Industrial Flat Panel Monitors

VisuNet IND DM5xx Series

Manual

Your automation, our passion.

PEPPERL+FUCHS

With regard to the supply of products, the current issue of the following document is applicable: The General Terms of Delivery for Products and Services of the Electrical Industry, published by the Central Association of the Electrical Industry (Zentralverband Elektrotechnik und Elektroindustrie (ZVEI) e.V.) in its most recent version as well as the supplementary clause: "Expanded reservation of proprietorship"

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1 System Operator and Personnel

The operator of the system is responsible in terms of planning, mounting, commissioning, operating, and maintenance.

Assembly, commissioning, operation, and dismounting of any devices may only be carried out by trained, qualified personnel who have read and understood the instruction manual. No internal components are field replaceable. Any internal fuses or batteries must be replaced at the factory.

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2 Introduction

Thank you for choosing a Pepperl+Fuchs VisuNet monitor. We have designed our products for easy installation, configuration, and use. While there is nothing difficult or tricky about installing this monitor, you should read this entire manual prior to installation. It is not long and may save you some time in the end. If, after reading this manual and visually inspecting the monitor, you are still unsure of how to properly install and operate, please ask for assistance.

This monitor can be used as either a digital or an analog monitor. This means it is designed to automatically work with any standard DVI or VGA connection from a computer. There are no special hardware modules, PROMS, cables, or custom software drivers required.

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3 Warnings and Cautions

When so labeled, this equipment is suitable for use in Class I, Division 2, Groups A, B, C, and D; Class II, Division 2, Groups F, G; ATEX \ IECEx Zone 2; or non-hazardous locations only.

When so labeled and installed in an enclosure that reduces environment to a Division 2/Zone 2/Zone 22 or non-hazardous location, this equipment is suitable for use in Class I, Division 1 Groups A, B, C, and D, and Class II Division 1 Groups F and G, as well as ATEX/IECEx Zone 1.

When powered, internal voltages present can be lethal. There are no user serviceable parts inside. Direct all service work to the manufacturer or an authorized repair facility. This product contains sensitive electronic components and glass. Dropping or extreme shocks may damage or break the glass. Such abuse is not covered under warranty. This product is intended to be mounted in a suitable cabinet or other enclosure. The NEMA 12, 13, 4 ratings are applicable only when properly installed in a like rated enclosure. All peripheral equipment must also be suitable for the location it is used in.

Power, input, and output (I/O) wiring must be in accordance with Class I, Class II/Div. 2 wiring methods [Article 501.4(B) of the National Electrical Code, [NFPA 70] and in accordance with the authority having jurisdiction. The cabinet for installations in Division 2 must be suitable for Div. 2 wiring.

Warning!

EXPLOSION HAZARD. DO NOT DISCONNECT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITIBLE CONCENTRATIONS.

AVERTISSEMENT - RISQUE D'EXPLOSION - AVANT DE DECONNECTER L'EQUIPEMENT, COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DESIGNE NON DAN-GEREUX.

Warning!

EXPLOSION HAZARD-SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR USE IN DIVISION 2.

AVERTISSEMENT - RISQUE D'EXPLOSION - LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATERIEL INACCEPTABLE POUR LES EMPLACEMENTS DE DIVISION 2.

This product contains a high-voltage inverter circuit. When powered, internal voltages present can be lethal. There are no user serviceable parts inside. Please direct all service work to the manufacturer or an authorized repair facility.

This product contains sensitive electronic components and glass. Dropping or extreme shocks may damage or break the glass. Such abuse is not covered under warranty.

This product is intended to be mounted in a suitable cabinet or other enclosure. The NEMA 12, 13, 4 ratings are applicable only when properly installed in a like rated enclosure. All peripheral equipment must also be suitable for the location it is used in.

Where "ATEX \ IECEx" appears throughout this document, it shall be understood that 'ATEX' applies to ATEX installation applications only, and "IECEx" applies to IECEx installation applications only.

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4 Certification Markings

Labels for V3 Option

Figure 4.1

Figure 4.2

Label for D1 Option
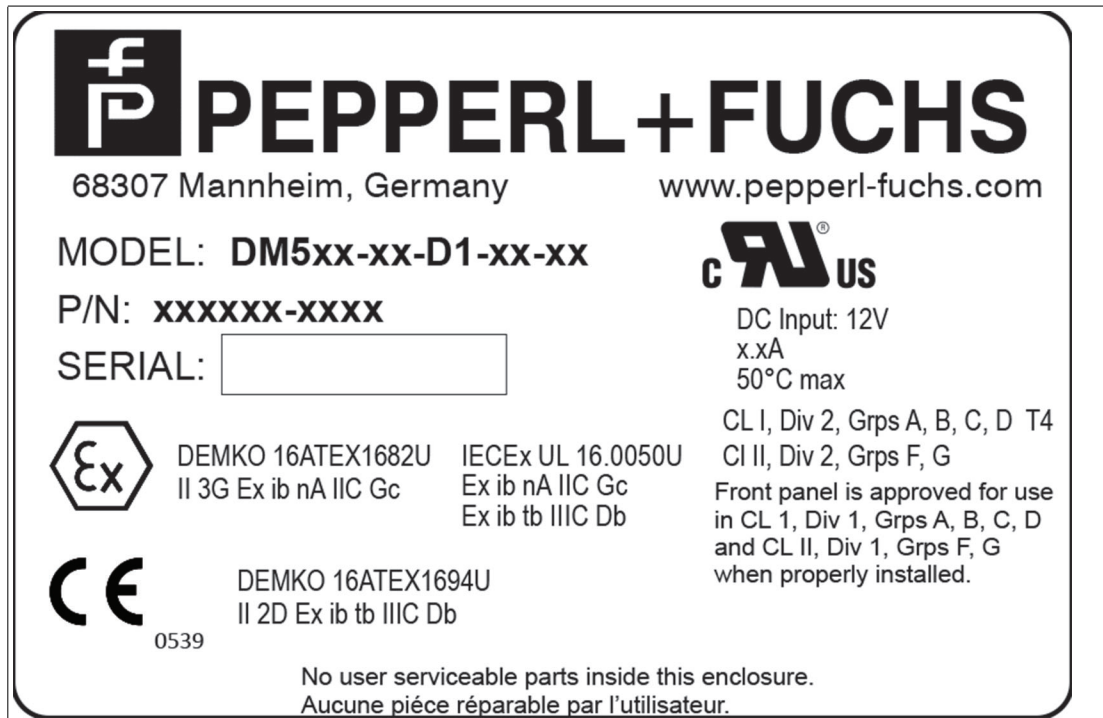
Figure 4.3

Model	Current Rating
DM512	1.2 A max.
DM515	2.5 A max.
DM519	3.8 A max.
DM521	4.1 A max.
DM522	4.4 A max.

