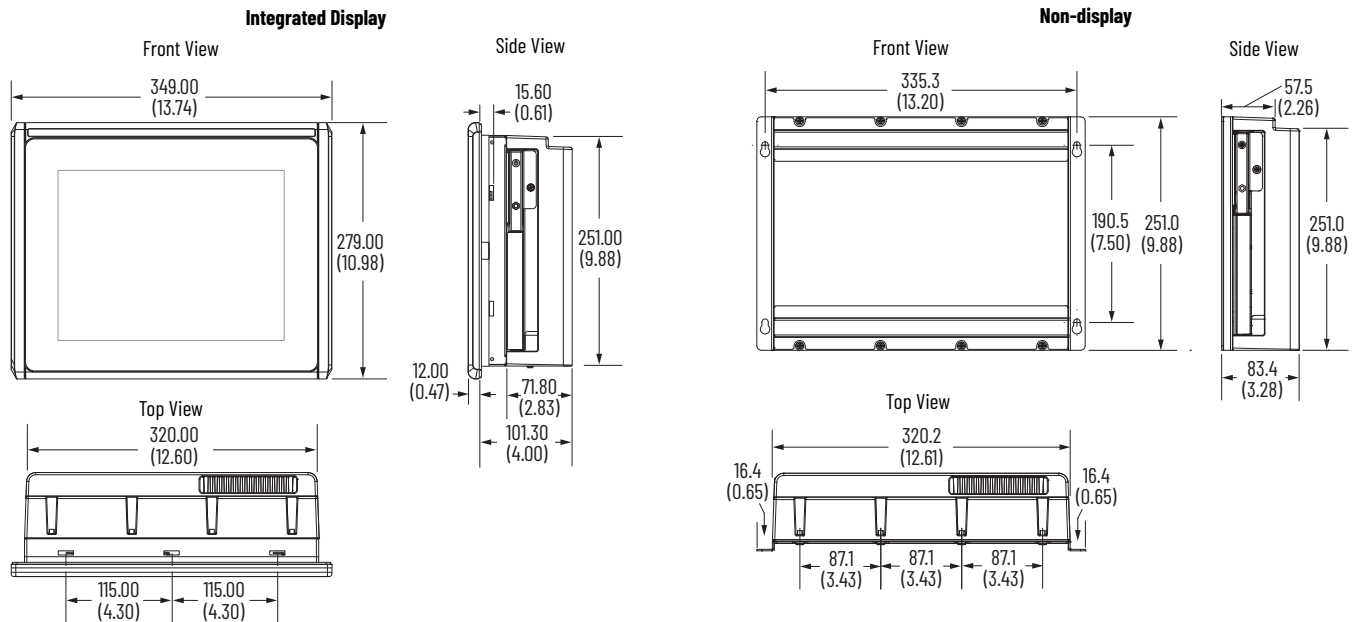
Accessories

For a complete list of accessories for your industrial computer or thin client, see Accessories for Industrial Computers for Hazardous Locations 6181X Series J Product Information, publication [6181X-PC002](#).

Approximate Dimensions

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

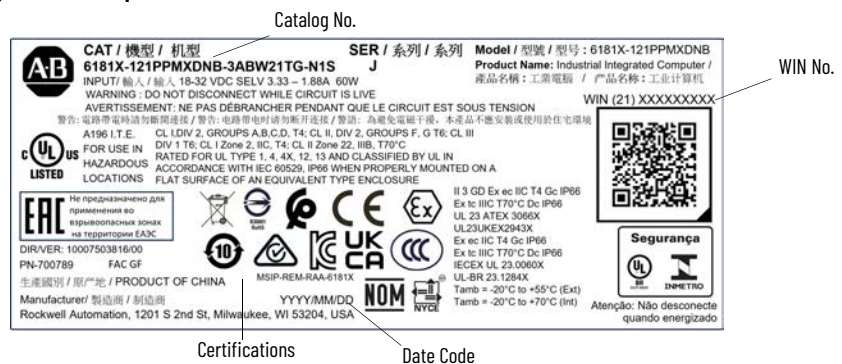
Figure 1 - Approximate Dimensions [mm (in.)]: Integrated Display



Nameplate

The nameplate for your industrial computer or thin client is located on the backside of the chassis. The nameplate is specific to your industrial computer or thin client and identifies its catalog number, serial number, and date of manufacture.

Figure 2 - Nameplate



Record your model-specific information here for future reference.

Catalog Number 6181X-	Series J
WIN Number	
Date Code	/ /

Notes:

Installation Precautions and Requirements

IMPORTANT Read all information within this section before proceeding with the installation of your industrial computer or thin client.

Installation Precautions

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 15](#).

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



ATTENTION: Cet équipement est prévu pour fonctionner en environnement industriel avec une pollution de niveau 2, dans des applications de surtension de catégorie II (telles que définies dans la norme CEI 60664-1) et à une altitude maximum de 2 000 mètres (6 561 pieds) sans déclassement.

Cet équipement fait partie des équipements industriels de Groupe 1, Classe A selon les normes CEI/CISPR 32 et ABNT NBR CEI/CISPR 32. Sans précautions suffisantes, il se peut que la compatibilité électromagnétique ne soit pas garantie dans les zones résidentielles et autres environnements, en raison de perturbations par conduction et par rayonnement.

Cet équipement doit être monté sur panneau ou être de type ouvert. Il est installé à l'intérieur d'une armoire accessible uniquement à l'aide d'un outil, adapté à l'environnement.



Tous les PC industriels à écran intégré 6181X-121 et les clients légers à écran intégré 6181X-121 sont fournis avec un boîtier étanche satisfaisant à des exigences spécifiques lorsqu'ils sont montés sur un panneau ou dans une armoire de classification équivalente. Pour de plus amples informations sur ces classifications, voir [Hazardous Location Information on page 15](#).

En plus de cette publication, consultez :

- la publication [1770-4.1](#), « Industrial Automation Wiring and Grounding Guidelines », pour d'autres critères d'installation
- les normes ABNT NBR CEI 60529, NEMA 250, UL 50 et CEI 60529, selon le cas, pour des explications sur les niveaux de protection assurés par les différents types d'armoire.

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.

	<p>ATTENTION: To comply with EN 55035 and EN 55032, the following applies to cable usage:</p> <ul style="list-style-type: none"> • USB cables must be less than 3 m (9.84 ft) in length. • 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. 		<p>ATTENTION: Pour être conforme aux normes EN 55035 et EN 55032, utilisez les types de câble suivants.</p> <ul style="list-style-type: none"> • Les câbles USB doivent être de longueur inférieure à 3 m (9,84 ft) • Tous les câbles d'E/S, à l'exception des câbles Ethernet, doivent être utilisés à l'intérieur • Tous les câbles d'E/S, à l'exception des câbles Ethernet ne peuvent pas sortir du bâtiment et ne peuvent pas être branchés directement aux câbles à l'extérieur du bâtiment.
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To comply with EN 55035 and EN 55032, use the following for cable types:

Cable Type	Required Attribute
LAN	Shielded or unshielded
USB 3.0 ⁽¹⁾	Shielded
Serial RS-232	Shielded
DVI	Shielded
DisplayPort	Shielded
DC Power	Unshielded

(1) For hazardous locations: Only connect a high-quality, shielded USB 3.0 cable with a retention feature.

Hazardous Location Information

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 and use '6181X-CT' as the search term.

North American Hazardous Location Approval









The following information applies when operating this equipment in hazardous locations.	Informations sur l'utilisation de cet équipement en environnements dangereux.
<p>Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.</p>	<p>Les produits marqués "CL I, DIV 2, GP A, B, C, D" ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.</p>
<div style="display: flex; align-items: center;">  <div> <p>WARNING: Explosion Hazard.</p> <ul style="list-style-type: none"> • Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous. • Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product. • Substitution of components may impair suitability for Class I, Division 2. • If this product contains batteries, they must only be changed in an area known to be nonhazardous. </div> </div>	<div style="display: flex; align-items: center;">  <div> <p>AVERTISSEMENT: Risque d'Explosion.</p> <ul style="list-style-type: none"> • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement. • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit. • La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe I, Division 2. • S'assurer que l'environnement est classé non dangereux avant de changer les piles. </div> </div>

Table 3 - Location Categories for Hazardous Locations

Integrated Display		
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 °C ≤ T _a ≤ 55 °C (-4 °F ≤ T _a ≤ 131 °F) (display side)
	Class I Zone 2, IIC, T4 Class II Zone 22, IIIB, T70 °C	
Canada	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 Ex tc IIIC T70 °C Dc UL 23 ATEX 3066X	
United Kingdom (UKEX)	 II 3 GD, Ex ec IIC T4 Gc Ex tc IIIC T70 °C Dc UL23UKEX2943X	
Global/IECEX	Ex ec IIC T4 Gc Ex tc IIIC T70°C Dc IECEX UL 23.0060X	
Brazil (INMETRO)	 Ex ec IIC T4 Gc Ex tc IIIC T70°C Dc UL-BR 23.1284X	
China (CCC)	Ex ec IIC T4 Gc Ex tc IIIC T70°C Dc	
Non-display		
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, UL 23 ATEX 3066X	
United Kingdom (UKEX)	 II 3 G, Ex ec IIC T4 Gc, UL23UKEX2943X	
Global/IECEX	Ex ec IIC T4 Gc, IECEX UL 23.0060X	
Brazil (INMETRO)	 Ex ec IIC T4 Gc UL-BR 23.1284X	
China (CCC)	Ex ec IIC T4 Gc	

RoHS Disclosure Table

See Restriction of Hazardous Substances (RoHS), [PEC-TD003](#).

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.

Outdoor Installation – Integrated Display Models

If your integrated display model (Cat. No. 6181X-121PPMXDNB-3xxxxxxG-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
- Horizontal position while maintaining a 0° vertical 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 is improved with 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. Sun shields that close and fold over the display must maintain an air gap to adequately vent the heat coming out of the display module in high temperature environments.

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 at a 0° vertical position 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.

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.

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 is provided if set at a level not exceeding 140% of the peak rated voltage value at the supply terminals to the equipment.
- 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 and the 64GB CFast accessory.
- 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 is 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 and the 64GB CFast accessory.
- 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.

	<p>WARNING: Explosion Hazard.</p> <ul style="list-style-type: none"> • 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. 		<p>AVERTISSEMENT: Risque d'explosion.</p> <ul style="list-style-type: none"> • Ne branchez ou ne débranchez pas l'équipement ou tout équipement périphérique connecté sans vous être assuré que l'alimentation est coupée et que l'environnement est classé comme non dangereux. • Les périphériques doivent être adaptés à l'environnement dans lesquels ils sont utilisés. • Aux États-Unis, l'intégralité du câblage doit être conforme aux méthodes de câblage de Classe I, Division 2 de l'article 501 du National Electrical Code, ainsi qu'aux réglementations applicables en vigueur. • Au Canada, l'intégralité du câblage doit être conforme à la section 18-1J2 du code électrique canadien, ainsi qu'aux réglementations applicables en vigueur. • Dans les applications finales, raccordez correctement ces dispositifs à la terre en utilisant la vis de borne de terre sur le châssis de votre PC industriel ou de votre client léger. • Les cartes d'extension PCIe et PCI doivent être classées 4 W (maximum) et de Classe I, Division 2, T4 (maximum), 90 °C (194 °F) (minimum) à la température ambiante environnante.
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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.

	<p>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:</p> <ul style="list-style-type: none"> • 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. <p>You must provide means to achieve a safe state during anomalies and help ensure that the system has adequate redundancy for critical functions.</p> <ul style="list-style-type: none"> • Failure to follow these instructions can result in death, serious injury, or equipment damage. 		<p>AVERTISSEMENT: Risque de mort, de blessures graves ou de dégâts matériels. Si l'écran intégré s'assombrit ou si le rétro-éclairage ne fonctionne pas correctement, il peut être difficile de lire l'écran intégré et son utilisation peut provoquer des risques potentiels. La conception du système doit prendre en compte le fait que l'écran intégré ou la dalle tactile LCD peut perdre sa fonctionnalité et donc devenir incapable de maintenir ou de changer le contrôle du système. La dalle tactile ne doit pas être le point de contrôle unique des fonctions critiques et n'est pas conçue pour remplacer l'arrêt d'urgence. La conception du système doit suivre toutes les réglementations applicables et les bonnes pratiques en matière d'ingénierie. Facteurs à prendre en compte :</p> <ul style="list-style-type: none"> • la possibilité qu'un écran LCD soit illisible ; • la possibilité qu'une dalle tactile soit inutilisable ; • une erreur de l'opérateur dans la commande du système ; • une utilisation correcte des arrêts d'urgence et autres pratiques de sécurité ; • des erreurs ou des retards de communication inattendus. <p>Vous devez fournir les moyens d'atteindre un état sûr pendant les anomalies et aider à garantir que le système possède une redondance adéquate des fonctions critiques.</p> <ul style="list-style-type: none"> • L'inobservation de ces instructions peut entraîner des blessures graves, voire mortelles, ou endommager l'équipement.
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DC Power Requirements

Table 4 - DC Power Specifications

Attribute	Value	
	Integrated Display	Nondisplay
Input Voltage, DC	18...32V DC	
Power Consumption, Maximum	18...32V DC (SELV), 3.33...1.88 A 60 W	18...32V DC (SELV), 2.50...1.41 A 45W
Maximum Heat Dissipation ⁽¹⁾	60 W (205 BTU/h)	45 W (154 BTU/h)
Peripheral Loading PCIe Card, Maximum	4 W	
USB Ports, Maximum per Port	900 mA, 10 W max for all ports (2 A)	

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

Table 5 - 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 ² (18...14 AWG)
	To Connect to Earth Ground: 1.5 mm ² (16 AWG) or larger ⁽¹⁾
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.

