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FPT-1015

User Manual

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NATIONAL INSTRUMENTS™

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Depending on where it is operated, this Class A product could be subject to restrictions in the FCC rules. (In Canada, the Department of Communications (DOC), of Industry Canada, regulates wireless interference in much the same way.) Digital electronics emit weak signals during normal operation that can affect radio, television, or other wireless products.

All Class A products display a simple warning statement of one paragraph in length regarding interference and undesired operation. The FCC rules have restrictions regarding the locations where FCC Class A products can be operated.

Consult the FCC Web site at `www.fcc.gov` for more information.

FCC/DOC Warnings

This equipment generates and uses radio frequency energy and, if not installed and used in strict accordance with the instructions in this manual and the CE marking Declaration of Conformity*, may cause interference to radio and television reception. Classification requirements are the same for the Federal Communications Commission (FCC) and the Canadian Department of Communications (DOC).

Changes or modifications not expressly approved by NI could void the user's authority to operate the equipment under the FCC Rules.

Class A

Federal Communications Commission

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user is required to correct the interference at their own expense.

Canadian Department of Communications

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

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* The CE marking Declaration of Conformity contains important supplementary information and instructions for the user or installer.

Conventions

The following conventions are used in this manual:

»	The » symbol leads you through nested menu items and dialog box options to a final action. The sequence **File»Page Setup»Options** directs you to pull down the **File** menu, select the **Page Setup** item, and select **Options** from the last dialog box.
	This icon denotes a note, which alerts you to important information.
	This icon denotes a caution, which advises you of precautions to take to avoid injury, data loss, or a system crash. When this symbol is marked on a product, refer to the *Safety* section of Appendix A, *Specifications*, for information about precautions to take.
	When symbol is marked on a product, it denotes a warning advising you to take precautions to avoid electrical shock.
	When symbol is marked on a product, it denotes a component that may be hot. Touching this component may result in bodily injury.
bold	Bold text denotes items that you must select or click in the software, such as menu items and dialog box options. Bold text also denotes parameter names.
italic	Italic text denotes variables, emphasis, a cross-reference, or an introduction to a key concept. Italic text also denotes text that is a placeholder for a word or value that you must supply.
`monospace`	Text in this font denotes text or characters that you should enter from the keyboard, sections of code, programming examples, and syntax examples. This font is also used for the proper names of disk drives, paths, directories, programs, subprograms, subroutines, device names, functions, operations, variables, filenames, and extensions.
`monospace bold`	Bold text in this font denotes the messages and responses that the computer automatically prints to the screen. This font also emphasizes lines of code that are different from the other examples.

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1

General Information

This chapter includes an overview of the FPT-1015 human machine interface (HMI).

Introduction

The FPT-1015 is a 15 in. color TFT LCD flat panel monitor for industrial applications. With the optional touchscreen, this monitor is a user-friendly system control interface and can be easily transformed into a remote control system.

In addition to its usual application as an LCD panel monitor, the FPT-1015 includes a Direct VGA control signal input, making it compatible with industrial PCs and workstations.

The onscreen display (OSD) function allows you to adjust the display and turn the backlight on and off.

The chassis is made of durable steel. The front panel is made of Al-Mg with NEMA4/IP65 compliance.

Connectors

The FPT-1015 includes the following connectors.

VGA Port (DB15)

You can connect the FPT-1015 to a system via the external 15-pin DB-15 connector.

Note Before connecting a VGA cable between the FPT-1015 and a PC, be sure the vertical frequency is within the acceptable range if you have installed an operating system on the PC. If you have not installed an operating system, adjust the vertical frequency to fall within the range.

USB Type B Touchscreen Connector

The FPT-1015 includes this connector and a touchscreen cable if a touchscreen is installed. You must connect it to the PC USB port.

DC 12 V Power In

This connector connects to the DC 12 V switching power supply.

2

Mounting

This chapter explains how to mount the FPT-1015.

Important Safety Information

Before setting up the FPT-1015, read these safety instructions carefully.

Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.

For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.

Keep this equipment away from excessive humidity.

Place this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.