Certification for V3 Option

ATEX Certificate:

DEMKO 14 ATEX 1379X

IECEx Certificate:

IECEx UL 14.0090X

ATEX Marking:

II 3G

Marking with touch screen:

Ex nA nC IIC T4 Gc

Marking without touch screen:

Ex nA IIC T4 Gc

Standards:

IEC EN 60079-0:2012/A11:2013

IEC EN 60079-15:2010

UL File E190294

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Class I Division 2 Groups A, B, C, D, T4

Class II Division 2 Groups, F, G, T4

Class III T4

Certification for D1 Option

ATEX Certificate:

DEMKO 16 ATEX 1682U DEMKO 16 ATEX 1692U

IECEx Certificate:

IECEx UL 16.0050U

ATEX Marking:

II 3G II 2D

Marking:

Ex ib nA IIC Gc Ex ib tb IIIC Db

Standards:

IEC EN 60079-0:2012/A11:2013

IEC EN 60079-11:2010

IEC EN 60079-15:2012

IEC EN 60079-31:2014

UL File E190294

Class I Division 2, Groups A, B, C, D

Class II Division 2, Groups F, G

Suitable for Class I, Division 1, Groups A, B, C, D

Suitable for Class II, Division 1, Groups F, G

5 Conditions of Safe Use

Conditions of Safe Use - General

- The devices shall be mounted in an IECEx / ATEX certified enclosure with a minimum ingress protection rating of at least IP54 and used in an area of not more than pollution degree 2 as defined in IEC 60664-1.
- The enclosure must utilize a tool removable cover or door.
- Provision shall be made external to the equipment to provide transient protection at a level not exceeding 119 V at the power supply terminals.
- The standard 5-wire resistive touch screen ("TA" option) has not been evaluated for potential damage from UV exposure. Therefore, installation is restricted against direct exposure to sunlight.
- Examples of acceptable installations include indoor applications away from direct sunlight; outdoor applications with shading to prevent direct sunlight; etc. Regular inspections are necessary to check for deterioration of the touch screen. Return the VisuNet apparatus to factory for repair or replace the VisuNet apparatus if damage is detected.

Conditions of Safe Use - D1

- The intrinsic safety barrier, gaskets and touch screens are suitable for a service temperature range of -20°C to 50°C.
- When mounted in a method that reduces the environment of the back side of the component to EPL Gc or nonhazardous, the exposed display/touch-screen is suitable for EPL Gb and/or Db.
- The input terminals are suitable for field wiring. See manual for installation details.
- The standard 5-wire resistive touch screen (TI option) has not been evaluated for potential damage from UV exposure. Therefore, installation is restricted against direct exposure to sunlight is required. Regular inspections are necessary to check for deterioration of the touch screen.
- Brightness Control Buttons - located on the back of the unit, were not evaluated as 'ic' circuits.
- The component is equipped with a separate ground terminal for the intrinsic safety barrier. Proper handling of this ground connection is required.
- The standard resistive touch screen (TI option) does not pose a static hazard from normal use when the component is properly installed. Keep away from high charge processes.
- The hardened resistive touch screen (HI option) has an outer layer of glass and no special consideration for static is required.
- When used within the service temperature range, the touch screen is suitable for a T6 temperature classification.

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6 Technical Specification

Resolution	
10" resolution	800 x 600 px
12" resolution	800 x 600 px
15" resolution	1024 x 768 px
19" resolution	1280 x 1024 px
21.5" resolution	1920 x 1080 px
22" resolution	1680 x 1050 px

Ambient conditions	
Degree of protection	IP66, NEMA 4x (front face, panel mount only)
Operating temperature	-20°C to 50°C
Storage temperature	-20°C to 60°C
Rel. humidity	0% to 90% (non-condensing)

Mechanical data	
Vibration	5 ... 100 Hz, 1 g, 12 m/s2, all axes
Shock	30 g, 6 ms, all axes

Directives and Standards	
2014/30/EU (EMC)	EN 61326-1:2013
2014/34/EU (ATEX)	EN 60079-0:2012/A11:2013 EN 60079-15:2010

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Note

The DM510 is only certified for Class I/Div 2 and Class II/ Div 2. It is not ATEX/IECEx Zone 2 certified.

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7 Power Supply

This product requires a regulated external power source to provide power as follows:

DM510 series	+12 VDC, 1.2 A continuous
DM512 series	+12 VDC, 1.2 A continuous
DM515 series	+12 VDC, 2.5 A continuous
DM519 series	+12 VDC, 3.8 A continuous
DM521 & DM522 series	+12 VDC, 4.1 A continuous
Output line regulation	+/- 0.2% or better
Output load regulation	+/- 5% or better

Class I, Class II/Div. 2 and Zone 2 Installation Requirements

Use an appropriate Div. 2/Zone 2 listed switched-mode power supply, rated as above and marked Class 2, Limited Power Source, or LPS. Follow local wiring codes and regulations that may apply. For applications requiring CE marking, a Series B or greater product is required with a CE marked power supply.

Power, input/output (I/O) wiring must be in accordance with Class I, Class II/Div. 2 wiring methods [Article 501.4(B) of the National Electrical Code, NFPA 70] and in accordance with the authority having jurisdiction. The cabinet for installations in Division 2 must be suitable for Division 2 wiring.

The enclosure cabinet for Zone 2 installations must be ATEX / IECEx marked IP54, or better, and the door and covers must be tool removable. Provision shall be made to provide transient protection device to be set at a level not exceeding 140% of the rated voltage at the power supply terminals of the apparatus.

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8 Sunlight Readable Display

For applications in high ambient light, there are options for a high bright display for sizes 15" (1200 nit), 19" (1000 nit), and 21.5" (1200 nit). Refer to the datasheet for specifications and model configuration.

