User Manual

A·B *Allen-Bradley*

Industrial Performance Monitors

Catalog Numbers 6186M-12PN, 6186M-12PT, 6186M-15PN, 6186M-15PT, 6186M-15PNSS, 6186M-15PTSS, 6186M-17PN, 6186M-17PT, 6186M-17PNSS, 6186M-17PTSS, 6186M-19PN, 6186M-19PT, 6186M-19PNSS, 6186M-19PTSS

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Important User Information

Solid-state equipment has operational characteristics differing from those of electromechanical equipment. Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls (publication SGI-1.1 available from your local Rockwell Automation® sales office or online at http://www.rockwellautomation.com/literature/) describes some important differences between solid-state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid-state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

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

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

New and Updated Information

This table contains the changes made to this revision.

Topic	Page
Added 'Linux' as a compatible operating system	11, 35
Changed Series letter from 'F' to 'G' in Table 1	12
Revised hyperlink for finding accessories online	12
Added '(USB Port-Type A)' to section title	15
Added USB Port Type A illustration and callout to Figure 1	15
Added '(USB Port-Type B)' to section title	16
Added USB Port Type B illustration and callout to Figure 2	16
Added Important table and revised information in 'Application Information' section	17
Updated website link for CE Mark certification	18
Revised instructions for panel-mounting the monitor	26
Relocated RS-232 Touch Screen Interface table from Appendix B to Chapter 2	35
Removed column of DB-25 information from RS-232 Touch Screen Interface table	35
Changed catalog number for replacement AC power adapter	37
Added Important table in 'Adjust the Monitor Brightness' section	42
Updated Important table in 'Using the Auto Adjust Control' section	44
Removed existing graphic in 'Changing Monitor Settings with the On-screen Display (OSD)' section	45
Added introductory paragraph and icons to 'General OSD Menu Navigation Guidelines' section	45
Created separate table for Temperature submenu choices	48
Revised Tools menu graphics	50
Created separate tables to correspond with revised Tools menu graphics	50
Revised typical luminance value for 1700M monitor	57
Revised contrast ratios for 1200M and 1500M monitors	57
Revised typical response time for all monitors	57
Revised UL Listed and cUL Listed certifications	58
Revised descriptions for Pins 2, 14, and 15 in Table 30	60
Removed 'Setting the Monitor Type Manually' section in Chapter 2	
Removed previous Appendix B (previous Appendix C is now Appendix B)	

Notes:

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Chapter 3

Display Configuration

Chapter 4

Perform Routine Maintenance

Notes:

About This Publication

Read this preface to familiarize yourself with the rest of the manual. The preface covers the following:

- Who should use this manual
- The purpose of the manual
- Conventions used in this manual

Intended Audience

Use this manual if you are responsible for installing, using, or troubleshooting the monitors.

Purpose of This Manual

This manual is a user guide for the monitors. It gives an overview of the system and describes procedures to do the following:

- Install a monitor in a panel or rack, or on a bench or tabletop
- Make monitor connections
- Configure a monitor's video setup
- Troubleshoot a monitor

Additional Resources

For additional information on the industrial performance monitors, refer to the Industrial Performance Monitors installation instructions, publication 6186M-IN002.

You can download electronic versions of these publications from the Rockwell Automation website http://www.rockwellautomation.com/literature/.

Notes:

Monitor Overview

Overview

The industrial performance monitors provide the latest in LCD flat panel technology. Combine these monitors with the heavy industrial non-display computers to create a visualization, maintenance, control, or information computing solution. The monitors offer the following features:

- 12, 15, 17, or 19-inch active matrix display
- Native video resolutions from 800x600 to 1280x1024
- Wide viewing angle with antiglare coating
- One-button automatic screen adjust
- Rear panel keypad with lockout feature
- Windows, Linux, and DOS compatible
- Input power, AC or DC
- Space efficient enclosure that is less than 63 mm (2.49 in.) deep
- Optional resistive touch screen

Before You Begin

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

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

Parts List

The monitors are shipped with these items:

- Mounting clips and cutout template
- AC power supply and applicable power cord
- HD-15 analog video cable
- DVI cable
- Touch screen serial cable (only for monitors with touch screen display)
- USB cable
- Cable retention tie wraps
- Installation Instructions
- Accessories CD (contains the installation files for the monitor drivers and the ScreenSet monitor setup utility)

Product Catalog Numbers

Table 1 - Catalog Numbers and Sizes of Performance Monitors

Cat. No.	Display Size	Series	Bezel	Touch Screen
6186M-12PN	12 in.		Aluminum	None
6186M-12PT				Resistive touch screen
6186M-15PN	15 in.		Aluminum	None
6186M-15PT				Resistive touch screen
6186M-15PNSS			Stainless Steel	None
6186M-15PTSS				Resistive touch screen
6186M-17PN	17 in.	G	Aluminum	None
6186M-17PT				Resistive touch screen
6186M-17PNSS			Stainless Steel	None
6186M-17PTSS				Resistive touch screen
6186M-19PN	19 in.		Aluminum	None
6186M-19PT				Resistive touch screen
6186M-19PNSS			Stainless Steel	None
6186M-19PTSS				Resistive touch screen

Accessories

You can view a current list of accessories at the Rockwell Automation Allen-Bradley® website, http://ab.rockwellautomation.com/Industrial-Monitors.

Installing the Monitor

Chapter Objectives

This chapter shows you how to install the monitor in a panel or rack, or on a bench or tabletop, and how to make monitor connections.

Review mounting types and product dimensions before installation.

Hazardous Locations

This equipment is suitable for the following hazardous locations specified on the product nameplate:

- Class I, Division 2 Groups A, B, C, D
- Nonhazardous locations

The following statement applies to use in hazardous locations.

WARNING: Explosion Hazard

- Substitution of any components may impair suitability for hazardous locations.
- Do not disconnect equipment unless power has been removed or the area is known to be free of ignitable concentrations of flammable gases or vapors.
- Do not connect or disconnect cables or components unless power has been removed or the area is known to be free of ignitable concentrations of flammable gases or vapors.
- Do not connect or disconnect components unless power has been removed or the area is known to be free of ignitable concentrations of flammable gases or vapors.
- All wiring must be in accordance with Class I, Division 2 wiring methods of Article 501 of the National Electrical Code, and/or in accordance with Section 18-1J2 of the Canadian Electrical Code, and in accordance with the authority having jurisdiction.
- The monitor and its AC adapter have a temperature code of T4 when operating in an environment that is within its specified operating temperature range. Do not install the equipment in an environment where atmospheric gases have an ignition temperature of less than 135 °C (275 °F).
- Peripheral equipment must be suitable for the location in which it is used.
- All hazardous-location equipment must be mounted in an enclosure that is suitably designed or rated for those specific environmental conditions that will be present, and designed to prevent personal injury resulting from accessibility to live parts.
- The monitor may be powered directly from the included AC adapter (100...240 V AC input), or an external 9...36 V DC power source wired to the terminal block. Do not use the AC adapter and external DC at the same time.

Control Drawing - Class I Division 2 and Zone 2 (USB port, type A)

The following control drawing is provided to comply with the National Electrical Code, Article 500 pertaining to Class I, Division 2, Groups A, B, C, D and Class I, Zone 2, Group IIC.

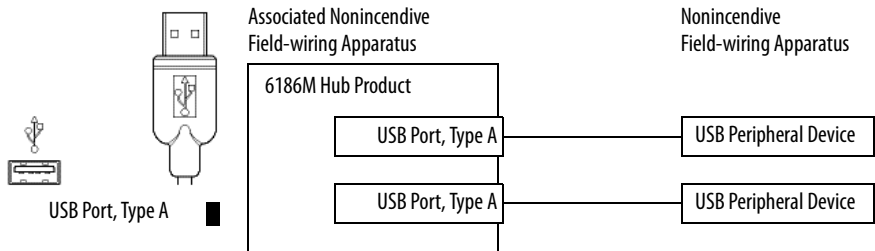**Figure 1 - Industrial Performance Monitors USB Port, Type A, and Peripheral Devices**

Table 2 - Industrial Performance Monitors USB Port, Type A, and Peripheral Device Circuit Parameters

Parameter	Value	Parameter Definition
$V_{OC\,(USB)}$	5.25V DC	Open circuit voltage of each host USB port. The maximum applied voltage rating, $V_{max\,(peripheral)}$, of each peripheral device shall be greater than or equal to $V_{OC\,(USB)}$. $V_{max\,(peripheral)} \geq V_{OC\,(USB)}$, as appropriate
$I_{SC\,(USB)}$	950 mA	Maximum output current of each host USB port. The maximum current, $I_{max\,(peripheral)}$, to which each USB peripheral device can be subjected shall be greater than or equal to $I_{SC\,(USB)}$. $I_{max\,(peripheral)} \geq I_{SC\,(USB)}$
$C_{a\,(USB)}$	20 µF	This value is the maximum total capacitance that can be connected to each USB port. The total capacitance of each USB peripheral and its cable must not exceed the indicated value. The maximum total capacitance, $C_{i\,(peripheral)}$, and cable capacitance of each separate USB peripheral device shall be less than or equal to $C_{a\,(USB)}$. $C_{i\,(peripheral)} + C_{cable} \leq C_{a\,(USB)}$
$L_{a\,(USB)}$	3.11 µH	This value is the maximum total inductance that can be connected to each USB port. The total inductance of each peripheral device and its cable must not exceed the indicated value. The maximum total inductance, $L_{i\,(peripheral)}$, and cable inductance of each separate USB peripheral device shall be less than or equal to $L_{a\,(USB)}$. $L_{i\,(peripheral)} + L_{cable} \leq L_{a\,(USB)}$

■

Control Drawing - Class I Division 2 and Zone 2 (USB port, type B)

The following control drawing is provided to comply with the National Electrical Code, Article 500 pertaining to Class I, Division 2, Groups A, B, C, D and Class I, Zone 2, Group IIC.

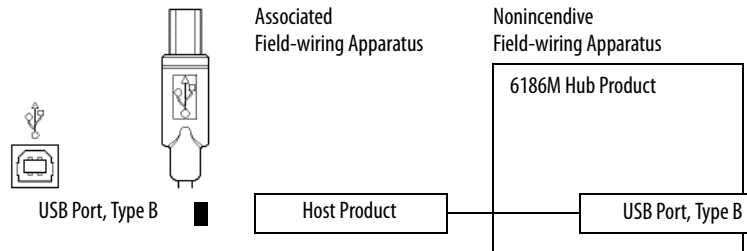**Figure 2 - Industrial Performance Monitors USB Port, Type B**

■

Table 3 - Required Circuit Parameters for USB, Type B, Connector - Connecting to Host

Parameter	Value	Parameter Definition
$V_{Bmax\,(USB)}$	5.25V DC, max	Maximum applied voltage rating of the 6186M USB Type B connector. The output of the host product shall not exceed this value. $V_{Bmax\,(USB)} \geq V_{OC\,(Host\,USB)}$
$I_{Bmax\,(USB)}$	110 µA, min	Maximum current required at the 6186M USB Type B connector. The host product must be capable of a minimum of this value. $I_{SC\,(Host\,USB)} \leq I_{Bmax\,(USB)}$
$C_{iB\,(USB)}$	0 µF	Total capacitance of the 6186M USB Type B connector. The host product must be capable of tolerating this value of capacitance. $C_{a\,(Host\,USB)} \geq C_{iB\,(USB)} + C_{cable}$
$L_{iB\,(USB)}$	0 µH	Total Inductance of the 6186M USB Type B connector. The host product must be capable of tolerating this value of inductance. $L_{a\,(Host\,USB)} \geq L_{iB\,(USB)} + L_{cable}$

Application Information

The circuit parameters of associated field-wired apparatus for use in hazardous locations shall be coordinated with the host product such that their combination remains nonincendive. The industrial performance monitors and USB peripheral devices shall be treated in this manner.

Each industrial performance monitor provides two separately powered USB ports. The circuit parameters for each USB port are found in tables on and .

IMPORTANT	Circuit parameters of USB peripheral devices and their associated cabling must be within the limits in the tables on page 15 and page 16 for the devices and their cabling to remain nonincendive when used with the USB ports of industrial performance monitors.

For the comparison of $C_{a\,(USB)}$ and $C_{i\,(peripheral)}$, use the capacitance of each individual connected USB peripheral device and its associated cable C_{cable}.

For the comparison of $L_{a\,(USB)}$ with $L_{i\,(peripheral)}$, use the inductance of each individual peripheral device and its associated cable for L_{cable}.