The openings on the enclosure are for air convection. Protect the equipment from overheating. *Do not cover the openings.*

Make sure the power source voltage is correct before connecting the equipment to the power outlet.

Position the power cord so that it cannot be stepped on. Do not place anything over the power cord.

All cautions and warnings on the equipment should be noted.

If the equipment is not to be used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.

Never pour any liquid into an opening. This may cause fire or electrical shock.

Never open the equipment. For safety reasons, only qualified service personnel should open the equipment.

If one of the following situations arises, have service personnel check the equipment:

- The power cord or plug is damaged.
- Liquid has penetrated into the equipment.
- The equipment has been exposed to moisture.
- The equipment does not work well, or you cannot get it to work according to the user manual.
- The equipment has been dropped and damaged.
- The equipment has obvious signs of breakage.

Do not leave this equipment in an environment where the storage temperature may go below –20 °C (–4 °F) or above 60 °C (140 °F). Doing so could damage the equipment. The equipment should be in a controlled environment.



Caution There is a danger of explosion if the battery is incorrectly replaced. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

Wall Mounting

The FPT-1015 wall mounting kit is optional. As shown in Figure 2-1, screw the hook and wall-mounted brackets to the wall and attach the FPT-1015 to the bracket.

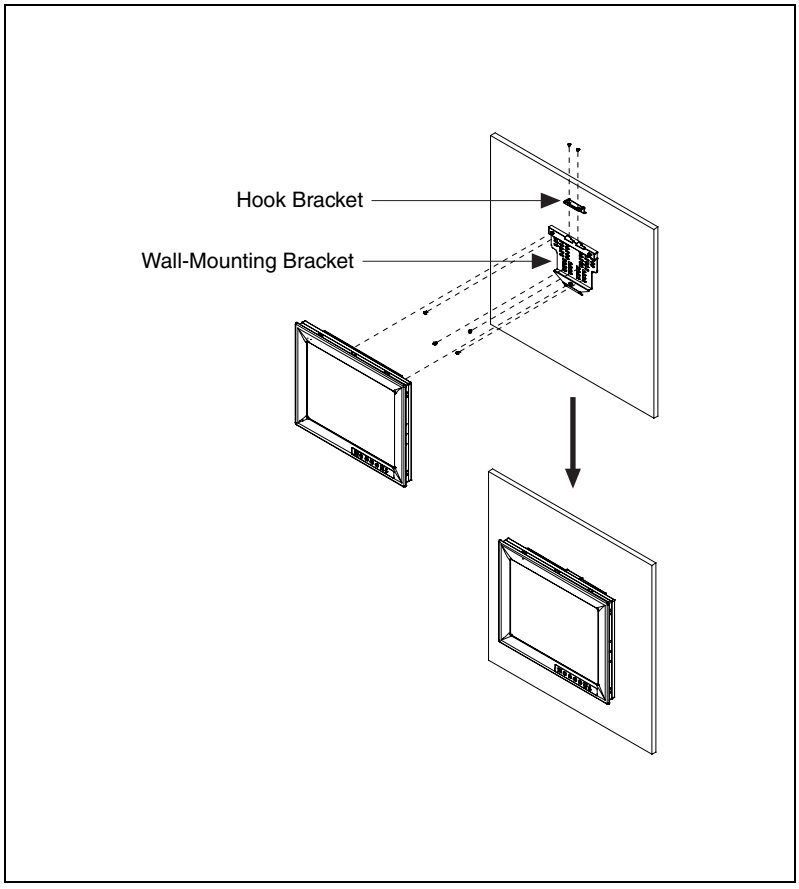


Figure 2-1. Wall Mounting

Panel Mounting

Refer to Figure 2-2 and follow these steps to install the FPT-1015 in a panel:

1. Place the panel-mounting brackets on the FPT-1015.
2. Fasten the panel-mounting brackets with the screws.
3. Insert the FPT-1015 in the panel.
4. Tighten the screws to fasten the FPT-1015 to the panel.