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9   Cabinet or Panel Mounting

The monitor is designed for easy panel mounting in a control or machine cabinet. Ensure that the mounting surface is flat so as not to bend or twist the bezel or compromise the usefulness of the outer gasket. Use the mounting clips provided to secure your monitor from the inside of the cabinet. The outer dimensions of the front bezel are:

Series	Dimensions
DM510	12.1" W x 9.9" H (307 mm x 251 mm)
DM512	13.9" W x 11.5" H (353 mm x 292 mm)
DM515	16.9" W x 13.6" H (430 mm x 345 mm)
DM519	19.0" W x 16.2" H (483 mm x 411 mm)
DM 521 & DM522	22.5" W x 15.5" H (572 mm x 394 mm)
Max. enclosure wall thickness	0.25" (6.4 mm)

1. Cut a hole

Cut or punch a rectangular hole in your cabinet or panel. Clean and deburr the edges.

Panel cut out	Dimensions
DM510 series	11.05" W x 8.85" H +/- 0.07" (281 mm x 225 mm +/- 2 mm
DM512 series	12.62" W x 10.20" H +/-.07" (321 mm x 259 mm +/- 2 mm)
DM515 series	15.92" W x 12.60" H +/- 0.07" (404 mm X 320 mm +/- 2 mm)
DM519 series	17.92" W x 15.17" H +/- 0.07" (455 mm x 385 mm +/- 2 m)
DM521 & DM522 series	21.10" W x 14.10" H +/- 0.07" (536 mm x 358 mm +/- 2 mm)

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2. Pre-assemble the mounting clip

Pre-assemble the mounting clips by threading each thumbscrew about 1/4 of the way into a clip. Note that the thumb head goes on the 2-prong side of the clip and the threaded side goes towards the single prong side.

Figure 9.1

3. Locate the mounting slots

Locate the rectangular mounting slots in the rear metal case of your monitor. There are slots located on top, bottom, and each side.
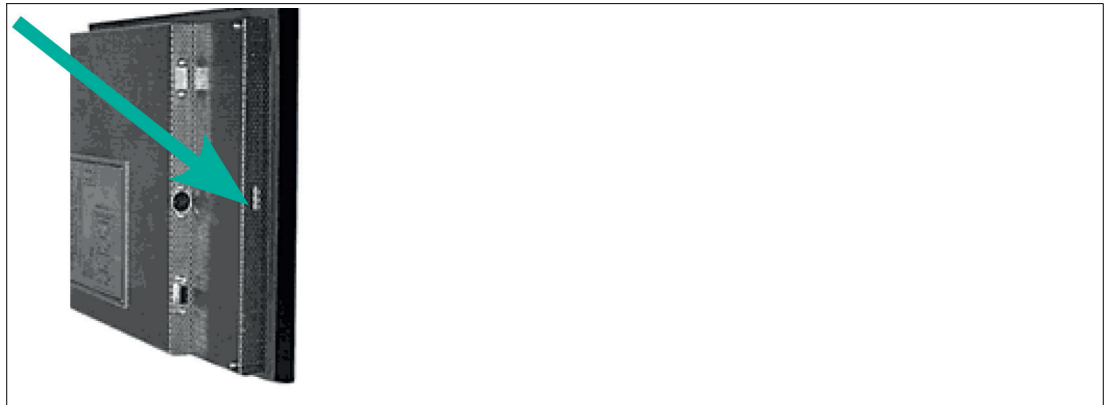

Figure 9.2

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4. Insert mounting clips and tighten

With the monitor placed in the panel cutout, insert the clips, single prong side first into the rectangular holes in the rear metal case. Tighten the thumbscrews firmly to compress the outer gasket; when tight, the front bezel should almost touch your enclosure surface.

Figure 9.3

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10 Wiring the Monitor

There are several electrical connections to be made depending on your exact monitor configuration. All connectors are located in the middle of the rear enclosure and designed for space saving cable routing.

1. **Analog or Digital Video Input**
The analog input is an industry-standard, 15-pin VGA connector with 3 rows of 5 pins each. The digital input is an industry standard, 29-pin DVI connector with 3 rows of 8 pins each. You must supply a high-quality cable between this connector and the video port on your computer, maximum 100 feet (30 meters) for the analog input and maximum 15 feet (4.5 meters) for the digital input.

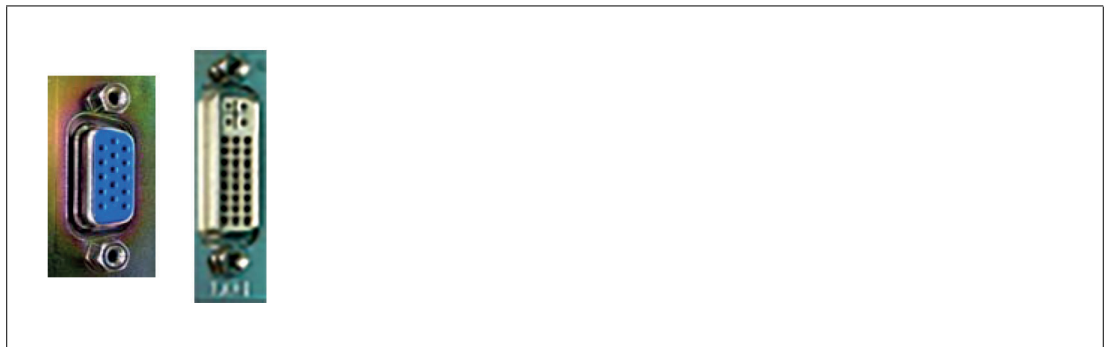Figure 10.1

2. **NTSC Video Input (option)**
This is an industry-standard, BNC connector. You must supply a coaxial cable between this connector and the live video port on your camera, video player, etc.

Figure 10.2

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3. **Serial or USB Touch Screen Output (option, choose and use only one!)**
This is an industry-standard, 9-pin, female RS-232C connector or USB 2.0 Type B connector. You must supply a cable between this connector and either a serial port or USB port on your computer. A serial cable should use all 9 wires connected straight through (not crossed) and will have a male end at the monitor and a female end at the computer. Maximum length is 50 feet (15 meters) without a repeater or modem. A USB cable will have an 'A' type and 'B' type end, maximum length 10 feet (3 meters) without a repeater or extender.
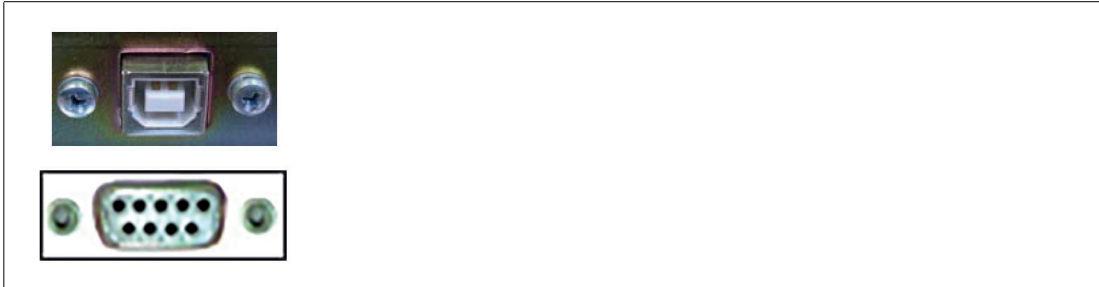
Figure 10.3

> **i** **Note**
>
> You MUST use a cable clamp to secure the USB cable to the rear case if used.