- 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 4 on page 21](#).

Installation Site Requirements

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

Table 6 - Environment and Temperature Specifications

Environmental Specification		Integrated Display	Non-display
Enclosure Ratings		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.	—
Temperature	Operating	Display Side: -20...+55 °C (-4...+131 °F) Back Side: -20...+70 °C (-4...+158 °F)	-20...+70 °C (-4...+158 °F)
	Non-operating	-30...+80 °C (-22...+176 °F) ⁽¹⁾	-30...+80 °C (-22...+176 °F)
Relative Humidity		10...90% without condensation	
Altitude	Operating	2000 m (6561 ft)	
	Non-operating	12,000 m (40,000 ft)	
Shock ⁽²⁾	Operating	15 g (1/2 sine, 11 ms)	
	Non-operating	30 g (1/2 sine, 11 ms)	
Vibration ⁽²⁾		0.012 in p-p (10...57 Hz); 2 g peak (57...640 Hz)	

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

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

Table 7 - Enclosure Requirements

Maximum Enclosure:	70 °C (158 °F)
Maximum Ambient Air Temperature:	55 °C (131 °F)
Minimum Enclosure Size (H x W x D):	403 x 497 x 154 mm (15.87 x 19.57 x 6.06 in.)

- The enclosure or cover must always remain in place during operation. The cover provides protection against high voltages inside the industrial computer or thin client and inhibits radio frequency (RF) emissions that can interfere with other equipment.
- If the minimum enclosure size is selected, you must provide adequate ventilation or other methods to lower the temperature in the enclosure so as not to exceed the maximum enclosure and ambient air temperature listed in [Table 6](#).
- Never allow air passages to become obstructed. Allow sufficient space around air inlets and outlets to provide the circulation necessary for cooling.
- 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 ambient air temperature must not exceed the maximum operating temperature in [Table 6 on page 21](#) and must avoid condensation. Consider a user-supplied fan, heat exchanger, or air conditioner for heat generated by other devices in the enclosure.

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



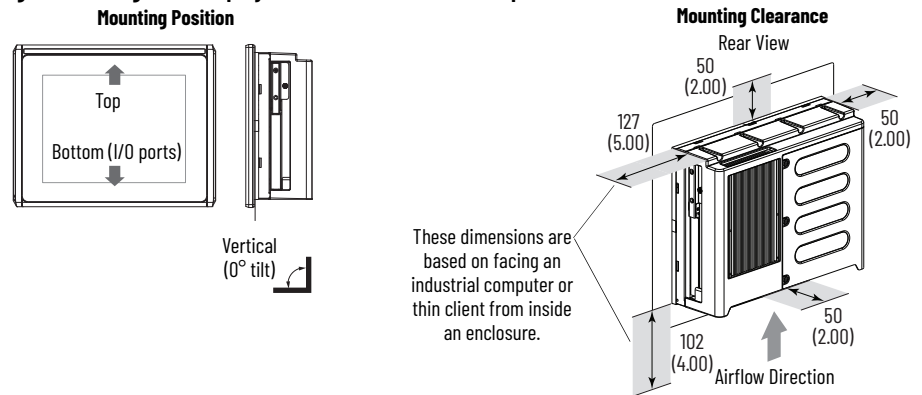
Hot air rises. The temperature at the top of the enclosure is often higher than the temperature in other parts of the enclosure, which is likely if air is not circulating.

- The relative humidity of the ambient air must not exceed the limits that are specified in [Table 6 on page 21](#) and must avoid condensation.
- If your industrial computer or thin client is exposed to direct sunlight, the Rockwell Automation approved sun shield, Cat. No. 6189X-SUNSHIELD, must be installed.

Mounting Requirements

Integrated Display Models

Figure 3 - Integrated Display Models – Panel Mount Requirements



Mounting Position

- When mounted, your industrial computer or thin client cannot be:
 - tilted from vertical.
 - mounted on a horizontal surface.
- Choose an ergonomic height suitable for the end user.

Mounting Clearance

- Do not operate your industrial computer or thin client in an enclosure with minimum clearances 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 the solid state drive drawer) 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 provided cutout template that is provided must be used to prepare the panel cutout.
 - For planning purposes only: The approximate dimensions [mm in.] for the panel cutout (H x W) is: 254 x 324 (10 x 12.76)

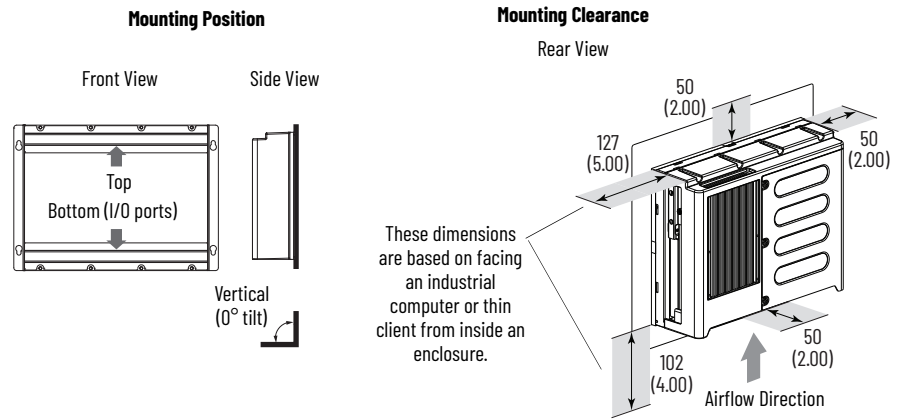
Non-display Models

Your non-display model can be mounted vertically at a 0° tilt either:

- a. directly to a wall, such as a steel panel in an enclosure or equipment room, or
- b. to a book mount bracket, cat. no. 6189V-BOOKBRKT.

Wall Mount Requirements

Figure 4 - Wall Mount Requirements – Non-display Models



Mounting Position

- When mounted, your industrial computer or thin client 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 the solid state drive drawer) 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 4](#) to plan the position of your non-display model.

Book Mount Bracket Requirements

Mounting Position

- When mounted, your industrial computer or thin client cannot be:
 - tilted from vertical.
 - mounted on a horizontal surface.
- Choose an ergonomic height suitable for the end user.

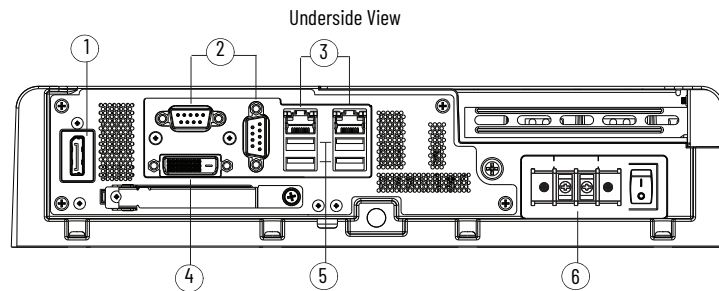
Mounting Clearance

- Allow for minimum clearances and space around your industrial computer or thin client to accommodate adequate airflow, future installation or removal of peripheral components (such as the solid state drive drawer) and peripheral cables.

Cable Requirements

IMPORTANT To comply with EN 55024 and EN 55032, select cables with the required attribute that is listed in [Table 8](#).

Table 8 - Peripheral Cable Requirements



Note No.	Description	Required Attribute
1	DisplayPort™	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 ⁽¹⁾	Shielded
6	DC terminal block	Unshielded

(1) For non-hazardous locations: The USB 3.0 ports and the bottom CFast card slot are hot swappable. For more information about proper use of these ports, see [Mounting Requirements on page 23](#).
For hazardous locations: The USB 3.0 ports and the bottom CF card slot are not hot swappable. Only connect a high-quality, shielded USB 3.0 cable with a retention feature.

IMPORTANT The USB ports will continue to draw power from the power supply of your industrial computer if the power supply is connected to an electrical outlet. Be sure to disconnect the DC power supply before performing maintenance and lockout operations.

Notes:

Installation



ATTENTION: Before proceeding with the installation, read and understand all information within [Installation Precautions and Requirements on page 13](#).

Unpack the Product

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



Keep the original packing material including the inner and outer packing cartons, in case you must return your product for service (such as Rockwell Automation for RTC battery replacement) or transport to another location.

Your product ships with these items:

Model	Contents
Integrated Display	<ul style="list-style-type: none"> • Mounting clips, quantity of 10 • Cutout template, publication 6181P-DS002 • Product test report • Industrial Computers and Thin Clients for Hazardous Locations, Series J Installation Instructions, publication 6181X-IN003
Non-display	<ul style="list-style-type: none"> • Screws with grommets, quantity of 4 • Product test report • Industrial Computers and Thin Clients for Hazardous Locations, Series J Installation Instructions, publication 6181X-IN003

Required Tools

The tools listed in are required to install your industrial computer or thin client.

Model	Required Tools for Installation
Integrated Display	<ul style="list-style-type: none"> • Cutout tools appropriate for panel material • Scissors for cutout template • Low-tack masking tape
Non-display	<ul style="list-style-type: none"> • Cutout tools appropriate for wall material • Drill, drill bit, and M4 screw tap
All Models	<ul style="list-style-type: none"> • #2 cross-head screwdriver • Tape measure • Level, square, and marking tool • Anti-static wriststrap • Torque limiting screwdriver • Assorted peripheral cables (see Table 8 on page 25 for required cables) • DC power supply (see Table 4 on page 20 for requirements)

Add Internal Component Accessories



To ease the installation process of your industrial computer or thin client, these accessories should be added before you proceed to mount, connect power, and connect peripheral cables: CFast card, PCI riser card, DDR4 SO-DIMM RAM memory modules, and solid state drive (SSD).

For a complete list of accessories, see [6181X-PC002](#). For accessory installation, see [Install Accessories on page 47](#).

Mount

For Integrated Display Models

Step A: Create the Panel Cutout

Follow these steps to create the panel cutout.

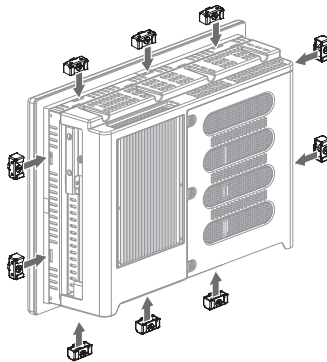
1. Remove all electrical power from the panel.
2. Use a scissors to cut the cutout template (provided) for your specific integrated display model indicated on the cutout template itself.
3. Affix the prepared cutout template against the panel at the preferred height and squarely positioned.
4. Use cutting 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

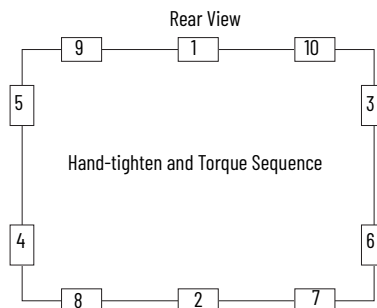
1. Make sure that the sealing gasket is properly positioned on your industrial computer or thin client.

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.



4. Hand-tighten the mounting clips around the bezel in the following sequence:



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 the figure above.
7. Repeat step 6 at least three additional times until the mounting clips are properly torqued, making sure that the gasket is compressed uniformly against the panel.



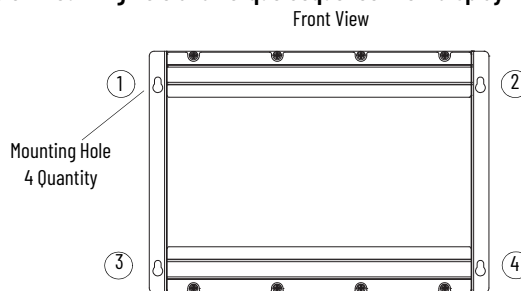
ATTENTION: Tighten the mounting clips to the specified torque to provide a proper seal to help prevent water or chemical damage to your industrial computer or thin client. Rockwell Automation assumes no responsibility for water or chemical damage to your industrial computer, thin client, or other equipment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

IMPORTANT Do not overtighten the mounting clips. Overtightening will cause damage to the gasket.

For Non-display Models

For Wall Mount Installation

Figure 5 - Mounting Hole and Torque Sequence: Non-display Models



1. Lift your non-display model in the desired position the wall.
2. Check that your non-display model is level and square.
3. Mark the locations of the four mounting holes shown in [Figure 5](#).
4. Verify that the marked locations are level and square.
5. Set your non-display model aside.
6. Drill a hole at each marked location to accommodate four M4 panhead screws (supplied).
7. Lift and align your non-display model with the four mounting holes created in step 4.
8. Attach the four M4 panhead supplied screws with grommets according to the sequence shown in [Figure 5](#).
9. Tighten the M4 panhead screws with grommets in the same sequence to a torque that is appropriate for the screw and wall material.



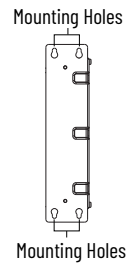
If you are attaching your non-display model to steel material, the recommended torque of the M4 panhead screws with grommets is 1.13...1.36 N•m (10...12 lb•in).

For Book Mount Bracket Mounting

Step A: Mount the Book Mount Bracket

1. Place the book mount bracket against the mounting surface.
2. Use a level and square to confirm that the mounting bracket is at 0° vertical.
3. Mark the four mounting holes of the book mount bracket.
4. Set the book mount bracket aside.
5. Drill the marked mounting holes on the mounting surface.
6. Align the four mounting holes of the book mount bracket with the four drilled holes on the mounting surface.
7. Use a torque limiting screwdriver to tighten the four screws (not supplied) to a torque appropriate for the screws and mounted material.