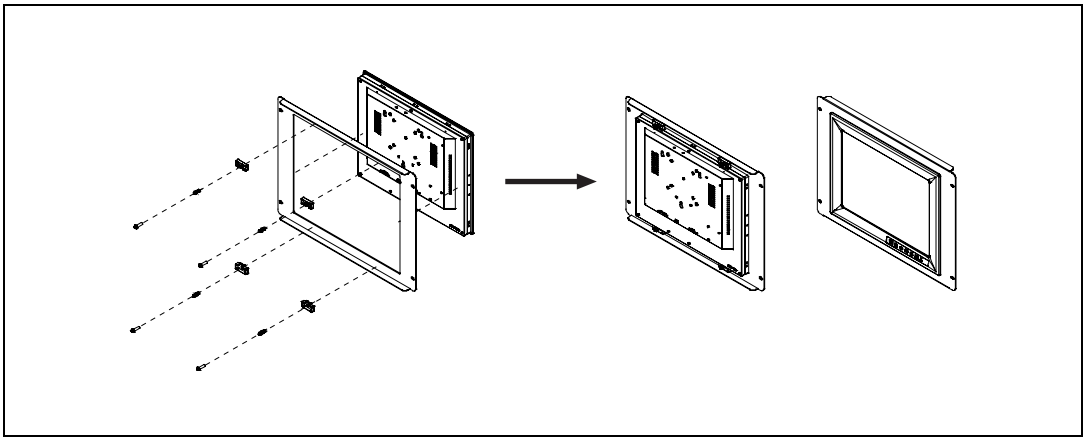


Figure 2-2. Panel Mounting

Rack Mounting

The rack mounting kit is optional. As shown in Figure 2-3, you can directly mount the FPT-1015 in a standard 19 in. rack and secure it with four screws.

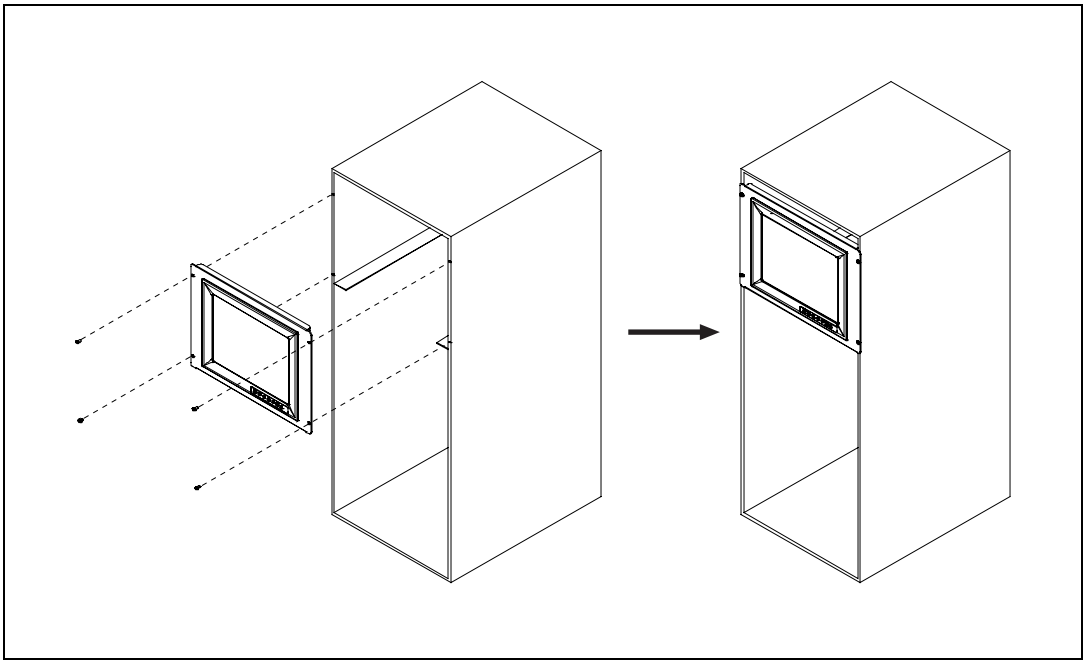


Figure 2-3. Rack Mounting

Desktop Stand Mounting

The desktop stand kit is optional. As shown in Figure 2-4, attach the desktop stand bracket to the rear of the monitor with two screws.