If cable capacitance and inductance are not known, the following values may be used:

C_{cable} = 60 pF/ft (197 pF/m)

L_{cable} = 0.20 μH/ft (0.66 μH/m)

European Union Directive Compliance

This product meets the European Union Directive requirements when installed within the European Union or EEA regions and has the CE mark. A copy of the Declaration of Conformity is available at the following website: http://www.rockwellautomation.com/products/certification/ under Product Certification.

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

Backlight Assembly Disposal

> **ATTENTION:** The backlight assembly in this unit contains mercury. At the end of its life, this equipment should be collected separately from any unsorted municipal waste.

Environment and Enclosure Information

Review the information on enclosures and environments before installing your monitor.

> ⚠️ **ATTENTION: Environment and Enclosure**
>
> This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC publication 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 Publication 11. Without appropriate precautions, there may be potential difficulties ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbance.
>
> This equipment is supplied as open-type equipment. UL recognized and hazardous location equipment must be mounted in an enclosure that is suitably designed or rated for those specific environmental conditions that will be present, and designed to prevent personal injury resulting from accessibility to live parts. UL Listed equipment need not be mounted inside another enclosure in ordinary (nonhazardous) locations if NEMA Type and IEC ratings are not required, but the mounting method must limit the tilt of the product to ± 60° from vertical. Examples include an articulated arm, table-top stand, or other means having sufficient mechanical stability. The mounting means must be firmly attached to the supporting surface using screws, bolts, or clamps so the monitor cannot tip. All units ship with a gasketed bezel to meet specified NEMA and IEC ratings only when mounted in a panel or enclosure with an equivalent rating.
>
> Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.
>
> In addition to this publication, see the following:
>
> - Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1
> - NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure

Installation Guidelines

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

- The installation site must have sufficient power.

> ⚠️ **ATTENTION:** The monitor's AC adapter must be grounded to maintain an electrically safe installation. Grounding the monitor itself is not required.
>
> To ground the AC adapter, connect the product to earth ground using the supplied AC cord ground wire or 0.9 mm^2 (18 AWG) or larger external wire. The ground wire should have green insulation with a yellow stripe for easy identification.

- The enclosure must have sufficient space around air inlets and outlets to provide the circulation necessary for cooling. Never let air passages become obstructed.

- The surrounding air temperature must not exceed the maximum operating temperature, either inside or outside of the enclosure. Consider heat produced by other devices in the enclosure. You may need a user-supplied fan, heat exchanger, or air conditioner to meet this condition.

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

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

- The humidity of the surrounding air must not exceed specified limits. In very dry environments, static charges build up readily. Proper grounding of the equipment through the AC power cord helps to reduce static discharges, which may cause shocks and damage electronic components.

- The enclosure or cover must remain in place at all times during operation. The cover provides protection against high voltages inside the product and inhibits radio-frequency emissions that might interfere with other equipment.

> ⚠ **ATTENTION:** Industrial computers and monitors are not safety devices. Follow standard safety practice and redundancy in the application of this product.

- When mounted, the product cannot be tilted more than 60° from vertical.
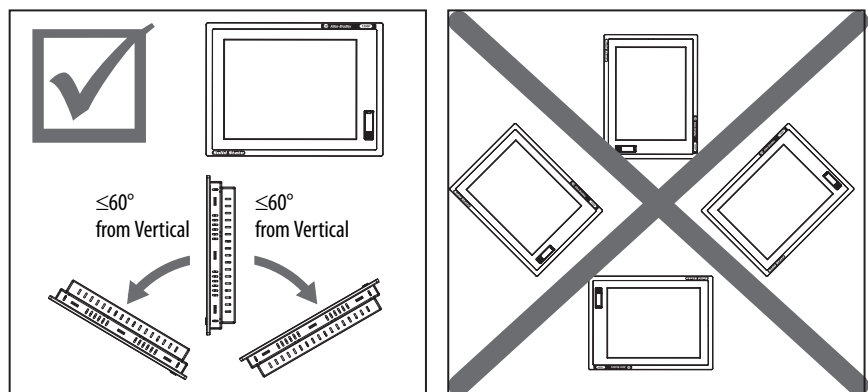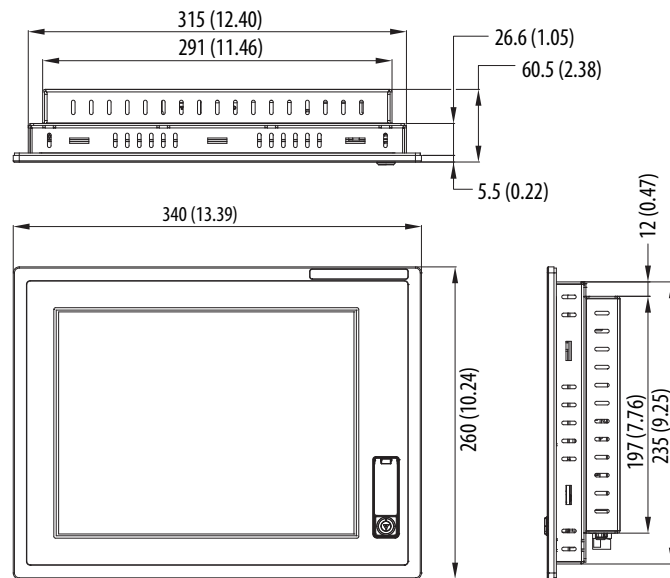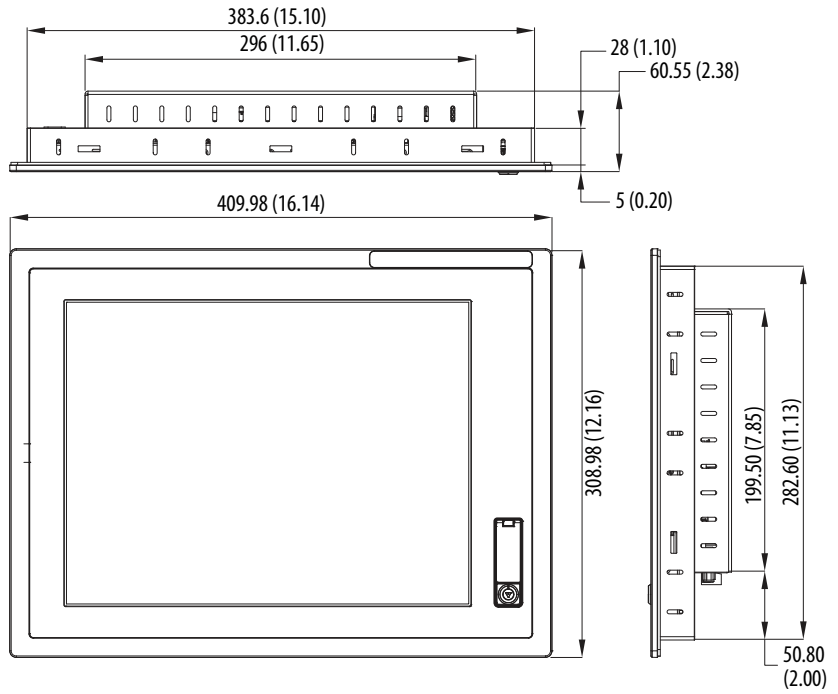
Product Dimensions

Review the product dimensions to make sure you allow adequate clearance on the sides and rear of the monitor for ventilation and cable connections.

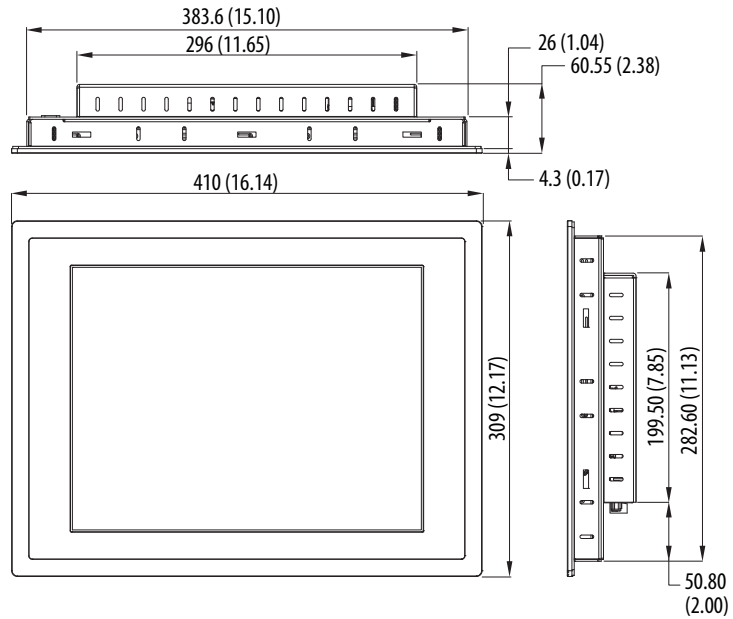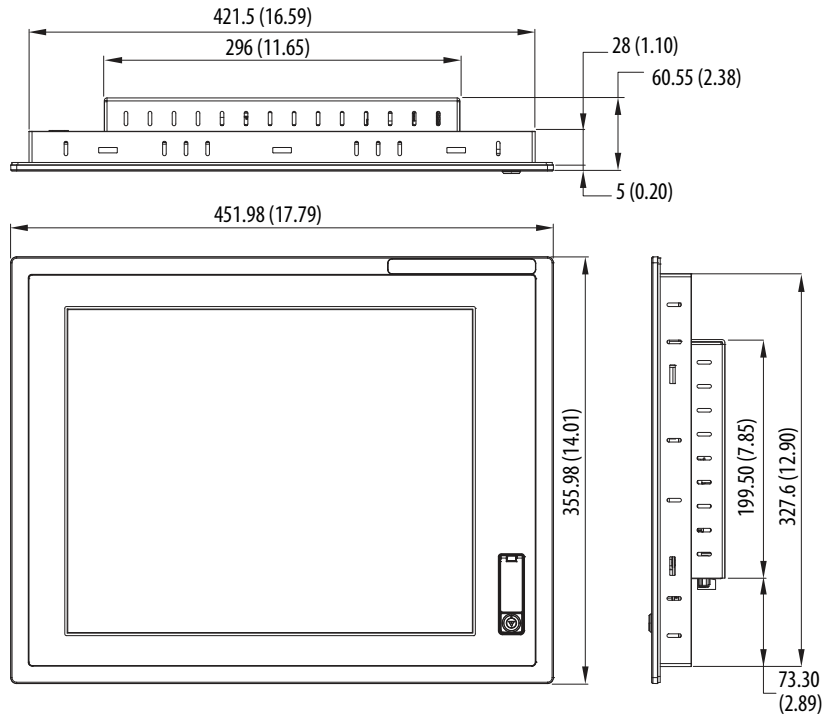The illustrations show the product dimensions in mm (in.).
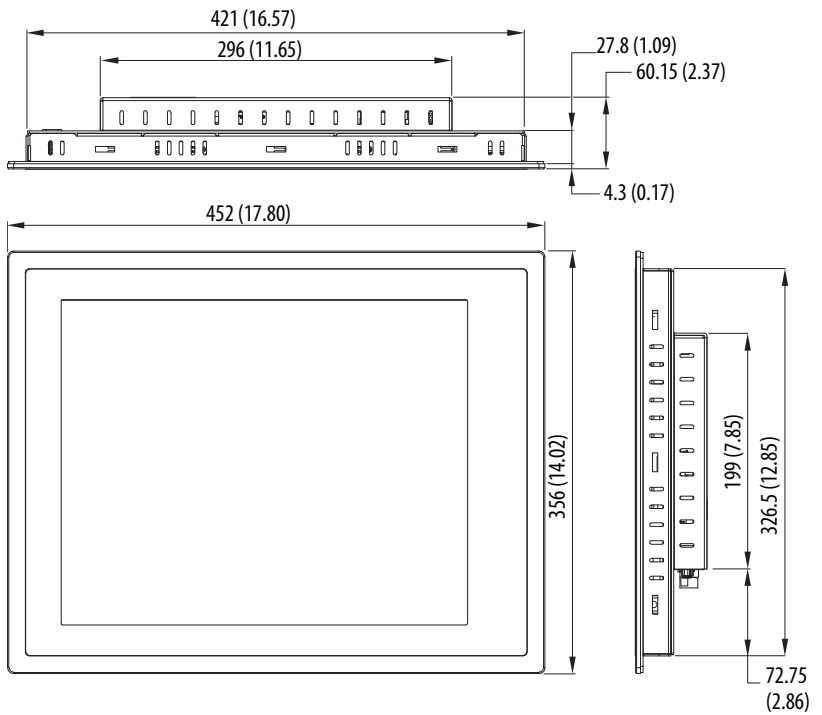
1200M Monitor