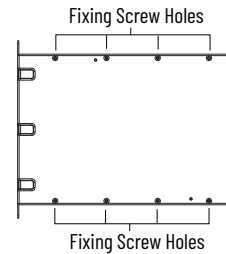
Side View



Step B: Attach the Non-display Model

1. Remove and discard the eight fixing screws from the backside of your non-display model.
2. Align the eight fixing screw holes of your non-display model with the eight fixing screw holes on the side of the book mount bracket.
3. Insert the eight fixing screws (supplied with the book mount bracket) through the eight mounting locations.
4. Use a torque limiting screwdriver to tighten the eight fixing screws to a torque of 1.7...2.0 N•m (15...18 lb•in.).

Backside View



Add External Component Accessories

1. If your industrial computer or thin client will be exposed to direct sunlight, install the sun shield (6181X-SUNSHIELD). See [Install the Sun Shield on page 54](#).

IMPORTANT

- The temperature between the sun shield and the integrated 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. If a CFast card is required for your installation:
 - a. Follow the [Voltage Precautions on page 47](#).
 - b. Follow the insertion instructions within [Insert a CFast SSD Card – Cat. No. 6189X-64GCFast on page 51](#).
3. If a solid-state drive (SSD) is required for your installation:
 - a. Follow the [Voltage Precautions on page 47](#).
 - b. Follow the installation instructions within [Install a Solid-state Drive \(SSD\) on page 52](#).

Operation and Connection

Requirements

Follow these operating requirements when using your industrial computer or thin client.

For All Industrial Computers and Thin Clients

- If your industrial computer or thin client is mounted in an enclosure, keep the enclosure door closed during operation so dust and other airborne contamination do not infiltrate it. Open the enclosure door only for routine maintenance.
- Always use the proper power down procedures as required by your operating system (OS), such as the 'Shut Down' command in the Microsoft® Windows® 10 IoT Enterprise 2021 LTSC (64 bit).
- After shut down, do not apply power again until the shut down is complete.
- The rear cover must be secured when operating your industrial computer or thin client.
- 警告：在居住环境中，运行此设备可能会造成无线电干扰。
- 警告：為避免電磁干擾，本產品不應安裝或使用於住宅環境。



SHOCK HAZARD: Do not operate your industrial computer or thin client when the rear cover is removed. An electric shock hazard exists. All covers are required to maintain EMI shield.

For 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 screen can be difficult to read and use of this screen could result in a potentially hazardous outcome. Do not use the LCD touch screen under these circumstances.

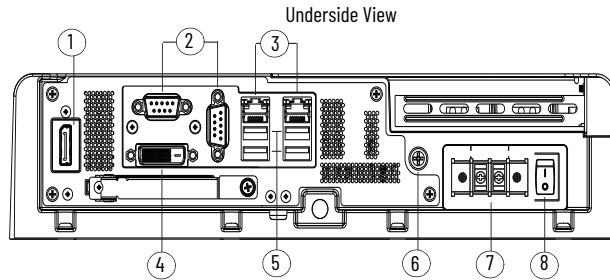
- When panel mounted, operator access is limited to the front of the industrial computer or thin client, which includes the display and the touch screen.

IMPORTANT Access to components behind the panel where the industrial computer or thin client is installed is restricted to authorized and properly trained personnel.

Connect Peripheral Cables

IMPORTANT To comply with EN 55024 and EN 55032, select cables with the required attribute that is listed in [Table 8](#).

Table 8 - I/O Ports and DC Power



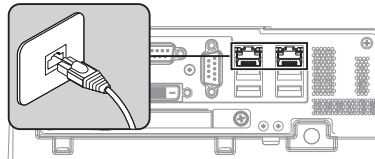
Note No.	Description	Required Attribute
1	DisplayPort™	Shielded
2	Serial COM ports (RS-232), quantity 2	Shielded
3	1 GB LAN ports (RJ45), quantity 2	Shielded or Unshielded
4	DVI-D port	Shielded
5	USB 3.0 ports, quantity 4 ⁽¹⁾	Shielded
6	Ground screw	—
7	DC terminal block	Unshielded
8	Power switch	—

(1) For non-hazardous locations: The USB 3.0 ports and the bottom CF card slot are hot swappable. For hazardous locations: The USB 3.0 ports and the bottom CF card slot are not hot swappable.

1. Attach a CAT5 or better twisted-pair Ethernet cable with RJ45 connectors to the LAN port (Note No. 3 in [Table 8](#)).



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 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 cables to extreme radiation or conducted high-frequency noise.

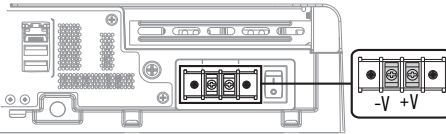
In industrial environments, proper cable routing and power conditioning are required for Ethernet communication. Rockwell Automation recommends that you route all Ethernet cable through dedicated metal conduits. For improved performance reliability, install ferrite bead filters at the cable ends.

2. Attach all other peripheral cables to your industrial PC or thin client. See [Table 8](#) for I/O port locations.
3. Attach the unattached end of the peripheral cables to the appropriate component in your schema.

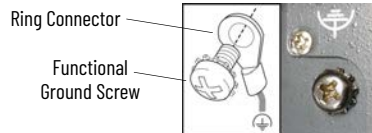
Connect DC Power

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

1. Before you proceed, be sure that all requirements have been met in [DC Power Requirements on page 19](#) and [Table 4 on page 19](#).
2. Turn off the main power switch or breaker.
3. Secure the DC power wires to the terminal block by tightening the terminal block screws to the torque value listed in [Table 5 on page 19](#).



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



5. Tighten the functional ground screw to the torque value listed in [Table 5 on page 19](#).

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 5 on page 19](#).

6. Apply power to all connected components with separate power supplies (such as an external display for non-display models).
7. 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 on your industrial computer or thin client.

8. If Microsoft Windows 10 IoT Enterprise 2021 LTSC (64 bit) is factory installed: Read and accept the end-user setup procedure.



WARNING: Do not disconnect power from the system until the setup procedure is complete. If power is disconnected, your system image can become corrupt.

Manual Start

Follow the procedure below to manually start your industrial computer or thin client.



Depending upon your schema, other connected components may need to be started before manually starting your industrial computer or thin client.

1. Press the power button on the underside of the industrial computer or thin client. See Note No. 8 within [Table 8 on page 30](#) for the location of the power button on the chassis.



When power is connected for the first time, the default BIOS settings initiate.

The system automatically initiates, completing the following activities:

RAM clears, POST initiates, peripheral devices initializes, and the OS loads.

2. For industrial computers or thin clients with Microsoft Windows 10 IoT Enterprise 2021 LTSC (64 bit): Read and accept the end-user setup procedure.



WARNING: Do not disconnect power from the system until the setup procedure is complete. If power is disconnected, your system image can become corrupt.

Restart



Depending upon your schema, other connected components may need to be restarted before restarting your industrial computer or thin client.

Use either of the following methods to restart your industrial computer or thin client using the Microsoft Windows 10 IoT Enterprise 2021 LTSC (64 bit):

Method 1

1. Click the Windows icon
2. Click the power icon.
3. Click 'Restart'.

Method 2

1. Simultaneously press the 'CTRL', 'ALT', and 'DELETE' keys on an attached keyboard.
2. Click 'Restart'.

During a restart, the system performs the following activities:

- RAM clears,
- POST initiates,
- peripheral devices (such as drives and printers) initialize, and the
- OS loads.

Shut Down

Use either of the following methods to shut down your industrial computer or thin client.

IMPORTANT Risk of data loss. After performing the shut down process, do not apply power again until the shut down is complete.



Depending upon your schema, other connected components may need to be shut down before performing the shut-down on your industrial computer or thin client.

Preferred Method

To be sure that all data is retained, follow the steps below to shut down via the OS.

1. Back up any data stored on your industrial computer or thin client.
2. For systems using Microsoft Windows 10 IoT Enterprise 2021 LTSC (64 bit):
 - a. Click the 'Windows' icon at the bottom right of the liquid crystal display (LCD) screen.
 - b. Select 'Power'.
 - c. Select 'Shut Down'.

For systems using another OS:

- a. See the software manufacturer's instructions to shut down the OS.

IMPORTANT If your industrial computer or thin client does not shut down using this preferred method, perform the steps in [Alternate Method](#).

Alternate Method

IMPORTANT Access to components behind the panel where your industrial computer or thin client is installed is restricted to authorized and properly trained personnel. This alternate method of shut down can result in data loss.

If the preferred method is an unavailable option or fails to properly shut down your system, have authorized, properly trained personnel perform the following steps.

1. Back up any data stored on your industrial computer or thin client.
2. Press the power button on the underside of the industrial computer or thin client. See Note No. 8 within [Table 8 on page 30](#) for the location of the power button on the chassis.

Configure the UEFI Setup Utility

The universal extensible firmware interface (UEFI) setup utility is a hardware configuration program that stores all data about initialization and startup in a file. This is a much different approach than the basic input/output system (BIOS) where all data is stored on the firmware. The UEFI setup utility allows for faster boot time, and offers 'Secure Boot' which prevents your industrial computer or thin client from booting from unauthorized/unsigned applications.

The UEFI setup utility is factory configured and optimized so there is no need to run the UEFI setup utility. However, you can access the UEFI setup utility to:

- Change the system configuration.
- Change the UEFI setup when a configuration error is detected by the system.
- Redefine communication ports to help prevent any conflicts.
- Read the current amount of system memory.
- Change the boot drive order.
- Set or change the password or make other changes to the security settings.
- Upgrade the system firmware.
- Run the diagnostic utility to determine the cause of system malfunction.
- Restore or back up the operating system (OS).

Access the UEFI Setup Utility

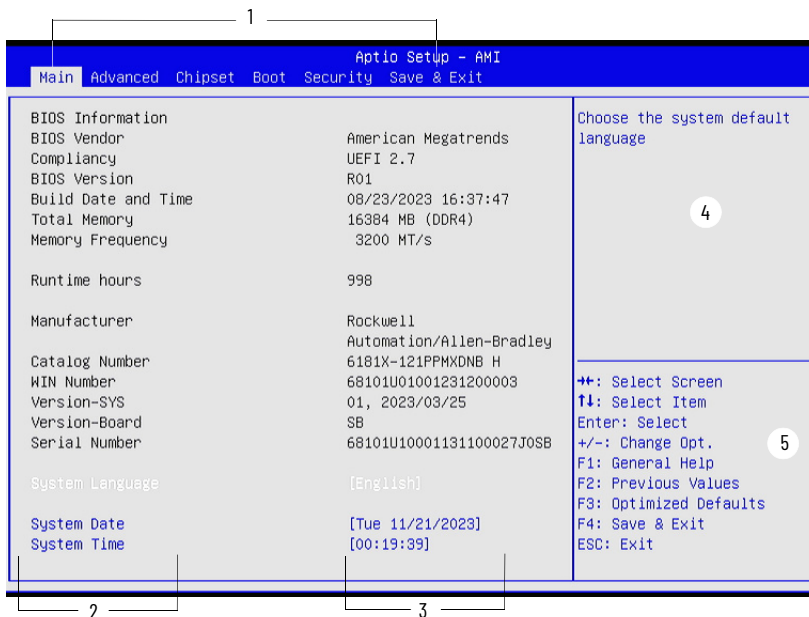
Follow the procedure below to access the UEFI setup utility.

1. For non-display models: Temporarily attach a USB connection keyboard to your industrial computer or thin client. This will allow you to navigate within the UEFI setup utility.
2. Restart your industrial computer or thin client as stated in [Restart on page 32](#). The power on self test (POST) initiates.
3. Immediately press the 'F2' key on your keyboard to access the UEFI setup utility. The initial UEFI setup utility screen appears as shown in [UEFI Screen Layout and Navigation on page 34](#).

UEFI Screen Layout and Navigation

When the UEFI is initially accessed, the 'Main' menu appears as active, highlighted gray with blue text (as opposed to not active text in gray with blue back screen).

Table 9 - UEFI Screen Layout



Note No.	Description
1	Menus (see Menu Details on page 35 for an overview of each menu)
2	Parameter
3	Parameter value
4	Description of active/highlighted parameter
5	Navigation legend

Navigation within the UEFI



Use the navigation legend (Note No. 5 in [Table 9](#)) shown at the bottom right of the UEFI screen to navigate within the UEFI.

- Use the > and < arrow keys on your keyboard to navigate right or left to access the desired menu. The active menu is highlighted to gray with blue text.
- Press the down arrow or up arrow on your keyboard to navigate to the item you want to change. The item will highlight to white text.
- For an item with a twist arrow to the left, press the 'Enter' key to expand the item.
- Press the 'Enter' key until the value you want to change is highlighted in white.
- Type or select the desired value in the highlighted white text. The selected value will appear as black text.
- Repeat steps 2...4 until all values you want to change within the active menu are complete.
- Press the 'F4' key. The 'Save and Exit Setup' screen appears and the 'Yes' option is automatically selected, highlighted in black.
- Press the 'Enter' key to save the value(s) you changed or press the right arrow key to select the 'No' option to return to the 'Main' menu.
- Repeat steps 2...7 to change other values within the active menu.
- Repeat steps 1...9 to change values in other menus.
- Press the 'F4' key to save your changes and exit the UEFI.

Menu Details

There are six menus listed horizontally across the top of the UEFI screen (see Note No. 1 in [Table 9](#)). In an active menu, items are listed in the left column and the value for each item is listed in the right column.



For detailed information on each menu, such as available parameters and values, see [Menu Details on page 35](#).

Menu	Description
Main	Select to view general information and basic system configuration for your industrial computer
Advanced	Select to configure information for the PXE, PCI, ACPI, processor, SATA, USB, power, video graphics, super IO, hardware monitor, and AMT
Chipset	Select to configure system chipset information
Boot	Select to configure boot device priority
Security	Select to set or change user and administrator passwords
Save and Exit	Select to save changes and reset, discard changes, and reset or restore defaults.