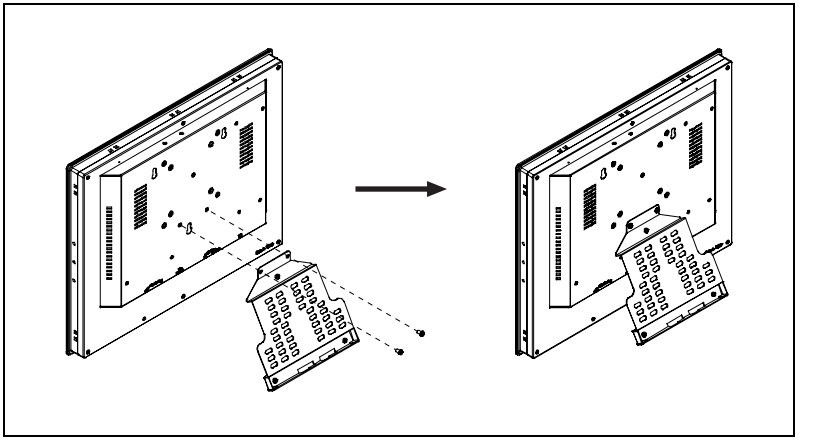


Figure 2-4. Desktop Stand Mounting

Power Adapter Mounting

Attach the power adapter bracket to the rear of the FPT-1015 monitor using four screws.