4. **Power Supply Input for 10", 12", & 15" Monitors**
An external DC supply is required for system power. If you did not purchase a supply from Pepperl+Fuchs, you should install a well-regulated supply wired to a standard 5-pin DIN connector, as shown below.

Figure 10.4

> ⚠ **Caution!**
>
> Incorrect application of power could seriously damage your monitor and is not covered under warranty.
>
> If you build your own power supply cable, we recommend you verify correct pin assignments with a meter prior to application.

> **i** **Note**
>
> The cable clamp MUST be used to maintain the hazardous rating.

Figure 10.5

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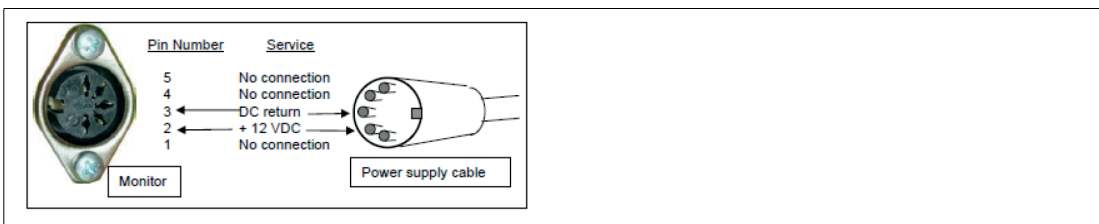
5. **Power Supply Input For 19", 21.5", and 22" Monitors**
An external 12-VDC supply is required for system power. You should connect a well-regulated supply wired as shown.

⚠ **Caution!**

Incorrect application of power could seriously damage your monitor and is not covered under warranty.

If you build your own power supply cable, we recommend you verify correct pin assignments and voltage with a meter prior to final connection.

6. Connection must only have one conductor at each terminal. Use 18 (0.823 mm2) to 14 (2.08 mm2) gauge wire and 12-inch pounds torque. Wire size for input power connection must be at minimum 14 AWG / 2.08 mm2.

Figure 10.6

ℹ **Note**

Connect +12 VDC to the terminal marked + Connect return to the terminal marked -

7.

Chassis Ground A grounding stud is located on the side. Connect a ground wire directly from this stud to earth and/or cabinet ground.
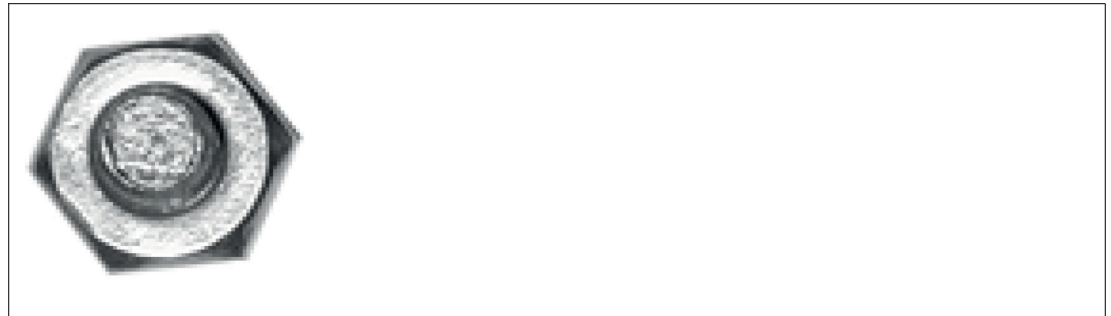
Figure 10.7

ℹ **Note**
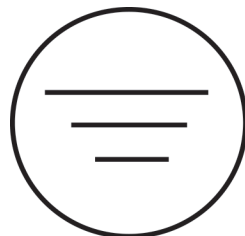
is your symbol for earth ground.

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8. **Intrinsically Safe Ground (I.S. touch screen versions only)**
Intrinsically safe circuits with zener barriers without galvanic isolation must be grounded. The cross-section of the ground connection, using a copper conductor, must be at least 12 AWG (4 mm2). For further details, see NEC 504-50 and EN 60079-14, section 12.2.4. The maintenance of these requirements prevents the occurrence of a dangerous potential with respect to ground.

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11 Touch screen Interface

Note

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The standard 5-wire resistive touch screen ("TA" option) has not been evaluated for potential damage from UV exposure. Therefore, installation is restricted against direct exposure to sunlight. Examples of acceptable installations include indoor applications away from direct sunlight; outdoor applications with shading to prevent direct sunlight; etc.

Regular inspections are necessary to check for deterioration of the touch screen. Return the VisuNet device to factory for repair or replace the VisuNet device if damage is detected.

This restriction does not include the 5-wire hardened resistive touch screen ("HR" option).