1500M Monitor - Aluminum Bezel

1500M Monitor - Stainless Steel Bezel

1700M Monitor - Aluminum Bezel

1700M Monitor - Stainless Steel Bezel

1900M Monitor - Aluminum Bezel

446.6 (17.58)
325 (12.80)
31.5 (1.24)
63.9 (2.52)
4.2 (0.17)
482.6 (19.0)
399.3 (15.72)
242 (9.53)
360.5 (14.19)
75.25 (2.96)

1900M Monitor - Stainless Steel Bezel

446.6 (17.58)
325 (12.80)
31.5 (1.24)
64.0 (2.52)
4.3 (0.17)
482.6 (19.0)
399.3 (15.72)
242 (9.53)
360.5 (14.19)
75.25 (2.96)
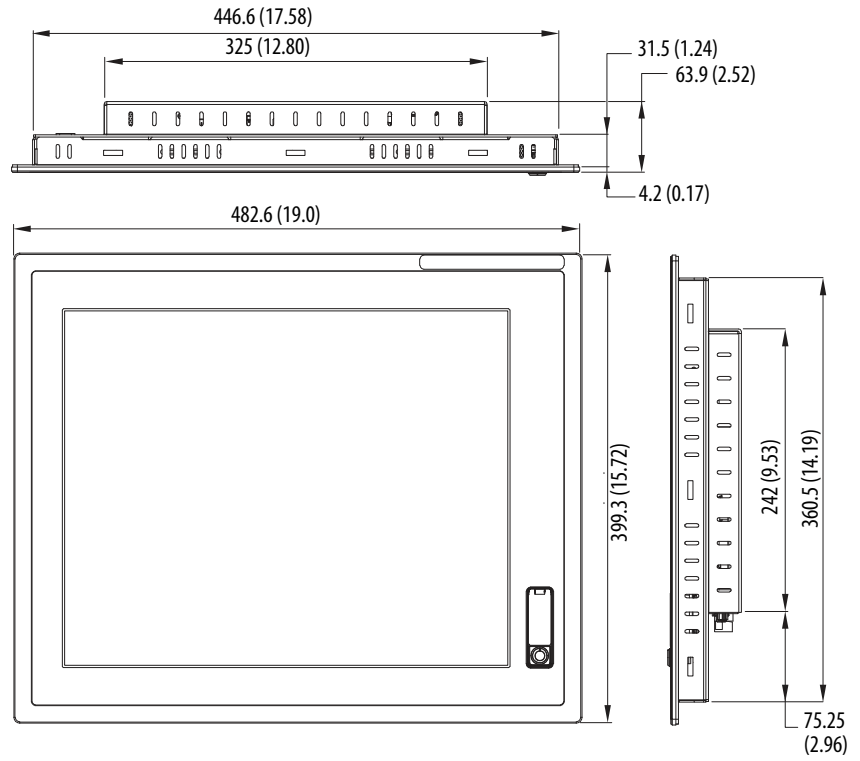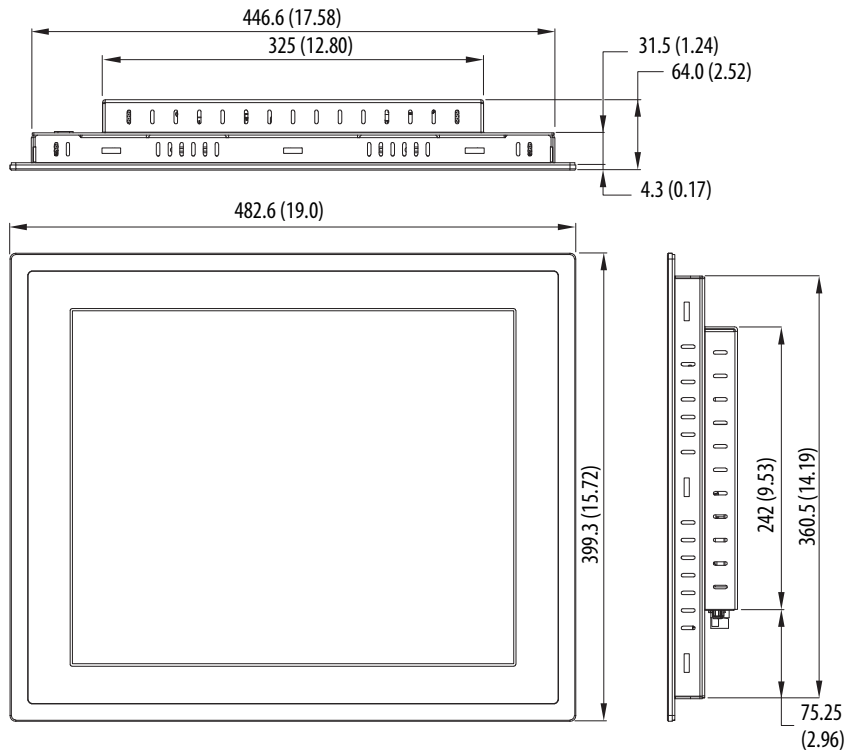
Panel Mounting

The monitors install directly into a panel with mounting clips. The number of clips varies by model.

Table 4 - Mounting Clips

Monitor	Mounting Clips
1200M, 1500M, and 1700M aluminum bezel	10
1700M stainless steel bezel	12
1900M	14

Table 5 - Panel Mounting Accessories

Cat. No.	Description
6189V-MCLPS3	Replacement Mounting Clips (14)

Mounting Adapters

Optional mounting adapters are available to mount a monitor into the existing panel cutout of an older monitor.

Table 6 - Panel Mounting Adapters

Cat. No.	Description
6189V-MMA12	Panel adapter for converting 6185-B to 1200M
6189V-MMA15	Panel adapter for converting 6185-C, 6185-F, and 6185-H to 1500M
6189V-MMA17	Panel adapter for converting 6185-D and 6185-J to 1700M

Required Tools

You need panel cutout tools and a #2 Phillips torque screwdriver.

Panel Cutout Dimensions

This table lists the panel cutout dimensions for each monitor. Use the full-size template shipped with each monitor to mark the cutout dimensions.

Table 7 - Panel Cutout Dimensions

Monitor Model	Cutout Dimensions, approx (H x W)
1200M (6186M-12)	238.0 x 318.0 mm (9.37 x 12.51 in.)
1500M (6186M-15)	285.6 x 386.6 mm (11.24 x 15.22 in.)
1700M (6186M-17)	329.5 x 424.0 mm (12.97 x 16.69 in.)
1900M (6186M-19)	363.5 x 449.6 mm (14.31 x 17.70 in.)

Mounting Guidelines

Observe these guidelines when installing the monitor in a panel:

- Confirm that there is adequate space behind the panel.

  - Allow a minimum of 51 mm (2.0 in.) around the back, sides, and bottom, and 77 mm (3.0 in.) on the top for ventilation.
  - A cabinet with a minimum depth of 112 mm (4.4 in.) is sufficient.

- Cut supporting panels to specifications before installation. Take precautions so metal cuttings do not enter components already installed in panel.

- Supporting panels must be at least 14 gauge to be sure of proper sealing against water and dust and to provide proper support. The mounting hardware supplied accommodates panels up to 6.00 mm (0.236 in.) thick.

- Take precautions so operating temperatures or other environmental specifications of the monitor are followed both inside and outside of the enclosure.

> ⚠️ **ATTENTION:** Failure to follow these guidelines may result in personal injury or damage to the panel components.

Mounting the Monitor in Panel

Follow these directions to mount the monitor in a panel.

1. Cut the panel opening by using the appropriate cutout dimensions.

2. Attach cables to the monitor before installing the monitor if rear access to the monitor will be limited after installation. See page 33 for where to attach cables.

3. Verify the sealing gasket is properly positioned on the monitor.

   This gasket forms a compression-type seal. Do not use sealing compounds.

4. Place the monitor in the panel cutout.

5. Slide the mounting clips into the slots on the top, bottom, and sides of the monitor; see Figure 3.

6. Hand-tighten the mounting clips around the bezel by following the tightening sequence in Figure 3.

7. Tighten the mounting clips to a torque of 1.35 N·m (12 lb·in) by following the torque sequence in Figure 3, making sure not to overtighten.

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

8. Repeat the torque sequence at least three times until all mounting clips are torqued to 1.35 N·m (12 lb·in) and the sealing gasket is compressed uniformly against the panel.

Figure 3 - Tightening and Torque Sequence

1200M, 1500M, and 1700M Monitors

1700M Stainless Steel Bezel Monitor
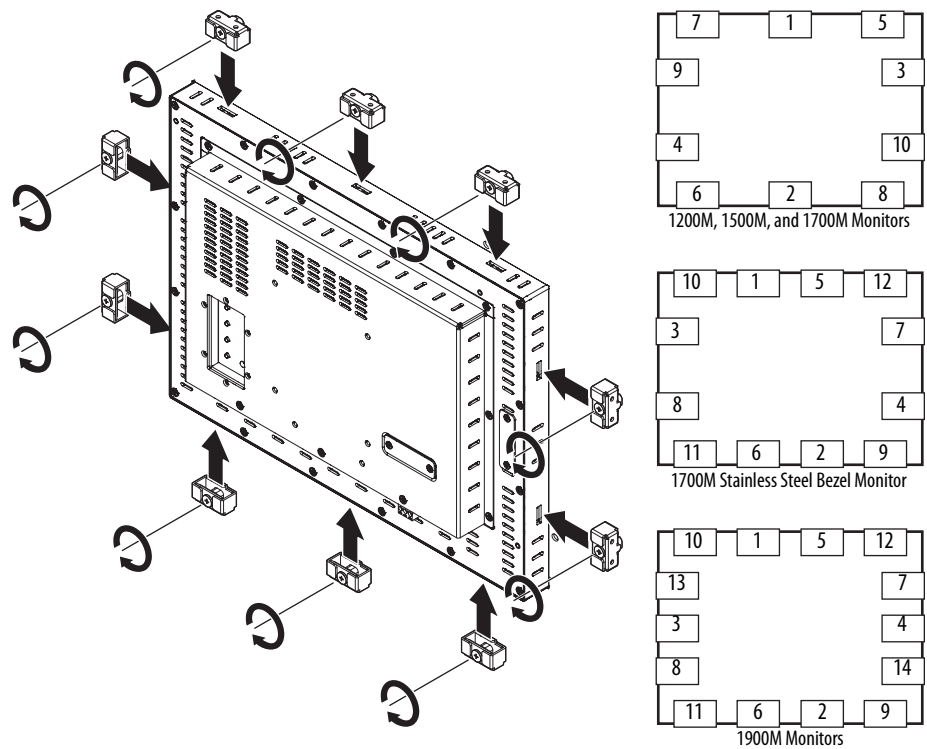
1900M Monitors

Rack Mounting

You can install the 1200M, 1500M, and 1700M monitors directly into an EIA-rack cabinet by using the appropriate rack adapters.

Table 8 - Panel Rack Adapters

Cat. No.	Description
6189V-MRA12	Rack adapter for 1200M monitor
6189V-MRA15	Rack adapter for 1500M monitor
6189V-MRA17	Rack adapter for 1700M monitor

Required Tools

You need the optional rack-adapter kit and a #2 Phillips screwdriver.

Mounting Guidelines

Observe these guidelines when installing the monitor in an EIA-rack cabinet:

- The height of the cabinet must accommodate the monitor's panel height.

- The depth of the cabinet must accommodate the monitor's depth plus rear clearance for cables and airflow. A cabinet depth of 112 mm (4.4 in.) is sufficient.

Mounting the Monitor in a Rack

Follow these directions to mount the monitor in a rack.

1. Place the 1200M, 1500M, or 1700M monitor in the rack adapter (**1**) and attach it to the rack adapter with the mounting clips provided (**2**).