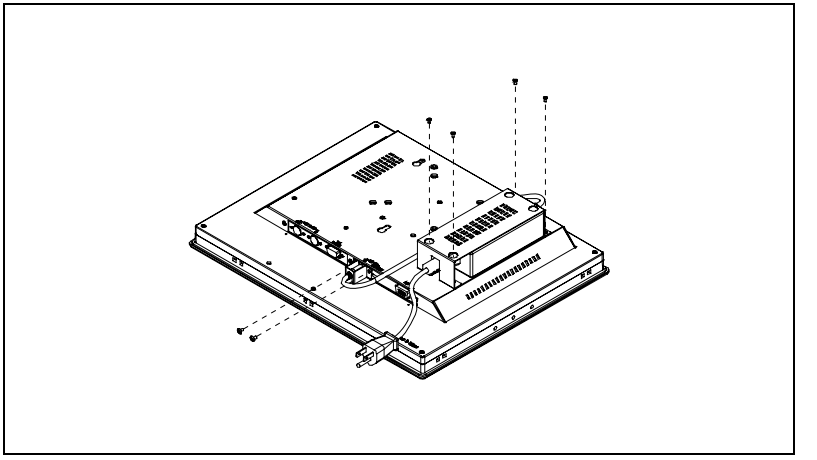


Figure 2-5. Power Adapter Mounting

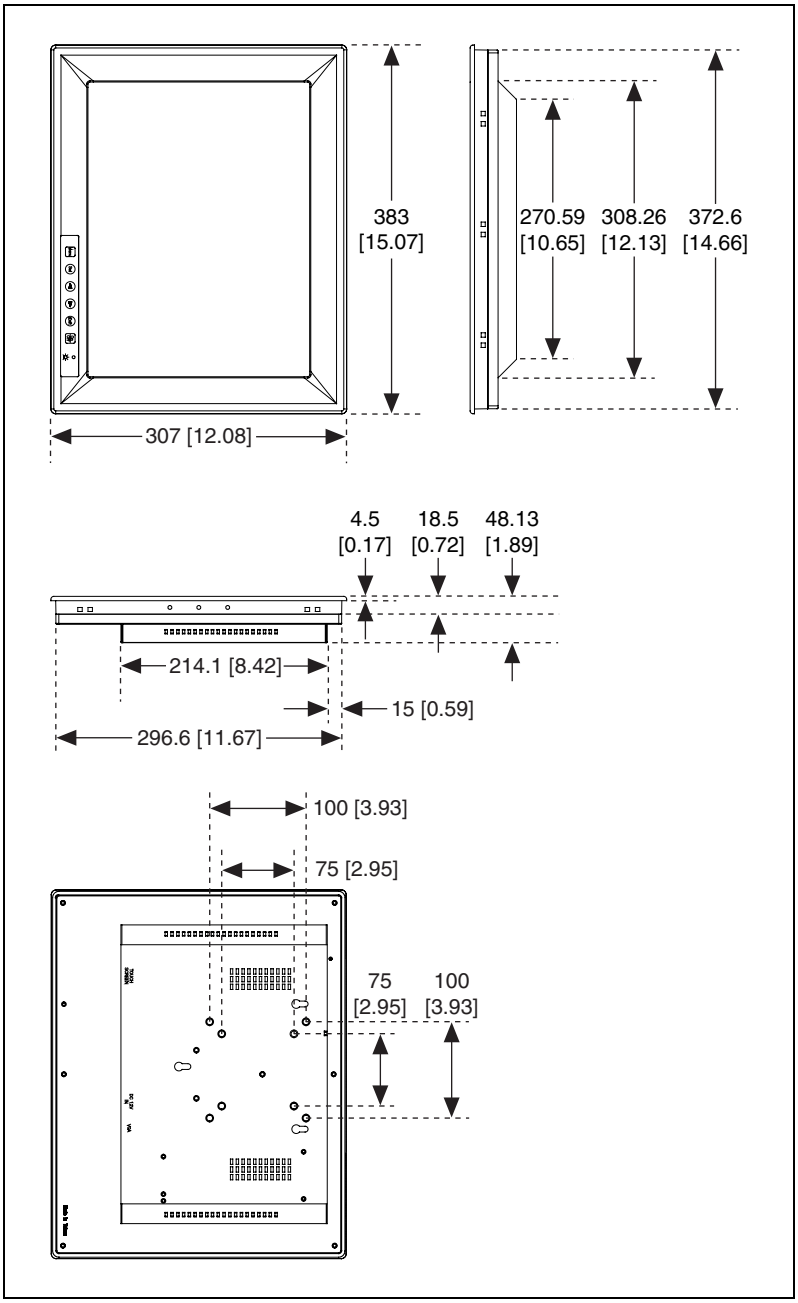
A

Specifications

Physical

Construction	Heavy-duty steel chassis
Front Panel	Al-Mg, NEMA4/IP65 compliant
Control	Onscreen display (OSD) control pad on front side
Mounting	Panel, wallmount, rackmount (with rackmount kit), desktop, or VESA arm
Cutout dimension	373.5 × 297.5 mm (14.7 in. × 11.71 in.)
Weight	4.5 kg (9.9 lb)
Vibration (operating)	5 to 17 Hz, double-amplitude displacement; 17 to 500 Hz, 1.0 G peak to peak
Power consumption	+12 V ±10% @ 2.5 A

Dimensions


383
[15.07]
270.59
[10.65]
308.26
[12.13]
372.6
[14.66]
307 [12.08]
4.5
[0.17]
18.5
[0.72]
48.13
[1.89]
214.1 [8.42]
15 [0.59]
296.6 [11.67]
100 [3.93]
75 [2.95]
75
[2.95]
100
[3.93]

Touchscreen

Type	8 wire, analog resistive
Resolution	1024 × 1024
Light transmission	75% (gouge hardness is greater than 4 H per ASTM D3363-92 for HCC01, HCG10, and HCG12)
Controller	RS232 interface or USB 1.1
OS support	Windows 9*x*/NT/2000/XP/ CE 4.2, MS-DOS
Lifespan	1 million activations (typical) at a single point with a 5/8 in. diameter silicone finger with a 350 g load at 2 touches per second
Contact bounce	<10 ms
Operating voltage	5 V (typical)
Sheet resistance	350 ± 22% Ω per square
Linearity	<1.5% full-scale linearity error in either direction
Insulation resistance	>20 MΩ @ 25 VDC
Test conditions	4 H hardness, 0.04 in. stylus pen, 350 g load
Character activation life	>100,000 characters written within a 20 × 20 mm area on the touchscreen
Chemical resistance	Hard coating is highly resistant to most solvents and chemicals
Visible light transmission	75% typical (>74% @ 550 nm test)
Clarity	Clear finish—25%; antiglare finish—15%

Sensor board .....Chemical strengthened glass with 4 H hardness standard (test condition: ASTM D3363-92A)

Ball drop test.....Able to bear a 225 g steel ball dropped from 660 mm elevation without breaking

Accelerated aging .....100 h at 60 °C/95% relative humidity

Thermal shock .....25 cycles (one cycle is 30 min. dwell alternating from –40 to 85 °C with less than 10 min. transfer time

LCD

Display type.....XGA TFT- LCD

Display size.....15 in.