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12 Configuring the Video Software Drivers

There are no special software drivers required for your VisuNet monitor. Select a standard analog driver in your computer's software. Most reputable computer vendors supply documentation on how to configure their software drivers and hardware adapter. If you have trouble, your computer vendor should offer technical support in this area. The following parameters are most important:

10" & 12" Monitor

- Resolution 640 x 480 (VGA) or 800 x 600 (SVGA)
- Resolution 1024 x 768 at 60 Hz only (XGA) in LS12 series C and greater
- Color depth up to 18 bit / 262 K / high color (these all mean the same thing)
- Vertical refresh or scan rate 60 Hz to 75 Hz (do not use an I or interlaced driver)

15" Monitor

- Resolution 640 x 480 (VGA) or 800 x 600 (SVGA) or 1024 x 768 (XGA) {XGA is preferred}
- Resolution 1280 x 1024 at 60 Hz only (SXGA) in series D and greater
- Color depth up to 24 bit / 16.7 million / true color (these all mean the same thing)
- Vertical refresh or scan rate 60 Hz to 75 Hz (do not use an I or interlaced driver) normally 60 Hz is recommended; with LCD technology there is no benefit to higher rates

19" Monitor

- Resolution 640 x 480 (VGA) or 800 x 600 (SVGA) or 1024 x 768 (XGA) or 1280 x 1024 (SXGA) (SXGA is preferred and is the native mode)
- Color depth up to 24 bit / 16.7 million / true color (these all mean the same thing)
- Vertical refresh or scan rate 60 Hz to 75 Hz (do not use an I or interlaced driver) normally 60 Hz is recommended; with LCD technology there is no benefit to higher rates

21.5" & 22" Monitors

- 21.5" Resolution: 1920 x 1080 Full HD
- 22" Resolution: 1280 x 720 (WSXGA), 1360 x 765 (WSXGA), or 1680 x 1050 (WSXGA). WSXGA is the native mode.
- Color depth up to 24 bit / 16.7 million / true color (these all mean the same thing)
- Vertical refresh or scan rate 60 Hz to 75 Hz (do not use an I or interlaced driver) normally 60 Hz is recommended; with LCD technology there is no benefit to higher rates

Diagnostic Messages

"Video Input Lost"

Video signal to monitor is not present or has been lost. Check cables and output from computer. Be sure that computer screen saver or energy saver has not shut off video output.

"Video Input Not Valid"

Video resolution too high, or non-standard. Verify within acceptable range. Check resolution and refresh rate setting. To resolve this issue, you may have to restart your computer in "Safe Mode" in order to get video back and then change to a more acceptable resolution.

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13 Adjusting Video Image 10", 12", 15", & 19"

Pepperl+Fuchs industrial monitors work right out of the box with no further configuration or setup. However, there are quite a few image, size, and position adjustments available if necessary.

These monitors use an on-screen menu system driven by the mylar keypad on the rear of the display. Basic adjustment is accomplished via a single 'auto adjust' command. More subtle attributes may be further configured using the menu system, if desired. Generally, the auto configuration is all that is needed; unless you specifically must adjust another attribute, we recommend you do not use any feature other than the standard auto adjust. Follow these steps to perform an auto adjust.

Note

For proper position and sizing, have a graphical image on the display during configuration. Do not use an all black or DOS style text mode background.

Figure 13.1

1. Press the Menu button on the keypad. A top-level menu appears on the center of the display, superimposed over the existing computer video image.

Figure 13.2

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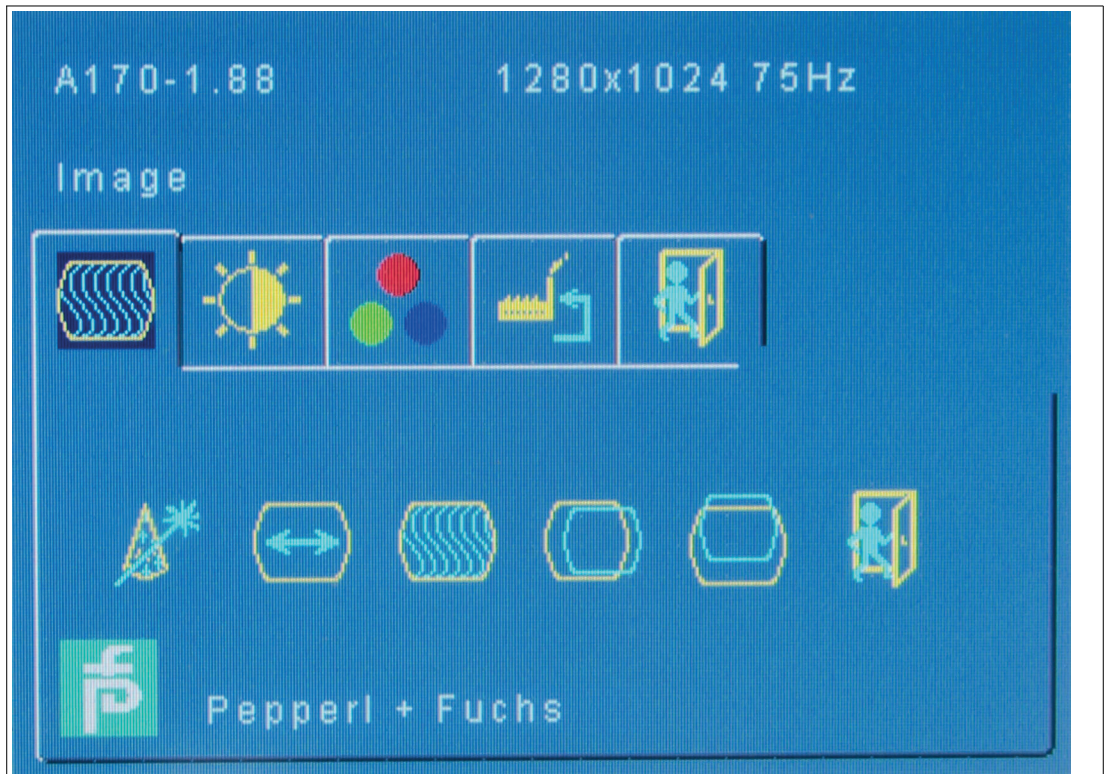
2. Press the Menu button again to enable the Image Adjust submenu.

3. Press the Menu button once again to start the Auto Adjust function.

Figure 13.3

4. The video image freezes for up to 5 seconds while sizing and positioning itself, ultimately moving to the center and filling full screen. When complete, either press Menu again at the "Smile," or do nothing and the settings are automatically stored and the menu released.