2. Secure the adapter to the cabinet by installing screws through the holes in the adapter, and into the mounting rails (**3**).
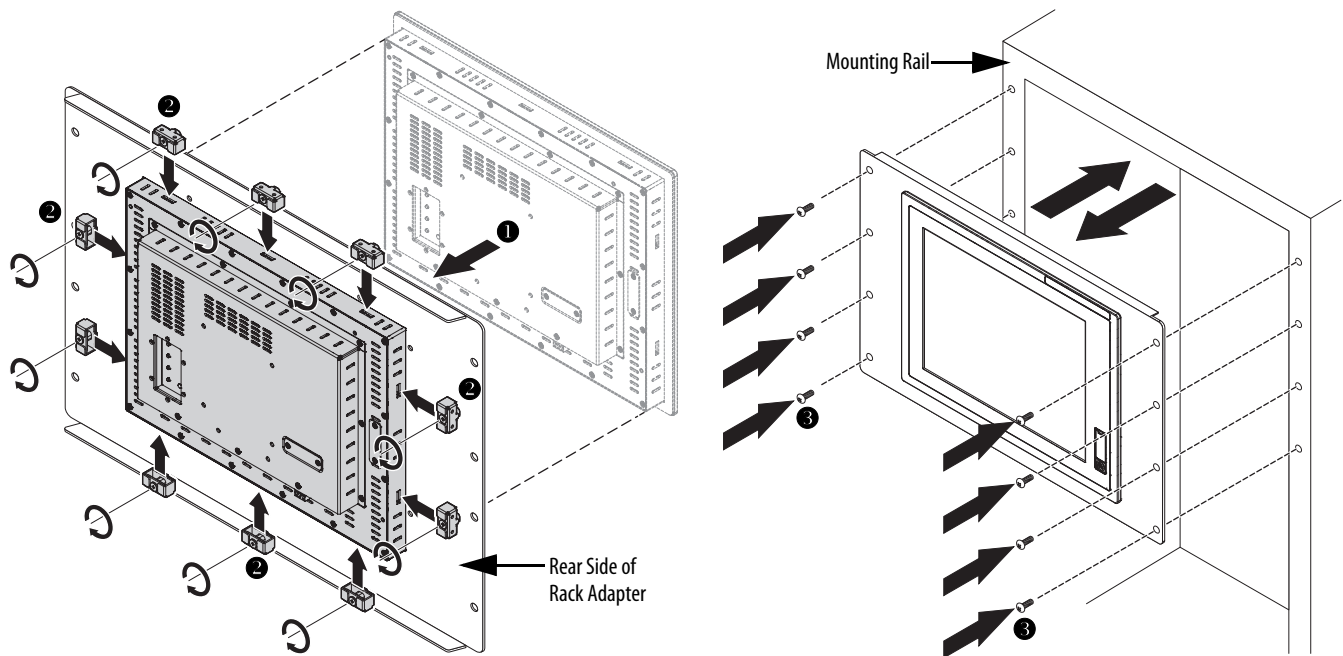
IMPORTANT	The mounting rails that run vertically along the inside edges of the front opening of an EIA-rack cabinet can be of two types:

- Wide rails have holes spaced 12.7 mm (0.5 in.) and 31.8 mm (1.25 in.) on centers, in a repeating pattern. Wide rails are prevalent in Europe.
- Universal rails have holes spaced 12.7 mm (0.5 in.), 15.9 mm (0.625 in.), and 31.8 mm (1.25 in.) on centers, in a repeating pattern. The universal rails have a hole pattern that contains the wide pattern but provides an additional hole at the midpoint of the pattern. Universal rails are most prevalent in the United States.

Bench or Tabletop Mounting

Use the optional adapter, catalog number 6189V-MBA, to mount your monitor on a bench or tabletop arm.

Required Tools

You need the bench or tabletop adapter and a #2 Phillips screwdriver.

Mounting Guidelines

Observe these guidelines when installing the monitor on an arm:

- The mounting surface and the mounting arm must be strong enough to support both the monitor and the mounting hardware.

- The interface between the arm and the monitor must meet VESA FPMPMI 100 mm standards.

- The mounting location must provide adequate clearance for positioning and moving the adjustable unit and routing cables.

Mount the Monitor on a Bench or Tabletop

Follow these directions to mount the monitor to a bench or tabletop.

1. Mount the arm to the bench or tabletop by using screws, bolts, or clamps so the monitor cannot tip.

2. Place the monitor over the arm and insert four M4 x 0.7 screws through the arm brackets and into the monitor.

   The illustration shows the mounting holes for VESA FPMPMI standard 100 mm (3.94 in.) interface pad.

Installing Arm

Installing Monitor to Arm

Monitor Mounting Holes (4)
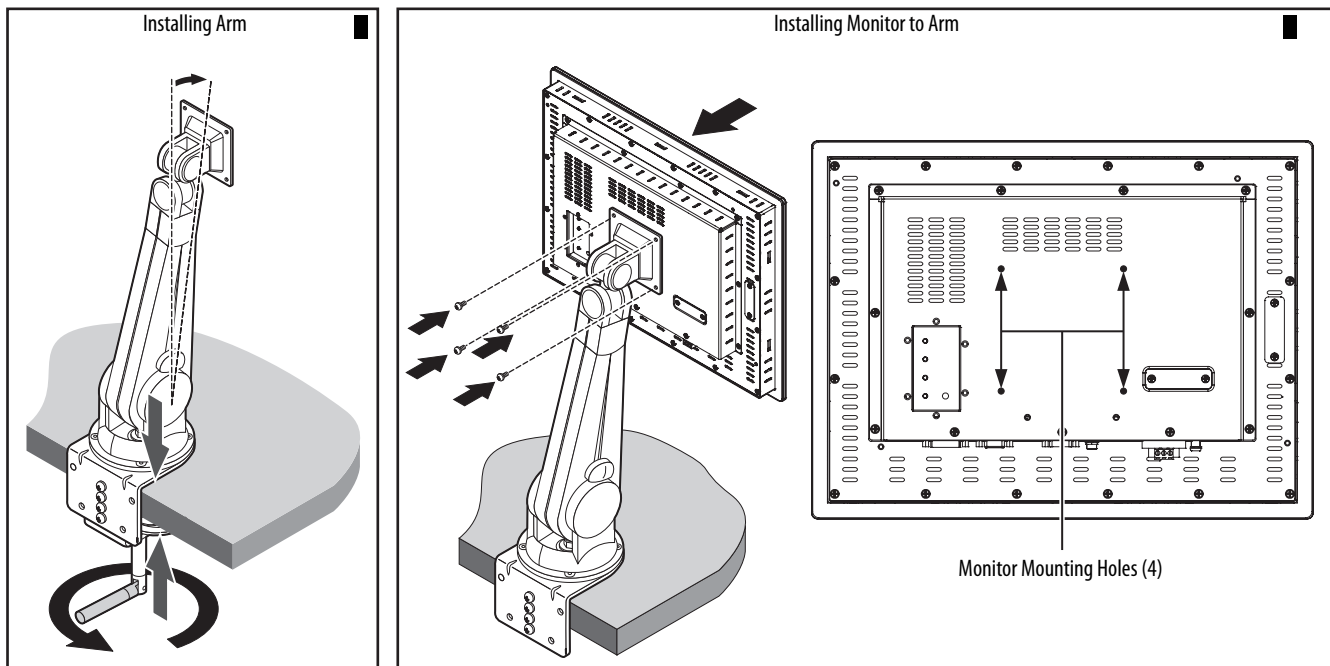
3. Tighten the screws.

Mount the DIN Rail of the AC Power Adapter

You can mount the AC power adapter on a DIN rail by using the DIN rail mounting accessory, catalog number 6189V-MPSDIN.

Follow these steps to mount the AC power adapter to a DIN rail.

1. Attach the DIN rail bracket to the bottom of the AC power adapter (**1**).

2. Secure the DIN rail bracket by using four of the provided M4 x 6 mm screws (**2**).

3. Torque the screws to 0.882 N·m (7.811 lb·in).

4. Attach the DIN rail to the wall or installation surface (**3**) by using two M4 x 6 mm screws (**4**); if using an existing DIN rail skip to the next step.

5. Torque the screws to 0.882 N·m (7.811 lb·in).

6. Mount the AC adapter on the DIN rail by inserting the upper lip of the DIN rail bracket on the top edge of the DIN rail (**5**), then pressing the AC adapter firmly against the lower edge of the rail (**6**).

7. Secure the installation by tightening the fastener on the DIN-rail bracket (**7**).
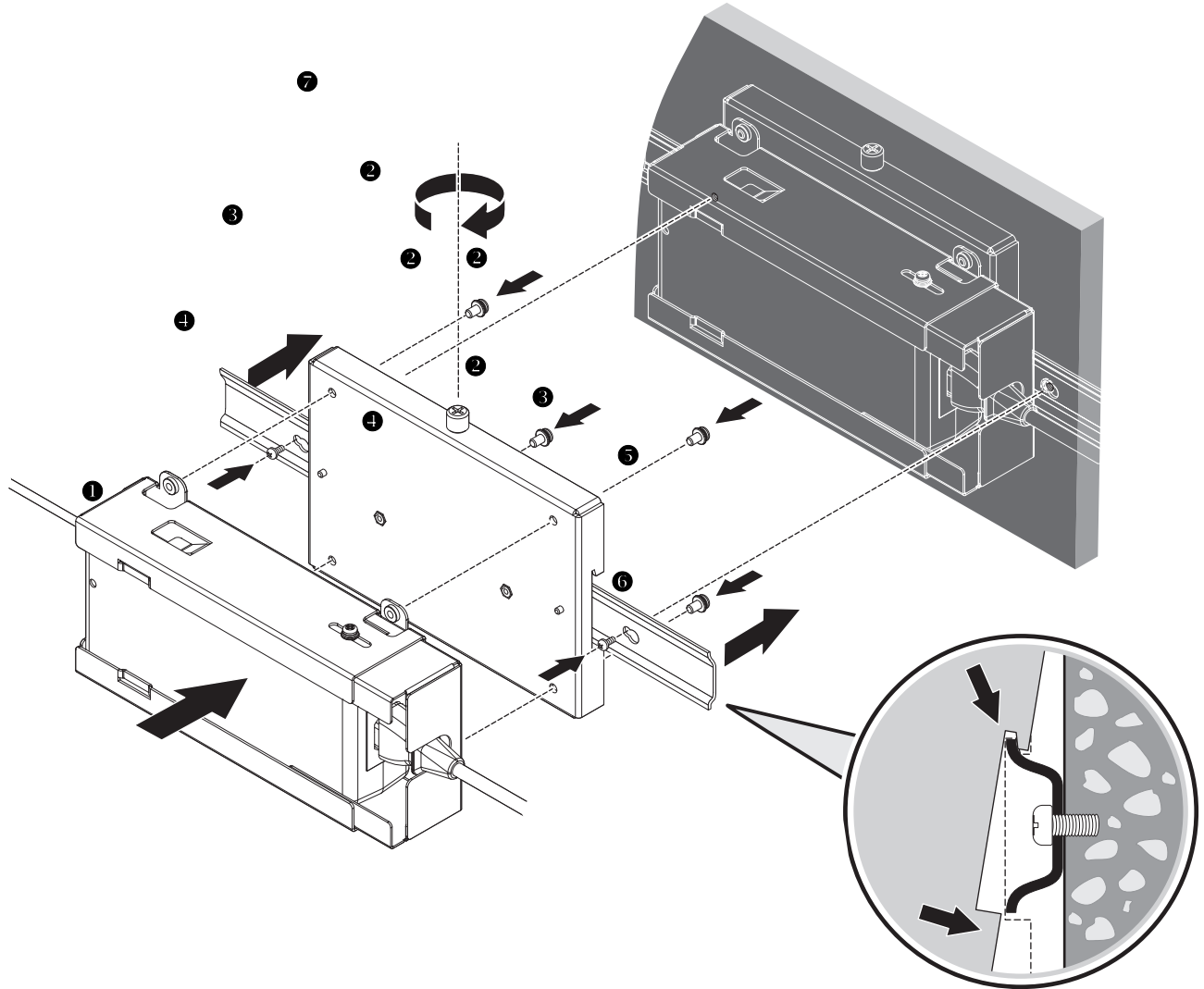
Monitor Connections

Use the connectors on the rear bottom side of the monitor to connect to a video host and a power source.
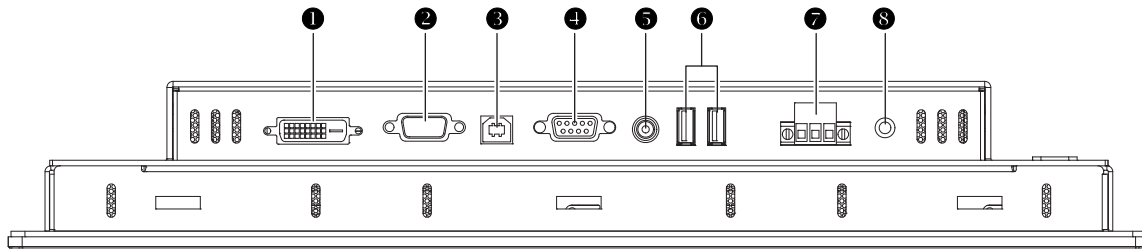
Item	Icon	Description	Item	Icon	Description
1	**DVI**	DVI port for digital video source	5	∼	Power input, AC adapter
2	▭	HD-15 VGA port for analog video source	6	⟶ USB	USB device ports, Type A (2)
3	⟶ USB	USB port, Type B for connection to host computer	7		Power input, DC terminal block
4	[O|O]	Serial port (RS-232) for touch screen interface	8	⏚	Functional ground screw