Maximum colors.....262,000

Maximum resolution.....1024 × 768

Viewing angle.....140° (H), 120° (V)

Luminance 250 cd/m2

Contrast ratio .....500:1 (typical)

Lamp lifetime (MTBF).....40,000 h

Power Adapter

Maximum output power .....42 W

AC input voltage.....100 to 240 VAC, 50–60 Hz

Output voltage .....+12 V @ 3.5 A

Environmental

Maximum altitude ..... 2,000 m

Pollution Degree 2

Indoor use only

Touchscreen

Operating temperature range..... –20 to 50 °C, 2 weeks at 50 °C/90% relative humidity

Storage temperature high ..... 70 °C, 240 h at ambient humidity

Storage temperature low ..... –40 °C, continuous at ambient humidity

LCD

Operating temperature..... 0 to 50 °C (32 to 122 °F)

Storage temperature ..... –20 to 60 °C (–4 to 140 °F)

Safety

This product is designed to meet the requirements of the following standards of safety for information technology equipment:

- IEC 60950-1, EN 60950-1
- UL 60950-1, CSA 60950-1

Note For UL and other safety certifications, refer to the product label or visit `ni.com/certification`, search by model number or product line, and click the appropriate link in the Certification column.

Electromagnetic Compatibility

This product is designed to meet the requirements of the following standards of EMC for electrical equipment for measurement, control, and laboratory use:

- EN 55024, CISPR 24 EMC requirements
- EN 55022, CISPR 22 Emissions; Class A
- EN 55011, CISPR 11 Emissions; Class A
- CE, C-Tick, ICES, and FCC Part 15 Emissions; Class A

Note For EMC compliance, operate this device according to product documentation.

CE Compliance

This product meets the essential requirements of applicable European Directives, as amended for CE marking, as follows:

- 2006/95/EC; Low-Voltage Directive (safety)
- 2004/108/EEC; Electromagnetic Compatibility Directive (EMC)

Note Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain the DoC for this product, visit `ni.com/certification`, search by model number or product line, and click the appropriate link in the Certification column.

Environmental Management

National Instruments is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial not only to the environment but also to NI customers.

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Waste Electrical and Electronic Equipment (WEEE)



EU Customers At the end of their life cycle, all products *must* be sent to a WEEE recycling center. For more information about WEEE recycling centers and National Instruments WEEE initiatives, visit ni.com/environment/weee.htm.

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Mercury Disposal and Recycling

LCD lamp(s) in this monitor contain mercury. Dispose or recycle according to local, state or federal laws. Consult the Electronic Industries Alliance at www.eiae.org for more information. For specific information on lamp disposal, consult www.lamprecycle.org.

Cleaning

If you need to clean the unit, use a soft, nonmetallic brush. Make sure that the unit is completely dry and free from contaminants before returning it to service.

B

Display Timing Mode and OSD

Supported Input Timing Modes

The FPT-1015 supports and automatically recognizes the frequencies listed in Table B-1.

Table B-1. Supported Input Formats

	Vertical Frequencies				
Resolution	**56 Hz**	**60 Hz**	**70 Hz**	**72 Hz**	**75 Hz**
640 × 480	—	Yes	—	Yes	Yes
720 × 400	—	—	Yes	—	—
800 × 600	Yes	Yes	—	Yes	Yes
1024 × 768	—	Yes	Yes	—	Yes

Note Even if you use the preset timing, you may need to adjust functions such as horizontal period, CLK-delay, and display position. The adjusted values are memorized in every preset number.