Figure 13.4

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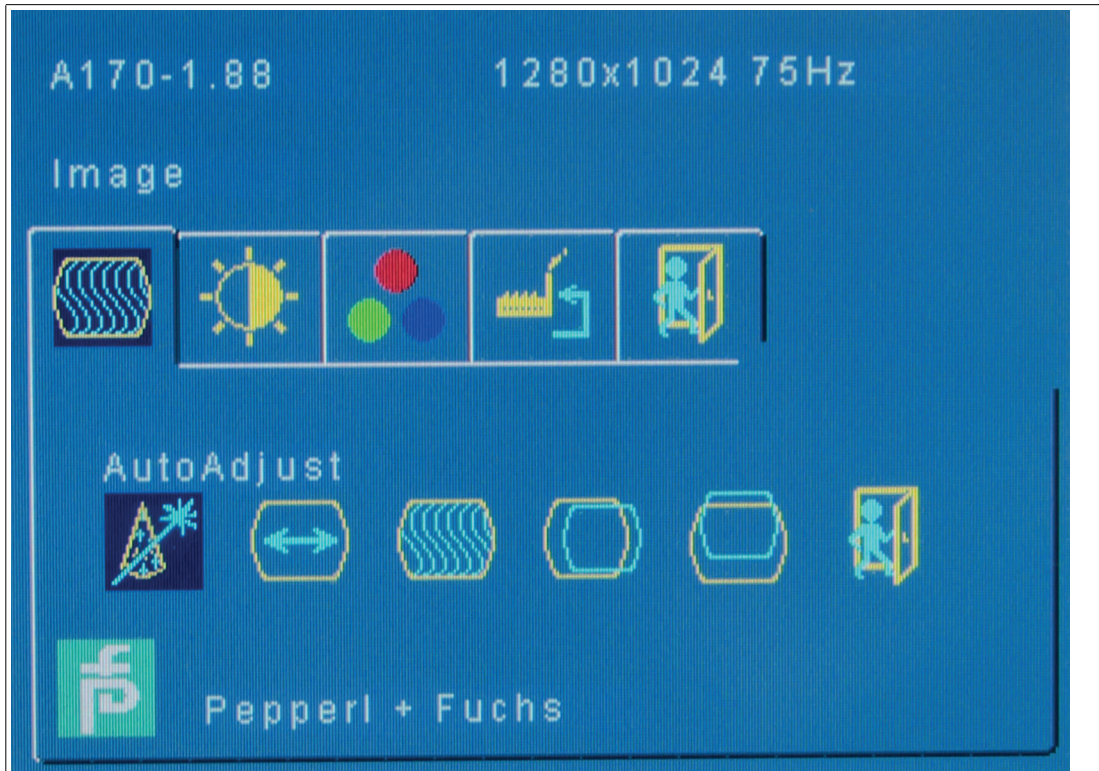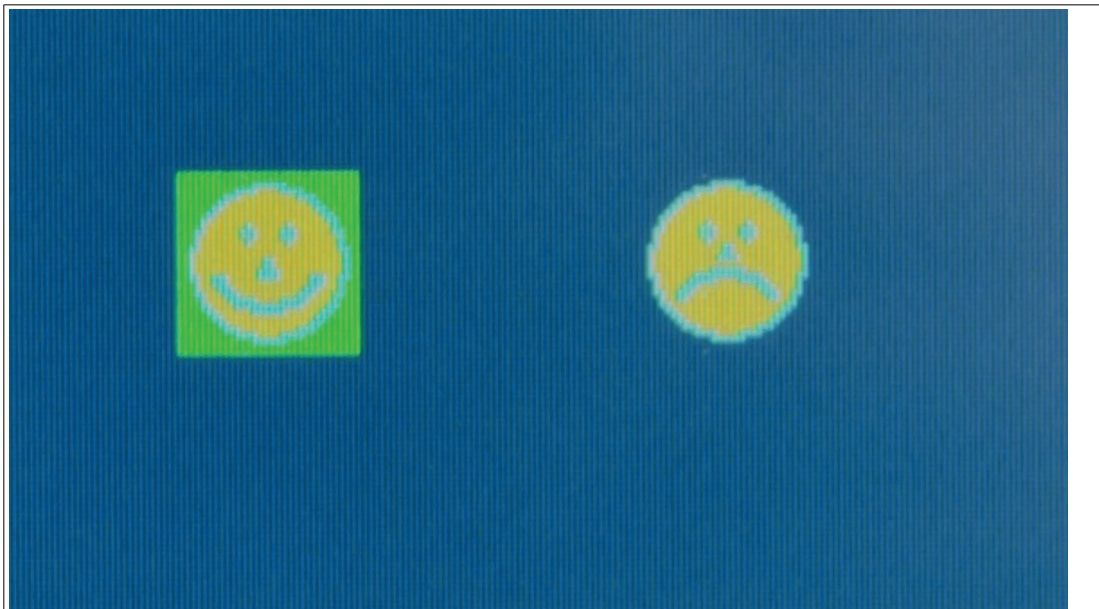**5.** If needed, when complete, move to the Save and Exit function by pressing the Select ▲ five times, and then the Menu button once.
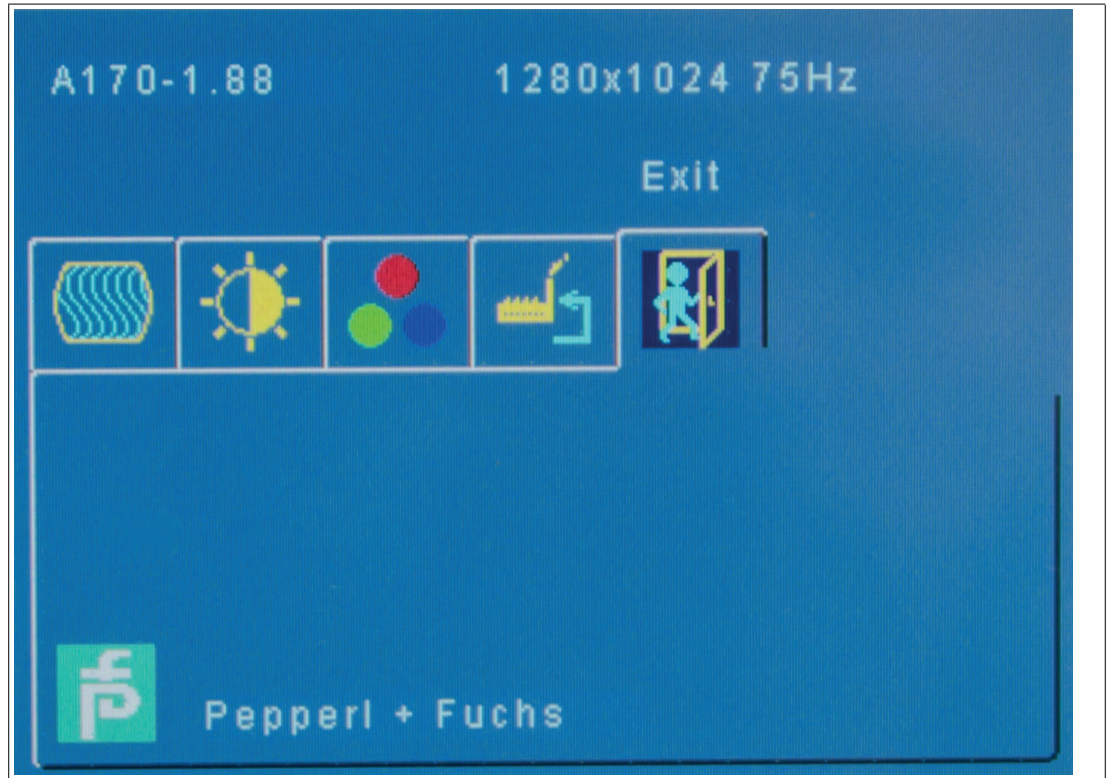

Figure 13.5

6. If you must adjust other video modes, follow the same procedure for each mode the computer operates in (such as 640 x 480).