Figure 4 - Aluminum Bezel
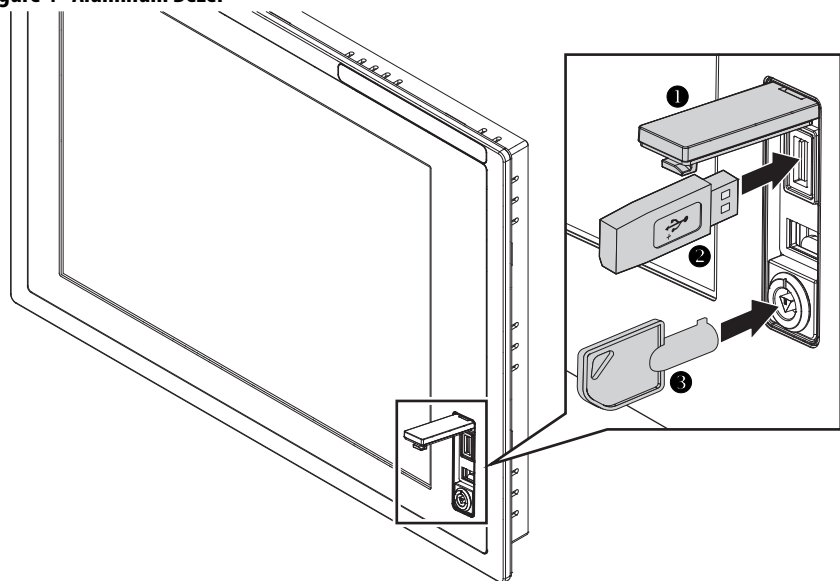
Item	Description
1	Front access panel
2	USB device port, Type A (aluminum bezel only)
3	USB key

Video Source Connection

All monitors support digital video. Your monitor ships with a high-quality DVI cable. Use this cable to connect the monitor to a digital video source.

Table 9 - Digital Video Accessories

Cat. No.	Description
6189V-DVICBL2	Digital video cable, 1.9 m (6.3 ft)
6189V-DVICBL5	Digital video cable, 5 m (16.4 ft)
6189V-PCIDVI	Dual analog/digital video card, PCI

Connect to a Host Digital Video Source

Follow these steps to connect the monitor to a digital video source.

1. Connect one end of the digital video cable to the female, DVI video port on the monitor.

2. Connect the other cable end to the output of any DVI video source.

> **TIP**   For a DVI cable longer than 5 m (16.4 ft), use a DVI cable extension.

Connect to a Host Analog Video Source

All monitors support analog video. Your monitor ships with a high-quality analog video cable. Use this video cable to connect the monitor to a video source.

Table 10 - Analog Video Accessories

Cat. No.	Description
6189V-VGACBL2	Analog video cable, 1.9 m (6.3 ft)
6189V-PCIDVI	Dual analog/digital video card, PCI

To connect the monitor to an analog video source, follow these directions.

1. Connect one end of the 1.9 m (6.3 ft) analog video cable to the female, HD-15 video input connector on the monitor.

2. Connect the other cable end to the VGA port of the computer or to the video generator VGA port, if used.

> **TIP**   You can use cables with a maximum length of 15 m (50 ft) at lower monitor resolutions, provided they are properly constructed. Video amplifiers are available for longer distances.

> **TIP**   You can connect the monitor to a video generator that does not conform to VGA standards if the generator provides analog RGB video signals (0.714V above reference black into 75 Ω) and separate horizontal and vertical sync signals. Depending on the signal, the monitor may or may not function properly.

Connect the Optional Touch Screen Interface

An optional touch screen provides a high-resolution touch input system. The driver software included with the monitor allows the touch screen to function with many Windows and Linux operating systems such as a pointing device or mouse.

A touch screen interface to the computer can be configured using either the serial RS-232 connection or USB connection.

Connect the Optional Serial RS-232 Touch Screen Interface

The RS-232 DB9 (female) D-shell connector on the bottom side of the monitor provides the serial touch screen interface connection to the host.

Follow these directions to connect the touch screen interface.

1. For units with the touch screen option, connect one end of the included touch screen serial cable to the RS-232 port connector on the monitor.

2. Connect the other end of the cable to a serial port on the host computer.

3. Tighten the captive screws on the cable connector to secure it.

The table shows how to connect the RS-232 wirings to the host serial port.

Table 11 - RS-232 Touch Screen Interface

Monitor (DCE device) DB-9 (male)	Signal Description	Host (DTE device) DB-9 (female)
1	Not Connected (DCD)	1
2	Transmit Data (TXD)	2
3	Receive Data (RXD)	3
4	Data Terminal Ready (DTR)	4
5	Common Signal Return (SG)	5
6	Not Connected (DSR)	6
7	Request to Send (RTS)	7
8	Clear to Send (CTS)	8
9	Not Connected	9

Connect the USB and Optional USB Touch Screen Interface

The USB type A connection to the host computer is used to allow USB devices and optional USB touch screen interface to the host computer.

Table 12 - USB Type A Connection Accessories

Cat. No.	Description
6189V-TCHCBL2	Serial touch cable, RS-232 cable, 1.8 m (6 ft)
6189V-USBCBL2	USB/USB touch cable, Type A to Type B, 1.8 m (6 ft)
6189V-USBKEY	USB key

Follow these directions to connect the touch screen interface.

1. Connect the USB Type B male connector end of the included USB cable to the USB Type B female connector on the monitor.

2. Connect the USB Type A male connector on the USB cable to the USB A Type female connector on the host computer.

Install the Touch Screen Driver Software

Before installing the touch screen driver software, check the following for the interface you are using.

1. RS-232 Interface: Verify that the supplied RS-232 cable is properly installed between the RS-232 input connector on the monitor and the host's COM port.

2. USB interface: Verify that the USB cable is properly installed between the USB input connector on the monitor and a USB port on the host computer.

3. Install the touch screen driver found on the Accessories CD or at http://www.rockwellautomation.com/compatibility/#/downloads.

Perform a Calibration

After installing the driver software, follow the calibration instructions in the touch screen documentation. Once the touch screen software and calibration is installed, the touch screen is ready to use.

Power Source Connection

The monitor connects to either a 100…240V AC or a 9V…36V DC power source, but cannot be connected to AC and DC voltage simultaneously.

Connect AC Power

With the AC power adapter, the monitor can use a single-phase AC power supply providing 100…240V AC at 47…63 Hz. Only use the AC adapter supplied with the monitor.

| **IMPORTANT**	Do not use the AC adapter and external DC at the same time.

Power must be available with a ground connection nearby. Whenever possible, connect the monitor to the same AC source that supplies the computer.

Table 13 - AC Power Adapter Accessories

Cat. No.	Description
6189V-MPS3	Replacement AC power adapter
6189V-MPSDIN	DIN rail mounting accessory for AC power adapter

To connect power to the monitor, follow these directions.

1. Turn off the main power switch or breaker.
2. Connect the AC adapter's 12V AC input cable to the 12V DC power-input connector on the monitor (**1**) and secure this connection by screwing the barrel over the threads (**2**).
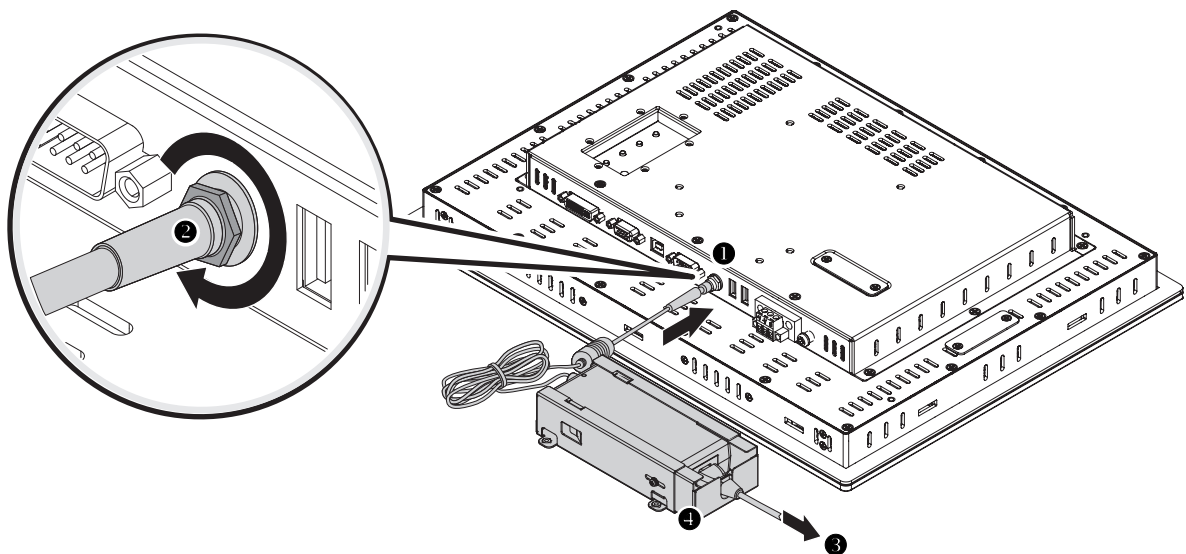
⚠	**WARNING:** In a hazardous location installation, secure the AC power cord by using the included metal cage.

3. Hard wire the AC power by using the provided AC power cord (**3**).

   Verify that the power cord is firmly secured to the AC power adapter by the metal cage already attached to the adapter (**4**).

4. Restore AC power.

Connect DC Power

The monitor connects to a 9…36V DC power source through a DC input terminal block. The DC power option supports operation from either a safety extra-low voltage (SELV) or protective extra-low voltage (PELV) power source. The power supply is internally protected against reverse voltage polarity.

> ⚠️ **ATTENTION:** Use a SELV isolated and ungrounded power supply as input power to the monitor. This power source provides protection so, under normal and single fault conditions, the voltage between the conductors and functional earth/protective earth does not exceed a safe value.

> **IMPORTANT**   Do not use the AC adapter and external DC at the same time.

Follow these steps to connect power to the monitor.

1. Turn off the main power switch or breaker.

2. Route the power wires from your DC power supply and connect the leads to the DC input terminal block on the monitor.

Terminals Screws

DC Power Wires
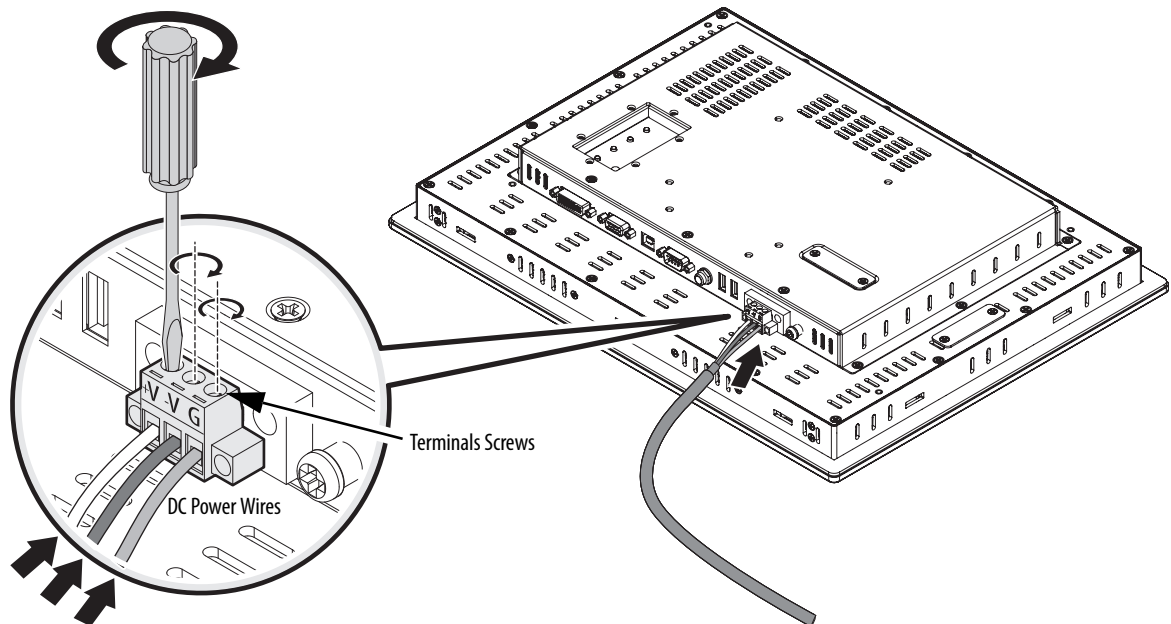
The monitor does not require a ground connection to meet any regulatory compliance when connecting DC power.