Keypad Interface

Table B-2 lists key functions.

Table B-2. Key Functions

Key	Function
Auto	Executes the autoadjustment process.
Sel	Shows the OSD screen or selects an item to change its setting.
	Moves between items or increases/decreases item settings. Press both keys simultaneously to lock/unlock the current settings.
Exit	Closes the selected item or the entire OSD screen.
On/Off	Turns the FPT-1015 backlight on and off. When power is off, the power indicator blinks.

Power Indicator LED Status

The keypad interface includes a dual-color LED driver to indicate status as follows:

- Green—The board detects an input signal and sends an output signal to the LCD panel.
- Orange—No signal detected, or out of range.
- Green and blinking—The backlight is off.
- No color—Power is off.

OSD Function

Each selected OSD function value is stored into LCD memory after an SEL signal input or timeout. The stored values are not affected if the power is off. However, the selected value is not available if a selected mode is changed or power is turned off before timeout.

Table B-3 lists the OSD function menus.

Table B-3. OSD Function Menus

Main Menu	Submenu	Functionality
Brightness	—	Adjust the display brightness
Contrast	Contrast	Adjust RGB channel contrast simultaneously
Color	9300k 6500k User	Adjust selected RGB channel color
Position	H.Position	Move the input image capture window left or right
	V.Position	Move the input image capture window up or down
	Phase	Adjust the ADC sample clock phase
	Clock	Adjust the number of clocks per line
All Reset	All Reset	Reset menu parameters to factory default settings
Information	—	System input mode information and maximum range the screen supports

C

Touchscreen

This appendix explains how to install and configure the FPT-1015 touchscreen.

Introduction

The FPT-1015 touchscreen uses advanced 8-wire resistive technology, providing more accurate sensing capacity than other technologies. The touchscreen is specially designed for tough industrial environments.

Installing the Driver for Windows

The touchscreen driver is on the driver CD included with the FPT-1015. To install the driver, locate the `Windows Driver V4.1.1008` folder. Run `setup.exe` in that folder and follow the installation instructions.

Configuring the Touchscreen

After you install the touchscreen driver, the FPT-1015 automatically finds the new touchscreen controller board on rebooting. The touchscreen is connected, but not calibrated. Follow these steps to start calibration:

1. After installation and rebooting, click the PenMount Monitor **pm** icon in the menu bar and select **Control Panel**.
2. When the PenMount Control Panel appears, click **Calibrate**.

PenMount Control Panel

The PenMount Control Panel functions are Calibrate, Multiple Monitors, Setting, PenMount Rotating Functions, Tools, and About.

Calibrate

The Calibrate function includes two ways to calibrate your touchscreen. Standard calibration adjusts most touchscreens. Advanced calibration adjusts aging touchscreens.

Standard Calibration	When you click this button, arrows appear pointing to red squares. Use your finger or stylus to touch the red squares in sequence. After you touch the fifth red square, calibration is complete. To skip, press <Esc>.

Note To access the Advanced Calibration option, go to the **Tools** tab and select **Advanced Calibration**.

Advanced Calibration	Advanced calibration uses 4, 9, 16, or 25 points to effectively calibrate the linearity of aged touchscreens. Click this button and touch the red squares in sequence with a stylus. To skip, press <Esc>.

Note The older the touchscreen, the more advanced calibration points you need for accurate calibration. Use a stylus during advanced calibration for greater accuracy.

Plot Calibration Data	When you select this function, a touch panel linearity comparison graph appears after you finish advanced calibration. The blue lines show linearity before calibration, and black lines show linearity after calibration.

Multiple Monitors

The Multiple Monitors function supports two to six touchscreen displays for one system. Each monitor requires its own PenMount touchscreen control board, installed inside the display or in a central unit. You must connect the control boards to the computer COM ports via the RS232 interface. Driver installation procedures are the same as for a single monitor. Multiple Monitors supports the following modes:

- Windows Extend Monitor function
- Matrox DualHead multiscreen function
- nVidia nView function

Note The Multiple Monitors function is for multiple displays only. Do not use this function with only one touchscreen display.