Main Menu

The 'Main' menu, the initial menu of the UEFI Main Setup, provides information about the BIOS and your industrial computer are listed.

Figure 6 - Main Menu Screen

Aptio Setup - AMI		
Main Advanced Chipset Boot Security Save & Exit		
BIOS Information		Choose the system default language
BIOS Vendor	American Megatrends	
Compliance	UEFI 2.7	
BIOS Version	R01	
Build Date and Time	08/23/2023 16:37:47	
Total Memory	16384 MB (DDR4)	
Memory Frequency	3200 MT/s	
Runtime hours	998	
Manufacturer	Rockwell Automation/Allen-Bradley	
Catalog Number	6181X-121PPMXDNB H	
WIN Number	68101U01001231200003	→+: Select Screen
Version-SYS	01, 2023/03/25	↑↓: Select Item
Version-Board	SB	Enter: Select
Serial Number	68101U10001131100027J0SB	+/-: Change Opt.
System Language	[English]	F1: General Help
System Date	[Tue 11/21/2023]	F2: Previous Values
System Time	[00:19:39]	F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit



The only values that can be changed within the main menu are system date and system time. The only value available for System Language is [English].

Table 10 - Main Menu

Parameter	Description	Value(s)
BIOS Information	BIOS Vendor	Manufacturer of the BIOS
	Compliance	Value of the UEFI
	BIOS Version	BIOS version information
	Build Date and Time	Date and time UEFI was created
	Total Memory	Total system memory and memory type in parenthesis
	Memory Frequency	Frequency of the installed memory
Runtime Hours	Records the total hours of computer runtime	
Manufacturer	System manufacturer	
Catalog Number	Allen-Bradley® catalog number with series letter	

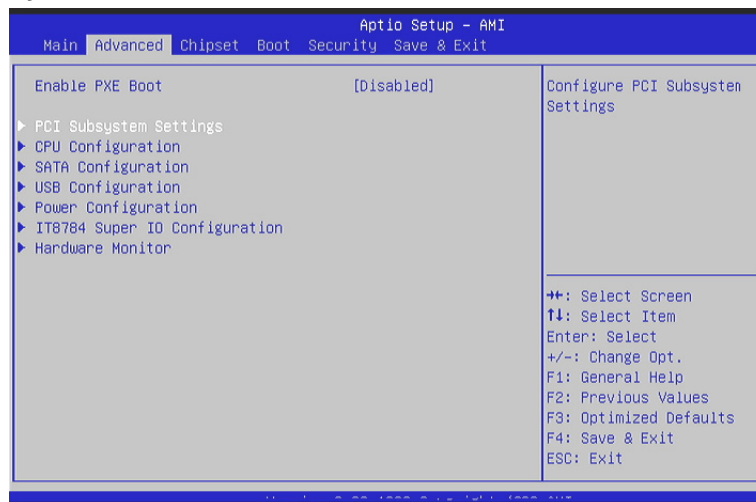
Table 10 - Main Menu (Continued)

Parameter	Description	Value(s)
WIN Number	Warranty information number	Static Value
Version-SYS	System version, manufacture date	[value][YYYY/MM/DD]
Version-Board	System board version information	[value]
Serial Number	Unique system serial number	[value]
System Language	Language of the OS	[English]
System Date	Value from the CMOS battery	[DAY MM/DD/YYYY]
System Time		[00:00:00]

Advanced Menu

In the 'Advanced' menu, information about the hardware of your industrial computer are listed.

Figure 7 - Advanced Menu Screen



Advanced Menu: Enable PXE Boot

Parameter	Description	Value(s)
Enable PXE Boot	Enables or disables boot option for legacy network devices. Disabled by default. When PXE boot is enabled, a computer boots from a server on a network before it boots the OS on the local storage drive.	[Disabled] [Enabled]

Advanced Menu: PCI Subsystem Settings

Parameter	Description	Value(s)
PCI Bus Driver Version	Displays the PCI bus driver version information.	<i>read-only</i>
PERR# Generation	Enables or disables PCI Device to Generate PERR#. Disabled by default.	[Disabled] [Enabled]
SERR# Generation	Enables or disables PCI Device to Generate SERR#. Disabled by default.	[Disabled] [Enabled]

Advanced Menu: CPU Information

Parameter	Description	Value(s)
Processor Type	Displays processor type and maximum speed.	<i>read-only</i>
Processor Cores	Displays processor core count.	<i>read-only</i>
CPU Speed	Displays maximum speed of the processor.	<i>read-only</i>
Hyper Threading	Enables or disables the hyper-threading technology. Enabled by default.	[Enabled] [Disabled]
Intel Virtualization Technology (VT-x)	When enabled, a Virtual Memory Manager (VMM) can use the extra hardware capabilities that are provided by Vanderpool Technology. Enabled by default.	[Disabled] [Enabled]
Intel Virtualization Technology for Directed I/O (VT-d)	Enables or disables VT-d. Enabled by default	[Disabled] [Enabled]

Advanced Menu: SATA Configuration

Parameter	Description	Value(s)
SATA Mode	Select an operation mode for the onboard SATA controller. AHCI by default.	[AHCI]
SATA Port 0	Port 0	Indicates the SATA drive that is connected to the SATA connector. The port (0 or 1) enables or disables the SATA drive that is connected to the SATA port. Enabled by default.
SATA Port 1	Port 1	

Advanced Menu: USB Configuration

Parameter	Description	Value(s)
USB Port #0	Enables or disables a USB port. Enabled by default. IMPORTANT: When the USB port is disabled, access risk from unauthorized or malicious sources is reduced.	[Enabled] [Disabled]
USB Port #1		
USB Port #2		
USB Port #3		

Advanced Menu: Power Configuration

Parameter	Description	Value(s)
Restore AC Power Loss	Specify what state to go to when power is reconnected after a power failure (G3 state). Power on by default).	[Power On] [Power Off] [Last State]

Advanced Menu: IT8784 Super IO Configuration Parameter

Parameter	Description	Value(s)
Super IP Chip IT8784	Displays the super I/O chipset information	<i>read-only</i>
Serial Port 1 Configuration	Serial Port	Enables or disables the serial (COM1) port Checked box (enabled by default) or unchecked box (disabled)
	Device Settings	Displays the Base I/O address and IRQ setting of serial port 1
	Change Settings	Select an optimal setting for the super I/O device Auto by default

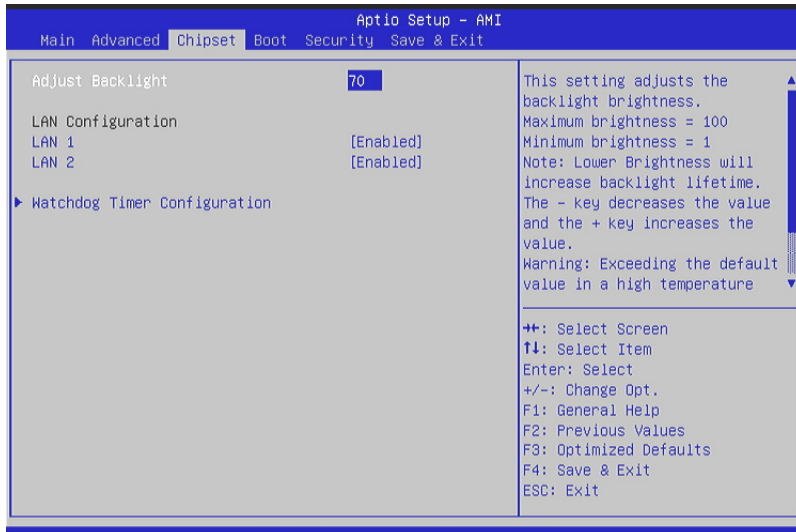
Advanced Menu: Hardware Monitor

Parameter		Description	Value(s)
PC Health Status	CPU Temperature	Displays the current temperatures (in °C) and core voltages of various hardware components All values are read-only	read-only in °C
	DIMM1 Temperature		
	DIMM2 Temperature		
	Vcore Temperature		
	MB Temperature		
	Panel Temperature		
	1V-CPU-CORE		
	PWR_VDDQ		
	V12D0_S0		
	5V-S0		
	3D3V-S0		
	VBAT		
	CPU (U2701) Max		
	CPU (U2701) Min		
DIMM1 (U2702) Max			
DIMM2 (U2702) Min			

Chipset

The 'Chipset' menu allows you to configure the settings to adjust the internal LCD light-emitting diode (LED) backlight brightness, LAN configuration, and the watchdog timer.

Figure 8 - Chipset Menu



Chipset Menu

Parameter		Description	Value(s)
Adjust Backlight Default		Adjust the internal LCD LED backlight brightness. Number range: 1..100 with 100 as full (100%) brightness; 70 by default TIP: Increasing the brightness from the default setting reduces the life of the LED backlight, particularly at high temperatures.	[70]
LAN Configuration	LAN 1	Enables or disables onboard LAN 1 controller	[Enabled]
	LAN 2	Enabled by default	[Disabled]

Chipset Menu (Continued)

Watchdog Timer Configuration	BIOS Boot Time Watchdog	Enables or disables BIOS boot timeout Disabled by default	[Disabled] [Enabled]
	BIOS Timer Out value ⁽¹⁾	Set BIOS timer timeout value in minutes 10 by default	[10] [20] [30]
	OS Time Watchdog	Enables or disables OS timeout Disabled by default	[Disabled] [Enabled]

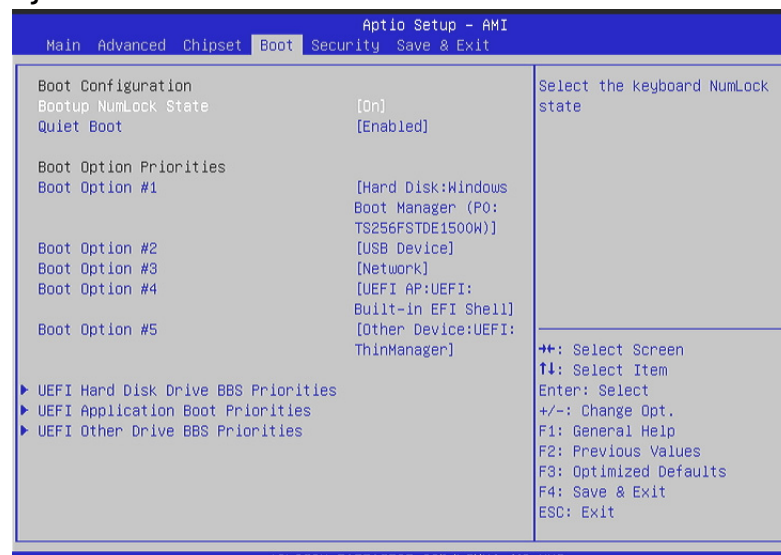
(1) This parameter field is only visible when 'BIOS Boot time Watchdog' is enabled.

IMPORTANT If BIOS Boot Time Watchdog is enabled, then it must be disabled before you update the UEFI firmware.

Boot Menu

The 'Boot' menu allows you to enable or disable the quiet boot and reprioritize the boot order.

Figure 9 - Boot Menu



Boot Configuration

Parameter	Description	Value(s)
Bootup NumLock State	Enables or disables the Num Lock key on boot. On by default	[ON] [OFF]
Quiet Boot	Enables or disables quiet boot option. Disabled by default When enabled, this option hides the POST screen messages at industrial computer startup	[ENABLED] [DISABLED]

Boot Option Priorities

Parameter	Description	Value(s)
Boot Option #1	Change the boot order. By default, these devices are the boot priority: (1) Hard Disk, (2) USB Device, (3) Network, (4) UEFI Shell, (5) Other TIP: Follow instructions in the dialog box to change the boot order, and to enable or disable options. TIP: Press the arrow keys to reorder the boot order.	varies
Boot Option #2		
Boot Option #3		
Boot Option #4		
Boot Option #5		

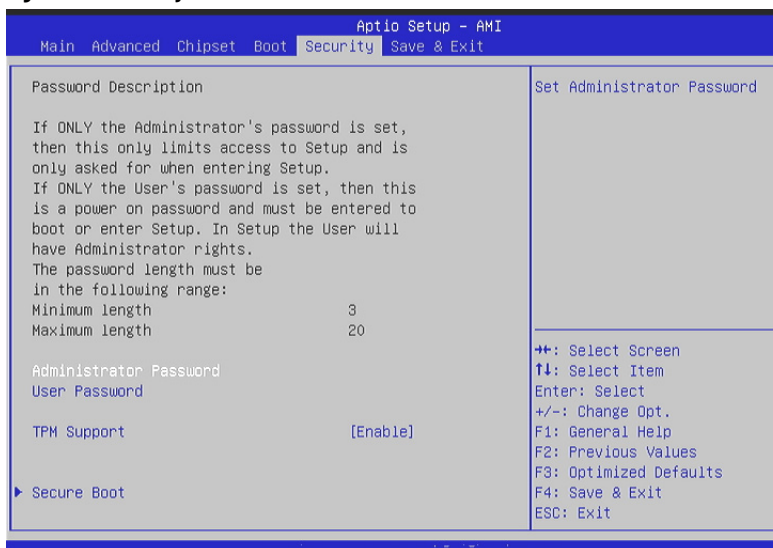
UEFI Priorities

Parameter		Description	Value(s)
UEFI Hard Disk Drive BBS Priorities	Boot Option #1	Detail of priorities	[Windows Boot Manager (PO: xx###xxxxx##x)]
UEFI USB Drive BBS Priorities	Boot Option #1		[UEFI: Mfg, Detail]
UEFI Application Boot Priorities	Boot Option #1		[UEFI: Built-in EFI Shell]
UEFI Other Drive BBS Priorities	Boot Option #1		[UEFI: ThinManager]

Security Menu

The 'Security' menu allows you to configure a password for both the administrator and user as well as configure a secure boot.