3. Tighten the screw terminals to provide a good connection.

4. Secure the terminal block connector to the unit by using the two side screws.

5. Restore DC power.

Secure the Cables

Secure all cables to each other or a fixed object after leaving the monitor by using the supplied cable ties. Securing the cables provides strain relief and avoids loose, hanging cables. It is particularly important in shock and vibration environments to reduce movement of the cables.

Functional Ground Screw

The pre-installed functional ground screw is not required for safety or regulatory compliance. However, if a supplemental ground is desired, use the functional ground screw in the I/O port panel of the monitor (**1**).

If you use the functional ground screw, connect the product to earth ground (**2**) by using a 1.5 mm^2 (16 AWG) or larger external wire. Use a ground wire with green insulation and a yellow stripe for easy identification.
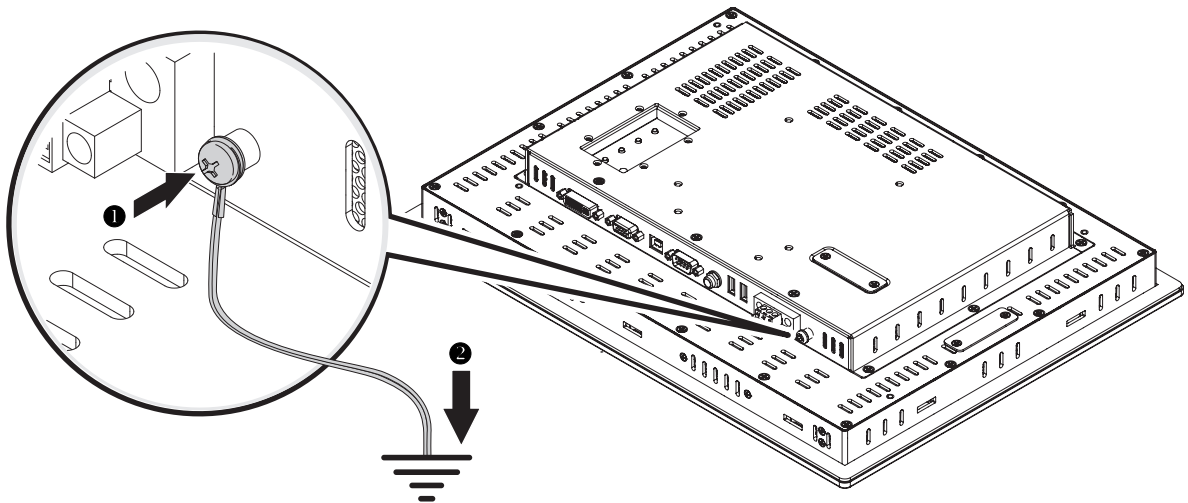
Notes:

Display Configuration

Chapter Objective

This chapter describes how to do the following:

- Set the monitor type
- Check and change the display resolution
- Adjust monitor brightness
- Adjust the display
- Enable Auto Adjust
- Use the OSD to adjust the monitor

Setting the Monitor Type

If you are using a Windows Plug and Play operating system, your computer will automatically detect the monitor type during the start-up process.

If your video card does not support Plug and Play, or if you are using the Windows NT operating system, you must set the monitor type manually. Some older video cards must also be enabled to detect the monitor type.

TIP	If your video card does support Plug and Play, but it does not appear that your monitor type has been set properly, set the monitor type manually. For example, the screen image may be too large or small, or otherwise distorted.

IMPORTANT	The monitors use a (digital) flat panel display. However, when they are driven by the computer's analog VGA interface, they are connected as an analog device. Some setup screens may indicate that the monitor is operating as a CRT (analog) device, rather than a digital or flat-panel device.

Check and Change the Display Resolution

Flat panel monitors are fixed-resolution devices. The image looks best when the monitors are operated at their native resolution. However, the monitors have advanced scaling capabilities to make the display look as good as possible while running in nonnative modes.

Native resolutions differ depending on the monitor:

- 1200M: 800x600
- 1500M: 1024x768
- 1700M and 1900M: 1280x1024

> **TIP**   Always operate the monitor at its native resolution.

If you switch the resolution of your monitor from its native resolution, the display may look slightly distorted due to the replication techniques used to fill the full screen with an image.

To check or change your monitor's display resolution, access the Display settings in the Control Panel on your computer.

Adjust the Monitor Brightness

To adjust the brightness level of the monitor, use the ⇧+⇩ buttons on the rear panel of the monitor.
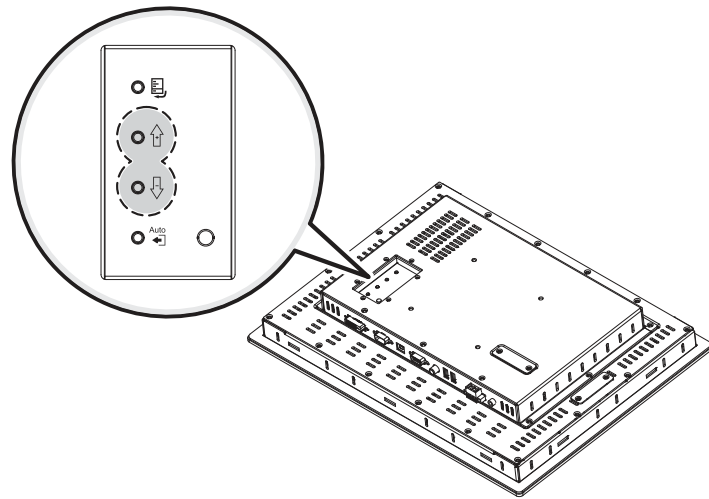
> **IMPORTANT**   Adjusting the monitor brightness higher than the factory default setting will reduce the life of the LCD display.
>
> The default setting may vary by display size and LCD model used.

Adjust the Monitor by Using Control Keypad

To adjust your monitor, use the buttons on the rear panel of the monitor.
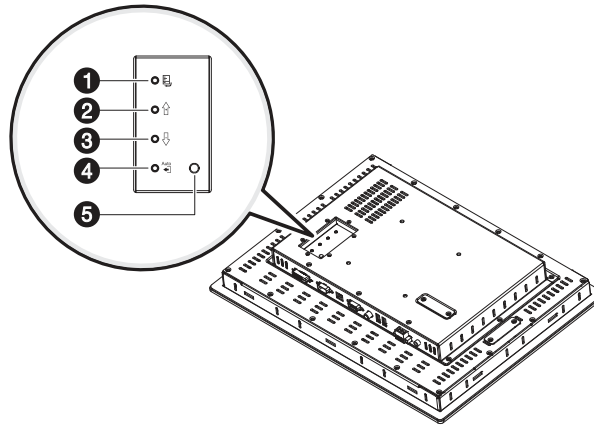
No.	Icon	Control	Function in Normal Mode	Function in OSD Mode
1		Menu/Return	Displays the on screen display (OSD).	Selects the highlighted OSD function.
2		Brightness controls[1]	Increases the display brightness.	• Moves the OSD selection to the right. • Increases the value of the selected OSD setting.
3			Decreases the display brightness.	• Moves the OSD selection to the left. • Decreases the value of the selected OSD setting.
4	Auto	Auto Adjust	Initiates automatic adjustment of the image display.	Closes the OSD screen.
5		Power/display status indicator	• Green - The monitor is on and the video signal is in sync with the video scaling engine. • Orange - The monitor is on but the video signal is not in sync with the video scaling engine; the monitor is in Standby mode. • Off - The monitor is turned off.	

(1) Press and hold the brightness control buttons simultaneously for three seconds to enable OSD lockout mode. This prevents access to the OSD. To disable this mode, press and hold the buttons again.

Lock Access to the OSD

OSD Lockout prevents unauthorized or unintentional adjustments to OSD functions.

To perform an OSD Lock or Unlock on the monitors while the OSD is off, press and hold the up and down arrow buttons simultaneously for at least three seconds.

Use the Auto Adjust Control

IMPORTANT	The Auto Adjust function applies only to a VGA **analog** video source. It has no effect on a DVI digital video source.

When the Auto Adjust ^{Auto} button is pressed, the monitor samples the input video signal and accurately adjusts the screen size, position, and phasing. This function works with most screens using reasonable video content, but Rockwell Automation ships a ScreenSet monitor set-up utility on a CD to display the best possible image for setup.

IMPORTANT	The ScreenSet monitor set-up utility is designed for only Windows 32-bit and 64-bit operating systems.

1. Insert the Accessories CD, provided with the monitor, into your computer's CD-ROM drive.

2. Locate and start the ScreenSet utility named ScreenSet.exe.

3. Press the Auto Adjust ^{Auto} button.

   The auto adjustment display appears. Your screen may flicker during the Auto Setup process. When the auto adjustment is complete, your monitor will be properly adjusted.

TIP	A computer switches through several video modes while starting. The monitor stores set-up information for each video mode. If you have trouble reading the display during the starting video modes, you can also press the Auto Adjust button during that time.

Change Monitor Settings with the On-screen Display (OSD)

Use the control buttons and On-screen Display (OSD) to modify your monitor's settings while viewing the ScreenSet setup screen. See the Perform Automatic Setup section.

The OSD contains similar menu functions for each monitor. The menus are icon driven.

General OSD Menu Navigation Guidelines

See <u>Adjust the Monitor by Using Control Keypad on page 43</u> for where the Menu/Return and arrow buttons are located. See any of the six OSD main menu tabs starting on <u>page 47</u> for where the Exit and Back buttons are located.

- Press the Menu/Return ⊞⤶ button to do the following:
    - Open the OSD main menu.
    - Activate the highlighted function.
    - Activate a highlighted sub-function.

- Press the arrow ⬆₊ ⬇₋ buttons to do the following:
    - Move between the function icons.
    - Make your changes.
    - Select the sub-function if an icon has more than one sub-button.

- As you move from one function to the other, the function menu changes to represent the correct icon.

- Press the Back ⬆ button once to return to the OSD main menu where you can select another function.

- Press the Exit button ✕ to exit the OSD main menu.

OSD Menus

You can modify the settings to the monitors by using the following menus:

- Signal Selection
- Brightness and Contrast
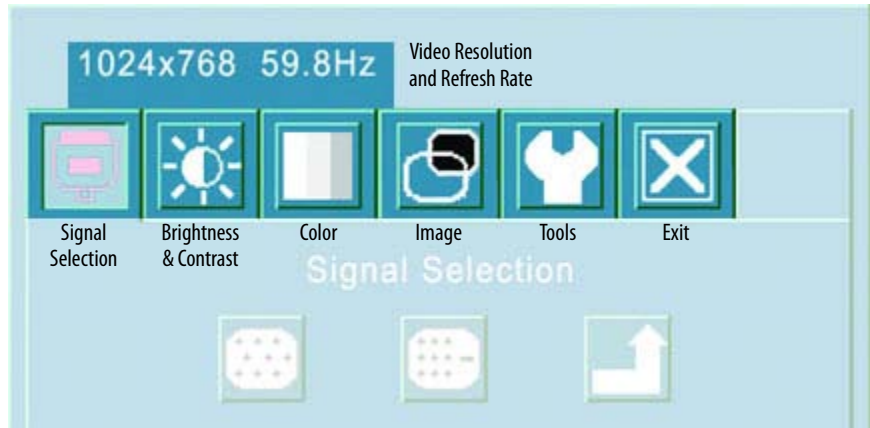- Color
- Image
- Tools

OSD Main Menu

Table 14 - Main Menu Description

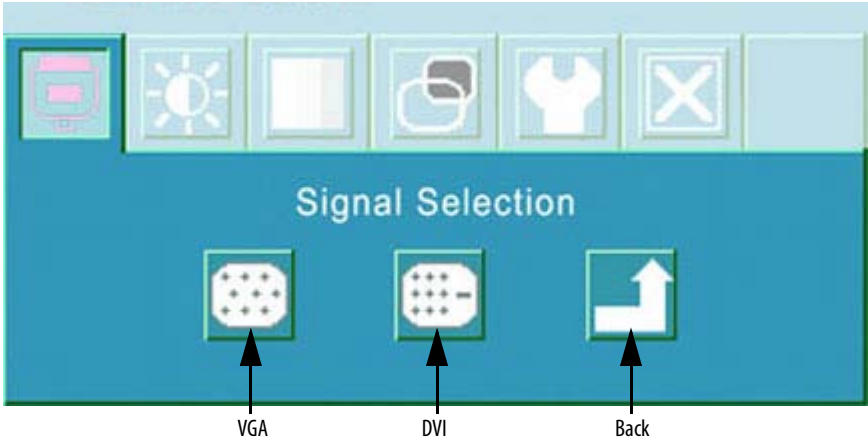| Main Menu	Description
Signal Selection	Accesses options for selecting analog or digital picture input. The input selection depends on the signal from the computer and the type of cable connected to the monitor.
Brightness & Contrast	Accesses functions to adjust the brightness and contrast.
Color	Accesses functions to select standard RGB levels, manually adjust RGB levels or set the color temperature.
Image	Accesses functions to auto-adjust the display settings or manually adjust the horizontal and vertical image position, frequency phase, and width level.
Tools	Accesses functions to adjust the OSD, reset factory settings.
Exit	Exits the OSD main menu.