Follow these steps to enable multiple displays:

1. In the **Multiple Monitors** tab, check the **Multiple Monitor Support** box.
2. Click **Map Touch Screens** to assign touch controllers to the displays.
3. When the mapping screen message appears, click **OK**.
4. Touch each screen as it displays **`Please touch this monitor`**. Following this sequence and touching each screen is called mapping the touchscreens.
5. Touching all screens completes the mapping, and the desktop reappears on the monitors.
6. Select a display and execute the Calibration function. A message to start calibration appears. Click **OK**.
7. **`Touch this screen to start its calibration`** appears on one of the screens. Touch the screen.
8. **`Touch the red square`** messages appear. Touch the red squares in sequence.
9. Continue calibration for each monitor by clicking **Standard Calibration** and touching the red squares.

Note If you use a single VGA output for multiple monitors, do not use the Multiple Monitors function. Follow the regular procedure for calibrating each monitor.

The rotating function is disabled if you use the Multiple Monitors function.

If you change the display resolution or screen address, you must map the touchscreens again so the system understands where the displays are.

Setting

Use this tab to change the configuration for specific touchscreen applications, such as point-of-sales (POS) terminals, beep settings, stabilizing cursor, and automatic station detection.

Touch Mode	Allows the enabling and disabling of the mouse's ability to drag onscreen icons. Mouse Emulation—This option allows the mouse to function normally and drag icons.

	Click on Touch—This option allows the mouse to have only a click function, and dragging is disabled.
Beep Sound Mode	Enable Beep Sound—This option turns the beep function on and off. Beep on Pen Down—In this mode, the beep occurs when the pen goes down. Beep on Pen Up—In this mode, the beep occurs when the pen goes up. Kind of Sound—This option modifies the type of sound the beep makes. Beep on Both—In this mode, the beep occurs when the pen goes down and up. Beep Frequency—This option modifies the sound frequency. Beep Duration—This option modifies the sound duration.
Cursor Stabilizer	Select this option to reduce cursor vibration, or where there maybe be excess vibration. Normally, you should not select this option.

PenMount Rotating Functions

The PenMount driver for Windows supports several display rotation software packages, such as:

- Portrait Pivot screen rotation software
- The ATI display driver rotate function
- The nVidia display driver rotate function
- The SMI display driver rotate function
- The Intel 845G/GE display driver rotate function

Configuring the Rotate Function

Follow these steps to configure the rotate function:

1. Install the rotation software package.
2. Choose the rotate function in the software. The calibration screen appears automatically. Touch the point, and rotation is mapped.

Note The rotate function is disabled if you use monitor mapping.

Tools

Draw	This option tests the touchscreen operation. The display shows touch location. Click **Draw** to start. When you touch the screen with your finger or a stylus, the drawing screen registers touch activity such as left, right, up, down, pen up, and pen down. Click **Clear Screen** to clear the drawing.
Advanced Calibration	This option enables or disables the Advanced Calibration Mode on the **Calibration** tab.
Right Button Icon	This option shows or hides the icon for switching buttons and lets you select whether the icon is in the System Tray or on the desktop.
Right Button Emulation	This option enables or disables right button emulation.

About

The About panel displays information about the PenMount controller and driver version.

PenMount Monitor Menu Icon

The PenMount Monitor icon (**pm**) appears in the Windows menu bar when you turn on PenMount Monitor in PenMount USB Utilities.

PenMount Monitor has the following functions:

Control Panel	Brings up the PenMount Control Panel.
Beep	Turns the beep on or off.
Right Button	When you select this function, a mouse icon appears. Click this icon to switch between right and left button functions.
Exit	Exits the PenMount Monitor function.

D

Technical Support and Professional Services

Visit the following sections of the National Instruments Web site at ni.com for technical support and professional services:

- **Support**—Online technical support resources at ni.com/support include the following:
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If you searched ni.com and could not find the answers you need, contact your local office or NI corporate headquarters. Phone numbers for our worldwide offices are listed at the front of this manual. You also can visit the Worldwide Offices section of ni.com/niglobal to access the branch office Web sites, which provide up-to-date contact information, support phone numbers, email addresses, and current events.

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