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14 Adjusting the Video Image 21.5" & 22"

DM521 and DM522 industrial monitors automatically configure themselves at initial power up and each subsequent change in video input. So there is usually no need to perform setup or screen adjustments.

However, there are quite a few image, size, and position adjustments available if necessary.

This monitor uses an on-screen menu system driven by the mylar keypad on the rear of the display. Unless you specifically must adjust an attribute, we recommend you do not use any feature other than the standard auto configuration and factory reset.

Note

This monitor uses an on-screen menu system driven by the mylar keypad on the rear of the display. Unless you specifically must adjust an attribute, we recommend you do not use any feature other than the standard auto configuration and factory reset.

Figure 14.1

Follow these steps to perform auto configuration:

1. Press the Menu button on the keypad. A menu appears on the center of the display, superimposed over the existing computer video image.

2. Press one of the select buttons to scroll to the Display submenu.

3. Once in the Display submenu, press the Adjust ▲ button once to highlight Auto Configuration. Press the Adjust ▲ button a second time to perform Auto Configuration.

Figure 14.2

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Follow these steps to adjust brightness:

1. Press the Menu button once to make the menu appear. The Image submenu is selected by default.

2. Press the Adjust ▲ button once to highlight Brightness, and press the Adjust ▲ button a second time to select it.

3. Use the Select buttons to make adjustments.

4. To exit and save changes, press the Menu button once. The menu will disappear after a few seconds, and the changes will be saved.

Figure 14.3

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Follow these steps to select input:

1. Press the Menu button once to make the menu appear, then press a select button to scroll to the System submenu.

2. Press the Adjust ▲ button twice to select Input Select.

3. Use the select buttons to scroll through possible inputs.

4. To exit and save changes, press the Menu button once

Figure 14.4

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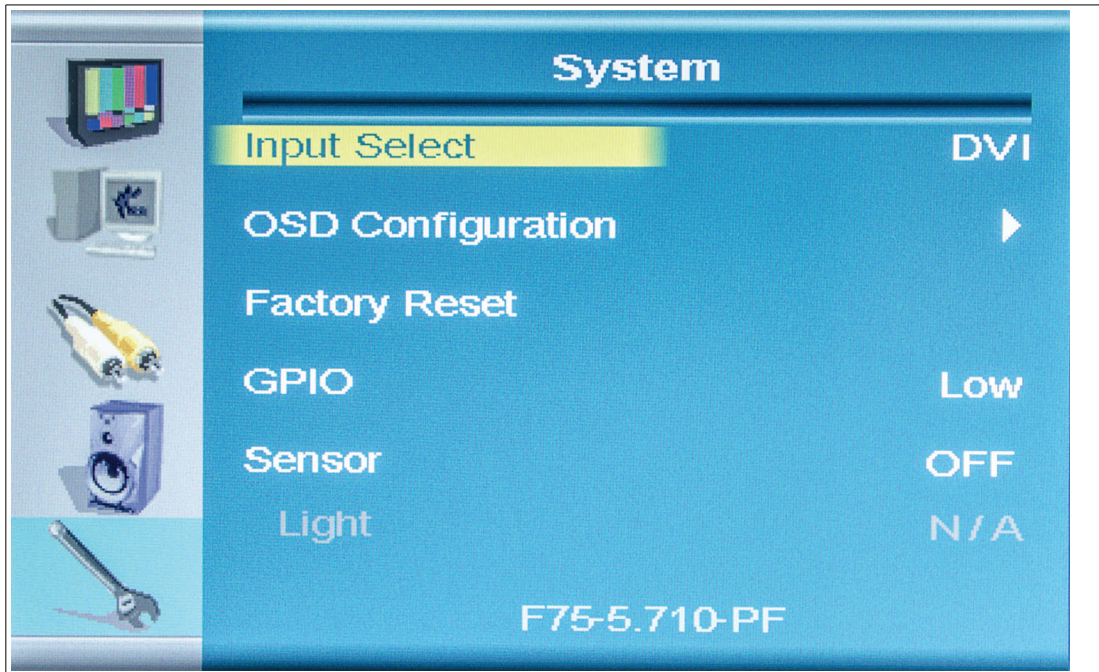**Follow these steps to perform a factory reset:**