Figure 10 - Security Menu



Passwords

Parameter	Description	Value(s)
Administrator Password	Sets the password. Use this password to minimize assess risk from unauthorized or malicious sources. Alpha and/or numeric character count for the password must be a minimum of 3 and a maximum of 20 TIP: To reset an administrator password, perform one of the following steps: Clear the UEFI; see Clear the CMOS on page 64 . Ship the industrial computer to Rockwell Automation for RTC battery replacement. See Shipment and Transport on page 61 for instructions.	<i>personal setting</i>
User Password		

TPM Support

Parameter	Description	Value(s)
TPM Support	Provides enhanced security and privacy in handling encryption operations in protecting data. Enable is the default	[Enable] [Disable]

Secure Boot – System Mode Setup

Parameter	Description	Value(s)
Secure Boot	This mode is active when set to [Enabled]; not active when set to [Disabled]	[Disabled] [Enabled]
Secure Boot Mode	In custom mode, the secure boot policy variables can be configured by a physically present user without full authentication	[Standard] [Custom]

Restore Factory Keys

Parameter	Description	Value(s)
Restore Factory Keys	Force the system to User Mode; install factory default Secure Boot key databases	[Yes] [No]

Reset to Setup Mode

Parameter	Description	Value(s)
Reset to Setup Mode	In custom mode, the secure boot policy variables can be configured by a physically present user without full authentication.	[Standard] [Custom]

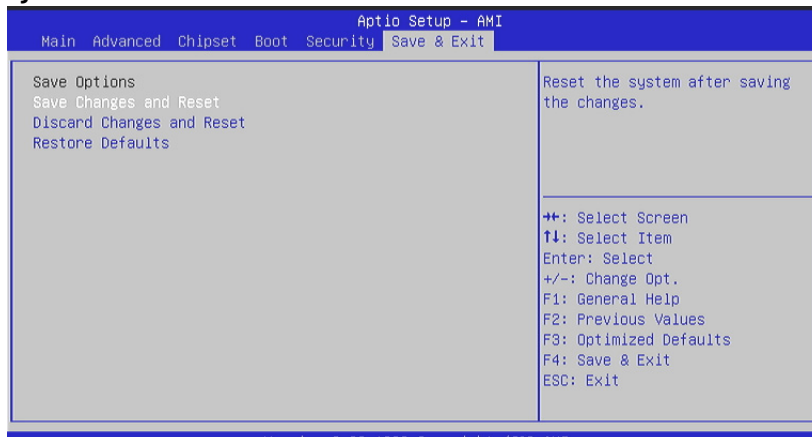
Key Management

Parameter	Description	Value(s)
Vendor Keys	When set to 'valid', provides flexibility and maintain strong security.	Valid
Factory Key Provision	Install factory default Secure Boot keys after the platform reset and while the System is in Setup Mode.	[Disabled] [Enabled]
Restore Factory Keys	pop-up window appears	[Yes][No]
Reset to Setup Mode	pop-up window appears	[Yes][No]
Export Secure Boot Variables	Select a file system	PciRoot (numeric value)/ Pci (numeric value)/ Sata (value)/HD (value)
Enroll Efi Image	Select a file system	[numeric value]
Device Guard Ready	Remove 'UEFI CA' from DB	Pop-up window appears
	Restore DB defaults	Pop-up window appears 'Press 'Yes' to proceed or 'No' to cancel'
Secure Boot Variable	Displays the size, keys, and key source of the secure boot variables	Size: [numeric value] Keys: [numeric value] Key Source: [No Keys][External]
Platform Key (PK)	Secure Boot Variable	[Update]
Key Exchange Keys	Pop-up window appears	[Update] {Append}
Authorized Signatures	Pop-up window appears	[Update] {Append}
Forbidden Signatures	Pop-up window appears	[Details] [Export] [Update] [Append] [Delete]
Authorized Time Stamps	Pop-up window appears	[Update] {Append}
OS Recovery Signatures	Pop-up window appears	[Update] {Append}

Save and Exit

The 'Save and Exit' menu allows you to save changes and reset, discard changes and reset, restore defaults, or save and exit.

Figure 11 - Save and Exit Menu



Save and Exit Menu: Save Options

Parameter	Description	Value(s)
Save Changes and Reset	Saves changes that are made and closes the set-up utility A pop-up window, 'Save and Reset Save configuration and reset?', appears when selected	[Yes] [No]
Discard Changes and Reset	Discards changes that are made and closes the set-up utility A pop-up window, 'Reset Without Saving Reset without saving?' appears when selected	[Yes] [No]
Restore Defaults	Loads the optimal defaults in the set-up menu A pop-up window, 'Load Optimized Defaults?' appears when selected	[Yes] [No]

Upgrade the UEFI

A new version of the UEFI can be released to enhance the performance or to correct an anomaly of your industrial computer or thin client. In these instances, you can download the UEFI upgrade from the Rockwell Automation PCDC at rok.auto/pcdc.



Before you download files from the Rockwell Automation PCDC site, you must:

- be registered with the Rockwell Automation PCDC website and
- accept a user agreement before files can be downloaded.

Perform the following steps to upgrade to a new UEFI (BIOS).

1. Attach the following external peripherals to your industrial computer:
 - Display (for non-display computers)
 - Keyboard
 - USB drive (1 GB or larger)
2. Access the Rockwell Automation PCDC site at rok.auto/pcdc.
3. On the home page, click 'Downloads'.
4. On the 'Find Downloads' page, type your industrial computer model in the 'Search' field.
5. Click the search icon to return results.
6. Follow the instructions on the Rockwell Automation PCDC site to find your UEFI (BIOS).
7. Download the UEFI (BIOS) file to your USB drive.
8. Restart your industrial computer. See [Restart on page 32](#) for proper instruction.
The POST initiates.
9. Press the 'F5' key on the keyboard.
10. Select 'Internal Shell'.

11. Wait for 'startup.nsh' to load.
12. Follow the on screen instructions to flash the system.

IMPORTANT Do not interrupt power to your industrial computer or thin client during the UEFI) flash.

13. After the UEFI (BIOS) flash is complete, restart your industrial computer or thin client. See [Restart on page 32](#) for proper instruction.
The POST initiates.
14. Press the 'F2' key.
15. On the 'Main' tab, verify that the system time and date are accurate.
16. Press 'F10' to save your changes and exit the UEFI setup utility.

Notes:

Touch Screen Use – Integrated Display Models

Your integrated display model features a Projected Capacitive Touch Sensors (PCAP) touch screen display. This PCAP touch screen is factory installed and calibrated so it does not need field calibration.

Activation

PCAP touch screens are activated with conductive touch of a human finger. You can operate the PCAP touch screen with a finger, gloved finger, or plastic stylus device with a minimum tip radius of 1.3 mm (0.051 in.).



ATTENTION: Risk of product damage. Do not use sharp instruments to activate either touch screen. Use of any other tool other than a plastic stylus device with a minimum tip radius of 1.3 mm (0.05 in.) can scratch and damage the PCAP touch screen.

Adjust Brightness

If the brightness of the PCAP touch screen needs to be adjusted from its default 70%, perform the following steps.

1. Temporarily attach a keyboard with a USB connection to your industrial computer or thin client.
2. Restart your industrial computer or thin client as stated in [Restart on page 32](#).
3. During the POST, press the 'F2' key on the keyboard.
4. Use the BIOS set-up utility to adjust the display brightness.



Brightness that is increased above the 70% default setting reduces the life of the backlight, particularly at high temperatures.

5. Exit the BIOS setup utility.
6. Disconnect the keyboard from the USB connection.

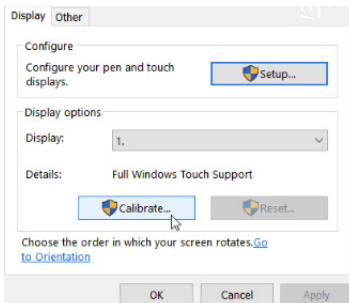
Calibrate the Resistive Touch Screen



The PCAP touch screen is factory calibrated and does not need any field calibration.

Microsoft Windows 10 IoT Enterprise 2021 LTSC (64 bit) OS features a calibration utility. To calibrate your resistive touch screen:

1. Click the Windows icon at the bottom left of your touch screen.
2. Navigate to Settings.
3. Select 'Display.
4. Start the calibration routine that is offered within the utility.



5. Follow the calibration instructions on the touch screen.

Install Accessories

IMPORTANT Before you install an accessory, review the specifications of the accessory to verify that it is compatible with your industrial computer or thin client. Record the model and serial number, and any other pertinent information of the accessory for future reference.

IMPORTANT We recommend that you use only Allen-Bradley® approved accessories. See Accessories for Industrial Computers for Hazardous Locations 6181X Series J Product Information, publication [6181X-PC002](#) for approved accessories.

Voltage Precautions

Your industrial computer or thin client contains line voltages. Disconnect all power to your industrial computer or thin client before you install or remove components.



SHOCK HAZARD: Disconnect all power to your industrial computer or thin client before you remove components. Failure to disconnect power can result in severe electrical shock to an individual or electrostatic discharge (ESD) damage to your industrial computer or thin client and its components.

Electrostatic Discharge Precautions

Follow these electrostatic discharge (ESD) precautions when replacing and installing accessories.

- 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 non-conductive 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.

Required Tools

The following tools are required to install accessories:

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

Prepare for Accessory Installation

Back Up Data

IMPORTANT Before you install internal components, we recommend that you first back up all data to avoid possible data loss.

Shut Down the System

Before installing any accessory to your industrial computer or thin client, you must properly shut down the system to be sure that all data is retained. To properly shut down your industrial computer or thin client, perform the steps below.



Depending upon your schema, other connected components may need to be shut down before performing the shut-down on your industrial computer or thin client.

1. Select the 'Windows' icon.
2. Select 'Power'.
3. Select 'Shut Down'.

Disconnect Peripheral Cables and Power

1. Disconnect the DC power supply that is connected to your industrial computer or thin client from the wall outlet.
2. Disconnect the DC power supply from the wall outlet to avoid exposure to high energy levels.



SHOCK HAZARD: Failure to disconnect power can result in severe electrical shock to an individual and/or electrostatic discharge (ESD) damage to your industrial computer or thin client and its components.

3. Disconnect telecommunication cables to avoid exposure to a shock hazard from ring voltages.
4. Disconnect all peripheral cables.

For Internal Components



ATTENTION: Read and understand all installation and removal procedures before you begin to configure the hardware.

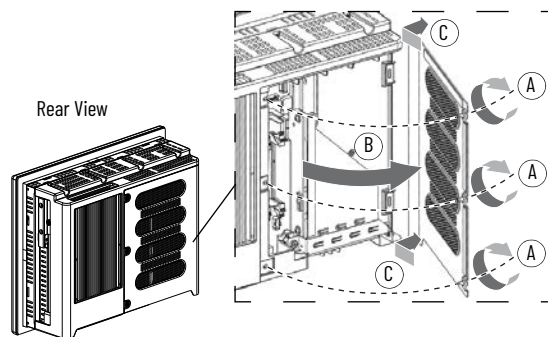
Remove the Rear Cover



SHOCK HAZARD: Disconnect all power to your industrial computer or thin client before proceeding with removal of the rear cover. Failure to disconnect power can result in severe electrical shock to an individual and/or electrostatic discharge (ESD) damage to your industrial computer or thin client and its components.

With your industrial computer or thin client properly shut down and all power and peripheral cables disconnected, perform the following steps to remove the cover from the chassis.

Figure 12 - Remove the Rear Cover



1. Using a #2 cross-head screwdriver, remove the three screws that secure the rear cover (A in [Figure 12](#)).
2. Open the rear cover (B in [Figure 12](#)) then detach it from the chassis (C in [Figure 12](#)).



SHOCK HAZARD: Do not operate your industrial computer or thin client when the rear cover is removed. An electric shock hazard exists. All covers are required to maintain EMI shield.

Install a PCI Riser Card – Cat. No. 6189X-PCIRISER

Follow the steps below to install a Cat. No. 6189X-PCIRISER PCI riser card.

IMPORTANT The PCAP touch screen was evaluated for use with a PCI riser card.

IMPORTANT Before performing the steps below, connect an anti-static wriststrap to the work surface, properly grounded tools, and equipment.

Figure 13 - Add-in Card Tray – Screw Locations and Tightening Sequence



1. Hold the replacement card by its edges to avoid touching the contacts on the bottom or circuitry on the board, then remove it from its protective packaging.
2. Remove the three screws that secure the add-in card tray.
3. Remove and retain the three screws from the existing add-in card tray shown in [Figure 13](#).
4. Remove and retain the two screws that connect the factory-supplied PCIe riser card to the add-in card tray.



5. Connect the replacement PCI riser card to the add-in card tray with the two screws retained in step 4.

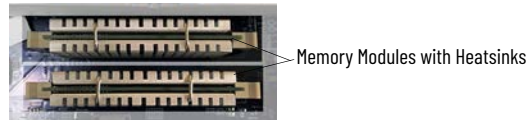


6. Tighten the three retained screws to the add-in card tray in the sequence shown in [Figure 13](#) to secure it to the motherboard.
7. Proceed to [Reattach the Cover on page 51](#).

Add Memory Modules

The motherboard on your industrial computer or thin client has two dual-channel DDR3 Small Outline Dual In-line Memory Module (SO-DIMM) slots, a dual memory module configuration.