Signal Selection Menu

<center>VGA   DVI   Back</center>

Table 15 - Signal Selection Menu Description

Icon	Function
VGA (analog input)	Displays the incoming VGA analog signal from the 15-pin VGA input connector. [1]
DVI (digital input)	Displays the incoming DVI digital signal from the DVI input connector. [1]
Back	Returns to the OSD main menu.

(1) The industrial monitor will autodetect either an analog VGA or digital DVI input if present.

Brightness and Contrast Menu

<center>Brightness   Contrast   Back</center>
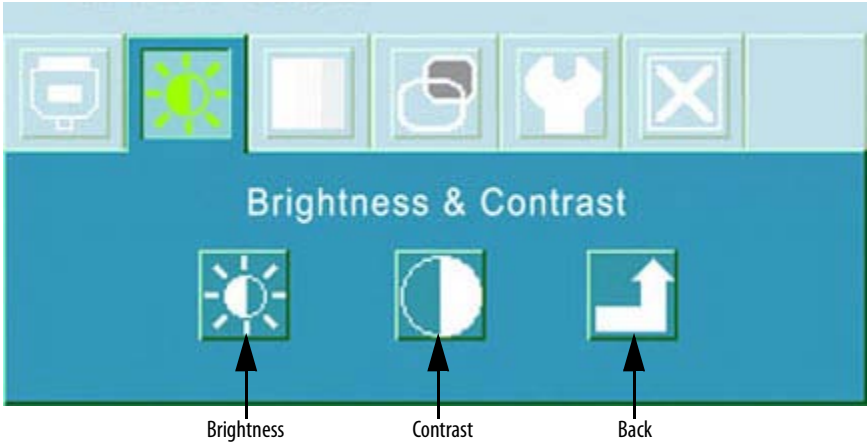
Table 16 - Brightness and Contrast Menu Description

Icon	Function	Value Range
Brightness	Adjusts the brightness of the screen.	0…100 [1]
Contrast	Adjusts the contrast of the screen.	0…100 with the default 50.
Back	Returns to the OSD main menu.	

(1) Adjusting the monitor brightness higher than the factory default setting will reduce the life of the LCD display. The factory default setting may vary by size and LCD model used.

> **TIP**   The more common way to adjust brightness is to use the Brightness Adjust button on the back of the monitor.

Color Menu

Manual   sRGB   Temperature   Back
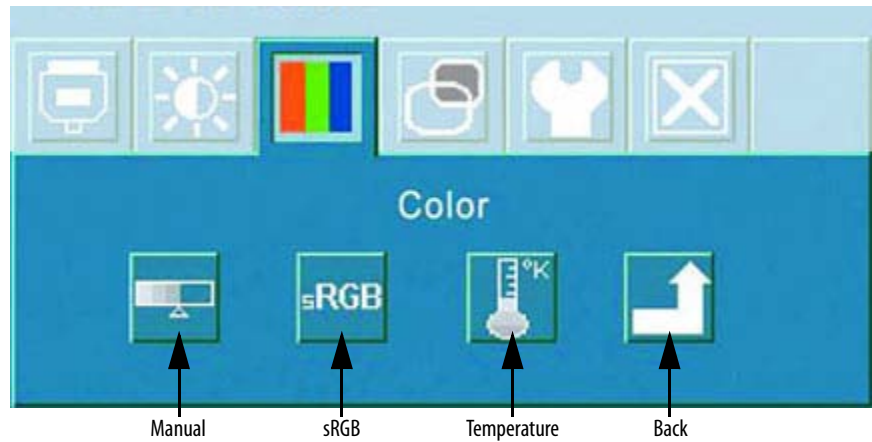
Temperature Submenu

Table 17 - Color Menu and Temperature Submenu Descriptions

Color Functions	Description	Value Range
Manual	Adjusts the amount of red, green, and blue on the screen.	0...100
sRGB	Automatically adjusts the RGB settings.	
Temperature	Adjusts the color temperature values.	
Back	Returns to the OSD main menu.	

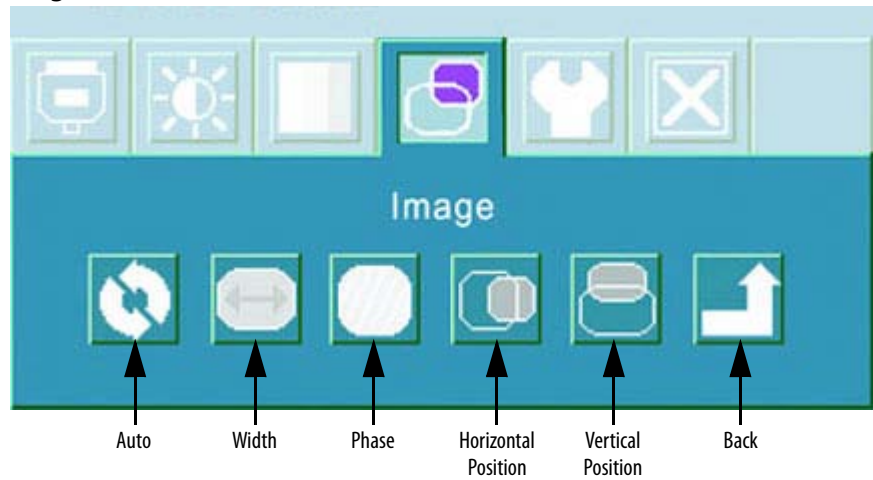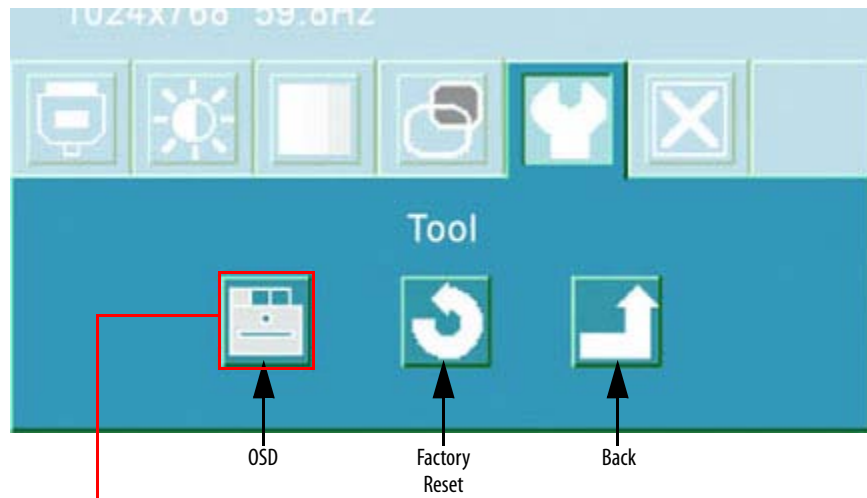| Temperature Functions	Description	Value Range
Temperature Settings	Sets the white point/color temperature based on degrees Kelvin (K): • 4200 • 5000 • 6500 = typical personal computer • 7500 • 9300 = typical television and monitor default setting	4200...9300
Back	Returns to the Color menu.	

Image Menu
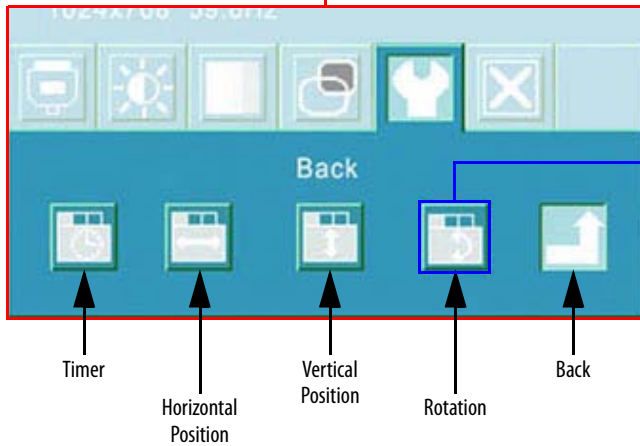

Table 18 - Image Menu Description

Image Functions	Description	Value Range
Auto	Automatically adjusts the horizontal and vertical image position, frequency phase, and black level.	
Width	Adjusts the width.	0...100
Phase	Adjusts the sampling phase.	0...100
Horizontal Position	Adjusts the horizontal position of the image on the screen.	0...100
Vertical Position	Adjusts the vertical position of the image on the screen.	0...100
Back	Returns to the OSD main menu.	

TIP   The Image functions are not available with a DVI connection.

Tool Menu

OSD	Factory Reset	Back

OSD Submenu **Rotation Submenu**

Timer

Horizontal Position

Vertical Position
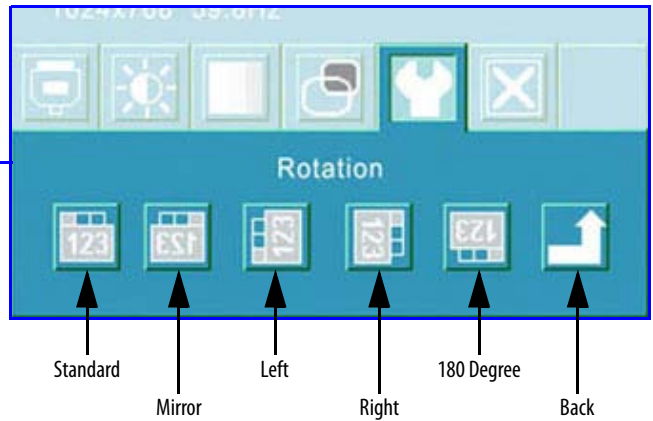
Rotation

Back

Standard

Mirror

Left

Right

180 Degree

Back

Table 19 - Tool Menu, OSD Submenu, and Rotation Submenu Descriptions

Tool Functions	Description
OSD	Accesses the OSD submenu.
Factory Reset	Resets all OSD settings to factory defaults.
Back	Returns to the OSD main menu.

IMPORTANT	All saved settings are lost when you reset OSD settings to the factory defaults.

OSD Functions	Description	Value Range
Timer	Sets a maximum idle time for exiting the OSD system if input is not received.	0…60 seconds in increments of 1 second
Horizontal Position	Adjusts the horizontal position of the OSD menu.	0…100
Vertical Position	Adjusts the vertical position of the OSD menu.	0…100
Rotation	Adjusts the direction of the OSD menu.	See submenu below
Back	Returns to the Tools menu.	

Rotation Functions[1]	Description
Standard	Images are upright and text is read left-to-right.
Mirror	Images and text are reversed (backwards).
Left	View moves from bottom-to-top of monitor.
Right	View moves from top-to-bottom of monitor.
180 Degree	Images and text are reversed and upside down.
Back	Returns to the Tools menu.

(1) Rotation functions apply to display but not the monitor. See installation guidelines on page 20 for monitor orientation.

Perform Routine Maintenance

Chapter Objective

This chapter describes how to clean the monitors and perform other routine maintenance.

Cleaning the Monitor

Occasionally clean the display panel and cabinet with a soft cloth dampened (not soaked) with a mild (nonabrasive) glass cleaner. Keep turning a fresh side of the cloth toward the screen surface to avoid scratching it with accumulated grit.

IMPORTANT	Apply the solvent only to the cloth, and not directly on the monitor screen. Do not use paper products as they may scratch the surface. To minimize the risk of abrasion, allow the screen to stand dry.

⚠	**ATTENTION:** You can use alcoholic or ammonia cleaners to clean the polycarbonate shield or a touch screen. However, use only one or the other at all times. A residue mixture can cause a chemical reaction.

Be careful when cleaning a touch screen shield that is installed over the screen. Abrasive and certain chemical cleaners can easily damage the surface.

Cat. No.	Description
6189V-SCRNCOVER12	12" Screen Cover for flat front bezels
6189V-SCRNCOVER15	15" Screen Cover for flat front bezels
6189V-SCRNCOVER17	17" Screen Cover for flat front bezels
6189V-19SCRNCVR	19" Screen Cover for flat front bezels

Replacing a Line Cord

To avoid shock and fire hazards, replace the monitor's power cord if the insulation breaks or if the cord develops a loose internal connection. Contact your authorized Allen-Bradley distributor for ordering information.