1. Press the Menu button once, then press a select button to scroll to the System submenu.

2. Press the Adjust ▲ button once and use the select buttons to scroll to Factory Reset.

3. When Factory Reset is highlighted, press the Adjust ▲ button once.
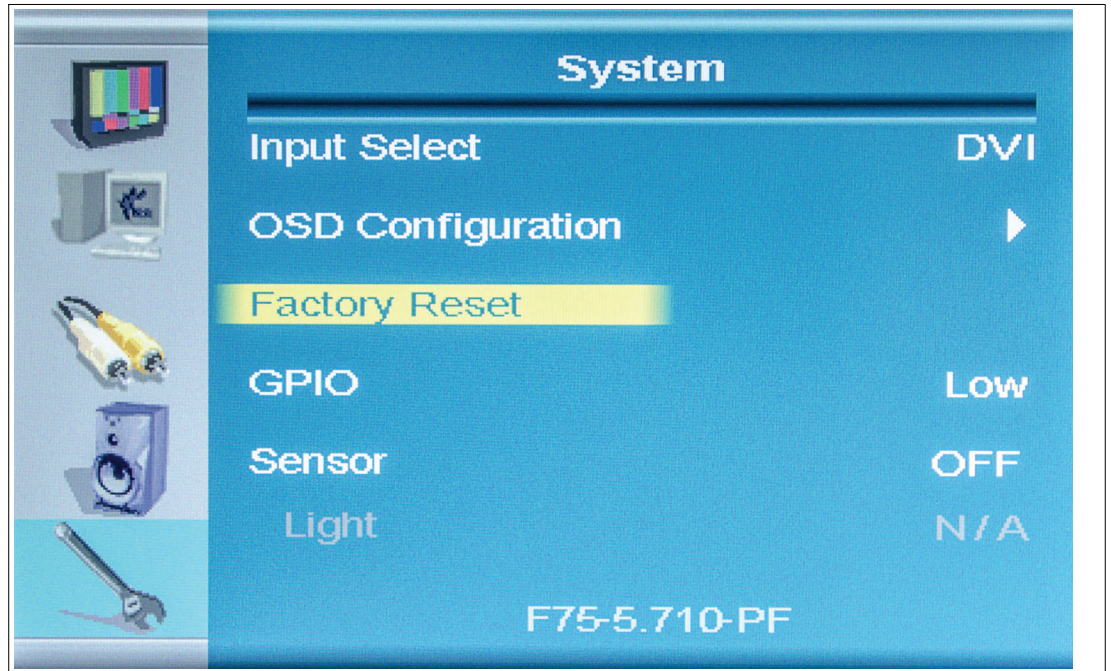

Figure 14.5

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15 Load Touch Screen Software (touch versions only)

All Pepperl+Fuchs VisuNet touch screen monitors incorporate the Elo Touch systems controllers. This includes a touch screen as the front surface of the display, an embedded controller, and software device drivers for you to install into your computer.

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Note

Some computers will automatically detect and install the device driver software for you. If so, skip to the calibration step and perform calibration.

Be sure the graphical image has been set up and is correctly positioned on the screen prior to calibrating the touch screen.

Choose and install the correct driver based on your operating system; additional instructions are located in a text file on the floppy or CD included with your monitor

You must declare and install serial or USB interface. After configuration, you can perform the standard calibration utility. You are presented multiple targets to press, then offset information is stored.

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16 Maintenance

Note

As a part of regular maintenance and depending on the operating conditions (vibration, shocks, additional load...) it is recommended to check the torques (20 Nm / 30 Nm) of the set screws (see below).
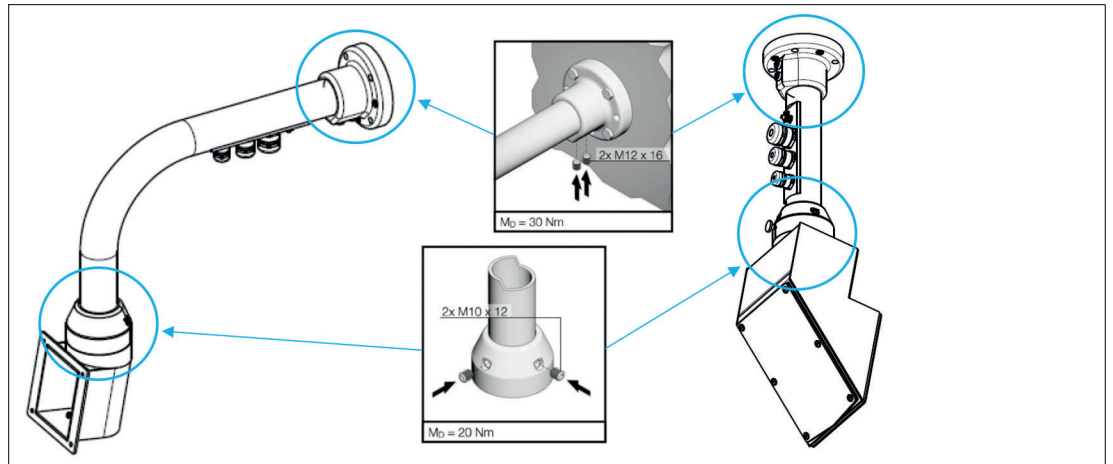

Figure 16.1   Possible wall arm constructions / applications

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17   Other Information

1. **Cleaning the Screen**

   Standard resistive touch screen models have a polyester coating over the front glass surface. Use any mild glass cleaner with a soft cloth. Do not use abrasives, as scratching would damage this surface. Capacitive, hardened resistive, and standard (non-touch screen) models have a hardened glass surface. Use any type of glass cleaner with a soft cloth. These surfaces are more resistant to scratching.

2. **Screen Saver**

   There is no functional reason or requirement to implement a screen saver. LCD technology does not "burn in" like CRT technology when a single image is displayed for a very long period of time.

3. **Energy Saver**

   The flat monitor consumes very little power, even when running. In order to conserve energy, or prolong the life of the back lamps you may implement an energy saver function in your computer. When the monitor detects the energy saver mode or loss of video signal, the back lamps power down, and the screen goes dark. Monitors automatically turn on when normal mode is reestablished in the computer.

4. **Touch Screen Activation**

   Use your finger, gloved finger, or other SOFT stylus pen. Do NOT use hard metal object like screwdriver, awl, key, knife!

Figure 17.1

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18   Troubleshooting

Error	Description
Screen is completely blank (dark)	No video signal, or computer screen saver is active, or computer energy conservation mode is active. Ensure there is power and video; try cycling power to the monitor
Slow scrolling bright and dim horizontal lines, image is stable	Power supply is not well regulated
Image is stable but shadowed and/or smeared looking and/ or random back-ground "shimmer"	"Noise" on the video lines. Recommend shorter cable or high-quality coaxial cable. If your video cable is extremely long, try remov-ing the shield at the monitor end only. This is the wire connecting the outer cable braid to the metal connector shell at the monitor side.
Image is too small, repeated on the screen vertically, and barely legible	Computer refresh rate is too fast - maximum acceptable is 75 Hz. Use non-interlaced mode.
Touch screen does not respond at all	Verify that monitor is powered prior to any startup or reboot of PC. Make sure that proper driver is installed per PC operating system and touch screen controller interface (serial or USB).
Touch screen does not line up where I press with my finger	Run touch screen calibration utility again.

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Note

If all else fails, consider a power cycle to the monitor and the computer!

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19 Contact Us

If you must contact Pepperl+Fuchs for any reason, please have the following information available:

- Product part number, series, and serial number (located on rear nameplate)
- Your name, company, and location where you are working
- A phone number where we can contact you if we must research your inquiry and call back
- The nature and urgency of your inquiry

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