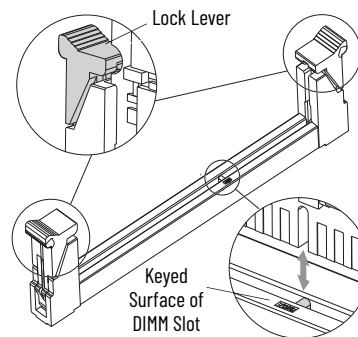
IMPORTANT Cat. No. 6181X-32GDDR4 and 6181X-64GDDR4 SO-DIMM RAM memory modules with heatsinks are manufactured specifically for use in hazardous locations. Replace any existing memory configurations, including modules without heatsinks.



Each of the two memory modules must:

- be of the same capacity and
- be the same brand and model number of memory in the two slots to avoid system instability.

Figure 14 - DIMM Slot Mechanism



Remove Memory Modules

1. Connect an anti-static wriststrap to the work surface.
2. Hold the existing memory module by its edges to avoid touching the contacts on the bottom or circuitry on the board.
3. Use your thumbs or two fingers to push open the lock levers to release each memory module from its DIMM slot for easy removal. See [Figure 14](#) for guidance.
4. Gently pull out each memory module to remove it from its slot.
5. Place each memory module on a static-dissipating work surface or inside an anti-static bag.

Install Memory Modules

1. Connect an anti-static wriststrap to the work surface and properly grounded tools and equipment.
2. Hold the memory module with heatsinks by its edges to avoid touching the contacts on the bottom or circuitry on the board, then remove it from its protective packaging.
3. Position each memory module so the notch on its bottom edge aligns with the keyed surface of the DIMM slot.

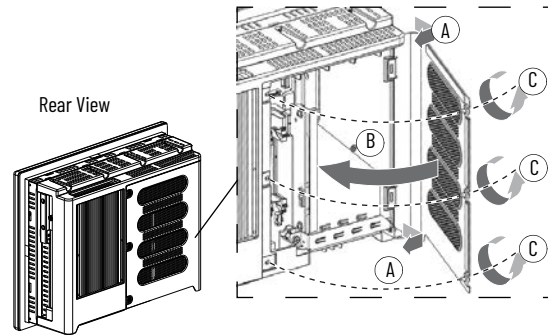


The keyed surface is off center to assist the correct alignment.

4. Press each memory module fully into the slot to engage the lock levers. See [Figure 14](#) for guidance.
5. Proceed to [Reattach the Cover](#).

Reattach the Cover

Figure 15 - Reattach the Cover



1. Reattach the rear cover to the chassis (A in [Figure 15](#)).
2. Close the rear cover (B in [Figure 15](#)).
3. Use a #2 cross-head screwdriver to secure the three screws to the rear cover (C in [Figure 15](#)).

For Externally Accessible Components

Insert a CFast SSD Card – Cat. No. 6189X-64GCFAST

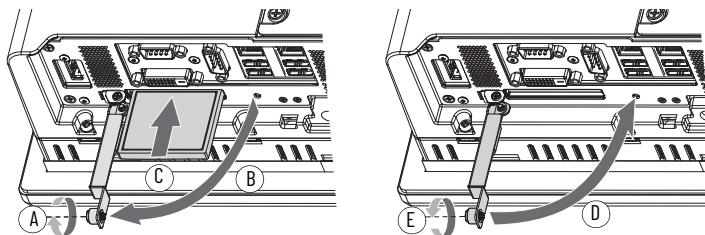


ATTENTION: For hazardous locations: Do not remove or insert the CFast SSD card from the CFast card slot unless your industrial computer or thin client has been properly shut down and power has been disconnected from it. **For non-hazardous locations:** The CFast SSD card is hot-swappable, meaning you can remove and insert the CFast SSD card from the CFast card slot while the industrial computer or thin client is powered on.

IMPORTANT

Cat. No. 6189X-64GCFAST is the only CFast card that can be installed in your industrial computer as it is approved for industrial and hazardous locations. A CFast SSD card intended for consumer products (such as digital cameras) does not have the endurance, performance, reliability, or data protection required for industrial applications (such as sudden power off). The CFast card should only be removed or installed in a non-hazardous location.

Figure 16 - Insert a CFast SSD Card



1. Loosen the screw that secures the CFast card slot cover (A in [Figure 16](#)).
2. Open the CFast card slot cover (B in [Figure 16](#)).
3. If an existing CFast SSD card is present: Push the button on the hinge side to remove the existing CFast SSD card.
4. Insert the Allen-Bradley CFast SSD card, Cat. No. 6189X-64GCFAST, into the CFast card slot until it is firmly seated (C in [Figure 16](#)).



When properly seated, more than 80% of the CFast 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.

5. Close the CFast card slot cover (D in [Figure 16](#)).

- Hand-tighten the screw to secure CFast card slot cover (E in [Figure 16](#)).

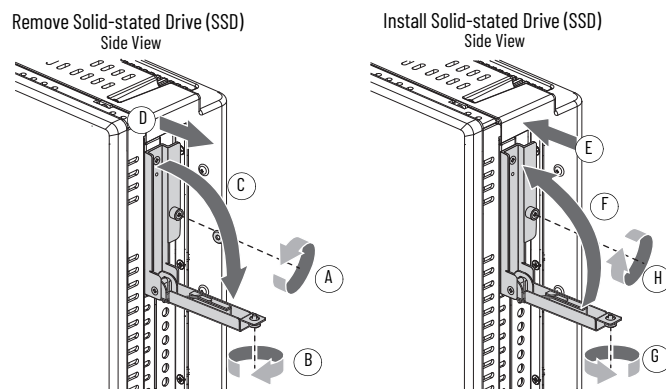
IMPORTANT For ATEX, CCC Ex, INMETRO, UKEX, and IECEx applications, the CFast card slot cover screw must be hand-tightened and verified as secure.

Install a Solid-state Drive (SSD)

Perform the steps below to install SSD drive, Cat. No. 6189X-256GBSSD3, 6189X-512GBSSD, or 6189X-1TBSSD.

IMPORTANT The SSD bay is not hot-swappable. You must shut down your industrial computer or thin client and disconnect power before replacing or installing a SSD.
Perform all steps in [Prepare for Accessory Installation on page 47](#) before proceeding.

Figure 17 - Removal and Installation of a SSD



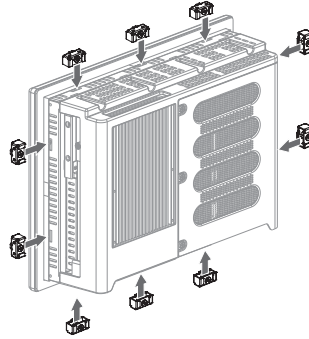
- Loosen the screw that secures the slot cover of the drive bay (A in [Figure 17](#)).
- Loosen the screw that secures the drive bay lever (B in [Figure 17](#)).
- Gently pull down on the drive bay lever (C in [Figure 17](#)).
- Pull out the existing SSD tray (D in [Figure 17](#)).
- Seat the new SSD in the SSD tray.
- Push in the new SSD tray (E in [Figure 17](#)).
- Close the drive bay lever (F in [Figure 17](#)).
- Tighten the screw that secures the drive bay lever (G in [Figure 17](#)).
- Tighten the screw that secures the slot cover of the drive bay (H in [Figure 17](#)).

IMPORTANT For ATEX, UKEX, and IECEx applications, the CFast card slot cover screw must be hand-tightened and verified as secure.

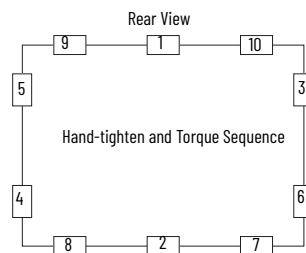
Attach Mounting Clips

Perform the following steps to attach mounting clips (Cat. No. 6181X-MCLIP5) to your industrial computer or thin client.

1. Use a screwdriver to loosen the existing mounting clips from your industrial computer or thin client.
2. Slide the existing mounting clips out from the perimeter of your industrial computer or thin client to remove them.
3. Slide the new mounting clips into the holes around the perimeter of your industrial computer or thin client.



4. Hand-tighten the clips around the bezel in the following sequence:



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 the figure above.
7. Repeat step 6 at least three more times until the mounting clips are properly torqued, making sure that the gasket is compressed uniformly against the panel.

IMPORTANT Do not overtighten the mounting clips. Overtightening will cause damage to the gasket.



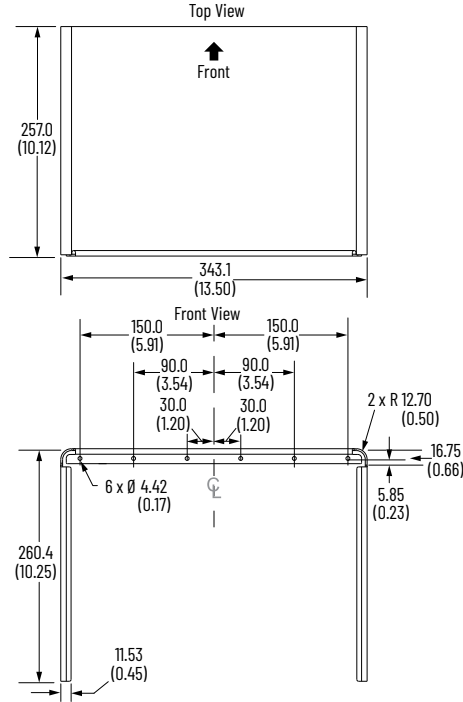
ATTENTION: Tighten the mounting clips to 1.35 N•m (12 lb•in) to provide a proper seal to help prevent water or chemical damage to your industrial computer or thin client. Rockwell Automation assumes no responsibility for water or chemical damage to your industrial computer or thin client and other equipment because of improper installation.

Install a Sun Shield

Approximate Dimensions

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

Figure 18 - Approximate Dimensions [mm (in.)]



Install the Sun Shield

Perform the following step to install a sun shield, Cat. No. 6181X-SUNSHIELD.

IMPORTANT To be sure your industrial computer or thin client does not exceed the environment specifications, adhere to the following requirements:

- 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 of the integrated display.



Gather these tools to properly install the sun shield: a small flathead screwdriver, 50:50 cleaning solution of isopropyl alcohol and water, a clean cloth, a 4 mm screwdriver or hex key, and a M4x8 torque limiting screwdriver.

1. Use a small flathead screwdriver to remove the screw overlay label above the integrated display.



2. Use a 50:50 cleaning solvent and clean cloth to wipe the perimeter of the integrated display where the sun shield will be installed.
3. Align the six mounting holes on the sun shield with the six mounting holes on your industrial computer or thin client.

4. Insert a M4x8 screw into each mounting hole on your industrial computer or thin client.
5. Tilt the sun shield backward to access each side of the sun shield.
6. Remove the adhesive strip backing from each side of the sun shield.
7. Align each side of the sun shield flush against the side of your integrated display.
8. Press each side of the sun shield firmly against each side of your integrated display.
9. Use a 4 mm screwdriver or hex key to tighten the six screws.
10. Use a M4x8 torque limiting screwdriver to tighten each screw to a torque of 0.7...0.9 N•m (6...8 lb•in.).

Install a Book Mount Bracket

The book mount bracket, Cat. No. 6189V-BOOKBRKT, allows for a book mount installation for all non-display industrial computers.

See [For Book Mount Bracket Mounting on page 28](#) for installation instructions.

Notes:

Maintenance



SHOCK HAZARD: Risk of severe electric shock. Failure to disconnect power before removing and installing components can result in severe electric shock to an individual or electrostatic discharge (ESD) damage to the industrial computer or thin client and its components.

If your industrial computer or thin client is mounted in a hazardous location: Before performing any maintenance procedures:

- Review the information in [Hazardous Locations on page 16](#) for equipment that is used in hazardous locations.
- Perform all steps within the [Prepare for Maintenance](#).



WARNING: Electrostatic discharge (ESD) can damage static-sensitive devices or micro-circuitry. These ESD precautions must be followed:

- Disconnect all power before performing maintenance.
- Keep electrostatic-sensitive parts in their containers until they arrive at the designated static-free work area.
- Keep the designated work area free of non-conductive materials, such as ordinary plastic assembly-aids and foam packing.
- Cover the designated work area with approved static dissipating material.
- Use an anti-static wriststrap connected to the work surface and properly grounded tools and equipment.
- 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.

IMPORTANT Before performing maintenance, follow these requirements:

- Review the specifications to be sure that it is compatible with your industrial computer or thin client.
 - Read and understand all installation and removal procedures.
 - Record the model number, serial number, and any other pertinent information of the internal component for future reference.
 - We recommend that you use only Allen-Bradley® approved internal components that are listed in Accessories for Industrial Computers for Hazardous Locations 6181X Series J Product Information, publication [6181X-PC002](#).
-

Prepare for Maintenance

Step A: Back Up System Data

IMPORTANT Back up all system data and/or create an image of your system before proceeding with maintenance. Maintenance to your industrial computer or thin client can result in data or image loss.

Step B: Perform Shut Down

Before performing maintenance to your industrial computer or thin client, you must shut down your industrial computer or thin client.



Depending upon your schema, other connected components may need to be shut down before performing the shut-down on your industrial computer or thin client.

Preferred Method

To be sure that all data is retained, follow the steps below to shut down via the operating system (OS).

1. Back up any data stored on your industrial computer or thin client.
2. For systems using Microsoft® Windows® 10 IoT Enterprise 2021 LTSC (64 bit) operating system (OS):
 - a. Click the 'Windows' icon at the bottom right of the liquid crystal display (LCD) screen.
 - b. Select 'Power'.
 - c. Select 'Shut Down'.

For systems using another OS:

- a. See the software manufacturer's instructions to shut down the OS.

IMPORTANT If your industrial computer or thin client does not shut down using this preferred method, perform the [Alternate Method](#).

Alternate Method

IMPORTANT Access to components behind the panel where your industrial computer or thin client is installed is restricted to authorized and properly trained personnel. This alternate method of shut down can result in data loss.