Other Maintenance

Qualified service personnel should perform all maintenance, except for the power cord replacement. Contact Allen-Bradley Technical Support for assistance.

Shipping or Transporting Product

If you need to ship your monitor via common carrier or otherwise transport it to another location, you must first uninstall the monitor and place it in its original packing material.

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

Troubleshoot the System

Chapter Objective

This chapter describes how to identify and resolve monitor anomalies.

Run the Self-test

Use the self-test feature to verify that your monitor is running correctly. If the monitor and computer are properly connected but the monitor remains dark and the power indicator is blinking, run the self-test.

Follow these directions to run the self-test.

1. Power down the computer and monitor.

2. Unplug the video cable from the back of the computer.

3. Power up the monitor.

If the monitor is functioning properly, you will see a self-test box that reads, No Signal.

IMPORTANT	This self-test box also appears during normal operation if the monitor is disconnected.

4. Power down your monitor.

5. Reconnect the video cable to the back of the computer.

6. Turn on your computer and your monitor simultaneously.

7. If your monitor screen remains blank after the previous procedure, check your video controller and computer system because your monitor is functioning properly.

Troubleshooting

The troubleshooting table lists typical problems you may encounter when using your monitor. It contains symptoms and possible actions to correct a problem.

> **TIP**   Perform an Auto Adjust if there is a video problem. If this action does not correct the problem, see the Troubleshooting table for additional corrective actions.

Table 20 - Troubleshooting

Symptom	Action
No signal message	Check the video cable connection between the computer and monitor. Make sure you are using the video cable supplied with the monitor or a similar high quality cable.
	Perform the automatic video adjustment function.
Screen is blank	The video mode may be out of range. Change to the native resolution.
	Disable the screen saver.
	Adjust the brightness and contrast settings by using the appropriate OSD menu.
	Verify that the power cord is connected.
	Test the outlet by plugging in a properly functioning device.
	Replace the suspected faulty cable or power cord.
	Have the monitor serviced.
Out of range message	Check the maximum resolution and the frequency on the video port of your computer.
Picture is scrambled	The video mode may be out of range. Change to the native resolution.
	Check the video cable connection between the computer and monitor. Make sure you are using the video cable supplied with the monitor or a similar high quality cable.
	Check the maximum resolution and the frequency of the video port of your computer.
	Perform the automatic video adjustment function.
Picture is not clear	Verify the screen refresh frequency rate: 1. Click the Control Panel>Displays>Settings. 2. Select the Monitors tab and then click Advanced. 3. Try refresh frequencies of 60 Hz, 70 Hz, or 75 Hz. **Note:** Settings higher than 75 Hz will not display.
	Check the video cable connection between the computer and monitor. Make sure you are using the video cable supplied with the monitor or a similar high quality cable.
	Perform a monitor power reset.
	Eliminate unnecessary accessories such as video extension cables.
	Perform the automatic video adjustment function.
Vertical shaded bars on screen image	Image lock is not properly adjusted. Reset the horizontal positioning using the appropriate OSD menu.
Picture has blurry streaks or ghosting to the right of objects on the screen	Adjust the contrast settings using the appropriate OSD menu.
Images are too bright or too dark	Adjust the brightness and contrast settings by using the appropriate OSD menu. Brightness problems that cannot be corrected may be the result of poor video signal output from the video source.
Image is not stable	The video mode may be out of range. Change to the native resolution.
	Check for proper video cable installation. Replace the suspected faulty cable.
Screen jitter or noisy video	The video mode may be out of range. Change to the native resolution.
	Check for proper video cable installation. Replace the suspected faulty cable.
	Reroute the cables or replace suspected faulty cables.
	Check the host computer and monitor grounding.

Table 20 - Troubleshooting

Symptom	Action
Image is dim, even with brightness and contrast controls set to highest level	Check for proper video cable installation. Replace the suspected faulty cable.
	Test the video source by connecting to another monitor that you know is operational. Brightness problems that cannot be corrected may be the result of poor video signal output from the video source.
Screen image is not centered or sized properly	The video mode may be out of range. Change to the native resolution.
	Adjust the horizontal and vertical position settings by using the appropriate OSD menu.
	Check the image size selection by using the appropriate OSD menu.
	Perform the automatic video adjustment function.
Color is not uniform Colors are distorted with dark or shadowed areas White does not look white	Adjust the color setting using the appropriate OSD menu.
The power indicator is amber	The monitor is using its power management.
Lock icon appears when any OSD key is pressed. 	Press and hold both brightness buttons for at least three seconds to unlock the OSD menu.

Notes:

Specifications

Table 21 - Display

Attribute	1200M Models	1500M Models	1700M Models	1900M Models
Display type	Color active matrix TFT LCD			
Display size (diagonal)	12.1 inch (307 mm)	15.0 inch (381 mm)	17.0 inch (432 mm)	19.0 inch (483 mm)
Display areas (WxH)	246 x 185 mm (9.7 x 7.3 in.)	304 x 228 mm (12.0 x 9.0 in.)	338 x 270 mm (13.3 x 10.7 in.)	376 x 301 mm (14.8 x 11.9 in.)
Native resolution (WxH)	800 x 600, 262K colors	1024 x 768, 16.2M colors	1280 x 1024, 16.7 M colors	
Supported resolution and refresh rates [1]	• 720 x 400 @ 70 Hz • 640 x 480 @ 60 Hz, 75 Hz • 800 x 600 @ 60 Hz, 75 Hz • 1024 x 768 @ 60 Hz, 70 Hz, 75 Hz • 1280 x 1024 @ 60 Hz, 75 Hz			
Luminance, typical	450 cd/m^2 (Nits)		350 cd/m^2 (Nits)	300 cd/m^2 (Nits)
Contrast ratio, typical	1000:1	700:1	1000:1	1300:1
Aspect ratio	4:3		5:4	
Response time, typical	<35 ms			
Backlight life, min	50,000 hours to half-life at 25 °C (77 °F)			

(1)   These resolution and refresh rates are typically supported for each monitor size up to its native resolution.

Table 22 - Video

Attribute	1200M Models	1500M Models	1700M Models	1900M Models
Video bandwidth [1]	42 MHz	80 MHz	140 MHz	
Analog video input signal	RGB analog [2]			
Analog sync input signals	Separate horizontal and vertical sync control, TTL signal levels			

Video input connectors
    Analog video signal
    Digital video signal
	HD-15 VGA
	DVI			

(1)   Maximum video dot clock.
(2)   White level = 0.700V above ref. Black, into 75 Ω.

Table 23 - USB Interface

Attribute	1200M Models	1500M Models	1700M Models	1900M Models
Type B USB port	1 back side (host computer port)			
Type A USB 2.0 port	• 1 on front side (aluminum bezel only) • 2 on back side			
Current capacity	500 mA per port			

Table 24 - Electrical

Attribute	1200M models	1500M models	1700M models	1900M models
Input voltage, AC	100…240V AC, autoswitching			
Line frequency	47…63 Hz			
Power consumption, max[1]	34 W		55 W	57 W
Input voltage, DC	9…36V DC			

(1)   Maximum power consumption with three USB ports fully loaded at 500 mA each.

Table 25 - Environmental

Attribute	1200M models	1500M models	1700M models	1900M models
Enclosure ratings[1]	NEMA UL 50 Type 1, 4, 4X, 12, and IP66			

Temperature[2]
    Operating
    Nonoperating
	0…55 °C (32…131 °F)
	-20…60 °C (-4…140 °F)
			0…50 °C (32…122 °F)
			-20…60 °C (-4…140 °F)	

Relative humidity	10…90% noncondensing			

Shock
    Operating
    Nonoperating
	20 g (1/2 sine, 11 ms)
	30 g (1/2 sine, 11 ms)			

Vibration[3]	2 g peak, 10…640 Hz			

(1)   Applies to panel-mounted monitors only.
(2)   At 40 °C (104 °F) operating temperature, the humidity must not exceed 90%. At 50 °C (122 °F) operating temperature, the humidity must not exceed 50%. Operating the monitors beyond these limits for extended periods of time can reduce the life of the product.
(3)   For operating and non-operating conditions.

Table 26 - Mechanical

Attribute	1200M Models	1500M Models	1700M Models	1900M Models
Dimensions (H x W x D)	260 x 340 x 61 mm (10.24 x 13.39 x 2.4 in.)	309 x 410 x 61 mm (12.2 x 16.14 x 2.4 in.)	356 x 452 x 61 mm (14.02 x 17.80 x 2.4 in.)	399 x 483 x 64 mm (15.71 x 19.02 x 2.52 in.)

Weight, approx
    Aluminum bezel
    Stainless steel bezel
	4.4 kg (9.75 lb)
	—
		7.3 kg (16 lb)
		8.6 kg (19 lb)
			8.6 kg (19 lb)
			10.1 kg (22.25 lb)
				10.2 kg (22.5 lb)
				11.9 kg (26.25 lb)

Mounting options	• Panel • Bench • Tabletop • Rack • DIN rail for AC power adapter			• Panel • Bench • Tabletop • DIN rail for AC power adapter

Table 27 - Certifications

Attribute	1200M Models	1500M Models	1700M Models	1900M Models
Certifications[1]	UL Listed Class I, Division 2, per ISA 12.12.01 (when marked on the nameplate) cUL Listed Class I, Division 2, per CSA No. 213 (when marked on the nameplate)			
	CE marked for all applicable directives RoHS compliant			
	C-Tick			
	China RoHS			
	Turkey RoHS			

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

Video Cables

You can use the HD-15 and DVI cables included with your monitor to connect the monitor to the host computer.

HD-15 Video Connector

The HD-15 video cable 1.83 m (6 ft) is equipped with a conventional HD-15 connector at each end.

The illustration shows the connector looking into the pin end of a male connector or the solder term end of a female connector.

The Standard DVI Video Cable table provides the pin numbers and corresponding pin assignments for the HD-15 video connector with the DDC2B capability.
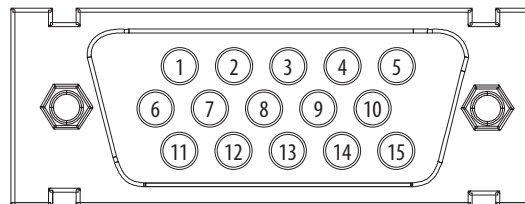
Table 28 - Standard HD-15 Video Cable

Monitor (female)	Signal Description	Host (male)	Monitor (female)	Signal Description	Host (male)
1	Red Video	1	9	VGA Power	9
2	Green Video	2	10	Not Used	10
3	Blue Video	3	11	Not Used	11
4	Not Used	4	12	DDC Data	12
5	Hot Plug Detect	5	13	Horizontal Sync	13
6	Red Video Ground	6	14	Vertical Sync	14
7	Green Video Ground	7	15	DDC Clock	15
8	Blue Video Ground	8			

DVI Video Connector

This table provides the pin numbers and corresponding pin assignments for the 2 m (6.56 ft) long DVI video cable. Each connector is female.
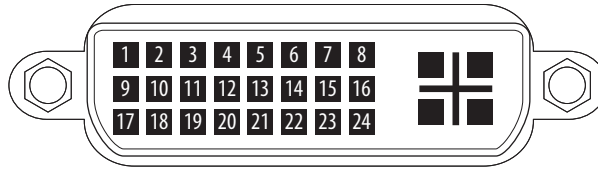
Table 29 - Standard DVI Video Cable

Pin #	DVI Port	Pin #	DVI Port
1	DATA2-	13	Not Used
2	DATA2+	14	DVI Power +5V
3	DATA 2/4 Shield	15	Ground
4	Not Used	16	Hot Plug Detect
5	Not Used	17	DATA0−
6	DDC Clock	18	DATA0+
7	DDC DATA	19	DATA 0 Shield
8	Not Used	20	Not Used
9	DATA1-	21	Not Used
10	DATA1+	22	Clock Shield
11	DATA 1/3 Shield	23	Clock+
12	Not Used	24	Clock−

Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products. At http://www.rockwellautomation.com/support/, you can find technical manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools.

For an additional level of technical phone support for installation, configuration, and troubleshooting, we offer TechConnect℠ support programs. For more information, contact local Allen-Bradley distributor or Rockwell Automation sales representative, or visit http://www.rockwellautomation.com/support/.

Installation Assistance

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

United States or Canada	1.440.646.3434
Outside United States or Canada	Use the Worldwide Locator at http://www.rockwellautomation.com/support/americas/phone_en.html, or contact your local Rockwell Automation representative.

New Product Satisfaction Return

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

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

Documentation Feedback

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