If the preferred method is an unavailable option or fails to properly shut down your system, have authorized, properly trained personnel perform the following steps.

1. Back up any data stored on your industrial computer or thin client.
2. Press the power switch on the underside of the industrial computer or thin client. See Note No. 8, [Table 2 on page 10](#) for the location of the power button on the chassis.



ATTENTION: Do not reapply power until shutdown is complete.

Step C: Disconnect Cables and Power



SHOCK HAZARD: The USB ports will continue to draw power from the power supply of your industrial computer if the power supply is connected to an electrical outlet. Be sure to disconnect the DC power supply before performing maintenance and lockout operations.

1. Disconnect the DC power supply that is connected to your industrial computer or thin client from the outlet.
2. Disconnect all peripheral cables.

Step D: Move to a Non-hazardous Location

If your industrial computer or thin client is located in a hazardous location, the following steps are required before proceeding with maintenance.

1. Remove your industrial computer or thin client from its enclosure, panel, or wall.
2. Carefully move your industrial computer or thin client to a non-hazardous location.

Care and Cleaning

Integrated Display Models

1. Perform all steps within the [Prepare for Maintenance](#).
2. Gently wipe the dust from the surface of the display using a dry, lint-free cloth, like a microfiber cloth.
3. If additional cleaning is needed:
 - a. Lightly dampen a microfiber cloth with water or a cleaner made specifically for cleaning LCD display surfaces.
 - b. Gently wipe the LCD display with as little pressure as possible.

All Models

1. Perform all steps within the [Prepare for Maintenance](#).
2. Vacuum dust and debris from the heatsink and vent holes.
3. Dampen a clean, damp cloth with water.



ATTENTION: Do not use of abrasive cleansers or solvents, which can damage the display or touch screen. Do not scrub or use brushes.

4. Gently wipe the exterior surfaces of your industrial computer or thin client.
5. If additional cleaning is needed for exterior surfaces:

For basic dirt and debris removal:

 - a. Apply a non-abrasive cleaner, such as a mild soap, to a clean, damp cloth.
 - b. Gently wipe the exterior surfaces.

For paint or grease removal:

 - a. Apply isopropyl alcohol to a clean cloth.



Do not allow the isopropyl alcohol to come in contact with the equipment labels. Isopropyl alcohol will cause the label print to smear.

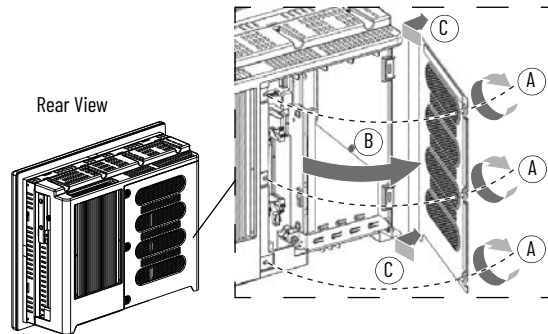
- b. Gently wipe away the paint or grease from the exterior surfaces except for the equipment labels.
- c. Dampen a clean, damp cloth with water.
- d. Gently wipe over the exterior surfaces where the isopropyl alcohol came in contact with the exterior surfaces.

For Internal Component Replacement

Remove the Rear Cover

Perform the following steps to remove the cover from the chassis.

Figure 19 - Remove the Rear Cover



1. Perform all steps within the [Prepare for Maintenance on page 58](#).
2. If your industrial computer or thin client is installed in a hazardous location, dismantle your industrial computer or thin client, then move it to a non-hazardous area.
3. Using a #2 cross-head screwdriver, remove the three screws that secure the rear cover (A in [Figure 19](#)).
4. Open the rear cover (B in [Figure 19](#)).
5. Detach the rear cover from the chassis (C in [Figure 19](#)).
6. Replace the internal component. See [For Internal Components on page 48](#) for replacement instructions.

IMPORTANT The RTC (real time clock) lithium battery must be replaced by Rockwell Automation only. For return information, contact your local distributor or Rockwell Automation representative, or visit the [Product and Application Support](#). For proper shipment procedures, see [Complete Maintenance on page 61](#)

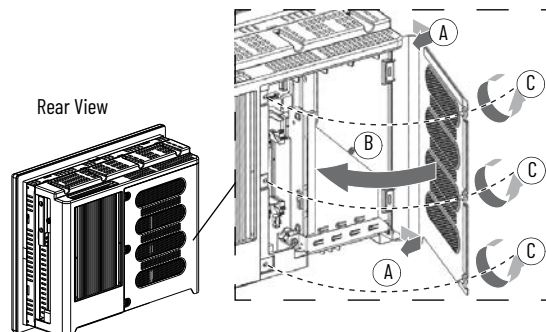


SHOCK HAZARD: Do not operate your industrial computer or thin client while the rear cover is removed. The rear cover must be attached to maintain EMI shield.

Reattach the Rear Cover

Follow the steps below to reattach the cover after internal components have been replaced.

Figure 20 - Reattach the Cover



1. Reattach the rear cover to the chassis (A in [Figure 20](#)).
2. Close the rear cover (B in [Figure 20](#)).
3. Use a #2 cross-head screwdriver to secure the three screws to the rear cover (C in [Figure 20](#)).
4. If your industrial computer or thin client was installed in a hazardous location: Remount your industrial computer or thin client.

For Externally Accessible Replacement

1. Perform all steps within the [Prepare for Maintenance](#).
2. See [For Externally Accessible Components on page 51](#) for replacement instructions.

Complete Maintenance

Reinstall Peripheral Cables and DC Power

1. Reconnect any peripheral cables which may have been disconnected during maintenance.
2. Reconnect the DC power. Your industrial PC will initiate its POST.

Shipment and Transport

Perform the following steps to ship or transport your industrial computer or thin client to another location for maintenance (such as Rockwell Automation for RTC battery replacement).



ATTENTION: Do not ship or transport your industrial computer or thin client when it is installed in an enclosure, machine, panel, or rack. You must uninstall your industrial computer or thin client and place it in its original packing material before shipping. Rockwell Automation is not responsible for any damage to an industrial computer or thin client that is shipped or transported while installed in a machine, panel, or rack.

1. Perform all steps within the [Prepare for Maintenance](#).
2. Place your industrial computer or thin client into its inner and then outer original packaging.
3. Apply shipping tape to the box to secure it shut.



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

End-of-Life Disposal

You cannot dispose of computer equipment like other waste material. Most computers and monitors contain heavy metals that can contaminate the earth. Check with local health and sanitation agencies for ways to dispose of computer equipment properly.

When a storage drive is part of what you are disposing, then permanently erase any data on it or destroy the drive before it is disposed.



At the end of its life, your computer must be collected separately from any unsorted municipal waste.

Notes:

Troubleshoot

Troubleshoot the Issue

Use the table below to guide you in finding a possible resolution to an issue with your industrial computer or thin client.

Table 11 - Issue and Possible Resolutions

Issue	Possible Resolution
Process or system is not responsive.	See Shut Down on page 32 to force a system shut down.
An error occurs during POST.	<ol style="list-style-type: none"> 1. Perform all steps within the Shut Down on page 32. 2. Disconnect power from your industrial computer. 3. Disconnect all peripheral devices from the computer. 4. If an external display is connected: Confirm proper connection. 5. Reconnect power to your industrial computer. 6. Perform a manual start as stated in The POST initiates. 7. Reconnect each peripheral device one at a time until an error occurs. <p>IF an error related to a specific software or driver occurs, THEN Reinstall the software or driver ELSE Proceed to Diagnostics.</p>
System fails to boot after changing default settings in the Setup menu of the UEFI set-up utility.	<p>Revert to the system default settings to correct the issue. These default settings have been selected to optimize performance.</p> <ol style="list-style-type: none"> 1. Restart your industrial computer as stated in Restart on page 32. 2. Press the 'F2' key during the POST to access the UEFI set-up utility. 3. Press or select the system default settings. 4. Exit the UEFI set-up utility.
Operating threshold levels of the internal voltage and/or component temperature sensors have been exceeded.	<p>The built-in hardware monitor of your industrial computer tracks the operating threshold levels of the voltage and temperature sensors.</p> <ol style="list-style-type: none"> 1. Perform all steps within Shut Down on page 32. 2. Reconnect power to your industrial computer. 3. Press the 'F2' key during the POST to access the UEFI set-up utility. 4. Select the 'Advanced' menu. 5. Select the 'Hardware Monitor' menu from the 'Advanced' menu. 6. Use the 'Hardware Monitor' menu to determine if there is an issue with internal voltages or component temperatures. See Hardware Monitoring on page 65 for more information.
The system configuration is corrupt. An incorrect setting has caused error messages to be unreadable. Cannot access the UEFI set-up utility to load the system defaults.	Perform all steps within the Clear the CMOS on page 64 to clear the system configuration values.
The brightness of the integrated display is too bright or too dull at my installation site.	<p>An adjustable display brightness setting is available in the BIOS. The default setting is 70%.</p> <p>IMPORTANT Brightness that is increased above the default setting reduces the life of the backlight, particularly at high temperatures.</p> <p>See Adjust Brightness on page 45.</p>
The system date and time is incorrect or real time clock (RTC) battery is low.	The RTC lithium battery must be replaced by Rockwell Automation only. See Complete Maintenance on page 61 then for proper shipment procedures.

Diagnostics

If an error occurs after completing the troubleshooting steps in [Table 11 on page 63](#), the Diagnostics menu in the universal extensible firmware interface (UEFI) setup utility will help to isolate the issue and determine the cause of the issue.



You do not need to disconnect or move your industrial computer to perform an initial diagnosis. The test you select effects the length of the process, which can take as little as 5 minutes or as long as 8 hours.

1. Connect power to your industrial computer.
The POST initiates.
2. Perform one of the following actions:
 - Press the 'F2' key during the POST, then select 'Diagnostics' from the UEFI setup utility main menu **or**
 - Press 'F10' at any time to directly access Diagnostics menu from the UEFI setup utility.
3. Select 'Generate Reports' from the Options menu.
4. Press the 'Enter' key.
5. Select 'Report Destination'.
6. Press the 'Enter' key.
7. Select 'File'.
8. Press the 'Enter' key.
9. Select the device path to generate the log report.
10. Press the 'Enter' key.
11. To generate the report in the current file system: Press the 'Enter' key.
12. To generate the report to another location: Select 'Continue', then press the 'Enter' key.
13. Enter the log file details, the file name and heading, for the report.



The default file name is "AMIDdiag.LOG".

14. Set the report parameters.



Report parameter examples are: log errors, log test activities, log test start time, log test end time, log errors only, log errors only with time, Append to old log file, Log device info on fail, Log device info on abort.

15. Select 'Continue', then press the 'Enter' key to exit the submenu.



When the diagnosis is complete, you can generate a report for analysis by a technical support representative, which expedites any necessary repair process.

Clear the CMOS

Perform the following steps to clear the complementary metal-oxide semiconductor (CMOS).



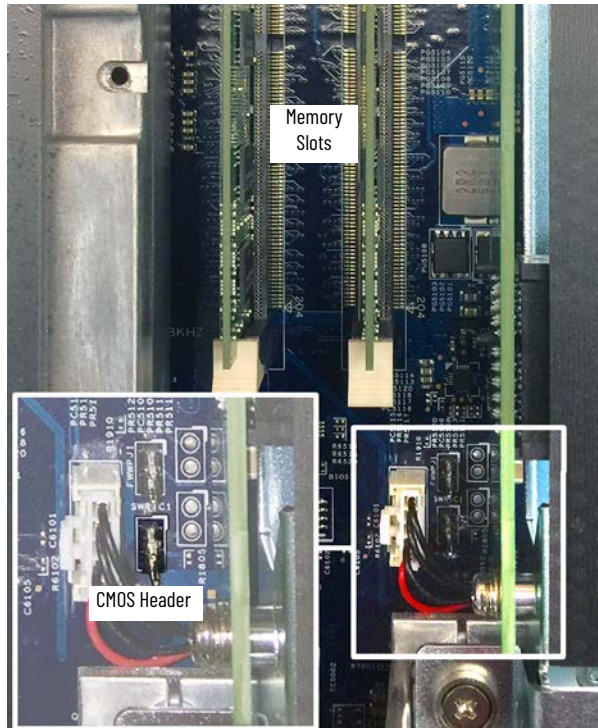
SHOCK HAZARD: Risk of severe electric shock. Only clear the CMOS after you have (1) backed up all system data, (2) disconnected power, and (3) have moved your industrial computer to a non-hazardous area.

1. Perform all steps within the [Shut Down on page 32](#).
2. Perform all steps within [Remove the Rear Cover on page 60](#).



SHOCK HAZARD: Do not operate the industrial computer while the rear cover is removed. The rear cover must be attached to maintain EMI shield.

3. Locate the CMOS header on the motherboard.



4. Use a conductive tool (such as a screwdriver) to make contact between the two pins for 10 seconds.
5. Perform all steps within [Reattach the Rear Cover on page 60](#).
6. Reconnect all peripheral cables.
7. Reconnect power to your industrial computer. The power on self test (POST) initiates.
8. Press the 'F2' key on your keyboard during the POST.
9. Reconfigure the settings within the UEFI set-up utility. See [Configure the UEFI Setup Utility on page 33](#) for guidance.

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

Hardware Monitoring

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

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

1. Perform all steps in [Shut Down on page 32](#).
2. Perform all steps in [Manual Start on page 31](#). The POST initiates.
3. Press the 'F2' key on your keyboard during the POST to access the UEFI setup utility.
4. Select the 'Advanced' menu.
5. Select the 'Hardware Monitor' menu.
6. Review the data within the Hardware Monitor menu to determine if there is an issue with internal voltages or component temperatures.

Load the System Defaults

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

Follow these steps to load the system defaults.

1. Restart your industrial computer as specified in [Restart on page 32](#).
2. Press the 'F2' key on your keyboard during the POST.
3. Select the system defaults.
4. Exit the UEFI set-up utility.

Ship or Transport the Computer

See [Shipment and Transport on page 61](#) for instruction.

End-of-Life Disposal

See [End-of-Life Disposal on page 61](#) for instruction.

Technical Data

Options Summary

This table summarizes the options that are available for 6181X Series J industrial computers for hazardous locations.



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		b Bezel Type		c Mount Type		d Display Size		e Resolution		f Power Input	
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
000	No display	N	No display	P	Panel Mount	M	Multi-touch PCAP	N	No display	D	24V DC isolated, no UPS
121	12.1 inch display	P	PCAP	W	Wall Mount	N	No Touch	X	4:3 1024 x 768		
g Fan / Fanless		h System Configuration		i CPU Class		j RAM Capacity		k Storage Type SSD 2.5 in.		l Operating System (OS)	
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
N	Fanless	B	1 x PCIe or 1 x PCI	3	Intel® Core™ i3	A	16 GB	B	256 GB	NNN	None
						B	32 GB	C	512 GB	W21	Microsoft Windows 10 IoT Enterprise 2021 LTSC (64 bit)
						C	64 GB	D	1 TB		
								N	None		
m Trusted® Platform Module (TPM)		n Riser Card Type		o Software		p Warranty		q Branding		r Coating	
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
F	fTPM (FW TPM)	G	1 PCIe x1 installed	N	None	1	Standard	S	Standard A-B branding	empty	No conformal coating
N	No TPM			X	Custom or future software, preloaded	X	Custom or future warranty				
T	TPM (HW TPM Chip)										

Initial Preferred Catalog Numbers



Non-preferred catalog numbers will have a minimum quantity order of 6 pieces.

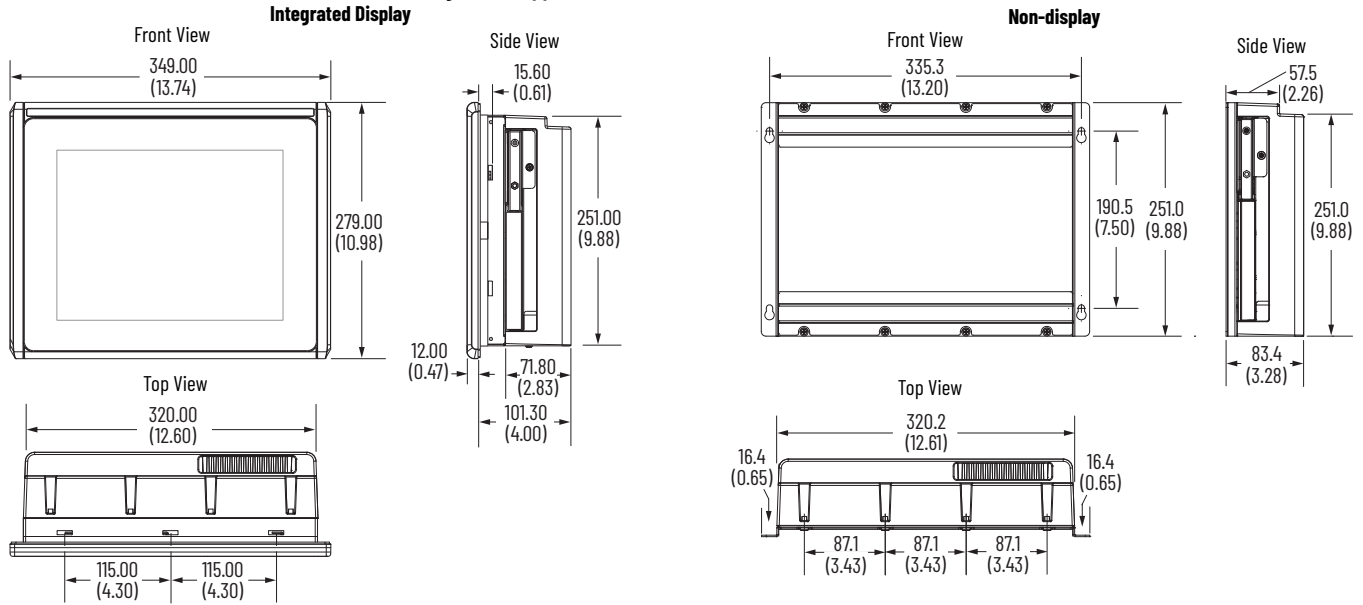
Table 12 - Initial Preferred Catalog Numbers

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

General Specifications

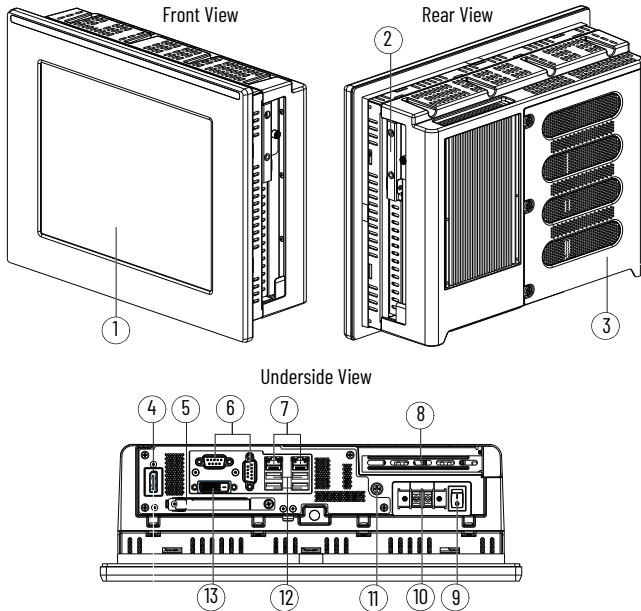
Dimensions shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Figure 21 - Approximate Dimensions [mm (in.)]



Although an integrated display model is illustrated in Table 13, the hardware features are also applicable to non-display models except for Note No. 1.

Table 13 - Hardware Features, I/O Port Locations, and Cable Requirements



Hardware Features	
Note No.	Component
1	LCD panel – integrated display models only
2	Solid-state drive (SSD)
3	Rear cover

I/O Ports		
Note No.	Component	Required Cable Attribute
4	DisplayPort ⁽¹⁾	Shielded
5	CFast card slot	–
6	Serial COM ports (RS-232), quantity of 2	Shielded
7	1 GB LAN ports (RJ45), quantity of 2	Shielded or Unshielded
8	PCIe riser slot cover	–
9	Power switch	–
10	DC input terminal block	Unshielded
11	Functional ground (earth) screw	–
12	USB 3.0 ports, quantity of 4 ⁽²⁾	Shielded
13	DVI-D port	Shielded

(1) For all models: The DisplayPort supports DP V1.4 and a daisy-chain configuration for up to six monitors in FHD (1920x1080 resolution or 1080p resolution). For thin client models: ThinManager® or other thin client software would need to support daisy chaining to be able to take advantage of this multi-monitor functionality.
 (2) For hazardous locations: The USB 3.0 ports are not hot swappable. Only connect a high-quality, shielded USB 3.0 cable with a retention feature. For non-hazardous locations: The USB 3.0 ports are hot swappable. See [Installation Precautions on page 13](#) for more information.

Technical Data

[Table 14...Table 21 on page 70](#) provide technical specifications for 6181X Series J industrial computer.



See [Installation Precautions and Requirements on page 13](#) for additional certification information.

Table 14 - Certifications



RoHS	Turkey RoHS (EEE Yönetmeliğine Uygundur. In Conformity with the EEE Regulation)	
		UAE RoHS Número 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 6181X-IN003-PT-P .

Figure 22 - RoHS Disclosure

設備名稱: 工業電腦, 型號: 6181X-121PPMXDNB, 6181X-000NWNNDNB Equipment Type designation						
零件名稱 Component Name	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(VI))	多溴聯苯 Polybrominated Biphenyls (PBB)	多溴二苯醚 Polybrominated Diphenyl Ethers (PBDE)
顯示器 Display	—	○	○	○	○	○
電路板組件 Printed Circuit Board Assemblies	—	○	○	○	○	○
電子零件 Electrical components	—	○	○	○	○	○
金屬零件 Metal components	—	○	—	—	○	○
風扇組件 Fan Assembly	—	○	○	○	○	○
接線與電線 Wiring and Cable	—	○	○	○	○	○
電池 Battery	○	○	○	○	○	○
塑膠零件 Plastic components	○	○	○	○	○	○

備考1. “超出0.1 wt %” 及 “超出0.01 wt %” 係指限用物質之百分比含量超出百分比含量基準值。
備考2. “○” 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。
備考3. “—” 係指該項限用物質為排除項目。

Table 15 - DisplayPort Specifications

Display Resolution	Resolution Type	Max No. of Monitors Supported (Based on Display 1.4 Bandwidth)	
At 60 frames per second (FPS) 10 bit	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 16 - Environment Specifications

Model	Enclosure Ratings	Temperature [°C (°F)]	Relative Humidity	Altitude	Shock ⁽¹⁾
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		Nonoperating: -30...+80 (-22...+176) ⁽²⁾		Nonoperating: 12,000 m (40,000 ft)	Nonoperating: 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 17 - High Bright Integrated Display Specification, 6181X-121PPMXDNB-3xxxxxG-xxx(x)

Attribute	Specification	Attribute	Specification
Display Type	active matrix color Thin Film Transistor (TFT)	Luminance	1300 cd/m ² (Nits)
Touch Screen	PCAP, chemically strengthened glass with matte finish to help reduce glare	Contrast Ratio, Typical	1000:1
	supports 10-point multi-touch operation	Default Resolution	1024 x 768, 16.2 M colors
Display Size, Diagonal	308 mm (12.1 in.)	View Angle, Typical	176°
		LED Backlight Lifetime, Typical	100,000 hours

Table 18 - Hardware and Software Specifications: Integrated Display and Non-display Models

Attribute		Specification	
Hardware	Processor		
	Intel Core i3-1115GRE, 2.2 GHz dual core/6 MB cache/15 W		
	System Memory	Type	Dual channel, DDR4 SO-DIMM
		Slots	quantity of 2
		Installed	16 GB (1 x 16 GB) to 64 GB (2 x 32 GB)
		Maximum Memory	64 GB (2 x 32 GB)
		Available Capacities ⁽¹⁾	2 x 16 GB (Cat. No. 6189X-32GDDR4) or 2 x 32 GB (Cat. No. 6189X-64GDDR4)
	Solid-state Drive (SSD) ⁽²⁾	Capacity Installed	256 GB, 512 GB, or 1 TB
		Available Capacities ⁽¹⁾	256 GB (Cat. No. 6189X-256GBSSD3), 512 GB (Cat. No. 6189X-512GBSSD), 1 TB (Cat. No. 6189X-1TBSSD)
	CFast	Slot	bootable, shipped empty; hot-swappable only in a non-hazardous location
		CFast Card	64 GB (Cat. No. 6189X-64GCFast) IMPORTANT: Cat. No. 6189X-64GCFast is the only CFast card that can be installed in your industrial computer as it is approved for industrial and hazardous locations. A CFast SSD card intended for consumer products (such as digital cameras) does not have the endurance, performance, reliability, or data protection required for industrial applications (such as sudden power off). The CFast card should only be removed or installed in a non-hazardous location.
	PCI Riser Card		Cat. No. 6189X-PCIRISER
	Expansion Slot		1 half-length PCIe, 4 W maximum supported, 1 half-length PCI is support with the PCI riser accessory (Cat. No. 6189X-PCIRISER)
	I/O Ports	DisplayPort	quantity of 1
		DVI-D	quantity of 1
		Serial COM	quantity of 2
		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
Real-time clock (RTC) Battery		Lithium RTC battery IMPORTANT: 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 Product and Application Support .	
ThinManager	ThinManager Ready	All models are ThinManager ready	
Software	Operating System (OS)	Microsoft Windows 10 Internet of Things (IoT) Enterprise 2021 LTSC (64 bit)	
	Factory System Image	To obtain a copy, access the Rockwell Automation Product Compatibility and Download Center (PCDC) at rok.auto/pcdc	

(1) For ordering information and installation instructions, see Accessories for Industrial Computers for Hazardous Locations, Series J, publication 6181X-PC002.

(2) 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 19 - 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 20 - Power Specifications

Model	Input Voltage DC	Power Consumption, Maximum	Heat Dissipation ⁽¹⁾	Peripheral Loading, Maximum	
				PCIe Card	USB Ports
Integrated Display	18...32V DC	18...32V DC (SELV), 3.33...1.88 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), 2.50...1.41 A, 45 W	45 W (154 BTU/h)		

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

Table 21 - Security

Model	Catalog Number	Root of Trust (RoT)	Model	Catalog Number	Root of Trust (RoT)
Integrated Display	6181X-121PPMXDNB-3xxxxxTG-xxx(x)	HW (Hardware) Trusted [®] Platform Module (TPM) 2.0	Integrated Display	6181X-121PPMXDNB-3xxxxxNG-xxx(x)	No TPM functionality
Non-display	6181X-000WNNDNB-3xxxxxTG-xxx(x)				
Integrated Display	6181X-121PPMXDNB-3xxxxxFG-xxx(x)	Preferred configuration: FW (Firmware) TPM utilizing Intel Platform Trust Technology (PTT)	Non-display	6181X-000WNNDNB-3xxxxxNG-xxx(x)	
Non-display	6181X-000WNNDNB-3xxxxxFG-xxx(x)				

Notes:

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, Knowledgebase, and product notification updates.	rok.auto/support
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Technical Documentation Center	Quickly access and download technical specifications, installation instructions, and user manuals.	rok.auto/techdocs
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.	rok.auto/pcdc

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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.

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